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Cover Photo – Opera Australia's Aida. Alexander Vinogradov as Ramfis & Stefano La Colla as Radamés. Photo courtesy Opera Australia.

Contents Photo – Technical Direction Company (TDC) projection onto the Sydney Opera House. Photo courtesy Technical Direction Company.

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Thomas Dawe

Springvale Urban Screen – Epic Engineering

by Jason Allen

A lot of ink has already been spilled about the Springvale Urban Screen in Melbourne's south-east. It's an astonishing AV installation project with some serious physical engineering from ENGIE AV Technologies, a 2.2 tonne, 6.5m by 3m LED screen in a custom frame mounted to the side of the Springvale Community Hub that cantilevers out at 45 degrees to address the surrounding civic space, complete with surround sound and remote production capabilities. Our media colleagues over at Inavate have even nominated the project as a finalist for an Inavation Award, to be handed out at ISE this year.

A huge cast of characters contributed time, effort and expertise to the project, including designer and audio visual integrator ENGIE AV Technologies, global consultancy AECOM, Ireland Brown Construction, VuePix screen provider ULA Group and audio supplier CMI Music & Audio.

With international media attention focussing on the sheer size and flexibility of the install, we talk to the project's instigator, Thomas Dawe, Media Production and Technology Coordinator at the City of Greater Dandenong and Director of Lux Consulting, about the cultural and community benefit of the project, and some of the surprising supporting technology that's integrated in the background.

Thomas Dawe's background is in broadcast integration. He started out with stalwarts Videocraft 20 years ago, before working for Melbourne's Federation Square on their huge Urban Screen, and then moving out to Dandenong Council in 2013. He's also worked on Urban Screen projects for local government entities nationally and internationally, as part of his consultancy practice.

So what is an Urban Screen anyway? "An Urban Screen is a large outdoor LED screen that is not commercially driven," explains Thomas. "It's wholly focussed on civic and community engagement. Its primary use is for cultural events, links to other sites, overflow from indoor live events, community messaging, advocacy, and film nights."

Springvale's Urban Screen joins a video network that includes another outdoor screen at Dandenong's Harmony Square, which is linked to The Drum Theatre, just across the road. With the entire Urban Screen system linked via dark fibre running around the council area, the two Urban Screens can mirror each other, take feeds from council venues as overflow, and run programmes live from The Drum Theatre.

"Council rents the fibre ring, and we have all of our services trunked on it," Thomas continues. "Our time-critical audio and video have a QoS reservation of approximately 10GB. This ensures quality signal between venues, and guarantees the crazy low latency that we enjoy. We are never hobbled by network infrastructure. Our switches are enterprise-grade HP Aruba 2900 series with 10GB links between them, and 40GB links between the venues, so we're never lacking bandwidth."

The networked video infrastructure is all NDI, run via NewTek and BirdDog hardware. "We chose NDI for its remote production functionality," illustrates Thomas. "The Mezzanine proxy format available in full bandwidth NDI means I can mix and produce shows from home over an NBN connection, and every new iteration of NDI shaves a few frames off the latency. For more hands-on live production and IMAG, we have Ross vision mixers that can take SDI inputs; we use baseband when required."

With a Crestron system offering touchscreen control from within the building, techs on-site at Springvale can also grab a tablet and go for a walk in the park, so to speak. “We can mix a show with an iPad, including both vision and audio, from within the square,” continues Thomas. “We can do lower thirds, transitions, and playback, all via the web panel control from NewTek. We have four NewTek NDI appliances, including a TC410 Tricaster in the council chamber that has a full custom web interface. Using the web interface, you can select any elected official, and the system will focus a PTZ camera to that person, pull up their mic, and mix everything to the webstream, all automatically.”

A typical use case for this flexible and powerful control is a citizenship ceremony. “For example, if there’s a ceremony in Springvale Town Hall, in just seconds we can have it routed to the public screen, giving us an instant overflow venue,” offers Thomas. “We’ve done this with shows in The Drum Theatre, sending them live to either screen. We do five or six very large events a year, and many smaller activations. Harmony Square and the surrounding streets and public spaces can hold 14,000 people for New Year’s Eve, so it’s very handy having such a large outdoor space we can broadcast to, especially if you consider COVID restrictions.”

Audio follows video, and the Council’s network features an all-Dante implementation across venues and hardware. A Q-SYS DSP core 510i sits at the heart of the Springvale install, and all venues use Dante-enabled Yamaha QL or CL digital mixers and their Dante stageboxes. A rackmounted Yamaha QL-1 is available to move between Dandenong and Springvale, and can go to The Drum Theatre to augment their flagship Yamaha PM5 Rivage if necessary.

Flanking the Urban Screen in Springvale, you’ll find modular Fohhn Focus FMI-100 and FMI-400 beam steerable column speakers. The FMI-100s provide highs, with eight 1” drivers, and the FMI-400s provide highs and lows, running 32 4” drivers, extending frequency response down to 60 Hz.

While Thomas and consultants AECOM originally preferred a compact line array solution for the left-right PA, it became clear that the tiny amount of space available each side of the screen ruled that option out. Fohhn distributor CMI’s technical staff designed the solution. “The Fohhn product fit the bill and was able to be integrated into the 800mm depth we had to play with,” relates Thomas. “The fact that they are beam steered meant we could mount them in the space we had available and still get the coverage right. Residential is pretty close, and that’s another benefit to having that controllability. We considered supplementing the system with a portable LF unit on wheels, but the FMI-400s go pretty low and they absolutely hammer!”

Another nice addition from Fohhn are the eight AT-221W all-weather 10” and horn loudspeakers mounted on poles around the square. “The lighting poles the AT-221Ws are mounted on also contain fibre with Neutrik terminations, coax, Cat6, and cameras,” adds Thomas. “There’s all the services we can access when doing outdoor events. The discrete feeds to the AT-221Ws means we can run proper 5.1 on movie nights.”

And finally, the large and obvious elephant in the room; the large outdoor screen chosen carefully and mounted by ENGIE AV Technoloiges is made of VuePix ER3 LED with a 3.9mm pixel pitch. “VuePix is supported by ULA Group in Australia, which is a requirement for government procurement, but also means we can go and see them here in Melbourne,” concludes Thomas. “Not only are VuePix products widely used, such as at the Melbourne Convention and Exhibition Centre, they’re a hyperfine pitch, can face into the Australian north sun and drive at 5000 nits, providing a full daylight readable image.” Like everything else about this project, that’s absolutely epic.

Michael Pfundt and Anthony Murdoch

MCEC is Open for Business with Shure Axient Digital

The Melbourne Convention and Exhibition Centre (MCEC) has come out of Melbourne's extended lockdown of 2020 with renewed technology, facilities, and passion for live events. Last November, MCEC re-started the massive project to extend and upgrade their already formidable wireless microphone and IEM systems, and chose to do so with fully networked Shure Axient Digital systems.

"Radio mics are one of the most used pieces of equipment at MCEC," explains Audio Specialist Michael Pfundt. "On a normal pre-Covid day, we could be running anywhere up to 150 channels of mics and a few IEMs. On big days, we could be coordinating up to 230 channels. Even with the slowdown of Covid, we haven't seen any decrease in the amount of radio mics required for upcoming events. We previously had 160 channels of mics in house, plus eight channels of IEMs. I ideally wanted to get us up to around 220 channels in-house with a few more IEMs to give us the capacity to deal with future growth."

With bandwidth getting maxxed out and RF administration becoming more and more complex, Shure Axient Digital offers the tools venues like the MCEC need – advanced spectrum management, remote control and monitoring, plus both High Density and Quadversity modes for more channels in a smaller space, or guaranteed reliability over a wide area.

"We were starting to max out our bandwidth with our previous equipment," continues Michael. "It was making it difficult to accommodate the large amount of external RF equipment that we often host in the buildings. Also, knowing that further reductions in available bandwidth are likely in the future, I wanted to ensure we were ready to deal with a more limited RF environment. On top of that, the features offered by Shure Axient Digital were really attractive."

With the seed of the RF upgrade sown back in 2018, Scott Jamieson, Media and Entertainment Sales Executive at Soundcorp, A Diversified Company, was involved in the project from early on. "We'd supplied Shure UHF-R systems to the MCEC as part of the Digital Dividend process years ago, and we've been part of the conversation as Michael and the team started thinking about the future," relays Scott. "MCEC have a really good understanding of what they wanted to achieve, and Shure Axient Digital fitted that perfectly. While this upgrade was delayed by the pandemic, it was amazing to see how quickly MCEC re-opened, got back up to speed, and started improving the venue again. In late November, they went back out to competitive tender, we applied successfully, then they called and said they're ready to go."

The rollout includes a large number of AD4Q four channel receivers and AD4D two channel receivers. These are fed by ADX1 bodypack transmitters and ADX2 and ADX2FD handheld transmitters. MCEC has racked up their networked AD4Qs, AXT600 Spectrum Managers, AD610 Showlink Access Points, UA845UWB Antenna Distributors, and SBC240 networked docking chargers, ready to roll in wherever they're needed.

The AXT600 Spectrum Managers and the AD610 Showlink Access Points are where the magic really happens. In addition to constantly scanning the RF environment and deploying the best frequencies to Axient transmitters and receivers, the AXT600 also automatically ranks a live list of backup frequencies and can deploy them instantly if interference strikes. The AD610 Showlink Access Points enable real-time remote control of ShowLink-enabled ADX and AXT transmitters, giving sound operators the ability to change transmitter settings including gain and frequency without touching the hardware or interrupting the show.

The AXT600s have certainly made the tech teams' day-to-day easier. "We're quite lucky; the design of the building is something of a natural deterrent for external RF," observes Michael. "But occasionally we've had some interference from nearby venues. Our biggest issue has been accommodating large amounts of RF from external companies when we were already flat out."

On delivery to the venue, Shure distributor Jand's local Business Development Manager Anthony Murdoch joined Scott Jamieson on-site to personally install new firmware on the entire fleet as the MCEC went through its asset management process. "That was definitely a big #firmewarefriday," relates Scott. "What's great is that it's all networked now; the receivers, chargers, spectrum management and everything else. The next firmware update will just get pushed out over the network with the click of a mouse."

All Axient Digital units at the MCEC are controlled and monitored across the network via Shure's Wireless Workbench 6 software, giving techs access to every piece of gear, building wide. Even the charge status of the batteries in the networked SBC240 chargers can be viewed remotely. Audio signal is also distributed digitally, and the whole system ties in with the MCEC's existing AMX control system.

With the network capabilities taking care of business behind the scenes invisible to the MCEC's clients, their experience of Shure Axient Digital is all in the transmitters and exceptional audio clarity. "We needed a wireless product that was straightforward enough to be handled by our large technical team, and would also meet the expectations of all of our clients," states Michael. "Shure Axient Digital ticks both of those boxes. The robustness of the units and the feature package that comes with the AD and ADX transmitters is really attractive, and the ability for them to easily integrate into our existing systems was a win."

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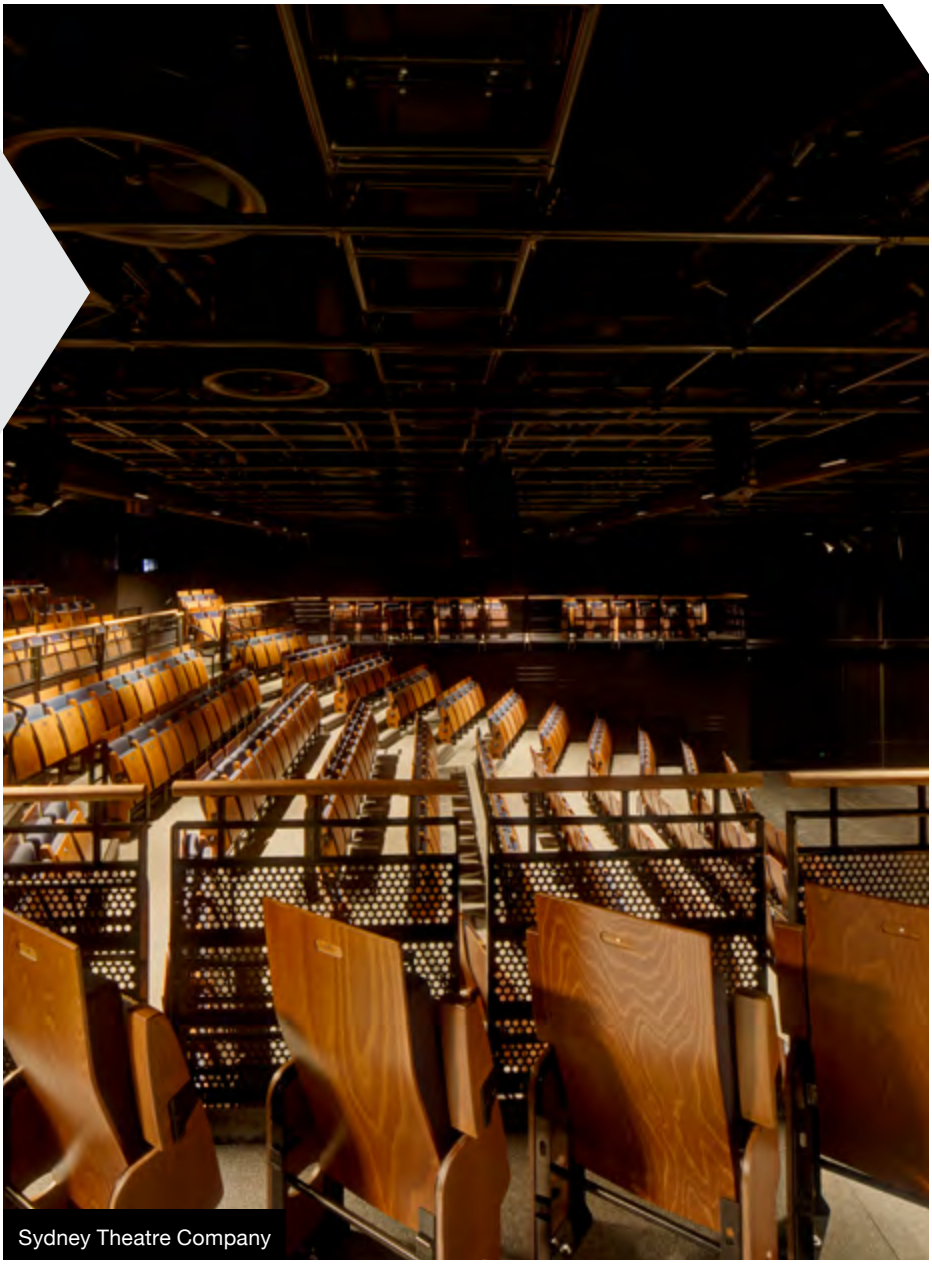
Meyer Sound ULTRA-X Loudspeakers and Spacemap Go Debut at Rejuvenated Sydney Theatre Company


Sydney Theatre Company

Sydney Theatre Company (STC) has reopened its home venue, The Wharf, at Walsh Bay in Sydney, following a two-year closure for a total renovation. A highlight of the complete technical upgrade was the installation of 32 new Meyer Sound loudspeakers, largely drawn from the company's new ULTRA-X series.

The system was designed by Bob McCarthy and Josh Dorn-Fehrmann to implement Spacemap Go, Meyer Sound's new tool for spatial sound design and live mixing. When it opened in late February, STC's production of Playing Beatie Bow became one of the world's first theatrical productions to use dynamic spatial effects provided by the new technology based on the GALAXY Network Platform utilizing Milan and a new iPad user interface.

For the theatre's Sound and Video Manager Ben Lightowlers, selection of the right solution was critical, so the venue chose to retain complete control of the PA budget, from specification all the way through to installation. The system renewal was a logical extension of a decades-long relationship with Meyer Sound.

"We did explore options from other manufacturers," he says, "but over the years we've been happy with the UPJ and UPM loudspeakers, which we could easily integrate into the new systems. More importantly, we were very impressed with the new ULTRA-X loudspeakers. They are excellent for vocal clarity, which is paramount as the dialogue must be out front. But they are also exceptional for music."

The flexibility and scalability of Spacemap Go enable the system to be easily reconfigured to accommodate the 420-seat Wharf 1 Theatre's different seating configurations, including end-on, L-shape and in-the-round as well as sound effect source locations specific to a particular production. Systems were supplied by Soundcorp, A Diversified Company. In any configuration, sound designers can easily leverage the spatial sound potentials of Spacemap Go.

"When Spacemap Go came along during this renewal project, it was exciting to have that added dimension," says Lightowlers. "I'm responsible for assuring our sound designers have access to a system that will afford them full creative potential. You don't want them to think too much about the system itself, so they can focus on their art and what they want to communicate with sound. The fact that you can control Spacemap Go from QLab via OSC made the Meyer Sound solution an easy sell."

David Bergman, the sound designer for Playing Beatie Bow, was the first to leverage the power of the new technology, allocating up to 20 outputs from QLab as direct objects for Spacemap Go.

"The composer, Clemence Williams, and I have been loving the way we can run various trajectories throughout the show," he says. "Some trajectories are doing slow circles around the audience while some randomly zig-zag. It's been great to move around sounds like wind, reverbs, and solo instruments that otherwise would be static. I love how democratic it makes the show. No one misses out and every show will feel slightly different, even from the same seat!"

Spacemap Go was introduced only after Bergman's sound design already was well underway, but going forward he expects to rethink dynamic sound possibilities from the outset. "We have just started exploring the capabilities. The next time I would love to build more specific spacemaps and trajectories, with more intricate recalls from QLab," he says.

For the theatre's Ben Lightowlers, the debut performance of the new system was a promising sign. "It's exciting to have a new system that is one coherent palette and have it backed by outstanding support. Some companies will sell you the boxes and then you are on your own, but that is absolutely not the case with Meyer Sound. The ongoing support, especially regarding additional configuration setups, has been outstanding."

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Sea World Resort


Thea Jeanes-Cochrane

Australian Festival Industry Conference Releases 2021 Program

The Australian Festival Industry Conference (AFIC) has unveiled its 2021 program.

The conference, which will run across 1 - 3 September 2021 at Sea World Resort, has expanded its program to 2.5 days (up from 1.5 in 2019) and includes:

- A number of keynote and informative presentations
- Two panel discussions covering the timely topics of 'Covid-19 Site Planning & Safety' and 'The Future of Streaming, Content-on-demand & Broadcast'
- Two evening networking events
- Workshops
- Trade show
- Gold Coast familiarisation tour of local event venues

Thea Jeanes-Cochrane joins the line-up as AFIC's second keynote speaker.

Thea will deliver a presentation on the industry's response to the pandemic and how COVID-19 has permanently altered both the event organiser's approach to producing festivals, and patrons' expectations of the festival experience, from both an in-real-life and digital viewpoint.

As the Director of Cochrane Entertainment, Thea is a leading originator in entertainment projects and touring exhibitions for globally renowned clients. She has helped generate well in excess of $20 million in ticket revenues across her 20+ year career. Among her achievements has been producing the City of Gold Coast's formal bid which secured the 2018 Commonwealth Games. She is currently a board member of the Gold Coast's Home of the Arts precinct and MotorSport Australia.

"I'm delighted to be announced as a keynote speaker of the Australian Festival Industry Conference in 2021. 2020 was such a devastating, standstill year for our industry and the challenges of the 'pandemic effect' will continue into the immediate and foreseeable future. AFIC is a great forum to unite industry, a platform to deliver insights and learnings through shared conversation. I would encourage anyone from the industry to attend this year's conference" said Mrs Jeanes-Cochrane.

Additional speakers to be added to the line-up include:

- Stephen Galbraith, General Manager, Royal Queensland Show-Ekka & RNA Showgrounds
- Rob Raulings, Director, Ferve Tickets
- George Hedon, CEO and Founder, Pause Fest
- Jeremy Fleming, Managing Director and Co-Founder, Stagekings & IsoKing
- Linda Tillman, Managing Director, Tilma Group & rEvents Academy
- Morwenna Collett, Senior Arts Consultant (specialising in diversity, access and inclusion)

They join the existing line-up, comprising of:

- Ulrich Schrauth, Founder and Artistic Director, VRHAM! Festival (the world's first virtual reality festival, held in Germany)
- Jan McCormick, CEO, Major Events Gold Coast
- Dr Jamie Ranse, Founder, Mass Gatherings Collaboration, Griffith University
- Cameron Little, Vice President, Sustainable Event Alliance
- Gill Minervini, Festival Director of Vivid Sydney and Director of Gill Minervini Creative
- Jon Corbishley (JC), President of the Event Safety Alliance (AU Chapter) and Director of The Safety Officer Pty Ltd
- Garry O'Dell, PhD Researcher, The University of Newcastle
- Dylan Lewis, Double J (AFIC's Master of Ceremonies)

Founder and event director of AFIC, Carlina Ericson, says she is delighted to be releasing AFIC's full program.

"I'm so excited to see the return of AFIC in 2021! Since the event was cancelled in 2020 due to the pandemic, it's vital that this year happens" says Ms Ericson.

AFIC's 2021 program will cover the following topics:

- (Keynote) How the Pandemic has Changed Us
- (Keynote) Future Opportunities for Virtual Reality Use
- (Panel Discussion) Covid-19 Site Planning & Safety for Festivals
- (Panel Discussion) The Future of Streaming, Content-on-demand & Broadcast
- Approaches to Festival Regulation in NSW – a PhD Study
- The Future of Festivals is Inclusive
- ***Follow up workshop: Building an Accessibility Plan***
- The Future of Sustainable Best-Practice in Festivals & Major Events
- Igniting Your Festival's Creative Program
- Leadership in a Crisis
- Major Events Gold Coast: Launching a Major Event Organisation during Covid-19
- Managing Your Festival's Revenue Streams

- Follow up workshop: Grant Writing 101

"After such a devastating year in 2020, I want to see the industry recover and grow!" says Ms Ericson.

"AFIC is critical to this happening and it presents each of us with an array of educational, economic, social, and even psychological benefits. In reality, AFIC's positive impacts are bigger than each of us put together.

"When I visited the Gold Coast last week for our first regional networking event, I met a range of people from all corners of the industry. By the end of the evening, people walked away feeling informed about this year's conference, but even better than that, they were excited for it! They were excited about the idea of learning and having the chance to connect with other like-minded people in the industry from all across the country. A chance to converse and share stories about how devastating 2020 was. People need this, and they want it too!" says Ms Ericson.

The conference is also a unique opportunity for suppliers from all across the country to get in front of some of the country's top festival decision-makers. AFIC is approved under Austrade's 'Business Events Grant Program' which allows potential sponsors or exhibitors to apply for a 50% reimbursement of their associated costs through the Federal Government. The deadline for applications has been extended to 30 June 2021.

A further cost saving for delegates is the Federal Government's half-price airline ticket program which will run until 30 September 2021. Those who are intending to fly from most major capital cities to the Gold Coast can access the discount. AFIC recommends contacting its dedicated travel agent (details can be found on the website). The discount acts a prime incentive for delegates to extend their stay and explore the destination's many attractions; from pristine beaches, to quality restaurants, to its various theme parks, and of course, its many spectacular major events and festivals!

"I would encourage everyone to take advantage of these limited time Government incentives that are designed to kick-start the national economy" says Ms Ericson.

This year's event will be crucial to the industry's post-covid-19 economic recovery and I look forward to welcoming everyone back once again!"

The final round of early bird tickets closes at 5:00pm (AEST), 31 May 2021.

To view the full program and for more information on the event, visit:

www.australianfestivalconference.com.au

AFIC

Astera for Lamborghini Huracán STO Launch

Photos: Matt van Daalen

Twenty-four Astera AX1 Tubes – high-quality wireless LED luminaires – were utilised by lighting designer Michael Negrao from event technical specialist Scene Change in Brisbane at the Australian launch event for the new Lamborghini Huracán STO (Super Trofeo Omologata).

Staged at Lamborghini's Brisbane dealership in Fortitude Valley, the streamlined and elegant racing-inspired Huracán STO, designed for ultimate driving fun on track and road, was the centre of attention.

With its 5.2 litre V10 nat-asp engine, extreme aerodynamics, super-sculpted 75% carbon fibre body including dramatic rear wing, LDVI control, CCMR braking technology and rocket-like 0-60 mph in 3 seconds, it was only fitting that Michael chose to match its amazing design and performance spec with the quality illumination from Astera.

The STO "hero car" in striking blue and orange marque, was always going to be the event's focus. However, with clients and guests also very important, a range of other fabulous Lamborghinis in residence for the night needed highlighting as their owners parked up, so these were lit to provide multiple Instagram moments for guests to happy snap themselves amidst an array of vehicular art.

Michael received a "high-level" brief from his client relating to the mood and ambience they wanted to achieve, inside and out of the premises. Michael's wealth of experience in lighting automotive events meant he was given free rein to design what he felt appropriate.

Twelve vertical Astera AX1s were positioned around the car park on stands at the corners of each car space. Another six were under the Huracán STO itself in the showroom and the remaining six positioned around the DJ booth.

The AX1s in the car park brought a "smart and futuristic" look to the space explained Michael, and the tubes also gave the impression that some cool intelligence was at work.

Empty spaces were denoted by AX1s set to a warm white, and as guests parked up, the Titan colour was changed to match the colour of their car – a touch of fun with which everyone could engage.

Once the STO was revealed, all the car park AX1s flipped into alternating blue and orange to match the hero car colour scheme.

The AX1s under the STO were used in conjunction with moving lights and other fixtures on Michael's showroom lighting rig for the reveal. They provided a sub-car glow effect accentuating the accumulating smoke from the fogger placed at the back of the car for the start of the sequence, then became part of a combined strobing effect during the reveal build up, switching to a cool-white post reveal under-car wash for the rest of the evening.

The AX1s surrounding the DJ booth were set to produce random effects before the reveal segued into a slow blue and orange fade chase afterwards.

