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* Cover Photo – Kylie Minogue, the Golden Tour, credit Andrew Whitton

Contents Photo – Fat Freddy's Drop, credit Troy Constable

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ELATION DARTZ FOR KISS “END OF THE ROAD” WORLD TOUR

Photo Credit: Todd Kaplan

Legendary rockers KISS launched their farewell “End of the Road” world tour in Vancouver in late January and used a multitude of Elation DARTZ 360 effects as key visuals in the dynamic, multi-sensory show.

More than 40 years on and KISS can still draw a crowd anywhere in the world with their crowd-pleasing hits and elaborate live show. “It’s simple, four-on-the-floor, rock ‘n’ roll music with heavy guitar riffs,” said production designer Sooner Routhier of the music’s continuing appeal. “As far as lighting, it requires an old-school light show with simple cuing that accents the music but isn’t overly embellished.” Routhier co-production designed the show with Robert Long, who has been with KISS in various roles for over 20 years. Associate designer/show director is Ashley Zapar.

Routhier and Long, who have served as production designers for KISS since 2013, say that they and Michael Cooper originally programmed the “End of the Road” show “with a lot of complex cuing, heavily accented with just about every beat embellished with some sort of fancy timing.” Routhier adds, “Once we saw the entire picture come

together in rehearsals though, we realised that we needed to strip back the cuing to let the overall picture of the production shine through.”

The result is classic KISS with the lighting complementing the band’s timeless on-stage theatrics and power-driven rock numbers. The setup is pure eye candy with 19 moveable video pods above the stage creating different shapes throughout the show while several pantographs with beam lights and strobes help create an industrial look. “Our main objective with lighting was to make a completely configurable lighting design package,” Routhier explains, adding that the design required “a smaller fixture that was very beamy and could provide quick movement throughout the stage.”

Narrow-beam DARTZ 360 LED moving heads with 3-degree aperture fulfil that speedy, tight beam requirement with 218 fixtures placed

throughout the scenic and lighting trusses. “We’ve positioned two sets of trusses on stage right and stage left of the upstage video riser and loaded them with DARTZ,” Long explains. “DARTZ are also mounted end to end across the entire upstage structure and drum riser to provide a lighting element to the scenic. They help add background to the stage and widen the overall look.”

KISS shows are filled with classic moments and perhaps none is more iconic than Gene Simmons’ fire-breathing performance. Fulfilling a special role in the routine, DARTZ fixtures act as spinning red police beacons. “We tilt them into the scenic and use the fixture’s continuous pan movement to create the effect,” the designer says. “They do the exact same effect in the trusses flanking the video wall.”

Lighting vendor for the “End of the Road” tour is Christie Lites, whose Martin Kelley has always provided top notch service, Long says. “The lighting crew on KISS is incredible and talented. The gear is well maintained even though they have to combat pyro on a daily basis!”

“End of the Road” is likely KISS’s final tour ever and is getting glowing reviews as another iconic rock ‘n’ roll show from one of music’s vintage acts. The tour plays North American, European and Australian dates through the end of the year.



JBL VTX A12 and A8 Line Array Systems impress at New Zealand's Summer Music Festivals.

Mount Maunganui, Tauranga, New Zealand: Literally the world's first festival of 2019 saw over 30 thousand festival goers brave the hot summer sun at Mount Maunganui to enjoy world class music entertainment.

Local and International artists including Peking Duk, Sticky Fingers, London Elektricity, Shapeshifter, Ladi6, Tash Sultana and rap superstar Cardi B were part of the line-up.

In only four years, Bay Dreams has become one of New Zealand's best summer festivals. The event began in 2016 with 5,000 attendees and has grown to over 30,000 in 2019 for the North Island event. Due to the popularity of the event, a second South Island location was added to the itinerary in the city of Nelson.

NZ Sound Reinforcement, a full-service production company, deployed a stunning JBL Professional audio solution for the second stage with a combined audio output of 500,000 watts RMS, including the new JBL VTX A12 and VTX A8 line array elements.

Bay Dreams signalled the upswing of the summer tour season in New Zealand, with NZ Sound's inventory set to bring exceptional audio coverage to the music festivals and international artists such as UB40, Toto, Slayer, KORA, Sound Splash, and The Hollies, who toured New Zealand over the summer months.

Having recently become part of the JBL VTX A-series family in New Zealand, NZ Sound owners Ray and Brenda Ward are exceedingly happy. "We are blown away; Bay Dreams was pretty epic. The JBL VTX A12 and A8 systems have performed beyond our expectations - they sound amazing. JBL certainly helped the artists to put on some of their best performances and the crowd loved it," says Brenda Ward.

With a packed itinerary, NZ Sound were able to provide a quick setup and turn around. "This is thanks to the VTX A-series new packaging, travel carts and world-leading rigging system, which is far more efficient for transport and set up," says Tim Robertson from local JBL distributor JPRO, who provided technical support and system design for most of the events.

with 16 JBL VTX M20 dual 10" and four VTX M22 dual 12" tour monitors for DJ and drum wedges. Two VT4883subwoofers took care of the drum subs with side-fills consisting of two VTX F35 dual 15" 3-way enclosures and two G28 subs.

All amplification was provided by Crown V-Racks with Crown iTech 3500 amplifiers, totalling in excess of 500,000 watts of sound



NZ Sound's Ray Ward with the latest addition to his inventory, the compact JBL VTX A8 line array

Ray Ward adds: "The new JBL VTX A-Series systems have provided an amazing experience for all involved, from the artists and organisers, to the spectators. The systems have shown impressive coverage outdoors, providing a very smooth and natural top-end."

For Bay Dreams, NZ Sound deployed a complete JBL Professional audio system featuring 24 VTX A12 line array loudspeakers on the main hang and 18 of the all-new smaller format VTX A8 line array loudspeakers on side hangs. Due to the nature of the performances, 24 ground-shaking VTX G28 subwoofers provided tight, powerful bass coverage. Infills consisted of eight VTX F12 12" biamplified loudspeakers.

Stage monitoring was equally impressive, allowing for exceptional audio for all performers

power. System management and control was handled through JBL HiQnet Performance Manager software and system set-up made easy with JBL's Line Array Calculator.

"During the summer tours, we have received numerous comments from up-and-coming sound engineers to seasoned professionals in the industry about the incredible sound of the new VTX A-Series," says Tim Robertson. "This is due to the A-Series being a complete re-design from component level, with the compression driver contributing to the audible difference. Metallic domes are replaced by composite materials making for a much smoother, warmer HF and - dare I say - European flavour. I highly recommend audio techs get in front of the new VTX A-Series systems and experience it for themselves."

Phase 3 appoints Asia-Pacific Distributor.

Connector-Tech ALS is now the official distributor for Phase 3 Powersafe and Showsafe products in the Asia-Pacific region. The appointment of a regional distributor is a key component of the UK manufacturer's global expansion strategy and will ensure complete coverage of the growing Australian market.

The innovative Phase 3 range includes the Powersafe single-pole 500- and 800-Amp connectors, the IP67-rated Powersafe Sequential Mating Box, Showsafe 3- to 19-pin entertainment industry connectors and a suite of network connection devices. As an early proponent of the advantages of the Phase 3 connectors and a long-term supporter of the product in Australia, Connector-Tech ALS was a logical choice to represent the UK brand in the region.

Andy Glachan, Managing Director of Phase 3, said Connector-Tech ALS has proven itself year-on-year. "Their product knowledge is second-to-none," Glachan said. "That experience, in parallel with their commitment to the best customer service, made Connector-Tech ALS the obvious choice for our sole distributor for Phase 3 connectors in the Southern Hemisphere."

Les Cook, Director of Connector-Tech ALS, said the Queensland business has been supplying Australian manufacturers, contractors and resellers with Phase 3 products for ten years. "We are ready to meet the needs of the broader Asia-Pacific market and have expanded our inventory accordingly," Cook said. "By working in direct partnership with Phase 3 we are able to provide greater value and improved technical support to our customers."

Readers interested in more information or a demonstration of the complete Phase 3 Powersafe and Showsafe range can call 1800 803 166 or email info@ctals.com.au.




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37 MILLION REASONS THEATRE ROYAL WILL STAY DARK

by Julius Grafton

Australia's oldest theatrical institution is the star of a political play with major international operators having converged on Sydney's Theatre Royal on April 11 for a briefing. Theatre Royal itself is up for grabs, but the long-term lease on offer may well be a Trojan Horse.

The original 1827 built theatre was demolished to make way for the high-rise MLC Centre and a modern theatre was incorporated into the basement of the iconic tower in the late 1970s. That 1,100 seat theatre was operated by MLC until three years ago when the MLC Centre changed hands.

Just prior to the NSW State Election in March, the Government was under intense pressure from the Arts community over inaction on theatre venues and the 'war on festivals'. It announced it had secured a long term lease over the theatre, and would seek an operator to take over and run the theatre 'at no cost to taxpayers'.

Now the tender for an operator has been released, and it contains a poison pill – any operator will pay Dexis, the owner, \$37 million upfront as a construction contribution. The construction is for entry and foyer works to harmonise the theatre with a major redevelopment of the greater centre. The theatre operator will then be required to refurbish and refit the theatre – at their own expense.

Industry estimates put that refit cost at over \$10 million, and that is before any increase in capacity is attempted. It is possible to rebuild the dress circle and take the capacity up to 1,450 but the cost of this major work is well north of \$20 million.

"I can buy a theatre on Broadway (New York) for \$70 million," one potential operator told me this week. They prefer not to be identified as they think the Government will water down

the tender terms. There are ten potential Australian and international theatre operators keen to run the theatre should the financials stack up.

Dexus have major works planned across the whole seven level retail podium at the MLC Centre, and have produced architect drawings that show the theatre foyer alterations they propose. With the security of a theatre operator paying them \$37 million, and presumably meeting reasonable rental, they have everything to gain.

But the question of rental is on the minds of theatre operators who risk black periods between shows. Math says that Dexus could convert the three levels occupied by the theatre, which sits on 2,500 square metres, into 7,500 gross square metres of retail space. With Pitt Street Mall rentals at sky high levels of around \$14,000 per square metre, it is reasonable to estimate the retail rental value of the theatre space is around \$25 million a year – at just half the price of Pitt Street nearby.

With mind-bending economics, it is clear that a theatre will not continue at the MLC centre, unless either the NSW Government or Dexus underwrite one. While the intentions of Dexus are unknown one could presume they seek maximum return for their shareholders. As to the NSW Government, it argues in the Expression of Interest document attached to

the theatre lease tender that lack of suitable theatres has lost Sydney major musicals, and that a new theatre would generate over \$37 million in visitor spend each year.

There's that magic number again. If only the Government could find an operator prepared to pay Dexus \$37 million, then invest another \$30+ million, then satisfy Dexus's lease, after all of that, the state will be better off.

Meanwhile 30kms west at Rooty Hills, the Sydney Coliseum Theatre is set to open this December with 2,000 seats and world-class staging suitable for virtually any West End or Broadway musical. That green field lyric theatre is costing \$72 million, without a single taxpayer dollar from the Government.

Against this background, it is very possible that the Theatre Royal will become history. The pre-election announcement pales against the post-election investment proposition in the Government Tender. The whole exercise gives Dexus certainty – they either get the \$37 million plus serious weekly rental, or they get to gut the space and win retail rent. The lease proposal is a Trojan Horse, containing \$37 million dollars.

The NSW Government will walk away with clean hands, saying that no commercially viable offer was received. Sydney will remain woefully under equipped with just two large lyric theatres, compared with four in Melbourne.

“Industry estimates put that refit cost at over \$10 million, and that is before any increase in capacity is attempted.”



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RAMPING IT UP FOR TRANSMISSION AUSTRALIA

Photo Credit: Photos by Palci

The biggest Transmission dance event to date – in terms of audience numbers AND Robe moving lights – was staged at Sydney Showground in Australia, where thousands of fans absorbed the great vibes and music of “The Awakening” plus some truly phenomenal visuals courtesy of lighting designer Bas Kemper and the Vision Impossible collective.

Over 200 Robe moving lights - 78 Pointes, 90 MegaPointes, 10 Spiiders, 20 LEDBeam150s and 19 BMFL Blades - on the rig ensured that this replicated the seminal moments of the ‘Awakening’ cycle which started in the O2 Arena in Transmission’s ‘home’ city of Prague, Czech Republic last October... and was another truly memorable visual extravaganza of epic proportions!

Transmissions originators, United Music, worked closely with local promoters Symbiotic, whose Janette Bishara and Richard McNeil understood the importance of recreating the defining spirit and essence of Transmission Prague, and went all-out to ensure the 2019 Australian event provided the same awesome production values.

The Robe presence at Transmission had started seriously at the 2017 Prague event, with 24 MegaPointes on Bas’s design. The fixture had just been launched then!

The 2018 Prague edition - which kicked off the ‘Awakening’ cycle - was delivered with 98 Robe fixtures, so Bas and his core programming / operating team of Zis Ankone and Martijn Deenen, both also from the Netherlands like Bas, were delighted when the

spec for Australia came through offering over 200 Robes.

These and all the other lighting for the show were supplied by leading lighting rental company, MPH Australia. The Melbourne based company has one of the largest inventories of Robe in the country. MPH’s Matt Hansen was the event’s lighting production manager and Mike Parsons was the lighting crew chief.

The idea was to replicate as far as possible the high-impact ‘Awakening’ production and visual design which had been such a success at the O2 Arena in Prague.

The shape of the room in Sydney was completely different. It was a lot wider, with around eight metres less headroom, so they scaled and re-formatted the design, including the detailed and elaborate custom Awakening set and scenic cloths together with seven video elements so it would work in the new space.

A large hexagonal LED screen presided centre stage, flanked by six smaller vertically ‘stretched’ hexagonal pods rigged across the width of the stage, with lights positioned in

between and around all of these and also over the auditorium roof.

Out in the auditorium were six columns of LED flown above the audience which were also rigged with lights like Prague.

The 78 Pointes were used on the main hexagon and in the pods and also on the vertical trussing above the audience. Positioned thus, they worked together to produce an infinite variety of fabulous looking scenes that enveloped the whole room.

The MegaPointes were the main fixtures onstage, used for all the high impact factors, WOW looks and retinal burn-outs!

The Spiiders were carefully positioned to provide DJ back-lighting, and for extra effects from individual pixel and ring looks during some of the timecoded numbers.

The LEDBeam 100s highlighted and expanded the decoration and augmented the aerial looks created with the Pointes and MegaPointes.

The BMFL Blades were all focussed on lighting the décor and scenic elements as well as key lighting for the DJ positions and backlighting for the dancers.

All the fixtures were originally chosen by Bas, together with some substitutions for the Sydney show, a task which Zis co-ordinated.

Zis loves Pointes for their “all-round variety and functionality”. Utilising them to the max, he created ‘structural scenery’ for the massive wide aerial looks that characterised this Transmission Australia edition.

Like many, he thinks MegaPointes are great for the brightness, small size and diversity of looks they can bring to any setting. He finds them perfect for trance music events which need to look scenic but also have a full-on rawness and punch to suit the music. “From tight, heavy beams to wide angle looks, and also in combination with standard Pointes,



MegaPointes are a joy to work with" he stated. He appreciates the intensity of the tight beam when the Spiiders are fully zoomed in, an effect used to back light the DJs and enhance the stage depth.

Even in the vast Showground venue, Zis remarks that the little LEDBeam100s really 'popped' and were instantly visible in all the photos.

The power and accurate shuttering of the BMFL Blades was harnessed to enhance the extensive décor elements and to help create a spacey vibe that both contrasted and ran in conjunction with the screen visuals.

As the lighting and general production design followed the architectural lines of the building so closely, getting the symmetry right to accentuate the shape of the space was vital to

all the technical elements looking their best, and the end results showed the dynamics and integrity of Bas's original 'Awakening' design.

Lighting was run via two grandMA2 consoles at FOH and a grandMA2 light for backup.

Zis notes that it was an excellent experience working on site with the team from MPH. The lighting rig proved extremely reliable and the process was efficient and streamlined.

"The quality of the Robe fixtures really came across on this project" he commented. "Combined with a great atmosphere, we could make the whole arena massive and overwhelming or close things right down, so it became a close and intimate space as the mood directed".

A fantastic line-up included performances from Above & Beyond, Vini Vici, Ilan

Bluestone, AVAO, Vision Impossible, Marcus Santoro, Sander van Doorn presenting Purple Haze, MaRLo, Simon Patterson and many more.

Transmission's own production manager was Cyril Horanek and their visual show direction was by Vision Impossible, with SFX by AVM SFX and lasers operated by Ministry SK from Slovakia. Dancers, choreography and costume design was co-ordinated by Marina Stepanenko and Tereza Lojkaskova.

Pyro for Transmission Australia 'The Awakening' was delivered by Foti fireworks, staging by Stagekings Australia, the video supplier was Mediatec AP, sound was from Sydney based JPJ Audio and the laser hardware came from Lumina Visual Productions.



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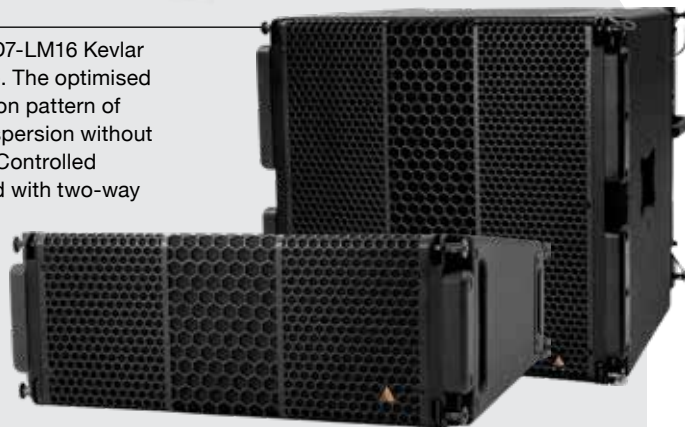
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GEAR



Maverick MK3 Profile

The Maverick MK3 Profile features an output of over 51,000 source lumens and a 4-blade shutter frame system with the ability to fully blackout and a 120° rotation. Its LED optics feature CMY + CTO colour mixing and a 9:1 zoom ratio that maintains a flat field of focus even when fully wide. It also has an adjustable CRI from 73 to 93 CRI for use as a key light for broadcasted events. Maverick MK3 Profile offers static, rotating, and animation effects from its 2 gobo wheels (1 rotating, 1 static), animation wheel, 2 independent and overlapping prisms and 2 frost options: superlight and medium. Control as you see fit with DMX, sACN, Art-Net or W-DMX.

