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Impressions from the ground are that events are beginning to pick-up. It is great news but it will take a little more time for companies to stabilise and get their revenues and profitability on track. Let's hope for the best. In this issue our Feature Editor, Elton Noronha, explores the intricate world of wireless microphone systems and what makes them undeniable for live events today. There are a wealth of options for users and selecting the right fit for your inventory and application goals boils down to having a clear understanding of the principles of wireless systems and how these actually work in real-world situations. Enjoy the read.

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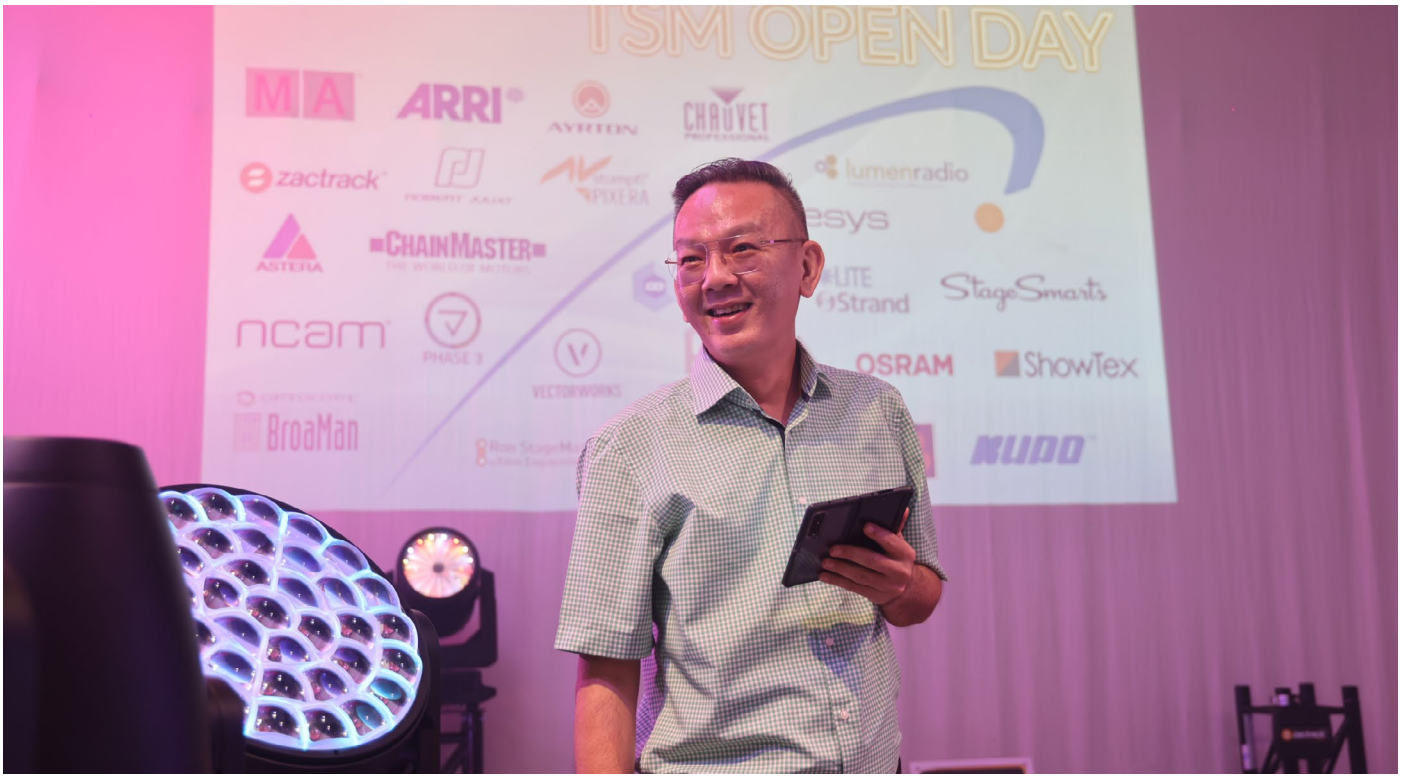
Total Solution Marketing Open Day



Glenn Wong, managing director, Total Solution Marketing.

SINGAPORE: Total Solution Marketing (TSM) Open Day was a regular annual event that many in the industry looked forward to till COVID-19 hit. So it was with great enthusiasm that many SIs, lighting designers, staging and rental companies and end-users from different verticals welcomed the news that TSM was once again holding its Open Day on 5th July.

The Open Day as expected saw a great turnout. Glenn Wong, managing director, TSM highlighted that he was humbled that many friends from the industry found time to attend the company's open house. He highlighted that personally he has gone through many world crisis such as the financial meltdowns and SARS in his work life and he was glad that many peers in our industry managed to survive the recent pandemic. He took the opportunity to highlight that the company has also taken up new distributorship for ZacTrack and Ncam.

The Open Day saw the introduction and demonstration of new solutions from some of the brands represented by TSM. These included the following:

Alistair Smyth, brand manager, ZacTrack introducing himself and the company to the audience.

Ayrton Cobra which offers a next generation speckle-free laser source, designed for rendering a D65 white point that allows perfect colour reproduction. COBRA pushes all the limits when it comes to beam definition, with native contrast never before achieved by a digital light source, an incredible beam angle of 0.6°, and an extreme range of focus which permits the beam shape

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to be adjusted according to the operating distance XT-Focus™. Fitted with a 170 mm frontal lens, the proprietary optical system uses 13 lenses, producing an unprecedented 38x zoom ratio and a zoom range of 0.6° to 23°.

Ayrton Domino LT is the first all-terrain LED luminaire in the Long Throw range designed for intensive outdoor use in long-distance applications requiring high precision. To create this extreme luminaire unrivalled on the market, AYRTON has used "XXL" 225 mm-diameter frontal optics weighing 7 kg that can obtain an ultra-intensive beam. The proprietary optical system has 13 lenses, delivering a 15:1 zoom ratio and a zoom range of 3.5° to 53°. DOMINO LT was developed to cope with the most extreme conditions, able to acclimate to all types of environments and endure rapid climate change.

Ayrton Zonda9 FX is the first luminaire in a new family of products devised for stage lighting, equipped with a high-performance 40 W LED source with RGB+W additive colour synthesis. This fixture offers a proprietary optical system consisting of a wide dial of 37 lenses in PMMA, 384 mm in diameter, combined with 37 glass light guides with an output surface made of an optical micro-structure. This LED/optical system combination can produce powerful light output of 25,000 lumens and a perfectly homogeneous mixture of pastel and saturated colours, regardless of the colour mix chosen.

Chauvet Professional ColorStrike M is an IP65 rated motorized strobe/wash with two ultra-bright, white light tube elements surrounded by an electrifying, colour-mixing, and pixel-mappable face.

Chauvet Professional Ovation Reve E-3 is the brightest, multicolour LED ellipsoidal that also has the capability of producing perfectly tunable whites. Colour Temperature presets ranging from 2800K to 8000K maintain outstanding brightness and a high quality of light, with an emulated "red shift" for a tungsten feel. Ovation Rêve E-3 also features several dimming curves, a virtually silent operation with fan-off modes, and a series of technician-friendly features such as an innovative, adjustable yoke that makes mounting in low clearance situations a breeze.

Robert Juliat Sully 4C Profile, the latest range of LED zoom profile with colour mixing which marks a major step forward in Robert Juliat's product development. The Sully 4C Series builds a new four-colour LED source (Red, Green, Blue, Lime) into a full package of lighting

tools, including a removeable lamp compartment as a quick and easy solution to upgrade RJ 600SX tungsten profiles to coloured LED sources, a Profile series offering the same zoom range as the 600SX Series range (650SX 4C).

ARRI Orbiter is an ultra-bright, tunable, and directional LED fixture from ARRI. All systems in Orbiter are completely new and designed with versatility in mind. Changeable optics is the core innovation in Orbiter. With a wide variety of optics to choose from, Orbiter transforms into the perfect light for your application without sacrificing beam, output, or colour quality. The Quick Lighting Mount (QLM) in Orbiter allows for optics with vastly different properties to be connected to the fixture. The new Orbiter Fresnel lens was demonstrated at the open house.

TSM is very grateful that Robert Juliat's managing director, Francois Juliat and sales director, Claus Spreyer as well as Alistair Smyth, brand manager, ZacTrack International, flew in from overseas to show support for TSM, introduce their products and meet the industry players.

"We also thank JR Chai and YC Low from ARRI Asia, Alan Loh, Luke Chikkala, Sukesh Hickson and Franco Zaghini from MA Lighting and Zactrack International and Vijay Thaygarajoo from Ayrton Lighting for finding time to attend and support the open house," said Glenn.

The evening as traditional with TSM Open Days ended with F&B and an opportunity for the industry to network and catch up.

Total Solution Marketing

Claypaky Rubs Elbows with Industry at PALM AV-ICN Expo 2022

INDIA: At the recent PALM AV-ICN Expo 2022 in Mumbai, the country's premier trade event for the professional sound, audiovisual, and lighting industry, Claypaky attracted large audiences to its stand. The stand was run by the company's Indian distributor, Hi Tech Audio and Image Pvt. Ltd with Rajan Gupta and Nirdosh Aggarwal as representatives. During the occasion, Claypaky unveiled its Mini Xtylos RGB laser source fixture and Sharpy X Frame multifunction luminaire, among other products.

The Sharpy X Frame multipurpose luminaire is a small, lightweight fixture that combines the best elements of the famous Sharpy series with a four-focal plane shutter system. It can create beam effects and act as a spot, profile, or wash unit. Sharpy X Frame is incredibly bright thanks to its potent 550-watt arc source, which also creates deep, consistent colours.

“Meeting in person at PALM Expo with clients, customers and partners after a gap of two years due to the coronavirus pandemic was really exciting,” said Pankil Ahuja, Claypaky Sales Manager for India and the subcontinent. “The exhibition was an example of how our industry is coming back very strongly; there will be more events, concerts and shows which we are very thrilled about and eager to support our customers in any way we can.”

Ahuja added, “Claypaky is a brand which everyone in India has a lot of respect for and recognizes as delivering premium quality products in the market for a really long time. Rental players aspire to buy Claypaky products; they have absolutely no doubt about the products. Sharpy X Frame, Xtylos, Arolla Profile MP and Mini B, particularly, are catching the eyes of our customers. We received quite nice feedback about these products at PALM Expo, and we are supporting our customers with the help of Hi Tech Audio and Image with product availability, competitive pricing and attractive terms.”

The Mini Xtylos, a portable version of the ground-breaking Xtylos with an RGB laser source, garnered its fair share of attention during PALM Expo. The

Mini Xtylos has a compact footprint and weighs only 9kg, but it maintains the same output and colour constancy as its larger sibling.

Italian Claypaky representatives attended the Expo and were moved by the crowd and the promise of the thriving Indian market."Events and shows in India are very colourful and joyful," said Dylan De Matteo, Claypaky's Sales Support Engineer. "Imagine what happens when the creativity of Indian lighting designers meets the world's best lighting brand, Claypaky! The market needs some pointers on differentiating quality lighting equipment – their effects, colours, precise movements – from cheaper fixtures. But with the help of our partner in India, Hi Tech Audio and Image, constant training and seminars will educate and uplift the market and boost the industry in the country."

PALM Expo gave Claypaky Sales Director Alberico D'Amato a chance to meet with partners whom he's known for more than 25 years. "It was very exciting and emotional too," he reported. "Certainly, the market is improving in terms of shows and events. A very good sign is the number of international events that have started coming to India – events driven by specified lighting equipment in which Claypaky is a really strong player."

