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The Australian connection



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Yamaha 01x • AKG 414
X-amp • A+H ML 5000
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\$10,500 competition
• See page 43

EQ



Our cover features this great picture by Adam Pratty. The Olympics Opening Ceremony story is our main feature this issue.

• Note re. Bambi - the cover girl on our last issue. Bambi actually never did work at Juliusmedia. To suggest she did was artistic license, or just a non-care lie. Apologies to her mom.

Winner!

Diane Parks from Mount Annan Christian College has subscribed and wins a training course worth \$2,625. (Details: page 43)
Subscribe and win!

Lighting for video
Worship Technology: • Tech Tips
• In Ears • Lighting for Church
Who's Left? Fry reviews the sound of The Who
Safety: big bang, wind and weights
Walter Gerin dies
Behind Swampy's Auction

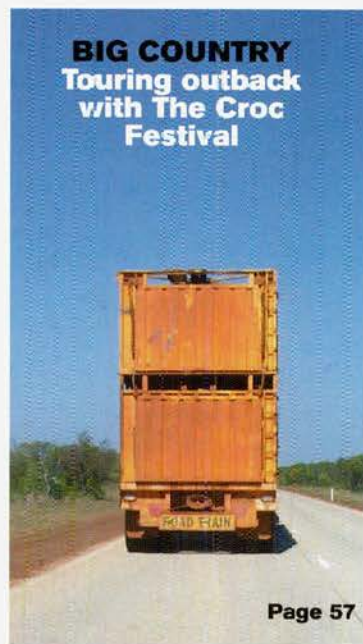
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Big Country

Along with the big gig Olympics, we celebrate the big country in this issue.

Flying back home on Lauda one time, I heard the captain had an Aussie accent. Being pre September 11, I got the purser to deliver my AOPA pilot card to the cockpit. I got invited up. That doesn't happen any more.

The 777 was flying over Derby - up north in W.A. on the great circle route to Sydney. From 39,000 feet, we looked at the empty horizon across the vast, enormous Tanami desert.

"There it is, the GAFA", said Captain Kev. "GAFA? What is that?" asked Marco the Austrian first officer, a quizzical look on his face.

"It's the Great Australian f - a!" replied Kev.

Many of us in the entertainment biz have travelled Australian roads. We quickly learned geography.

We often called from a public phone box to give some advice to the entertainment agents who had set our schedule. Those calls were never nice.

I got a call to join the Croc Festival tour and teach indigenous kids some show skills. The tour covered more kilometres than any other recent tour. We baked in Weipa, got wet in Geraldton, and froze in Port Augusta.

Croc Festival is the love child of Peter Sjoquist who runs the Rock Eisteddfod. He has a burning passion to help Australia's indigenous. Many do. Few know how to.

We had ideas about helping our indigenous brothers. We now have even better ideas, and are working really hard to get some people out of remote places and into the entertainment industry.

Would you, or someone you know, be interested in hiring a terrific indigenous dude or dudette on a government funded traineeship? Hopefully we can facilitate this now. We have a vision to bring some people down east and to sponsor them. Can you help us do it? We need work for them, and travel cost donations. Get in touch. Send money.

Croc takes a performing arts festival on the road, to 8 far flung towns. Everything is trucked on road trains. Tough miles for the drivers. Tough conditions for the gear.

I saw how trashed the rig was at the second town, Katherine. The road from Weipa has about 1000k of dirt. Much of it is corrugated. The driver says he averaged 40kph on some of it.

I'd flown to Broome, and driven to Derby to advance our Croc training. I got to meet some locals. Then I flew to Darwin the next day.

It gave me the chance to have dinner with Colin West and his partner Kerrie Alterator.

They run Top End Sound, which has a spin off called Top Event Services. I was real impressed at what they are up to.

Then I drove down to Katherine to meet up

with John Grimshaw, Juliusmedia's lead trainer. The road has no speed limit. I discovered a Toyota Avalon will do 190. I backed off to 140. The road was excellent. I saw a lightly loaded freight train on the new railway to Darwin. I read it costs 4 grand to send a container by rail from Melbourne to Darwin, then by sea to Singapore. The article said it was cheaper to ship a container all the way from Melbourne. The Darwin rail trip saves less than 2 days. I wonder if the rail line was worth the money?

I did the loadout in Katherine. The show came down at 9 and we worked until about midnight. We came back ten hours later and it was already hot. By lunch the black Pro Stage elements were too hot to handle.

Everything worked at about two thirds the speed I remember from the old days. OH&S rules and safety awareness slows things down. We don't run any more, we walk.

James the production chief was methodical, he had a certain way he wanted the trailers loaded. Mid afternoon I took a car full of trainees back to Darwin.

They put some rap on the CD player, and we cruised in the afternoon sun. We were all filthy from the dust and sweat. A roadhouse came up, we bought some drinks. They dozed and I struggled to stay awake to Darwin.

I flew down to Perth, then back up to Geraldton. Air connections in the west are less than convenient. Geraldton was clean and blue and green. I met the Queens Park Theatre boss Brian Robertson. He gave me his perspective on running a subsidised performing arts centre. He also had some negative entertainment agent stories.

Western Australia doesn't have a lot of performing arts venues.

To get to Port Augusta I needed to go back to Perth, then overnight in Adelaide. The next day dawned cold and wet. I got a truly shocking early call to say my mum had suddenly died in her sleep, so I raced to the airport. Qantas let me change my Sydney ticket, but only after I asked nicely twice. The first time, the agent wanted me on a midday flight. I needed to move. I got on at 9.30, landed at 11.50 and then struggled 40 minutes through the long term car park routine.

I desperately needed to get to the family. It took until 1.30pm to get there. A 6 hour trip.

Then I had to wrestle with the grief, the funeral, and the business backlog. Plus oversee our Croc Festival work from afar. Afterwards I set about making this issue, which we delayed for the Olympics story.

I'm blessed with terrific people around me. They look out for me, and take as much off my shoulders as they can. They tell me when I'm wrong. Thanks guys, I really do love you.

- Julius Grafton, editor

NEWS



ARX EarDriver

NEW: An ultra compact headphone amplifier joins the AudiBox range. EarDriver comprises two sets of Stereo inputs feeding two channels of headphone level outputs. Channels 1 and 2 are AutoLinkæ into Channels 3 and 4 unless other inputs are jacked into 3 and 4, allowing upto 4 separate headphone outputs. All with separate level control.

www.arx.com.au

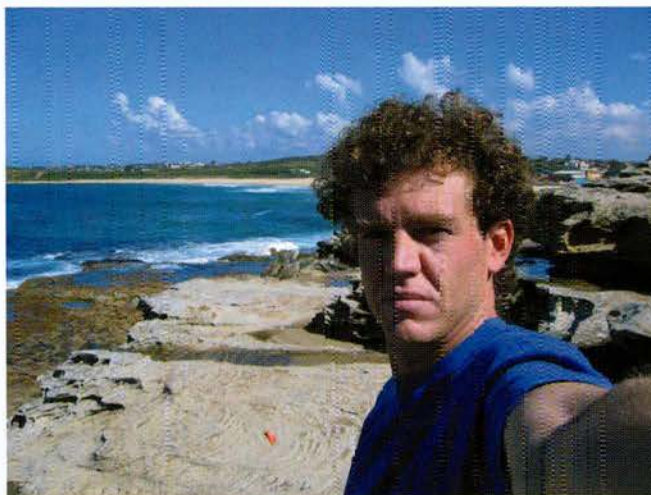
John Walsh Joins Jands

John Walsh has been appointed

Account Manager Broadcast and Production at Jands, who are now exclusive agents for Clear-Com in Australia.

Walsh was initially contracted to Jands to ensure the transition of the Broadcasting agency between the two companies. Jands were originally the Clear-Com agents for staging and Theatrical.

Jands are currently contracted to the Sever Network to build the internal infrastructure of their new Martin Place Studios, including; Lighting Control, Grids and Hoists.



Jeremy Ireland

The Australian Audio Supervisor for "Survivor" has been nominated for an Emmy award: "Outstanding Sound Mixing for Non Fiction Programming (single or multi camera)" Survivor - All Stars.

The All Stars series aired recently on the 9 network.

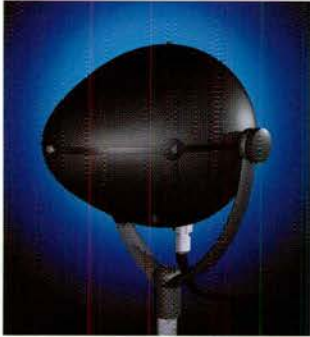
Jeremy Ireland (pictured, above) first became involved with Survivor when the production was shot in Australia near Cairns

in late 2000. With the success of that series they then went on to shoot in Africa, Tahiti, Thailand, Brazil, Panama (twice) and Vanuatu which was completed this month. They are gearing up to shoot Survivor 10.

Great photo!

Interval at Festival Theatre (SA) at a recent Kasey Chambers show. Pic by Neale Mace of Entertainment Installations.





Surround Sound Mic

Amber Technology has been appointed as Australian distributor for the Holographic H2-PRO surround sound microphone system.

The H2-PRO's unique elliptical shape incorporates a total of 8 x miniature microphone transducers from DPA Microphones. This design approach emulates the characteristics of the human head, allowing sound waves to "bend around" it to provide a amazingly accurate spatiality, a wide imaging and natural directivity

www.ambertech.com.au
www.holophone.com

Ashly - Protea 24.24 Matrix Processor

Ashly Audio adds the Protea 24.24M to the Protea System.

This new box (matrix) provides up to 24 channels of audio matrixing and processing. The base unit offers a four-input/four-output configuration. Each input and output expansion card has an individual DSP processor allowing you to expand the base unit's total inputs or outputs four channels at a time. These cards are easily installed in the field without the need to reprogram the device.

www.syntec.com.au



Gearhouse loads up on New Sony DVW M2000 VTR

Gearhouse Broadcast has recently purchased 125 Sony DVW M2000 machines.

The new VTR's offer high quality digital betacam recording, they are multiformatted and are smaller, more lightweight than DVW-A500. The M2000 machine is the redesigned successor of the DVW A500

The M2000 now accommodates for playback of all formats: Betacam, Betacam SP, Betacam SX and MPEG IMX as well as digital betacam. With longer head life, it is a more reliable unit when used in a 24/7 recording format.

Operational set ups can now be stored on the new memory stick this enables a once off setup allowing a faster handover. The record time has been extended to 124 minutes using the L cassette and 40 minutes S Cassette.

The new Sony DVWm2000 machines are available for hire at Gearhouse Broadcast on either a 4 for 7 day rate or daily. Call +61 2 9313 3100.

"Wally Box" found at Madison Technologies

THE Broadcast industry's famous "Wally" Box has finally gained a real identity thanks to Australian owned technology specialists, Madison Technologies.