Maverick MK3 Spot

Maverick MK3 Spot features an output of over 51,000 source lumens. Its LED optics feature CMY + CTO colour mixing and a 9:1 zoom ratio that maintains a flat field of focus even when fully wide. The unit also has an adjustable CRI from 73 to 93 CRI. Maverick MK3 Spot provides static, rotating, and animation effects from its 3 gobo wheels (2 rotating, 1 static), animation wheel, 2 independent and overlapping prisms and 2 frost options: superlight and medium.

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Chauvet DJ Freedom Flex H4 IPx6

Freedom Flex H4 IPx6 wireless lighting system features a quick-change battery pack allowing you to keep your lighting in use for longer, and the built-in D-Fi transceiver makes control easier than ever. The fixtures are temporary outdoor-rated (IP54) and have a robust housing that repels water, snow, dirt, and sand for all-weather applications. Freedom Flex H4 IPx6 has multiple wireless triggering and control options via the FlareCON Air and the FlareCON app and it works in master/slave mode with any Freedom Par. System includes 6 Freedom Flex H4, Charging Road Case and 6 Freedom Flex batteries.

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NEW GEAR

ChamSys QuickQ Rack

ChamSys QuickQ Rack is a small rack mountable version of the QuickQ console designed for installations. It features the same operating system as ChamSys QuickQ series consoles, but is designed to operate as a remote system without physical user control. Supporting four universes, the unit can be used as a desktop box or rack mounted with the supplied rack ears. Main features include: ten scene buttons, four universes, two RDM 5-pin DMX Outputs, nbuilt Wi-Fi for programming and remote control, four 10 scene ports for connection of up to forty 10 scene wall plates, four remote input ports, same software as QuickQ consoles, simple hot-takeover mode allowing external console to take control of connected fixtures.

Australia and New Zealand: ULA Group www.ulagroup.com
or +61 1300 852 476 / +64 9 889 3363

LumenRadio MoonLite

With built-in support for Bluetooth connectivity, MoonLite enables tablet and phone based lighting control softwares to connect directly without the need for extra hardware. MoonLite is a state-of-the-art transceiver; thanks to its small size, built-in battery and dual XLR connectors it is ideal for use at clubs, small stage events, corporate events, in theatres and temporary events where wireless DMX connectivity is needed. MoonLite has the same reliable functionalities as all LumenRadio's CRMX products, but is updated with smarter disturbance detection technology, allowing for even more stable connectivity – and it comes in a much smaller package.

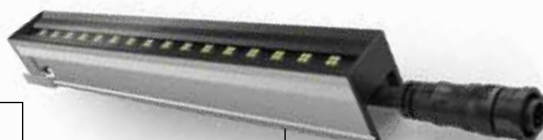
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SGM VPL Series

The new SGM versatile Video Pixel Linears are designed to create powerful pixel mapping and media effects. The VPLs are based on an easy, flexible and reliable system that consists of low-profile fixtures in multi-core single-cable installations, with no external power supplies involved. These weatherproof linears are designed to avoid pixel hotspots while delivering maximum output, and have consistent thermal management to ensure reliability. The VPLs are perfect for radial installations where high-visibility and a very flexible setup are essential. This easily integrated fixture with full pixel mapping control is suitable for a wide range of applications, including media facades, touring concerts, stadiums, theme parks or just about any fixed or temporary tight space installation, where you want a direct view illumination.

Australia ULA Group
www.ulagroup.com or 1300 852 476
New Zealand: Direct Imports
directimports.co.nz or (06) 873 0129



Radial RA-DAN-RX2 and RA-DAN-TX2

Radial Dante boxes are designed for those needing two channels of stereo analogue either onto or receiving from the Dante Network. Targeting the commercial install and pro touring applications, the new Version 2 DINETs now feature locking etherCON jacks and can be mounted in standard racks with the optional SA series rack adaptor kit.

Australia: Amber Technology
www.ambertech.com.au or 1800 251 367
New Zealand: Amber Technology
www.amber.co.nz or (09) 443 0753



Powersoft X4L

The Powersoft X4L has been designed to deliver the output voltage required by the latest generation of high performance loudspeakers. Powersoft's power supply is suitable to Single Phase, Bi-Phase or Three Phase operation from 85 VAC up to 460 VAC without need of selection. True Three Phase load balancing is directly achievable without any complex load assignment in the power distribution system. Powersoft X4L provides four fully processable channels and selectable inputs from analogue sources as well as AES3 and two redundant Dante streams.

Australia and New Zealand:
PAVT www.pavt.com.au
or +61 (0) 3 9264 8000 / +64 (0) 21 410 050



Epson 4K PRO-UHD

4K PRO-UHD is an umbrella term Epson have coined that comprises a suite of three key technologies developed to power their latest generation of projectors, starting with the just launched EH-TW8400, EH-TW9400 and EH-TW9400W. Series key features include 1920x1080x2 resolution, 10 bit (12-bit digital colour processing, 2600 lumens - colour and white brightness, up to 1,000,000:1 contrast ratio, HDR10 compatibility, 100" screen 3.0 - 6.3 metre projection distance, and a two year projector warranty.

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www.epson.com.au or (02) 8899 3666
New Zealand: www.epson.co.nz
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Sennheiser XS Wireless Digital

Sennheiser's brand-new XS Wireless Digital series replaces the cable with sleek, compact transmitters and receivers that work on 2.4 GHz for worldwide, license-free operation. Versatile and easy to use, the series provides wireless solutions for almost every conceivable configuration and application. Transmitters and receivers can be freely combined so users can opt for a wireless link that will protect their existing microphone investments, or select one of the fully-equipped wireless microphone sets. Presenters, vocalists and instrumentalists can choose between a Vocal Set with an XS 1 dynamic cardioid microphone, a Lavalier Set with an ME 2-II clip-on microphone, and an Instrument Base Set for instruments with a 6.3 mm (1/4") output. Also available is an XLR Base Set for use with existing dynamic microphones, and a Presentation Base Set for use with an existing clip-on microphone that has a 3.5 mm (1/8") mini-jack connector. All transmitters and receivers are also available separately.

Australia: Sennheiser
en-au.sennheiser.com
or 1800 648 628

New Zealand: Sennheiser
en-nz.sennheiser.com



Riedel Artist-1024

Riedel Communications have unveiled the Artist-1024 node, a powerful expansion to the Artist intercom ecosystem. The Artist-1024 node boasts 1024 non-blocking ports in 2 RU, and introduces a range of technical innovations centred on software-definable Universal Interface Cards (UIC). This new type of interface card combines networking, mixing, and management, and can be configured to act as an AES67 or MADI subscriber card, or as an Artist fiber/router/processor card. Changing the connectivity type is as easy as reconfiguring the UIC with the click of a button in the Director configuration software. The frame provides ten bays for UICs, with two being reserved solely for routing and networking UICs. The remaining eight bays can be equipped with UICs of various configurations to provide subscriber connectivity. The integral mixer on each subscriber card can be scaled from 8 to 128 ports per card and can access all 1,024 ports of the Artist backbone. In addition, four expansion slots are available for various GPIO or synchronization applications.

Australia and New Zealand:
Riedel Australia www.riedel.net
or +61 (0) 2 9669 1199



Shure TwinPlex

Shure TwinPlex is a new line of premium subminiature (5 mm) omnidirectional lavalier and headset microphones. Designed to stand up to the toughest conditions, TwinPlex provides natural audio at both high and low frequency when professional vocal performance is a must. TwinPlex consists of four lavaliers (TL45, TL46, TL47, TL48) and an ultra-light, fully-adjustable headset microphone (TH53) in multiple colours with extensive accessories and options. The unique dual-diaphragm omnidirectional design yields extraordinary off-axis consistency and industry-leading low self-noise creating lifelike vocal clarity and warmth.

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



SSL SiX

The SSL SiX is a condensed professional console for use in the studio, in post-production, on stage, and for podcasting. SiX offers big console sound and an impressive set of utility features in a format that is small enough to stick in a bag and go wherever you need it. SiX offers two recording channels with SuperAnalogue™ mic pres, two band EQ, an essential one knob version of the classic SSL Channel Compressor, a new two-band Channel EQ, inserts and 100mm faders. There is a two-knob version of the legendary G-Series Bus Compressor on the main mix bus and the unique Listen Mic Compressor on the Talkback. In mixdown mode it is a very capable twelve channel summing system that offers analogue detail, depth and width to your mixes.

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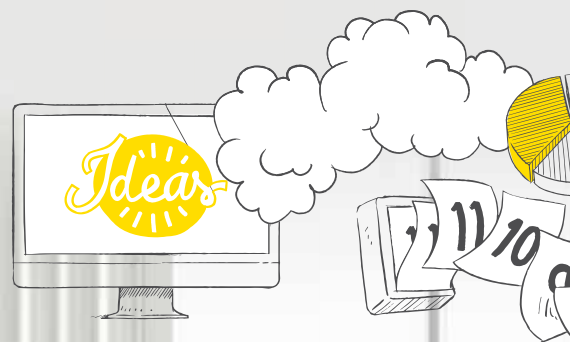
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by Cat Strom

Australian pop princess Kylie Minogue bought her Golden Tour to Australia, performing a string of headline shows at arenas and some very soggy outdoor venues across the country.

The tour hasn't been a long one, with three weeks in the UK followed by three in Europe, and three in Australia.

The show featured six distinct sections each with a different setting and style. It opened with Kylie waking up in the middle

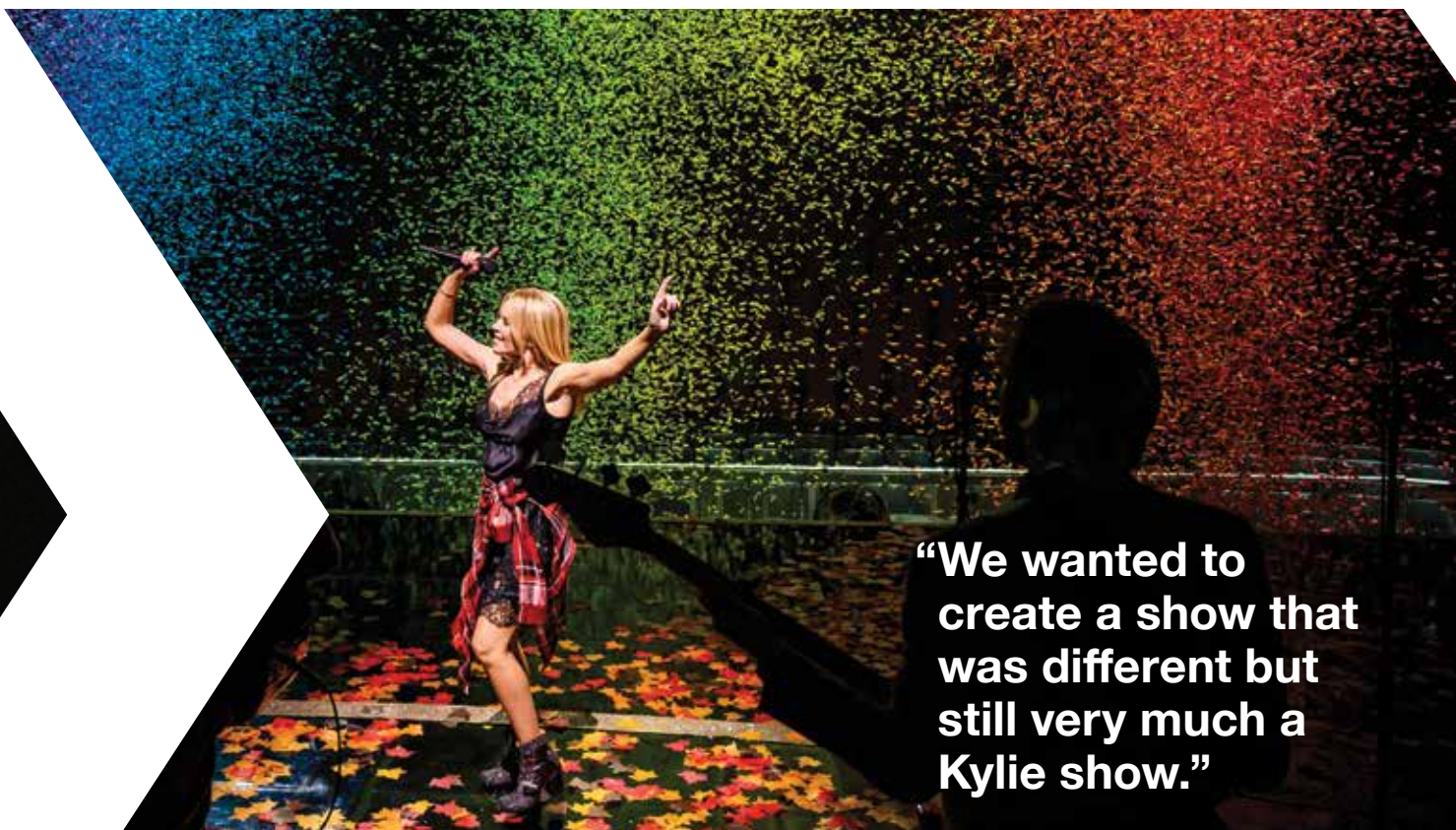
of the desert and ended with her dancing in Nashville. The retro look of the show featured an enormous LED video screen upstage with the entire show set in the 1970s as an abstract road movie. Blink created all the show's screen content shooting live action footage in the California desert and a London studio

following the narrative that linked the music, screen content and choreography.

With an eye on the big picture, Rob Sinclair was both Creative Director and Lighting Designer for the show.

"We wanted to create a show that was different but still very much a Kylie show," commented Rob. "We're really happy with how Golden has been received. Working with Kylie to create the show has been hard but rewarding and almost entirely down to the great talent of our cast and team."

Rob opted for a mainly Martin rig saying that their gear is cheap, reliable and you can get it anywhere. He noted that he is only really



“We wanted to create a show that was different but still very much a Kylie show.”

picky about the spots, as his main job and focus is to present Kylie at her absolute best.

“That means I need very consistent lighting so the lighting on her is the same for the entire show in every city,” he added. “We try get the same levels from the same angles from the same lights – the flipside of that is really consistent cameras and we run everything through Notch for the very finest smoothing so we get rid of the harshness of the LED wall in all of her pictures.”

The tour carried five Robe Robospots described by Rob as great and working really well. He placed four at the FOH tower as they’re bright enough and narrow enough to

be able to do that plus one upstage centre.

“I love the system especially the level of control I get over it,” said Ali Pike, Associate LD. “I still occasionally in my head call spots the old fashioned way though! When you’re using different spot operators every day, it means a lot less stress involved getting it right because they really only have to point at one person and I do the rest.”

disguise 4x4pro media servers were toured to drive the massive LED screens and facilitate real-time Notch VFX. All IMAG was treated with Notch in order to ensure that Kylie looked her best on the screens at all times with Notch used for some slight skin smoothing as well

as more creative VFX.

“disguise’s tight Notch integration was a key element throughout the show,” remarked Rob. “The live feed was even more important than usual on this show as the screens needed to not just relay the show but also help convey the story. Multicam Director Blue Leach and disguise programmer Nev Bull did an amazing job using Notch to cleverly format the feed and help reinforce the 70s theme with appropriate filters and effects.”

Due to the nature of the show, with different chapters and styles, flexibility in the lighting design was important. Fixture wise, the rig was fairly similar to the European gigs



Rob Sinclair and Ali Pike



although a few Martin MAC AirFX were swapped for MAC Profiles due to fixture availability. The runway had been lost, and consequently the lights above it, plus the oval truss above the stage had become a straight truss due to rigging constrictions at the outdoor gigs.

There were three straight trusses housing MAC Vipers whilst upstage there was a row of MAC Vipers plus rows on the floor down either side of the stage. Two square scaff frames held four Robe BMFLs per side as flown side light. MAC Aura XBs were used extensively around the set and truss ladders held GLP JDC1s.

A feature was the custom-made wireless, battery-powered mirrorball that doesn't need cabling running to it – Ali just had to remember to charge it every day! Claypaky Sharpys on the front truss were an essential addition for the mirrorball.

Ali has worked with Rob many times, although previously he has been the lighting designer and she has programmed and operated the show for him. However on this show, as he is looking after all visual elements, she was left to her own devices a bit more.

"The show is almost all timecoded which gives us the ability to add a better level of detail," said Ali. "I could never run live during

the show the amount of stuff that we have in there. I got Christian, our keyboard player, to sit at the MA2 during rehearsals and I recorded him playing his part as buttons on the MA2. So what you see out there is what he played directly into the console and we recorded and played back via timecode."

Ali manually loads all songs and ends all songs so any moments where it feels like it needs to hold a little longer can be controlled. She also controlled all of the transitional looks but once a song is up and running, it's all timecoded.

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SHURE REVEAL TWINPLEX.

MISSION: TAKE ON DPA



by Julius Grafton

Shure revealed their new ultra-compact microphone line called TwinPlex at a media event in Chicago. It was a well-kept secret, despite its seven year gestation and a very, very large beta test campaign.

The testers included Hillsong Church and Sydney Opera House whose audio teams were signed to non-disclosure agreements – just like many dozens of others, spanning Broadway, TV, and production houses over the world. They probably would have spilled details if they didn't like what they were using, we surmise.

TwinPlex is a 5mm dual diaphragm omni directional lavalier and headset microphone – something Shure never did before, and something that put DPA Microphones on the map.