The car park AX1s were controlled via AsteraApp on a tablet, with the colour wheel selector proving "very handy" for quick selection of the car colours as they parked up.

The other units were run via a grandMA Dot2 and wireless DMX. All kit was supplied by Scene Change Brisbane.

"Portability and wireless operation were perfect for this application as cable management would have been a nightmare," stated Michael, adding the AX1 markers in the car park were a novel and well-received surprise.

Battery power was also extremely useful for this project as the dealership had only four 20A circuits of power available for production, and that was needed to power a 10K laser projector and an expresso machine, without which no self-respecting Italian car distributor would be taken seriously!

"Using AX1s in all these locations was critical to getting the right look, tone and feel for this stylish and exclusive event," reiterated Michael.

He uses Astera products a lot in his work, and they are a 'go-to' for automotive shows due to their flexibility, wireless control, and colour range. The plastic construction also means they can be positioned close to expensive vehicles without worrying about any damage potential!

"I'm a big Astera fan," Michael commented. Having used Astera AX3 LightDrops, AX10 SpotMaxs and Titan Tubes extensively in his previous roles on the Queensland festival scene, when he joined Scene Change Brisbane permanently in 2018, he convinced them to invest in AX1s – supplied by Astera's Australia and New Zealand distributor ULA Group – which he now uses "on virtually every job!"

For the next project, he is employing 96 AX1s split beneath a Plexiglas floor and rigged on a custom shaped frame flown above the car!


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Anolis at Auckland Sky Tower

The iconic 328-metre-tall Sky Tower in downtown Auckland has had its grace and elegance further enhanced with an Anolis - a Robe business – lighting installation comprising 154 Divine 72 LED fixtures.

The high-profile landmark is also a vital telecommunications hub and a popular observation point sitting at the heart of and presiding over this vibrant metropolis.

The lighting design was created by Richard Bracebridge and Sam Walle from Light Works Ltd. Technical specification, installation and systems integration were the work of Nick Abel from LS Group, with lighting fixtures supplied through Anolis' New Zealand and Australian distributor, Jands.

Light Works has been involved with lighting the Tower since 2007 when it was first re-lit following the original metal halide installation which dated back to 1996 whilst it was under construction.

The 2007 floodlighting involved re-lighting the shaft, utilising positions on top of some conveniently located bus shelters along Federal and Victoria Streets below, and upgrading the upper part of the tower and mast using the best quality RGB LED floodlights available at the time.

Forward 11 years, and by 2018 the installation was unsurprisingly looking patchy and dated, and in that time, LED technology had advanced dramatically, becoming brighter, more efficient, hugely more effective, and better value.

The team faced several challenges, starting with the ongoing city centre and waterfront regeneration project, which saw the removal of the bus shelters and the installation of some sculptural artworks around the base of the Tower.

While these did offer up some 'top space' for mast illumination lighting positions, the footprint was vastly reduced, and not in optimum positions for effectively lighting the shaft section.

Lighting real estate on the 'shaft' for fixtures to highlight the top section was even more at a premium, as any fixtures had to share the space with a forest of communications equipment including FM radio transmitters, local and national TV satellites and broadcasting kit, wireless internet hubs, cell phone hubs, weather monitoring and laser links.

So, size and space criteria initially informed the choice of fixtures for both top and bottom elements of the tower. The Anolis Divine 72s, which had just been launched at the start of the project, were selected for these and several other reasons.

The signature colour was white, so they needed to produce a proper crisp white with the smoothest and most even coverage.

The size and shape of the fixtures made the Divine 72s ideal for fixing on the top of the street level sculptures, with 96 units sitting on top of the three building locations and a single column "artwork" at the base of the Tower.

Sixty Divine 72s are deployed around the Tower's top section, ensconced between the various communications elements.

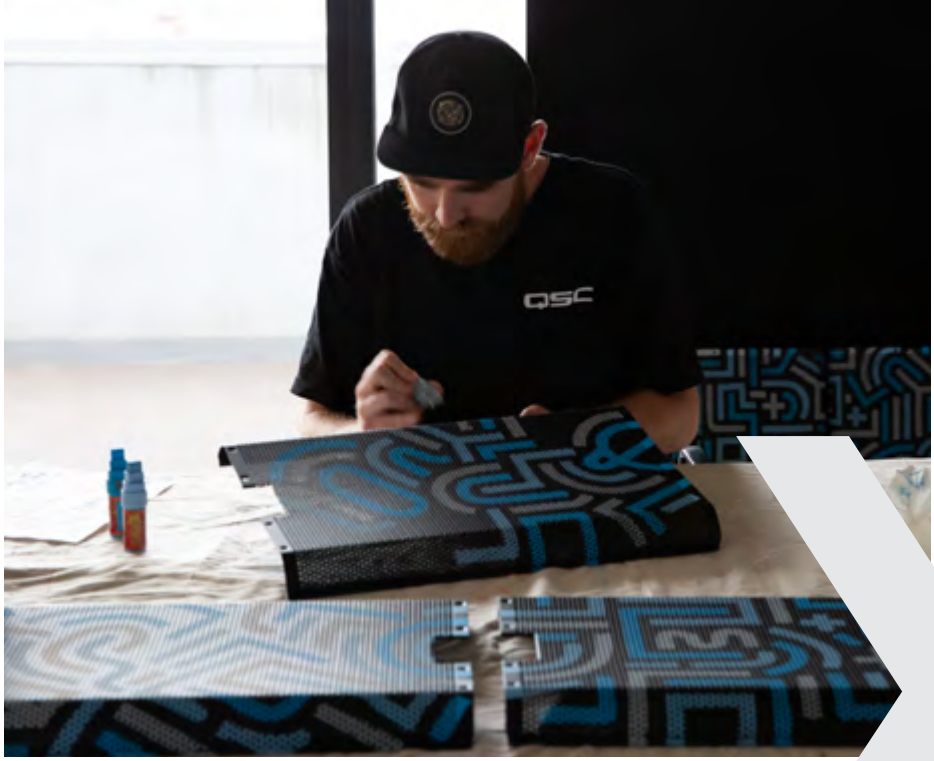
To optimise the dynamics of the positioning and the different throw distances and angles, they are fitted with a variety of lenses, which are readily available with the Anolis Divine ranges.

Being downtown and an urban residential area as well as a CBD, extreme caution was needed to minimise light pollution and keep the lumen focus concentrated on the Tower.

The Divine 72s are run via a Pharos LPC 2 controller that can be remotely accessed via phone and tablet app.

It can instantly be switched into any colour or any number of combinations at the touch of a button for special occasions.

The upgraded lighting scheme was proudly launched with a 30-minute choreographed lightshow synchronised to a music track played by local radio station The Breeze, allowing the whole city to enjoy the spectacle.



Limited Edition QSC K10.2 ‘Chehehe’ Painted Speakers

QSC Australia have unveiled the next chapter in their ‘More Than A Black Box’ artist collaboration project: a limited run of K10.2 speakers with hand painted grills courtesy of Melbourne artist Chehehe.

“The ‘More Than A Black Box’ project began with Chehehe, so it made perfect sense to take the next step with the artist that kicked it all off,” commented QSC Australia Marketing Manager Nicholas Simonsen. “He is one of the artists featured on the mural gracing our Melbourne offices’ exterior wall and he was the first artist to paint a pair of speakers for this project. We’re very grateful to continue working with Chehehe and getting to showcase his eye-catching style and flair."

Throughout the last 12 months, QSC Australia have revealed five unique collaborations, and after constant requests from the QSC community around Australia and beyond, they are finally doing a small production run to celebrate these colourful collabs. This very special run of speakers is strictly limited to 50 pieces and will only be available through select QSC dealers around Australia.

Every speaker in this run features Chehehe’s signature style on the grill. They have all been hand painted, ensuring that each grill is unique, design-wise. The speakers will ship with the painted grill installed. The plain black grill will be included inside the box as well as a numbered Certificate of Authenticity signed by Chehehe.

These limited editions will be exclusively available via participating QSC dealers around the country. They aren’t likely to be around for long so get your hands on them while you can!

Please contact Nicholas Simonsen for any further questions: ns@tag.com.au

The dancers of West Australian Ballet in 4Seasons. Photo by Bradbury Photography.

Dayana Hardy Acuna and Juan Carlos Osma in Moment of Joy. Photo by Bradbury Photography.

Robe T2 Profiles Make No Noiz for West Australian Ballet Shows

The first Robe T2 Profiles to arrive in Australia were snapped up by Perth-based lighting and visual rental and production company What Noiz and made their debut on the lighting rig designed by Matt Marshall for West Australian Ballet's compelling "As One: Ballet at the Quarry".

This was performed as part of the 2021 Perth Festival at the Quarry Amphitheatre, a magnificent outdoor rock quarry in Perth's coastal suburb of City Beaches.

What Noiz's founder and owner Benjamin Fry explained that they had been looking for a powerful LED profile for some time. They loved what they saw in terms of features and functionality with Robe's T1, but wanted something with just a bit more brightness, and then along came the new T2 Profile just at the right moment!

These have replaced the company's older discharge profile moving lights from another manufacturer.

"It's a beautiful fixture," stated Ben, adding that he was considering both the T2 and Robe's FORTE, however it was the complete silence of the T2 Profile, designed from the ground up for theatre and other performance events that tipped the scales as it is one of their primary sectors.

He mentioned that the quietness is also ideal for servicing high-end corporate events and other spoken presentation scenarios where no noise is essential.

Additionally, he appreciated all the subtleties and elegance of the T2, complete with CMY colour control and DataSwatch filters offering exact pre-programmed colours via Robe's RCC (Robe Colour Calibration) algorithm plus the extremely flexible 2,700 – 8,000 degrees K variable colour temperature.

The purchase was completed in time for the West Australian Ballet's 2021 summer season with its three dynamic works combining ballet and contemporary dance.

"4Seasons" was a stirring existing work choreographed by Natalie Wier; "Heartache" was a collaborative re-working of six different pieces delivered by the Company dancers and artistic team, with a concept created by artistic director Aurélien Scannella and principal rehearsal director and artistic associate Sandy Delasalle; and "Moment of Joy" was a brand-new piece presented by West Australian Ballet principal dancer Dayana Hardy Acuña and soloist Juan Carlos Osma.

This exciting outdoor venue, formerly a working limestone quarry, dates to colonial times, and West Australian Ballet is the resident company there every Perth Festival season.

The Company's lighting designer Matt Marshall was delighted to be the first in Australia to use the T2s, having already used the T1 Profiles on various projects.

He explained that one of the pieces needed shifting colour temperature adjustments and shuttered rectangular looks, the next demanded saturated vibrant colour, while "4Seasons" required large, shuttered corridors of light, which is the effect for which the T2 Profiles were positioned.

This was Matt's first time designing a show at the Quarry Amphitheatre, although he has seen many West Australian Ballet productions there in the past, having studied at WAAPA (Western Australian Academy of Performing Arts) where he graduated in 2000 and has been a lighting professional ever since.

"I needed a shuttering profile with a wide zoom range and decent output so the T2s seemed perfect," he commented, adding that it was tight freighting the T2 fixtures to Perth in time with COVID border control measures making the process protracted, but they arrived just in time!

Six of the eight T2 Profiles were positioned over the stage and used as specials and for shuttering large rectangular shapes across the stage, with the other two downstage on

the front truss and used as front light and texturing positions to assist if any of the choreographers wanted additional front light.

The units were "specifically distributed to allow for all the shuttering shots I needed, but still flexible enough to be a standard rig for additional movement".

Being outdoors, the technical production has certain givens in terms of positions and power, and Matt utilised the theatre's standard ground support setup and worked hard to make all the elements realise the design, which also involved several house fixtures lighting the limestone cliffs behind the stage. With a little bit of extra budget, he changed the usual tungsten side light to LED to produce saturated side lighting for one of the pieces.

For the work that needed the shuttering, it was an ideal solution to be able to do this remotely on the fixture rather than waiting for crew to climb the truss to focus lamps!

However, the feature impressing Matt the most on the T2 Profiles was not actually a factor in this production because they were outdoors … but the noise – or rather, lack of it!

"The absolute silence makes it such a GREAT fixture for theatres or concert halls! Conductors worldwide will simply love these fixtures," he declared.

In addition to the T2s, twelve Robe Spiiders were on the lighting rig, together with an assortment of conventionals.

The main challenge of the project for Matt was evoking the intimacy of a ballet performance on an outdoor stage and achieving that in a very short tech week frequently interrupted by rain!

He worked alongside Rhys Pottinger, programmer from West Australian Ballet and "an absolute whizz" at getting the show together and experimenting with the various T2 features in the available time!

The schedule was further complicated by a COVID shut down for a week just as the Company's opening night started.

It was decided to continue with the season, which was sold out, keeping performers dancing and easing the public back into the concept of going out to enjoy live performances again, with extra shows scheduled to accommodate everyone.

Matthew has also been back in Perth since the pandemic began. Since leaving WAAPA he was based in Sydney for 15 years, and then for the last three was working all over Australia and internationally. He feels his decision to return to Western Australia for the moment was extremely fortunate, as it gave him the chance to work with West Australian Ballet's fabulous technical team headed by technical director David Cotgreave.

His lighting crew for the "As One: Ballet at the Quarry" season was led by head of lighting and audio, Neil Webster alongside Adrian Wright, Dillan Kuiper and Peter Young.

These eight new T2 Profiles plus one more have been added to What Noiz's existing Robe stock of Spiiders and LEDBeam 150s. "We love our Robe fixtures," declared Ben, all of which have been supplied through exclusive Australian distributor, Jands.

He feels that Robe takes a "personal responsibility" for delivering its products which is reflected in their design and engineering. "Everything about the lights is thought-through and properly applied," he says. "This diligence and attention to detail evokes a large level of trust in the brand, its philosophy and products."

Ben thinks that luminaires like the ESPRITE, FORTE and T2 all using the same framing modules is clever forward thinking, and he and the What Noiz team are extremely happy with the T2s.

"It's everything we wanted in a moving head and even the 'bananaring' of the framing shutters has been solved and at full zoom these are perfectly straight!"

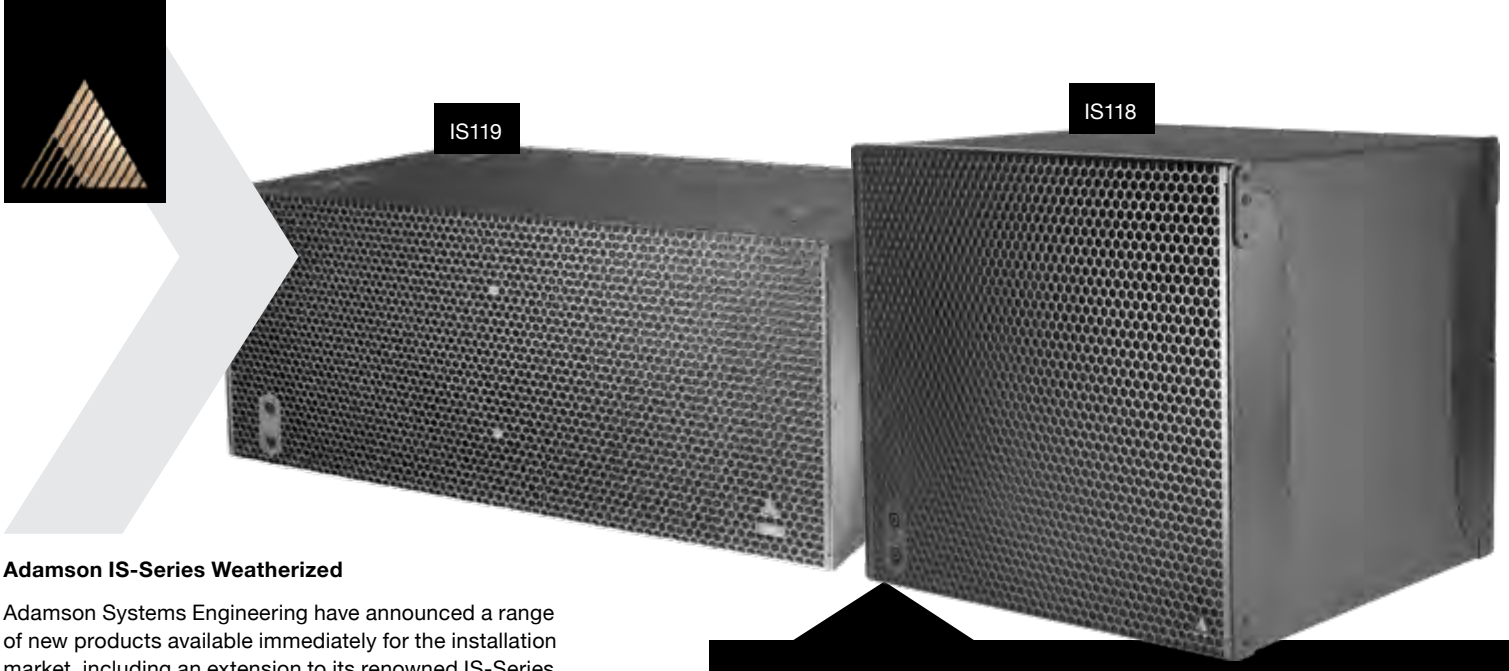
What Noiz was started eight years ago by Ben and business partner Daniel Hocking as a bit of a novelty and an enthusiastic hobby at the time, initially staging silent discos. The venture was extremely successful, and two years later they started growing, purchasing equipment, and offering bigger and better production values to clients.

While most clients are now in theatre, the arts, and corporate worlds, they still do the odd silent disco!

Ben has also personally been associated with the West Australian Ballet since 2005. He has taken on assorted roles in that time including as a lighting operator, head of lighting, lighting designer … and now as a supplier, and is extremely passionate about this work.

In March 2020, as happened everywhere, COVID-19 hit and event and performance activities ground to a halt, however with Western Australia's swift recovery, the arts industry has largely recovered and is back to performing with audience capacity limitations.

Ben reckons it will still be a long road back to 'normal', whatever that may now be … but his hope is by the next summer at the end of this year, some international touring activities will have re-started and that the artist and technical communities will be on the road to re-starting and thriving once more.



Adamson IS-Series Weatherized

Adamson Systems Engineering have announced a range of new products available immediately for the installation market, including an extension to its renowned IS-Series of installation loudspeakers and a suite of improved and updated design tools for architects, integrators, and sound designers.

With the introduction of the IS-Series Weatherized line, Adamson offers AV professionals a loudspeaker family purpose-built to withstand the most extreme climates in the world. Weatherized enclosures are ideal for marine and coastal venues, outdoor stadiums, open-air performance spaces, and other permanent outdoor installations.

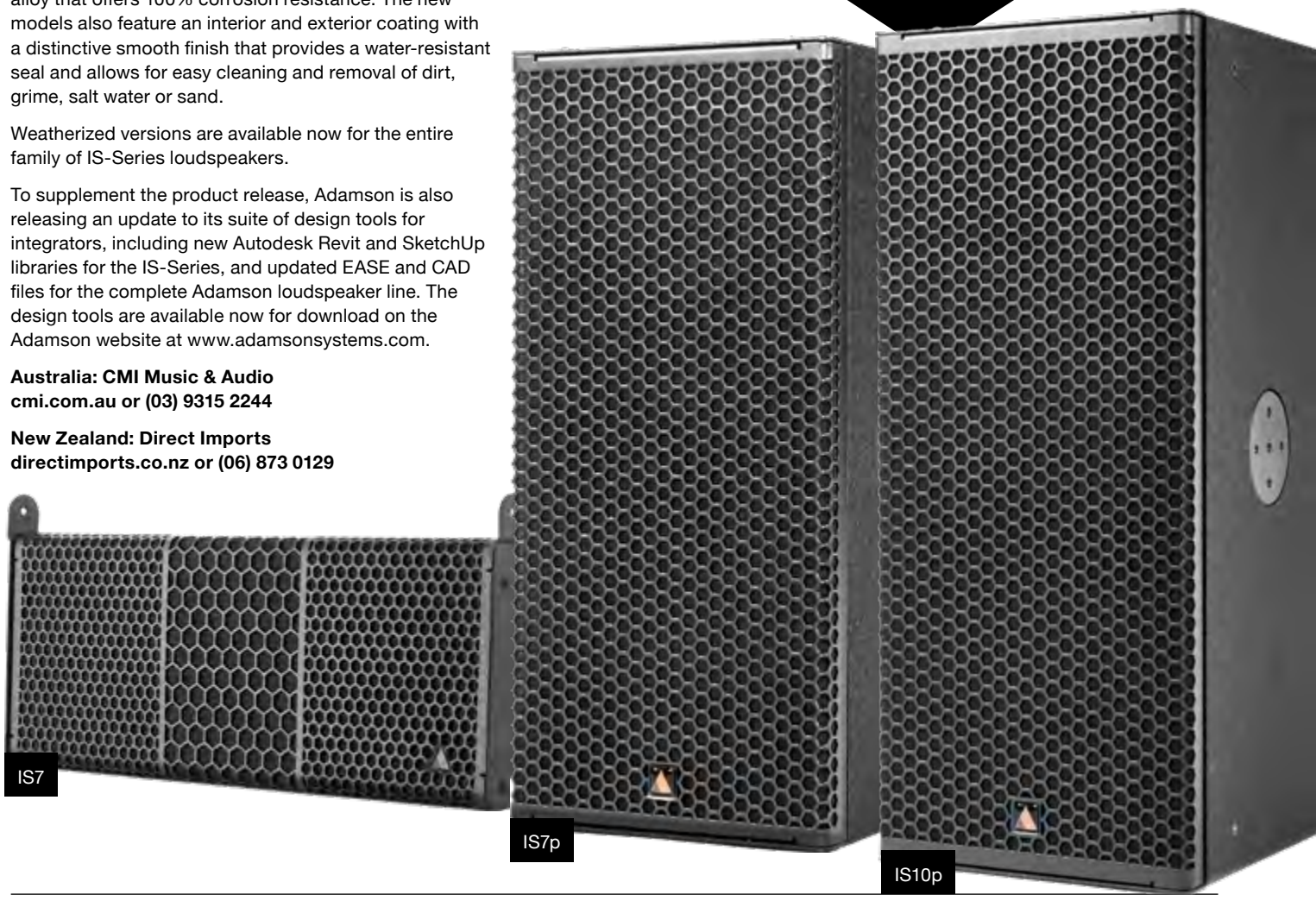
IS-Series Weatherized models achieve an IP55 rating without sacrificing performance or aesthetics. All structural steel elements of the IS-Series Weatherized cabinets are made of a high yield strength stainless alloy that offers 100% corrosion resistance. The new models also feature an interior and exterior coating with a distinctive smooth finish that provides a water-resistant seal and allows for easy cleaning and removal of dirt, grime, salt water or sand.

Weatherized versions are available now for the entire family of IS-Series loudspeakers.

To supplement the product release, Adamson is also releasing an update to its suite of design tools for integrators, including new Autodesk Revit and SketchUp libraries for the IS-Series, and updated EASE and CAD files for the complete Adamson loudspeaker line. The design tools are available now for download on the Adamson website at www.adamsonsystems.com.

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

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



Robe launches iPointe65 and the iSpiider

Robe lighting has launched two new products in its all-weather IP65 rated iSeries – the iPointe65 and the iSpiider, both suitable for exterior work or any damp, misty, steamy or high condensation environments.

iPointe65

The iPointe65 is a bright, high-performance multifunctional luminaire modelled on Robe's famous and best-selling MegaPointe, which works equally well as a beam, spot, effects and wash fixture.

Designed, developed, and manufactured to be sealed against water and particle ingress, thereby strictly adhering to their IP65 rating, both protection and performance are assured. The iPointe's aluminium housing gives a dust-free environment for the optical, gobo and colour systems, eliminating the need for frequent cleaning and maintenance.

NFC (Near-Field Communication) technology enables access setup, diagnostics and other performance-related features directly from a mobile device using the Robe Com app, even when the fixture is not powered.

The light source is a 310W lamp with a lifetime of up to 4,000 hours that has been specially developed for Robe by Osram. Providing 12,000 lumens (measured at the front lens) the source produces a brilliant, crystal clear, razor-edged beam, which is adjustable from a tight, punchy 1.8° column to a wide 42° spot.

The beam can be accurately shaped and positioned using innovative framing shutter emulation, and as the iPointe is a proper beam unit, the light source outputs an impressive 1,600,000 Lux @ 5 metres.

Both static and rotating glass gobos offer precision in-air effects and projected images with a sharp, high-contrast, flat field. A dynamic effects engine has 12 varying beam and 'flower' effects.

GEAR

iSpiider

Modelled on Robe's hugely successful industry-standard Spiider LED wash beam, iSpiider is a bright, high-performance luminaire, retaining all the favourite features of the indoor version. Like the iPointe65, it is effectively and robustly sealed to prevent water and particle ingress strictly adhering to the IP65 rating, so users can be confident of both its protection efficacy and its great performance.

The aluminium housing ensures that the optics stay dust-free and that the plastic elements are UV-protected, eliminating the need for frequent cleaning and routine maintenance.

As with the iPointe65, onboard NFC technology enables remote access for diagnostic and performance features from a mobile device or smartphone via the Robe Com app.

iSpiider uses the same 18 x 40-Watt, and 1 x 60-Watt LED sources as the original fixture, and the identical 12.5:1 zoom optical system gives huge flexibility, going from a tight collimated 4° beam to a super-smooth wide 50° wash.

The unique central Robe patented MCFE (Multi-Coloured Flower Effect) is also there, driven by the 60W central RGBW LED multichip for sharp, rich, multicoloured spikes of light, rotating in both directions at variable speed, adding style and extra visual impact to any show or event.