'Wally' features a 10 pair IDC module, breaking out to 10 XLR connectors. It has a parallel RJ45 socket for XLR's one to four.

Its big brother, 'Big Wally' incorporates 2 by 10 pair IDC modules breaking out to 20 XLR connectors, which are also paralleled to 5 RJ45 sockets. Call +61 2 9748 1911.



MAXIM REVIEW MISSED MANY FEATURES

Last issue we ran a review of the LSC MAX M lighting control desk, and managed to mislead our readers. We did a disservice to LSC, and are happy to put the matter straight.

'We said: "...the max m does not have a built-in effects generator"

In fact, the maxIm DOES have a very powerful shape generator capabilities. Its a very straight forward operating system and offers a lot of features not generally found at this price level. Programming Fan effects, shapes and times together creates a myriad of creatable looks.

Further, we then said: "...The maxIm comes with a Quick Reference Manual..."

The maxIm with PaTpad actually comes with a maxIm Operating Manual, a PaTpad Operating Manual, the Quick Reference Manual and an Interactive Training CD-ROM.

The CD-ROM runs through all the main programming features

and functions from simple patching through to complex scene generation. Each topic consists of a short concise video with voice over, showing the desk and simulated lighting rig

LSC produced it, knowing full well that no-one reads the hard copy manuals. It is ideal for self learning, training seminars and demonstrations and of course - Product Reviewers!

Some of the other advanced features of the Maxim which were not mentioned in our review:

- Individual timing (move, delay and flags) for each parameter
- Fan functions that not only controlling position, but also move times and delay times
- Interactive templates - show you correct operation of any DMX channel even though modes may have changed (not offered on any other console we know of).

CX wish to apologise to LSC for these omissions and for our incorrect assumptions.

DISSOCIATIVES LIGHTING DESIGNER

Last issue we credited Chris Upjohn with the lighting design for the Dissociatives tour. In fact Hugh Taranto designed the lighting and employed Chris as the programmer and operator.

CX apologise for the error.



NEWS



SSL & Amber Form Australian Distribution Partnership

UK console manufacturer Solid State Logic, has appointed Amber Technology as exclusive distributor for Australia & New Zealand.

Solid State Logic is the world's largest manufacturer of professional analogue & digital audio consoles for music, broadcast, post production & film.

"We are extremely pleased that Amber and SSL will now be working together in the Australian and New Zealand markets," commented Amber's Professional Products Manager, John Fitzpatrick.

New products for SSL include the AWS900 Analogue Workstation System (above), C100 Digital Broadcast Console and XLogic SuperAnalogue onboard processors.

Niall Feldman, SSL's Director of Product Marketing said "Amber's experience and understanding of the Pro Audio market in Australia & New Zealand make them an ideal fit to bring these new products to the region."

www.ambertech.com.au

Enttec's New & Improved DMXPlayBack Remote

Enttec's new DMXPlayBack Remote (below) makes controlling DMX light shows as simple as pressing a button. You can even change the show with a TV remote!

Long-time Enttec users will be already be familiar with the DMXPlayBack Remote, which as

the name suggests, is a Remote controller for Enttec's DMXPlayBack and DMXStearmer DMX show recorders.

The PlaybackRemote gives one-touch control of up to 12 separated light shows, not just lighting states, stored in either the DMXPlayBack or the DMXStearmer.

The DMXPlayBack and DMXPlayBack Remote is the perfect team for bars, cafes, trade show booths and retail environments, where some lighting control is required but a lighting operator is not justified.

www.balarcedtech.com.au

Clay Paky lights up projects

The latest news from Clay Paky is the completion of several high profile lighting projects for Sydney's hospitality industry.

Both the Huuq nightclub at Parramatta Leagues Club (below) and Club Troppo at Central Coast Leagues Club have new lighting.

Maintenance Manager of Parramatta Leagues Club Kevin Keeble comments: "The new lighting has given a tired environment a new lease of life. The Clay Paky system has offered us more flexibility with a more responsive control system. The patrons love it."

Head of Audio Visual at Central Coast Leagues Andrew Clow says: "Staff members have reported that the transformation is unreal, with a new look that has created a very exciting atmosphere."

www.totalanceprojects.com



Turbosound's New Aspect

Turbosound's flagship Aspect, the high-efficiency sound reinforcement system, has launched worldwide. Seen first at ENTECH this year, the four-model Aspect series is capable of generating peak SPL in excess of 146dB with very low distortion.

It utilises in-house-designed transducers, which operate over four frequency bands divided between the system's modular mid-high and low frequency enclosures, and which all feature high-stability neodymium magnets.

Among the new system's most innovative developments are the Polyhorn waveguides - these are employed for the design's high frequency and high-mid frequency bands, and comprise equal-path-length, multi-section waveguides that create a phase-coherent wavefront.

The Polyhorn concept allows individual wavefronts to coincide seamlessly with the physical curvature of an array. This approach minimises comb-filtering effects between adjacent cabinets and is responsible for the system's tightly focused point-and-shoot directivity. It is intuitively adaptable to the largest range of room-size and audience-coverage requirements, with easy scalability from small clubs to the largest arenas and stadia.

The Aspect series also features integral flying hardware, and offers dramatically rationalised sized mid-high and LF enclosures optimise truck packing.

www.audiotelx.com.au



Cadac Expands Products

New for Cadac: M16 Remote Mic Amp, and the production D16 Digital Input Mix Matrix. The M16 integrates Cadac's classic mic pre-amps into a 19" rack unit. The D16 provides a high quality 16 x 16 digital matrix with 96kHz 24-bit sampling and SHARC DSP processing, using proprietary Cadac mix, EQ and dynamics algorithms to deliver quality that matches the company's hallmark analogue sound.

www.cadac-sound.com

Res X Gobo Competition

As part of the 2004 Melbourne Fringe Festival, Resolution X is inviting entries for an open Gobo Design Competition. The winner will see their gobos projected at Melbourne's landmark Federation Square complex. The winning designer will also receive a \$500 Lighting Hire credit with Res X.

www.resolutionx.com.au



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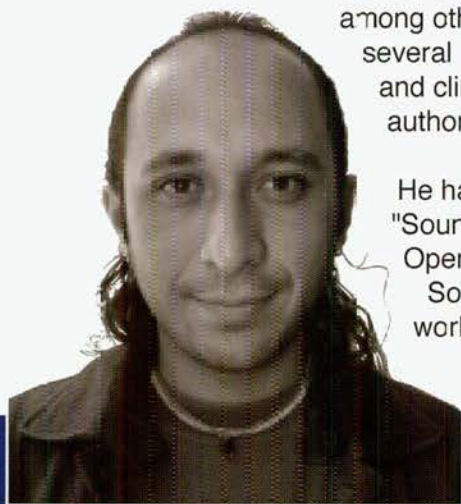
Thursday 7, October
Friday 8, October



Salvador Castañeda has studied myriad branches of audio in both Mexico and the United States at the Eerklee College of Music and the Meyer Sound SIM School, among others. He has worked as an FOH monitor, analysis and systems engineer for several internationally acclaimed performers. He has also taught courses, seminars and clinics on audio in more than fifteen countries across four continents. He is the author of the book: Procesadores de Audio (Audio Processors).

He had his first contact with Meyer Sound in 1997 when he attended the course "Sound Reinforcement System Design" in Mexico City, and the SIM System II Operator certification program in Berkeley, California. In 1999, he joined Meyer Sound as an instructor at the Meyer Sound Mexico School. At the side, he is working as an engineer and producer in his own label 4Raiz.

Salvador Castañeda



To register please visit www.meyersound.com.au and follow the links.



Inside the biggest show on earth

The Athens 2004 Olympic opening ceremony surpassed any live performance ever attempted. New technology, brilliant imagination, and military execution made it a flawless event.

CX takes you back stage for an exclusive inside look at how it was staged....

By Julius Grafton

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Athens 2004 Opening

The Olympic Stadium arena floor is the stage. There is apparently nothing there when you take your seats in the hour before the Opening Ceremony.

Little is known of what director Dimitris Papaioannou has planned. Secrecy surrounding Olympic Ceremonies is always incredibly tight.

All you can see is a lake. How and what will happen is puzzling. The International Olympic Committee always require their host country to feature a historical segment in the opening ceremony. But water?

First we need some history, to place this event into context.

Jack Morton Worldwide was appointed Producer of the Opening and Closing Ceremonies of ATHENS 2004 in January 2003.

The Jack Morton team was headed by Lois Jacobs: President, International, Jack Morton Worldwide; and David Zolkwer: Director of Jack Morton Public Events.

In December 2003, following the departure of the Executive Producer through ill health, Lois Jacobs invited Sydney based events supremo Andrew Walsh of Accolade Event Management to join the project.

Australians Mik Auckland and Nick Eltis joined the technical team late in January, as did Australian Producers Celia Smith and Antony Spanbrook.

The technical team was international in its composition- there were over 400 people on the

production and creative team.

WATER

The main performance area was taken up by an expanse of water 'supplied' by Stage One Creative Services (UK). Supplied in this context means Stage One invented the structure - the water itself came from the ancient lake of Marathon. Athens has a water shortage, like many modern cities.

It took 2,162 cubic metres of water (2,162,000 litres of water) to fill the lake in the stadium. The water covered an area of 9,645 square metres.

The lake structure comprised a plywood and fiberglass construction with a waterproof membrane in the concrete tray under the grating.

A 'doughnut' reservoir and a filtration system were installed underground, around the pit to store the water for the lake.

It took more than 4 hours to fill the lake, but less than 3 minutes to drain.

There were ten drainage valves, each 0.5 metres in diameter and capable of handling a flow of up to 3000 litres of water per second.

The water represented the beautiful seas that surround Greece, and reflected the nation's ancient relationship with the oceans.

THE OPENING SEGMENT

400 percussionists marched on, with a massive smashing of synchronised drum beats. 24 EAW

*Water and fire,
sound and light
- all came
together in a
massive way in
the first few
minutes. But
the best was yet
to come.....*





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Athens 2004 Opening



subwoofers were flown in clusters. They reinforced the power and the impact of the segment.

The lights pulsed with the drum beats as the drummers circled the lake, playing the rhythm of the Greek dance "Zeimbeiko".

Now stationary around the lake, a flame signifying a comet was travelled to the surface of the water, which erupted into flames. The Olympic circles formed amidst the noise.

THE FIVE OLYMPIC RINGS OF FIRE

The rings were designed and engineered by FCT in Adelaide. They were installed under the lake. Gas was allowed to bubble to the surface in order for the flames to float on the water.

The rings burnt natural gas supplied from the Athens gas mains. Notification had to be provided to the gas company to ensure that there was an adequate supply available when it was needed.