The TwinPlex range starts with four models, most available in four colours, and with four

connector choices. Church and corporates will use the headset, which comes with an innovative clutch arrangement that encourages you to tilt and lock the boom rather than bend it. The head spanning covers kids to adult.

A significant factor in the very long evolution of the product was the science behind the cable, which at 1.1 or 1.6mm in diameter, was deemed to be a critical fail point. On this, theatre audio techs say they run their fingers down each cable before a show to try to detect any short or nil circuit pops.

That long practice may abate if Shure have got this right – they have a new cable that looks like a double helix – and significantly it



carries two earth paths. Mating that cable to the 5mm microphone element was a big part of the development agony.

Each prototype was sent through the dungeon, where grim white coated specialists worked relentlessly to break them. Machines twisted the cables endlessly. Elements were introduced to the SweatBOT, a chamber where artificial sweat (Shure buy the stuff by the barrel) was smothered over.

The engineers identified a bunch of key issues with development – firstly just making the microphone element, itself so small. The microscopic processes and almost nano-scaled circuit board came together with acquired and internal knowledge at the modern seven story design campus in Niles, near Chicago city.

Cable technology eventually won out with a design that did not fail after 120,000 flexes in the dungeon machine. Shure point out that this is ten times better than their (at that stage in the presentation) competition. But we all knew who that was – DPA, and Sennheiser



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who do well with the MKE2. We're not warranting Shure's cable reliability claims, just reporting what they say.

Another issue of design intention was how to voice the product. Shure have 90+ years of experience there. They ended up shooting for something close to the curves that DPA deploy. More on that shortly.

The dual diaphragm concept is not the same as the KSM8 – Shure's most recent dual diaphragm design which features one active and one passive diaphragm. Instead, the TwinPlex offers dual diaphragms engineered for better dynamic range and lower cable noise.

In Use

Shure rolled out some Beta testers, who spoke of their experiences. A sports broadcaster spoke of deploying the TwinPlex on the backboard at basketball, where it captures the swoosh of the ball through the net, and/or the thunk on the backboard.

"It gave me immense low end, never available before."

He also buried a TwinPlex with a new miniature belt-pack from the Axient digital wireless range, the ADX1M that has an internal antenna, in the turf in a baseball field. 'You make a slit on the

grass, and burrow that down there.'

His other use was to mic the net near the goalie in soccer. These soundscapes are recently a big thing in pro sport audio.

Another new trick is to shove a TwinPlex into the cup of a golf hole! At the Gold Masters he had TwinPlex and belt-packs all over, and ended up getting accolades for the sound of flocks of birds. Apparently, some broadcast engineers sometimes cheat this by adding in bird noises – until they are caught out by serious bird people calling that the bird noises they insert are not a native species. Serious people, these bird people.

Shure say the TwinPlex is 'resilient to water', with the cap designed to wick away and keep the element less clogged. They concede sweat is a big issue for some users.

We bussed over to the Chicago Shakespeare on Navy Pier Theatre, to have a real demo with several performers who spoke lines and sung to a backing. The performers wore a DPA 4061 and a TwinPlex, each in their hairline, and each (obviously) with its own belt-pack.

This demo had the engineer switch between Shure and DPA, following a script. An assistant held up a sign to show which mic was in use. Due to the close proximity of the performers and the acoustics of the venue,

it was very hard to hear differences between the two.

Sound designer Ray Nardelli told me later that he was a beta tester of TwinPlex, and that until now his preference was to use DPA on females due to better high frequency performance, and Sennheiser MKE2 on guys, because 'it has better chest sound'. He says he will now standardize on the Shure TwinPlex.

He also spoke of testing TwinPlex in tap shoes, which is given to be a very hostile environment for a little microphone. (Also for feet, we suspect.)

The head of sound at the theatre spoke of the attrition rate of miniature microphones, which they have measured over many seasons of musicals. As a regional theatre, they notice each \$500 replacement and they have hopes the Shure TwinPlex will be better.

Overall given the amazing development evolution, and breadth of the beta testing campaign, Shure look to be plugging a gap in their lineup with the TwinPlex. It offers a price advantage of about 20% over the Europeans. It should match them for spit, cable flex breaks, and durability. Plus it is grown and nurtured over many years in the United States.

That helps.



"Each prototype was sent through the dungeon, where grim white coated specialists worked relentlessly to break them."

WIRELESS VOODOO

- Not a Dark Art

by Fraser Walker

Wireless in the world of audio is often referred to in dubious terms. It fails by way of voodoo, or works flawlessly as if by magic. All of this uncertainty is caused by the fact that we as humans have no means of detecting it. There is a huge hole in our senses between our range of hearing and the spectrum of visible light; and that space is full of electromagnetic energy that can make or break your show... however, despite all the myths and old wives tales there is no reason to consider wireless a dark art.

The first successful radio transmission was achieved in 1896, and by the time Woodstock rolled around in 1969 we had FM radio and colour TV. In the moment our burgeoning industry was figuring out how to achieve a large concert system, radio transmission was already a full-fledged commercial and military technology. By the late 70s wireless microphones were finding their way onto stage, and the voodoo began to appear. Of course with the right RF engineering a huge number of these systems can work simultaneously... Olympic ceremonies, Eurovision and the NFL Super Bowl are a continual testament to this. On the flip side undertaking no RF engineering at all with just a couple of wireless microphones will quickly turn into a disaster. Being audio related, help is often sought or expected from the audio crew, an engineer used to dealing with sound waves up to a few kilohertz. The problems that present themselves at a few hundred megahertz are slightly different, however by considering they too are caused by the interaction of wavelengths, many of the prevalent issues can be overcome.

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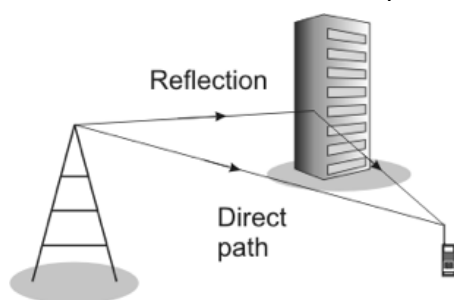
Light Up
LETTERS

The main cause of wireless microphone voodoo is interference. The main cause of interference is using un-coordinated wireless frequencies, or by using a frequency that is part of a local TV channel. Almost every manufacturer has software tools to enable you to avoid both of these common pitfalls – and whilst most audio engineers are familiar with the process, a common frustration is this: “I did the scan, I coordinated my frequencies and I still have dropouts at specific points on stage, why?!” This leads us to the second cause of voodoo: multipath propagation.

Most of our wireless equipment operates in the UHF range, and at those wavelengths, any metallic surface larger than a few centimetres will be reflective to RF energy. Most audio engineers are familiar with lumpy bass response caused by the differing arrival times from left and right subwoofer stacks. This is the same theory that causes nulls due to multipath propagation.

Nulls occur where there is a direct line of sight signal, and a reflected signal that has traveled a slightly longer path. This path length difference creates a time offset and thus a degree of phase cancellation occurs. In a real world scenario, these reflective surfaces may be lighting truss uprights, scenic set elements or the truss supports of an outdoor stage. There is a common misconception that these kinds of wireless dropouts can be fixed by increasing the transmitter power, however the cancellation will remain unchanged regardless of power. The only way to rectify multipath cancellation is to change the path length relationship between the transmitter and receiver.

Production specific



Scenario: The band is on IEM, and using no wireless mics. Upon doing a walk test of the stage, there is a strong null on the lead singer's frequency at their mic stand downstage centre. You can't move stage centre. The singer's pack is on 600.000Mhz, and a null is being caused by reflected energy arriving $\frac{1}{2}$ wavelength delayed. Moving the transmitting antenna just 20cm towards them will change the phase relationship at the IEM receiver and that null will be moved elsewhere.

It should be noted that moving the transmitting antenna has changed the path length for all frequencies in use on stage. Another option to overcome the null at the lead singers mic stand would be to change their frequency, using one of the spare frequencies from the

coordination. This has the same affect as changing the physical path length, as the new frequency will have a different wavelength, therefore the reflection will have a different phase relationship at the IEM receiver. Multipath propagation can be avoided by ensuring there are no reflective objects within the 2nd Fresnel zone between the transmitter and receiver, a topic beyond the scope of this article and purposefully avoided, as it is usually not achievable at most events.

The final major cause of voodoo is a lack of received power at the receiver. Wireless receivers are working incredibly hard to capture what is left of a signal after it has endured the losses caused by antennas, air and cable. The front end of a receiver contains an amplifier to receive these weak signals, however this amplifier will also turn itself down when it encounters a strong signal to prevent itself from being damaged by overloading. This is known as desensitisation. For example a handheld microphone that is sitting on a stand next to your receiving antennas will severely reduce your ability to receive a weak signal from a mic located far away or otherwise obscured from the antennas. Similarly, mounting your IEM transmit antenna to a stereo bar along with your receive antennas is a clean and fast way to use one mic stand at a festival and also a sure fire way to desensitize the mic receivers, particularly if you are smashing eight channels of 100mW from the transmitters to try and overcome a multipath issue. Give your receive antennas some freedom from strong radiation. When using directional antennas, use that to your advantage by placing known sources of interference in the null points of your receive antennas.



All antennas should be operating in a free field, theoretically 6x wavelength if space will allow it. This is around 3m for the range used in Australia. Diversity receiving antennas should be spaced at least 1x



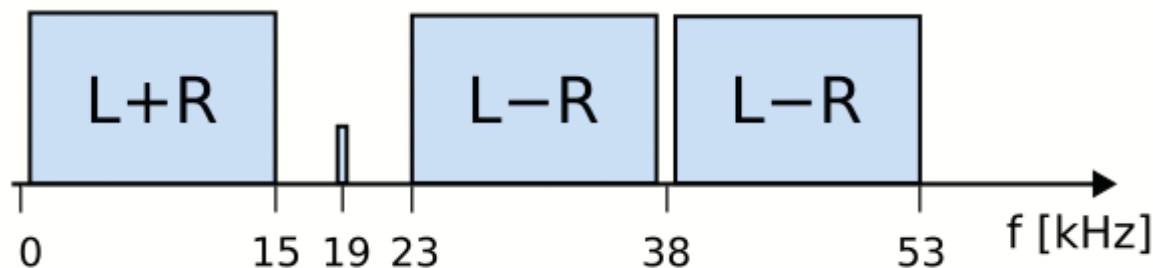
wavelength, to allow for differing path lengths to the transmitter. Where space does not permit spacing for multipath diversity, the antennas should be offset by 90 degrees, thereby offering polarization diversity instead. (RF Venue Diversity Fin is an example of this)

You can't see the radiation but you can visualise the antenna beamwidth in horizontal and vertical planes.

Using high-power transmit modes aimlessly only serves to increase the noise floor and create desensitization issues and should only be used where every other best practice has not allowed for enough power to be received. Wireless belt packs worn on the body often suffer huge losses in radiated power due to skin contact conducting the energy from the transmitting antenna more readily than it can be transmitted into the air. This gets exponentially worse on sweaty skin. Try and keep the belt pack high and dry, particularly the antenna – disposable latex gloves and lubricant free condoms are tools of the trade here. It is also one of the few times where a high power transmit mode can be used for good reason, offering comparable radiated power to a handheld microphone at standard output.

IEMs use the same transmission method as commercial FM radio. Developed in the 1960s when stereo was just catching on, it was imperative that any stereo transmission was also mono compatible. They achieved this by developing a multiplexed standard of modulation, known as FM MPX. By employing the same mid/side encoding techniques known from microphone placements, mono compatibility was ensured with the ability to easily expand to stereo.

The MPX standard consists of three parts - a Mid component with a bandwidth of 40Hz to 15kHz, a pilot tone centered at 19kHz and the Side component from 23kHz to 53kHz. Where the receiver does not see a pilot tone, it demodulates to a mono compatible L+R signal. Where it sees a pilot tone it will demodulate a stereo signal by using the sum and difference of the two channels.



$$M + S = \frac{L + R}{2} + \frac{L - R}{2} = L$$

$$M - S = \frac{L + R}{2} - \frac{L - R}{2} = R$$

There are two important things to consider here. Whilst there is a LPF in the transmitter at 15kHz, it is not infinitely steep. There is a tendency to boost the “air” on vocals to overcome some of the occlusion that singers wearing IEM experience, however large amounts of HF boost can ultimately lead to the pilot tone being modulated inadvertently. This leads to issues in the demodulation of the stereo signal – causing a lack of separation in stereo elements. The suggestion is there is nothing above 15kHz being received, so there is no need to boost any frequencies beyond

that. Thanks to digital consoles there is a good argument for having an additional LPF on all IEM mix outputs.

The second part to mastering this codec puzzle is to ensure strong mono compatibility in the transmitted stereo signal. Having large phase discrepancies between the left and right channel will cause artifacts when the receiver attempts to decode the stereo signal. Usual culprits for this are that artificially wide sounding percussion stem coming from playback, or some enthusiastic usage of stereo widening on the monitor console. A little bit goes a long way, and once again, overdoing it will result in effectively collapsing the stereo image despite the overzealous attempts to widen it.

Another myth that needs to be dispelled is that frequencies in different ranges do

not interact with each other. It’s uncanny how often engineers familiar with intermodulation and frequency coordination throw it all out the window as soon as transmitters are spread across multiple frequency bands (i.e. Sennheiser A and G band).

Intermodulation is well covered by many other articles, but remember that 500Mhz and 700Mhz will create a product at 600Mhz.

As most are aware, the entry price to wireless audio has been coming down at the same time that our available spectrum is shrinking. The end result is we have more frequencies trying to fit into a smaller space. That said, wireless is here to stay and having a strong grounding in the fundamentals of RF will make you a highly employable audio engineer well into the future. Self-education is the key and we are lucky that Shure and Sennheiser both offer excellent training here. And for those wanting to go the extra mile, remember that they are all just wavelengths, and white papers from GPS manufacturers and study guides for amateur radio are all applicable to having clean wireless at a gig.



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IN-EAR MONITORING

by Sennheiser's Adam Karolewski

Put simply, the purpose of monitoring is to assist band members or performers by allowing them to hear themselves and others. Back in the day when I was still playing drums, I would have edited this to read, “allowing them to hear themselves”. End of story. Nothing really sounded quite as good as my drums thundering back at me through a 3-way drum fill. But enough about me.

Back to monitoring and the way in which this is delivered.

Typically, two options:

- Stage Monitors (wedges)
- Wireless In Ear Monitors (IEMs)

Because of the wireless specific nature of this issue, our focus will be very much on IEMs.

Why choose In Ear Monitoring?

Unless you're a singer and need somewhere to rest your foot, then there are compelling reasons to consider In-Ear Monitoring for your monitoring solution. Except if you need somewhere to rest your foot. IEMs suck at that.

Refer to the table right for a Stage Monitors vs IEM comparison.

Features	Stage Monitors	In-ear Monitors
SPL at Ears	Depends on the mix	Depends on the mix
Stage Volume / Noise	High	Low
Gain Before Feedback	Depends on level	Higher
Mix Types	Mono	Stereo, Mono, Focus
Private Talkback	No	Yes
Portability	Heavy, not as portable	More portable
Mobility	Less mobility	More mobility
Aesthetics	More equipment on stage	Lower profile
Mixing Methods	Different than IEMs	Different than stage monitors

Most of the above are self-explanatory but let's take some time to review some of the main differences.

SPL at Ears

With stage monitors, the SPL can be very high at the ears, this is obviously dependant on the quality of the mix, while significantly lower with In-ear monitors when mixed and operated properly. “Less is more” being the guiding philosophy.

Stage Volume / Noise

Monitors add to the stage noise, having the potential to affect the Front of House mix. In-ear monitors have much lower stage noise affording the sound engineer greater control of the house mix.

Mix types

Stage monitors deliver a mono mix. Sennheiser In-ear monitors offer the choice

of Mono, Stereo or Focus (allowing you to make your own blend out of two separate mono mixes i.e. band mix on one channel and vocals on one channel) mix.

Mobility

Because the In-ears are always, well, in your ears, the mix remains constant regardless of where you are on stage. With stage monitors, the perceived mix changes depending on stage location.

IEM Tips and Tricks – System Design

- Never operate two transmitters on one frequency!
- Never use equal channel/frequency spacing!
- Select coordinated frequencies that avoid TV interference and intermodulation products
- Use an active antenna combining system to avoid intermodulation
- Allow five metres distance between transmitter and receiver to avoid receiver overload

- Allow 8-10 MHz spacing (minimum) between wireless mic and monitoring (IEM) frequencies.
- Operate IEM and mic systems in different frequency bands whenever possible
- Keep transmit antenna cables as short as possible (and use the best quality low-loss cable) to preserve your signal.
- Signal losses are greater for RF than for AF: if long runs are necessary, it's better to run audio cable than RF cable
- Physically separate transmit and receive antennas to avoid "blocking"
- Consider mono transmission to extend range in distance-critical applications

Suggestions from sound engineers when it comes to using IEMs:

- Plan for increased artist-tech communication. Artists have varying expectations and needs regarding mix.
- If possible, monitor with the same transducer technology as artists. Monitoring and mixing an IEM on a cue wedge or

headphones can be misleading.

- Mixing ambient microphones back into the in-ear monitors will help the band have a sense of what is happening around the stage and in the room.

Sennheiser offers two excellent In-Ear Monitoring solutions, our new evolution wireless G4 IEMs and the twin transmitter SR 2050 from the 2000 Series, with the receivers from both systems featuring Sennheiser's "Engineer" mode.

In "Engineer Mode", you can read out the settings of other EK receivers and save these settings in profiles using your EK 300 IEM G3 receiver. These profiles can be loaded during a live transmission to monitor and, if necessary, adjust an audio signal reproduced by a read-out EK receiver.

Complementing our IEM systems we now offer our new range of dynamic driver monitoring earbuds, spearheaded with the IE 40 PRO, delivering a warm, yet powerful and precise sound, even in extremely loud environments. IE 400 PRO and 500 PRO models are scheduled to arrive in June.