Claypaky

CTME Expands SI Division with Appointment of Huw Godfrey

MIDDLE EAST: With Huw Godfrey's appointment as Head of System Integration, Creative Technology's Middle East System Integration(SI) division is continuing to expand.

As a result of his solid managerial expertise, Huw offers project teams and stakeholders high levels of strategic management advice, guidance, and support. He has exercised leadership in the planning and execution of numerous concurrent national and international initiatives, helping to encourage accountability, transparency, and collaboration across the project teams. In both the systems integration and live events sectors, Huw has extensive professional AV expertise in roles spanning the entire project lifecycle, including engineering, project management, account management, and operations management. He has led teams on many high-profile projects over the years, including Bloomberg Walbrook Square, the World Cup in Russia, and the UAE's Palm Jumeirah launch party. Huw has a profound understanding of multiple disciplines and is crucial to the growth of the company's SI division.

Anticipating his new position, Godfrey remarked, "I am delighted to be returning [to] CT at what is an incredibly exciting [time] for both the SI division and the business as a whole. There is such fantastic growth in the region, and I am look[ing] forward to working on many more exciting projects with the team over the coming months and years."

Creative Technology Middle East

Prolights Dances with the Stars in New Season Debut

NEW ZEALAND: The ninth season of New Zealand's Dancing with the Stars premiered with the benefit of twelve extra Prolights EclPanel TWC compact LED soft lights. The fixtures were purchased by Big Picture NZ along with a range of accessories such as crates to aid in controlling the light.

“The big difference with the show's lighting this year is that we have switched all the white light to daylight replacing all the specials with LED and all the Fresnels with soft lights,” commented Simon Garrett, Head of Broadcast Lighting at Big Picture NZ. “I find it delivers a cleaner look with the native temperature of the LED screen and set lighting and of course, all the movers are daylight too. It means we spend less time correcting but can warm any light up if required.”

Simon noted that they get ‘tons of light' out of their EclPanels and that they're very easy to use.

“They're a great workhorse and I'd like more!” he declared. “They're compact and economical with a broad flat spread so rigged in pairs they supply an even wash across a studio stepping upstage. I only used a single soft centrally for the entire upstage and stairs. We generally lit the studio for big group dances with only nine panels. The colour temperature control is fast and accurate. Colour and effects easy to use, wireless control is good and they case well.”

Simon specifically mentioned that the EclPanels produced good results at steeper angles than your standard broadcast angles of 30°.

“They can be rigged more overhead and used at steeper angles because they're such a large source and so wide, you get a decent broadcast-filled facial look,” he added. “For a virtual event in a normal size theatre, you'd use seven to nine EclPanels to cover the entire stage with maybe a few framing spots to give a bit of edge on talent and that does it. They've definitely increased our setup efficiency.”

For this project, Simon said they needed to crate the EclPanels with the Prolights 8 chamber egg crate. He also purchased some soft boxes plus 30-degree and 60-degree egg crates.

“The 60° DOP choice egg crates are my favourite, they fold down well for transport and give you a decent bit of control with flare and spill without losing too much light,” he said.

Prolights/EclPanels TWC

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New XR/AR Lab from A&L Offers Hands-on Experience for Creatives and Technology Experts

SINGAPORE: The doors to the Acoustic & Lighting System ("A&L") XR Lab are now open. The lab, which A&L curated and designed, is powered by advanced systems comprising disguise and Unreal Engine, stYpe Redspy, ROE Visual Black Pearl and Black Marble LED Panels, and Blacktrax.

A&L XR Lab, based in Singapore, will also enable individuals to learn about and gain first-hand experience with the newest developments in XR/AR, interactive lighting, and audio solutions whilst serving as an experimental platform for training.

The lab has already organised several disguise XR boot camps to attract filmmakers, visual artists, and technological experts from various Southeast Asian nations, including Malaysia, Vietnam, Cambodia, Indonesia, Singapore, and even Japan.

A&L welcomes brands and manufacturers who would like to test new technologies in their lab. They can be

contacted at info@acousticnlighting.com with bookings available at: https://calendly.com/acousticxrlab/.

Acoustic & Lighting

Men-At-Work Stagecraft and Asterix Invest in MagicFX

INDIA: In a bid to keep up with the demand to suffice the need for 'the big grand reveal' that live events of all types these days insist upon; two of South India's most prolific technical service companies have invested sizably into reinforcing their respective inventories with multiple units of the MagicFX PowerDrop system. Chennai based Men-At-Work Stagecraft (India's most renowned staging and infrastructure service provider) and Hubli based Asterix ((one of Northern Karnataka's most tenured comprehensive technical solutions provider), have both added 30 units each of the Magic FX PowerDrop units to their respective arsenal.

MagicFX positions the PowerDrop as a compact and reliable plug-n-play backdrop drop (kabuki) system that drops curtains from a truss to unveil stages, buildings, products and special objects. A standard system set comes with 10 units of the PowerDrop mechanism along with clamps, clips and a flightcase; with each mechanism sporting an impressive weight support capacity of 20kg.

"Despite being a staging, rigging and fabrication company, a lot of our customers would come up with requirements for special effects such as turntables, hydraulic systems and scissor lifts. Back in the early days, we had to come up with our own solutions and engineer all our special effects mechanism in house mainly because this kind of equipment was very expensive and importing from Europe wasn't easy. Infact our first set of kabuki drops that we used for events were DIY (engineered in-house) and we used them for 3-4 years until we decided to take this particular aspect of our service offering to the next level and subsequently understood the need to add formidable and fail-proof world-class systems to realize our vision. Magic FX is known world over for the brilliant special effects machines that they manufacture. They also have a great dealer network in India, and are very competitive with the pricing. And perhaps most crucial of all, they're known to offer great after sales support. Therefore, it made our decision a lot easier, especially considering the fact that purchasing quality gear was the key driving factor behind this investment," comments Mankaran Singh – director of Men-At-Work Stagecraft as he informs that the recent purchase rounds of the company's MagicFX PowerDrop inventory to a total of 40 units.

Asterix PowerDrop inventory

On the other hand, Asterix's investment into the MagicFX PowerDrop establishes them as perhaps the first company in Karnataka to boast of the technology. Venkatesh Govindarajan – director of Asterix, shares, "The MagicFX PowerDrop is an extremely versatile and flexible system; and after seeing it in action, we were convinced that investing into this system would enhance our value proposition tremendously. We're an early investor into this technology, especially in Karnataka; and with our company headquartered in Hubli, which is quite close to Goa in terms of location – the addition of the MagicFx PowerDrop equips us with the ability to provide a comprehensive technical solution for events in Karnataka as well as Goa.

When it comes to the performance of the PowerDrop system on-ground – both Mankaran and Venkatesh are all praise – as they laud the system for its dependability and precision.

MagicFX

Asterix

Men-At_Work

d&b audiotechnik Caters to Rise in Theatrical Sound Technology

HONG KONG: Production engineers, sound designers, and mixing engineers were able to successfully obtain the recently developed d&b certification during the five-day inaugural event known as the Soundscape Production Engineer Certification Programme (SPEC).

Years of productive collaborations between d&b Greater China and local arts and culture organizations led to the Hong Kong SPEC event. The team at d&b Greater China noted that a training program was required due to a rise in interest in theatrical sound technology among venues, students, and audio engineers as well as an increase in the number of Hong Kong productions using d&b Soundscape.

The course included signal processing, audio object-based mixing, and investigated the potential of the robust En-Scene and En-Space software modules from d&b Soundscape. The session came to a close with an exam to certify the participants as completely educated and prepared to deliver top-notch d&b Soundscape events.

The event was presented in collaboration with the East Kowloon Cultural Centre (EKCC), an arts complex run by the Hong Kong government's Leisure and Cultural Services Department, in place the Yuen Long Theatre, which has a d&b Soundscape system installed permanently. The certification program was started by Daniel Chan, CEO of d&b audiotechnik Greater China, and its training materials were handled by Ralf Zuleeg and the d&b Soundscape Enablement team.

“Immersive audio offers creators a wealth of opportunities. In the past, audio technology sometimes limited creativity but today, thanks to tools like Soundscape, the sky is the limit – if you can think it, you might just be able to do it!” said Daniel Chan. “Soundscape is really well positioned to provide the

solution for the best immersive audio experience. I'm very happy that this course is being supported by the EKCC, who are providing a Soundscape-ready venue. Students can actually use the Yuen Long Theatre's system to practice, to experience, put their learning into practice and to realise their creative ideas."

The d&b Soundscape system is also being installed in an expanding number of locations, including the Hong Kong Cultural Centre, Yuen Long Theatre, Shaw Auditorium at the University of Science and Technology, and the Hong Kong Design Institute.

"We can foresee more venues upgrading to Soundscape systems in the coming years," Chan concluded. "As they do, we want to ensure audio production teams and engineers are equipped with the right knowledge to succeed – we are on a path to the sound designs of the future. Education has always been at the heart of d&b's value to our customers. As a market leader in immersive sound for live event applications, we are committed to supporting our industry's adoption of this exciting technology and the creative possibilities that it inspires."

d&b audio

Ganpati Sound Celebrates 2022 with Additions to its Adamson Systems Inventory

INDIA: 4 x Adamson S10 line array cabinets, 4 x E119 subwoofers, and 2 x Lab.Gruppen PLM20K44 amplifiers have been added to Ganpati Sound's rental inventory to increase its capacity. Their current Adamson system, which consists of E15s, S10s, E119s, and E219s, saw a lot of use on major tours and events in 2020 and 2021, and they are now ready for a busy 2022.

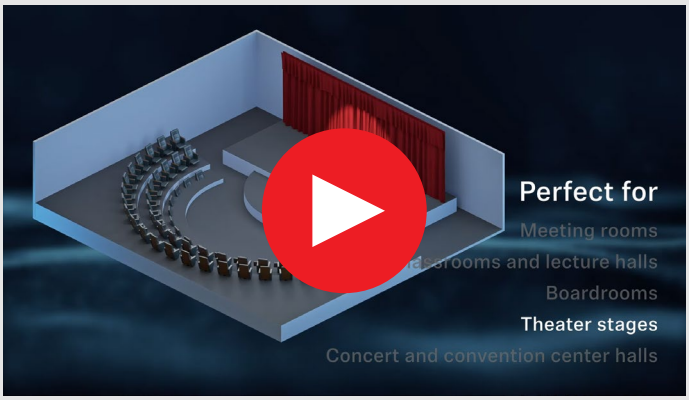
The company was the first in Rajasthan to invest in Adamson Systems Engineering boxes. As their business has expanded, so too has their partnership with Adamson and StageMix Technologies the country's distributor for Adamson products. "The S10 & E119 are very impressive for their size. This system offers us comparable power but is much smaller and lighter, with easy rigging," said Banwari Lal Sharma, owner of Ganpati Sound. "Undoubtedly, you invest in gear that will help your company grow, but it's even more amazing to make that investment with such a supportive team like at StageMix and Adamson."

Adamson Systems

PROLIGHTS EclPanel TWCXL

With a wide range of white tones, from daylight to tungsten, the PROLIGHTS EclPanel TWCXL achieves an excellent light quality with high CRI, TLCI, and TM-30 values. Through four rotatory knobs and three fully-featured modes—CCT with +/- green shift, HSI for total control of hue, saturation, and intensity, and FX mode to access the pixel cinema effects—the EclPanel TWCXL enables quick and precise local control.

Sennheiser EW-DX



By leveraging sophisticated technologies to deliver a digital UHF system that can be scaled with ease, Sennheiser EW-DX streamlines the workflow. The network-ready system is designed to integrate effortlessly, benefiting classrooms, corporate campuses, and live performance productions with its advanced feature set and hardware options.