It took approximately 1km of piping to feed the gas to the rings.

400 drummers surround the lake as the air moves with massive low frequency waves. The lights pulse.....

The 5 blazing fire rings were each 17.5 metres in diameter or 58 metres in circumference.

With the crescendo of percussion, the segment ended with an aerial burst of pyrotechnics. Lights had already driven all eyes skyward. It was dazzling, and the senses struggled to return.

Then a serene and whimsical image appeared, a paper boat with a little boy on board. The tiny boat sailed smoothly, resembling the affinity with the sea.

The boat journey ended with the boy met by officials.

ALLEGORY : THE SPECTACLE IS REVEALED

This fable took viewers at the stadium, and on TV, on a trip through Greek history. A Centaur creature appears, part man, part myth, and brilliantly lit in red light throws an illuminated javelin. It travels through the air, towards an innocuous 10 metre wide pit in the middle of the lake.

This pit in the center of the performance space was 23 metres deep and 25 metres in diameter (10 meters in diameter at the surface) with a central lift that was capable of lifting up to 48 tons. All of this was not apparent to the spectator.

The javelin cued the next segment, which will go down in history as the most complex theatrical



The New Generation of Allen & Heath **MixWizard**

Allen & Heath's MixWizards have been the best-selling compact multi-function consoles in the world for many years, and are as popular now as when they were launched in 1997. They've been used all over the world, in hundreds of different applications, from church and theatres to pub bands and DJs.

So why have we changed them?

Well, we've been listening. Thousands of our customers have given us feedback on what they like and what they'd like to see improved and we've taken their comments on board. So, as it's the little things which make the difference, we've made small changes throughout the mixer to make sure that the MixWizard is ready for many more years at the top of the tree.

New MixWizards: WZ³ 16:2, WZ³ 12:2 and WZ³ 14:4:2

Performance improvements with new mic preamp design and more responsive EQ.

Extended PA possibilities with control of aux fed subs or new mono output fader.

Channel phantom power switches and signal indicators added.

Addition of a versatile 6x2 matrix on WZ³ 14:4:2.

User friendly options on aux sends and direct outputs.

XLR lamp socket. New display options.

Slimmer build.

Pluggable jumper links.

Easy service construction.

New meter moulding design.

Extra feet on connector pod.

Universal rack or desk mount.

Dual stereo channel routing modes.

New side trims for style and portability.

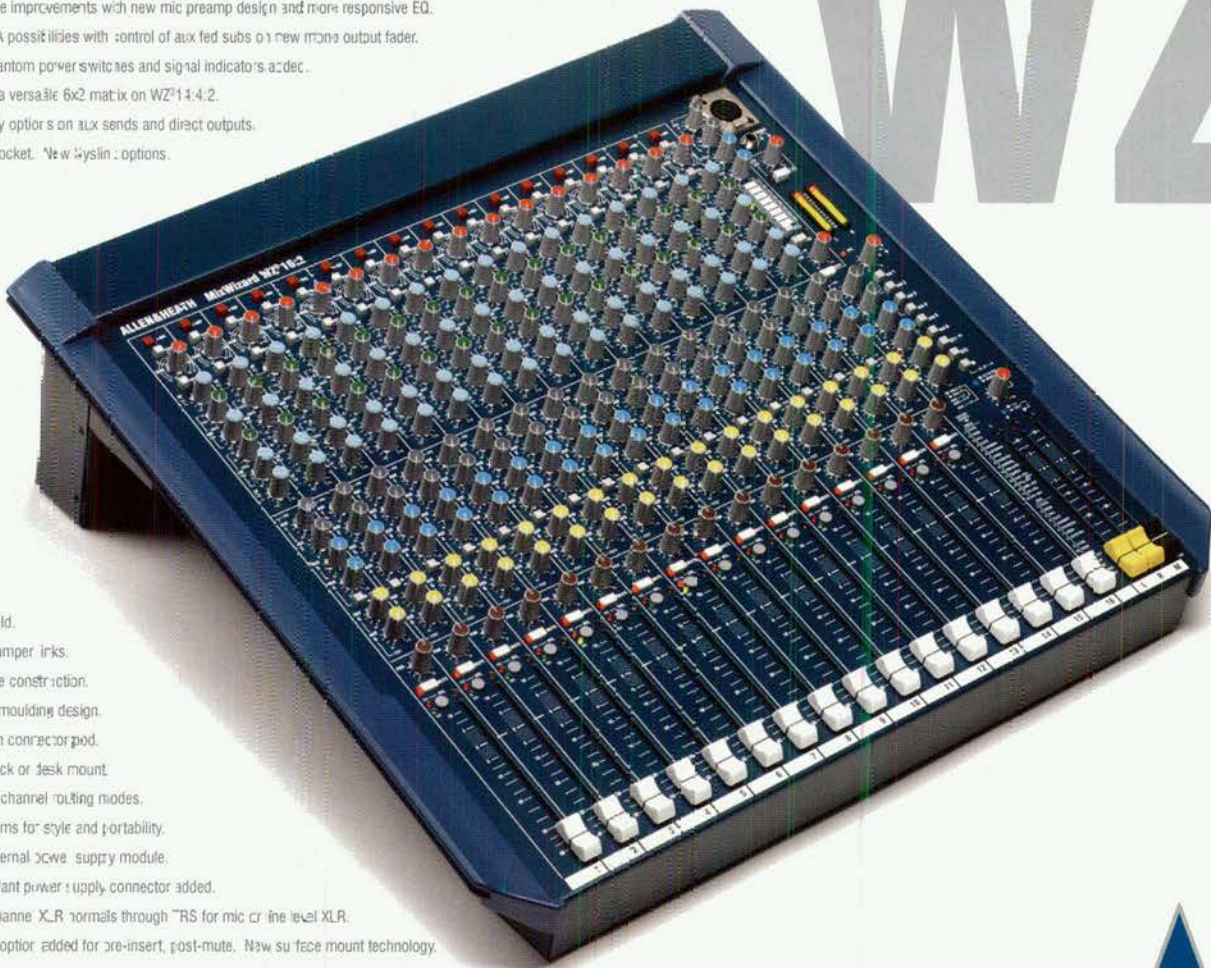
Separate internal power supply module.

Dual redundant power supply connector added.

Balanced channel XLR normals through TRS for mic or line level XLR.

Pre-EQ aux option added for pre-insert, post-mute. New surface mount technology.

WZ³



WORLD CLASS MIXING



4 BAND EQ



6 AUXILIARY SENDS



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Athens 2004 Opening

effect ever successfully attempted.

A giant 17 metre tall white Cycladic 'head' appears, raising from the pit. It came to rest, just above the water. The red lit Centaur looked on, as an amazing laser display projected on to the head.

4 lasers were used, supplied by Tarm Lasers of Germany. They projected a dazzling array of shapes and math formula, in tribute to great ancient Greek physicists and mathematicians.

But the best was yet to come.

The head then rose over the waters edge, and started to come apart.

This was where the complexity of the cable net aerial flying system became apparent.

FLYING LIKE NEVER BEFORE

The flying system was supplied and operated by Stage One Creative Services (UK) who deserve an award.

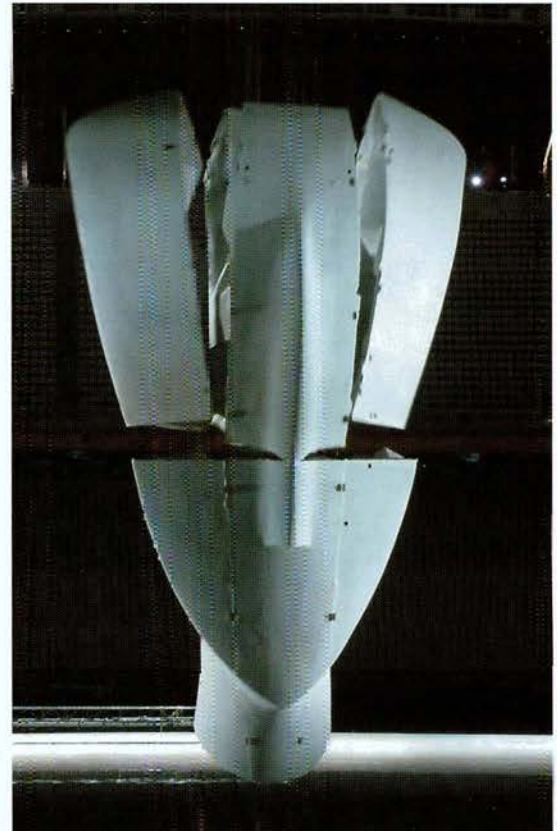
The sculpture reveal/break sequence occurred in 3 stages. The Cycladic (17.3 metres high, 9 metres wide and 6 metres deep) was made up of 8 pieces each weighing 1500Kg. They each independently flew apart to reveal Kouros – the middle piece (9 metres high, 2 metres wide and 2 metres deep) made up of 6 pieces each weighing 900Kg.

By now the crowd and the TV audience were paying



The head, stored in its silo (p t) at left. The start of the breakup sequence (below).

The giant 'Cycladic' head appears, and allows the lasers to break new ground.....



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DSR-PD170P

Whether you are making a short film, a documentary, or shooting for anything from the Web to television, the new DSR-PD170P gives you even hotter pictures than its predecessor.

Add to this a host of new features, new standard accessories, and the flexibility you expect from a professional handheld 3 chip DVCAM camcorder, and you've got one hell of an evolution.

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DSR-PD170P New Features:

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- Improved audio performance
- High precision iris control
- Zoom and record controls on top of the handle to improve handheld operations
- Professional wide angle lens adapter and lens hood included
- New standard lens hood with built in lens cap
- New precision colour Hybrid LCD for optimum performance in all lighting conditions
- Simultaneous viewfinder and LCD operation
- DVCAM and DV recording

DSR-PD170P with normal lens



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SONY

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high, 2 metres wide and 2 metres deep) made up of 6 pieces each weighing 900Kg.

By now the crowd and the TV audience were paying complete attention.

Kouros then flew apart to reveal yet another white statue form, named Classical. The final piece (5 metres high, 1.5 metres wide and 1 metre deep) was made up of 4 pieces each weighing 400Kg.

The Classical statue also flew apart. There were now 18 pieces all independently flown, and all moving outwards.

The combined weight of the sculpture structure was over 20 tonnes.

72 simultaneous winch movements were required to lift the head, with radio controlled remote hydraulic releases on catches to facilitate the break.

Large custom towers were built to support the primary cable net system, and anchored to the ground outside the stadium.

The secondary cable net provided the working platforms for the winch system main winch system.

In addition to flying scenery, the cable net was also deployed to fly 35 aerialists in one segment alone.

It took approximately 36 hours to rebuild the sculpture structure after each run-through of the sequence.