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Over 20 HelixNet Masters and 400 HelixNet beltpacks
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CLEAR-COM FREESPEAK II



For years, simple and reliable full-duplex wireless communications has been somewhat of a holy grail for Intercom manufacturers. So, what is 'full-duplex' I hear you ask? Full-duplex intercom refers to an intercom system that has the capability to talk and listen at the same time, just like a telephone. No need to talk, then pause whilst the other party responds - and no chance that some of the communication might get lost if someone talks over you.

In the past, the only way to achieve full-duplex comms was to use two frequencies - one for 'talk' and one for 'listen'. In a multi-belt pack / multi-user system that would become difficult very quickly, as each user would need a separate frequency to talk back; a twenty-user system would require at least twenty-one channels, which in a crowded RF spectrum becomes impractical. These types of systems and topology formed the basis of the iconic BTR wireless system from Telex and explained why it was generally limited to a few belt packs - and required coordination with TV stations, Radio Mics, and In-Ear Monitoring systems.

So as someone immortal probably once said, there had to be a better way. Back in the early 2000s a group of intercom engineers in the UK began experimenting with a technology called DECT to see if they could improve on

the current state of play in wireless intercom. DECT had its basis in the wireless telephone space and forms the basis of many domestic and commercial PABX wireless solutions. Back in the early days DECT was limited to telephone quality and solutions had to be found to use multiple 'time slots' to achieve intercom quality; but the team succeeded and the first generation of FreeSpeak was born. It was expensive and far from perfect, but it showed that there was another way.

Fast-forward a few years. After Clear-Com joined the HME family back in 2010, there was a mood to reinvigorate the FreeSpeak concept.

In 2014, Clear-Com released the FreeSpeak II. A completely redesigned belt pack, along with a new antenna transceiver, was released. The industry acceptance was significant and



Pyeongchang 2018

shortly after the products release, The P.A. People were awarded the communications contract for the Inaugural European Games in Baku, Azerbaijan in 2015. The production crew did not include full-duplex on the original specification, but as the artistic component of the event developed, and after we had been appointed as contractor, it was determined that a full-duplex solution would constitute a significant advantage for the Ceremonies.

The P.A. People turned to FreeSpeak II as its solution. Over 80 packs were deployed with twenty antennas and the system worked flawlessly.

Fast-forward again. The Olympic Games are widely regarded as the pinnacle of competitive sporting competition. What many may not know is that the demands on athletes are replicated by the demands on the technical systems that support them. In 2018, for the first time the Committee of the Pyeong Chang Winter Olympic Games decided that it was time to upgrade the venue sports presentation and results intercom systems, from a traditional two-way radio solution to a full-duplex system. Again, The P.A. People were on hand to provide a solution based on the Clear-Com FreeSpeak II system. At fifteen Winter Olympic venues, we deployed 400 FreeSpeak II belt packs, over 100 antennas and 30 splitters as a mixture of systems integrated within a Matrix frame and stand-alone FreeSpeak II Bases. That's a lot of FreeSpeak II at one event.

Recently, FreeSpeak has received another upgrade, which has significantly improved its performance and flexibility yet again. In response to a growing requirement for



networked solutions, Clear-Com have released a fully networked antenna solution for FreeSpeak II. The upgrade consists of a new AES67 card for the Eclipse range of Matrix Intercom frames and a new IP antenna transceiver allowing the IP system to run up to 10 belpacks per antenna. Extensively tested by DORNA, the organisation behind the Moto GP competition, the new IP solution has found wide acceptance in the twelve months since its release.

FreeSpeak II can now operate with the original antennas and splitters or with the new IP



Baku 2015

based antennas. Belpacks can be user-configured to work with either infrastructure.

Freespeak II provides the best of both worlds. It is the original DECT based full-duplex system and is still the market leader. You can use it either fully integrated with a matrix, OR standalone with a base; it has traditional antennas and splitters (simple to use and no network required) OR it has IP antennas with 10 devices per antenna and works on a network; it is scalable – you can use a few packs or a hundred; it is the industry standard with literally thousands and thousands of

systems deployed worldwide

FreeSpeak II just works. From the largest theatrical productions to sports presentations to corporate events, it is available for hire from The PA People either as part of a full comms system package, as a standalone system to integrate with your kit, or simply some extra packs or antennas for your own FreeSpeak II system.

By Chris Dodds, Managing Director, The P.A. People (proud owner of the world's largest Clear-Com rental inventory and a FreeSpeak user since 2004.)



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SIGNAL OUT OF THE NOISE

by Simon Byrne

I've done a few radio courses in my time. I hold an electronic trades certificate, Marine Long Range Operator Certificate of Proficiency, Aeronautical Radio Operator Certificate (AROC) and I even got a foundation level ham radio licence (VK1FBDA).

If there is one thing I have learnt, it is that in order to achieve reliable performance of wireless systems at events, don't fight the laws of physics.

Wireless systems use radio waves that are a type of electromagnetic radiation. Like all other electromagnetic waves, in the air, they travel at close to the speed of light. They are generated by electric charges undergoing acceleration, such as time varying electric currents and radiated from the transmitter's antenna.

On the receiving end, the power is induced into the receiver's antenna, and from that carrier, a usable signal is extracted out.

For those of us in audio, we know that for sound pressure waves, the shorter the wavelength, the more control we exert over it, but this also means the easier that those frequencies are blocked.

For example, a 1 kHz tone is roughly 34 centimetres long. By placing an item of around that dimension in front of the source, we will substantially block it, as well as reflect some of it back, the effect being reduced output. The wavelength of a 10 kHz signal is just 3.4 centimetres, and it will be greatly affected by our larger blocking device. Whereas a 100 Hz tone's wavelength is about 3.4 metres. The wavelength is so long that it will simply wrap around our much smaller

blocking device. Basically no effect at all. Which is why, in part, bottom end is harder to control.

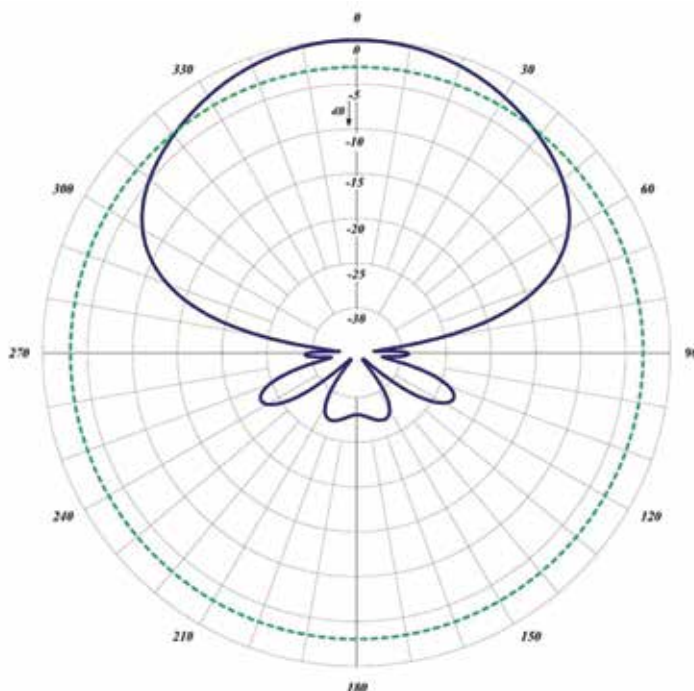
Similar effects apply with radio transmission frequencies (or RF for short).

For most event applications, we are interested in the radio frequencies from around 520 MHz through to 2.4 GHz. Interestingly the wavelength of RF at 550 MHz is 54.5 centimetres, and at 2.4 GHz, 12.5 centimetres. Are you starting to see a theme here?

Frequencies at the lower end of the spectrum have a better ability to get around obstructions because they are in the 50 centimetre range, whereas the higher frequencies are easily absorbed due to their much shorter wavelength.

That means the higher the frequency, the more important it is for line of sight between the transmitter and receiver.

Just as sound waves reflect off surfaces, so do radio waves. These waves can arrive



Log Periodic Array response vs omnidirectional monopole

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via multiple, and different length paths which contributes to phase cancellation. By getting the receive antennas up high, as well eliminating line of sight blockages, you can reduce the relative strength of the reflected waves because they then have to travel further in relation to the direct wave.

Whilst talking line of sight, the human body will soak up as much as 50% of the radiated power from a wireless beltpack. That being the case, having the receive antennas up high, and in a location where clear line of sight of the transmitter beltpacks, that is, behind the performers if need be, dramatically improves reliability.

In a free field, the inverse square law can apply to RF too, so use it to your advantage. Say your receiver is side stage, 10 metres away from the talent. Through poor planning, another transmitter is on the exact same frequency in the next room, 100 metres away. By definition the rogue transmitter will be down about 20dBm, or 1/100th the power at the side stage receiver! Not ideal, but you'd get away with this. But say you put the receiver at front of house so it is 25 metres from the microphone on stage. The ratio between the two transmitters is now only 4:1, so the difference in power is 12dBm. Definitely at risk of interference!

Antenna manufacturers talk of gain. Unless they incorporate active circuitry, antennas don't have gain in the way a mic preamp does. Antenna gain refers more to an antenna's directivity. That is enhanced in a particular direction; the greater

the gain of the antenna in that direction. Gain describes the ability of the antenna to receive signals preferentially from certain directions. Gain does not create additional power beyond that delivered by the feed line — it only focuses that energy. I like to think of directional antennas as cardioid antennas. That is, they pick up from the front, but not so much from the sides or the back. Whereas an omnidirectional antenna will pick up equally from all directions which in most cases means the signal to noise will be lower because noise is being received from all directions. An ideal use case is LED screens which emit electromagnetic radiation. By using directional antennas, you can null out a lot of the energy from the screens, which means you have increased the signal to noise. You could not do this with an omnidirectional antenna.

Do you need to use active gain? Maybe, maybe not. We are interested in a strong signal, relative to the noise floor. Radio receivers are quite sensitive so as long as there is a signal significantly higher than the noise floor, you are OK. Therefore if you put an RF amplifier in the circuit, you are raising all the signals received, as well as the noise floor by the exact same amount. You run the risk of overloading the front end of your receivers.

Therefore the primary reason to have active gain is to account for loss in the signal path, especially the cabling between the receive antennas and the receivers. I've been advocating to get the antennas up high and to aim them so there is always line of sight to the transmitter, not being blocked by humans so you have to use coaxial cables. All coax

cables used in RF environments have loss, so you need to work out whether the losses are acceptable. The higher the frequency, the greater the loss per metre. At 600 Mhz, standard RG58 cable will lose about 5 dB per 10 metres which is quite a lot. You definitely want active RF amplifiers at the head of that circuit. However, by using high quality, low loss LMR400 coax that loss is reduced to about 1dB per metre. You can usually buy LMR 400 by the metre from two-way radio communications suppliers.

Importantly, you never want to remotely locate the monopole 1/4 wave antenna's that are designed to be attached directly to receivers. They rely on a ground plane which is provided by the case of the receiver itself. Log periodic antennas, or paddles are usually the best solution for remote antennas and for difficult applications, RF Venue have some superb special application antennas.

You can make some high performance paddles yourself by buying the Kent Electronics printed circuit board antennas. These are circuit boards that you simply fit mounting hardware and connectors to, paint them black and you have some very respectable and dirt cheap paddles.

A major emerging culprit for reduced range of wireless microphones is LED lamps in house lighting. As incandescent lamps are replaced with LEDs, they incrementally contribute RF noise thereby raising the venue's RF noise floor.

Lastly, I generally feel that there needs to be a compelling reason to use wireless. Devices connected by cables will always be more reliable, so if it doesn't need to be on wireless, don't.

RF Venue - High quality antennas and accessories for wireless used in production.

www.rfvenue.com

Kent Electronics - Low cost printed circuit board log periodic antenna circuit boards
www.wa5vjb.com/products1.html

Is that a wireless intercom in your pocket?

by Jand's Jeff MacKenzie

Need to quickly deploy secure wireless production intercom to a wide area? The latest offering from Clear-Com may be the answer.

Clear-Com have added Agent-IC, a BYO wireless intercom solution designed to run on portable devices such as smart phones, tablets and even wearables such as the Apple Watch.

Agent-IC systems consists of at least one hardware device or "base" such as a Clear-Com LQ box or a Matrix frame fitted with an IVC-32 HX card which then supports up to 48 channels of portable devices.

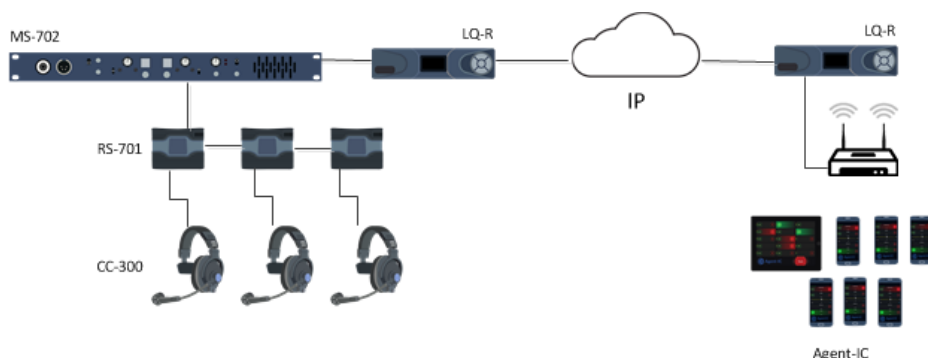
Agent-IC utilises standard IP connectivity to connect to devices running the Agent-IC app, either locally via Wi-Fi or wide area / globally via 3G/4G systems.

Agent-IC can run as a standalone system or interface to cabled analogue or digital intercom systems.

Ideal for applications such as wide area wireless connectivity for outside broadcast / ENG or for ad-hoc additions to live production systems.

Agent-IC opens a world of IP-based connectivity to broadcast and production communications systems, allowing us to finally break free of the restrictions inherent in traditional line-of-sight wireless solutions.

For further information on Agent-IC including application examples, go to www.clearcom.com/product-family/agent-ic-mobile-app/#agent-ic-for-lq-series





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Antennas

by Jand's Jeff MacKenzie

Antennas are arguably the most critical component in a wireless microphone system, akin to both the ears and mouth of the system. However, they are largely misunderstood, often treated more like devices of black magic than critical elements of the system that require careful consideration regarding positioning and orientation to ensure optimal performance of the wireless audio system in question.

In this series of articles, we will look at a couple of the more common antenna types used with wireless microphone systems and explain terms such as wavelength, omnidirectional, polarisation, ground plane etc.

In this first article we will look at the most common antenna type and fundamental building block of more complex antenna systems, the $\frac{1}{2}$ wave dipole, and its close cousin the $\frac{1}{4}$ wave monopole.

The dipole is one of the earliest types of antenna; it was invented by German physicist Heinrich Hertz around 1886 in his pioneering investigations of radio waves.

The $\frac{1}{2}$ wave dipole consists of two radiating elements (wires) each a quarter wavelength long. The wavelength of a radio wave is defined as the physical distance between adjacent peaks in the electric field. Wavelength is inversely proportional to frequency, meaning as frequency increased, wavelength decreases. Wavelength can be calculated by dividing the propagation speed of the wave (approx. 300 million m/s) by the frequency in Hz. This can be simplified to $\text{wavelength(m)} = 300/\text{Frequency (MHz)}$. Wireless microphone systems in Australia mostly operate in the UHF TV band allocation in the range 520MHz – 694MHz. The average wavelength for this frequency range works out to 0.495m or approximately 500mm. Thus, a half wave dipole antenna designed for operation over this range would have a length of approximately $500\text{mm}/2 = 250\text{mm}$. By comparison, a VHF system operating on 200MHz would have a wavelength of $300/200 = 1.5\text{m}$ and thus a $\frac{1}{2}$ wave dipole antenna for this frequency would need to be $1.5\text{m}/2 = 750\text{mm}$ long.

Dipole antennas are usually fed in the centre via coaxial cable, per figure-1. However, those designed for wireless microphone applications tend to utilise a coaxial lower radiating element enabling a bottom feed point per figure-2. Commonly referred to as a coaxial dipole, this results in a more convenient form factor for antennas mounted directly to the front or rear of receivers.

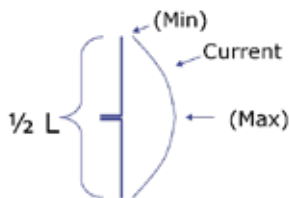


Figure 1

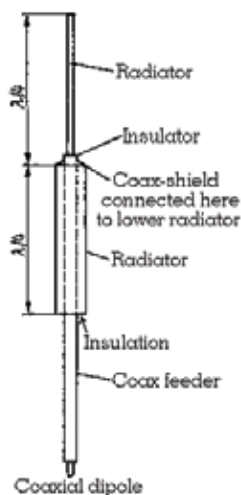


Figure 2

Dipole antennas are referred to as Omnidirectional. Implying they radiate (or receive) equally in all directions. However, this is not strictly true. A $\frac{1}{2}$ wave dipole antenna when operating vertically will exhibit omnidirectional coverage in the horizontal plane (looking down) but will exhibit deep nulls directly above and below the radiators in the vertical plane. Maximum radiation (or sensitivity in receive) is directly on axis to the antenna (see Figure-3). This means the optimal height for dipole antennas is around, or just above head height. Often operators mistakenly assume “higher is better”, however it is possible to position dipole antennas too high such that your desired transmitters become off axis which will impact performance in both transmit or receive applications.

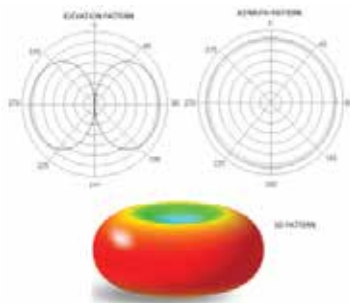


Figure 3

For maximum signal transfer the transmit antenna and receive antenna must be in the same polarisation (physical orientation), i.e. vertical to vertical, or horizontal to horizontal. Worst case scenario is a 90-degree offset which will result in significant signal loss potentially resulting in a complete drop out. Wireless microphone systems in Australia traditionally run in vertical polarisation. This makes good sense as wireless microphone systems share spectrum with TV broadcast services which in all capital cities run in horizontal polarisation. So, by running in opposite polarisation to TV we gain a degree of isolation between the two services.