All the usual control protocols are present, and dynamic video effects can be achieved by mapping individual iSpiider pixels when running through DMX control desks and media servers via sACN with internal HTP merging or Kling-Net.

Australia: Jands www.jands.com.au or (02) 9582 0909

New Zealand: Jands NZ jands.nz or 021 674 601

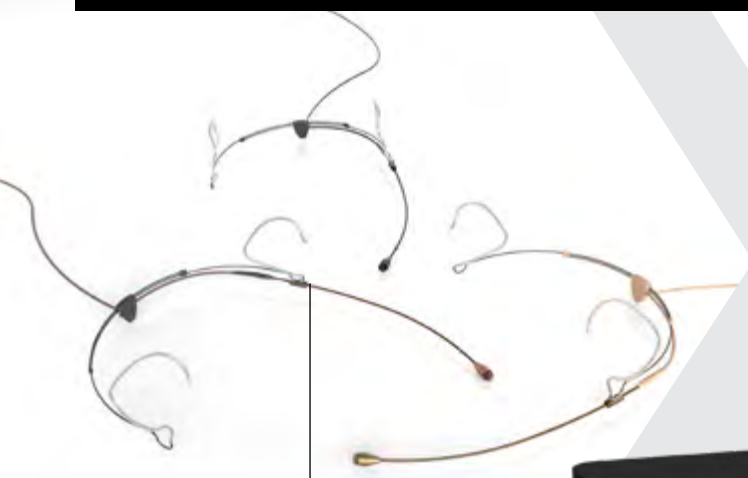
NEW GEAR

Chauvet Professional Ovation Rêve E-3

Ovation Rêve E-3 is a multi-colour LED ellipsoidal that also has the capability of producing tuneable whites. Colour Temperature presets ranging from 2800K to 8000K maintain brightness and a high quality of light, with an emulated "red shift" for a tungsten feel. Ovation Rêve E-3 also features several dimming curves, a virtually silent operation with fan-off modes, and a series of technician-friendly features such as an innovative, adjustable yoke that makes mounting in low clearance situations a breeze. With Ovation Rêve E-3 you can seamlessly transition from captivating a wide range of saturated colours in class-leading output to distinct whites with +/- green adjustments using one fixture.

Australia: Showtools
www.showtools.com.au or (02) 9824 2382

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



DPA 4466 and 4488

DPA's 4466 CORE Omnidirectional and 4488 CORE Directional Headset Microphones are based on the design of the company's groundbreaking 6066 Subminiature Headsets. With a one-size-fits-all design and adjustable height and boom length, the 4466 and 4488 headsets accommodate small to large head types. A unique, three-point gripping system (above, below and behind the ear) ensures a greater level of security, while the flexible ear hooks provide continued comfort during extended use. The headsets share the same interchangeable cable and boom options as the 6066 Subminiature Headsets. This includes the 90-degree cable management at the neck. The headset frame, boom and capsule have a non-reflective surface for unobtrusiveness and ease-of-use for camera crews. With a high-quality, professional look, the 4466 and 4488 are available in the company's standard black and beige options, with a brown version coming soon.

Australia: Amber Technology
www.ambertech.com.au or 1800 251 367

New Zealand: Amber Technology
www.amber.co.nz or +64 (0)9 443 0753

Epson EB-L700U series

Epson's new L700 Series offers up to 7,000 lumens brightness for schools and meeting rooms. Different from other classroom display technology, these laser solutions deliver images up to 500 inches with 16:10 or ultra-wide 16:6 displays for optimal visibility in hybrid education and meeting room settings.

The new L-Series come equipped with versatile connectivity options and easy installation tools, including lens shift, HDBaseT and 360-degree placement flexibility, along with upgraded Miracast and screen sharing for enhanced collaboration. Powered by a virtually maintenance-free, 20,000-hour laser light source with no lamps to replace, the new L700 Series is designed for reliable operation with energy-saving features for a long lifecycle.

Australia: Epson
www.epson.com.au or (02) 8899 3666

New Zealand: Epson
www.epson.co.nz or (09) 366 6855

NovaStar H Series

NovaStar's H Series is the first all-in-one LED splicer and controller in the industry, which greatly simplifies system integration. With a capacity of up to 130 million pixels and true 4K video processing, H Series can drive ultra-large walls in fine-pitch applications. Featuring a modular design for both inputs and outputs, H Series can accommodate up to 80 custom inputs and 200 LED outputs. Connectivity includes HDMI (1.4 or 2.0), DVI, DP(1.1 or 1.2), SDI, CVBS, VGA input cards and IP cards. Each LED output card supports 16 x 2K open layers or 4x 4K open layers, giving you maximum creative control.

Australia and New Zealand: ULA Group www.ulagroup.com or AU 1300 852 476 / NZ +64 9 218 6532

Event Lighting SWIRL5

The Event Lighting SWIRL5 hanging confetti blower will average around 80m2 of coverage at 10m high. The machine holds 500 grams of confetti and is controllable by either RF remote or DMX. Eventec carries a wide range of confetti suitable for the SWIRL5.

Event Lighting BLOWER6LED

The BLOWER6LED is a powerful confetti blower featuring 12 3W RGB LEDs. It features 30 seconds of continuous out and a firing distance of 3 metres for loose confetti and 6 metres for packed confetti. Controllable via DMX or RF remote, and holding up to 500 grams of confetti, Eventec carries a wide range of confetti suitable for this unit.

Australia and New Zealand: Eventec
eventec.com.au or +61 (0) 2 9897 3077

Redback Q 2004

An absolute necessity for all PA system installers, this impedance meter for 'dummies' designed and manufactured by Altronics calculates and displays speaker loads in watts. It's Altronics first impedance meter model that features a rechargeable internal lithium battery, making it easy to keep the unit charged up and ready to use when you need it. The Q 2004 measures and calculates loads for 70V & 100V line systems up to 10kW in power. Recharge via a standard USB wall or vehicle charger, or via 5V DC plugpack (not included). Also includes a handy system test function that produces a continuous 1KHz tone, making it easy to confirm that all speakers on the circuit are working.

Australia and New Zealand: Altronics
www.altronics.com.au or +61 (0) 8 9428 2122

Spark Fabrica Kungfupao

The Kungfupao is a short burst cold spark machine with an adjustable outlet angle, reaching a height of up to 3 metres and is controllable via DMX. Unlike most cold spark machines, there is no heater so the machine uses very little power, and therefore can be powered by batteries with a standby time of 160 hours. The machine uses composite titanium granules and has a tank capacity of 70 grams. Each burst uses one gram of the granules, while the source of ignition is provided by standard camping butane gas canisters. An optional case suitable for two machines is available.

Australia and New Zealand: Eventec
www.eventec.com.au or +61 (0) 2 9897 3077

Portman Mantis

The Portman Mantis is a unique, fully LED-based decorative stage light. The species belongs to the Portman family, and is characterised by a high spreading rate, especially in the tour, festival, and TV show environment, while remaining easy to tame by LDs. They can be encountered as independent units or found in larger clusters. Mantis evolved in Poland, its evolution taking place in a purely dark and silent environment, perfect for developing a strong light source with a unique design with the utmost attention to detail. The Mantis is characterised by three dim to warm powerful main LED light sources that can act as a blinder. At lower intensities, these can be hypnotic warm and smooth dimming light sources. These light sources are accompanied by strong RGBW LEDs with good saturation and beautiful colour mixing. The whole species is crowned with RGBW LED light sources in the centre with a frosted filter and ability to add a gobo inside.

Australia and New Zealand : Showtools International
www.showtools.com.au or +61 (0) 2 4646 1199

REVERB PROJECTION

by Andy Stewart

Artificially generated reverb is one of the most important tools at a mix engineer's disposal. It's also one of the most misused and misunderstood. All too often the complaint about reverb is that it tends to 'swamp' recordings, turning them into an inarticulate mess. But that's a lazy description of what's going on. Reverbs don't swamp anything; you do! Here are a couple of ways to clean up your 'mess.'

All too often, engineers send a dry signal to a reverb, return it on another channel and expect the result to be almost perfect right out of the gate. When it's not, their next effort is to turn the reverb up or down. That's some fancy technique right there!

The problem with this approach – if indeed you can call it that – is that here reverb is thoughtlessly assumed to be entirely about quantity: how much or how little does this sound need?

Mistake Numero Uno

But there are far more pieces to the reverb puzzle than that. Quite apart from the quality of the reverb being generated, whether by a hardware unit or software plug-in, the size of the spaces to which you're sending the dry signal, their shape, reflectivity and so on, are all crucial components of what makes a reverb work in each specific context. You can't just bung a Hall reverb on a channel and expect it to work. Doing that is a thoughtless, lazy, and frankly shambolic way to approach the use of reverb in a mix. Occasionally you'll get lucky, but mostly you won't.

And right here is where the problem begins. The perennial issue of reverb turning your mix into a 'soup' happens before you even switch the reverb on! Unless YOU switch on, you'll soon be awash in a large hall reverb (invariably), that's nearly always inappropriate for the circumstances! From there – and particularly if this happens to you regularly – you'll be fighting an uphill battle to establish a setting that's right for the song.

Hold Your Fire!

First and foremost, you've got to switch on. Even if you're not the most skilful engineer when it comes to reverb parameters (the architectural blueprints of any reverb setting), before you hear any reverb at all, ask yourself some basic questions about what you're hoping to achieve, like: 'What size do I imagine the space I'm conjuring up to be?' 'How big is the overall soundstage?' and 'Where is my sound source in this picture?'

Once you can at least answer these basic questions you should then be able to choose a reverb that's closer to the mark.

But if your answer to the question: 'What is my reverb's size?' is simply 'Big!' (i.e., lots of reverb on it) ask yourself why, and be sure the answer isn't just a reflex action. If you're an engineer who often finds yourself awash with too much reverb at the end of a mix, 'big' might be the wrong answer! The quickest way to minimise the damage of a washy reverb is to shorten it.

Put another way, have you ever heard someone complain that their 'short room' reverb swamped their song in a cloudy maelstrom of echoes? The problem invariably starts with a large space, like a Hall. It's no coincidence that nearly every hardware and software device ever made has a Large Hall as its very first preset: they're glamorous and attractive, make the manufacturer look special… and regularly wreck the mixes of engineers who reach aimlessly for Preset 1.

But let's just say you do want a Large Hall reverb on your vocal – you wouldn't be alone in that choice. You're certain that shortening it is only going to compromise the vision you have for the sound of the song.

At this point then, we need to find a new way to achieve the big glamorous space that you imagine for the vocal, without ending up where you always do: in a giant, flat, inarticulate mess of reverb that prevents the vocal from projecting outward, thus remaining clear and compelling.

Your Activation Key

Okay, so this is the plan. We send our vocal to the reverb, doing our best to make conscious choices about pre-delays, early reflections and echoes until we're happy with the sound. In fact, it's awesome now because we finally bothered to get in there and tweak some parameters, possibly even discovering how some of them work along the way!

But this time, before we simply return the reverb to our mix, we add a compressor after the reverb plug-in (directly below it on most DAWs). If your signal chain is hardware-based, the same rationale applies. Don't worry yet about the compressor's settings… we'll sort them out in a moment.

The next thing we need to do is key the compressor off the vocal signal so that every time we hear the voice, it activates this compressor.

Stay with me now.

'Keying' may be a term you've not heard before, and no, it doesn't involve running your keys down the side of someone's car. If you don't know what 'keying' is in an audio engineering context, that's cool. I'd simply

Andy Stewart owns and operates The Mill studio in Victoria, a world-class production, mixing and mastering facility. He's happy to respond to any pleas for pro audio help... contact him at: andy@themillstudio.com.au or visit: www.themillstudio.com.au

urge you to do some extra reading and YouTubing to clarify this process in your own head, because though slightly more involved, it's a great technique for problem solving issues like spill and bleed on the one hand, and creative sound effects like pumping and unnatural dynamics on the other.

Basically, keying an input in this manner is a process by which a signal that is NOT going through an audio device is nevertheless controlling its behaviour. In this example, our compressor is under the spell of an external influence; the vocal. The audio signal travelling through the unit itself – our reverb – is no longer dictating terms about how the compressor behaves. It's kind of like using The Force on it, manipulating its behaviour from afar.

So, now our vocal reverb is dynamically diminishing in level whenever the vocal is present, in some respects contrary to how it normally behaves. The compressor is after the reverb, don't forget, so when the singer sings, the compressor turns the reverb down. Then, as if by magic, the instant the vocal's gone (depending on the speed of the release setting on the compressor) up comes our big lush vocal reverb!

Depending on how big a contrast you want here, you can make the compressor react a little or a lot. Typically, when I perform this manoeuvre the volume shift is around 2 – 4dB… not huge. But, that's entirely up to you.

Secret Weapon Revealed

So now we have a weapon at our disposal that, in some respects, gives us our cake to eat as well. We get projection from the vocal thanks to a dynamically diminishing reverb. The voice is more detailed and focussed sounding, appearing to push forward whenever it speaks. Then, when it stops, our big space expands to fill the newly created void. What's doubly cool is that, to the untrained ear, the amount of reverb we hear between vocal phrases appears to have been there all along!

This awesome ducking trick can also be used on naturally recorded ambient tracks too, of course. The compressor is simply applied to the ambient channels and keyed off the source in the same way.

Let's say you've recorded an awesome ambient component to an acoustic guitar in a large country hall. If you like the amount of ambience trailing off the end of the guitar phrases, but that same quantity tends to overwhelm the instrument when it's playing, by ducking the reverb down a bit, you can satisfy both requirements.

No more messy reverbs swamping your music!

Once you learn this trick of putting things before, or after, another device to influence its behaviour in different ways, a whole new world of control opens up. Keying sounds via others can be a miracle cure for things like bleed on drums, for example, not only because you're using the dynamics of the instrument as a natural automation pass, you're potentially saving huge amounts of time along the way.

One Reverb?

Another cool trick is to add time-delayed send signals before they reach a reverb, sending different delay settings from different instruments in the mix. So, for example, you could have just one hall reverb for your whole song, like was often the case back in the day… with a pre-delay setting of zero, or close to zero. The instruments themselves feed the reverb unit their own pre-delay settings via an aux send (along with EQ, flange, distortion or whatever!). This contributes enormously to the sense of where in the space the instruments appear to reside.

If the space you're generating is trying to sound big, any instruments that send a pre-delay value of zero will tend to sound like they're standing up the back. Instruments with modest amounts will appear in the middle distance, and larger pre-delayed sounds will be more up front. To reinforce this illusion, you need to make sure the loudest, most up-front sounds have the longer pre-delays, and the quietest (background sounds) none at all.

It's a big wide world out there… don't let it swamp you.

What is bonded internet and how can it help me at a live show?

by Benjamin Powell, founder of BetterCast

Over the last few months, I have been trying to wrap my head around internet bonding and how to make it more accessible for everyone in the industry. Since a large number of AV teams have moved from switching a camera and PowerPoint on a screen to producing live-streamed shows for their clients, it's become apparent there isn't much out there for teams on a budget.

Traditionally, internet bonding devices and services were used by large scale events or broadcasts, and as such, the costs for hardware, software and subscriptions have been priced for that market.

Now though, with so many techs moving to offer live streaming as an add-on service, low-cost bonding is becoming a real need for a lot of people. So in this article, I want to talk about what internet bonding actually is and how it works, then discuss the options available for techs who need a better and more reliable internet solution at their events.

Why does it even matter?

Picture this: you're at an event in a venue you've not been to before. The client wants a single camera and PowerPoint projected on a screen, but they also need to stream to a platform like BetterCast. The venue manager has placed you at the back corner of the room, and then you find out there is no LAN for you to connect to. OK, you can connect to their Wi-Fi. It's got maybe a 10mbps connection. Not great, but not the end of the world.

So you do your tests, and everything seems fine, but then the event guests start to file in. Of course, it's a hybrid event, so the room is only half full, but there is still a good 50 or so people attending. Now, the presenter tells everyone the Wi-Fi user and password because they want them to participate online and ask questions of the panel using a service called Slido. In five minutes, all 50 people are on the same 10mbps connection you're using to stream 1080P video on.

Your connection instantly goes to hell, the quality reduces, and now the client is giving you a hard time because they got a Facebook message from a user saying that they can't see the picture because of the quality, and you're the one being blamed.

So you then decide to switch to using your phone as a hotspot as you have a decent internet connection. You know it's going to hammer you with a bill as you will be streaming about 2GB of data an hour, and this is a four hour gig, but the show must go on. The problem you suddenly find is that everyone in the next room is also on their phone, connected to the one cell tower in the area, and your connection there is just as bad.

Unless the venue has a well-planned infrastructure deployment in their rooms, this will happen to you if it hasn't already. Even five star hotels with massive conference rooms suffer from this problem, so it's not just a small venue issue.

What is internet bonding?

Internet bonding is where you take multiple internet connections and use them together as one. The concept is that it makes your internet connection more stable and much faster than any single connection would be on its own.

It also allows you to connect multiple types of internet connections together; Wi-Fi, LAN, and LTE sim data connections. All these will get combined into a single pipeline that you can connect your device to, and no matter what, you can be sure that you have a constant and stable connection.

How does it actually work?

There are three stages to internet bonding; the first is the device, the second is the aggregation software, and the third is the re-combination server.

Simply, you connect multiple internet connections to a device. You feed in your data stream. The device sends data out across all the networks to a central server, and it combines all the connections and data into one stream again.

The bonus is that once your data is combined at a server into one, you're then in the internet infrastructure network, and your speeds are super fast, as you're not limited to one single connection and local networks.

In a little more detail

Let's start with the device. This is the hardware solution you will use to connect the different connections. However, most internet bonding devices have been developed for the enterprise consumer and are maybe not as cost-effective as you would want.

However, most of them will try to lock you into a costly closed environment, like Apple, where you have to use their hardware and software, and you can't do anything with the device outside of their networks.

Some devices will give you an option to just connect USB sim modems to the device, or you can plug the sim directly into the device.

The second part of the equation is the software that disassembles and streams the data to the re-combination server. In this case, you really only have two options; you can use the software installed on the hardware device you have, which is, of course, the easiest option, as it's just plug and play. Or you can use a service like Speedify, which gives you the software option to connect devices, but you have to work out how to configure hardware yourself. I will detail how you can use Speedify as a low-cost option at the end of the article, but the low cost usually means more configuration.

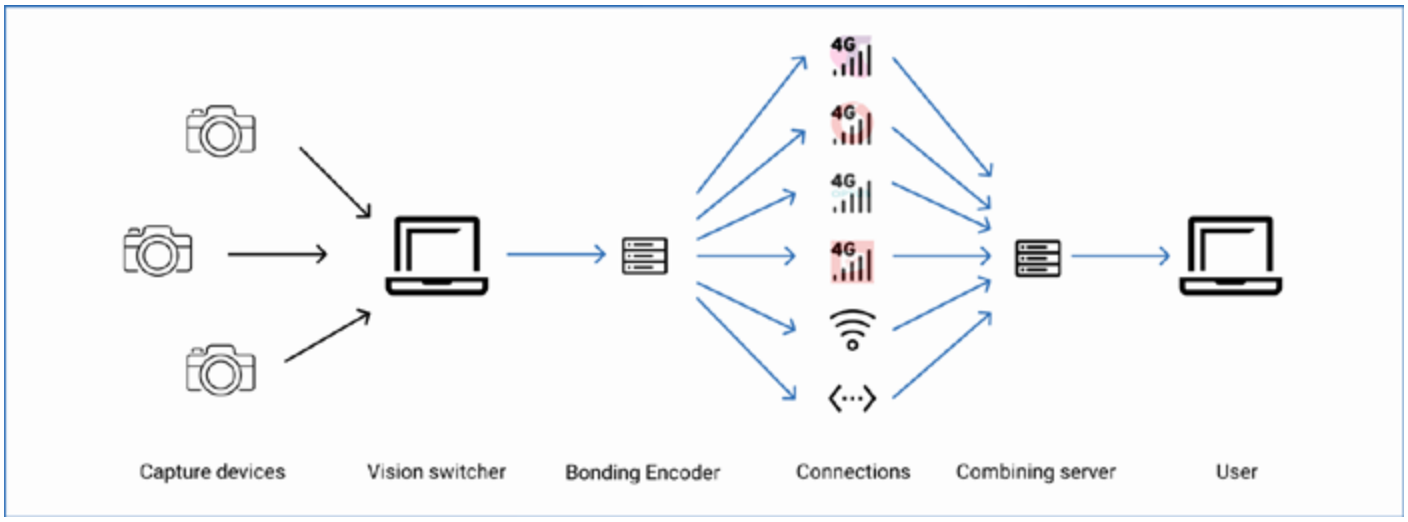
Lastly, we need to talk about the re-combination server; this is similar to a VPN. You can connect your computer to a server in a data centre, and then all your network traffic is directed through a single encrypted connection.

In the case of bonding, all your internet connections are connected to the same server. Every outgoing connection has been tagged with a small timestamp. The software on the server will read the stamp, then match the connections together. Suddenly you have this one significant connection.

It also means that when you have one signal degrade or just drop altogether, the server is still combining the other connections together, so you can add and remove connections and have zero issues on the stream.

What are some commercial options?

What you chose to use will depend on your



use case and how much you want to spend on this connection insurance. At the top of the list is the Terradek VidiU series. They are probably the most well known and robust option with sim, LAN and Wi-Fi bonding in some of the devices, and for US users, you can now get sim cards packaged with the device that you buy credits for.

The additional bonus of the Terradek devices is that they can also manage the data encoding for you. If you are doing a run and gun event and want to keep the hardware at a minimum, you plug your switcher directly into the device. It will encode your video for you.

Their devices can cost between AUD $1200 and $2600, and you'll have a subscription for their Core and bonding services, as well as your data cost for the day.

Another option is the MineMedia Q series devices, which have the same LTE and Wi-Fi/LAN connection in a box, and some of their options come with encoding onboard as well.

This is a good option if you can manage some of the software stacks. You can self-host the re-combination server software in your own data centre, meaning if you work only in Victoria, you can rent a server in Melbourne and keep everything local. Local means faster.

Similar to Terradek, these devices will cost you between $1200 and $2500 for the hardware, and you have the bonding and data costs for each event, which in most cases will be a monthly cost you have to wear. Regardless of if you are working or not, subscriptions need to be paid, or the devices become paperweights.

I want to mention that BetterCast is in the process of developing a sub $500 device for the Aus/NZ market and is intending on releasing these by the end of 2021. They will be making a special CX Magazine subscriber offer, so keep your eyes out for that!

Is there a cheaper low tech option?

At this point, I'm sure you can see the value in having internet connection insurance, but the idea of paying a chunk of change for it can be a little daunting. Insurance is great when you use it but a pain in the pocket when you don't.

There is a way you can make your own low tech bonding device for a fraction of the price. Be aware, though, there are some limitations to this, and you can only use this option if you are doing the encoding on a laptop or computer.

For this, we're using a few mobile phones that are USB connected to a laptop, then you can join the local Wi-Fi and plug in your LAN cable to the venue Ethernet.

Then all you need to do is install the Speedify software, get yourself an unlimited plan with them for about $10 a month and sign in.

The interface will then register that you have multiple connections and then just turn them on; it's really that simple. You can tweak the options a little, like preferring the LAN and Wi-Fi as your first connections and then using the sim as backups, so this will reduce your costs. Additionally, it's worth setting your server locations to somewhere close to you so you can get the best connection possible, and then you can start streaming.

Again, this solution will only work if you are doing the encoding on a computer with OBS or Vmix or similar, but if you're in a pickle, this is a great, fast and low-cost option that can save an event!

In conclusion

Internet connection insurance is one thing that can ruin the entire event when you need it and don't have it. Still, as most available options were really built to support enterprise clients, it can be a significant investment.

That investment is sometimes hard to justify if you're not working regularly, or they are low-value gigs. There will be some options released over the next year that will work more within budgets, but for now, it's a commitment.

I cannot stress enough that having a solution that you can use when needed is really important. Because when your gig goes down because of something that isn't in your control, but you're the one getting blamed for it, then having peace of mind is worth the cost.

The Cast of Opera Australia's 2021 production of Aida at Arts Centre Melbourne.

OPERA AUSTRALIA'S AIDA

by Jason Allen

Finally making its delayed Melbourne debut, Verdi's Aida helped fully re-open the State Theatre in spectacular style over eight performances in May. The digital production is a masterclass in automation and the integrated use of big screen visuals. Ten seven-metre-tall columns of high definition LED are the technical stars of the show, flying, rotating, tracking and constantly transforming to envelop the audience in ancient Egypt.

The stunning all-Italian creative from set designers Giò Forma, digital content makers D-Wok, and costume designer Gianluca Falaschi all work together to create lavish tableaux of gold and power. While the digital content and huge moving screens could have been gimmicky and distracting, it's the opposite, adding dramatic weight and power to the opera.

The creative and directorial decision to let the screens completely take over during the opera's iconic Triumphal March was pure genius. Extremely elaborate productions of Aida have been staged in some dramatic settings; in front of the Pyramids of Giza, for one. The Triumphal March is traditionally the most over-the-top part of the production, where you parade the elephants, camels, horses, and supporting cast of thousands. In this production, all cast left the stage, and the screens performed a graceful ballet while a stunning visual of an Egyptian general on horseback filled the screens. Not only was this creatively brave, it was technically brilliant.

I dropped in on the tech crew of Aida around lunchtime before opening night, while the crew were still hanging and aligning the screens. OA's technical director Clif Bothwell and freelance media server programmer and operator Peter Lynn were there to talk me through how they make the magic.

Stefano La Colla as Radamés & Leah Crocetto as Aida

Alexander Vinogradov as Ramfis & Stefano La Colla as Radamés

"The seven-metre-tall panels are broken down into three sections two metres tall and a one metre section at the bottom," explains Clif. "We then build them up, with scenic wooden backing panels on the back. These screens can track on and off, and move up to 16 metres here in the State. They can rotate 540 degrees in both directions, and we can fly them in and out if we want, but we're not doing that in this production." All screens, media servers, and video processing are provided by Big Picture, along with a video tech.