37km of 48mm steel wire rope was required along with 20Km of 8mm steel wire rope for the hoist hauling lines to make-up the cable net.

2 megawatts of power was required to run the automation system and 4 Km of 95mm power cable was required to power the cable net

32 x 30Kw hoists and 40 x 22Kw hoists were required with a maximum running speed of 3 metres per second in traverse and lift.

There were 18 separate aerial trajectories radiating outwards from a central hub which in itself weighed 3000Kg.

This segment was staggering in its technical and

engineering complexity, yet it flowed seamlessly and looked easy.

WHAT CAME NEXT

The 18 pieces all had radiated outwards. They settled a few metres above the lake, like celestial bodies floating in space. A male figure appeared, crouching on a white cube, a symbol of the earth. The man stood and began walking, the cube twisting and rotating beneath his feet representing man's evolutionary journey towards becoming a logical, spiritual being, searching for knowledge.

The galaxy of floating rocks surrounding the cube then rose into the air as the faces of the rock fragments were transformed through video into images of human faces and bodies – a celebration of the beauty and diversity of humanity.

THE VIDEO PROJECTION

The video images on the rocks were projected from projectors located around the edge of the upper level seating tier.

8 Barco XLM25 projectors were used to project imagery (in excess of 600 lux) at the rocks.

A High End Systems Catalyst head was installed on each projector with a custom built DMX trackball to allow an operator at each projector (the 'Rock Steady Crew') to track the moving rock with the images ensuring that the image was always centred on the rock with no overshoot.

The system was driven by 16 computers running "Watchout" to provide the playback and the masking for each individual rock. Each rock was digitally photographed, imported into Photoshop and then into Watchout to provide soft edge marking.

A surveillance camera was mounted on each projector to allow the replay operator and technical team to see exactly what was happening at each projector and on each rock.

Video projection equipment was supplied by Creative Technology (London).

This was the highlight of the sequence - moving rocks, with brilliant moving imagery, all transforming and informing, all on cue. Total eye candy.

Finally, the rock fragments lowered and came to rest in the water to represent the Greek Islands. Two lovers ran into the water, throwing off their clothes to play and swim in the 'sea', at which point Eros, the god of love, emerged from the water, flew above the lovers and out toward the edge of the scene to greet the next arrivals into the stadium.

CLEPSYDRA - A GRAND PROCESSION

Clepsydras were ancient clocks that measured units of time through the steady flow of water and sand. Here they symbolized the passing of time as depicted in a dream-like and colourful parade.

Depicting stylized figures brought to life from Greek frescoes, mosaics, sculptures and paintings; this was a chronological procession, atop a moving stage, of images ranging from prehistoric to modern times. Ten scenes of mythology, discovery, history and culture culminated with a final scene featuring the first Olympic Games

The cable net and flying system broke new ground and could not have been more complex!



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YOUR MUSIC



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PS-4HA

Active 12" 2-way loudspeaker

- 250W + 50W RMS E Amp
Class H Power Amplifier
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- 1 1/4" titanium compression driver
- Mic line input XLR combo, with XLR linkout
- Max SPL @ 1m: 121.5dB
- Frequency Response: 50Hz-20kHz +/- 10dB
- Weight: 23.5kg

For more information visit...

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atdnt@musiclink.com.au



Athens 2004 Opening

The rolling parade platforms were engineered and fabricated by Severn Lamb (UK).

The segment featured 11 independently operated rolling platforms. Each rolling platform comprised a tractor unit and six trailers. The total combined length of the platforms was 307 metres.

These rolling platforms had a combined weight-bearing capacity of 120,000 kg. The tractor units for each train ran on batteries. Once fully charged, each unit could run for up to 4 hours.

With the sounds of the operatic soprano Maria Callas filling the stadium, Eros swooped down to greet a pregnant woman, the final figure of the 'Clepsydra' parade.

She descended from her stage and moved into the water; her pregnant belly gently glowing as she waded into the water while a galaxy of lights submerged beneath the water began to radiate outward from her.

The stunning image at right was captured by photographer, Adam Pretty.

The picture below shows the lake, with hundreds of little lights under the way, with the still flown white rocks - statue parts - forming islands.

In ancient times, the stars in the sky were thought to be the milk of the Goddess Hera, wife of Zeus. Hera awoke to discover that an unknown baby, the son of Zeus, had been breastfeeding.

The baby grew up to be the hero Hercules and Hera's milk nurtured his immortality - the root of the expression 'the milky way'.

The lake was the focal point for the opening ceremony, and water gave the lighting designers something unique to exploit



THE LIGHTS

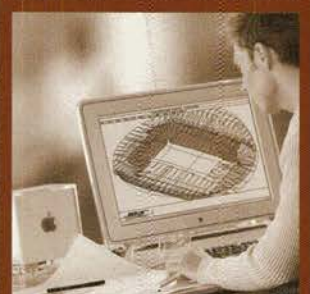
The absolutely stunning lighting design was by Eleftheria Deko and Robert Dickinson.

This was the largest single lighting assignment ever undertaken in history. Lighting equipment was



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How do you select a high quality sound system? The answer, quite simply, is with your ears. Once you hear a Bose® system, we're convinced you'll accept nothing else. The most respected name in sound, Bose® will make it easy to select your sound system with confidence. **And we can guarantee the results.** We have the experience and technology to create a sound system that's right for you. Your sound system design should be integrated into your plans as early as possible. That can save you time and money, and help ensure you get crisp, clear, lifelike sound for your venue, inside or out. Call now for your free consultation with a Bose® representative in your area.

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Athens 2004 Opening

supplied by Procon (Hamburg) and Vari*lite Production Services (London).

The specification included over 1700 moving lights, a mixture of Martin Professional, and Vari*Lite branded equipment. A 'moving light hospital' is shown at right.

The lighting system was controlled on 3 Virtuoso consoles, with 3 active backup consoles.

Some more Lighting inventory statistics: there were 300 par cans lighting the flags of nations.

26 follow-spots.

6 Space Cannons to provide upright for the cauldron.

A fibre distribution network was installed, with proprietary network interfaces and nodes.

Dimmer rooms like the one below were located in 2 different places around the stadium.

Over 84 truck movements were required to install and remove the lighting system, with over 70 crew plus loaders.

The crew was made up of teams from the UK, USA, Germany, Greece, Australia and Dubai.

20 generators delivered over 12 mega-watts of power to the ceremony. These were running 24 hours a day from early June.

Many areas were provided with dual supplies with



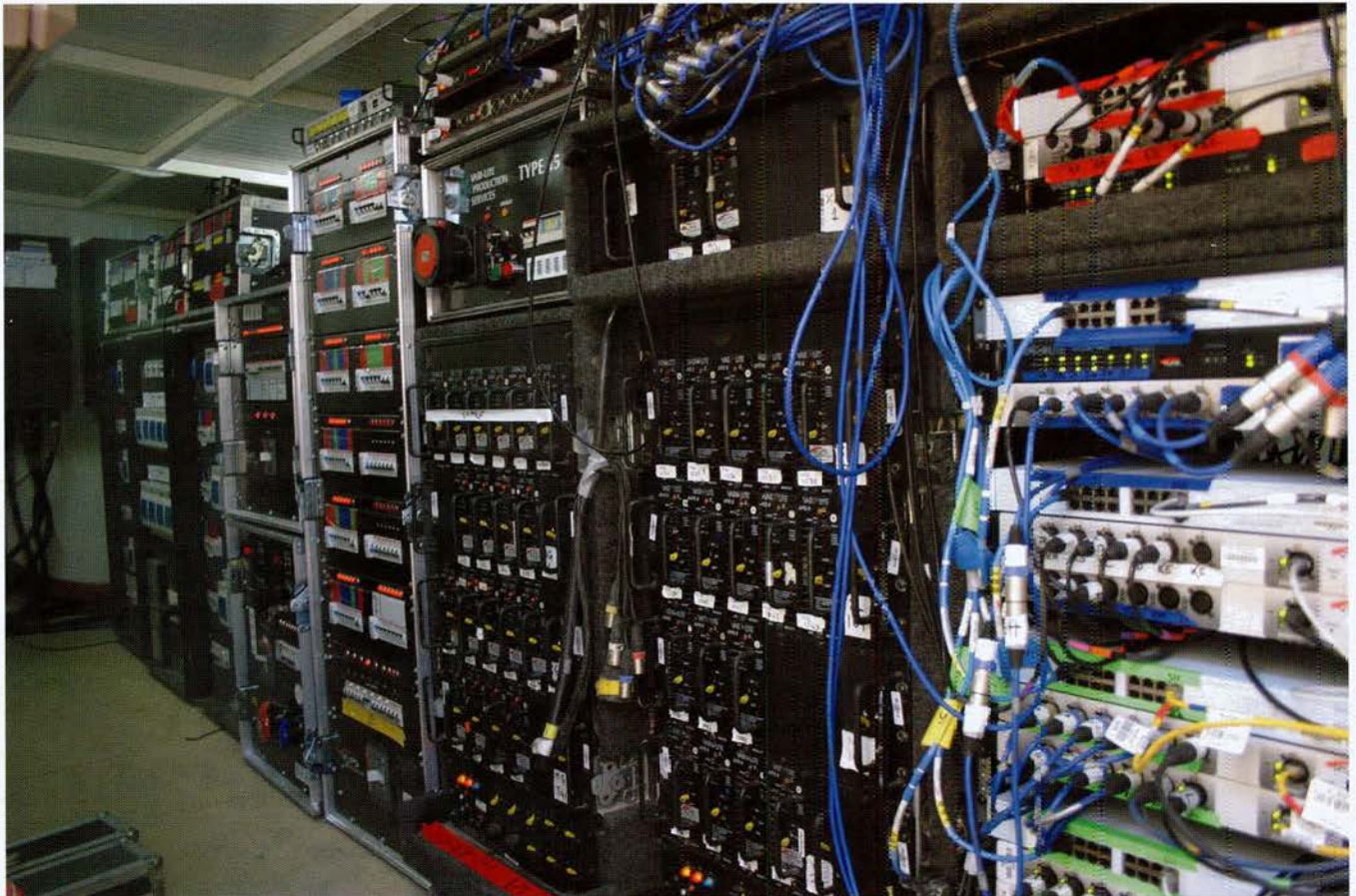
automatic change-over switches.

All critical elements, including all control equipment for every department (and all production office spaces) were supported with uninterruptable power supplies UPS. The radio transmission room could operate on battery power for over 1 hour 45 minutes ensuring reliable show communication.

COMMUNICATIONS

Communications equipment was supplied by The

The lake was the focal point for the opening ceremony, and gave the lighting designers something unique to exploit



A Perfect 10.4

10.4" screen size | 3D graphics | video capability | built-in 2-way audio | modern exterior

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Athens 2004 Opening

PA People (Sydney)

The specification included over 800 2-way radios on 44 channels.