A close cousin of the half wave dipole antenna is the quarter wave monopole, or “ground plane” antenna. The $\frac{1}{4}$ wave monopole works in a similar manner to the $\frac{1}{2}$ wave dipole however it consists of a single $\frac{1}{4}$ wave radiating element working against a ground plane which acts like the image or 2nd half of the $\frac{1}{2}$ dipole. A ground plane is an area of conductive material at least $\frac{1}{4}$ wave large. Usually the chassis of the receiver, if a metal chassis, or a conductive PCB trace. See figure 4

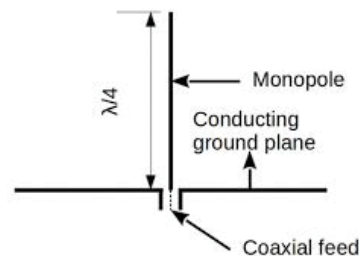


Figure 4

$\frac{1}{4}$ wave mono pole antennas are often referred to as “ground dependant” or “non remote able” as efficiency is significantly compromised if the $\frac{1}{4}$ radiating element is removed from the ground plane. $\frac{1}{4}$ mono pole antennas are generally used on belt pack transmitters and receivers with fixed antennas.



Figure 5
Shure UA8 1/2 wave dipole antenna



Figure 6b
Shure UA700 1/4 wave monopole antenna

We hope you found this article helpful. If you wish to delve deeper into wireless microphone technology and techniques, consider attending one of our in-class Advanced Wireless training seminars. We hold these several times a year in all major capitals. Schedule and booking details available via the Training section on the Jands website here <https://www.jands.com.au/training-and-certification>

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The Politics of Wireless.

by Simon Byrne

Recently I was intrigued to see a post on the Live Sound Engineers Facebook page complaining that a major venue would not free up some wireless frequencies, so as to permit a freelance audio recordist to record a gig in that venue for a podcast.

The implication being that the venue had the right to dictate what frequencies could, and could not be used, and this amounted to restriction of trade because the audio recordist could not confidently do his job because he could not guarantee that his wireless gear would be on clean frequencies.

This is wrong on several levels! No person has any more rights to the class licenced spectrum that we use than anyone else. The restriction of trade allegation is an entirely different matter which I'll get to later.

Wireless microphones in Australia operate under the Radiocommunications (Low Interference Potential Devices) Class Licence 2015 (as varied in 2018).

That means the users or the devices themselves are not licenced, but the category of equipment has an overall licence. Therefore manufacturers design the equipment to meet the specifications of the LIPD class licence such as transmission frequency, effective radiated power, modulation type, and so on. If equipment meets the requirements of the licence, it automatically qualifies for use under the licence.

Users of the LIPD class licenced devices are bound by the rules set out in the licence. As LIPD class users don't have to pay fees to use the spectrum, they operate on a 'no interference' and 'no protection' basis. As you can see, a LIPD class licence is the simplest form of licence which affords users very little rights.

Users must ensure that their devices don't cause interference to other radiocommunications devices in the vicinity. They also have no protection from interference or changes that may affect them. The concept is that they are low power devices and therefore the risk of causing interference to others is also low. Works great, unless you have a lot of devices such as wireless microphones in one venue!

Unless users are specifically licenced (which can be done for major events), ACMA takes a dim view of people claiming that they have exclusive rights to some of the spectrum. That is completely against the goals of a LIPD

class licence. The objective of the licence is to maximise the amount of low power users in an area, with the minimum amount of administration.

Wireless spectrum is an extremely valuable and finite resource. The live event industry is just one small category of user of wireless spectrum (and we are small in the scheme of things), that has extreme and ever increasing demands on it.

By way of comparison, the new 5G cellular phone technologies are forced to operate at extremely high frequencies (about 20 Ghz) because there are no other large amounts of spectrum available. Because of the extremely high frequencies, their wavelengths are extremely short which means they have very poor propagation. This is forcing the phone companies to put in as many as four times as many cells as compared to 4G to get adequate coverage. That would be hideously expensive.

As the use of technology such as drones and autonomous vehicles evolves, increased wireless internet and mobile communications usage will make wireless spectrum even more valuable. More devices are competing for less spectrum. It is right that we are encouraged to manage our use of it in an efficient way and we should not feel hard done by. It is after all, free for us to use.

For background, things are much worse in the United States as they are well established on their second round of spectrum buy-back, this time from the television stations who are getting out of free-to-air television broadcasting. In many markets, this will force US wireless users to once again buy new systems as their frequencies get restacked even more.

As for the restriction of trade claims that prevent outside audiovisual contractors coming into venues, I'm afraid that horse bolted years ago.

If a client signs a room hire contract with a venue that contains a clause stating that they will use the in house provider, or that the venue may place restrictions on outside contractors, it ends there because that is what the client has accepted in writing. That is, the venue

hirer has agreed to the audiovisual supplier restrictions as part of the contract as a whole.

A comparable, but equally poor argument would be hiring a full service venue, but wanting to bring your own food because you can buy it cheaper, rather than purchasing the venue's more expensive offerings. The venue has an agreement in place to say no, so it doesn't fly. This is why on the last ENTECH Roadshow, Julius paid for some outrageously expensive sandwiches!

The venue hire client is entitled to negotiate audiovisual (and sandwich) issues prior to signing the contract (and some clients do), or take their event to another venue where they can use their own audiovisual suppliers on better terms. As much as it displeases the independent audiovisual suppliers, there is no restraint of trade here.

However, should a venue permit external audiovisual suppliers in, it has no rights that are backed by law to dictate what frequencies they can or cannot use under a LIPD class licence. The licence is very clear; all users operate on a 'no interference' and 'no protection' basis and no person has greater rights than any others, and in Australia, a venue cannot contract out common law.

Having said that, it makes sense that the operator of the most wireless devices in a building, the in-house provider, takes responsibility for coordinating the use of the available spectrum within those walls.

In my view, as part of a house frequency allocation plan, venues should allocate a dozen or so spare and permanent frequencies to be available to visiting contractors. When an outside audiovisual supplier comes into the venue, they are simply handed a list of available frequencies. Then both the venue, and the outside provider can be confident that their use of wireless devices will not cause problems for the other party.

I've only ever had one instance where a venue representative has tried to stop me using wireless microphones on the basis of potential frequency conflict. I politely told him that under the law they had no basis to stop their use, and that we needed to work together. I then gave him a list of frequencies that I planned to use and advised him that it would be a great shame if I had to explain to my client that in the event of wireless interference, it was a direct consequence of the venue refusing to work with us to ensure that we do not interfere with each other. Unsurprisingly, a solution was worked out.

Get on people! Available spectrum is going to get tighter and planning will become even more important.

WIRELESS RECORDINGS

by Andy Stewart

The use of wireless microphones in a studio setting seems downright pointless to many of us – never even occurs to others.

It's the realm of live performance, theatre, movies, documentary making, and outdoor sports, is it not? Why would you use a wireless mic in the studio when an artist is typically static, often seated, and commonly 12 feet from the recorder?

The simple answer is, because this is not always the case. Moreover, though a musician might be placed statically in a room, and irrespective of whether they are close to, or far away from, the recorder, they don't always want to be nailed to one spot in front of a large diaphragm condenser! Have you ever asked them?

Some musos, particularly singers, find the conventional arrangement of being stuck in front of a big mic quite stifling and intimidating. Vocalists, more than most, are often quite animated on stage – especially when they're used to wireless mics – and part of their delivery is bound up in this very freedom of movement. For them, the need to stand still in the studio in front of a mic, can seriously cramp their style. Wired headphone systems add a similar level of constriction to their physical performance, and yet most engineers never consider offering vocalists either of these wireless options, or can't.

But even if a muso is sitting slumped over one knee, playing a classical nylon stringed acoustic, it doesn't necessarily follow that the mics – particularly room mics – can't be distant, or placed in strange positions. And although there aren't too many places in a studio where a wireless mic becomes vitally important because a wired mic simply can't be positioned there, it's interesting how liberated you can feel, as an engineer, to roam around a recording space with a wireless mic on a stand, wireless headphones on your head, listening to the placement. This setup allows you to think three-dimensionally, and travel into corners (or even down the hallway) where a wired mic quickly becomes a pain in the butt.

For most engineers, the level of disincentive to place a mic at a far-flung distance, or high on a rafter, grows with every step.

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Their instinctive sub-conscious tells them that it will be too hard because either: the leads won't reach, the doors won't shut, or the mic stands won't telescope that high. "Maybe it would just be easier to put a mic here on that last remaining boom stand," they muse to themselves, as their experimental side is pulled into line by their practical voice. At that moment, the option to discover an über-cool ambient mic placement is lost, replaced instead by a conventional setup.

The desire of an engineer to experiment is hindered by many things: time, bias and preference, a lack of equipment, a fear of the unknown, a fear of looking stupid, laziness etc, but this natural tendency should be fought at every turn. Wireless technology helps fight this battle, encouraging experimentation in some small way, even in a fast paced studio setting. It also forces engineers to think slightly differently, and for the good ones, leads to new, unexplored territory.

Wireless Mic, Wireless Recorder

There are a couple of other wireless options that can work wonders in a studio setting: standalone recorders (like the Zoom H6 etc) and Bluetooth headphone systems (like Audio-Technica's ATH-M50xBT etc).

The first of these – standalone recorders (digital, or even analogue) – have an unexpectedly liberating effect on the recording process, insofar as they can not only be placed in crazy positions when, as is the case with the digital Zoom H6, the whole box and dice is small and light enough to balance on a 2x4 up on an exposed rafter, they also record autonomously. This means that, not only don't they require leads, preamps, or in many cases a stand, they don't even consume recording channels or computational power in your DAW. The downside of this autonomy is that they're essentially freewheeling during the recording session; in much the same way as remote temperature sensors are in the Pacific Ocean. But once the session is over, you can climb up and retrieve them, download the data into your DAW and manually align the files with the various takes, as needed. This is slightly tedious, but well worth the effort.

The only problem with this idea, especially now that half the world's recordings are done in someone's bedroom, is that ambient mics and autonomous recorders are often shite sounding in small domestic environments – but not always. Good ambience can be found in the unlikely places: the hallway, the stairwell, the bathroom, the garage... you just have to go searching. More people are branching out into larger spaces again now too, like halls, churches and factory spaces, and in these settings, freewheeling recorders can produce some awesome, outrageously over-the-top results.



Andy Stewart

Headphones Without Frontiers

For me, this goes to a pet-hate I've endured for decades. Headphone leads... I simple hate them, always have. I trip on them daily, knock drinks off tables with them, tangle them in amongst the knobs on my console, strangle myself with them at the drum kit. They also rattle against the bodies of acoustic guitars during a recording when you least expect them, tear off your head as you walk away from a mic, forgetting they're on, and worst of all, get caught under the wheels of your chair 20 times a day.

If ever there was a need for something wireless in the confines of a studio, it's headphones. Curiously, there's still a level of mistrust out there about the benefits, sound quality and/or reliability of wireless headphone technology, but I think the time for this is fading fast. For example, headphones, like the ubiquitous Audio-Technica ATH M50x – a high-quality studio headphone – have their equivalent Bluetooth version, the M50xBT (imaginatively named). This wireless model sounds very similar to its hard-wired siblings. I have both sets in the studio – the wireless versions for only a short while – but already I'm hooked (or is that not hooked?). One thing's for sure, I'm not getting tangled up nearly as often in things I need to steer clear of in the messy confines of my workplace.

Wireless headphones are fantastically liberating. The only problem with them is that now I can barely bring myself to wear anything with a lead attached, except when I'm doing more critical listening, like mixing, rendering nearly all my headphones redundant!

Wire Less, Trip Over Less

Though sonically it's by no means the most compelling argument, certainly when it comes to the recording studio, there are probably more trip hazards per square foot than in any other audio workplace environment. Between all the mic and headphone cables, instrument, IEC and extension leads, there are probably a hundred trip hazards created in the first hour of your typical recording session setup.

Q.E.D the use of wireless technology in a studio setting is bound to increase in popularity as both time and audio quality progress. Who knows, one day we may find ourselves living in an almost entirely wireless studio environment, where the floor is for stepping on rather than stepping over...

Andy Stewart owns and operates The Mill on Victoria's Bass Coast. He's a highly credentialed producer/engineer who's seen it all in studios for over three decades. He's happy to respond to any pleas for recording or mixing help...
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TIM MINCHIN

by Cat Strom

Photo Credits: Troy Constable

Tim Minchin, internationally renowned award-winning musician, comedian, actor, writer, and composer, returned to the Australian stage with his first national tour since 2012.

Entitled BACK, the tour is billed as “Old Songs, New Songs, F*** You Songs”, hinting at a set list of material from all corners of Minchin’s eclectic repertoire.

Lighting designer Cam McKaige started working with Tim ten years ago on his solo tour entitled Ready for This which was followed by two orchestra tours and several one-off shows. This is Tim’s first live tour in seven years after his success with the musical Matilda and various TV projects.

“It’s been a long time between drinks!” laughed Cam, who clearly enjoys working with Tim. “Tim and I had a meeting in a pub in

South Melbourne about six months ago and his main brief was that he wanted something that looked like you can’t hire it off a shelf. He wanted lighting towers and the stage to be well presented.”

Cam designed a set accordingly with brand new red velvet legs, rear drapes, and 12 columns of assorted heights, all of which is beautifully lit. Initially, the audience sees only Tim at his piano, and it stays this way until the fifth song when the kabuki suddenly drops to reveal the stunning stage set.

“The response is fantastic and we enjoy it immensely!” said Cam. “The band reveal

is such a surprise to the audience, Tim has asked for nothing to be shown on social media until the tour has finished.”

A central video screen runs IMAG during the show, and either side of that are six Roman columns stepping down in size from 4.5 metres to 2 metres. On top of each column is a Claypaky B-EYE K20; Cam is a master at achieving a wide variety of looks out of a B-EYE!

Cam was using 16 Claypaky Unicos for the first time, describing them as perfect for this job. The Unicos were all in the air over the stage, spaced with the 20 ShowPRO Colliders resulting in just strobes and profiles in the air. Res X purchased 20 ShowPRO Collider Strobes for the tour and Cam describes them as amazing, loving the pixel face of them.

“I’m running the Colliders in Graphics mode which is perfect for this tour,” said Cam. “In Perth I used the GLP JDC-1s but I have to say I’m happier with the Colliders; they’re super-bright, super-smooth and you can’t go wrong.



Cam McKaige

It's nice to have a light that can be used in so many different ways; it can be a wash light or a strobe or can deliver a 'graphics' look. They're fun and it's always a bonus when you find a light you enjoy using."

With the Claypaky Unicos, Cam actually specified MAC Vipers but Res X offered him the Unicos and even though Cam wouldn't normally think of shuttering for an onstage light, he accepted their offer.

"I would normally have them on a front truss if I wanted to shutter off something," he added. "Having said that, I've ended up using the shuttering as a look in one of the songs and I'm enjoying doing so. The Unico is super bright, super smooth and I'd be happy to use them again."

The bulk of the colour comes from the front truss with 8 Quantum Wash and five Martin MAC700s as profiles for the band members. Twelve MAC Auras are on the floor uplighting the columns, with 12 Ayrtton MagicBlades also on the floor to uplight the red velvets.

Tim requested that some effects were held



back until the end of the show and so Cam used 20 ShowPRO GoldenEye 77s in an interesting manner.

"Originally I was going to run the GoldenEyes around the piano, on their backs facing straight up," Cam elaborated. "Unfortunately everyone comes to the piano for the acoustic section so that wasn't possible. They're now run along the lip of the stage with five more in front of the drum riser. They are a really bright fixture, in fact last year I used them on a show with the panels facing outwards and I had to run them at 1%!! This way I utilise their brightness by having them shooting up into the gods."

One lonely MAC Viper was specified for the custom gobo of Tim for when the audience are taking their seats. This disappears as soon as he takes to the stage, which is why it's not printed onto the back drop.

Two MDG hazers, one in front of the curtain and one behind provide atmosphere. Some may say that's a little overkill but there are many moments with just one light on Tim and

if the stage isn't filled with smoke, you lose the impact.

This tour was the first time Cam used an MA Lighting grandMA3 fullsize, with a grandMA3 light for backup.

"Again, I actually specified an MA2 but jumped at the opportunity to have an MA3 as I know it is a product I'll be seeing a lot in the future," he said. "It's in MA2 mode but to get a bit of muscle-memory and find out where everything is on a prolonged tour is a no-brainer for me. It's beautiful and feels really comfortable."

Eve Conroy heads up the Res X team with Stephen Valvasori flying in and out for the bump ins/outs.

"From the factory prep to the touring show, I can't speak highly enough of the way Res X delivers their product," commented Cam. "I've never used nine different lighting products in a single show with such confidence."

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Celebrations and Reactions at the Launch of New Qualification.

by Jenny Barrett

CX Magazine attended the launch of the highly anticipated New Zealand Certificate in Performing Arts – Entertainment and Event Technology (Level 4), held appropriately enough in the Auckland Arts Festival Spiegeltent in Aotea Square.

Relief was written all over President of ETNZ Vicki Cooksley's face as she addressed the sixty strong crowd and described the release of this new qualification as "a massive milestone". The journey began some fifteen years ago when a group of senior industry people acknowledged that there was a complete lack of appropriate qualifications. Overseas qualifications were investigated and ruled out as they failed to meet New Zealand's regulatory environment and were too tight in scope. ETNZ and their membership wanted something much wider that would cater for all disciplines from stage management, to lighting, to sound, to rigging.