With Aida being presented in repertory along with a traditional production of Verdi's Ernani, whose old-school wooden set sat upstage and side-stage of Aida, getting the productions swapped over takes about the same amount of labour hours of a traditional season. Purely digital seasons offer huge cost savings in labour, but increased technical complexity and a lot more pre-vis and programming.

During the show, video cues running on disguise gx 2c media servers are triggered from the ETC lighting desk. Positional and movement data from both the Kinesys chain motors and Waagner Biro flying system are fed to the d3 via PosiNET, enabling some stunning visual tricks as the screens move and rotate, like the illusion that the image stays static.

"The image canvas is just under 8K wide," explains freelance video tech Peter Lynn. "There's two 4K outputs feeding OP and PS independently. There are different techniques used in disguise to map the content to the screens for the different looks. One of the main ones is Parallel Mapping, which is what enables an image to appear to stay in the same spot during a screen move. This is a lot more technical than throwing a video up on a rear LED screen at a conference! The gx 2c servers live up on level 7, with KVM and fibre running back to bio box. The signal output is HDMI, via Brompton processing."

"Getting the screens perfectly aligned with each other is a challenge," adds Clif. "We're running on our Kinesys chain motors, so we're not asking too much of the State's flying system. Sideways motion is via a Raynok truss system, which has been a great addition to our automation requirements. Our biggest physical problem is balancing the screens with the scenic wooden backing panels. If not centred, they'll kick out a little bit. We are now changing in and out every day, and getting everything back perfectly where it was."

Changeover with the massive set of Ernani in the background

THE TECH OF AIDA

by Nick Bojdak
Technical Director, Big Picture

The digital stage

Big Picture is proud of its ongoing association with Opera Australia and we are happy that we have finally been able to bring the digital stage environment to Melbourne.

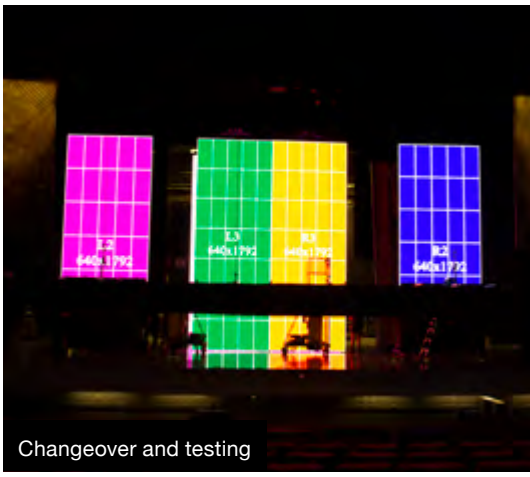
Aida's Melbourne season used 175 square meters of UniView Tekken 3.9 with Brompton Processing arranged into 10 columns seven metres tall. These were all driven by a fully redundant disguise system comprising of four gx 2c servers. In addition to the LED outputs, there is also a front projection element using a Barco UDX-4k32 laser projector. The disguise system is managing eight 4K content layers, as well as dealing with incoming data streams from Opera Australia's custom Raynok automation system, which manages the individual screens rotation and tracking on and off stage.

The show cues within disguise are synced with lighting and controlled via sACN triggers. In past productions, the list of data inputs has included the in-house Waagner Biro fly system at Sydney Opera House, and tracking beacons from Zactrack and BlackTrax. It has been a task in itself to create a base file within disguise that has all of these external data parameters already written, so we can distribute the base file to all of the upcoming productions that will be using the digital setup. The current disguise system has been designed so that it has enough headroom to deal with multiple digital shows in rep. These shows could incorporate additional LED or projection elements without having to add to the server side of the system.

Before the system's debut in 2018, there was a lot of research and development, as well as a good amount of trial and error. Since that first season in Sydney there have been incremental changes to the system to make it more robust and expandable to deal with larger shows and additional video elements.

Having two or three digital shows in rep is easy; you simply load a new show file and the

Peter Lynn and Clif Bothwell



Changeover and testing

visual aspects are ready to go. But when you rep with shows that are more traditional, we need to remove the LED panels to make way for large set pieces and flown items, which has to been done quickly and efficiently.

The main challenge with Aida was to be able to install 175 square meters of hi-res LED in two hours and remove it in one hour. We got creative with some customised set carts and some specialised locator pins which enable us to break the screens down into 2.5 x 2m sections. This method of building LED is not new, but it has not been widely adopted with hi-res products due to their fragility. The large number of LEDs so close to the edge of the panels as well as the precise manufacturing tolerances required for a seamless wall make them much more prone to damage. So far, we have been really happy with how the product has stood up to the rigorous ins and outs of the schedule.

Crew Credits

Video System Supervision for Big Picture: Nick Bojdak and Jeremy Moore

Onsite disguise Operator: Peter Lynn

LED System Techs: Matt Downs, Brett Pichler, and Dean Pentz

Creative Team

Conductor: Tahu Matheson

Director and Choreographer: Davide Livermore

Revival Director: Shane Placentino

Set Designer: Giò Forma

Costume Designer: Gianluca Falaschi

Digital Content Designer: D-Wok

Lighting Designer: John Rayment

Assistant Director: Shaun Rennie

TAG take Q-SYS training online

by Jason Allen

Matt Stapleton

QSC's market leading Q-SYS networked AV environment has broken a lot of ground over the last few years, in both hardware and software. It also leads the pack in training and certification, with some of the best online courses ever created, starring the AV-famous Pat and Nat. I've often raved that QSC's decision to hire long-term friends and improv comedy buddies Patrick Heyn and Nathan Makaryk as Senior Director of Marketing and Senior Training Manager is the best marketing decision ever made by a manufacturer.

Australian QSC distributor Technical Audio Group have been running excellent in-person training sessions in both their Sydney and Melbourne offices for years. Customers love getting into a room with the gear, and getting to know their local technical gurus and support staff. TAG's training is so popular, they had to tour it around the country. But 2020 saw TAG's plans hit with two very different problems.

First – the good problem. Q-SYS has gotten so popular, and the requirement for installers and AV staff to be Q-SYS certified so embedded into tenders and contracts, that there was a huge backlog of people waiting to get into training sessions. The bad problem was the lockdowns, border closures, and possible quarantine and isolation issues that would come with physically trying to move around Australian capital cities during a pandemic.

The basic introductions and Level 1 Q-SYS training has always been offered free online, with the more difficult subjects of Control and DSP handled in-person at Level 2 courses. These are where the real hands-on knowledge comes in, and the certification becomes meaningful. With a rack of touring gear grounded at TAG's Strathmore HQ and the doors shut to visitors, Design and Support Specialist Matt Stapleton had to find a way to get the still-busy AV install market the training it was clamouring for.

"We had a massive 2020 planned," sighs Matt. "It was a huge calendar line up, in a new state every month. Obviously, that didn't happen. When we run Level 2 in person, everyone gets a Core, touchscreen, speaker and mic, and gets to play with the equipment. QSC had run it virtually in two ways previously, with every student having a dedicated PC in the classroom they could remotely control, or by configuring VPNs for the students to connect to. Setting up to deliver the amount of virtual training we needed with either method would have required a huge amount of dedicated equipment and been very complicated in terms of networking. But then, QSC released version 9 of their Reflect Enterprise Manager."

The big new feature added in Version 9 is the ability to log in to Cores remotely, via Reflect's cloud service, over public internet. Not only did this mean Matt could set up a Core at HQ and have his students log in, it enables integrators and service technicians to check in and perform maintenance on any Cores they're responsible for, from anywhere with an internet connection. No more three-hour roundtrips to hit the 'unmute' button.

"When we run Control 201 online, we use a Core as a third-party device emulator," explains Matt. "The students dial into it, and we do things like run a simulation of multiple televisions you can turn on and off, and change their channels. We did this previously in person on a local network, but now students can send strings to those port numbers over the internet. When we're doing DSP, you can make changes to a design, play

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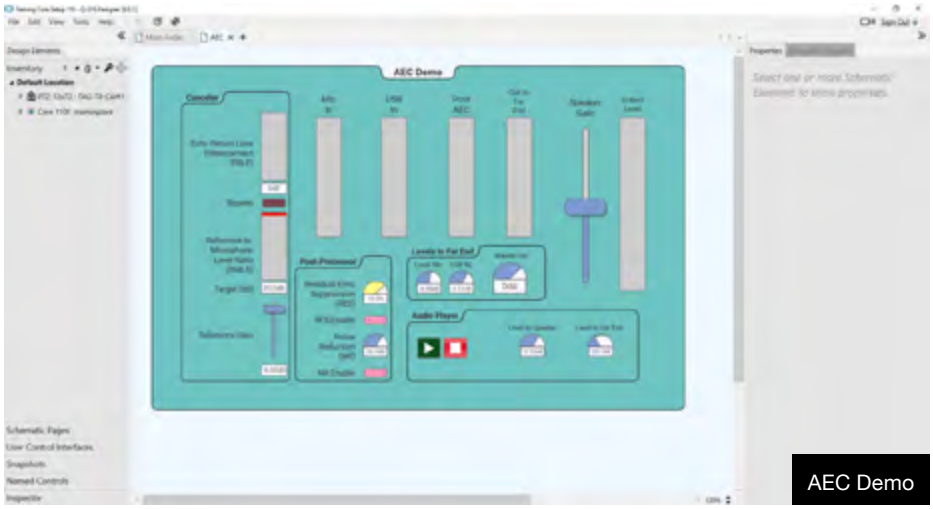


AEC Demo

audio through the system, and verify signal with the real-time visual RTA you get with the Hover Monitor."

There's a couple of upsides to going virtual. "One advantage of virtual training is that you can do excellent AEC demos," Matt illustrates. "In person, it's really hard, because of course there's no 'near end' or 'far end'. AEC is a fundamental component of most jobs now, and actually being able to demonstrate how it works and what happens if you don't get it right is invaluable. During a training session, I can bypass it, I can wind it in and out, and turn the gain up and down. It's a real-world example of how you should commission a system."

After students have got their certification, Reflect becomes a valuable tool in their workplaces. "I think our industry is on the verge of shifting from being reactive to proactive," offers Matt. "An AV tech can log on and check a system, with monitoring on speaker or microphone connections. Third party devices like TVs can be verified as being on or connected. You can set-up Q-SYS to run a ping module to any networked device, and if it goes offline, you get an email. Integrators don't have to go to the trouble and expense of leaving a dedicated NUC onsite anymore. Another advantage is that the dual network interface on Q-SYS Cores mean LAN A can connect to Q-SYS devices like amps, and LAN B can be the internet connection, keeping the Q-SYS network separate from general traffic."

TAG are now rolling out Level 2 training both online and live. "We're finding a balance between the in-person Sydney and Melbourne sessions, and the virtual," concludes Matt. "The demand is there, and the call is out. We're ready to go for whoever needs us."

"AEC is a fundamental component of most jobs now, and actually being able to demonstrate how it works and what happens if you don't get it right is invaluable."

The Sydney Training Room

Upcoming Training Dates

June

23-25 - Level 2 (Virtual)

29-30 - Level 2 (Sydney)

July

6 - Level 1 (Sydney)

7-8 - Control 201 (Virtual)

August

3 - Level 1 (Sydney)

10-11 - Level 2 (Sydney)

17-19 - Level 2 (Virtual)

23-24 - Level 2 (Melbourne)

25 - Level 1 (Melbourne)

Check https://training.tag.com.au/ for calendar or email training@tag.com.au for registration

by Jenny Barrett. Photos by Matt Clode.

SIX60 BREAK GROUND AT EDEN PARK

Six60 first band to play iconic Eden Park Stadium

A Six60 tour seems synonymous with the phrase a 'New Zealand first'. It was no different this year, when Six60 became the first band to play at the iconic sports stadium Eden Park in central Auckland. Global Production Partners and Human Person had five weeks to pull together this quite literally ground-breaking concert.

"The real curveball was the decision to go ahead at Eden Park this year, rather than during the next tour cycle as previously planned. Five weeks out we had no design or anything," recalls Leon Dalton, Global Production Partners. Leon had just got back home to Perth from the Six60 Summer Tour and had to turn around and head straight back to New Zealand.

Producing a live show for the first time at Eden Park also brought other challenges. Permission for Eden Park to hold up to six concerts a year was the culmination of a long-running legal battle, "There was an encyclopedia of resource consents, nothing unusual, just the sheer amount. We were very mindful that we had to get our ducks in a line." The one problematic consent issue was the limitation on moving trucks after the show, and with only six of the twenty trucks required able to fit under the stadium, most were loaded the following day.

Equally, requirements such as house lights, aisle lighting and access to the venue were all very much work in progress, "The venue were really good about it - and clever, bringing in Six60's old representative Glynn Leggat to be their liaison for live entertainment, someone who understood what we needed."

The long legal battle also meant that the CEO of the stadium Nick Sautner and his team were unusually invested in the show, "They wanted a spectacle like no other that had to tick all the boxes."

As did the band. Frontman Matiu Walters grew up locally, played first fifteen on the field, had sung the national anthem to open a recent All Blacks Wallabies game, and his grandfather had captained the All Blacks out in 1957. The band's brief? Far more hands off having worked with Global Production Partners and Human Person for the last few years, it was simple. Create a historical musical moment.

A seamless partnership now in terms of design and production, Ben Dalgleish, show designer from Human Person and his team sketched out the vision and Leon and his team made it happen. Ben describes what he wanted to achieve, "We'd done three back-to-back tours, we weren't going to go ahead with Eden Park unless we could make it something significant. I wanted the visual and the music to complement each other as much as possible. Previously separate, I wanted to bring the IMAG and the band together on the same screen, use a lot of Notch and UV mapping which would be ground-breaking for New Zealand, a new way, a tasteful way of using the cameras." Ben saw an 'A' symmetrical open stage with no side walls, 3D towers either side and full automation.

Leon took up the challenge, "The tour used a 27 metre wide custom stage with no sides to avoid that 'band in a box' look so we expanded it for Eden Park." Stageset duly created the biggest stage that they had ever made at 68 metres wide and the highest point was 18 metres high with 133 rigging points.

One element that Ben wanted to add for the Eden Park show was four large pillars of LED screen, covering the stage legs. The desired 3D effect required exact engineering and a large amount of square metres of LED.

Although dubious about the cost versus impact of the pillars, Leon backtracked, "I ate my words on the night. That's how I see our partnership. Ben has the vision and his role is to push the boundaries, and I make it happen and ensure that we don't blow the budget."

Managing the budget was a mighty task for what was in Leon's words, "Everything we toured with times three." They used every LED that Big Picture had in stock to create a 600 metre squared screen, "We essentially 'meccano'd' what we could get our hands on." Being a stadium with seating pushed as far up as possible, they angled the screens back and spent a lot of time checking sight lines. The video from the Summer tour was re-rendered for the much larger set up.

The full automation, so critical to the Eden Park show's vision was provided by CP Solutions, led by Chris Browne, and for Ben was the really dynamic element of the production, "They were under the pump to get all 50+ cues programmed and gear secured safely, and did an amazing job." Lighting-wise, there were 11 moving light trusses, five pods at the back for the Robe LEDBeam 100s and six fingers full of Robe Tarantulas that came up, down and angled as required. An additional automation element was 24 Astera Titan Tubes with custom facades on

"Stageset duly created the biggest stage that they had ever made at 68 metres wide and the highest point was 18 metres high with 133 rigging points."

mini winches provided by Human Person. For Spotlight, the lighting supplier, it was the biggest show they had ever done, cleaning them out of lights.

College Hill Productions deployed a large L-Acoustics System for the tour consisting of K1 and K2. Chris Tate (FOH engineer)'s console of choice was a Soundcraft Vi7000, along with an extensive Universal Audio Plugins package. Monitors was handled by David O'Brien using a DiGiCo SD7 with a large array of Shure IEMs and RF mics. One of the interesting things on the tour was the monitor console was hidden behind all of the LED screens, so David had to rely on a complex video monitoring system and talkback matrix with all the other crew.

Ben also threw pyro in the mix supplied by LiveFx which was "very impactful" and the band are keen to use pyro at every show going forward.

Already broadcasting the show live to eleven Pacific Island countries through Pasifika TV (another New Zealand first), Six60 made a late decision to add pay for view, having successfully livestreamed to TikTok at their Hamilton show (guess what - another first!), "This added a huge degree of complexity requiring an additional broadcast system on top of the show system, and adding another twenty-five people to our two-hundred crew."

To add to the streaming, the short timeframe, vagaries of a new entertainment venue and the exceptionally high expectations of all stakeholders, the final challenge was putting a concert on in New Zealand in late April, "We would never usually have done that, and with an open design. We spent a lot of time on weather proofing." And even though the Six60 Summer Tour had miraculously dodged the COVID19 level changes, to the extent that it was laughingly rumoured the band had a direct line to the government, there was no such luck with the weather. "Although we had five days rehearsal at the Spark Arena before we started the Summer tour, we only had the afternoon before to rehearse for the Eden Park concert, and it got rained off after three songs. I walked out panicking that we hadn't tested anything, but everything ran faultlessly on the night. Testament to the expertise of the team."

And the feedback was resoundingly positive, reviewers bravely harking back to the night at Eden Park when the All Blacks won the 2015 Rugby World Cup. In deference to the band's – and much of the audience's - connection with the venue as an iconic rugby stadium, the show opened with the band coming out of the All Black's tunnel and launching into the first song on a B stage with a 40 metre thrust. A kapa haka group performed a haka to 'Don't Forget Your Roots', stirringly tying art, sport and music together. It was an intimate start to the international standard performance that everyone wanted – and in the case of the Eden Park team – needed.

For both Ben and Leon, it was the culmination of a three-year partnership and five weeks of 24/7 days. Leon reflects, "There was something special about being the first person to produce a show at Eden Park, but more than that it was the feeling that we had put together something that would compete globally. It was an incredible team effort, using local resources and local people."

For Ben, "I've been working with the band for 12 plus years and moving from where we started up to this 50,000 seater show at Eden Park was very special. To be there alongside them helping to create this momentous occasion was very emotional."

With a fast-selling Australian tour and concerts in the Islands on the cards, plus planning underway for a New Zealand stadium tour in 2022, Global Production Partners and Human Person will continue to have ample opportunity to create and produce some more Six60 firsts.

Technical Direction Company's Greatest Hits

At TDC, projection is in our DNA. TDC's history as an innovator and early adopter of technology, in particular projection, has seen us collaborate closely with leading manufacturers such as Barco and Panasonic. TDC is recognised internationally as a pioneer in the field of large-scale architectural projection design and mapping, laser projection, projection blending, 360 degree projection, interactive, motion tracking and immersive projection environments. For us projection is something of an art form and we pride ourselves on perfecting the results.

Challenging projects are what drive us; over the years we have been involved in projects for theatre, TV, corporate and large-scale public events. Here's a little bit more about some of our most memorable projects.

Projecting onto the Sydney Opera House over the years

It is always an honour and a privilege to project on to the iconic Sydney Opera House sails. These 9,000 square metre sails provide the perfect backdrop for our projection expertise. TDC have been involved in projecting on to the Opera House from as far back as 2007 and, over the years, we have looked at projection from many different technical perspectives and have changed the projection design many times, each time acheiving a better result. We continuously vary and evolve the way that we project onto the Opera House to get bigger, better and brighter results as technology evolves. The designs and systems have evolved with technology advancements and now challenging-shaped installations, such as the Opera House, are done in a full 3D workflow.

Sydney Opera House


Sydney Opera House

We have lit the sails for many momentous occasions, from the Royal Australian Centenary Celebration to the opening of the Invictus Games, but what we are most proud of is the projection onto the sails that

was done for the bushfires last year, as it really gave us an opportunity to give back to the community. We only had two hours to install and line up 16 projectors at dusk to put a message of thanks up there for all the firefighters who helped in the disaster. If it wasn't for TDC's resident projection expert, Steve Cain, disguise's 3D workflow and our accurate model of the Sydney Harbour, this would not have been possible in such a short time frame.

Of course, we can't look past the numerous years that we have lit the sails for Vivid Sydney. It is a much anticipated event and each year we have the opportunity to work very closely with the most talented of content creators from all over the globe to ensure that they understand how to get the best results from the graphics they are creating. We recently switched to using disguise's Omnical camera assisted line-up systems, and combined with our multi-skilled team, this helped us get this iconic landmark lined up and running far more quickly and efficiently.

Woody and Buzz at the Argyle Cut for Vivid Sydney

The Argyle Cut at the Rocks is a 30 metre arched tunnel, providing us with a unique canvas to project onto, and we have done so twice for Vivid Sydney over the years. We have perfected the projection by using our disguise previsualisation studio and advanced skill sets to design templates for the artists and also to design the split of the eight projectors used inside the tunnel to create this unique projection blend.

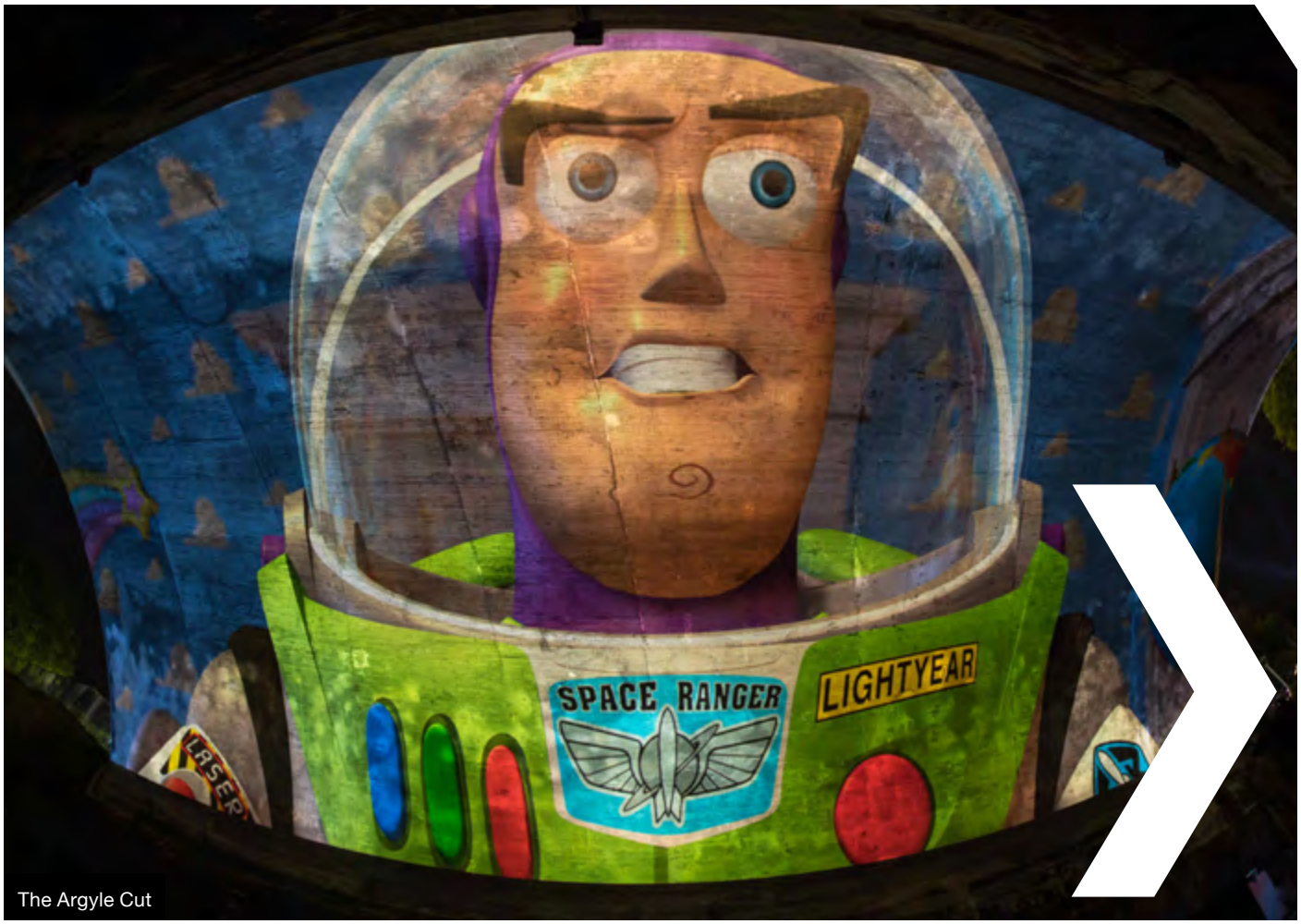
Based on our experience with projection light physics, physical textural environments and advanced server 3D workflows, Pixar Animation Studios transformed the Argyle Cut for Vivid Sydney with a creative light projection that delighted visitors of all ages. Viewers were transported through a visual retrospective of behind-the-scenes artwork and animation to mark the release of Toy Story 4.

Urban Tree at Martin Place for Vivid Sydney

We always have amazing results when projecting onto the Commercial Travellers Association (CTA) Building at Martin Place, the first of which was Urban Tree for Vivid Sydney. For this unique projection, we only used four projectors, but did the projection extremely efficiently by using every aspect of great projection design; using building attributes, shadows and lines to enhance and complement each projectors focus.