There were 20 full duplex constant transmit repeaters and 8 simplex radio interfaces

Also used was a Clearcom 200 System with 67 key stations, plus over 25 party line or 4 wire interfaces.

Over 6500 FM receivers were used (across Opening & Closing); on 3 licensed FM broadcast channels allowing the cast to hear all the music and also live called cues. These are typically little 'throw away' battery operated radios. Each requires batteries - think about that.....

There were 2 high-speed laser date links, 8km of audio and data cable, and 1000 metres of 'tactical' fibre optic cable.

Chris Dodds from PA People in Sydney was in charge of the system and the implementation. He had a crew including up to 7 Australians on site.

A couple of 'comms' racks are shown at right, with obvious redundancy shown by the UPS or Genset direct power pathways.

RADIO FREQUENCY SPECTRUM

A total of 120 frequencies were licensed for Ceremonies use, (1,700 other frequencies were used across the Olympic Precinct).

Over 100 of the frequencies were changed from the initial allocation in the design phase between February and May.

On an event like this, usage of spectrum needs to be monitored by people who understand all possibilities. Production people use radio. Security people, police, and emergency authorities use spectrum. Broadcasters use spectrum. Your mobile phone uses spectrum. It is a potential problem, if any two frequencies, or nearby frequencies conflict.

The local authorities monitored spectrum throughout the rehearsal period and show day, providing



Audio For Houses of Worship From the Solution Factory

Mix • Critical Adjustment • Distribution • Remote Control • Power

Audio for a house of worship can be tricky. You need to get clean clear, controllable audio to every corner of the main room, which often includes a balcony (where sound has to reach into and below the balcony). Additionally, you need audio to feed the sanctuary, the nursery, and a possible overflow room. Ashly ensures that your equipment is completely compatible, providing a core solution that covers everything from mixing to remote control of each zone.



MIX:

MX-508 Mixer (8-stereo channels with Insert Points) - enough inputs for every "speaker in the house."



CRITICAL ADJUSTMENT:

DPX-200 Parametric EQ/Compressor (with built-in mic pre) - custom EQ adjustment and dynamics limiting to lavalier, handheld or lectern mics.



DISTRIBUTE/EQ/DELAY/PROTECT:

Protea 4.24G (4-channel graphic EQ) - digital graphic equalizer allows easy distribution to all zones, hands-on EQ for quick adjustments, delay for proper alignment, and built-in limiters.



REMOTE CONTROL:

VCM-88/RD-8 - anyone (even non-technical types) can control sound levels and microphones from any location in the house without interfering with the system's sound settings.



POWER:

PowerFlex 4400 - 400watts@4 ohms x 4 channels. All the power you need for every speaker location.

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Athens 2004 Opening



support and issue resolution where necessary.
But let's go back to the artistic segments.....

THE BOOK OF LIFE

The stadium was then bathed in sparkling stars as the audience activated their own lights to complete the picture before a huge mist screen rose from the center of the lake to reveal stars floating upward to form a spiralling strand of DNA which concluded the symbolic journey from man's first attempt to understand himself (the Cycladic Head) to his most recent and profound discovery – the decoding of DNA.

This was a most amazing effect - pictured above. A water curtain 24m high and over 50m wide provided the element onto which the 4 lasers were used for the DNA spiral effect projected onto the water curtain.

THE OLIVE TREE

All the performers assembled around the water as all the rocks rose and retracted back towards the center of the space.

As 'Asteri tou Voria', a song of journey and celebration was sung, the rocks formed a mountain crowned by an olive tree. They it all went back down into the pit, in order. An amazing end to a flying journey.

The lake was drained.

Then came the parade of athletes of the world. For the first time, athletes took a spiral route into the stadium and onto the 'field of play' – a reference back to the 'DNA' theme.

Musical accompaniment for the athletes' parade was provided by the famous DJ, Tiesto, twice voted number one DJ in the world by DJ Magazine. He is

Athens excels

What a town. Hot but bearable during the Olympics, it can snow something fierce in February. Some crew arrived from their southern hemisphere summer to find long johns and gloves were required.

The Athens Railway Metro worked better than almost any other rail system we have sampled. Trains ran every five minutes.

The media lead up to Athens 2004 was negative about whether Greece could stage the games. In Australia some media reports were so far off beam it angered some people working on Athens 2004. "It was disgusting, jingoistic crap", was one comment.

History has set the record straight.

Meantime, getting to Athens from Australia was most commonly achieved via the services of Gulf Air, who fly via Singapore and Bahrain.

The atmosphere in Athens is laid back, but things do get done. There seems to be a cafe on every corner, and during the games these were filled with people watching TV and of course smoking.

The complexity of the ceremony meant there were multiple points where if one thing went wrong, much of what should follow would not happen!





EX Series High-Definition Stand-Alone Active Speakers

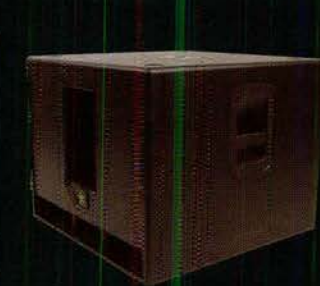


No other speaker this size can match the performance and resolution of the EX10. That's the beauty of an active loudspeaker design in which the amplifiers are perfectly matched to the transducers and every component is rigorously optimized. The EX 10 can be used as a full range solution or with the EX 2.2 and EX 2.5 Active Subwoofers. Both provide incredible, high quality, bass performance and total flexibility from a standalone, small footprint.



KV2 EX10 \$2995_{RRP}
500 Watt Extreme Resolution Speaker

- High-output, extreme resolution, compact full-range speaker system
- 125 dB sustained output with very high dynamic range and low noise floor
- Integrated active amplification and control electronics with 500 total watts of power
- Complete, on-board speaker system management system



KV2 EX2.2 \$3995_{RRP}
1000 Watt Dual 12-inch Subwoofer

- Active high output, double 12-inch, bass module
- 1000 Watt High-efficiency amplifier featuring current-enhancing switch mode technology with linear active filter
- High efficiency design delivers over 130dB output
- Complete, on-board subwoofer management including equalization, crossover filters, amplifier overdrive protection, output level, phase controls



KV2 EX2.5 \$4995_{RRP}
1600 Watt Dual 15-inch Subwoofer

- Active high output, double 15-inch, bass module
- 1600 Watt High-efficiency amplifier featuring current-enhancing switch mode technology with linear active filter
- High efficiency design delivers over 134dB output
- Complete, on-board subwoofer management including equalization, crossover filters, amplifier overdrive protection, output level, phase controls

ES Series High-Definition Stand-Alone Active Speakers



EPAK 2500 \$3995_{RRP}
2500 Watt Control & Amplification System for KV2 ES Speaker Modules

A four-way, active control and amplification system specifically designed for the KV2 Audio ES Series modular loudspeaker systems. It not only houses all signal processing and amplification but also controls allocation of power depending on the number of bass modules employed.



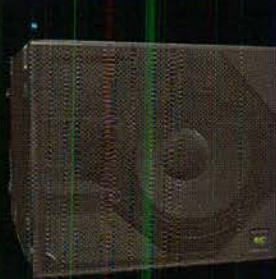
KV2 ES1.0 \$2895_{RRP}
Compact Active-Driven Mid/High Module

The ES 1.0 is a 3-way high output, active-driven, compact mid/high/mid-bass speaker module. It is designed as part of a sound reinforcement speaker system that includes the EPAK™ 2500 control and amplification system plus a variety of bass modules. Achieves extremely high output levels consistently and safely.



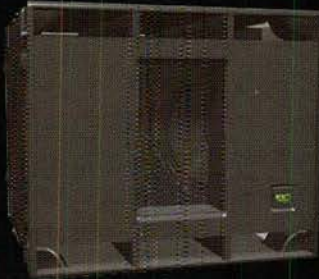
KV2 ES1.5 \$1695_{RRP}
Single 15-Inch Active-Driven Bass Module

- High-output, compact, lightweight Bass Module
- 126 dB of output (per unit) – 133 dB (when using 3 units)
- Acoustic loading via twin asymmetrical chambers.
- Fifteen-inch mid-bass driver with 3.00" (76mm) voice coil assembly and neodymium magnetic motor structure
- Professional, exterior grade Baltic birch construction with highly resistant polymer coating
- Acetal copolymer high impact, low friction feet are asymmetrically located on three sides allowing vertical or horizontal system set up, lock-in and easy cabinet movement
- Four internal corner braces with eight M10 suspension points. A total of 24 suspension points are available for custom installation applications



KV2 ES1.8 \$2495_{RRP}
Single 18-Inch Active-Driven Bass Module

- High-output, single 18-inch, Bass Module
- 129 dB of output (per unit) – 134 dB (when using 2 units)
- Acoustic loading via large-format low-distortion reflex port
- 18-inch Low Frequency driver with 4.00" (100mm) polyimide, high-temperature voice coil assembly & carbon fiber reinforced cone assembly
- Professional, exterior grade Baltic birch construction with highly resistant polymer coating
- Acetal copolymer high impact, low friction feet are asymmetrically located on two sides allowing vertical or horizontal system set up, lock-in and easy cabinet movement
- Six internal corner braces with twelve M10 suspension points



KV2 ES2.5 \$2995_{RRP}
Double 15-Inch Active-Driven Bass Module

- High-output, double 15-inch, Bass Module
- 134 dB of output (per unit)
- High acoustic loading via twin asymmetrical chambers
- Two fifteen-inch low frequency drivers with 4.00" (100mm) polyimide, high temperature voice coil assembly and carbon fiber reinforced cone assemblies
- Professional, exterior grade Baltic birch construction with highly resistant polymer coating
- Acetal copolymer high impact, low friction feet are asymmetrically located on two sides allowing vertical or horizontal system set up, lock-in and easy cabinet movement
- Six internal corner braces with twelve M10 suspension points

KV2 ES Series: An Overview

The ES Series is an embodiment of KV2's product philosophy. It is a compact and flexible speaker system with all the electronics and amplification housed in a separate, roadable unit called the EPAK 2500: four task-specific power amplifiers mounted on a massive heat sink. The control system incorporates electronic crossover filters, time correction, equalization, system protection, level controls and a unique bass management circuit that lets you control bass extension and attack. Placing the active electronics package outboard results in a lighter, easier to handle system with much more flexibility.



Time is Money



Optional Zone Controller Wall Panels

DriveRack™ 260

Time is money; and because programming time can be the difference between making and losing money on a job, we at dbx have created a self-configuring system processor, the DriveRack™ 260.