At that point naively unaware of the amount of work involved, a subcommittee was set up to lead the development of a new suite of qualifications. Their mantra was 'clear, credible and accessible'. This was to be a qualification that people could undertake in the workplace, whether they were working full-time, or as freelancers, casuals or volunteers. The qualification was to include core business skills to support legitimate career pathways. There was not to be any of the pressure of exams and essays, rather the focus was to be on practical, hands on unit standards that could be assessed by industry personnel willing to be trained up as assessors. Vicki describes their vision as, "Wanting to help people achieve something that they never thought they could do." Skills Active were the Industry Training Organisation (ITO) who won over the sub-committee. In the words of Graham Phillips, one of the initiators of the project, "They understood that we didn't want to replicate what happens at Polytechnics, that this was to be entirely different." Together ETNZ and Skills Active began a somewhat arduous journey to develop a practical, cost-effective and formal on-the-job training framework.

Whilst celebrating the launch and the journey to date, Vicki also called for patience as they "continue along this winding path." Much work is still to be done, with a Level 6 Diploma in development and the need now recognised for a Level 5 qualification. Vicki did acknowledge that now they know how to get around and through the NZ Qualification Authority (NZQA), they are in a much stronger place to deliver the next set of qualifications. Even amidst the

air of abject relief and possibly the imminent collapse of the key players, there was still talk of next steps, online courses and the phrase 'the sky's the limit' was even overheard.

As an industry, it is worth acknowledging the sentiments expressed by Linda Dorrington, the Skills Active Industry Advisor who worked alongside Vicki and her team to achieve this qualification, "An awful lot of passionate people made this happen. Without these industry people and the huge amount of industry input, this would never have happened. It is a special day for a very special and specialist group of people who make so many wonderful events possible – the riggers, the lighting people, the stage constructors."

Perspectives on the New Qualifications Framework

Theatre Company Director - Eve Gordon was at the launch as a student on the pilot course and as the multitasking founder, General Manager, Artistic Director, Producer and Performer for the Dust Palace Circus Theatre Company. It makes financial sense for Eve to do her own rigging and she had been searching for a course for close to fifteen years to extend her knowledge. After the new Health & Safety Act came into effect, as a PCBU (Person Conducting a Business or Undertaking) she seriously considered undertaking a course in Australia even though the time commitment would have been arduous. Fortunately, as Chairperson of the Aotearoa NZ Circus Association she learnt of the imminent pilot of the new Level 4 qualification, "I was overjoyed on a personal level and hugely appreciative of all work that had been done. I wanted to contribute in any way I could to the process. Coming from a slightly different sector to others on the pilot course, I felt I might be able to add something."

Eve expects to gain from the course on many levels. She will be better trained, and this will filter down through her business to the freelancers that she works with, to the point that at some time in the future she will only employ qualified personnel, "I think we are generally pretty good as an industry but there is nothing wrong with raising standards to achieve a base level of competency across the board." She will also have more clout when working with event managers and their clients, "People always want more but I will be able to insist that we meet industry standards and use best practice and I can now back that up with evidence." Lastly she fully intends to advocate for the course throughout the circus industry,

"Nobody untrained should be rigging."

And feedback on the course to date, "The Skills Active model is genius, especially for a rigger. It is focused on competencies and I just have to pull together some case studies. Plus I have Andrew Gibson and Vicki Cooksley as assessors. You couldn't get much more experience than that?"

Production Management Company - Andre Goldsmith was one of a few who travelled all the way from Christchurch to the launch to show their support and appreciation for the people who had made this happen. Andre, Managing Director of Hang Up and now a qualified assessor for the course, talked about his interest from a business perspective. In his opinion, the 120 credit qualification is an opportunity for his seasoned staff to have their experience acknowledged not only in New Zealand but overseas. And secondly, it legitimizes professional outfits, and makes it easier for paying customers to separate the cowboys from the genuine article.

School Educator - Richard Wiltshire, Operations Manager at Burnside High School's 700 seat theatre, Aurora Centre, was not at the launch but was frequently referenced when the potential of the new qualifications' framework was discussed. Richard, recently retired from his "other role" of science teacher to focus on the school's community theatre, supports a group of forty students from Year 9 to 13 who are passionate about lighting, sound, front of house and stage construction and management.

One team run the school assemblies and events held in the fully professional theatre, whilst other students have moved on to paid work, operating the sound, lighting and running the front of house for client productions such as local dance and primary schools. Of this group, four Year 13 students are undertaking the Level 3 qualification launched last year. The Level 3 qualification is being funded by the Gateway Programme, a government initiative widely regarded as a means for students to enter the more traditional 'trades' but also applicable to entertainment technology. The students attend a number of weekend courses and spend their Monday afternoons with Richard, as well as working on the theatre's client productions. The course consists of some written tasks but is predominantly evidence-based, with students choosing a task and reflecting on how they did, whilst Richard in his role as assessor observes them and gives them feedback, "It is by nature an introductory



Eve Gordon



Richard Wiltshire



About the Qualification

The Entertainment and Event Technology qualification (Level 4) is designed for working professionals in real-life industry settings. The trainee chooses two out of seven areas of specialty: Entertainment Rigging, Lighting, Live Sound, Video, Stage Management, Stage Mechanics and Scenic Construction. Cost: \$1380 incl GST.

To register for the course, visit the Skills Active website: <https://www.skillsactive.org.nz/our-qualifications/performing-arts/>

Skills Active are an ITO, one of a number of non-profit organisations, funded by government to promote careers and workforce development in our industries, work with those industries to create world-class qualifications, and support workplaces to train staff.

level course but promotes operational safety and an understanding of the workplace and students can choose sound, or lighting, or front of house or even stage management as their focus."

Richard is excited about the possibilities that the Level 4 qualification offers his protégé's, "My students are in a position to be able to do the Level 4 qualification in their own time, with Burnside High as their employer, with myself as an observer and mentor and with a local Level 4 assessor on hand. I need to work on some logistics such as funding, but I hope to be able to offer the course for the

students working in the school's theatre in the near future." A model, which if replicated at schools with similar facilities elsewhere in the country, will hopefully grow the pool of young people who can see a viable and professional career path in the entertainment and event technology industry, and perhaps begin to alleviate the nationwide skills shortage.

And Across the Ditch? Watch this space. Back in the beginning there was no interest from Australia but ETNZ leaders are sensing a change of heart. Rumour has it there may even be some Aussies crossing the ditch to attend the ETNZ conference in July to learn more...




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MIKING & MIXING JAZZ IN A SMALL VENUE - PART TWO

by Greg Simmons

In the previous issue I wrote about miking drums, double bass and piano for mixing jazz in a small venue, and discussed the different perspectives required for mixing jazz compared to pop and rock genres. In this issue I'm continuing the miking advice, and next issue I'll look at soundchecking, monitors and mixing. The advice given here is intended for use in small venues where the off-stage sound is a significant part of what the audience hears, therefore the emphasis is on mics and placements that complement the off-stage sound with maximum GBF (Gain Before Feedback) and minimum fuss.

Miking the organ

The Organ Trio consists of electric organ, drums and electric guitar. It's the only jazz ensemble that does not have a dedicated bass instrument; the bass lines are provided by the organ and, in some cases, are played from a pedal board, which is essentially a huge piano keyboard designed to be played by the organist's feet. Watching a jazz organist with a pedalboard is like watching a Thunderbird puppet on speed – their arms and hands are moving in a seemingly oblivious manner to their legs and feet, while their head is turning around cueing other musicians, checking the charts and acknowledging the audience. It is a truly remarkable demonstration of physical and mental dexterity.

If the bass lines from the organ are balanced properly with the drums and guitar, the results can be exhilarating. How that is done depends on the type of organ. Most contemporary designs and emulations have stereo direct outputs that provide a convenient and clean way of getting the sound into the PA – although the level of the bass lines relative to the rest of the organ's range may not be what you need to balance the bass lines against the drums and guitar, and you may find yourself resorting to some carefully tuned and subtly manipulated LF

shelving to keep it sitting right. Here's a tip based on a recent discussion on this very topic with one of Sydney's top organists: create a bass channel by splitting the DI signal into another channel, roll off all the tops and add a touch of compression. I haven't tried it, but it makes a lot of sense.

Sometimes an organist would bring in the classic combo of a Hammond B3 organ and a Leslie Tone Cabinet (aka 'Leslie') – a highly-revered two-way speaker enclosure with a built-in tube amplifier. The Leslie is to organists what Marshalls are to rock guitarists, and once you hear one you're not going to want the direct sound. The big challenge is doing it justice through the PA. The enclosure is divided into three sections. The amplifiers and drivers are in the middle section, but that's not where the sound comes out; a low frequency driver faces down onto a rotating baffle or rotor in the bottom section, and a HF compression driver faces up into the top section and drives a pair of back-to-back rotating horns. Note that only one of them is actually a horn; the other is a mirror-image dummy to provide balance and prevent wobbling. That bit of knowledge changes everything when it comes to microphone placement.

I always used three mics on the Leslie and was more fussy about where they were rather than what they were. I used any of the standard kick or bass mics on the bottom section of the enclosure to capture the low frequencies, rolling off everything above 1.6kHz or so (the Leslie's crossover point is around 800Hz). I'd pan that centre and found it provided a good way of balancing the energy of the bass lines against everything else. Then I'd place a mic on either side, at the centre of the slots at the top of the cabinet that allow the high frequencies to come out, and pan them hard left and hard right. On a small stage the Leslie is typically jammed in between the organist and the drums so it is prudent to use

cardioids here and make sure the one closest to the drums has its back facing the drums for maximum rejection. I found that condensers in this position picked up too much mechanical noise and spill, and got better results with a pair of Sennheiser 421s set one or two clicks before the M position.

The mic placements I've just described are standards that you'll find at the top of a Google search, but in a small venue where the off-stage sound is a significant part of what the audience hears I sometimes got a more impressive result by moving those top mics towards the enclosure's rear corners. This created a gap in the PA's stereo image that was filled in with the off-stage sound of the horn passing by the front of the cabinet.

If you've got enough channels, take the organ's Direct Out, split it to create the bass channel as mentioned earlier, mic the Leslie, check the polarities and blend it all together. Electric organs through Leslie cabinets are supposed to sound exciting; if yours isn't, fix it.

Rhodes electric piano

There's not much to say about this easy-going and beautiful-sounding keyboard, which is just as well because I've devoted so much space to the electric organ in this issue and the grand piano in the previous issue. It's a simple DI job that comes with a built-in gotcha for the uninitiated: the output jack is marked 'Input' on the early models. Not helpful...

Miking electric guitars

Most jazz guitarists in the smaller ensembles would settle for an SM57 with apathetic resignation, but would spark to life if seeing something less 'rock' going in front of their amp. If I had to mic up a small ensemble that included grand piano, drums and electric guitar, and I only had one SM57, I'd be putting it under the grand piano (as described in the previous issue) and getting something else for the guitar amp. A 421 on M worked well in the



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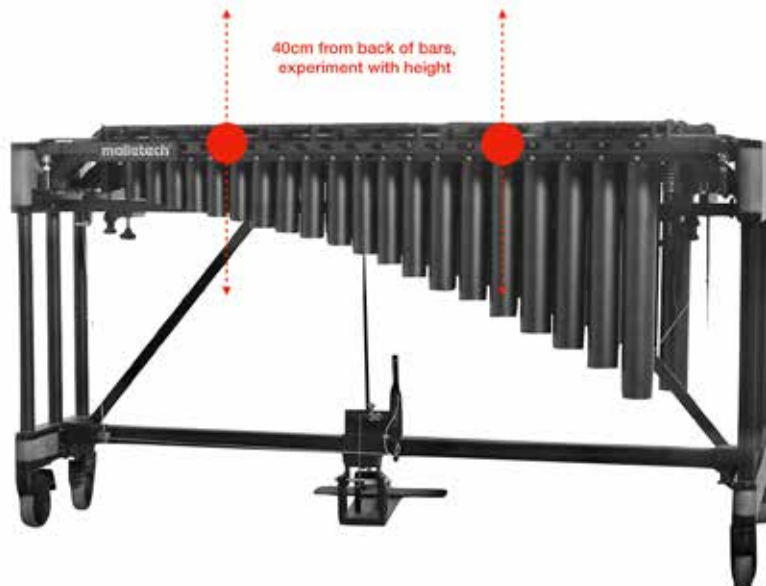
small venue context. Ribbon mics of any type except broken were always worthwhile. Audio-Technica's AT5045 rectangular diaphragm cardioid condenser gets special mention for gigs that involve acoustic and semi-acoustic guitars played through high quality stage amplifiers – place it off centre of the speaker cone, about 20cm back, dip 4k by a couple of dB and don't be surprised if you have guitarists on-stage and in the audience asking what it is, where they can get it and how much it costs. For the Big Band genre I was happy with any microphone that allowed me to keep the guitar audible over the horns and drums without cranking the guitar amp to Metallica. SM57? Shure...



Vibraphone and other mallet percussion

The vibraphone and similar instruments (e.g. marimba, xylophone) consist of a series of tuned bars that are struck with mallets. Resonating tubes beneath the bars provide body and sustain, and sometimes pedals or motors control vibrato. The trick here is getting the right balance between the attack of the mallet and the resonance of the tubes. There are many variables affecting that balance, making it irresponsible to suggest a one-size-fits-all mic placement. Instead, I'm going to describe my strategic 'three step' approach.

I start with a pair of cardioids or hypercardioids, one placed about one quarter of the way in from the left side of the instrument, the other placed about one quarter of the way in from the right side (count the bars, divide by four, you know the rest...). I set up both mics so that they're directly at the back edge of the bars but about 40cm away. This is a starting 'reference' point only. Based on the overall sound I'm getting from this reference position (FOH combined with off-stage) I decide what I need more or less of. Moving upwards (while angling the mics down so they're still facing the back edge of the bars) will provide more attack but less resonance. Moving downwards (again keeping the mics focused on the back edge of the bars) will provide more resonance but less attack. You should find the right placement



within one or two moves from the starting point, hence 'three moves'. Once you get the right location in terms of height, check the balance of notes as the musician plays across the length of the instrument. You may need to tweak the spacing between the mics, the subtended angle between them, and/or their overall distance from the bars to make sure there are no dead notes or hot notes.

I got consistently useful results from this technique in a small venue with a pair of Rode M2 handheld condenser vocal mics, thanks to the M2's tightly-controlled supercardioid polar response and relatively flat frequency response from 100Hz to 8kHz. I bet a pair of BeyerDynamic M160s (hypercardioid ribbons) would also work well. Some engineers prefer miking the vibraphone from underneath but I found that technique captured too much mechanical noise while also being too unfocused for reinforcing jazz in a small venue. One thing you can be certain of: if there's a vibraphone or similar in a small jazz ensemble it's going to be playing solos at some point, so don't treat it as an afterthought. As with piano solos and double bass solos, everyone watches the musician when they can hear it and the sound engineer when they can't.

'Working' the microphone

All the miking suggestions discussed so far in this and the previous issue apply to sound sources that stay in a fixed position relative to the microphone (with the exception of the double bass, which has a limited degree of movement by pivoting around its endpin, as discussed in the previous issue). The remaining instruments are all handheld and allow the musician to 'work' the microphone, which is a truly wonderful thing. Assuming you've got the monitoring right (discussed in the next issue), the musicians will move their instruments around their microphones to get the desired tone, volume and blend between themselves, thereby making your job as an engineer much easier.

Brass and woodwind

Of all the instruments that fall into the brass and woodwind category, the sax family are

the most commonly found in jazz. I never had a sax player complain about using an SM58 but had many say "Please, not a 57!" Somewhere between 57 and 58 is a line that saxophonists don't want to cross!



Most jazz saxophonists are very familiar with the SM58 and know how to work it. That ultimately translates to a better overall end result with less work on the engineering side in terms of tone and feedback rejection. Place it on a typical boom stand, about 20cm above the bell and looking down into it, but don't fuss too much about setting it up beyond that point because almost every jazz saxophonist I've ever worked with will tweak the microphone placement during soundcheck and sometimes during the gig, fine-tuning it to suit their playing style, their placement on stage, what they're hearing, and how they like to 'work' the microphone to get the desired tones. Be sure to give them traditional boom stands that are in good working order and don't require pliers or gaff – unless you want some embarrassing stage moments. If you're not comfortable with the idea of a musician adjusting the stand and positioning the mic as they prefer it, don't mix jazz.

In the small venue I never needed more than one microphone on saxes, except the soprano. Place an SM58 on a small stand facing directly into the bell from about 30cm away, and another perpendicular to the body of the instrument and about 30cm above its centre. Soprano sax players tend to sway



around like snake charmers so you'll need to keep both of those mics at a reasonable distance to maintain a consistent capture – hence the 30cm recommendation. Once you get the FOH and monitors sorted, the player will do the rest of the work for you, moving the mics or adjusting their playing position to make it work.

Trombone and trumpet players were always easy to please, being happy to use just about anything as long as it was on a tall stand directly in front of them. (Note that experienced trumpet players are familiar with the SM57 and, unlike saxophonists, don't mind it at all.) The sound from these instruments comes almost entirely from the bell, and the players tend to work the mic using subtle shifts in distance and moving the bell on- and off-axis to the mic – as long as the mic is directly in front of them, they'll make it work for you. Trombonists are particularly good at this, knowing that aiming their instrument directly at the microphone is precisely the wrong thing to do when they want to let out one of those unique 'blat' sounds that only the trombone can do. For moments like that, they'll always turn themselves off-axis so that the mic is looking at the edge of the bell rather than down

the throat... unless you upset them during soundcheck, in which case it's probably payback. Trust me, one of the last things you ever want coming through the PA in a small venue is an on-axis trombone 'blat'.

There are a few other woodwind instruments that show up in jazz from time to time, in particular the transverse flutes and the clarinets. The transverse flute can usually be miked just like a vocalist; set up an SM58 on a tall stand, sort out the foldback and the musician will take care of the rest. Most tend to get the mouthpiece right up close on the mic, some will ask for a foam pop filter and others will need it but won't want it.