ROE Visual Black Pearl Panels

Shanghai-based MuShang Advertising Co., Ltd. has created an XR space that is furnished with ROE Visual Black Pearl panels. The stage is now available for high-quality virtual productions that allow images on stage to be brought to life.

Claypaky Volero Batten Aqua

Volero Batten Aqua is a new fixture that brings all the Claypaky quality but now for outdoor use in all weathers. The light source is made up of 10 x 60W Osram RGBW LEDs, capable of emitting a much higher light power than most of the LEDs bars on the market. Each LED adopts 80x80mm lenses, a very unusual width that allows you more versatility with focussing the power of the LEDs, optimizing their luminous efficiency and resolution.

Choices Choices Choices - Today Consoles

I want to look at the choices of the gear we use and what we might favour. Knowing that people have different preferences, I don't want to advocate any particular brand or product. Still, I will share my criteria for making, as I hope, well-informed choices for my projects. Since you all know that I am a live sound engineer, I will have a look at consoles and options this time and then next month spend some time on loudspeakers and, in a third column, look at microphones.

There are a few criteria that I have. Since I am coming from the analogue days and I have worked at least half of my career still on analogue consoles, this has defined a lot of my thinking and how I approach my job. The fixed layout of an analogue console has forced me and everyone else to find our way of working within this given layout. After you have worked like this for an extended period, you will bring this same approach to digital mixing consoles and of course, they offer much more freedom and flexibility. Still, you must get your head and heart around this and embrace the possibilities. I recognize that colleagues who have only ever mixed on digital consoles are less limited in their approaches than I was because of my history and experience working in the analogue field. The console that broke this open was the INNOVA SON SY 80. I remember well that I hated it with a passion when I first saw it, and then once I got my head around it, I found that I could do things that no other console could do at that time and all this because of the architecture was flexible and open. So I ended up buying one, and it was my favourite console for quite a while and for many reasons because it allowed a new level of creativity.

With developments around digital mixing consoles, my first criterion is fixed architecture or flexible architecture. This means, will I be able to live with just 32 channels, just 48 channels, just 64 channels? What is the maximum channel capacity of the system? Is the architecture flexible, so I can buy something with 32 channels now and then expand later? The same can apply when you start with just 16 channels and might expand to 24 or 32 channels later. This raises the question, do I ever need the maximum number of channels possible within any given architecture. In my approach, this was and is important because most times, I would not have the budget to buy everything I want at the same time, but being able to grow with the system is an important feature for me and my work.

In my field of work in the live sound industry, redundancy has always played a significant role. Even though I only ever needed this once in my career, being prepared for this has become increasingly more important. I have found that these days, it seems almost acceptable to have a 15 minutes break in the middle of the show or any concert because someone needs to reboot their console. This was unthinkable in the past, even in the analogue days, and I would not be here today if I did not care and think about this a lot. We seem to change our attitude on this.

And then, of course, the question of what else I might need besides the console, and the more complete this package is, the more appealing it will be to me. Yes, I might want to bring my favourite plug-ins and effects as a separate hardware unit, but can any given system be sufficient all by itself and get me started? Any platform that depends on third-party gear to make a complete system is no longer state of the art. Yes, it is imperative to be able to interface with the outside world, but a console package these days needs to be a complete working solution, in my opinion.

With this in mind and the fact that nowadays, literally, 99% of all large-scale consoles are digital consoles, I will take a look inside and explain what I am looking for with regards to digital console processing during the next column before we go to loudspeakers and then microphones in the comings months. Allow me to wish you all enough gain on the fader, happy mixing!

Join the conversation and share your thoughts with Alex. Alex can be reached at alex@asaudio.de

DiGiCo Increases Processing Power of S-Series Consoles

The latest software upgrade, Version 3.0, from DiGiCo significantly boosts the processing capabilities of its compact, cost-effective S-Series consoles. The channel count is dramatically increased from 48 to 60 flexi channels and 24 flexi busses with Version 3.0's optional software expansion, converting S-Series consoles into an S21+ or an S31+.

Two new Master Buss settings are included in V3.0: LCR (Left Centre Right) and LRM (Left Right Mono), providing additional control on the channels over the LCR blend or the LRM Mono Gain. When using an additional speaker configuration or putting out a mono mix in addition to your stereo mix, LCR or LRM are the best options. Additionally, increasing the Master Buss size doesn't result in any compromises because you can still access all of your busses and channels.

Software version 2.2 introduced OSC Control of Snapshots. Version 3.0 extends the OSC control capabilities to channel processing controls. This upgrade gives a significant degree of versatility when combining your S series console with external remote control systems by allowing you to manage various aspects of channel and buss processing, including EQ and dynamics.

The DMI-MADI-B and DMI-MADI-C are now compatible with MADI Sample Rate Conversion in version 3.0. SRC offers useful versatility when connecting to external MADI devices by allowing the S21 or S31 to operate at a different sample rate from linked MADI devices.

Compatibility for DiGiCo's Dante-based DQ Rack, a compact 48 in/24 out high-performance Stage Rack is also included. The Dante64@96 DMI Card, when attached to your S Series console, offers cost-effective expansion, making it ideal for both touring and installation applications.

The S-Series now makes use of GPIO (General Purpose Inputs and Outputs), with both the S21 and S31 featuring a ¼" GPI and ¼" GPO on the back for connection to external devices. GPI can be used to fire a specific Snapshot or to trigger the previous or next Snapshot.

Dynamic EQ is a potent processing function that is already included in the channels and allows you to regulate how much EQ is applied to a signal dependent on its level. Software version 3.0 introduces ganging of this function across multiple channels, a time-saving feature when combining numerous comparable inputs that require the same processing.

When mixing, it is useful to have a single tap control that sets the delay time across all your delays. With version 3.0, the Ten Tap Delay effect can now be added to the Global Tap Delay, so no matter which internal delay effect you are using, you always have access to the control you need.

Finally, since all channels on the S21 and S31 are flexi channels (meaning they can be either mono or stereo), the optional software expansion allows up to 120 inputs to be processed across the 60 stereo channels, and 48 output processing paths across the 24 stereo groups. It also includes the previously mentioned Master buss (including the new LCR and LRM configurations) and standard 10 x 8 Matrix.

Version 3.0 is free to all S-Series owners.

DiGiCo

PROLIGHTS Expands EclFresnel Range with Four White Variants

The four new variable white EclFresnel models have a CCT range of 2,700K to 5,600K, portraying skin tones naturally and producing a clear light beam with smooth fades from warm to cool white. Because these are variable white-only fixtures, users get an incredibly bright beam across the entire zoom range, whilst keeping high CRI, TLCI and TM30 values.

The variable white series consists of :

- The MINI with a 60W LED engine and a 100mm lens
- JUNIOR with a 150W engine and a 150mm front lens
- The 1K Fresnel with a 250W source and a 200mm front lens
- The 2K Fresnel with a 500W LED source and a 250mm lens

The EclFresnel line is designed for high-output applications like theatre and broadcast. A 28mm TV spigot and an eight-leaf barndoor are among the many accessories available. There are also dedicated pole-operated yokes available for all of the variants.

The devices are loaded with the newest technologies, including adjustable PWM, colour temperature presets, 16-bit smooth dimming, and much more. Just like the fixed white or full-colour series, the EclFresnel VW range is also available in white housing and caters to music halls and other multi-purpose venues.

PROLIGHTS/EclFresnel 2K

Pure and Powerful Culminate in PK Sound T218 Subwoofer

Pure and powerful low-end has been a staple of PK Sound's acoustic signature. Highlighting this signature is the flagship subwoofer in the company's Trinity series. The T218 consists of a number of robot-controlled line array elements. With an operating range of 25 Hz-90 Hz, this high-output, low-profile enclosure offers exceptional low-frequency performance.

T218 offers a bass reflex design with dual front-loaded, long-excursion 18" transducers for clear and powerful output. High SPL performance is produced with minimal port distortion via a large, unrestricted vent. The 4,000 W Class D amplifier, control electronics, and power supply are all housed in a single field-replaceable module that is attached to the back of the cabinet. Advanced onboard DSP streamlines calibration and setup while maximising performance.

IR sensors surround the module, enabling auto-identification to enhance deployment and control efficiency when used in conjunction with the PK .dynamics platform. Via presets within .dynamics, low-frequency directivity and performance are further optimised.

Up to 16 T218 modules can be flown in a column or safely ground-stacked with integrated rigging hardware. T218 is perfect for both mobile and performance installation applications thanks to its low-profile design, which enables it to glide under any stage and be neatly packed for international shipping.

PK Sound/T218

HK Audio POLAR 8 Column System Delivers Optimal Audio in Tight Spaces

POLAR 8 is aimed at environments where flexibility and perfect sound are required, making it the perfect companion for musicians, entertainers and DJs on small stages, in rehearsal rooms, seminar rooms and at garden parties.

Six powerful 2.5" neodymium speakers with 1" voice coils work in a curved column arrangement in the POLAR 8 mid/high unit. With dispersion angles of 120° x 45°, they provide clean and uniform sound, even in difficult or low rooms. The 8" high-performance bass speaker is housed in a metal-reinforced plastic/ABS subwoofer enclosure for dry and accurate bass response.

A powerful, 1,200-watt (peak power) Class-D power amplifier provides excellent power reserves and robust, consistent sound at any level. Unlike systems with continuous speaker arrangement, POLAR can be used on stages, as a monitor system, and with a seated audience without the need for a spacer.

The column elements can be wirelessly attached to the subwoofer, without wobbling, thanks to the plug mechanism that was specially created for POLAR.

A three-channel mixer with Master volume control and modern Bluetooth 5 audio streaming is available with POLAR 8. In addition to one AUX channel with cinch sockets for DJ gear or MP3 players that simultaneously controls Bluetooth audio, two channels are offered as XLR/jack combo sockets for microphones and line signals, such as for mixers or keyboards. With a Bluetooth 5-capable device, the range can be up to four times greater than prior Bluetooth versions.To create a true stereo system, two POLAR 8s can be simply and wirelessly connected to a Bluetooth device using Bluetooth TWS. The overall sound can be quickly modified to local conditions or personal preference using the Sub Level and Treble settings.

Additional accessories included are a padded bag for the mid/high unit and spacer, as well as a padded transport bag for the subwoofer. POLAR 8 is now available in stores for €649.00 (RRP).

HK Audio/POLAR

GIS Launches LPL D8 Motor for a Lifting Capacity of 2000 kg

A new LPL1000 D8 model will be offered by GIS in the third quarter of 2022. The LPL1000 electric chain hoist offers the same features as its two smaller siblings, with a relatively low dead weight of 46 kg and an exceptionally high lifting capacity of 2000 kg. The fact that this D8 motor can safely lift and hold more than 40 times its own weight is among other things due to the profile steel chain used, which offers a 15% higher load capacity than a traditional round steel chain with an identical nominal diameter.

The LPL series was specifically developed to provide riggers with the lightest possible D8 motor for stage technology applications. At the beginning of 2020, the new product line was launched very successfully with chain hoists for capacities of 500 kg (LPML250) and 1000 kg (LPL500). GIS noted that these are the lightest motors on the market in their classes. The LPL series designed according to EN14492 and EN17206 will be completed by another model in the third quarter of 2022.