The DriveRack™ 260 is the only processor that offers the Wizard, an automated setup tool that loads the correct Filter and Gain settings for the speakers, manages gain structure and sets the output Limiters based on speaker and amplifier selection. The Wizard also provides an Auto-EQ function and our patent-pending Advanced Feedback Suppression™ algorithm for room tuning.

Built with the same philosophy as the other products in the DriveRack™ family, the 260 provides, "Everything you need between the mixer and the power amps." From the Input Mixer, EQ, and Feedback Suppression to the Output Routing, Delay and Dynamics, everything is there to meet your application's needs. The 260 even offers additional wall panel control for simple system management, such as zone volume and muting, or program selection. With all these features, the DriveRack™ 260 offers a single processor solution that is simple yet elegant for even the most complex applications.

Many products give you processing tools, the DriveRack™ 260 is the only one that saves you time by setting them up. For more information contact your dbx® representative, or download the software and specifications online at www.dbxpro.com or www.driverack.com. You owe it to yourself, because time is money.

Features

- 2x6 Configurable Audio DSP
- Advanced Feedback Suppression™ (AFS™)
- RS-232 PC GUI control
- 2.7 Seconds of Configurable Delay
- Graphic and Parametric EQ
- Classic dbx® Compression and Limiting
- Wall Panel Control Inputs
- Bandpass and Crossover Filtering
- Open Architecture Routing
- Setup Wizard with JBL® and Crown® Components
- Wizard Auto-EQ Function
- Security Lockout

dbx®

PROFESSIONAL PRODUCTS

The Professional's Choice In Signal Processing™

Source Four® Revolution™



Rotating Wheel Module



Color Scroller

Not just another moving light. A Source Four.

There has never been a moving light like this. Astonishingly quiet. Versatile, reliable and affordable. And best of all, brilliantly *Source Four*.

Acclaimed Source Four optics and lighting power with revolutionary modularity. Additional features and functionality when you want more. Designed specifically with theater in mind. Powerful automated lighting... for every performance venue.

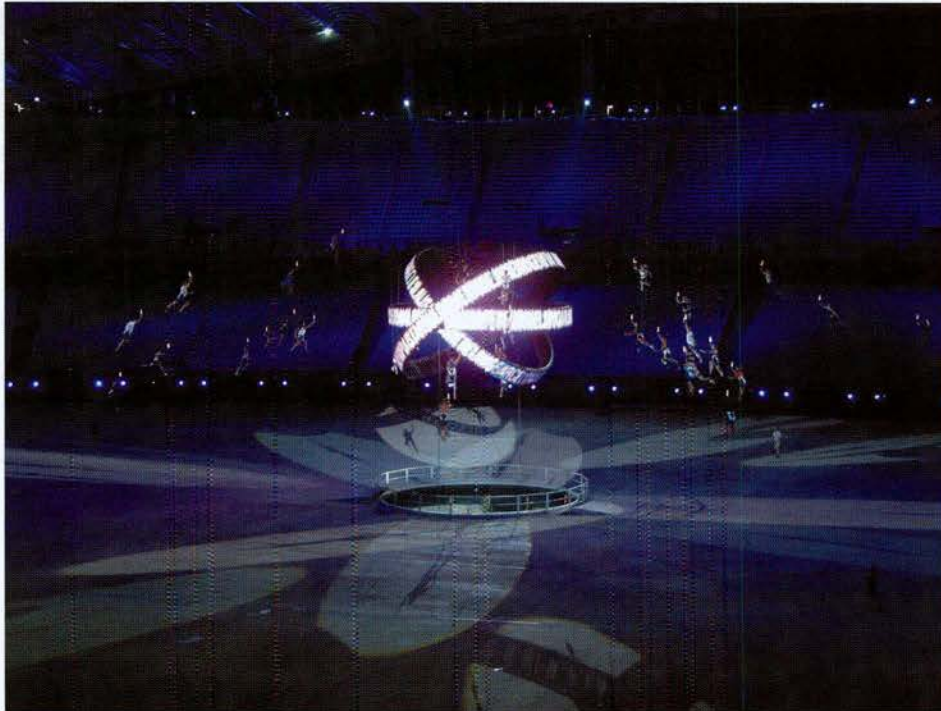
- QuietDrive™ silent automation
- Four optional modules:
 - Iris, Static Wheel, Rotating Wheel, and Shutter
- New QXL™ Quick-eXchange Lamp
- Global power compatibility
- 540° pan/270° tilt
- 16°-36° zoom focus
- Beam-edge control
- On-board dimmer
- Internal Media Frame
- Quick-change color scroller cartridge

Source Four Revolution, new from ETC.

For more information on Source Four Revolution, go to www.etcconnect.com/revolution/



Athens 2004 Opening



pictured (below) during rehearsal.

Then the performer known as Bjork appeared, set high above the athletes with her long dress reaching down to the ground. As she sang, her 'dress' extended out over the entire field covering all the athletes and an area of 99.781 square feet to reveal an image of the globe – the largest photograph ever printed.

A runner carrying a flag bearing the image of an olive branch entered the stadium and began his way around the stadium as the roll call of each previous host city was announced. At the mention of World Wars I and II, the runner stumbled and fell but recovered each time to complete his circuit and eventually break a ribbon as the Olympic host city, Athens, was declared.

Hovering above the athletes, a 'runner' was revealed and raced toward the center where three large concentric rings (loaded with LEDs, shown above during rehearsal with safety fence around the pit) representing the globe were revealed. Holding an illuminated baton to the 'globe' the word 'Olympia' was illuminated on its surface.

The single runner was then joined by 35 aerial "runners" who rose from the athletes to similarly touch the globe and illuminate the name of every other city the Torch Relay has visited en route from Olympia

to Athens.

A final 'runner' then travelled outwards from the center and descended to illuminate the word 'Athens' on the ground with the word pulsing like a heartbeat while the entrance of the Olympic torch to the stadium was announced.

The torch entered the stadium and the flame was passed among seven torchbearers before then being run along an avenue the length of the field through the athletes. The spectacular 102 foot long cauldron lowered to meet the torchbearer who ascended a staircase to light the cauldron which was then raised skyward – the ultimate Olympic symbol of peace.

As the cauldron reached its final position, a magnificent firework display filled the sky finally herald-

ing in the Athens Olympic Games.

The crew then had 48 hours to remove the lake.

BEHIND THE SCENES

Video surveillance monitoring and stadium screen output control was supplied by CinePlus (Munich).

11 Surveillance cameras were used to monitor the show, including 1 on the massive flying hub set 37 metres above the field of play and one in the pit to allow the callers and technical crew to see exactly what was happening at any time.

The hub camera in particular provided invaluable information about what was happening with the flying system during the head break rehearsal sequences. This helped the flying crew and designers to monitor and understand where problems with



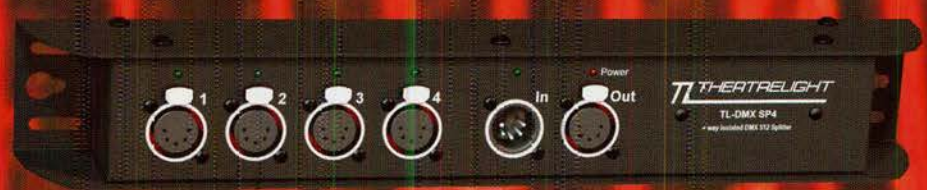
Huge dual concentric rings of LEDs with dual data pathways allowed text to be 'chased' and streamed

THEATRELIGHT

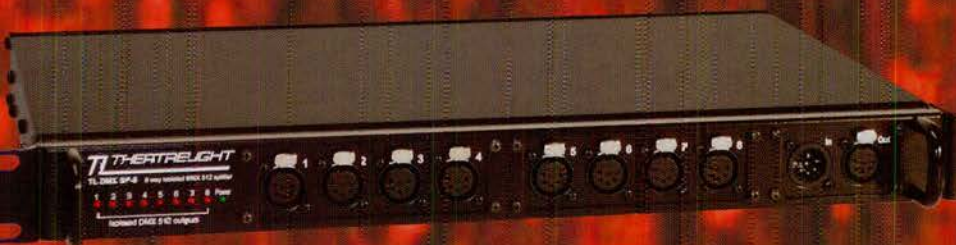


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Athens 2004 Opening

the break sequence were happening and exactly what was right ... and wrong.

Over 48 monitors provided show crew with the monitoring.

Live stadium screen production was relatively simple, with 21 video inserts, mostly time-code locked to the audio system. Because of the latency in the screen processing, the crew had to slip (run) the inserted videos forward in time to ensure that they were synchronized with the live audio. They then had to delay them to the broadcaster to ensure they were synchronized with the broadcast audio!

The pyrotechnics were provided by Groupe F (France) and designed by Christophe Berthonneau

The load-in proper started in early June and ran concurrently with venue construction work.

The first task of each day was to identify which roads to the stadium were open (a task that was repeated about every 4 hours).

The load-in ran 24 hours a day for over 2 months. (The last month including rehearsals).

After the closing ceremony, the bumpout went around clock, to clear the stadium for the Paralympic Games. •

Next page: The sound of the Olympics Opening.

SHOW CREDITS

There were over 400 people on the production and creative team.

The Opening & Closing Ceremonies were produced by Jack Morton Public Events headed by:

Lois Jacobs - President, International, Jack Morton Worldwide

David Zolkwer - Director of Jack Morton Public Events

Andrew Walsh - Executive Producer

Senior Technical Director: Adam Wildi (UK)

Technical Director – Technology: Nick Eltis (AUS)

Technical Director – Staging Mik Auckland (AUS)

Technical Director – ‘Clepsydra’ & Closing – Costas Charalabidis

Associate Technical Director – Aerial Systems – James Lee (UK)

Associate Technical Director – Ground – Piers Sheppard (UK)

Associate Technical Director – Seg C, Closing– John Zarganis (GRE)

CAD, Animation – Gareth Lowe (UK)