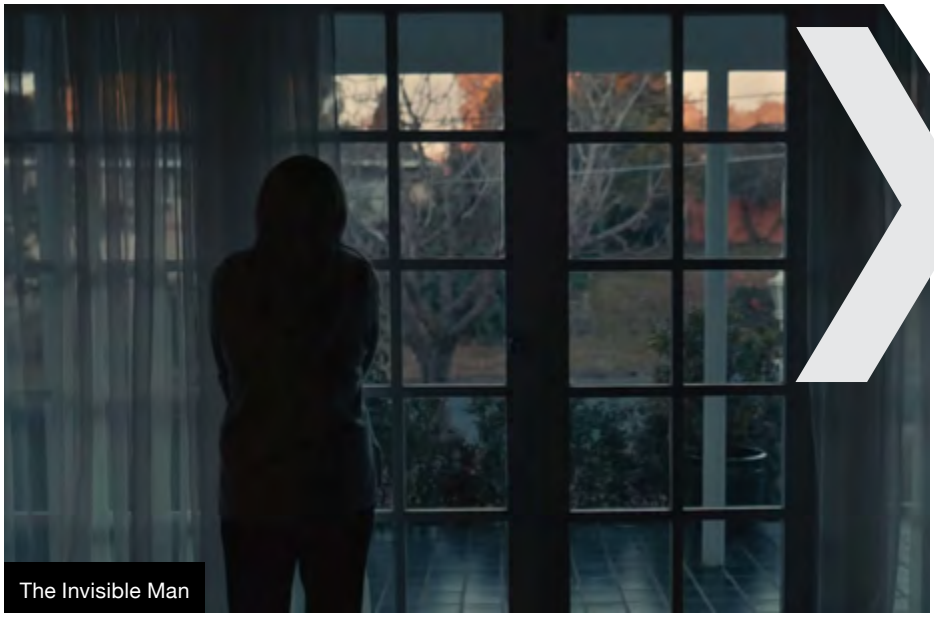
We worked closely with the talented team at Ample Projects to help design the best projection solution for this challenging architectural screen and the results were truly magical. They are experts at producing content that is so beautifully designed for the architectural canvas that they are transforming. For this project, we were taken

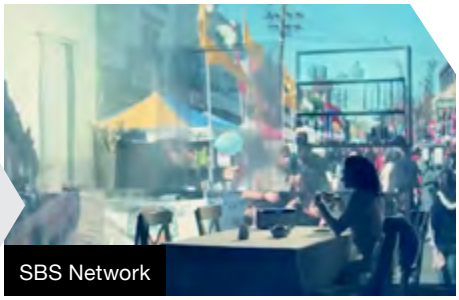
CTA Building (Martin Place)

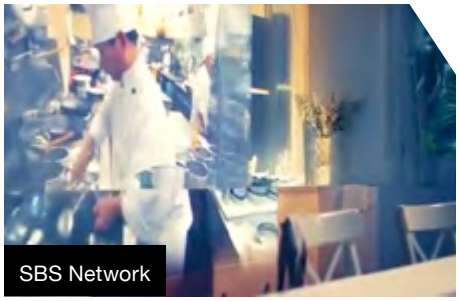


The Argyle Cut

Salesforce World Tour


The Invisible Man


SBS Network


SBS Network


SBS Network

through the lifecycle of a tree growing out of the ground to become a magnificent living tree within the surrounding Martin Place urban environment, celebrating and reflecting on Sydney's original green landscape. Urban Tree won awards for live events design at the 2014 AEAF Awards and the 2014 Australian Production Design Guild Awards (APDG). The project was also a nominated finalist in the 2014 Australian Event Awards, and awarded a highly commended place for Concept Design and Illustration at the 2014 Australian Production Design Guild Awards (APDG).

We went on to reproduce this work of art with Ample again for Vivid Sydney a few years later and have perfected the projection mapping on this mushroom-shaped building through other projection projects, such as Sydney's iconic Christmas Projections.

A 42K Projection Raster for Salesforce World Tour

TDC provided a massive 42K projection raster for the Breakouts of Salesforce World Tour in Sydney. We used five disguise 4x4 servers, all running full sockpuppet mode off of an MA2, outputting via SDI to our Riedel Micron signal distribution system to around 30 Barco high-powered projectors with six breakout rooms captured back through disguise and PIPd up on the mega wall video screen that was around 120m long.

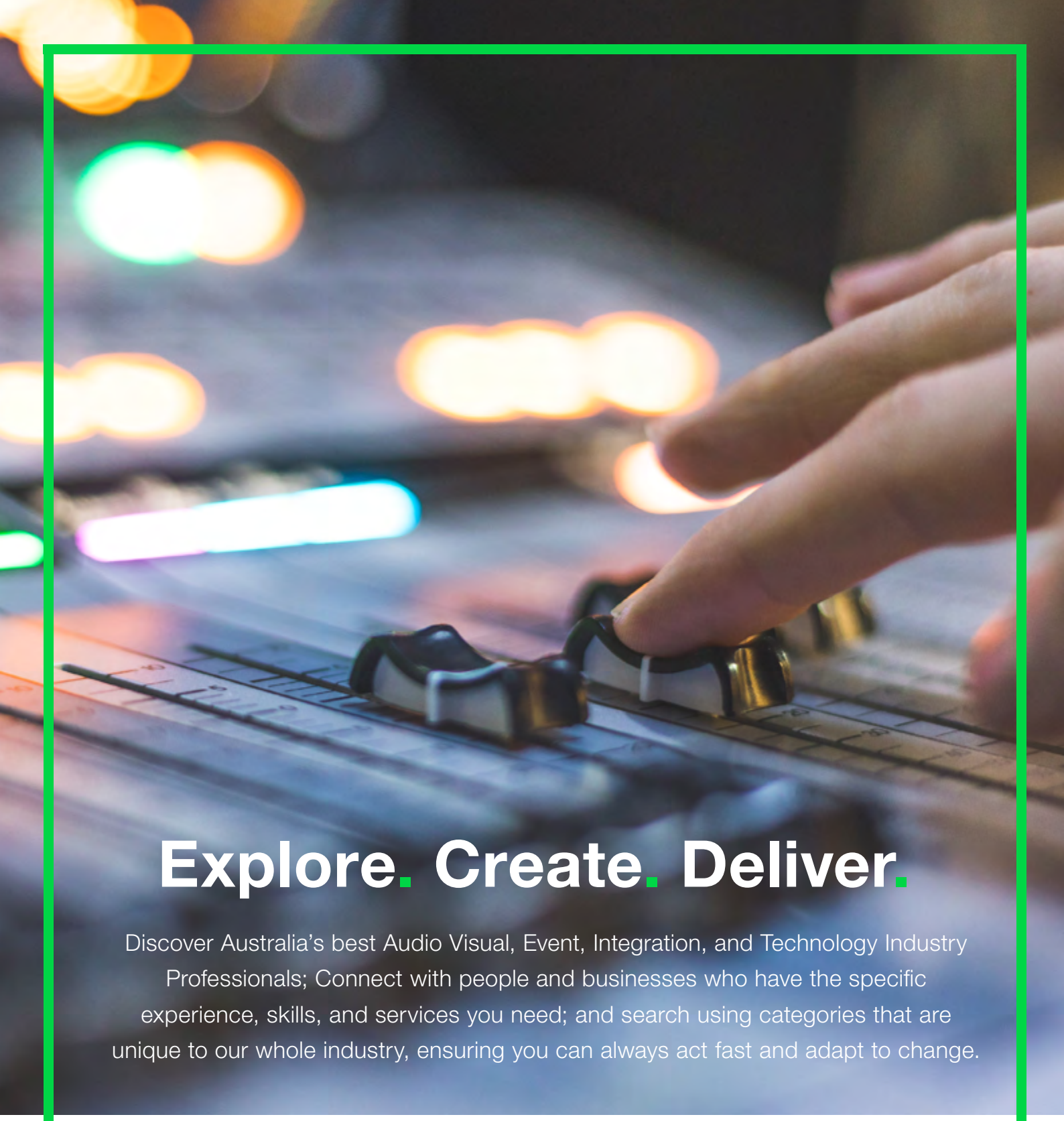
This project had many unusual aspects to overcome as no graphics were able to be created or processed beyond 16,384 pixels wide due to the limitation on the silicon chip, so we had to "chop up" and synchronise all the disguise servers and projectors to be able to do this project successfully. The result was truly stunning.

Immersive projection for SBS TV

Shot in studio, TDC provided immersive projection to simulate all the interior and exterior imagery for the SBS Network. Using all the power of the media server, this was a simple yet highly effective projection. We were able to lock to the filming standards needed for the shoot and have the flexibility to position content everywhere; we used three different models of Barco projectors with a range of lenses to constantly relocate and adjust the projection to perfect it for the film crew. As you can see, it provided great results.

Visual effects for The Invisible Man

TDC provided projection to create the atmospheric visual effects for The Invisible Man using high-end graphics servers; we lead the way in pushing the boundaries of never before seen XR experiences that can transition seamlessly through pre-vis, tech-vis, and on-set implementation.



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Immersive video projection for the Gold Dinner

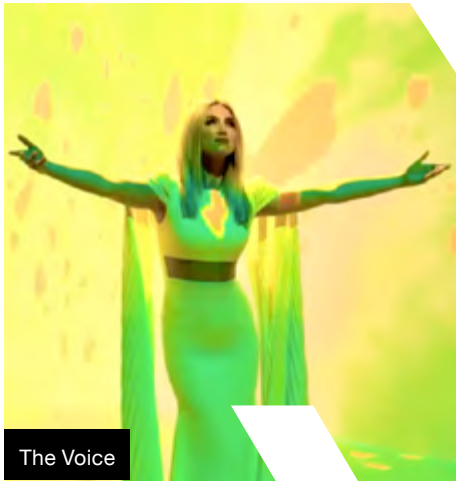
TDC has been a long-term supporter of The Sydney Children's Hospital Foundation in many capacities. We are always proud to be involved in the Gold Dinner and for one year Sydney Technology Park was transformed into an opulent colonial setting for the night by Tony Assness. We provided an immersive video projection surrounding the VIP dinner party audience in colour and movement, projected onto speciality gold paper using disguise and 16 Barco projectors to design and make a full 360˚ wrap around immersive video environment, using Blacktrax and real-time tracking to keep it in alignment at all times.

The Gold Dinner

An Immersive Space for The Voice

TDC used disguise and four different Barco projectors to design and make a fully immersive space for this promotional shoot for The Voice to advertise their upcoming series of the show. It was a full 3D environmental workflow, allowing for total immersion of the judges with outstanding results. Based loosely on a show moment for Lucy, a contestant from the series, our Head Engineer and Media Server specialist, Steve Cain, worked closely with The Voice's creative designer to come up with the concept of the "projection room", which was used again later in the series.

The event was a feat of projection and media server coordination as we controlled and ran around 70 different Barco projectors and around 10 disguise servers scattered across Sydney Harbour from a secret top floor location where Steve could see the whole Harbour. Projectors and media servers were scattered around the city at either side and end of the Sydney Harbour Bridge, and linked back to the event control room on the other side of the city via a sophisticated city-wide 'dark fibre' network. The control room housed two additional disguise servers, operating as masters. The result, according to Steve, was a truly stunning, very impressive representation of the whole colour spectrum, delivered from a network of projection towers.



The Voice

The Voice

Projecting around the city from one central location

A final projection highlight was providing the projections for Sydney's New Year's Eve celebrations in Sydney Harbour. TDC were commissioned to design, deliver, install and operate a projection spectacular, with a focus on the sandstone pylons of the iconic Sydney Harbour Bridge. Steve Cain, our Head Engineer and Media Server Specialist explains that for New Years Eve, "it wasn't just the projection, we designed everything from the content templates for the animations through the 3D models to the control system."

One area of focus was to deliver even more vibrant colours at even higher levels of brightness. To achieve this, Steve took the unusual step of specifying two different projectors to leverage the unique strengths of each. Using the Barco UDX 4K32 projectors for their incredible capability to deliver the primary colours – red, green and blue – with stunning contrast and black levels, he then overlay blended them with Barco HDF W26K projectors as they deliver amazing punch and really excel in the secondary colours – cyan, magenta and yellow.

NYE Celebrations

Building an effective system for projection mapping

presented by Barco

The four Ws of your project

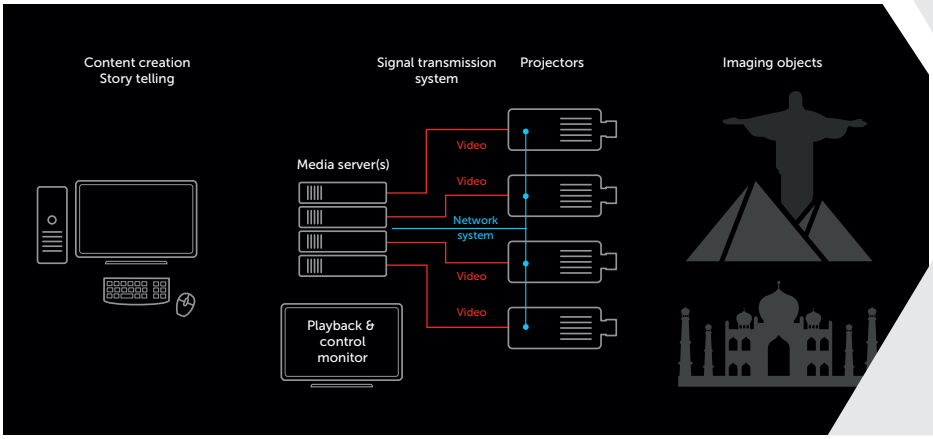
1. Why?

What's the primary purpose of your projection mapping? Is it a public service project or a commercial project? Who is the investor? All these factors will impact your next steps and approach to completing this project.

For instance, if the projection mapping is a public service project, your investor will likely be a government body or organisation. Projection mappings for commercial purposes, e.g. advertainment, focuses more on ROI – meaning you'll have to win the investment back from tickets sold.

2. What?

What is the story you want to tell, the content you want to visualise? Is it storytelling using only audio/video content, or a complete lighting show combining projection and other conventional lighting systems? Are there any other props involved besides the projection image? And is there an additional live performance during the projection mapping?



3. Where?

Have the imaging objects been decided upon? Will the projection mapping take place indoors or outdoors? Is there enough space to set up the whole system including projectors, speakers, media servers, the power supply system and cabling?

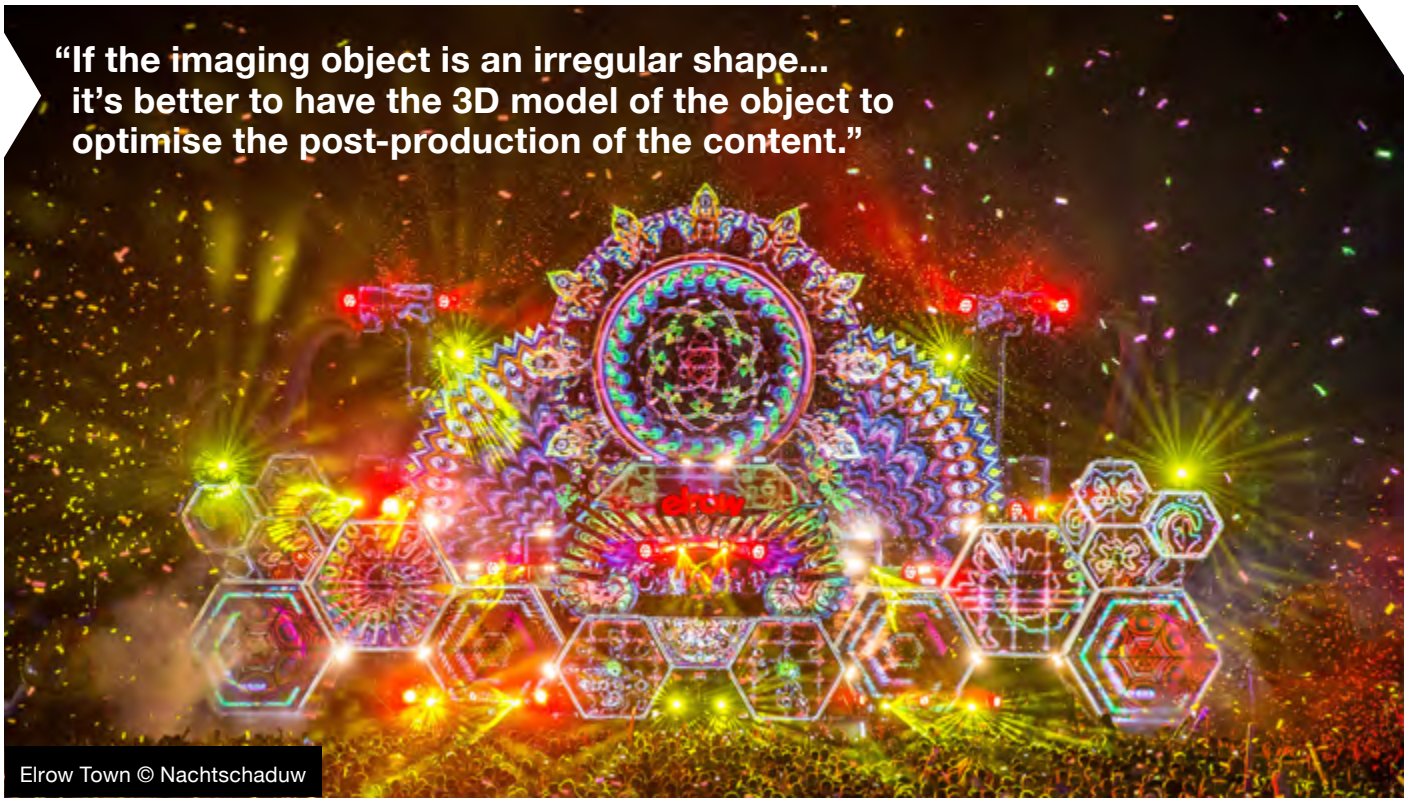
How about the environmental factors: humidity, altitude and temperature? What protection measures are needed to keep your equipment and its mechanics safe? Where will the viewers be located (viewpoint) and where will the projectors be installed? We'll come back to these questions and their impact on the choice of projectors further in this whitepaper.

4. When?

This question tackles the commercial aspect of your project. Will the projection mapping play around the clock or just one single evening/night? Is it a permanent fixed installation system or a temporary rental set-up? Based on the different business models, there are different approaches to implementing the project.

Additionally, you need to think about seasonal variables, e.g. rain/snow/wind?

Once most of the above questions are answered, you can start to calculate the project cost and ROI, and analyse your budget.



Elrow Town © Nachtschaduw

Arcadia London 2018. Photo by Lukonic Photography

The nature of the imaging object

To make the right content for your projection mapping, you must know a lot about the properties of your imaging objects, including shape and size of the projection surface, reflectivity, focus plane etc.

If the imaging object is an irregular shape, for example, a sculpture, church, or the wall of a big building, on which you want create an autostereoscopic effect by using the natural depth of the imaging object, it’s better to have the 3D model of the object to optimise the post-production of the content.

Conducting an onsite survey is a must to know the details of the imaging object, to check the projection surface and other parameters, and to think about how to map the objective.

Ambient environment

This one goes back to the question of ‘where?’.

Environmental factors like ambient light, humidity, temperature will affect the requirements of your projector. For example, a high amount of ambient light asks for a projector with a higher brightness level to maintain a high-quality image and increase the wow factor of the projection mapping.

Viewpoint

Here too, the onsite survey is very important. It is not only about making sure the imaging object is OK to project on, but also to seek the best possible positions to place the projectors.

The perception of human vision

What is the visible pixel size or perceived pixel size? Let’s take the HD (1920 x 1080) and 4K UHD (3840 x 2160) resolution as an example. In the table below you can see the size of each pixel in mm: the visible pixel size is an important factor of the system design, the selection of playback equipment and projectors, and audiences’ visual experience.

What's the smallest size a human eye can see or distinguish between two small objects (two pixels, or two lines with different brightness)?

Visual acuity is a measurement of our ability to see detail. It defines the extent to which information densities can be perceived. Acuity is measured with visual angle, the angle subtended by an object on a viewer’s retina specified in arc-degrees, arc-minutes (1° = 60'), or arc-seconds (1' = 60''). Given an object size “s” and a viewing distance “d”, visual angle “θ” can be calculated as θ = 2 arctan(s/2/d).

Image width (m)	10	15	20	25	30	35	40
Pixel size (mm) 1920 x 1080	5.2	7.8	10.4	13.0	15.6	18.2	20.8
Pixel size (mm) 3840 x 2160	2.6	3.9	5.2	6.5	7.8	9.1	10.4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Bern Bundesplatz. Photo by Jean Marc Charles, Spectaculaires


Vivid 2019 Sydney. Photo courtesy TDC


Place Stanislas. Photo by Spectaculaires

Blending and warping

If you can't find a perfect place to situate an on-axis projection within the acceptable lens shift, the image will be distorted. You need to consider the pre-distortion by embedding the warping function of a projector or correcting content through a playback system. The same goes for multi-channel projection mapping systems which require blending capacities. Additionally, blending will influence the quantity of required channels because the blending zone will also occupy a certain amount of pixels.

Content

Knowing your content is key for the system design. How many pixels would make up the total resolution of the canvas (projection mapping surface)? From that the total system resolution can be calculated, and you can further break down to calculate the required resolution per channel/projector.

For instance, a total system resolution is 19,200 x 2400 pixels. It could be 5 channels with 4K resolution (3840 x 2400) per channel, or 10 times 2K per channel. This example doesn't include the pixels of the blending zone. These key parameters will further influence the post-production of the content and how to choose the correct projector and playback system, etc.

Outdoor protection

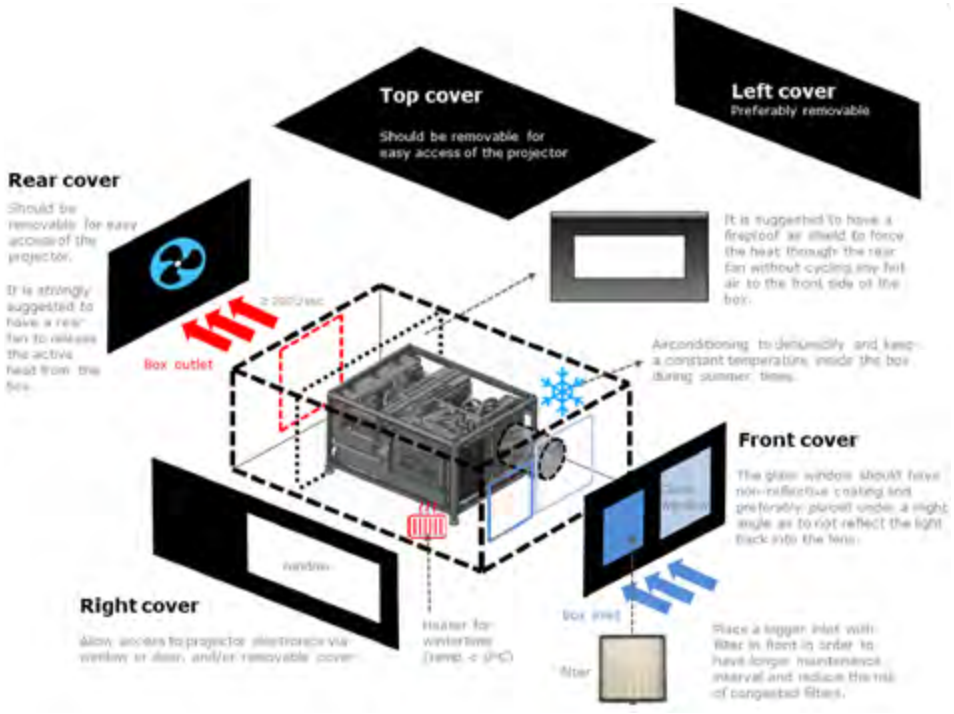
An outdoor box or projection booth are measures you can use to protect your projector from water, dust, changing temperatures, humidity, etc. during outdoor projection mappings. A projector is designed to operate in free airflow, with cold air coming in the front side of the projector and hot air freely flowing out the back side of the projector. The projector can be put inside a box or installed in a dedicated booth, as long as this free airflow is secured and all the hot air can be released via the back of the projector (so without cycling any hot air into the front of the projector which would distort the image and overheat the projector itself).

Below are some visual acuity limits for basic visual properties.

Property	Description	Acuity
Point acuity	Resolve two point targets	1'
Grating acuity	Distinguish bright and dark bars in a uniform gray patch	1-2'
Letter acuity	Resolve letters, 20/20 vision means a 5 arc-minute letter can be seen with 90% accuracy	5'
Stereo acuity	Resolve a just-noticeable depth difference through binocular disparity	10"
Vernier acuity	Resolve if lines are collinear	10"

Based on the information above, it's possible to calculate the pixel size relative to the viewing distance.

Property	Minimum visual angle	Pixel size (mm) @10m distance	Pixel size (mm) @20m distance	Pixel size (mm) @30m distance
Point acuity	1'	2.91	5.82	8.73
Grating acuity	2'	5.82	11.64	17.45
Letter acuity	5'	14.54	29.09	43.63
Stereo acuity	10"	0.48	0.97	1.45
Vernier acuity	10"	0.48	0.97	1.45A



Is there still a requirement for 3D projection surfaces?

by Norbert Schmiedeberg, ITI-Image Group

You might not know it, but there are a number of 3D cinema releases in the pipeline, scheduled right up to 2028. These include the Avatar series, and Star Wars. Even this year there are a total of 27 3D-shot releases planned. So 3D is definitely still around and will be for a long time to come. Of course, we do not know how many of these releases will appear as 3D in cinemas in Australia and how many may only be streaming.

So, as valid as 3D is for the movie world, it could and should be also used in corporate, theme parks, museums, and other displays. In fact, 3D is often used in simulation. Because of this, I'd like to talk about 3D projection surfaces, which of course can be used for 2D as well.

Essentially, we have two types of 3D projection surface materials; PVC in-base and PVC-surface externally coated. The PVC in-base coated material is like a normal projection surface, but special reflecting components are imbedded. This allows the material to be handled like a normal surface, though rolling it up is better, since any creases create problems with the 3D effect.