The LPL1000 can be rapidly and easily set up for its intended use, just like the other hoists in the LPL series. As an illustration, a second independent DC spring-loaded brake can be mounted on the existing shaft or the setup can be adapted from direct control to low voltage control can be done in just a few steps. In addition to other options, it is also possible to integrate a load and path measurement. A stackable flight case has been specially designed for the LPL1000 as an ideal packaging unit for gentle, space-saving transport from one event to the next.

The aluminium housing and covers give the entire LPL product line its incredibly strong yet lightweight construction. The entertainment motors are sealed against water and dust jets and come with standard IP65 protection. Thanks to its modular design with readily-accessible wear parts, maintenance works can be carried out quickly and easily. The LPL series of electric chain hoists are “Made in Switzerland” and built for a long service life. GIS provides a three-year extended warranty as a guarantee.

GIS/Electric chain hoist LPL D8

Disentangled: Wireless Microphone Systems 1-0-1

Exploring the intricate world of wireless microphone systems and what makes them undeniable for live events today

by Elton Noronha

Technology has bred the era of convenience intertwined with efficiency that we live in today. And nowhere else is this best observed than perhaps in the world of microphones. Bulky wired microphone systems of the past have made way for sleeker, more stylish and profoundly more efficient wireless microphone systems – the uses of which span a multitude of applications ranging from something as day-to-day as live entertainment to something as niche and critical as earth-orbit communications; and pretty much a whole lot of communication applications in between.

The beauty of it all lies in the fact that today's equipment has progressed to a point that excellent results can be achieved with minimal effort – be it a casual user deploying a simple wireless system for a karaoke party or professional users and audio system designers who ensure multiple wireless microphone systems work flawlessly at mega-concert productions under the most stressful and demanding conditions imaginable. These days, high-performance wireless systems are noted to sound as good as—or even better than—wired systems ever did. And they're more reliable than ever.

Limiting our focusing on wireless microphone systems for live event applications – it's safe to say that they are viewed by field professionals as extremely critical tools in modern productions, from concerts to theatre events to houses of worship to corporate presentations.

The benefits of wireless systems over their wired counterparts are obvious: freedom of movement, less cable clutter and a low profile. And with the wealth of options for users to choose between – from simple analog systems to complex, multi-channel digital operations – selecting the right fit for your inventory and application goals boils down to having a clear understanding of the principles of wireless systems and how these actually work in real-world situations.

The Basics

It's probably common knowledge that wired microphones convert sound waves into an electrical signal, which is sent over a cable into a sound system. Wireless systems convert those sound waves into a radio signal, which is then transmitted to a receiver, which converts the signal back and sends it into a sound system. Basically, a wireless system allows the target sounds to be transmitted wirelessly.

Every wireless system includes three main components i.e. the microphone, the transmitter and the receiver.

Microphone
The microphone (or instrument input) include types like handheld, headset and lavalier mics, clip-on instrument mics and guitar and bass input systems. Handheld microphones as standard, archetypal stage microphone – usually a dynamic or condenser – with a transmitter built into their body, making them quick and easy to set up and move around with. On the other hand, headset microphones are worn on the head, often over the ear, while a discrete arm positions the capsule very close to the mouth. And finally, lavelier or 'lapel' mics are small and unobtrusive, designed to be clipped onto the clothing, and usually used in speech only applications wherein the microphone's close proximity to the mouth affords a good signal-to-noise ratio

Transmitter
The transmitter converts the audio signal into RF and broadcasts it through the airwaves to a receiver, with this mechanism usually being built into handheld microphones and clip-on belt packs. To explain the key differences between the three types: wireless handheld transmitters are included in the microphones' body and powered by battery, thereby making the microphone bigger than traditional wired counterparts to some extent, with the converted radio signals being broadcast from the antenna. On the other hand, plug on wireless transmitters are stand-alone devices that can convert most corded microphones to wireless, as it connects to the model's lower section, which is normally attached to a cable. And finally, a wireless transmitter belt or body pack is used when using a "handsfree" microphones, such as headsets or lavaliers, with the unit being the size of a deck of cards, and sporting provisions to be tucked into a pocket or clipped onto a belt or waistline.

Receiver
The receiver receives the radio signals from the transmitter and turns them back into audio. Here, the RF signal is converted back to an electrical audio signal, where it enters the sound system. Receivers connect to your sound system, and can take the form of rack-mount or standalone boxes. These come in three main types i.e. non-diversity, diversity and true-diversity. Non-diversity types use one antenna to gain the wireless signals, whereas diversity wireless receivers have two antennas that both connect to the same receiver where if one antenna captures weak signals, the receiver can turn to the other one and thereby enable stable signal transmission. Finally, true diversity receivers use two separate antennas that each connects to a separate receiver module, where the receiver notes which among the two gains better signals and selects the better one, thereby drastically reducing chances of audio dropouts. In addition to these, there is also a wireless plug-in type receiver without visible antenna which is compact in size and offers convenience for mobile recording applications.

Analog vs Digital

As a cumulate – wireless systems can either be analog or digital in nature; with each one presenting their own unique set of working principles.

Analog systems use companding to compress the signal transmitted from the microphone and expand it again at the receiver. This process maximizes the audio signal's dynamic range and minimizes noise; however it can introduce artifacts such as "pumping" and "breathing."

Digital systems, on the other hand, encode sound as a digital signal—zeroes and ones—that modulate a radio carrier signal, which is then sent over the air and picked up by a receiver, where that signal is converted back to sound.

Wireless systems convert analog audio into a radio signal and back through either analog or digital processes. And when one decides to compare analog vs digital systems to ascertain which one has the advantage over the other; it usually boils down to key tangible factors such as the quality of components, the range of features offered, the buyer's budget and the intent of application. That being said, it cannot be denied that there are fundamental differences that can be narrowed down to basic factors encompassing quality of sound, transmission range, frequency bandwidth operation, latency, battery life, ease of operation, and of course, security.

Sound Quality: Digital systems convert sound waves into electrical signals as 1s and 0s i.e. a high-resolution (often 24-bit/48kHz) digital signals that are devoid of analog byproducts (like those introduced by companding) and interference. Analog systems, however, transfer sounds in the form of modulated radio waves, which are more prone to interference thereby elevating the chance of poor audio output. Moreover, the dynamic range will be compressed by compander, causing the degradation of the audio signal, which is easy to notice, especially in cheap analog units.

Transmission Range: Different systems have different transmission ranges, ranging from short distances to hundreds of feet. A good rule of thumb is to think about how far you will usually be from your subject, then doubling it to be safe. Range is often reflected in the price of a system, so don't go spending hundreds of dollars on something with greater transmission capabilities than you need.

Latency: Latency is basically the time delay between signal input and output in a system. And when considering this aspect in terms of a live performance – the latency value of a wireless system becomes even more crucial. Analog systems, by design, have virtually no latency. Early digital technologies had unacceptably high latency, which was introduced by the process of converting analog to digital and back again. However, most modern digital systems have now managed to overcome those limitations

Battery Life: On an average, digital systems can last 40% longer owing to the fact that their transmitters need considerably lower power to operate. Longer battery life in turn offers vendors greater peace of mind, especially in terms of logistics and pre-event preps.

Security: Digital systems are usually found to offer encrypted transmission, thereby providing a higher level of security and minimizing the risk of eavesdroppers. On the other hand, analog signals can be captured extraneously with a suitable receiver. If privacy is important, then digital encryption is the only way to ensure that nobody but the live audience is able to hear the content of the event.

Ease of Operation: Setting up wireless systems—be it digital or analog system – requires users to adhere to certain basic necessities. First up, the transmitter and receiver must operate on the same frequency, and two wireless systems in the same location cannot / should not operate on the same frequency. While in most analog systems user will have to configure these essential settings manually; fortunately in most digital systems, these can be handled by themselves. For example, there are plenty of digital wireless systems, that are plug-and-play simple: Channel pairing happens seamlessly in the background once the receiver is set to seeking mode and the rest can be controlled easily by the user.

Spectral Efficiency: Digital systems use only binary code, meaning that they make no use of frequency modulation which occupy great space around the transmission frequency in traditional analog RF (= radio frequency) systems. As a consequence, professional digital wireless systems operate reliably with less space between frequencies and more systems are allowed to operate at the same time in the same location.

Frequency Bandwidth Operation: Across the world, wireless systems are allowed to operate in dedicated radio frequency bands, on both a licensed and unlicensed basis. Wireless systems share these bands with other technologies, such as television and radio broadcast and cellular services. These bandwidths are finite; and as major chunks of the spectrum continue to get auctioned off to other major wireless service providers – this means that a considerably lesser portion of the spectrum is being made available for analog wireless microphone and instrument systems. Fortunately, since most new-age digital wireless systems operate in the 2.4GHz space (which is a global, license-free standard) those systems have not been as adversely impacted as the analog systems have.

VHF vs UHF vs 2.4Ghz

Wireless microphone systems transmit and receive on a specific radio frequency, called the operating frequency. Individual radio frequencies are found in frequency "bands" which are specific ranges of frequencies. And these are broadly classified into VHF (Very High Frequency), UHF (Ultra High Frequency) and 2.4GHz bands.

VHF bands operate at the range between 49 and 216MHz; wherein the recommended bandwidth for acceptable audio performance is considered to be anything above 169MHz. If you want to record high quality sounds within a decent range and run single microphone wireless system, VHF is usually considered to be the preferred choice.

Frequencies above 300MHz are considered to be part of the UHF band, with it being noted that this spectrum is less crowded in many countries thereby making it more feasible to run multiple systems at the same time. Several users identify UHF as ideal for assuring excellent audio quality and the ability to operate more than one system while fulfilling a high requirement on transmission distance.

Like the VHF region, the UHF region contains several bands that are used for wireless microphone systems. However, certain physical, regulatory, and economic differences between VHF and UHF regions should be noted here. The primary physical characteristic of UHF radio waves is their much shorter wavelength (one-third to two-thirds of a meter). The visible consequence of this is the much shorter length of antennas for UHF wireless microphone systems. Quarter-wave antennas in the UHF range can be less than 10 cm.

There are other consequences of the shorter UHF wavelength. One is reduced efficiency of radio wave propagation both through the air and through other non-metallic materials such as walls and human bodies. This can result in potentially less range for a UHF signal compared to a VHF signal of the same radiated power.

"Line-of-sight" operation is more important in the UHF range. Another consequence is the increased amount of radio wave reflections by smaller metal objects, resulting in comparatively more frequent and more severe interference due to multi-path (dropouts). However, diversity receivers are very effective in the UHF band, and the required antenna spacing is minimal. Finally, the signal loss in coaxial antenna cables is greater in the UHF range. Amplifiers and/or low-loss cable may be required in UHF antenna systems.

On the other hand, for FM signals in the UHF band, greater occupied bandwidth is allowed. This effectively permits greater FM deviation, for potentially greater audio dynamic range. In addition, greater transmitter power is allowed (up to 250 mw). Finally, the available radio spectrum for UHF wireless microphone system use is eight times greater than for high-band VHF. This allows for a much larger number of systems to be operated simultaneously.

In practice, the effectively greater deviation limits of UHF are not generally used because of the resulting reduction in the number of simultaneous systems that may operated: the corresponding increased occupied bandwidth of each system uses up more of the available frequency range. Also, use of increased transmitter power is rare due to the resulting severely decreased battery life and to the increased potential of mutual system interference. Even with limited deviation and power, however, the capability for an increased number of simultaneous systems is a significant benefit in certain applications. This is especially true since UHF systems can generally be used in conjunction with VHF systems at the same location without mutual interference.