Clarinets are difficult to amplify on a small stage at the best of times and often require two microphones as per the soprano sax approach mentioned above – although you might need more sensitive and flatter mics than the SM58s mentioned there, and that's likely to invite feedback. The bass clarinet is a gorgeous sounding instrument that is very difficult to amplify when

sharing the stage with drums. Regular players of these subtle instruments have solved the miking problem by bringing their own clip-on microphones or pickups designed specifically for their particular instrument, and they're definitely worth considering. DPA's 4099 is becoming very popular for these applications; it's a supercardioid, but you'll still need to be careful in terms of stage placement to avoid feedback when used on very mellow instruments. The benefit of the clip-on is that the instrument is always 'on mic'. If a brass or woodwind player shows up with their own microphone or pick-up system, be sure to try it first of all. If they're used to being permanently on mic, it's a safe bet that's become part of their playing style.

Next issue: soundcheck, monitors and mixing...



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GRANDMA2 THAT BLANK SCREEN

by Alex Hughes

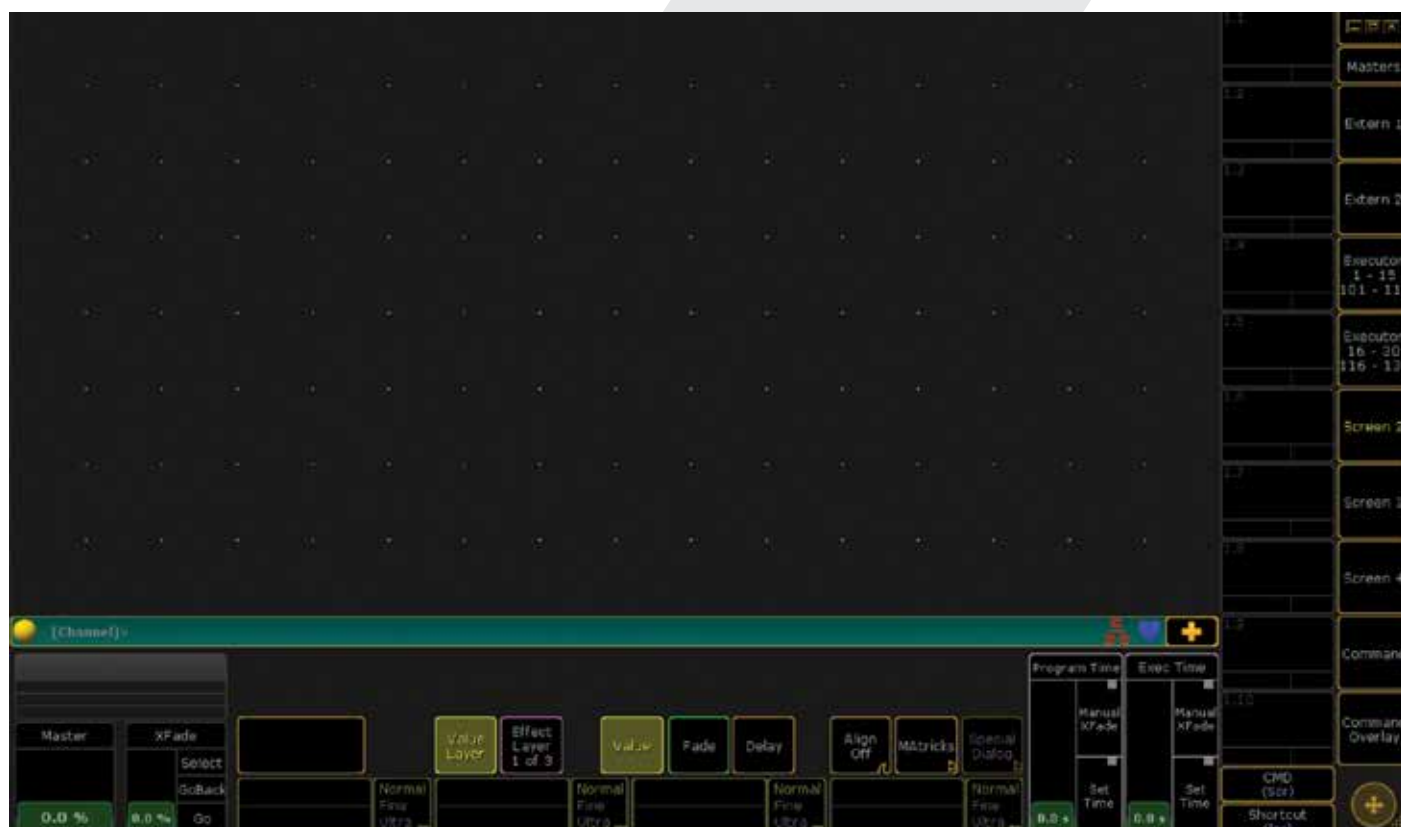
Malcolm Gladwell once said “Success is not a random act. It arises out of a predictable and powerful set of circumstances and opportunities.” That is especially true when we discuss the rapid mental transition required when going from a basic digital lighting control system to something like a grandMA or other digital lighting system.

When you first turn on an MA you are greeted with a screen that looks like this:

A blank page can be just as daunting, or even more daunting as a page with too much on

it. This is especially true when you first start with MA. You can quickly find yourself with that feeling of being in over your head. The next step is normally to reach out to someone and ask what to put where. The answer will normally be a variety of “Well, what do you want on there?” or a simple “Oh, do it like this,” without any explanation.

This article sets out to showcase the two basic ways to layout this page and to get the most from it. In time you will find your own way of laying out a console and the reasons for that layout. Let’s begin with the first question you ask when you are setting up a page for another person to busk on.



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How does your brain work?

This seems like an odd question to ask but some people like things arranged in a vertical fashion and others prefer horizontal. Here are two examples of the same information represented in two entirely different ways.



The horizontal method



The vertical method

Both views here show you the same information in the same space (15 boxes of information) and are both valid ways of displaying and interacting with the information. It all depends on your personal preference. In both examples we see a variety of the basic programming we need to reference to program a show effectively and with enough space to store and view a

fair amount of programming data without it becoming too confusing.

Many people adopt the vertical method (including the author of this article) as that was the way they first interacted with the console. It also seems to make sense to operate left to right as you do when you are reading a book. A simple process of selecting the fixture, the brightness then position

is made easy with this system with some also preferring to put the dimmer preset pool furthest away so that output is the last thing to happen. Many theatre and even live programmers omit the dimmer preset pool entirely depending on how they are programming a show.

The same methodology can be applied to the horizontal layout where instead of having to dedicate two lines of screen space we can achieve the same with one line due to the fact on an MA2 screen the surface is laid out 8 elements high and 15 wide. In the same way we did with the vertical method we can work top to bottom depending on what suits the user.

Colour doesn't have to stop at the stage.

In both examples we can see that each preset box type (position, gobo, etc) has a different colour around it. Now by default all of these colours default to the same drab grey and it is a simple manual process to go into each preset type and pick whatever colour suits your mood or thinking.

Again, due to the endless options, the colouring is entirely up to personal choice and there are thousands of ways to colour these presets. There is certainly plenty of room for experimentation. Some well-known programmers will use similar colours for similar preset types such as grouping gobo, focus and beam into green shades as mentally they associate them together. Others find it easier to try to match colours with ones that match other programming systems that they are used to.

The colouring of information, while not vital, can certainly help you speed up your muscle memory when working with any console, and the faster you can locate and output the required information, the better programmer you will become.

Systems like the grandMA are infinitely powerful in terms of their customisation and way of displaying information. For some, getting over that first initial setup challenge can derail people for hours to the point that many give up before they have even really started. In the end what your desk looks like is not important. No-one judges you or pays you for your desk layout; it is all and always will be about what is on stage.

In an upcoming Lighting Nerds podcast we will be discussing this topic in-depth from both a grandMA and a general perspective - lightingnerds.com

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FAT FREDDY'S DROP

by Cat Strom

Photo Credits: Troy Constable

From humble beginnings as a 'jam band' in Wellington in the late 90s, the award-winning seven-piece Fat Freddy's Drop is now internationally regarded as one of the world's finest live acts.

Fat Freddy's Drop, the New Zealand seven-piece band from Wellington, has an infectious musical style that has been characterised as a combination of dub, reggae, soul, jazz, rhythm and blues, and techno.

The group regularly tours Europe and whenever they do, lighting designer Johnny Bamford is released from the shackles of being Phaseshift's Production Manager to enjoy life on the road.

"It comes with some very strong conditions though!" laughed Johnny. "I'm still on email everyday doing quotes in between sound checking and show time. There's no sightseeing on our days off either."

The main set element is the unusual backdrop painted by New Zealand artist Otis Chamberlain using UV reactive paint.

"Originally we talked about using LED and animations but it soon became apparent that would not be practical for all the shows that we are doing and definitely was not cost effective," explained Johnny. "Once we decided to use UV reactive paints we approached Rockdrops in the UK to manufacture it and they also custom made

the circular frame it's mounted on. They were really good; when we had some issues with the Velcro, they made a whole new backdrop and delivered it to us on the European tour. We'll be using them again for the November tour."

Johnny had one Martin MAC Viper on the front truss dedicated to highlighting the artwork as well as some UV LED PARs. When he lights the artwork with various colours from the MAC Viper, different parts of the image disappear or standout.

"It can be quite two dimensional but when you hit it with UV, it takes on a three dimensional appearance," added Johnny. "It's really been fun to play with and having it circular on a frame, meant it was good for the smaller venues where we didn't have the trim height as it could actually sit on the floor."

The colours on the backdrop strongly influenced the lighting colours chosen by Johnny, changing the look of the show lighting wise. Green definitely didn't work with it and had to be stripped from songs already programmed, but pink, blue, magenta and dark lavender were ideal.

The rig (obviously supplied by Phaseshift) had 19 Martin MAC Viper Profiles, 22 MAC Aura XBs, 12 Claypaky B-EYE K10s, six MAC700 Washes, 11 GLP JDC1s, 25 Duets, eight 4-liters and nine ETC Source IV Profiles.

"I do like the tungsten glow and the band get very involved with the crowd with lots of call and response sections so it's good to be able to light them up," remarked Johnny.

Three was the magic number for Johnny on this tour with the back truss housing six Vipers and six Aura XBs, as did the mid truss, mounted in alternating groups of three. The front truss held MAC Aura XB, the Source IV Profiles and 4-liters. Two groups of three MAC Vipers sat upstage on their cases making them easy to be wheeled on and off stage for festivals. The ladders and side wash are also in groups of three.

Eleven JDC1s were spread across the mid and the rear truss for strobing and colour washing the stage without a beam.

"To be able to point them straight out over the crowd and then point them straight down on the stage created some good looks," said Johnny. "I find the JDC1s have a much better dimming curve than other LED strobes and they're really reliable."

Whilst touring through Europe and elsewhere, Johnny was very adaptable when it came to fixtures saying there was no point in being too precious about particular fixtures on this gig. As long as he had an MA console, he could make a show out of it!



Cam Elias



Johnny Bamford



Ron Kessels



"I prefer an MA2 fullsize but I can do the show on an MA2 light with a 12-channel analogue console to plug into it for my profile faders," he said. "Nearly the whole two hour show is busked because the band tend to turn a song that may be five minutes long on the record into 25 minutes long for the show. The next night it may be eight minutes, you never know! I have only three songs that are cued in the whole show because they don't change from night to night."

Cam Elias was at front of house for the Australian shows, except for the last show in Perth, and although he is not the band's usual FOH engineer, he often steps in and has done many shows with them, recently including two European tours - one at each end of the multicore.

For most of the tour, a full control package was supplied by Eighth Day Sound who also supplied a PA system for the Eaton Hill's outdoor show in Queensland. VJam supplied the gear in Tasmania whilst the Sydney and Melbourne shows utilised in-house PAs from JPU Audio.

"As their usual FOH guy Richard McMenamin was due to do the last show in Perth, we more or less kept his FOH control spec to maintain consistency from the various providers," said Cam. "The spec used to have a Midas Pro series out front, but Rich has been running DiGiCo SD5 or SD10, with a Waves Server for a bit over a year now. The only thing I added was a FATSO Jr. as a buss compressor."

Cam noted that the Waves provided the Abbey

Road Plates and H-Reverbs which worked well for this show, but otherwise he tried to keep it as simple as possible.

Cam says although the show has its challenges, it is always very enjoyable. He describes it as 'fluid', and given the show is rarely the same two nights in a row, allows him to "approach it open mindedly and intuitively".

"You're never too sure how a song is going to turn out!" he laughed. "Since their roots, their music has been formed from jamming and doing dubs live on stage, so that element is always a possibility in their shows. Sometimes you're anticipating something to happen and it doesn't, whilst at other times new things evolve. I really enjoy mixing Fat Freddy's Drop as it lends itself to a lot of creative freedom. I think most people find it hard to even put them into a genre."

They have used Royer ribbon mics on the brass section for many years which according to Cam have really stood the test of time and work well in monitors and out front.

Mixing monitors on his console of choice, a Midas PRO2, was Ron Kessels who has been with the band for many years.

"The last big NZ tour we had a Midas PROX as we were running lots of different support acts so we needed a console that could handle a lot more inputs and outputs," said Ron. "We have tried other consoles, and even used a DiGiCo SD11 on one of our European tours, but we just can't get the same tone that we can get from the PRO series. We always come

back to the nice, warm sound of the Midas."

With a mixture of wedges and IEMs and so many people onstage, Ron's job can be challenging but using the same console and hopefully the same wedges, really helps.

"It is tricky in a sense but we do have it all sussed and the guys are really good at telling me what they want," he added. "The d&b M4 wedges are perfect, the 15" drive really works with this band as does their low end."

For IEMs, Ron and Dallas uses Ultimate Ears and the brass section use a generic brand but will be switching to Ultimate for the next tour.

As lead singer Dallas can hear latency very well, Ron implemented a complete analogue vocal chain.

"Any latency that comes through the digital console really affects him," said Ron. "So now his feed comes out of his wireless mic into an Avalon and is Y-split into an XL42, meanwhile I send another mix from my PRO2 into the XL42 and the output of that goes straight into his ear mix. It's been really beneficial for all of us."

With seven, sometimes eight people on stage to keep track of, Ron always has to be extra observant.

"I have only one scene, which keeps progressing, as the guys improvise a lot there are no sudden set changes and all the songs glue into each other so there's not any point to me creating multiple scenes. That's why I've got some really good glasses!"

Dave Jackson is the CEO of Creative Productions, one of Australia's leading concert production providers. With offices in Brisbane and Sydney, Creative Productions have worked with the most recognised names in the business, from worldwide touring artists such as Metallica, Bullet for my Valentine, Paramore, Alice in Chains, The Wombats, and Marilyn Manson, to major corporate clients that include Michael Hill, MTV, McLaren, Rolls Royce, Aston Martin, and Volvo.

AYRTON MISTRALS

by Dave Jackson



Creative Productions were looking to replace some aging discharge fixtures that we had. We have a lot of Robe BMFL Spots and GLP GT-1s in stock, so we wanted something that was smaller and lightweight; something we could use for day-to-day gigs in some of the smaller venues we work in, where we're weight-limited in terms of rigging. A small, bright, and light LED spot was what we were looking for.

We were fairly intense with our testing and product shoot-outs when we did our research. We evaluated multiple fixtures over five days, looking at most of the contenders in the brands that we already own and use, plus other market leaders.

When we first took delivery of the Ayrton Mistrals, I took them straight out on tour with The Wombats. We had a few festival shows where The Wombats rig became the festival rig. We had a lot of different LDs come through on the festivals and ask "What are these fixtures?" because they punched straight through the huge LED screen upstage.

We encouraged a few of our clients to give them a try. Colourblind is now one of the biggest users. The Ayrton Mistrals are half the size and weight of the spot fixtures they were

typically using, with only around 15% less output. Once we started giving them Ayrton Mistrals they fell in love with them. Now they incorporate Mistrals into their designs and riders. The LDs that typically hire our gear weren't asking for Ayrton Mistrals specifically, but they are now. We haven't had a negative response from any of our clients; everybody that's used the Ayrton Mistrals has been impressed. We originally bought the Ayrton Mistrals for Rock'n'Roll and EDM touring, but we're using them a lot on corporate events now too.

Rigging

There are a number of venues our equipment regularly goes into that can be difficult in terms of weight limits in their rigging; the Hordern, the Enmore, the Tivoli, Max Watts, and the Triffid all spring to mind. It's hard to take in bigger spots.

In hotel ballrooms, we've always got low ceilings to deal with. The rigging in those spaces is limited, so the Ayrton Mistrals are perfect for sitting up nice and high in the roof. You can generally hang them off of house bars and other rigging where you're limited to around 30 kilos, so you can get a couple of them up there before there's a problem.

CRI

In terms of choosing between the Mistral TC and S models, the higher CRI of the TC was not important to us, nor was its framing system. We just wanted a good high output spot. In terms of the trade-off between CRI and brightness in the 'S' versus the 'TC' model, we haven't suffered at all. I've got good friends in the USA who use the S model for television with no issues.

Colour

The colour mix is pretty good - the colours are very saturated as well. About the only thing I don't like is that because the LED source produces such a flat field, if you're focusing in at short distances you can sometimes pick up the gradients of the colour flags coming in and out. Thankfully, it's a very rare occurrence when that is actually visible.

Movement and Optics

The Mistrals are extremely smooth in their movement, and the accuracy is fantastic. They are fairly quick, which is great for EDM shows, as they always need a fixture that's quick and bright. Even zoomed right out to the full 53 degrees, the optics are good and the intensity is still there.



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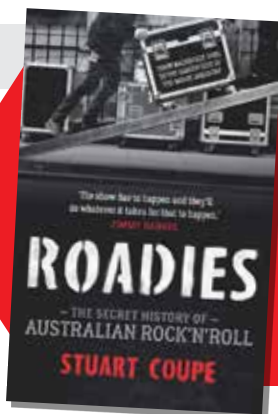
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Effects

The animation wheel is great, and the prism's fantastic. The 'sparkle effect' is created by the ability to adjust the intensity of each of the three or four LEDs that make up each engine individually; you can get them to do traces. It's a cool little feature, which is now available on a few fixtures.

Manual Handling

At 18 kilograms, we pack four Ayrton Mistral S in a roadcase, and we're saving space in the trucks. If you want to, you can actually pick up two of them at a time. Larger fixtures like Martin MAC Vipers and Robe BMFLs are two person lifts, so with work safety policies it's a better option for us that one person can deal with lifting these lights.