Experience has shown that this type of surface is best suited for special effects and very large architectural or similar 3D projection, since in passive 3D, the image separation L>R is often not as good and 'bleed through' of the other image may appear; an issue much less prominent with large viewing distances.

The best 3D projection surface is a surface coated with a silver aluminium flake. Because of this coating, these surfaces cannot be welded, once applied. There are a few manufacturers who produce this type of surface, such as Harkness, Stewart, and Spectro. At ITI-Image Group, we work with Spectro, based in Korea. Spectro material is used by more than 50 countries worldwide, and is 100% made in Korea.

Projection Types: Passive and active

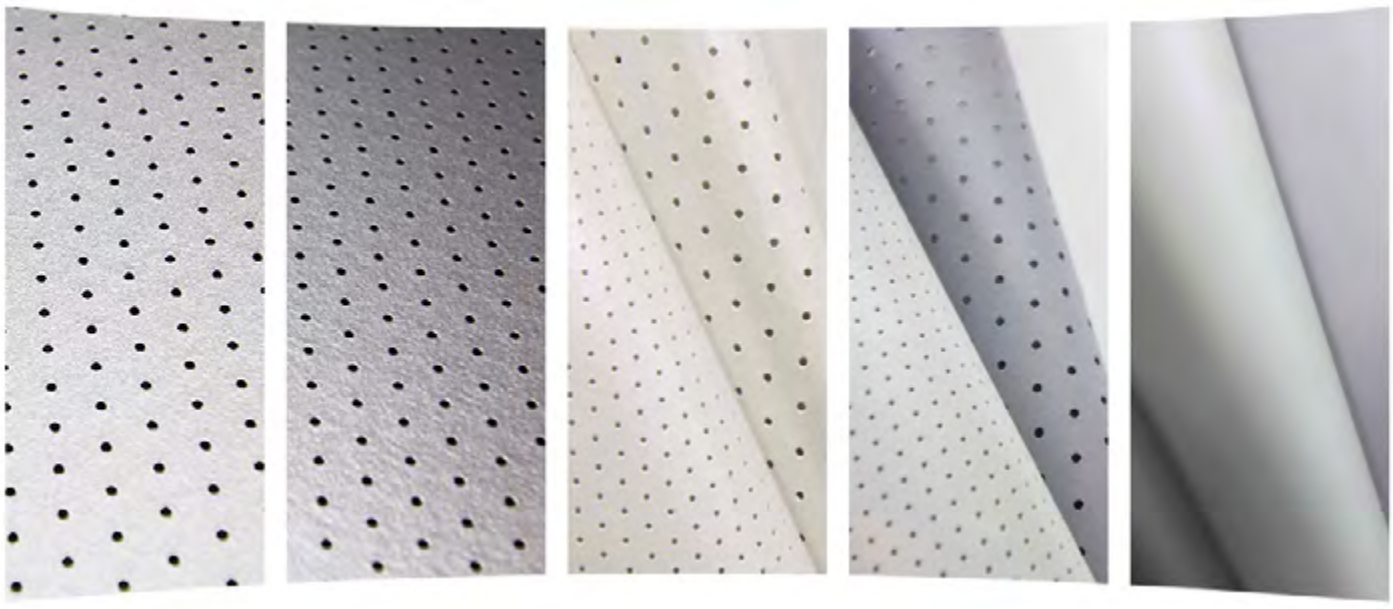
Active has the advantage that the 3D glasses create the image separation by working like an alternating shutter for left and right, synchronised with the projector. In principle, any type of surface can be used for active 3D, but generally, selective surfaces create a better result.

But active has disadvantages because the glasses must be recharged and, in Covid times, are much more difficult to sterilise. So the predominant form of 3D projection is passive, using polarised glasses and filters on the projector. Passive glasses can be very cheap and the audience may take them home, so sterilisation is less of an issue. For passive projection we need a surface which can separate the beam from the Left and the Right projectors without bleeding.

Usually, to create large projection surfaces the base material must be welded together. Coated surfaces cannot be welded once they are coated. The common approach is to weld the surface to size and then coat it. Spectro, for example, can coat up to 34m wide. With this method, the weld can not be seen in projection.

Coated surfaces should not be folded, since this can damage the coating. However, it may be possible to install them on a roll-down screen. Early last year, we supplied a roll-down 3D screen for an installation in Australia.

3D screens are mainly used in cinemas, venues, simulation and advanced home theatre. For cinema screening the centre loudspeaker is installed behind the screen. For this we need perforated material to let the sound through. In addition to the standard 1.2mm and mini 0.6mm perforation, there is now a 0.8mm Digital Perforation. This DP avoids the moiré effect which can occur with 4K projectors. By the way, the total hole space is the same across all three perforation types: 4.97%.



Gain

The gain of 3D surfaces is usually higher, due to the better reflectivity of the silver particles. This higher gain also compensates some of the light loss due to the use of polarising filters. Usually a higher gain may have a lower HGA (Half Gain Angle) or a narrower viewing angle. The Spectro Silver with a gain of 2.4 has a HGA of 22°, while the Prima Silver has 34°. Spectro makes 3D surfaces with different gains, depending on the application, such as 2.1, 2.4, 3.0, 3.3, as do other manufacturers.

At this point I'd like to introduce another factor; Speckle. Speckle is a characteristic of the laser light source, which gives the appearance of boiling on the screen and affects the quality of the image. Speckle from RGB laser projectors is a hot issue, while speckle from Phosphor laser projectors seems to be no problem. In the case of Spectro, the 'normal' silver surface is rated by the manufacturer as 'bad' for Speckle, while the Prima Silver is not. Selecting a 3D surface requires some research and consideration in respect to the desired on-screen result.

If you are planning for 3D, do your research and select the best suitable surface for your project to achieve the best result. With 4K and 8K projection we may see a stronger revival in 3D and much more stunning on-screen effects.

Spectro

Spectro is a Korean projection surface manufacturer that is leading the Asian cinema installation market. One year ago, ITI-Image Group imported a 3D roll-up screen from Spectro. This company is one of the very few that makes 3D surfaces which can be rolled. The strength of the factory is in large format surfaces with different gain options, for Front Pro, 3D option and silver screens, and Rear Pro.

Spectro also manufacturers frame-based installation screens.

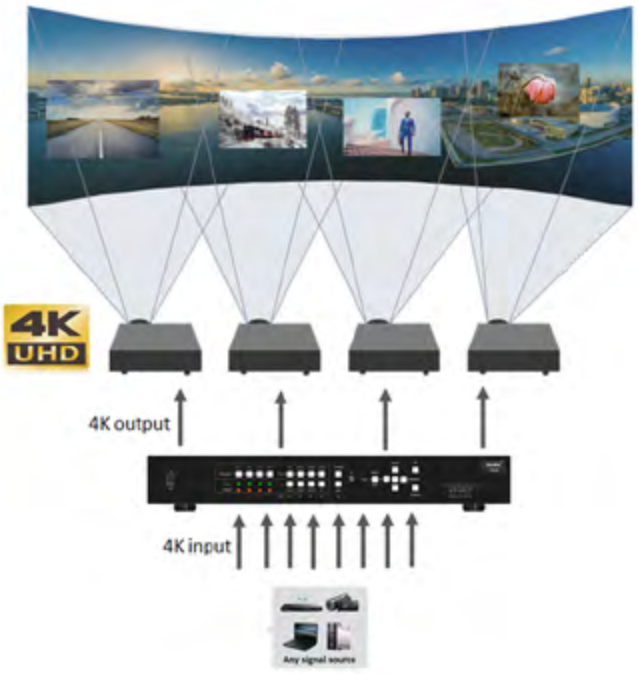
We've found it easy to deal with Spectro because of their very short manufacturing time of about seven days and their reliable supply.

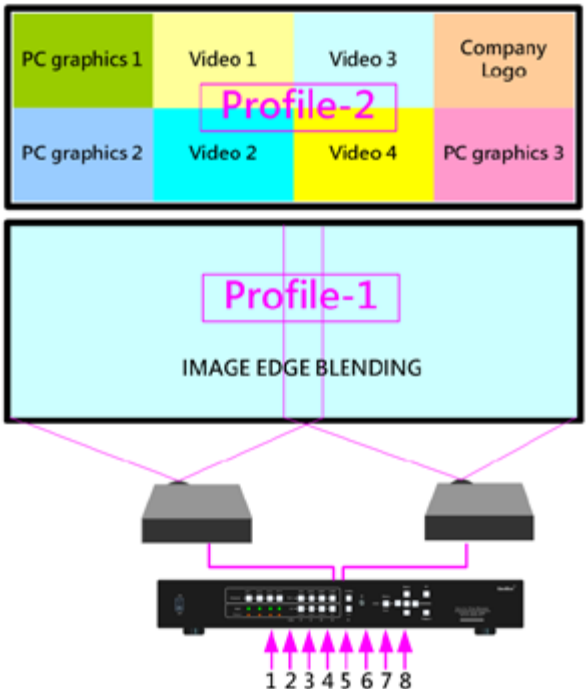
Spectro Front Pro surfaces are seamless because they are welded before coating; this is the best option for large screen design.

We can source the surfaces with eyelets, pipe pocket, cloth web and press studs, straight sides or shaped or cut square (unfinished edge).

All SP material is available in perforated, digital perforated, micro perforated and unperforated.

Digital perforation avoids the Moire effect on high resolution projection. The hole sizes are: Standard 1.2, Figital 0.8mm, micro 0.6mm.





New from ITI-Image Group - GeoBox UDxxx series

While many projectors are being manufactured with built-in blending and warping, VNS Geobox adds functionality which is normally not part of the projector. With the release of the UHD series, GeoBox is now able to output 4K per channel.

The Geobox internally consists of individual modules, of which each is equipped with 3x HDMI 2.0 and 1x DP 1.4 input, and a HDMI 2.0 output. There is also the loop-through output, which can be used to send the unprocessed signal to another projector.

GeoBox typically does not require a PC to operate, but for extended numbers of control points, the Gwarp software is available at no charge.

GeoBox is operated through front panel keypads, IR, USB or Ethernet. The units include full edge blending, except the UD101Lite, which is for non-blending applications. In addition to the ability to switch between different inputs, PIP and POP functions are available with flexible location on screen. PIP can size up to WUXGA.
The new multi-viewer function allows 2/3/4 splitting for each projector and up to 16 contents in one UD104.

The UD series complements the G-8xxx and M-8xxx series for blending and warping, and the G-4xxx and G-9xxx videowall controllers.

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DIGITAL PROJECTION DELIVERS PIN-SHARP IMMERSIVE AND INTERACTIVE EXPERIENCES

E-Vision Laser 15000 WU

E-Vision 9000

M-Vision Laser 23000 WU

Committed to providing cost effective projectors without compromise, Digital Projection has released three new single chip projectors.

Ideal for creating large, immersive digital displays in retail spaces, entertainment venues, and places of worship, these new models produce more vivid, colour saturated and life-like images than was previously possible on single-chip DLP projectors.

M-Vision Laser 23000 WU

Digital Projection's M-Vision Laser 23000 projector is the world's brightest 1-chip DLP Laser Phosphor projector. Featuring 23,000 lumens output and a 10,000:1 contrast ratio, this model delivers a large-screen imaging solution for budget-sensitive applications. With close to 3-Chip performance at a 1-Chip price point, the lamp-free, laser-phosphor projector is charged with COLORBOOST+ Red Laser technology to provide the most realistic and saturated colours at previously unimaginable luminance levels.

Venues needing a powerful, yet budget-conscious large-format imagery solution without sacrificing on colour accuracy, as well as those contending with ambient light, will directly benefit from the M-Vision 23,000's light output, contrast ratio and colourimetry. Motorised shift, zoom and focus across the whole lens range offers extra flexibility and ease of setup.

E-Vision Laser 15000 WU

New to the E-Vision 15000 is Art-Net control that allows easy integration into existing lighting installations, making this E-Vision powerhouse projector ideal for everything from live events to visitor attractions. Renowned for being a robust, reliable workhorse, the latest generation of this compact, lamp-free projector utilises COLORBOOST+ Red Laser technology to create the most realistic and beautifully saturated colours ever seen from any high-brightness 1-Chip DLP Projector.

The E-Vision 15000 WU has sealed optics and uses liquid cooling with radiators to remove energy to the outside environment. The optical system, from the laser light source up to the lens is completely sealed, ensuring that light output and colour performance will not be degraded due to the ingress of dust.

E-Vision 9000

The all-new E-Vision 9000 is an exceptional solution for those seeking a compact and powerful projector that includes a manual zoom. Ideal for medium sized screens in applications such as visitor attractions, boardrooms, retail spaces, and hospitality meeting rooms, the E-Vision 9000 features a wide range of lenses including a 1.54 to 1.93:1 zoom lens. The ability to mount in portrait mode makes it flexible for non-standard applications. With an impressive 9,000 lumens for a compact chassis, and an unbeatable TCO with 20,000 hours of stable illumination, the new E-Vision Laser 9000 packs a punch.

M-Vision 23000 RRP $56,999

E-Vision 15000 RRP $33,499

E-Vision 9000 RRP $15,199

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ARTECHOUSE NYC

L-Acoustics' L-ISA is the perfect complement to ARTECHOUSE NYC's immersive imagining of Julius Horsthuis' Geometric Properties

Supplied by See Factor in 2019, the first fixed art-gallery install of L-ISA technology continues to sonically delight artists and audiences alike for new exhibitions. ARTECHOUSE NYC, located in a never previously occupied boiler room beneath the iconic Chelsea Market, is one of the most unique art destinations and experiences in New York City. Despite its century-old confines, ARTECHOUSE rightly presents itself as the art organisation for the digital age. It's an innovative space for immersive and interactive art exhibitions dedicated to providing the most advanced platforms for genre-pushing artists experimenting with emerging technologies and new forms of creative expression.

Geometric Properties, which runs through September 2021, is a perfect example. Fractal visuals created by Dutch artist Julius Horsthuis, with original soundtracks by Michael Stearns and David Levy, the gallery's newest exhibition is a 30-minute, eye-popping environment that "explores fundamental mathematical patterns to stimulate existential self-reflection and emphasize the pure wonderment of being," according to the artist's website.

But what makes ARTECHOUSE NYC unique, and what enables artists to push their creativity to new levels, is the implementation of L-Acoustics L-ISA Immersive Hyperreal Sound technology. Designed and installed in the main gallery for the venue's grand opening in September of 2019, L-ISA allows artists to expand their canvases from the visual to the aural.

"This is ARTECHOUSE's third location, and we wanted it to push the benchmark of the experience," says ARTECHOUSE Executive Creative Director Riki Kim. "When we were looking into the audio element, L-Acoustics and L-ISA stood out from the competition. The appeal was to have an immersive sound system with no 'hot spots' in the room, plus

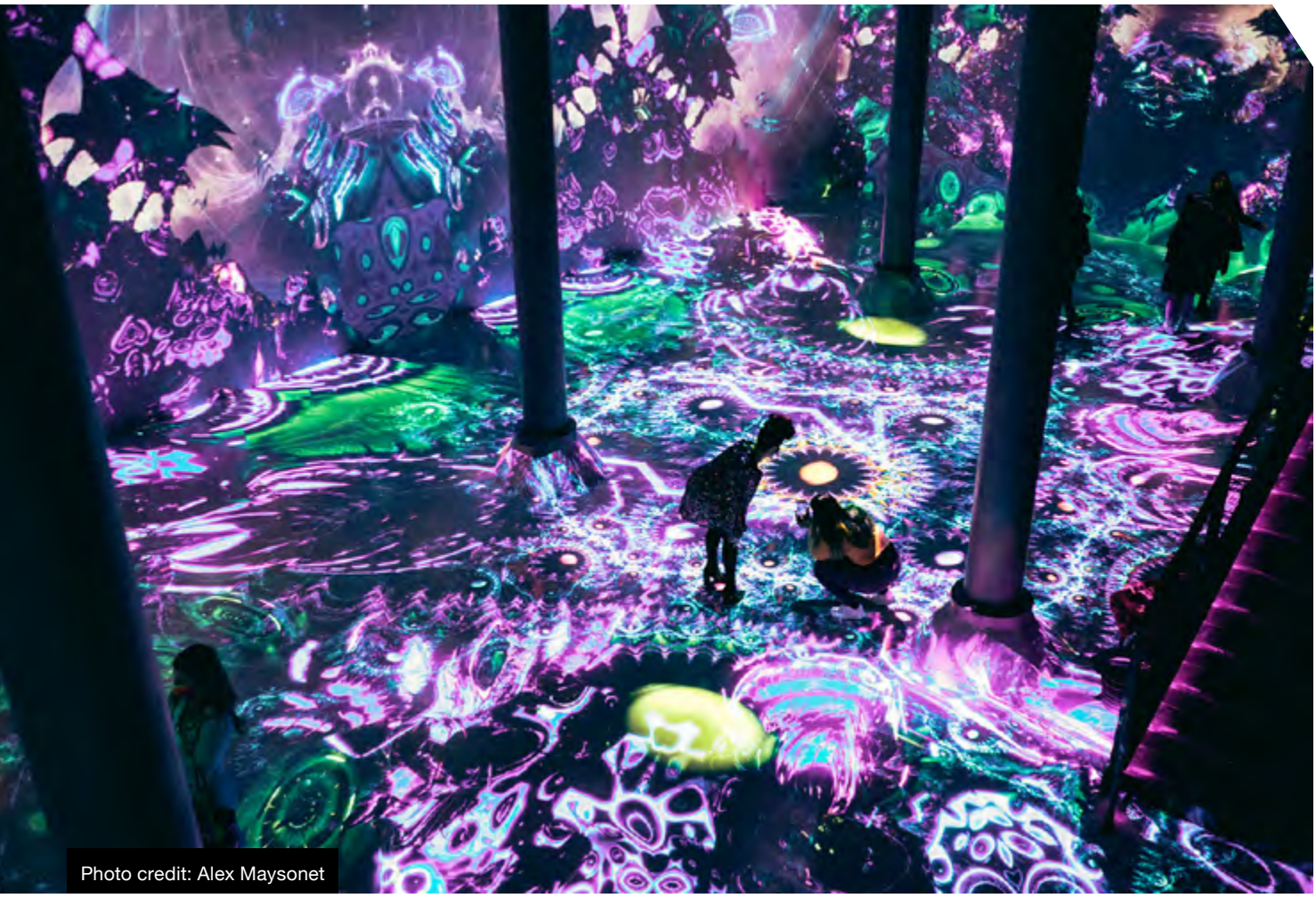

Photo credit: Alex Maysonet

a clear and transparent sound that could express the art's wide range of tone and emotion. But it wasn't just the product; it was also the people at L-Acoustics and how they approach us as partners in artistry. With L-Acoustics, the people and the products are a complete package."

Queens-based See Factor supplied the 31-channel sound system at ARTECHOUSE NYC, which comprises 20 L-Acoustics X8 speakers used as perimeter/outer speakers, ten 5XT speakers deployed as overhead/inner speakers, and two SB15m subwoofers, which function as a single mono channel. The entire sound system is powered by a total of six LA4X amplified controllers, with the immersive mix running through the L-ISA Processor. The sound technology is complemented by Barco-powered, 16K-resolution, 150-megapixel raster laser projection system.

Art-installation composers and sound designers, such as Berlin-based composer Kerim Karaoglu, who provided the sound design for ARTECHOUSE NYC's inaugural installation, Machine Hallucination, by Refik Anadol, use the L-ISA Source Control plugin in a Logic Pro session to adapt and localise the installation's score to the immersive environment. Outputs from the processor are then rendered to multitrack files that are played by the in-house media server for video and audio. MADI from the computer is converted via an RME M32 Pro to analog, feeding the LA4X amplified controllers. In effect, L-ISA became an extension of the artistic process during the mixing of the show, enabling artists to create and deliver new multidimensional sound experiences for live and recorded productions.

"ARTECHOUSE was a very fulfilling project to be involved with on many levels," says sound designer Jesse Stevens, who designed and engineered the installation. He worked in conjunction with Kim and the ARTECHOUSE team to develop a system that would give maximum resolution within the necessary design constraints, such as not putting speakers in the projection area. "We were tasked with thinking about a system not only with our usual engineering eye but also from a creative point of view. It needed to adapt to any artistic idea, and even become an extension of the artists' work." Stevens went on to mix sound for Machine Hallucination, and he says that implementing the Keraoglu's rich and beautiful score was a "dream come true."

Stevens says that Geometric Properties was a unique installation, broken into two distinct halves, delineated by the contrasting musical scores of composers Michael Stearns and David Levy. "They asked me to make the best use of the L-ISA technology and do the live mixes of both scores, as well as to add and augment sound effects to each piece. So there was quite a bit of work to do from both a mixing standpoint, as well as adding some sound design and sound effects, which would all run as a continuous loop," Stevens explains.

Levy's score occurs first, which Stevens compares to an action movie trailer. "It's very dynamic with a lot of very cinematic elements," he says. "David comes from the video game composing world, so there are very intense hits, sounds, whooshes, crashes, and a lot of dynamics. Literally, the only way to be doing the mix in this sort of space was with L-ISA because we were able to take this very complex score and all of these elements, separate them, and place them in different places around the room. We also had to develop an interaction between elements so the viewer could get a unique mix depending on where they're standing in the room."

Furthermore, Stevens adds, the mix had to be considered from all different angles because the audience is constantly walking around inside the space, experiencing the visuals and the sound from wherever their vantage point happens to be. "There are a lot of very specific placements of objects that create this interaction between elements and work with the dynamics of the pieces," he says. "But we also had to be able to step back to make sure that the perspectives of the audio matched the perspectives of the visuals in the space. Only with L-ISA technology could I have accomplished that."

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For Michael Stearns' score, which Stevens characterises as “much more subdued, more ambient,” he created a combination of sound effects and sound design. “It was great for the audience to have a bit of a break after the adrenaline rush of the first half, but we still wanted to match the tone and energy,” he says. “I was able to design and preview the sound effects and music mix in my home studio and then send it to Michael, Julius, and Riki, for input and collaboration. Michael's piece has a lot of sound effects, which required finely detailed editing to synchronize with the visuals. The movement of the effects adds dimensionality and excitement, and it was important for them to work in perfect tandem with the visuals. L-ISA gave me the ability to precisely place all of these elements.”

Stevens credits L-ISA with being a creative partner in the process. “What’s really unique is that L-ISA technology itself is incredibly intuitive,” he contends. “For example, I played all the audio on a Pro Tools system, and we recorded automation for placement and movement in Pro Tools. I then controlled all that using the L-ISA Controller, listened to each single element, and then recorded its position or trajectory in real time. Being able to layer the elements while recording automation allowed total freedom for iteration, which was crucial because it was the only way to tackle this dense, large-scale mix. It’s a one-of-a-kind process.”

Kim adds the impact of L-ISA technology is evident in the satisfaction of both artists and visitors to the venue and the installations. “They can’t always put it into words, but everyone experiences it viscerally,” she says. “And the composers and sound designers are always excited to hear that we have L-ISA available. You can tell it makes a difference for everyone involved.”

Photo credit: Max Rykov

“The movement of the effects adds dimensionality and excitement, and it was important for them to work in perfect tandem with the visuals. L-ISA gave me the ability to precisely place all of these elements.”

Photo credit: Max Rykov

A projection of management

by John O'Brien

"Congratulations, you get to be PM." "Whoa, Prime Minister?" "No, more important than that - Project Manager on our big install job." So went the conversation with my then Tech Manager.

But first, some background. What is a Project Manager (PM) and what defines a project? Oxford defines a project as "an individual or collaborative enterprise that is carefully planned to achieve a particular aim." A PM is the individual tasked with planning and executing that project.

Wiki elaborates further: "The primary constraints are scope, time, budget. The secondary challenge is to optimize the allocation of necessary inputs and apply them to meet pre-defined objectives."

All parts of our personal and professional lives can be divided into projects. Running a gig, tour or install is a project. They have time, scope, and budget to contend with. Even a simple task such as making lunch has these constraints: how much time can I allocate to preparing or buying; do I want a simple sandwich or a 3-course gourmet spread; and can I afford lobster or Vegemite?

As PM, it's your gig to manage these inputs effectively to deliver the project. As PM, the buck stops with you. You own the project and are responsible for seeing it through. That doesn't mean that you should personally complete every task. Far from it.

Our wannabe-PM's favourite source continues: "Project managers are in charge of the people in a project. People are the key to any successful project. Without the correct people in the right place and at the right time a project cannot be successful."

For greatest efficacy, a good PM should delegate well but keep a strong grasp on how the different elements of the project intersect, particularly the people involved.

A dummies guide to being PM

Modern project management became formalised as a distinct management discipline in the 1950s. Many theories and methodologies have since evolved but most contemporary practices contain characteristics of either Critical Path Method (CPM) or Program Evaluation and Review Technique (PERT) approaches.

CPM suits construction style projects with the defined end goal of building handover in mind. IT projects are a better fit with the more iterative PERT style PM techniques.

In 1969, the Project Management Institute formed and produced PMBOK Guide. I've delved into this monster tome and found it deep and heady - it's still a widely used reference. As are the various ISO standards. Prince2 (PRojects IN Controlled Environments) and Capability Maturity Model (CMM) are common in information and IT scenarios. Agile, Lean, Waterfall and many more have their place too.

Regardless of methodology, it all comes down to how well you manage the "4 Ps" - Planning, Processes, People, and Power. Plan well at the start, adopt and adapt processes that enhance workflow and governance, understand and manage the dynamics of the people (and personalities) involved, and be clear about lines of authority or responsibility.

Some of these steps are best managed with assistance from a PM software package. There are dozens of these in the market and each has differing features and price points. Many share common tools, including my favourite - the GANNT chart (a bit like a spreadsheet to the left and a timeline to the right). Many also feature Dashboards, Task Lists, Kanban Boards, and a variety of Project Reports (to identify strategic progress).