The primary economic difference between VHF and UHF operation is the relatively higher cost of UHF equipment. Typically, it is more difficult and hence more expensive to design and manufacture UHF devices. In many ways this is a consequence of the behavior of high frequency (short wavelength) radio signals. This cost differential applies to antennas, cables, and other accessories as well as to the basic transmitter and receiver. Currently, though, economies of scale have reduced this premium substantially so that it is now possible to produce basic UHF systems at prices comparable to VHF. However, advanced features and performance tend to remain in the province of high-end UHF products.

Finally, the 2.4GHz band operates in 83 MHz of spectrum between 2.400GHz and 2.483GHz; and this system is legal in almost every country in the world so you don't need to worry about the international spectrum policy anytime and anywhere. Additionally, 2.4GHz wireless microphone systems are known to provide extremely quick and efficient pairing of the transmitter and receiver, which saves crucial time during setup. 2.4 GHz system uses the same brand as your WIFI signals, and as the locations of WIFI channels are predictable, it allows users to sniff out the occupied frequencies easily. Moreover, 2.4 GHz offers better communication with the other mics since its microchips are more sophisticated than the typical UHF chips with less MHz spectrum. Also, the 2.4 GHz mic systems do not work on the F.M. modulation technology. Instead, they use digital signals to pass the information. Hence, they become less affected by intermodulation that can damage the UHF channel band. Plus, since the 2.4 GHz range chips use smaller wavelengths, manufacturers can benefit greatly. Hence, these systems will use smaller antennas and electronic systems for superior performance. You will get a reasonable price for the same audio quality UHF may provide you.

A 2.4 GHz system may offer a good sound experience in an ideal environment, but it comes at the price of having limited channel count at your disposal. As the chip operates on less spectrum, it cannot provide a media pool to you. Moreover, the 2.4 GHz gets crowded with WIFI and Bluetooth, so you may not get all the spectrum for yourself.

The generally accepted norm is to choose a 2.4 one if you only need a few channels, work relatively short distances, want operational simplicity, and make sure that your device will not be phased out depending on the future regulatory changes. However, for users needing lots of channels, ultra-low latency, and are capturing critical sound at a large stage, sports, or premium-marketed events; UHF systems are still considered by many to be the best choice for ultimate audio quality.

Selecting the Right System

Selecting the right wireless microphone system consists of several steps based on the intended application and on the capabilities and limitations of the equipment required for that application. It should be remembered that while wireless microphone systems may not be absolutely flawless, the performance of currently available wireless can be very good, allowing excellent results to be obtained.

Following the expert recommended steps mentioned below might ensure selection of the best system(s) for a given application.

1) Define the application: This definition should include the intended sound source (voice, instrument, etc.) and the intended sound destination (sound system, recording or broadcast). It must also include a description of the physical setting (architectural and acoustic features). Any special requirements or limitations should also be

noted: cosmetics, range, maintenance, other possible sources of RF interference, etc. Finally, the desired performance level must be defined: radio quality, audio quality, and overall reliability.

2) Choose the microphone (or other source) type: The application will usually determine which microphone physical design is required: a lavaliere or clip-on type attached to clothing, or a head-worn type, both for hands-free use; a handheld type for a vocalist or when the microphone must be passed around to different users; a connecting cable when an electric musical instrument or other non-microphone source is used. Other microphone characteristics (transducer type, frequency response, and directionality) are dictated by acoustic concerns. As mentioned earlier, the microphone choice for a wireless application should be made using the same criteria as for a wired application.

3) Choose the transmitter type: The microphone choice will usually determine the required transmitter type (handheld, bodypack or plug-on), again based on the application. General features to consider include: antenna style (internal or external), control functions and location (power, muting, gain, tuning), indicators (power, battery condition), batteries (operating life, type, accessibility), and physical description (size, shape, weight, finish, material). For handheld and plug-on types interchangeability of microphone elements may be an option. For bodypack transmitters, inputs may be hardwired or detachable. Multi-use inputs are often desirable and may be characterized by connector type, wiring scheme and electrical capability (impedance, level, bias voltage, etc.).

4) Choose the receiver type: For reasons mentioned in the receiver section above, diversity receivers are recommended for all but the most budget-conscious applications. Though non-diversity types might work well in many situations, the insurance provided by diversity and true-diversity receivers against multipath problems is usually well worth the somewhat higher cost. Other receiver features that should be considered are: controls (power, output level, squelch, tuning), indicators (power, RF level, audio level, frequency), antennas (type, connectors), electrical outputs (connectors, impedance, line/ microphone/headphone level, balanced/ unbalanced). In some applications battery power may be required.

5) Determine the total number of systems to be used simultaneously: This should take into account future additions to the system: choosing a system type that can only accommodate a few frequencies may prove to be an eventual limitation. Of course, the total number should include any existing wireless microphone systems with which the new equipment must work.

6) Specify the geographic location in which these systems will be used: This information might help avoid possible conflict with other establishments that use frequencies within the same bands that are marked for other communication applications and technologies.

7) Coordinate frequencies for system compatibility and avoidance of known non-system sources: Consult the manufacturer or a knowledgeable professional about frequency selection and integration of the planned number of systems. This should be done even for single systems and must certainly be done for any multiple system installation to avoid potential interference problems. Frequency coordination includes the choice of operating band (VHF and/or UHF) and choice of the individual operating frequencies (for compatibility and avoidance of other transmissions). For fixed locations choose frequencies in unused TV channels. For touring applications, it may be necessary to carry additional systems on alternate frequencies, though this is only practical for a small number of channels. The preferred approach for touring is to use frequency-agile (tuneable) units to insure the required number of systems at all venues.

8) Specify accessory equipment as needed: This may include remote antennas (1/2 wave, 5/8 wave, directional), mounting hardware (brackets, groundplanes), antenna splitters (passive, active), and antenna cables (portable, fixed). These choices are dependent on operating frequencies and the individual application.

Setting up the System

Perhaps the most crucial aspect of setting up a wireless system is the manner in which you mount and place the receivers. Proper placement of receivers involves both mechanical and electrical considerations. Mechanically, wireless receivers are usually designed to be used

like other standard rackmount products. The electrical concerns are possible RF interference and possible hum or other electrical noise induced in the audio circuits. Receivers should be kept away from RF noise sources such as digital processors, computers and video equipment. They should also be separated from large AC sources such as power supplies for high current or high voltage equipment as well as lighting dimmers, fluorescent light ballasts and motors.

If wireless receivers are mounted in racks with other equipment it is best to place them with low-power analog devices nearby and potentially troublesome devices farther away or in a separate rack. In particular, if other wireless transmitting devices such as personal monitor transmitters or wireless intercom transmitters are used, it is strongly recommended that they be mounted in a different rack. Antennas from these transmitters should also be at a sufficient distance from receiver antennas. Obviously, if receivers are placed in metal racks or mounted between other metal devices it will be necessary to make sure that antenna function is not compromised.

Setup of receiver antennas involves first the antenna-to-receiver interface and then antenna placement. The simplest case is a receiver with the antenna(s) permanently attached. Receivers with non-detachable antennas should be placed on an open surface or shelf, in line-of-sight to the transmitter, for proper operation. They are often not suitable for rack mounting except perhaps as a single unit at the top of a rack and then only if the antennas are mounted on the front of the receiver or can project through the top of the rack.

A receiver with detachable antennas offers more versatility in setup. In most cases the antennas attach to the rear of the receiver. If the receiver is to be mounted in a metal rack the antennas must be brought to the outside of the rack. Some designs allow the antennas to be moved to the front of the receiver, while others provide an accessory panel for antenna relocation. Again, the receiver should be mounted high enough in the rack so that the antennas are essentially in the open. Here are some general rules concerning setup and use of receiver antennas:

1) Maintain line-of-sight between the transmitter and receiver antennas as much as possible, particularly for UHF systems: Avoid metal objects, walls, and large numbers of people between the receiving antenna and its associated transmitter. Ideally, this means that receiving antennas should be in the same room as the transmitters and elevated above the audience or other obstructions.

2) Locate the receiver antenna so that it is at a reasonable distance from the transmitter: A minimum distance of about 5 meters is recommended to avoid potential intermodulation products in the receiver. The maximum distance is not constant but is limited by transmitter power, intervening objects, interference, and receiver sensitivity. Ideally, it is better to have the antenna/receiver combination closer to the transmitter (and run a long audio cable) than to run a long antenna cable or to transmit over excessively long distances.

3) Use the proper type of receiver antenna: A quarter-wave antenna can be used if it is mounted directly to the receiver, to an antenna distribution device or to another panel, which acts as a ground-plane. If the antenna is to be located at a distance from the receiver, a half-wave antenna is recommended. This type has somewhat increased sensitivity over the quarter-wave and does not require a ground-plane. For installations requiring more distant antenna placement or in cases of strong interfering sources it may be necessary to use a directional (Yagi or log-periodic) antenna suitably aimed. Telescoping antennas should be extended to their proper length.

4) Select the correctly tuned receiver antenna(s): Most antennas have a finite bandwidth making them suitable for receivers operating only within a certain frequency band. When antenna distribution systems are used, receivers should be grouped with antennas of the appropriate frequency band as much as possible. For the VHF range: if the receiver frequencies span two adjacent antenna bands, the longer (lower frequency) antennas should be used. If the range spans all three antenna bands, one long antenna and one short antenna should be used (no middle length antenna). For the UHF range: receivers should only be used with antennas of a matching range.

5) Locate diversity receiver antennas a suitable distance apart: For diversity reception the minimum separation

for significant benefit is one-quarter wavelength (about 30 cm. for VHF and about 10 cm. for UHF). The effect improves somewhat up to a separation of about one wavelength. Diversity performance does not change substantially beyond this separation distance. However, in some large area applications, overall coverage may be improved by further separation. In these cases one or both antennas may be located to provide a shorter average distance to the transmitter(s) throughout the operating area.

6) Locate receiver antennas away from any suspected sources of interference: These include other receiver and transmitter antennas as well as sources mentioned earlier such as digital equipment, AC power equipment, etc.

7) Mount receiver antennas away from metal objects: Ideally, antennas should be in the open or else perpendicular to metal structures such as racks, grids, metal studs, etc. They should be at least one-quarter wavelength from any parallel metal structure. All antennas in a multiple system setup should be at least one-quarter wavelength apart.

8) Orient receiver antennas properly: A nondiversity receiver should generally have its antenna vertical. Diversity receivers can benefit from having antennas angled 45 degrees apart. Yagi and log-periodic types should be oriented with their transverse elements vertical.

9) Use the proper antenna cable for remotely locating receiver antennas: A minimum length of the appropriate low-loss cable equipped with suitable connectors will give the best results. Refer to the chart presented earlier. Because of increasing losses at higher frequencies, UHF systems may require special cables.

10) Use an antenna distribution system when possible: This will minimize the overall number of antennas and may reduce interference problems with multiple receivers. For two receivers a passive splitter may be used. For three or more receivers active splitters are strongly recommended. Verify proper antenna tuning as mentioned above. Antenna amplifiers are not usually necessary for VHF systems but may required for UHF systems with long cable runs.