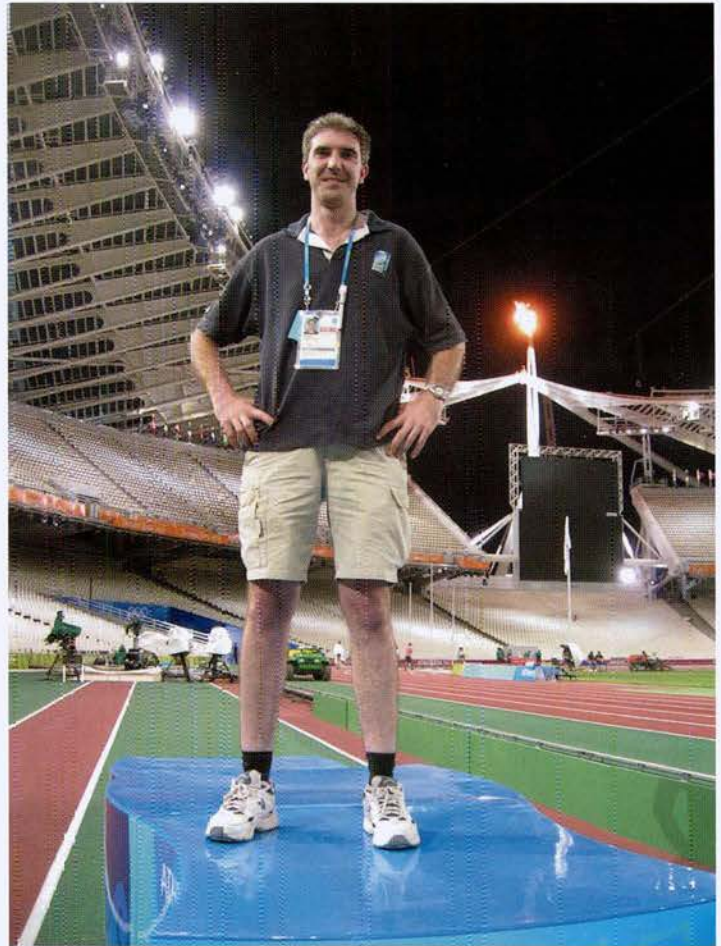
Associate to the Senior Technical Director – Sacha Watson (UK)

Production Assistant – Technology – Alexia Naef (AUS)

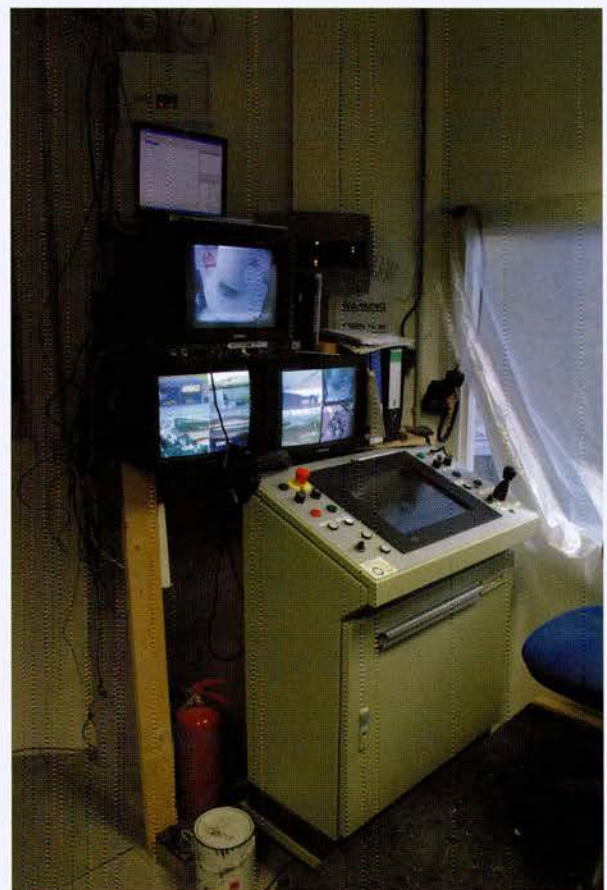
Story credits: CX wish to thank the people within the production who assisted us. There are extensive prohibitions and conditions of contract in place with all Olympic vendors. We appreciate the chance to work within these boundaries. We have borrowed wording from Jack Morton at times within our story, where they have eloquently described some of the sequences way better than we ever could. Thanks to Jack Morton Worldwide.



Accidents happen! This wasn't a production fire, but it damaged some of their gear



Technical Director – Technology: Nick Eltis. Below: the control for The Pit



 **YAMAHA**

SOUND REINFORCEMENT



5 YEARS PEACE OF MIND



Athens 2004 Opening

Sound at the Opening

Audio equipment and audio design for the opening was supplied by Norwest Productions (Sydney) with assistance from their local partner, Enttech SA. Norwest won the work after they offered a design, which was done by Sydneysider, Scott Willsallen. Scott and Norwest founder Chris Kennedy (right) flew to Athens in early April to seal the contract, for a rumoured A\$3 million.

The specification included 112 Macaulay MLA3 speakers flown in 16 drops, and 6 drops of 4 Macaulay subs. These were supplied by Enttech SA, after Scott measured their performance and did calculations.

Norwest's contribution in the speaker department came with 34 clusters of EAW KF860/861 positions set around the performance area. These were the same boxes used around the ground at the Sydney Olympics opening. Norwest now own 72 of these horn loaded quasi line arrays, which are, according to Chris Kennedy, the best box for this kind of work.

"They are not a true line array", he says, "so you can use them in pairs. We use them all the time."

A number of EAW KF750's were used to provide additional fill, and 36 EAW BH760's did the sub work.

Then 50 Nexo PS15 were used as delays and some



additional fill boxes.

Working back along the audio chain, there were over 300 power amplifiers - Lab Gruppen fp6400, Camco Vortex and Crown. These were fed audio from a distributed system based around a new Opocore digital fibre optic system that Norwest have purchased.

2 Yamaha PM1D mixing consoles running in parallel for

Norwest have used this Olympics like they used the last one: as a great chance to buy a lot of equipment at the right price.

Ian Shapcott, FOH engineer with 2 Yamaha PM 1D consoles



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VR62 Premium 2-way installation speaker



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VR51 Premium 2-way installation speaker



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VR12 Premium sub-bass enclosure

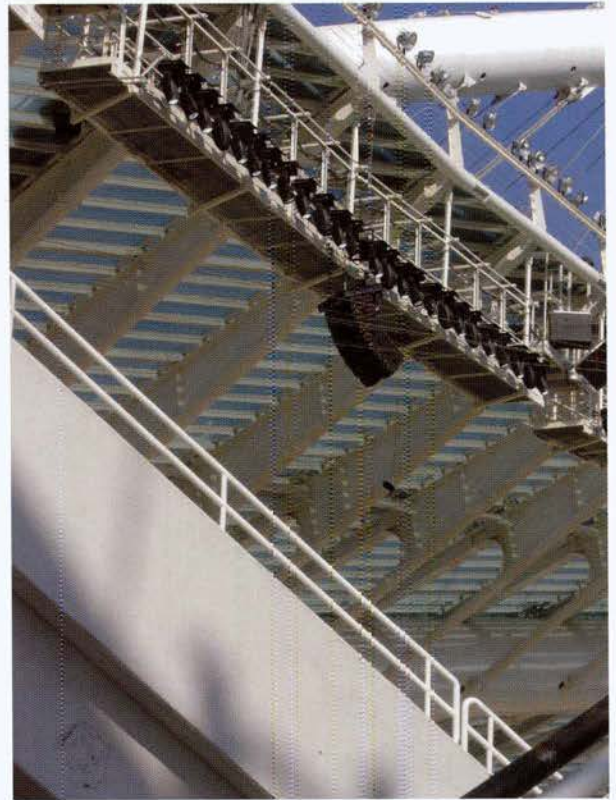


VRM12 Premium vocal monitor

Athens 2004 Opening



Macauly MLA3 speakers ready to fly..... 15 clusters like this went up...



Look how small they appear when in place

4.5 kilometres of fibre optic multicore make up just some of the expensive and rare infrastructure an audio firm needs to do mass scale events like this.

FOH and 2 Yamaha PM5C in parallel for monitors.

On the subject of monitors, Norwest provided 900 in ear monitor systems, which were managed by 17 stage managers and 20 volunteers. These mainly shared frequencies, 14 sends of in ear monitor were transmitted. Many of these in ear systems were sourced from Delta Sound in the UK.

Paul Hitchens and Selena Cross had the gargantuan task of managing the in ear systems.

Norwest used new Lake Contour system processors, which Chris Kennedy describes as 'the duck's nuts'. Norwest have 16 of these, including several new Lake Mesa Quad EQ 4 x 4 digital matrix processor.

To facilitate the segmented show calling as well as all the time code locked cues, 2 types of time code were generated and distributed: one that reset with every new track; and one that incremented to a new hour start position with each track.

Dual Pyramix replay systems - also purchased by Norwest - with support from 2 additional hard disc replay systems as well as an instant replay handled the

playout tasks. The Pyramix is one of the world's leading multitrack systems, with ultra high definition sampling rates. When they come back from Athens, they will go into one of two trucks that Norwest have an interest in.

Also new for Norwest are two TC Sydney 6000 5.1 effects processors, loved by broadcast people everywhere because they can produce a 5.1 mix from a stereo feed. There are a number of preset 5.1 mix types on board, choose one then sit back and relax.

The work on site started on time, Norwest project manager Ian Baldwin spent a long time in Greece. Davie Rennie was the senior account manager, while Andrew Rodd was the project manager from the Australian end.

Chris Kennedy made six trips to and from Athens.

Ian Cooper, Trevor Beck, Adriar Ricdell, Steve Caldwell and Peter Twartz - on leave from Jands - made up the rest of the Norwest team from Australia.

Enttech provided 18 local crew and support, and vendors like Audio Technica, Opiconore and Yamaha all sent representatives.

As the games closed, the gear was shipped home. •



Replay engineer Trevor Beck (left), Project Manager Ian Baldwin (top), Designer Scott'swa Willsaller (right), and RF Frequency guru Peter Twartz far right



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Tec Sound reborn as TSV Holdings

It's an Australian first – the public float of a contracting audio visual company. TSV Holdings has been created to purchase the Tec Sound businesses in Sydney and Melbourne, and then to grow through acquisition. Julius Grafton reports....

TSV is the brain child of Hilary Evans, the owner of the Melbourne Tec Sound. He was a key staff member at the Melbourne arm of Sontec in the late 1990's, a highly successful audio contracting firm which was sold to Chubb. Chubb are a large security contracting firm with revenues of more than A\$1 billion in Australia. They acquired Sontec Group for around A\$17 million. Sontec was made up of businesses in most state capitals, and had a turnover of about A\$30 million.

Understanding the Sontec and Chubb connection sets the scene for TSV Holdings. TSV stands for Technology, Sound, Vision. The float seeks A\$6 million, valuing the company at \$10 million. TSV is expected to list on the Australian Stock Exchange on the 23rd of September.

Upon completion, TSV will pay \$2.5 million for the two Tec Sound businesses, and management will retain 40% of the issued shares – worth around \$4 million. New shareholders will hold 60% of the company.

Tec Sound turned over \$6 million to June 30 this year, up from \$4.1 million in 2003 and \$2.7 million in 2002. They forecast revenue of \$8.5 million for the current financial year. Profit for last financial year was \$866,000 before tax, and they project \$1.3 million this year.

The business is at the bread and butter end of contracting. Tec Sound have blue chip clients, like Coles and Kmart. Typical work involves the sales and service of background music, intercom, security, video and PA systems in shops and public places.