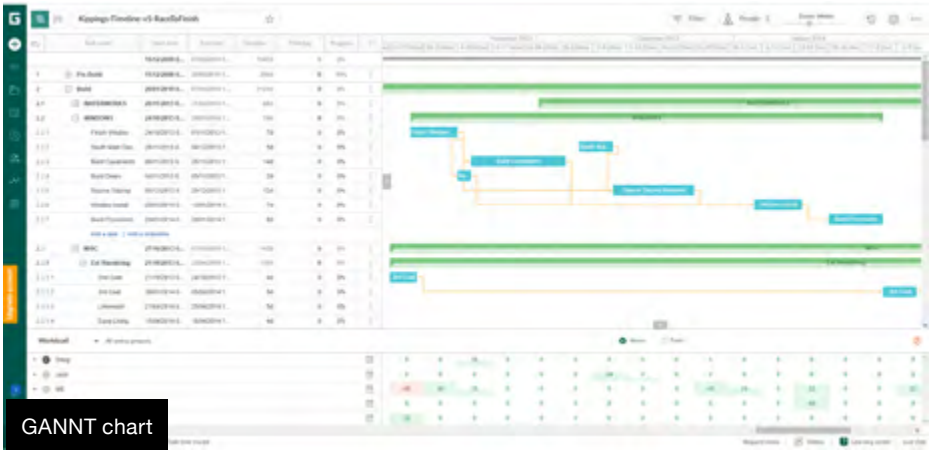
You can even do plenty of funky things with spreadsheets. I've run all manner of big and small projects with just these. Before widespread computing, we used paper and still hit targets. It's all about getting the job done on time and under budget, regardless of what soft or hard tools you use.

Learning from major projects

For real world analogies, here's a potted history of my professional experience and some lessons learned alongside.

In 1987, the average income was about $26k. After six months as assistant PM and no qualifications beyond year 12, I'd just doubled my wage to $40k and was banking a $500k cheque for work - it all seemed a bit surreal. 1987 was Gordon Gekko year after all. Five of us (Developer, Architect, Administrator, PM, Assistant PM) were running $9m of mainly commercial construction. I was responsible for all the tenders.

I also had to do the pay runs. It was completely legit, with pay slips and



GANNT chart

PA Options

option	what?	qty	RRP	RRP running total	special price	special running total	GST	our cost GST inc
3	**add 1x 12" & 2 x 15" powered speakers & extra mics**							
	ABC12	1	$ 649.00	$ 649.00	$ 387.00	$ 387.00	$ 38.70	$ 425.70
	ABC15	2	$ 749.00	$ 1,498.00	$ 446.00	$ 892.00	$ 89.20	$ 981.20
	speaker stand	3	$ 140.00	$ 420.00		$ -	$ -	$ -
	mic leads	7	$ 40.00	$ 280.00		$ -	$ -	$ -
	drum mic	1	$ 188.00	$ 188.00		$ -	$ -	$ -
	instr mic	3	$ 158.00	$ 474.00		$ -	$ -	$ -
	mic stands	4	$ 80.00	$ 320.00		$ -	$ -	$ -
				$ 3,829.00				**$ 3,088.90**
2	**add 1x 12" & 2 x 15" powered speakers**							
	ABC12	1	$ 649.00	$ 649.00	$ 387.00	$ 387.00	$ 38.70	$ 425.70
	ABC15	2	$ 749.00	$ 1,498.00	$ 446.00	$ 892.00	$ 89.20	$ 981.20
	speaker stand	3	$ 140.00	$ 420.00		$ -	$ -	$ -
	mic lead	3	$ 40.00	$ 120.00		$ -	$ -	$ -
				$ 2,687.00				**$ 1,946.90**
1	**add single 12" powered speaker & stand**							
Budget Sample		1	$ 649.00	$ 649.00	$ 387.00	$ 387.00	$ 38.70	$ 425.70
		1	$ 140.00	$ 140.00		$ -	$ -	$ -
		1	$ 40.00	$ 40.00		$ -	$ -	$ -

appropriate deductions but workers expected cash every Thursday. With all our sites in full swing, that could total over $35k in folding that I was packing. Imagine a callow 20-year-old walking onto a building site with catcalls of "let's bash the office guy and hit the pub for a blinder". I saw their bants as bluff and told them to self-fornicate if they wanted me to come back again next week. The site crews respected me after that.

PM lesson number 1 - nurture strategic relationships, however difficult

Ten years later I fell into the $4m project mentioned above. This one was a multi-screen installation as part of a $1.5b behemoth. A job of that scale required formality and was all managed under ISO 9001. It felt like unending layers of paperwork after my more 'seat of the pants' RnR management of the previous decade. I still have a copy of the installation manual - it's 70mm thick!

In more evidence of the harsh environment of the construction industry, we were stood over and hardballed by highly experienced professional bullies. I had the good sense to know our contract intimately and stared them down, refusing to do works variations without full contractual authority. This mightily impressed my own managers. As did delivering on time, beyond scope and under budget.

PM lesson number 2 - know exactly what you are contracted to do and stick to it

Fast forward to the mid naughts, where I invoiced about $5.5m as sales rep over 2.5 years. Exceeding budget (cost control) is the main driver in this role, with monthly or annual targets and KPIs. But you still must be across all your (current and prospective) client's projects. It is easy to get sucked into any one of them but, in this ongoing project, you do what you need to lock an order in.

PM lesson number 3 - always retain focus on the project goal (KPI, milestone, budget)

That transitioned into being a PM for a residential integration company with $5m of projects in my direct auspice. I thought I was given clear authority to manage our resources (staff, contractors, suppliers) as efficiently as possible to get our multiple projects satisfactorily completed. Unfortunately, the boss kept undermining this by re-allocating staff and stock on the fly to satisfy whimsical customer requests. If he'd been firmer with them and lied less to me, we would have completed most of the jobs well. As it was, it all turned to crap and imploded.

PM lesson number 4 - make sure that the key stakeholders are on your side

Next up came my magnum opus project - the house build. I planned hard but it ended up being the least controlled, worst timeline blowout, and greatest percentage budget over-run I've ever done. Ultimately, it was also the most satisfying. This gig was more personal than professional. Scope, time, budget - meh, check out this shiny new addition...

PM lesson number 5 - when you are also the client, it's quite easy to move goal posts

Some rough sums on all those projects add up to over $40m in 2021 dollars of other people's money that I've been substantially responsible for. They were stressful but much less so than spending $300k of my own hard earned.

I learnt early on that worrying about the big numbers was pointless. You still have to make similar decisions, regardless of the number of zeroes on the end of any figure. Whatever the scope, you never have room for profligacy and need to keep an eye on project budget (and outcomes) at every step.

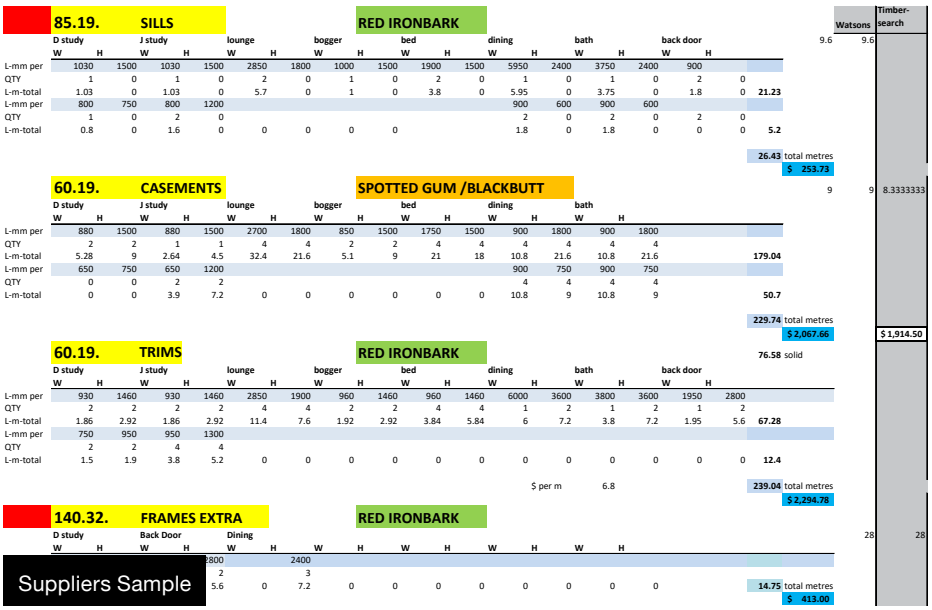
Staying in control

The PM principles outlined above can be applied to much of your life. You don't need a degree or expensive software to track these endeavours. I've never had formal education in this discipline and (with a little homework along the way) picked up all this knowledge on the job. Particularly useful concepts are milestones, key dependencies, and trigger points.

A good project manager embraces multiple disciplines. Apart from being across the technical limitations of the project, they need to show leadership, influence key players, be deft at negotiations and managing politics, take control of change and conflict management, and employ humour at the right moments. These soft skills help engage the most important part of your project - people.

These people are the inputs that will help you control the triple constraints of scope, time, and budget. If you've planned well, all you need do is get the right people (and gear) to the right place at the right time.

With the high level of planning and logistics required in a project like rapid mass vaccination, I know which type of PM I would prefer.



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AV	32%
Other*	26%
Sound	23%
Lighting	18%

*typically Audio/Lighting/Staging

WORKPLACE

Other*	27%
Production Supply	19%
Corporate	15%
Conventions & Exhibitions	13%
Theatre	13%
Education	8%
Worship	5%

*typically Audio/Lighting/Staging

EMPLOYMENT TYPE

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

*typically self employed

ANNUAL SPENDING

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

Contact us for more information:

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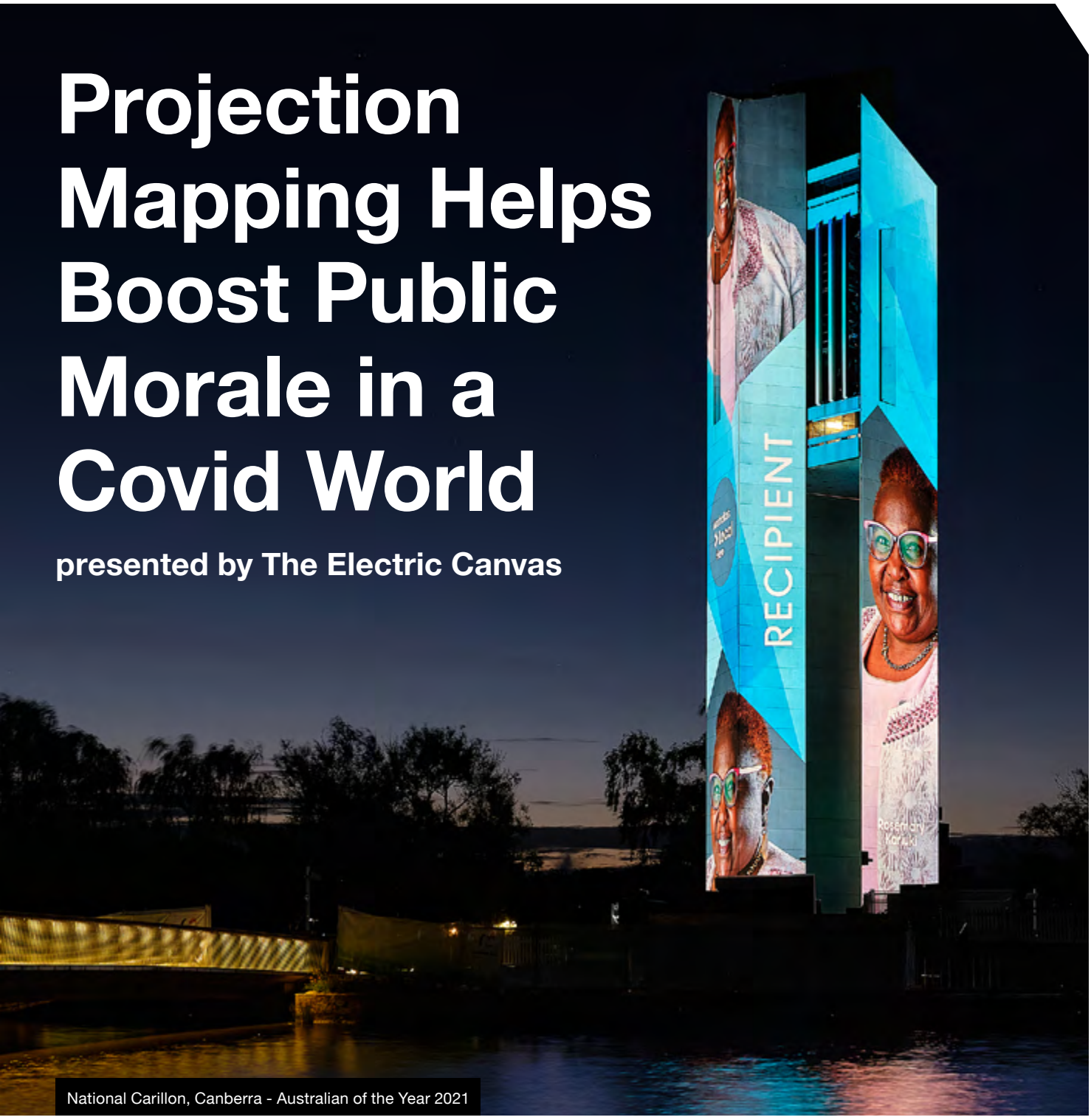
Projection Mapping Helps Boost Public Morale in a Covid World

presented by The Electric Canvas



National Carillon, Canberra - Australian of the Year 2021

When considering the effects of Covid-19 on a global scale, one realises just how lucky we are in Australia to be isolated on our own little island bubble, shielded from this ruthless virus that continues to ravage other countries. Indeed, Australians can be extremely proud of how we've rallied together in a collective effort to battle the pandemic and remain healthy and safe.

However, in being protected from the potentially catastrophic impacts of Covid, Australians have also been deprived of the joy and delight that our beloved cultural events bring. And, of course, our entire industry is only too aware of the devastating consequences that Covid-induced event cancellations have inflicted throughout the past 14 months.

The Electric Canvas is amongst those in our industry who have fought (and continue to fight) hammer and tongs to stay afloat during the Coronavirus onslaught. There have been some pretty close calls and high hurdles to jump over on more than one occasion –

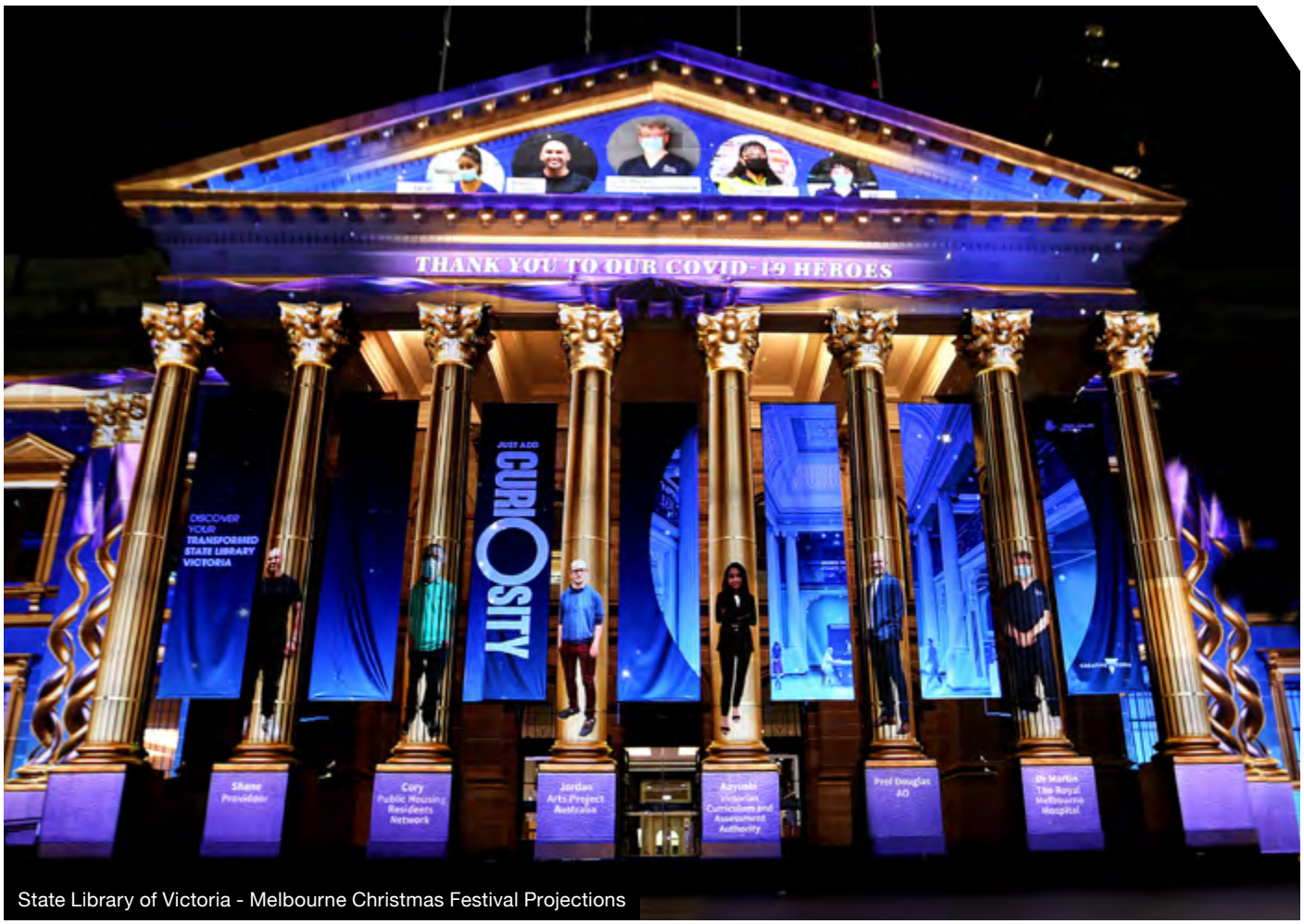
some of which could have really knocked us down for the count. Take the snap "circuit-breaker" lockdown in mid-February, in which almost every other state and territory closed its borders to Victorians. TEC was on the verge of bumping in eight major projection sites for the Enlighten Festival in Canberra, for which essentially half of our 12-person strong technical team would have been shut out of the ACT. The solution was loading and transferring a semi-trailer full of equipment from Melbourne to Canberra on just 12 hours' notice, as well as chartering a private jet to see our technicians safely across the border before it was closed for the foreseeable future.

Challenges aside, we feel extremely fortunate to have so many loyal and supportive clients, all of whom have remained so throughout the pandemic. In the early days of Covid, with everyone on tenterhooks, these customers realised the importance of helping us to preserve our teams, who hold the knowledge and experience relevant to their projects. We were able to work with some of our valued clients to develop their future projects a little earlier than usual, which kept our staff engaged and the fires burning.

Large-scale projection has proven to be an extremely successful way of boosting public engagement and morale during Covid. Many of our "canvases" are conducive to social distancing regulations, making them ideal activation sites. The Sydney Opera House, for example, can be viewed from almost anywhere around Circular Quay and beyond (in fact, the world). Since the pandemic began, we've delivered no less than twelve activations onto Australia's most iconic building. The projections have ranged from commemorating national and international events, to casting a spotlight on our country's unsung heroes, to celebrating Cathy Freeman's Sydney 2000 gold medal victory, to reliving 48 years of memories made under the Opera House's world-famous sails.

Sydney Harbour Bridge - National Road Safety Week campaign, Transport for NSW

Sydney Opera House - Saying thank you to NSW's SES Volunteers for their tireless efforts



State Library of Victoria - Melbourne Christmas Festival Projections

360° projections onto the 50-metre high National Carillon in Canberra (which can be seen from near, far and all around) helped shine a light on some of our nation's most important events in 2020 and 2021 – National Reconciliation Week, NAIDOC Week and Australian of the Year. Likewise, striking projections onto the Sydney Harbour Bridge pylons and coloured lighting of the arches (by TEC and 32 Hundred Lighting, respectively) aided the NSW Government to bolster its all-important National Road Safety Week campaign in May. Pylon projections also helped the National Rugby League celebrate its champions and thank its fans and supporters for "a season like no other".

Despite the logistical challenges imposed by Covid, we were able to deliver several large-scale projection activations for Christmas in three different cities across Australia. Having outdoor spaces as our "theatre" made it possible for local councils to manage physical distancing measures and helped the public feel confident to attend these events in safety. Our creative team also developed projection content that assisted cities like Melbourne (that had only just finished emerging from a 112-day lockdown) to keep the public circulating safely when viewing the projections.

Just recently, we were approached by Northern Beaches Council to deliver a special Anzac Day commemoration in lieu of their usual veteran's march, which was understandably cancelled due to Covid restrictions. With just seven days' notice, we were able to create a series of poignant visual treatments, accurately mapped onto the façade of Manly Town Hall, paying homage to the Anzacs and providing the public with a great sense of solidarity and pride.

The Electric Canvas continues its resurgence from the Covid-19 pandemic, which has brought our team together and made us stronger than ever. We consider ourselves as not just a company, but a family, where each and every individual's efforts contribute to delivering some pretty spectacular and memorable projects. Of course, we remain astutely on our toes – one can never be too wary of a snap lockdown at a moment's notice – but we are confident that the future of projection mapping is indeed bright (pun intended).

"We consider ourselves as not just a company, but a family, where each and every individual's efforts contribute to delivering some pretty spectacular and memorable projects."

National Carillon, Canberra - Australian of the Year 2021

Manly Town Hall - Anzac Day

Element ICT – Production Points of Difference on Sydney's North Shore

by Jason Allen

Out and about

While the rest of us have had to learn IT skills as production gear went networked, Sydney company Element ICT have grown the other way, leveraging a healthy IT business as they launched in to live events.

"I've always had a connection to live performance, and started an events business many years ago, before I joined the corporate world," relates Chris Manton, Event and Delivery Technology Manager at Element ICT. "Thirty years later, I'm back and doing it again! My wife Lisa and I run Element ICT as a family business. She started the company as an IT business while I was still in corporate, and we organically added hire and production after I joined a band and became 'the guy who did the PA'. Hires started coming in from friends and family, and by 2019, we were out of the garage and doing events properly."

Chris is being quite modest about the types of production work that started the company down that road. Due to their IT background, Element ICT's first production jobs were dealing with the networking side of complex projection mapping implementations and large Dante audio networks. "Now our work is all over the market," continues Chris. "We've supplied major TV studios and worked for wealthy private clients who want an intimate but technical garden party; it's been such a wide gamut. We can afford to be a little picky, so we pursue projects that are complex, unique, and stylish. We also get a surprising number of enquiries just from having a well-optimised web site. We often joke about what enquiry is going to come in today; 12 cubic metres of mirror balls?"

Other business comes in through Element ICT's diverse team of technical staff. "The base of experience in the team is quite wide," explains Chris. "We have a graphic designer, a theatrical designer, and a composer, all with passions for live sound or lighting. We even have a guy with his own business startup who has a passion for truss builds."

Diversity in sales leads translates into some very interesting projects. “We commissioned a PA running off a Dante backbone in a working railyard,” illustrates Chris. “We all had to get our rail safety certifications. The whole journey of rail certification and working on a live site with actual trains moving around is a story in itself. In contrast, prior to this, we’d just installed a permanent truss-based photo studio for a major fashion brand. We do a lot in the truss market. We have licensed riggers, and a comfort factor with flying things, working safely within regulations. We also have a relationship with a local engineering company for certification of bespoke or permanent truss builds.”

Having really only been full time in production since 2019, 2020 was a difficult year for the company, but the diverse customer base helped them through. “Hire stopped, of course,” concedes Chris. “But we were very fortunate to have two very large installs that kept us going. The IT business span off into its own entity in 2019, and that grew exponentially last year. We were in the enviable position of being able to invest in equipment in 2020, including lighting, truss, and PA.”

Brand stalwarts in Element ICT’s inventory including lighting from Claypaky; “The Italian optical industry has always been strong, and riders want them,” observes Chris. On the audio side, transitioning from analogue to digital, “Allen & Heath really works for us,” Chris adds, “particularly with our shared British heritage!”

Completely new and out-of-the-box for Element ICT is the addition of JBL’s new BRX300 compact line array to their hire stock. “I auditioned the BRX300 here in Sydney and did a lot of onsite research into its competitors,” reveals Chris. “I was honestly blown away that something with the capabilities of the BRX300 exists at that price point. It’s opening doors to us that we thought would be closed for a bit longer. We’ve purchased eight top boxes and two subs, and like the fact we can split it or grow it as necessary. It looks, feels, and sounds like a much more expensive system, and makes us feel like we’re playing the game seriously.”

elementict.com.au

Chris Manton

The JBL BRX300

Up and about

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.

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UNINTERRUPTIBLE POWER SUPPLIES ON GIGS

by Simon Byrne

I'll say it up front, I hate them.

To me, it seems they cause more problems on the days you don't need them (which is 99.9999% of the time) than on that day you actually need them. The power in the venue is probably down anyway so your show won't be running due to the many other systems needed to keep a show and venue running and safe.

A case in point. I have a name brand, mid-tier line interactive UPS on my cloud streaming system which is permanently setup within my house. The voltage coming into the building is typically about 244 volts which is within specification. As part of my testing, I disconnect the supply to the UPS to ensure things still run as expected. The UPS promptly kicks in, but only supplies 230 volts, so my computers are suddenly being fed with 14 volts less. Despite this, they cope just fine and I am happy.