Real World Challenges in Setting up a Wireless System

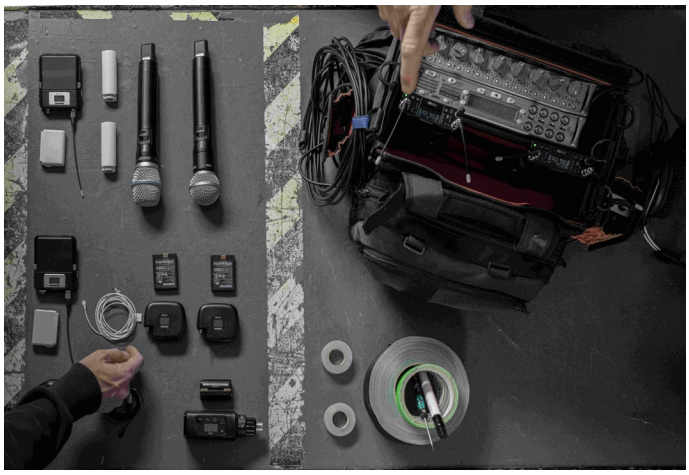
While the aforementioned points offer a rather concise approach to some of the fundamentals in ensuring that a wireless system is setup appropriately to assure optimum performance; the fact still remains that the task of achieving 'wireless perfection' in real-world scenarios is laced with a multitude of challenges.

Manish Mavani, director of Sound & Light Professionals – one of India's leading technical solution providers for live events of all scales and sizes – measures up some of the common on-ground challenges as he informs, "A majority of the events lack precise planning at various stages of the event life-cycle – be it production or venue construction or even execution for that matter. This in-turn results in crippling limitations when it comes to finding the optimum location for a technical service vendor to place the RF antennas. At the same time, this also impacts the service providers' capability to plan for a precise and efficient cable management between multiple levels of the supply chain. Then there's also the aspect of ensuring that the artists / end users are briefed appropriately in terms of the right way to use the RF Transmitter. For example - how to hold a Handheld Radio Microphone, how to check if the transmitter is powered off or on mute while entering stage, how not to point microphone capsule toward a stage monitor, and how to ensure belt back transmitter antenna is in line of sight to the main RF antenna signal path… Needless to say, these are crucial aspects of that have a direct impact on the level of complexity involved in executing a flawless wireless system setup."

Technologies to Ease

"When we consider about our end users, many are demanding for easy but reliable application, especially in the professional audio industry. Users want solutions which will not fail them at critical moment but also make

their jobs easier. This is why Shure continuously develop an integrated solution that incorporates both hardware and software capability/ features into our wireless system" states **Vick Teoh, senior specialist, Market Development, SHURE Southeast Asia**; as he shares how brands like SHURE have keenly noted user-feedback to develop and integrate new features within their product offerings. Vick notes some of the key points taken into consideration in the development of new wireless technologies include key aspects such as enhancing portability/convenience, allowing for better integration/ inter-changeability, offering more battery options, and allowing for easier and more efficient toggling capabilities. Referencing portability and convenience, Vick explains that SHURE's wireless transmitters not only consist of the traditional Handheld, Beltpack type for users to roam freely, but the brand also has boundary and gooseneck wireless transmitter microphones that allow users more portability options for conferencing. In terms of better integration/inter-changeability, the brand's interchangeable capsule for handheld wireless transmitters, such as SM58, Beta58, KSM11 enable users to apply different applications for optimum performance, while the new ADX5D wireless receivers are also compatible with professional broadcasting cameras, DSLR, mobile mixers in the market. At the same time, it is learnt that all of Shure's wireless transmitters can be powered via Alkaline batteries or Shure rechargeable batteries; with digital wireless mic systems like the SLX-D, QLX-D, ULX-D, Axient Digital all being operable via AA batteries or optional rechargeable batteries with charging station. On the other hand, some digital wireless mic series like the G-LXD & ADX series are also available with lithium-ion batteries, while the MXW wireless transmitter features in-built lithium-ion batteries for ease of usage. Vick also asserts in terms of the receiver hardware, that the form factor plays an important role in affording ease of toggling the menu button, safe lock capabilities, the receiver display etc. Audio protocols such as Analog/Digital audio (Dante or AES3) provides more scalability and options to be integrated onto existing systems, while models like the SLXD is available in single/dual, whereas the ULXD is available in single, dual or Quad, as all these receivers are crucial in terms of rack mounting options.



Shure wireless solution

More crucially the brand has taken a keen interest in reinforcing its software value proposition within the wireless system domain, as Vick explains, "For software, we do have the Shure wireless workbench, Microflex wireless software that enables monitoring of the TX/RX status, remote management and many more features. What's best is that it is free to download! Wireless Workbench 6 lets you remotely monitor and manage every piece of gear connected to your system without interrupting the production. Frequency calculation and analysis for supported devices allows you to coordinate the entire show from one application. The Timeline feature even lets you track RF data and review it later. Advanced Zone Management makes calculating and organizing frequencies for large or distributed environments more manageable. With this much control in your grasp, wireless freedom always moves the performance forward."

In the same stride, Sennheiser affirms that the brand makes it a point to be in close contact with various end user groups before and during the development process of any major product offering; mainly to ensure that they're intimately familiar with what end users like and don't like in interacting with a wireless system. The brand's market relations team reportedly spoke to a dozen of bands and found out that band members are often multitasking and therefore need something that

works right away without having to scan a venue for frequencies, set input gain etc. This invaluable input helped Sennheiser to develop a mobile application called the Smart Assist App that does all the planning and guides users through the set-up. It is essentially an engineer in the pocket so that the end users can focus on what they need to do on stage instead of sweating over other details.

"For the longest time, wireless systems have been an exercise in problem solving. Coordinating frequencies, setting input gain, and changing settings remotely are just a few of the many challenges that come along with traditional RF technology" cites **Kenan Phang, Radio Frequency Engineer, Sennheiser Electronic Asia**, as he continues, "Since the launch of Digital 9000 in 2012, Sennheiser has been delivering true on one of the main philosophies of our digital wireless microphone system -Spectrum Efficiency. Sennheiser's Digital 6000 and Evolution Wireless Digital (EW-D) family also inherited this same philosophy. They have higher channel density with maximum signal reliability. They are also intermodulation-free and assures through its equidistant frequency grid excellent spectral efficiency and the simplest frequency configuration– even in the toughest frequency environments where other systems already fail. With this, traditional frequency coordination is no longer needed. This is especially so for the EW-D family, where the set-up workflow is further simplified with new features as well as the Smart Assist App. Then in June last year, Sennheiser launched the Evolution Wireless Digital that is designed to solved these problems and bring simplicity to wireless. It gives you the freedom to move, makes set-up times faster and it's a perfect solution for schools and corporations looking for an easy wireless solution that has superb audio quality. More recently i.e. last month, we announced our exciting plans to expand the EW-D family of radio microphones. Named EW-DX, the new microphone systems will inherit family features such as lowest latency on the market, equidistant frequency spacing and ultra-wide input dynamic range – and add new, compelling capabilities. These include additional transmitter and receiver options such as Dante versions, automatic multi-channel RF set-up, scalable remote control and monitoring as well as AES-256 encryption for secure transmission of contents."

Sennheiser EW-DX family

Keeping up with the evolution of customer preferences, Audio-Technica has also presented technologies with enhanced capabilities that allow technical service providers for live events a greater level of efficiency and flexibility while working on-field. The brand recently released the all-new 3000 Digital UHF series which features 60mhz of tuning bandwidth, HD mode, AES256 encryption with additional layer of pin code lock for added wireless audio security. True Diversity & advanced hybrid modulation design ensures robust audio signals & quality. In HD mode, up to 24 channels work simultaneously within one 6mhz channel space. Plus, the Audio-Technica Wireless Manager Software allows efficient management of wireless channels by managing frequency coordination, device monitoring and real-time field check. 5000 series receivers also feature antenna loop out to connect a pair of antennas to cascade up to 8 receivers, connecting a total of 16 channels.

Adwin Lin, pro-audio sales manager, Audio-Technica (S.E.A.) Pte Ltd elaborates on some of the key take-aways of the new capabilities as he shares, "Audio-Technica's new generation 3000 & 5000 series feature a 'Smart Frequency hunter', wherein the receiver is able to

Audio-Technica 3000 series

perform a spectrum scan on the fly. And with 3 levels of scan filtering, it offers the cleanest available channels. Also, based on the strictness of the scan, it automatically kicks out channels that face certain levels of noise interference. Triggering a back-up channel is also a great feature that these next generation mic models have. With a press of a button on the transmitter, the transmitter & receiver automatically switch to a clean back-up frequency. Plus, the all-new Wireless Manager features a new Graphic User Interface that allows advanced tools with everything a RF Engineer needs to ensure an efficient and easy-to-use workflow."

Key Purchase Considerations

There are a number of different wireless microphone systems available in the market; which is why it's even more important for potential buyers to do a thorough research before purchasing one.

Offering an experiential insight, Manish lists the following technical features as his personal purchase considerations:

1. Channel Quality Meter
2. Dante Output
3. Long Battery Life
4. Streamlined Management Software
5. Battery warning indicator
6. True audio quality
7. Networked charger bay
8. Long RF Range
9. Quadversity receivers
10. Frequency diversity
11. Real time spectrum scan
12. Changeable power output of the transmitter
13. True digital diversity
14. Multiple zone antennas

Adding to these, potential buyers might also want to consider the following points before choosing the to purchase their next wireless system:

Price: There is always a trade-off between the price of equipment and the value for the price. If the system is intended to be used constantly, it be would beneficial to invest in better-quality gear even if the price is higher.

Durability: The construction build that uses all-metal pieces is usually found to be superior to any devices that are made from plastic.

Noise Floor:The noise floor of a cordless microphone is the sound that the equipment makes when recording silence. You'd ideally want the noise floor to be as quiet as possible.

Simultaneous Mic Use Capability:There are systems for a single cordless microphone, dual-mic systems, and systems that can accommodate four or eight devices. If you have a smaller system, you may run into a problem when adding a second system if it uses the same transmission frequencies as the first one.

Warranty: It is advisable to invest in systems that come with at least a one-year warranty. Also, ensure that the purchase is made from a trustworthy source with a physical presence in your city/state that provides warranty repairs.

Audio-Technica

Sennheiser

Shure

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The smallest professional studio condenser microphone is now modular!

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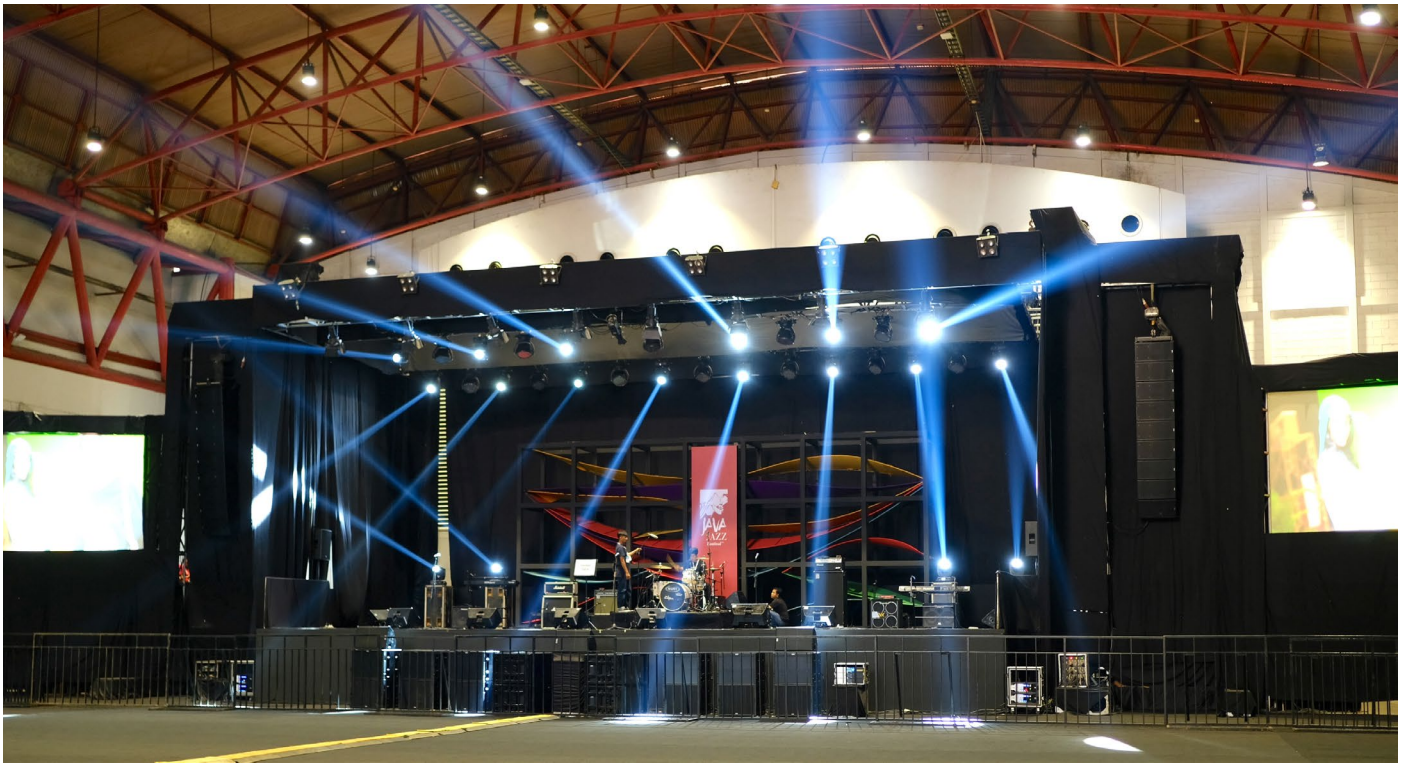
INDONESIA