Gobos

We've done some corporate events with custom gobos fitted. The quality of the optics

ensures that gobo projection is crisp, so the clients are always happy. Normally with discharge lamps you have a hot spot that you can see in custom gobos, which is not great for a client. With the Ayrton Mistrals, the gobos are always flat and crisp.

The standard gobo set they ship with is fantastic; Ayrton have put together a clever selection. You get a lot of aerial effects, and they have a cone gobo that is incredible. If you point it directly into the audience and get someone in the centre of it, they're in darkness but you can see the cone of light all the way around, so it's just like they're standing inside a tube. It's so flat that you think they're actually standing inside a laser. That's very hard to achieve with discharge fixtures. Back in the day, the cone was a common gobo, before the manufacturers moved on to fancy foliage gobos and such. But Ayrton have gone back to basics, which I think is fantastic, especially for some of us older LDs!

Conclusion

It's very hard to fault the Ayrton Mistral S. We've had them for six months now, working solidly without many days off, and we haven't had a single issue. The service and support from Show Technology is fantastic, even though we've never had an issue with the Ayrton Mistrals. We run a strict maintenance regime, so that reduces the likelihood we'll have any problems, touch wood!

Brand: Ayrton

Model: Mistral S

Product Info: www.ayrton.eu

Australia: www.showtech.com.au

New Zealand: www.showtech.com.au/homenz

Ayrton Mistral-S – The Specs

- Beam aperture: 6.7° to 53°
- Light source: 26,000 lumens 8000 K white light engine
- Total luminaire output: up to 18,000 lumens
- Colour temperature output: 6500 K
- CRI: greater than 70
- Rated life (L70): up to 40,000 hours
- Moving head range: 540° (pan), 270° (tilt)
- CMY colour mixing, variable CTO colour

temperature correction, fixed colour wheel with seven saturated colour filters

- Indexable rotating gobo wheel with 7 high precision glass gobos plus open position, fixed gobo wheel with 9 high precision glass gobos plus open position
- Fast iris diaphragm with adjustable dynamic effects. Iris range : 15 to 100% open
- Light frost filter (Heavy frost filter in option)
- Focusable graphic animation effect-wheel with continuous rotation in both directions
- 5-facet circular indexable rotating prism

- Sparkle effect: dynamic animation effect with speed and fade adjustment
- Integrated wireless CRMX TiMo RDM receiver from LumenRadio
- XLR 5 pin male and female connectors for DMX connection
- powerCON TRUE1 male and female connectors for power connection
- Dimensions: 365 x 591 x 212 mm (l x h x d). Weight - 18.9 kg

Nikita Miltiadou is a studio and live sound engineer based in Melbourne. Currently working out of the Aviary Recording Studio and Creative hub, his live/studio clients list includes Tash Sultana, Client Liaison, Crooked Colours, Hayden James, Running Touch, Holy Holy, Ash Grunwald, and No Mono, among others.

UNIVERSAL AUDIO UAD-2 LIVE RACK

by Nikita Miltiadou

I come from a studio engineering background, and UAD products are all through my work; I use them for processing, A/D D/A conversion, and I/O. It was a natural progression for me to apply the same processing for artists I've recorded in the studio to their live performances. Using UAD processing live creates a studio quality result. In a studio, with small speakers, there is a real art to getting the right kind of impact. It's easier to create impact live because PAs are big, the subs are there, and the stage is so wide. Now that these sonic tools are crossing over, studio tools are having a huge effect in live production. It's been amazing to realise just what's possible when you push that already large, tall, and wide soundscape even further.

Live, I've always used Waves plug-ins, and I've always felt built-in effects have been lacking on digital consoles. Honestly, even Waves plug-ins don't quite cut it for me effects wise. My first live use of external UAD plug-ins was via LiveProfessor, a plug-in host for Win and Mac, which I ran with a UAD-2 Satellite DSP Accelerator and used for a couple of effects.

The Set-Up

In designing my ideal touring rig, I wanted something with as close to zero latency as possible. It was a no-brainer to adopt the UAD-2 Live Rack, as I rely on UAD effects in the studio. I'm now touring a DiGiCo SD11 and the UAD-2 Live Rack, which is hosted

on a rack-mounted Mac Mini, with control via Thunderbolt. I take the MADI out from the Live Rack into a Sonible ml:mio which converts optical into coaxial MADI. The coax goes into the DiGiCo. I have 16 channels of UAD-2 Live Rack processing, which is expandable up to 64 channels if you daisy-chain Live Racks.

My live rig is constantly evolving. It has to be rack mountable and flyable. It took a while for me to settle on a set-up and get that stable. I'm big on touch control and integration with analogue gear. At the moment, I'm running two screens with touch support, one controlling Waves, and one for the Mac Mini running the UAD-2 Live Rack. It's a great workflow – I just power everything up and I'm immediately touching and interacting with settings. My set-up is always evolving; it's an application I enjoy perfecting, and at the moment it's doing exactly what I want it to.

For effects, I set up sends and returns via aux busses back into stereo or mono channels, and I run insert effects on both individual channels and busses. For some acts I'm using the Waves LV1 mixing system via DiGiCo hardware, giving me native Waves control, with insert points wherever I want them for the UAD software. Other acts I'm using the DiGiCo for control and summing, while the Waves software is used for EQ and surgical adjustments. UAD plug-ins are used to create sonic 'character' processing – on vocals, anything synth based, and over playback tracks and master. UAD plug-ins give the signal a lot of harmonic information, and they handle dynamics in digital audio in an acceptable way – they just feel right and with me having to do less.



The Plug-Ins

I find the Neve 1073 Preamp & EQ Collection and Neve 88RS Channel Strip Collection really nice for EQ; they're subtle and even very small changes have a big impact. I use the Neve 33609 Compressor not even compressing, just inserted on the master buss, in conjunction with the Pultec Passive EQ. Those two plug-ins just inserted without doing much have a huge sonic impact. It's hard to put into words, but the result is just 'better', and if you look at the results in Smaart, there's more harmonic information and harmonic excitement in the upper midrange. With the EQs, I'm not doing drastic cuts. When using the DiGiCo channel EQ, I find if I have a problem, I'm cutting and cutting, and before I know it, there's an 8dB reduction. With UAD plug-ins, changes of just 1 or 2dB have a big effect.

My go-to compressor is the UA 1176 Bluestripe Edition and AE Edition. They're absolutely magic on vocals. I also use the Shadow Hills Master Compressor, often not on master buss, but on kick, snare, and bass guitar. I use the SSL Channel, API Channel

and the Manley Massive Passive for EQs. For reverbs, I like the AKG BX20 spring reverb and EMT 140 plate reverb. The Lexicon 224 Digital Reverb and AMS RMX16 are probably my favourite plug-ins from UAD – both sound incredible.

Comparisons

When it comes to the question of UAD versus Waves, it's down purely to sonics. Waves has been in the market longer, the integration is tight and the support is there, but the big point of difference is just that UAD sounds a lot better. The UAD control interface is built specifically for touch, with its cascade plugin view and functions all built specifically for touch interface. Waves lacks that in its MultiRack support. The user interface of UAD-2 Live Rack 2 is superior, and it sounds better.

Improvements

The UAD-2 Live Rack doesn't have a coaxial MADI output, which makes it harder to integrate into some setups. I'd like to see it natively support more than 16 channels

without having to cascade more boxes. I think it's limiting that you get 16 channels for \$7,000 and having to cascade Live Racks to get more channels gets expensive. Regardless of that, the sonic integrity is worth it. I'm all about compact touring, which is why I have the DiGiCo SD11 and LV1 builds, especially for international tours. If I could run more than 16 channels of UAD affordably and in less space, I'd completely replace my Waves processing and invest in more UAD plug-ins. I can't do that and keep it compact in my touring rig at the moment.

Support

Australian UAD distributor CMI have been great through purchase, and the support is always there. They're a great team. I've had no issues with the UAD-2 Live Rack, and nothing's gone wrong, which is reassuring when you're on tour.

Brand: UAD

Model: UAD-2 Live Rack

Product Info: www.uaudio.com

Australia: www.cmi.com.au

New Zealand: www.rockshop.co.nz

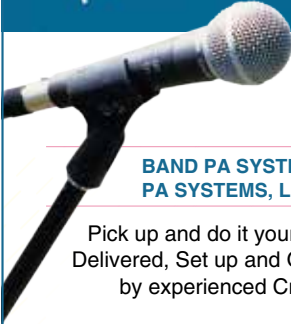
UAD-2 Live Rack – the Specs

- 16-channel MADI effects processor for live mixing w/ Realtime UAD QUAD Core Processing and UAD plug-ins
- Process with acclaimed UAD Powered Plug-Ins while mixing live sound — including no latency pitch correction with Antares Auto-Tune Realtime

- Includes a suite of UAD plug-ins including Antares Auto-Tune Realtime, Teletronix LA-2A and 1176 compressors, Pultec EQs, and more
- Allows use of any licensed UAD plug-in(s) in users' UAD accounts
- Combine 4 units for up to 64 channels of Optical MADI signal processing

- Store configuration Snapshot files for easy recall of all show settings
- Load Snapshot configurations via MIDI or Soundcraft Vi CUE function
- Connects to Soundcraft Vi consoles via Ethernet for Snapshot CUE control
- Thunderbolt 3 connectivity for Macs (for plug-in control only)

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¹Passion, Pride, Pitfalls Dec 2014

www.entertainmentassist.org.au

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Gary Eastwood is a Melbourne based musician. He has spent the past 15 years mastering his craft in pubs and clubs in Australia and overseas. After recording a successful album in 1998 accompanied by video clips, TV, and radio performances, Gary has established himself as a highly sought after corporate entertainer.

DBTECHNOLOGIES OPERA UNICA 12

Gary Eastwood

As a gigging musician-about-town, I play at lot of venues in Melbourne, including residencies; one of which I've played every Sunday night for 19 years. I mix myself on my smaller solo gigs, and employ a sound technician to mix the gigs where I play with a band. In the rooms I'm familiar with, I've worked out the EQ, settings, and a basic mix I can run myself. When I'm playing with a three or four piece, the engineer handles everything.

My solo shows are a simple set-up with no outboard. The Opera Unica 12s have their own processing on-board, and are flat enough that they don't really feedback, except in terrible acoustics like glass-walled rooms. I run a basic 12 channel analogue desk that has three band parametric EQ with sweepable mid on the channels. It has Lexicon effects built-in, but other than that, there's no other processing. I use a couple of different vocal mics, a guitar, and a stomptbox

for kick drum. I've always found that if you use a good mic, a good guitar with good pickups, and do a good mix, you'll get the best out of the speakers.

Comparison and Performance

When I was researching for purchase, I was lent some Opera Unica 12s to do some comparisons against other speakers, and I felt the throw, clarity, feedback rejection, and low weight made them a very attractive

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proposition; almost a no brainer. Ultimately, I chose the Opera Unica 12s because of their price, size, weight, and performance. Compared to other brands of powered 12s, I found that they're close in performance to those that are double in price. That's value for money.

I've owned a lot of speakers over the years. With most of them, I've had to boost or cut frequencies, and when you change things, that's when things start to sound unnatural. I run the Opera Unica 12s flat and they sound great with no tweaking. I switch them on and I don't have to EQ, except in highly reverberant rooms with a lot of reflections, where I might take some bottom end out. I've found I don't need any outboard compression or GEQ.

I now own four Opera Unica 12s, and I run two a side in the bigger rooms, which is more than ample. On smaller events, like the pub I play on a Sunday, I can use one, and it cuts it even with around 500 people there. I've found the Opera Unica 12s sound good both at low volume and pumped up. When I use them with my dBTechnologies SUB 18H, the throw distance and level is surprising for boxes of their size. The Unica 12s have a wedge profile, and I've used them as foldback. The 12" driver gives them enough power to get a vocal to really cut through. They're very robust.

Sound

To my ears, the Opera Unica 12s sound "alive". Their response is not honky or bassy, and voice and guitar just come to life. They enhance vocals and you get all of the range and tone – they don't camouflage anything. Their response is like pressing the 'Loudness' button on a home stereo; everything boosts and comes forward. They're not 'bright' per se, more alive without being unrealistic.

Weight and Handling

At 15kg, the Opera Unica 12s weigh less than most of their more expensive competitors and deliver the same quality sound. There are two handles, one of the top and one on side, and it doesn't bother me there aren't two side handles. They're easy to manoeuvre, and anyone can put one on a speaker stand with no problem, even at height. They're easy on the body, especially when you're solo and doing production yourself. While light, they're still extremely robust; however they engineer the componentry and the cabinet to be both light and powerful, they're doing a good job. They're a workhorse of a speaker.

Reliability

I've never had a problem with a dBTechnologies speaker, not even a blown fuse. I drive them hard and get the maximum out of them, and I've still never blown a tweeter or a cone. They are definitely solidly manufactured. Support from the distributor, NAS, is great, and I've never had any dramas.

Conclusions

I've noticed that dBTechnologies isn't as well known in the market as some other brands. When I bring them to use on gigs where I'm employing an engineer, sound techs tend to ask "What are these boxes?" After they've used them, they're usually impressed, and some say they're going to buy some for their own systems. I've had mates who have bought them after hearing my rig, too.

It's all about the price and performance. dBTechnologies products are getting noticed, and I think people need to hear them. If you lined the Opera Unica 12s up in a blindfolded listening test against the competition, I believe most engineers would put them near the top. dBTechnologies develop their products, and they're getting better all the time. They're comparable to all major brands, and they're definitely in the top-tier category.

Brand: dBTechnologies

Model: Opera Unica 12

Product Info: www.dbtechnologies.com

Australia: nas.solutions

New Zealand: directimports.co.nz



Opera Unica 12 – The Specs

- | | | |
|---|--|-----------------------------|
| • Speaker Type: 2-Way Active Speaker | • Vertical Directivity: 85° (+ 25°/-60°) | • Housing: Polyporpylene PP |
| • Usable Bandwidth [-10dB] 67 – 20,000 Hz | • RMS Power: 900 W | • Width: 350 mm |
| • Frequency Response [- 6dB] 73 – 20,000 Hz | • Peak Power: 1800 W | • Height: 642 mm |
| • Max SPL: 132 dB | • Crossover Frequency: 1600 Hz | • Depth: 349 mm |
| • Horizontal Directivity: 100° (85° up/120° down) | • Limiter: Peak, RMS, Thermal | • Weight: 15 kg |

MOVING THE WALL OF VINYL

by Duncan Fry

They say that vinyl (as in records, not wet-look trousers) is making a comeback. As I look at my wall of 12" LPs I realise that for a lot of us it never went away!

The reason I was looking at the wall of records was that it had to be moved about a metre to make more room for my 'studio-in-a-corner'. Moving it is not an easy job when it's full of at least 200 of my musical memories in one of those IKEA room dividers. There are four rows of four sections, with about 50 albums to a section. The top two rows are all 12" LPs, the bottom two rows are filled with cardboard boxes of 7" singles and other stuff - desk tape cassettes mainly.

And the truth is that all of it has to be taken out before the thing can be moved. I know this for a fact because when I shifted out of my old apartment I tried to move it without emptying it, with the help of some friends. As I would have it we managed to shift it about 12" (poetic justice?) before the end corner dug into the floorboards and the whole thing collapsed like a house of cards! Or, to be more accurate, a house of vinyl! Ah, a little joke there. When the wood dust had settled I bought myself a new one at IKEA, and glued and screwed the old one together. I then sold it online for more money than the new one cost.

I didn't have the time to do all that this time, so the long task of emptying began.

I thought I might take the opportunity to perhaps weed out any records that I no longer needed.

Hah! Like that was going to happen. My good intentions disappeared in a cloud of dust as

I flicked my way through the first twenty five records ...

I suppose at one stage the whole lot were organised in alphabetical order, but that was about four moving house occasions ago. Now they were in what I like to call quasi random order; a kind of genre, artist, vibe, and year listing. In other words wherever there was space for them!

This first bunch were all compilation albums of various artists, like Woodstock 1 and 2. Sadly Woodstock 1 is the local Australian version, edited to remove Country Joe and the Fish's "Fish Cheer" track so that listeners from various religious organisations would not be offended! Looks like they've lost the right to the moral high ground in the intervening 50 years, doesn't it.

Other collections were some TV specials, like "Up in Lights '82", "Go for It '83", and "Bop Girls '83" from K-Tel. Sadly this one was sold under false pretenses, since it had no tracks from our original Bop Girl Pat Wilson. The trouble with the TV special albums was that in order to fit a lot of tracks on, they often were shortened, and/or lacking much bottom end since low frequencies needed more track space and bigger grooves. Once again you got what you paid for - or not, as the case may be. I probably picked up these from Sunday markets for three fifths of sweet f.a., just to have a particular track. Or they might have been stock left over from Dunk's Disks record shop.

Others are collections of the same artist from early to late, such as The Shadows 20 Golden Greats, Cliff's Hit Album, The Kinks Greatest Hits, etc. Some good, and others too embarrassing to mention.

The late Glen Campbell would often say that he was the 12-string guitarist on the Rooftop Singers massive hit record "Walk Right In". Sadly he may have been mistaken, because the last time I was in New York (always wanted to put that in a story) I managed to buy a copy of the original LP of the same name at the Hell's Kitchen market. The album lists all the players on the rear cover, and he ain't one of them.

As I slowly flicked through the albums, I thought 'Isn't it great that I have this tangible record - no pun intended - of all the music I've ever liked.' Sure it's a real pain in the bum having to bundle it all up and take it with me every time I've shifted house, but it's there whenever I want to play some tracks, or settle an argument over who played what, or even just look at the cover.

Compare that to the Millennials, who carry all their music on a memory stick full of MP3s or on their phone. Sure it's convenient, but phones break with monotonous regularity, and memory sticks fall out of your pockets and then that's it. All your music is gone. It's OK because of course you've backed it up ...Not!

Now I'm not planning on starting an argument over the quality of today's music, but there's very little of it that I would actually buy if it was available on vinyl.

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