Test completed, I reconnect the supply to the UPS back in, and the UPS takes out the residual current breaker (RCD) to my whole house! That means if I were to actually have a blackout, yes the UPS would keep my gear running for a short period, but when the power supply was restored to the building, the UPS itself would take out the RCD, which takes out the entire power supply.

The UPS is supposed to solve problems, not create bigger ones! That particular UPS will be replaced.

As an aside, did you know that the nominal voltage in Australia according to the standard is 230 volts? I must admit that I did not. In 2000, Standards Australia issued a system Standard AS60038, with 230 V as the nominal voltage with a +10% to –6% variation at the point of supply.

That is, it can be as much as 253 V, or as low as to 216.2 V and still be within spec. However, the voltage is set by state regulation and for example, Western Australia is still yet to adopt the standard, so the nominal voltage is still 240 volts in that state.

Despite their challenges, UPS do have a role. Power outages often only last for seconds, and brown outs, where the voltage temporarily drops, can be fairly common. Our friends in South Australia can tell us all about unreliable power. Therefore, it makes sense to put a UPS on equipment that requires booting up, or does not save state should the power go out, even briefly.

Examples include digital sound mixers, lighting desks, routers, switches, computers that are mains powered only as well as projectors that take some time to power up. I do not put them on laptops because they have their own batteries anyway.

Power Conditioning - I reckon power conditioning is rarely needed. When someone talks of "sensitive electronics", they are not talking of modern day power supplies. It is 2021 and power supplies are dead easy to design and build with a stable output irrespective of what voltage is fed into them. As a matter of fact, you routinely see power supplies designed to operate with input voltages ranging between 100 and 250 volts. A voltage fluctuation of say 30 volts is not going to upset it in the slightest. Manufacturers claim that power conditioners can protect sensitive loads by smoothing out voltage fluctuations such as spikes, transients and electrical noise. I say that standard power supply designs can do this anyway.

In my career, I have only once come across a situation where the power needed stabilising. Our company installed a multimedia display at Regatta Point one the shore of Lake Burley Griffin in Canberra. The system was based on the now superseded Dataton Trax equipment. For reasons we could not understand, the system would hang very, very occasionally and for weeks we could not work out why as there seemed to be no pattern that we could identify.

Finally, we realised that the problems occurred when the Captain Cook Fountain which was in the lake outside the exhibition, sprung to life. The fountain pushes 500 litres per second, at 260 kilometres per hour, up to 152 metres into the air. When operating, there is six tonnes of water in the air at any time. It has two huge electric motors and when they kicked in, the inrush current as they started caused a brief voltage sag which was enough to upset the Dataton Trax multimedia controllers.

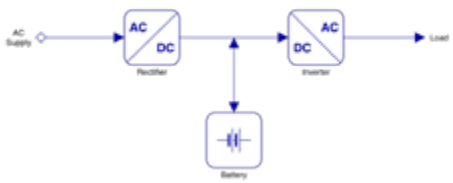
The reason we did not identify a pattern earlier is because the fountain's operation is dependent on wind strength and direction. Weather sensors with a computer automatically turned it on and off depending on whether the water spray would land on the nearby Commonwealth Avenue bridge, or on the foreshore. If either of those conditions were likely, or if the wind was too strong, it would not turn on, so its operation was quite random.

In that case, we solved the problem by installing not a power conditioner, but an online UPS.

An online UPS is the most expensive form of UPS. The term 'online UPS' has nothing to do with internet connectivity but fully online UPS power supply (often called a 'true UPS') refers to one that is constantly filtering, storing and delivering electrical flow,

even when conditions are normal. That is, a "double conversion" method of accepting AC input, rectifying to DC for passing through the rechargeable battery, then inverting back to 230 V AC for powering the protected equipment.

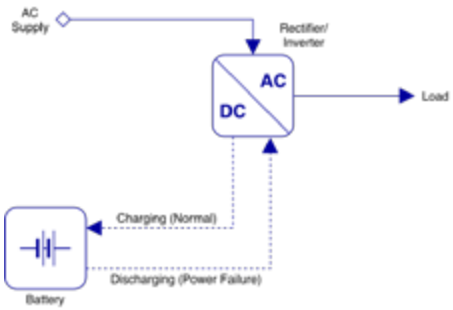
Online UPS



Because the output is always being fed by the inverter off the batteries and DC supply, if the DC supply drops or fails (as a result of the AC supply), the output is not affected in the slightest because it was always driven from the battery anyway. This is the ultimate in power protection.

The step down from online is the line-interactive UPS. A line-interactive UPS maintains the inverter in line and redirects the battery's DC current path from the normal charging mode to supplying current when power is lost.

Line Interactive UPS



In this smart design, the battery-to-AC power inverter is always connected to the output of the UPS. When the input AC power is normal, the inverter of the UPS is in reverse operation and provides battery charging. Once the input power fails, the transfer switch will open and the power will flow from the battery to the UPS output. This design offers additional filtering and yields reduced switching transients since the inverter is always on and connected to the output. This design is probably the sweet spot between performance and price.

The next step down from a line interactive UPS is an offline or standby UPS. It does exactly what you'd imagine from the name. Rather than constantly cycling, storing and converting power through to device, it idles until absolutely needed.

Offline UPS

In practice, whenever the standby UPS detects that electricity flow from the wall socket is registering as normal, it is effectively bypassed. The instant it detects a problem - which is usually within five milliseconds, the offline UPS power supply switches over to its internal battery backup instead. My unit is one of these, which is why the output voltage dropped from 244 volts to 230 volts when it kicks in.

Offline UPS tend to be functional and much more cost-effective for most applications and are only really seen as unsuitable in very critical applications where any risk at all of data or hardware loss is unacceptable.

UPS are typically rated in VA, or volts amps as well as watts. A lot of you are thinking, hey volts amps is just watts! Not quite. Something called Power Factor comes into play.

In a purely resistive AC circuit such as a lamp or heater coil, voltage and current waveforms are in step (or in phase), changing polarity at the same instant in each cycle. All the power entering the load is consumed.

Where reactive loads are present, such as with capacitors or inductors, energy storage in the loads results in a phase difference between the current and voltage waveforms. During each cycle of the AC voltage, extra energy, in addition to any energy consumed in the load, is temporarily stored in the load as electric or magnetic fields and then returned to the power grid a fraction of the period later.

The actual power used by a device is stated in watts, but the power supplied, complete with its current and voltage out of phase, is stated in VA.

Devices containing resistive loads have a power factor of almost 1, so the VA and watts consumed is pretty much the same. But circuits containing inductive or capacitive loads (electric motors, transformers, lamp ballasts, and others) can have a power factor well below 1, for example 0.8.

Therefore, a 1000 watt ballast with a power factor of 0.8 needs a supply of 1,250 VA (1,000 watts divided by the power factor of 0.8 equals 1,250 VA).

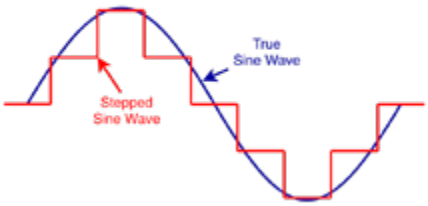
In a UPS (and the electric power grid for that matter), reactive loads cause a continuous ebb and flow of non-productive power. A circuit with a low power factor will use a greater amount of current to transfer a given quantity of real power than a circuit with a high power factor, which causes increased losses due to resistive heating lines, which requires the use of higher-rated conductors and transformers.

That is why the VA rating of a UPS will always be higher than the watts rating. In practice, you mainly care about the wattage specification as that is what you actually consume.

The batteries within a UPS are obviously low voltage DC, so the UPS needs to raise the voltage as well as modulate it into AC. This is done by an inverter within the UPS.

AC power supplied by the electricity provider is a sine wave, in Australia at 50 Hz, so the inverter needs to replicate that. It is cheaper to design a circuit that only simulates a sine wave and UPS that do this usually state something like "modified sine wave" or "stepped sine wave" in their specifications.

Stepped vs True Sine Wave



This is done by simply stepping the output voltage up and down in a rough facsimile of a sine wave. In my view, modified or stepped sine wave is not good enough because in some cases, the 50 Hz mains power cycle is used as a clock source for timing video circuits in particular. The correct choice is True Sine Wave which, as the name suggests, faithfully reproduces a proper waveform.

Battery capacity determines how long you can run when the power fails. Obviously, the more load you hang off a UPS, the more energy is consumed and the battery is depleted faster. That is why I only put devices that really need it. For example, laptops have their own battery so there is no point running them through a UPS.

When purchasing a UPS, you need to decide what is an acceptable battery run time for you. UPS running at their full load with Sealed Lead Acid batteries typically only have a short runtime on battery, around 10 minutes or less. Some UPS have Lithium batteries. Some have the ability to connect more batteries to increase that run time. Some have both which results in very long run times.

In conclusion, using a UPS successfully requires a careful assessment of your needs. Then you can decide which technology is required (online, line interactive or offline), and then an adequate rating for your load and required run time. As with all backups, it is critical that you test the system to ensure it works as you expect.

ACME STAGE PAR 100 COLOUR IP

by Pat Chambers

Pat Chambers is a freelance LD that has spent most of the past decade touring the world with The Thunder from Down Under and Manpower. Pat has clocked up 25 years as a drummer, and 20 years as a touring production manager and lighting designer.

I was part of a team that recently upgraded the lighting rig at RSL Club Southport, along with entertainment booker and lighting operator John Martin and production manager Gary Walker. The venue was struggling to get the kind of whites on stage that videographers and photographers required at their corporate events, and the ageing rig of traditional fixtures and dimmers was beginning to become problematic to maintain and repair. Their old Parcans in particular were becoming harder and harder to find new lamps for.

John and Gary had both seen and loved the Acme Stage Pars when an act brought them into the venue last year. They both commented how much they looked and felt like a traditional Parcan. When the venue's committee gave the upgrade project the green light, Acme distributor ULA Group brought in some demo units. As soon as they turned them on, Gary said "Yes, that's it." We ordered 29 colour models, and eight of the warm white variation.

All of us usually dislike LED Pars; particularly the 'dotty' look of the individual LEDs. As the Stage Par 100s have the single adjustable lens, they look almost exactly like a traditional Parcan. As part of the refit, we actually left some of the old cans up there, and the Stage Par 100s fit in beautifully. Their output is comparable, too.

I've been particularly impressed by the five position zoom selector. There's a tab inside the ring of the can that slots into grooves. You just reach in there, move it to the position, and you can vary the beam angle to five positions ranging from 7° to 25°. It's smooth and easy to change. You can fly the lighting rig in, change some beam settings, and it's like it's a different rig. The beams are great; from wide to very narrow. Even though we've got the front hung high and set wide, we are still on the middle setting, as we are upstage, and the coverage is phenomenal.

While we did have initial plans to use more of the warm white only fixtures, we discovered that the colour mixing on the Stage Par 100 Colours produced excellent warm and cool whites. We've ended up with four warm white and four colour models on the front bar, which is creating the right kind of white for the corporates. I'm more rock'n'roll, so I've ensured there's also lots of colour up the front, and the stage is covered with plenty of punch. Once you add the warm whites on top of the colours, you have a crazy amount of light!

Control wise, we're running a MagicQ PC Wing Compact and a touchscreen PC. On delivery, the fixture libraries were already installed and ready to go. I did half a day of programming, running the fixtures in full eight channel mode, and now there's four pages of scenes set-up for John to play with.

I can honestly say there's nothing about the Stage Par 100 I don't like. The strobe function, colour saturation and output are all excellent. The look and physicality of the fixture is just like a Parcan, and there's nothing cheap or gimmicky about them, which is pretty common in the LED par market.

Acme Stage Par 100 Colour IP - The Specs

Light Source: 1x 120W RGBA LED module

Luminous Flux: 1913 lumens

7°/11.5°/16°/20.5°/25° manually switchable beam angles

Variable speed strobe effect

Flicker-free management

IPX4 protection rating

Dust and oil-proof design

Installation – RSL Club Southport, Gold Coast Queensland

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ACME STAGE PAR 100 IP WW

by Neale Mace

A couple of years ago I was lucky enough to travel to China to visit the GETShow tradeshow in Guangzhou. I visited the very large and impressive Acme stand, which was full of moving lights, lasers and all of their most advanced technology. They also had a display of Stage Par 100s. I thought they looked amazing - they look just like Parcans! Their adjustable lens movement means you can change them to be an NSP, VNSP, FL, or WFL just by moving a tab.

Later, we went on the Acme factory tour. Their facility is staggering. It's like metal and wood goes in one end, and lights in road cases come out the other; they do everything. There's a hotel on site, worker's accommodation, and a shopping centre. Their quality control is also impressive; there's QC staff at every stage of production checking work at every step of the way, which is one of the reasons they OEM for other manufacturers.

Acme had 40 Stage Par 100s mounted in the roof of a demo room. They ran a demo that looked like 1980s Queen lightshow, and I was sold. It just so happened we had a gig coming up that wanted a huge amount of Parcans with racks and racks of dimmers, and we knew there had to be a better way. We bought 84 of the warm white model and retired our old Parcans and dimmers. Now, wherever LDs want ordinary Parcans, we put these in.

We find that LDs that use them want to recreate those classic looks from the 70s and 80s. The first time we sent them out they were in pods of 16 each, and it looked like an aggressive, old-school light show. The single source, lens, and attention to detail in the design is responsible for their success in replicating the original. People who used to shy away from LED cans because they think they're cheap or the physical look isn't right are converted when they see the Stage Par 100.

The Stage Par 100s can sit next to real Par64s and blend right in, while having all the advantages of LED. You can daisy chain power, there's no heat, you don't melt gels, you don't blow lamps, and you don't have to change lamps when the LD decides they want the back truss to be NSP. Lamps are so hard to come by now anyway, so all that messing about is gone.

The Stage Par 100s have been reliable and durable. They've been smashed around the country in road cases, in pods, and on Meatracks, and apart from the normal wear and tear of scratches and scrapes, they've proved more solid than an alloy can.

Service and support from distributor ULA Group has been great. They always answer the phone and have prompt answers to any questions, but we haven't really needed them for a product that doesn't break!

Product Info: en.acme.com.cn

Distributor Australia and New Zealand: www.ulagroup.com

Neale Mace is the Manager of Gosford's EI Productions. Since 1979, EI have used their deep experience in lighting and audio to provide production expertise and gear hire for touring concert productions and installation.

Acme Stage Par 100 WW – The Specs

Light Source: 1x 100W WW LED module

Colour Temperature: 3000K

Luminous Flux: 4973 lumens

CRI: ≥90

9°/15°/20°/25°/30° manually switchable beam angles

Variable speed strobe effect

Flicker-free management

IPX4 protection rating

Dust and oil-proof design

Live Production – EI Productions

Dave Evans is the owner and operator of Digital Vision Live. Based in Nelson, Digital Vision Live provide live streaming platforms, live production, live stream hosting, remote video production, simulcasts, hardware and software, with years of experience working on budget conscious productions delivering content across the public network, for a mix of corporate, sporting, and creative clients. Digital Vision Live aim to bring the latest live streaming technology at a price point that's affordable for everyone.

Kiloview E1 and E2 Video Encoders

by Dave Evans

In lockdown last year, with time on our hands, we went looking for a way to provide remote production with minimal infrastructure on-site along with cloud-based production. We conducted initial tests using some great SRT encoders and decoders, which worked very well, but the pricing was out of the ballpark for the majority of our clients. Eventually we discovered Kiloview and put some equipment out on trial. We soon learnt that they were not only affordable, but also very robust. We now almost exclusively use Kiloview's very straightforward SDI and HDMI models, the E1 and E2.

Application

A typical use case for the E1 and E2 is remote production. This sees us sending just the camera operators to a venue with pre-configured encoders. They plug in their cameras, connect to Ethernet ports, and then they're streaming back to our endpoints.

The camera operators are the only personnel we send on site. We receive their SRT feeds on an AWS instance in the cloud, where we run a VMix switcher. We work out the latencies required for the connection and to match cameras so that replays and switching between cameras are visually acceptable. We are talking hundredths of milliseconds here.

Once up and running, the encoders will stream the camera content for a whole day if needed, for example, for a volleyball tournament. Some of the sporting events we stream are often 13 or 14 hours long. Our E1s and E2s just keep on streaming, and with SRT their latency never changes. Our graphics and scoreboard packages are also available as a remote service and can be controlled courtside by the official scorers, taking responsibility and keeping our and their onsite footprint as small as possible. Remote commentary, connecting remote producers and interested parties are all possible with this workflow. We then send the programme mix to whichever streaming platform the client is using or to our own digitalvision.live platform, where it's published to the public.

Another use case is for sports clients who want autonomy over their streaming, running their own cameras and production. They just want a simple way of streaming, adding graphics and scores live at courtside and then having those elements combined and presented to their viewers with no additional postproduction. Our workflow and platform manage that perfectly.

We pre-programme the encoders and send them to our clients. They plug in, switch on, and away they go. If necessary, we can log into the E1 and E2 remotely to change settings or update firmware but rarely have to as the encoders are robust and just work, even in 24/7 streaming situations.

Pricing and Quality

The price point of the E1 and E2 is key; they are very affordable units. As we know in broadcast, lower price often means a sacrifice, usually durability and robustness. Cheaper units can overheat or need to be reset after a certain period of operation. While the Kiloview price point is excellent, it's also backed up with durability. The componentry used is a higher quality compared to a lot of other devices at similar and even more expensive price points. One product we trialled was also affordable and was from a reputable brand, but there were lots of issues, particularly if they ran for long periods of time. Another unit we tested was top-of-the-line, worked beautifully, and was extremely well-made, but came in at more than 10 times the price of the Kiloview.

Changes and Improvements

We would like to see some changes in the Kiloview software interface. Our biggest issue, which is really a very small annoyance, is that you can't currently give the encoder's stream endpoint configurations a customisable name in the interface e.g. the IP address it is streaming to, or a human readable name until that endpoint is active. You can set up lots of endpoints and turn them on and off as you need them, but without a label for in-active endpoints, it can be hard to tell which one is which. Once you've turned an endpoint on you can see its IP address, so you know which one it is, but before turning it on there's no identifying info. We have communicated this to Kiloview, and they've taken it on board, so I'm sure we'll see that capability in a firmware update soon.

Service and Support

Kiloview have been incredibly responsive to requests for changes and updates. For example, we needed a feature of SRT implemented called Stream ID, which makes it easy to identify streams coming in, and they added that almost overnight. Before SRT version 1.4, it wasn't even part of the specification. The timely fashion of that implementation was really something, and is almost unheard of in this industry. If something is easy or can be done without major changes, Kiloview are great at accommodating requests.

Kiloview run a solid web database with all the latest firmware available for download. As a customer, you will get an email letting you know when new firmware is available for your device. You can connect directly to the device, or use a web login. There's also a nice feature where you can use a configurable URL that you can adapt to your network specifications for remote connection. Start the procedure, then the unit reboots itself and presents you with updated firmware.

Conclusion

In choosing a video encoder that's right for your application, it's horses for courses. Certain devices lend themselves to certain workflows. If you want to move video and audio around quickly, affordably and without too many technical hoops to jump through, you can easily configure a Kiloview encoder to work with a multitude of protocols. Our favourite protocol is SRT, but if your client hasn't even heard of it, conventional RTMP streaming is also available. There is also RTP, RTSP and others. Just paste in the URL to Facebook, YouTube or a custom service, and away it goes.

Product Info: en.kiloview.com

Distributor Australia and New Zealand: www.adimex.com.au

Kiloview E1 and E2 – The Specs

E1

Video input: 1x BNC SDI

Video loopout: 1x BNC SDI

E2

Video input: 1x HDMI

Video loopout: 1x HDMI

Both Models

Analog audio input: 1x 3.5mm jack

Analog audio output: 1x 3.5mm jack

USB interface: 2x USB 2.0 Type-A; 1x USB 2.0 Mini-USB

1x Micro SD/TF Card storage interface

Network: RJ-45 Ethernet

Video encoding: H.264/ AVC High/ Main/ Baseline profile (up to Level 5.3) ; Motion-JPEG

Audio encoding: AAC/G.711

Encoding latency: ≤67ms

View from Cathedral Rock in Mount Buffalo National Park, Victoria Australia

HIGH TIMES IN THE HIGH COUNTRY

by Duncan Fry

Every now and then, the band got asked to do various private function gigs. Not the most exciting things to do, and usually at places like wedding reception venues, or clubs hired for the night for their members' kids 21st birthdays, engagement parties and the like.

But, they had two major benefits; they paid well, we got to eat the same food as the guests, and had an open bar. Sorry three major benefits (I didn't expect a sort of Spanish Inquisition...)

One of them went beyond the norm, and organised their party at a chalet up at Mt Buffalo ski resort. This was to be the second snow gig for the band; the previous one was at Mt Baw Baw a couple of years earlier. At the time (60s-ish) the facilities at Mt Baw Baw were pretty basic. There was a blizzard blowing when we arrived, and the band gear had to be hauled up to the chalet from the carpark by a bulldozer towing a trailer. It snowed incessantly, the gig was eventually cancelled and we were all told to leave before the place got snowed-in! We didn't need telling twice.

We were luckier this time, as Mt Buffalo had a well-made, albeit twisting road right up to the carpark of the Tatra Inn, where we were to be playing. It was run by a chap called Mr Poloneck or something, an ex-skiing champion and instructor, who we instantly re-named Mr Bottleneck since we were musicians!

Food and accommodation were provided for us and our friends/crew, who drove up the mountain with our gear, their cars loaded to the roof with drums, guitar amps, and a $5 McLeans PA system. Our mate Ian Spurrit, ('Stoop' to his friends, and us!) had just bought himself a yellow 427 cu.in. Monaro, and proceeded to slide his way up the U-turns of the mountain road as if he was leading the Monte Carlo Rallye. LL the drummer had drawn the short straw and volunteered to go in the car with him, a decision he later regretted!

It had been a mild winter so far, with not a lot of snow, and Stoop slithered the Monaro to a halt in the car park, right next to a group of foreign tourists who were gazing in awe and snapping pictures of the only large lump of snow to be seen.

Stoop leapt out, grabbed his huge Esky from the rear seat yelling "Out of the way, out of

the way", popped the top off the Esky and manhandled the lump of snow into it, while the tourists watched aghast as he fanged the car over to the main door of the chalet and disappeared inside, followed by the rest of us.

A little queasy after his rally ride up the mountain, LL took the opportunity to slip into some bushes and jettison the day's takings, followed by the fascinated tourists busy taking more pictures of this slice of life in the snow!

Mr Bottleneck showed us where our room was; a large dormitory type room full of bunk beds, and then told us "Dinner served for you in half an hour, boys, in the dining room." and he pointed down the corridor. "Don't be late or it'll be all gone." He disappeared and we unpacked the equipment, then went searching for the dining room.

The food looked and smelled delicious - schnitzel parmigiana with hash brown potatoes, but as we sat down we could see that something was missing - there was no cutlery to eat it with!

We sent LL on a mission to find Bottleneck, and found him near the bar. When he saw LL he greeted him like an old friend, possibly due to an excess of gluhwein.

"How's the food boys - taste good, huh?"

Ever the diplomat, LL said "Oh the food looks lovely, but there's something wrong, I'm afraid. I'm not sure that we'll be able to eat it."

Bottleneck looked horrified "What? What could be wrong?"

"There aren't any forks to eat it with," LL replied.

He stared at LL "Forks? FORKS?" as if it were the craziest thing he'd ever heard. He started pacing up and down, muttering "Forks? There's no forks?" and he disappeared into the kitchen, still muttering about forks.

LL came back to us in the dining room. "Looks like there could be a bit of an issue with our cutlery. I think Mr Bottleneck's a bit 'tired and emotional', so I'm not holding out much hope."

Suddenly there was a crash outside the door, and Bottle strode in with an armful of forks, and flung them on our table. "FORKS!" he announced, turned around and that was it.

The party went well, the happy couple and their friends and well-wishers retired to their rooms, while we sat around drinking and analysing the gig. Looking out of a window, I could see light snow drifting down onto a trampoline. I suddenly got the urge to have a bounce on the trampoline to unwind.

I put on a waterproof jacket and slipped out the side door. It was very dark but gentle moonlight filtered through the clouds and illuminated the scene. I was happily bouncing away, halfway through my famous triple bounce and belly flop, just me communing with nature and the night sky, when suddenly a voice in my ear shouted "WHAT DO YOU THINK YOU'RE DOING?"

Aaagh, I lost my footing, fell over the edge of the trampoline and went headfirst straight into the snow. It was mine host Mr Bottleneck. I was waiting for him to talk about forks again, but no;

"Get inside you fool before I lock all the doors - you don't want to be out here all night. There's snow coming."

I went back inside the Inn quick smart, only to find that my 'friends' in the band had locked the door to our room, leaving me outside, cold and hammering on the door. I could imagine them nice and warm inside in just their t-shirts and underpants. They weren't to know that I had put on a warm jacket before I went a-trampolining.

"Come on guys, let me in, it's freezing out here."

"Sorry, can't hear you, what? Speak up - what?

"LET ME IN"

"What?

I'll fix their little red wagon, I thought. I went back outside and scooped up as much snow as I could fit down the front of my jacket and went back inside. I banged on the door again, but quieter this time. "Let me in guys, I'm so cold, oh, I can't stop shivering oh, oh, so cold..." then I went silent.

After about 30 seconds the door opened a crack, but I was waiting. "Cop that ya bastards," I yelled, and threw myself at the door, hurling the freezing cold contents of my jacket all over them as they scrambled to get away from me!

Ah, happy days! I was very sad to find out that the Tatra Inn was burnt to the ground in the bush fires of 2006, so reminiscences like these are all we have left of the place. All any of us have to do when at a restaurant now is to mention forks and we're instantly back to the late 60s, laughing like drains.

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