NEXO Jazzes Up Former Aeroplane Hangar with Even Coverage and Frequency Directivity

DSS Sound Systems turned to NEXO and Yamaha for help with complex acoustic challenges in this one-of-a-kind location for what may be the largest jazz festival in the Southern Hemisphere

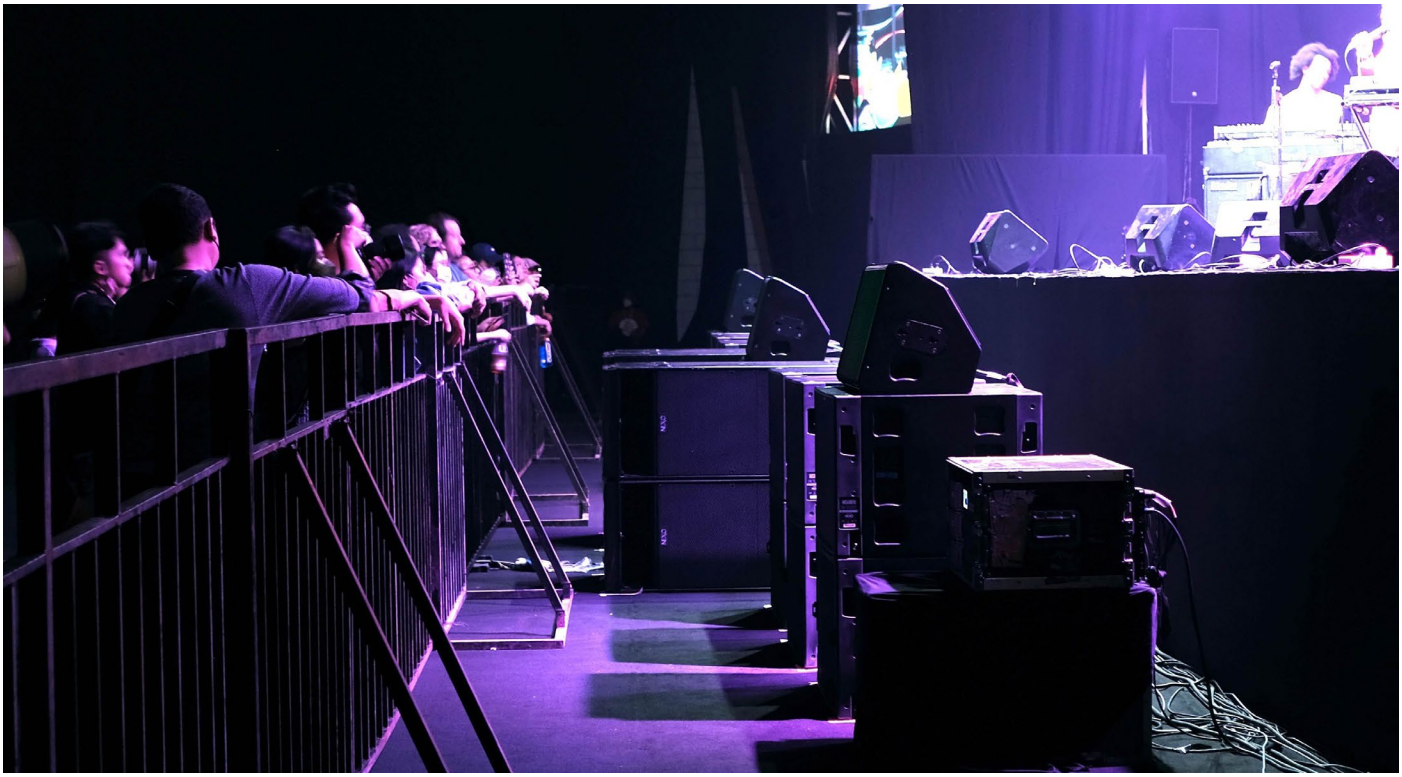


Since its inauguration more than 15 years ago, the Java Jazz Festival has established itself as a yearly staple in the Indonesian entertainment calendar. As one of the largest jazz festivals in the world, Java Jazz draws the most influential figures in the music and sound industries for both business and pleasure. The festival was forced to take a break due to Covid but made a triumphant return to the Jakarta International Expo Kemayoran with musical acts performing on a total of nine stages.

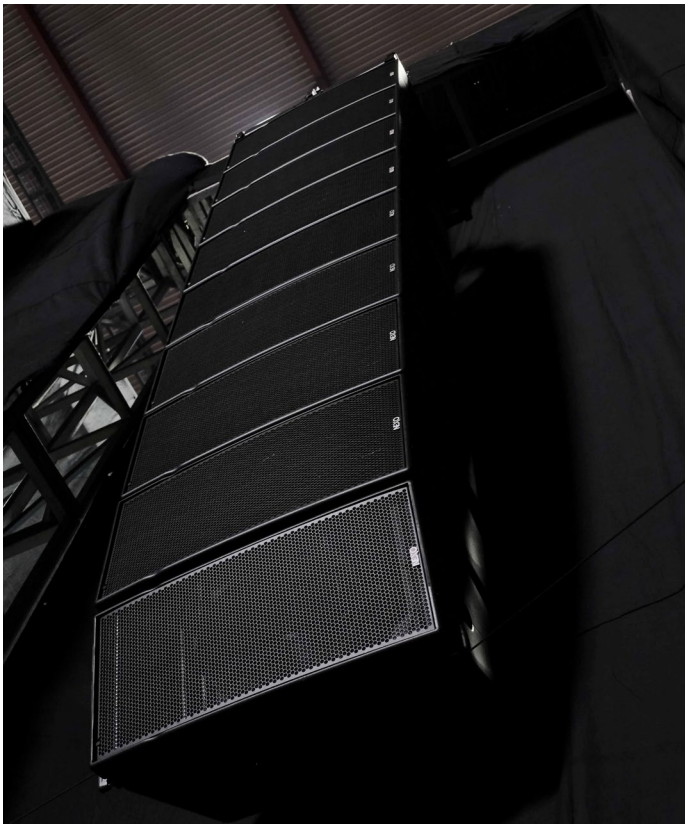
The GRAB Hall, a former aeroplane hangar, was one of the festival's most challenging acoustic environments. Local rental company DSS Sound Systems deployed a NEXO GEO M12 line array with support from local distributor Yamaha Music Indonesia Distributor's (YMID) the technical team.

Ryan Indra Kusumah from YMID explained, "With no acoustic treatment on the concrete walls or domed ceiling, the room generates a lot of unwelcome resonance at certain frequencies, making it very difficult to achieve both clarity and impact from the sound system. But the NEXO system was able to overcome the challenges and performed brilliantly."

With Yamaha Rivage PM7 and CL5 consoles mixing FOH and monitors, the full system comprised of two hangs of



9 x GEO M12s, with 12 x MSUB18 and 4 x RS18 subs, and 4 x PS15s as front fills. Amplification and processing came from 5 x NEXO NXAMP powered controllers.



“Using a NEXO system of this scale in a hall measuring 38x35 meters obviously gave us plenty of headroom, but our first consideration was to achieve even coverage and frequency directivity control to tame the acoustic problems evident in such a challenging environment” commented Norman Hajadi, the system engineer appointed to oversee the system.

“We deployed the subs in [a] cardioid configuration after modelling the system and venue in NEXO NS-1 simulation software” explained Gabriel from YMID’s on-site technical team. “The result was spot on and, with only minor adjustment, worked perfectly to minimise low-end bleed onto the stage while distributing low-end energy evenly throughout the venue.”

“Kudos to the NEXO NS-1 simulation that so accurately predicted the coverage of the system within the hall” concluded YMID tech team member, Edmonds. “Following the system we designed in NS-1, we flew the speakers and were ready to go. With slap-back avoided, we could direct SPL precisely where we needed it.”

NEXO

CHINA

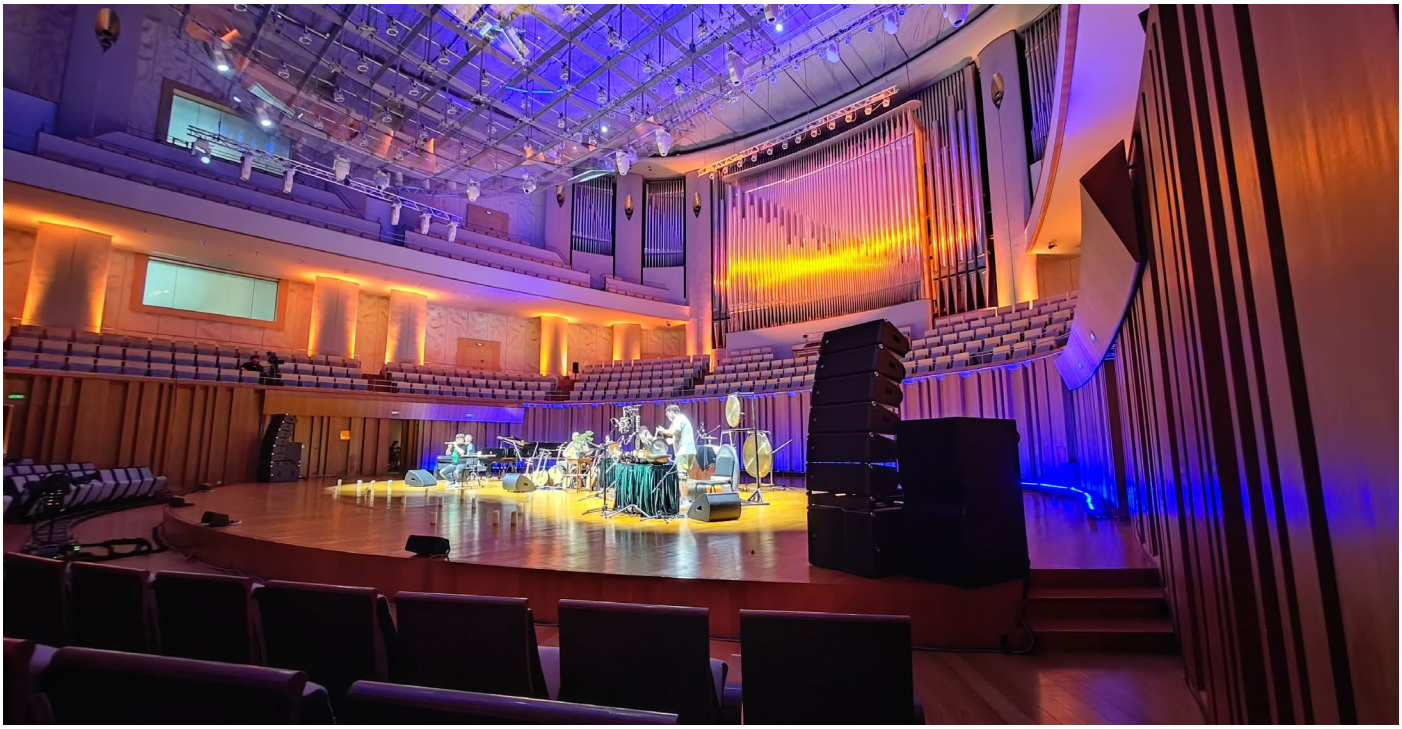
ViRAY Delivers Clarity for Spellbinding Performance at NCPA in Beijing

Tongbo takes CODA Audio up and down the mountain

The National Centre for the Performing Arts in Beijing is the largest theatre complex in Asia. Known colloquially as 'The Giant Egg', the Centre houses an opera hall, music hall, theatre and art exhibition halls, as well as restaurants, shops and other ancillary facilities. CODA Audio's Chinese distributor, production specialist Tongbo, regularly provides systems for key events at the prestigious venue, and having last year supplied a CODA N-RAY system for the Chinese Peking Opera Arts Festival, returned this summer to meet another interesting challenge.

Feng Mantian a prominent virtuoso on the four-stringed Chinese instrument the zhongruan, delivered an ambitious performance based on the theme of 'Up and Down the Mountain', drawing inspiration from China's rich cultural heritage. First conceived in 2018, the show, which featured The Mantian Orchestra, was honed on an extensive world tour before returning to the Beijing stage for this gala evening.

The nature of the eclectic performance, which also featured wind instruments, keyboards, percussion and electronic elements blended with singing and spoken voices, demanded crystal clear audio that could faithfully represent the wide diversity of sounds and styles to be covered. From jazz and rock to classical and poetry, 'Up and Down the Mountain' covered the full spectrum of audio for which Tongbo this time supplied a system based around CODA Audio's ViRAY line array.



The ground-stacked ViRAY system was supplemented with CODA's SCP Subwoofers with HOPS5 and HOPS8 point source speakers as fills. CUE ONE and CUE TWO three-way stage monitors completed the system.
David Webster, Global Marketing Director for CODA Audio commented: "To see CODA Audio systems in use again at one of China's most high-profile venues is fantastic and is a great testament to the work of our distributor Tongbo. The second half of the performance was designed to be staged entirely in the dark, with Feng Mantian and the other musicians delivering an unscored, unrehearsed improvisation. Under those circumstances, the audio system becomes the audience's only link with the music, so the sonic detail needed to be outstanding. By every measure the show was a huge success and we're very proud to have been a part of it."

CODA Audio

AUSTRALIA

The P.A. People Activate Significant Communications Network For Vivid Sydney 2022

Some 600 digital two-way radios over 44 talk groups on the Orion network were deployed

The drone show at Vivid. Photo courtesy of Destination NSW.

The P.A. People are no strangers to large scale public events, and in May 2022 the team were called upon to create what is possibly one of the world's largest temporary event communications networks and a significant audio system in Cockle Bay for Sydney's iconic Vivid Sydney festival.
Vivid Sydney is the largest festival of Light, Music and Ideas in the Southern Hemisphere, transforming Sydney's CBD into a fusion of creativity, innovation and technology for 23-nights, from 27 May to 18 June 2022.

This year the program featured the longest continuous Light Walk in the festival's 12-year history, spanning eight kilometres from the Sydney Opera House around Circular Quay, through the Rocks and Walsh Bay, Barangaroo, Darling Harbour, Cockle Bay and Tumbalong Park, Darling Quarter, Darling Square, the Goods Line and Central Station.

Along the Light Walk, the temporary event network provided a comprehensive IP backbone to support the distribution of content for a series of LED wayfinding signs, cameras, an emergency paging system, and centralised Sound Pressure Level monitoring. The network was based on existing in-ground dark fibre cable, temporary tactical fibre and a range of high-capacity wireless links, to achieve a high availability and resilient topology.

The network also supported the provision of internet services for both staff and various light installations,

The P.A. People also provided the audio system to support Oracle Liquid's Sydney Infinity liquid and light show on Cockle Bay.

as well as connectivity to the 'cloud' for real time data analysis to support event operations.

As part of the communications package, in addition to the network and various end points around the event footprint, The P.A. People also provided a comprehensive communications framework to support the event team. Some 600 digital two-way radios over 44 talk groups on the Orion network were deployed, interfaced with a large Clear-Com Eclipse matrix intercom system comprising some 60 key stations installed in six separate event control rooms across the city. The intercom system was also extended with a FreeSpeak II Full Duplex system and additional Key Stations at the Overseas Passenger Terminal to provide production intercom for the opening night 'First Light' Welcome to Country and Performance and the Paramount+ Drone Show at Vivid Sydney – the largest in the Southern Hemisphere

Meanwhile back in Darling Harbour, a second team was busy providing the audio system to support Oracle Liquid's Sydney Infinity liquid and light show on Cockle Bay. Comprising some 24 Bose SMS118 subwoofers and 48 Celto CMP10 10" coaxial cabinets the system was powered from just 6 Linea Research M44 amplifiers. "It was a privilege to be involved in the delivery of this years' Vivid Sydney Festival. After more than a year of planning and a couple of postponements, it was great to be able to get out and deliver the network and systems

Central Station Vivid Reflections by The Electric Canvas Art Collective.Photo courtesy of Destination NSW.

to support the Vivid Sydney production team, particularly given the crowds that came out in record numbers this year" commented Dom Jones, The P.A. People's Project Manager for the event.

Vivid Sydney will return in 2023 from 26 May to 17 June. For more information go to www.vividsydney.com

The P.A. People

ETA SPOTLIGHT is a heart-to-heart with industry professionals from across Asia, as they discuss their foray into the business and their journey thus far, while sharing their honest opinions about key aspects like market trends, technology, upskilling and more…

Brief about yourself.

My name is Paul Collison. I run a creative design agency in Sydney Australia. We specialise in lighting design and motion graphic content design. I've been involved in the lighting industry for 30 years.

What got you interested in getting into the industry?

I started playing music in bands and soon developed a keen interest in the visual aesthetic. I started spending time with the tech guys who would set up a PA or bring some lights. I'd bring candles and other light sources to band practice. Looking back, it was clear I was always going to end up in this world. It was never a conscious decision and it was probably many years in before I realised it could actually be a career for me.

What do you feel about the industry?

Terms like "the industry" are funny because I see so many variances in what we do from country to country and genre to genre. I love working in Australia and Asia, particularly as we are less focused on single genres. I can do a corporate show one week, an opera the next and a music awards show the week after. I love the variety and change of perspective working in different areas. Working in different countries, I love the passion brought to the table in countries with less money to spend on projects, and the resourcefulness of people with less means. I often find that process more creative, than projects where money is thrown at problems rather than creative solutions.

What is your most memorable experience and why?

My most memorable experiences are often people based. I've come to realise in life that the journey we're on is more important than a destination. By that I mean, working with good people and good experiences is far more important to me rather than working on a big show that doesn't have those things. I remember doing a stadium show in Abu Dhabi for the opening ceremony of the Gulf Cup. I was employed just after the producers were, with less than 40 days to show day. We pulled together as a team and managed to deliver a spectacular show in such a short period of time. Again, this was with great people that made the long days and nights worthwhile.

What was your worst experience and why?

My worst experiences are also people based. Being knee deep in water in Bangkok on an outdoor fashion show was miserable, but fun. It's not those experiences that make for bad days. Bad days are with people who don't appreciate you, or are belligerent or ignorant. I've learned to be careful to make sure I'm working with good teams.

Tell us about serious challenges you have had at work and how did you resolve them?

The biggest challenges I find are time related. Balancing multiple projects and deadlines is a fundamental part of what we do, but when multiple projects overlap, it can get quite stressful. Learning to employ people, delegate and not over manage people is a skill I've definitely had to learn. Technical challenges always have a solution. If you look hard enough and try to see things from different angles, then a solution will always appear.

Having said that, sometimes things just go bad. I remember doing a corporate fashion show outdoors, it started to rain and a drop of water landed on the grandmaster fader. This was before fancy consoles where one could disable to master, suffice to say. That show ran at 62% for the whole night.

How exactly has the evolution in technologies impacted your line of work?

I am so glad I learned my craft in the 90's. I learned a lot of fundamental lighting skills like understanding of colour temperature, lighting angles etc. Skills that I find are often lacking in present times because of the proliferation of automated lights. Sure these lights make life easy, but if they're not located in the right spot to start with, then you'll have problems. Lighting control has come such a long way. I love getting down and dirty in complicated workflows to find solutions for lighting/video and audio control. That's definitely something we do a lot of.

What are the products / technologies that are absolutely crucial to your workflow? Do you have a personal favourite among them? If so, please let us know why.

There are several pieces of software crucial to our workflows. Vectorworks and its integration via MVR to Depense2 has rocked our world. Depense is an incredible visualiser. Far superior to anything we've used in the past. We can very quickly export flythrough renders of a high quality for client presentations.

Cuepoints is our first port of call when we're given music for a show. We can create all of our lighting cues, special effect cues and media server cues here. Exporting from Cuepoints then directly into GrandMA3 for lighting control and Pixera for video playback has saved us hours and hours of work.

In your line of work (specialization), have you noticed any new trends in terms of workflow / technologies etc that you feel could revolutionize the future for specialists like yourself? If so, please us know.

Certainly in the live events and corporate worlds, even in fashion shows, there is a focus on making sure everything looks great on an iPhone. In days gone by, we'd only care about the photographers pit on a fashion show. Now, we have to light for not only that, but every guest position too. It makes some jobs quite challenging. Thank goodness phone cameras are getting better and better now.

Over the years we've had to become networking experts as more and more of our systems become IP based.

Control over the internet is something we all delved in to during the lockdowns. We supplied video content and lit a show in Japan from Australia all over the internet. It's opened up a whole new market for us now that was previously not accessible because of the huge costs in travel and accommodation. We certainly learned a lot during those lockdowns.

Do you have any Hobbies outside of work and what is it?

In a way, I'm kind of cursed that my hobby is my work. So the lines are blurred between work and play. On the flipside, I rarely, if ever, wake up not wanting to go to work.

Highlight any professional training or certificates.

I left high school and went straight to work. At that time there were very few educational institutions in our part of the world that specialised in the broader aspects of the entertainment industry. There are some great course and institutions now that provide good training, however, in my opinion, there is no substitute for real world experience. I find that people coming out of these course, undergo a year or two of adjusting what they've learned to real world applications.

What did you do during the COVID-19 period?

Work obviously stopped completely when Covid first hit. Television really saved us during the period. We also diversified to producing corporate web based events. Trimming overheads and embracing some time off was important for me. I felt like I knew from the start that Covid was going to be at least 12 months before things got back to normal. So I made a point of embracing the time off.