Sontec were market leaders in this area, but their market share has shrunk. Chubb purchased Sontec and then disengaged key staff from the business. They reasoned that it was just another business unit, and failed to recognize the unique and specialized nature of the business. An example of Chubb's handling of the Sontec business: they moved the Sydney office of the firm but forgot to divert the phones.

According to Ian McLean, it wasn't too long until some key Sontec clients were looking for an alternative. "Business is about relationships", Ian told CX.

"Relationships with customers, with staff, and with suppliers. You need to follow things closely, and be able to look someone in the eyes and see no b.s." The Chubb acquisition set the scene for Hilary Evans and Ian McLean to start Tec Sound, which they did in 2000. Hilary and Ian were not joined in a non-compete agreement with Chubb, because at the time Sontec was sold, Hilary was an employee and Ian – the former owner of the Sydney branch of Sontec – had already sold his interest to other Sontec owners.

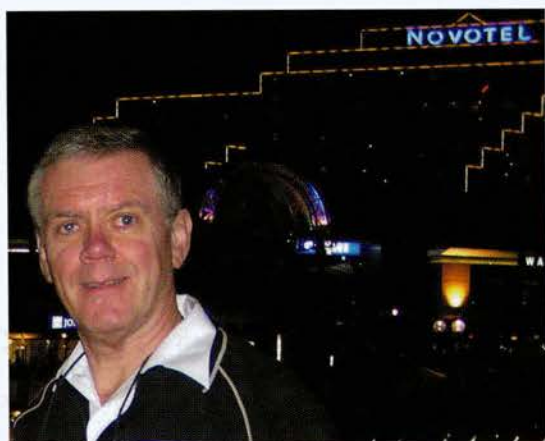
Hilary and Ian were nobodies on the Chubb corporate radar screen, which enabled them to lawfully start new Tec Sound businesses which today form the core of TSV.

Ian McLean is selling his interests in Tec Sound NSW and retiring at age 60. Hilary Evans will also sell his interest in Tec Sound Victoria, but continue as managing director and possibly as majority shareholder, assuming no other party buys more than 40% of the shares.

www.tsvholdings.com.au



Hilary Evans, TSV managing director is ready to buy more businesses in order to grow TSV.



Ian McLean (pictured left) is a versatile guy. He started his audio career at Seeburg in the 1960's, and then set up his own company called Sound Affair in the 1970's. He did mobile DJ work, and still today has a few clients who entice him back.

He was amongst the first people to buy professional sound reinforcement gear in the mid 1970's. I was working lights at a fabulous freaky Paddington Town Hall gig with the likes of Captain Matchbox Whoopie Band and similar hippy acts. There were hundreds of people all whacked on acid prancing around in no particular order. Arrrs and hair flying everywhere. Fragrant oils, incense and sweat. With a stall selling carrot juice.

Then there was Ian, sitting proudly and looking very straight laced at his ETI kit made 8 channel

mixing console, with 2 Phase Linear 400 amps, 4 BL 4560 boxes and 2 Altec horns. He probably even arrived wearing a tie, but took it off. A night earlier he was the DJ at the Aquarius Club.

Later on he rented his equipment to acts like Bush and Marcia Hines. Sound Affair continues to this day, now known as SAVI, run by Edgar Kramer.

When he ran Sontec NSW, Ian had 15 vans and 25 staff. The business turned over \$6 million.

Ian's approach was to service the customer. If a supermarket client opened in a town where he had no agent, he would go to the RSL club and ask the secretary manager who serviced their PA. He built a network, sold Sontec, and then he built a new network to get Tec Sound up and running.

We hope he enjoys his retirement.

- JG

EVI Audio now Australian Owned

EVI Audio Pty Ltd has become a fully Australian company, with all shares being acquired from Telex Communications Inc. by long time managing director Colin Formston. "It was two years ago that discussions on whether I would be interested developed into negotiations", Col told CX. Now he owns the firm.

EVI Audio distribute leading brands owned by Telex, including EV, Midas, KT, Dynacord and Telex. It is a top five distribution firm in the tightly competitive pro audio market in Australia.

When Greg Richter, the C.F.O. at Telex commenced negotiations with Colin Formston, Telex was going through a rough time financially. "But they weren't in a hurry", says Col. That itself says things were OK.

Now EVI Audio are doing very well, as the product cycle swings in their favour. EV's X-Array compact amplifiers, Telex communications products, and Midas are all selling strongly. The German connection with Dynacord is on the rise.

One interesting component to EVI's performance is the staff longevity. Key staff like sales manager Ian Johnston and financial controller Brian Sharpe have been there longer than Col, who himself started as general manager 18 years ago. "It was interesting talking to the banks and financiers about this deal", Col reflects, "they couldn't believe I had been in the job through three different foreign owners!" These were Gulton Investments, the original owners of Electrovoice. Then Mark IV Industries purchased EV and invested in Midas, KT and Dynacord. They sold to Greenwich Street Capital Partners, who acquired Telex Communications – forming the group which just sold Australia.

What will change? The product distributor deals are locked in place. The main difference, according to Col, is that he is free to add no conflicting products, to expand his range. When he does, it'll be at the mid to top end of the market.

There's been some impact on the psyche at EVI Audio by some of the marketing seminars run by the German arm of Telex – indeed the blend of American, English and German suppliers has given Col some unique insights. He was most impressed by a recent product seminar where a German dude powered up two amplifiers – one an EV brand amplifier, the other Japanese. "I will not discuss the brand of the other amp", the German guy starts, "but think about the motorbike company.....". According to Col, he then plugs a 110v angle grinder into the EV amp speaker outputs and starts grinding up some steel! A new twist on total harmonic distortion, right?

EVI Audio is a tightly run firm, with very stable brands, and a loyal customer base. By way of example, 80 Australian dealers qualified for an incentive driven trip to Vanuatu recently.

- Julius Grafton



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MIGHTY mini's

3 little powered PA speakers compared! These little dudes all have an 8" woofer - which makes them very easy to handle, compact, and lightweight. So how do they stack up? We put them into the Juliusmedia lab to find out!

Used for:
Music and Public Address

Used at:
Small venues, schools, theatres, production hire

Models
FBT Jolly 8B a A\$995
Quest QSA 200 A\$745
Yamaha MSR 100 A\$995

Web sites:
www.tag.com.au
www.gtaust.com.au
www.yamahamusic.com.au

Distributors:
FBT: TAG
Quest: Group Technologies
Yamaha: Yamaha Music Aust

These three powered loudspeakers are similar in that they have an 8" speaker for bass and a 1" high frequency device. It's OK, in audio we still use inches. In back of each is an amplifier with limited mixer features. These boxes are small enough to carry in one hand.

There's been advances in light weight professional audio components and amplifier design which make these puppies into viable, real world contenders. They get used in smaller places, like restaurants, and schools and churches. They would be super ideal inventory for rental firms who need secondary speakers for delay zones and in-fills. We also used them for Kristal's party, where around 40 13 and 14 year olds all threw food at one another. Two of these speakers fitted on the front seat of the CX sports car.

We happened to select these three because they were available in our street - we have two several pro audio outlets within a few doors of our HQ. There are other, similar models around. They were not excluded

for any reason other than that we thought these three were simply representative.

To test them, we lined them up and fired up SmaartLive, an analysis programme on the laptop. We connected an AKG C414 mic set in omni mode, and positioned it 2 metres away from the trio. The testing team were Tony Moffat, and your writer, Mr. J. Media.

Smaart let us measure the three boxes. For the same given electrical gain (dBu), from our source console we could compare input sensitivity.

Running the same signal into the boxes produced these output numbers:

Quest 99.6dB (least sensitive of the three)

Yamaha 105.3dB

FBT 106.3dB (most sensitive, needs less input).

Note that input sensitivity is not a very important number. One thing did become apparent at turn on:

▶ please turn to next page



FBT, Yamaha, Quest

Mighty Mini's

So why not DSP?

Every time we look at a powered speaker box - that is, one with an amplifier built in - we ask this question: "Why not install a DSP?" Aside from the cost, of course!

DSP means digital signal processor, it is a chipset which enables you to do things on the fly, like change gain settings, and EQ.

The really BIG opportunity lies ahead for a manufacturer who offers variable or remote time delay over the input to a powered speaker box.

This is because in live sound, it is common to use powered speakers for fill - covering areas that may be distant from the stage, so the box may be distant from the source.

These 'delay' speakers need a delay setting, roughly about 3 milliseconds per metre distant from the source. The delay time varies according to temperature and humidity. A powered box (like one tested) with a screwdriver operated rotary control for time delay would be very popular with installers and live sound engineers.

the Quest produced a slight buzz independent of the gain setting, with nothing connected.

Then we decided to see how loud these three would go, using the point where the 'Clip' warning light came on. Note that we were not very interested whether the clip point was 1, 3 or 6dB under actual clip. What we are saying is that the individual boxes may have the clip warning light set to trigger somewhere before clip - clip being the point where the amplifier produces a clipped output wave, instead of a beautiful, clean sweeping wave. Different manufacturers set clip warning thresholds in different places. Put another way, it is quite possible some or all of these boxes will go louder before clip.

On the input gain rotary controls, FBT and Quest had a zero dB indication, the Yamaha didn't, so we turned it up full. We fed in noise, and stopped when the clip light shone.

The results were close, but note that 10dB equals an apparent discernable doubling of gain:

- FBT 112.6 dB (it was the loudest of the three)
- Quest 111.5 dB
- Yamaha 111.0 dB

FEATURE SETS

Yamaha MSR 100 is slightly taller than the others, and has more bass porting. It also has the largest heatsink, but claims the smallest output power at 100 watts.

On back the Yamaha has more mixing inputs than the others, with a total of 3 inputs. These are made up of an XLR for mic or line, and 2 x 6.5mm jack sockets for line inputs. Each has a gain control. There's a Link out on a 6.5mm jack, so you can feed another box with the same input signal. It has master volume, master bass and master treble controls, plus power and clip lights.

Up top is an easy handle, and under are 2 threaded bolts for installation.

Quest's QSA 200 is trapezoidal shaped, and the test example had an optional extra installation bracket and yoke. It has 1 x XLR in with a mic/line selector switch with indicator lights to show which is chosen. There is an XLR out, and a master gain control. There is also a bass, and a treble control, with a centre detent at the 12 o'clock setting,





which appears to be the zero point, or the place where there is no cut and no boost. But for some reason, the labeling around the bass and treble controls is wrong. (Pic, left).

It looks like the naughty graphic designer just copied and pasted the indications from the volume control, showing infinite cut at the far left, and +6dB at the far right. If your eyes are good, you can see what we mean. This may confuse someone who is pedantic about these things, but most people will assume when the control clicks with the detent at the 12 o'clock position, then this is the zero point.

The spec says the internal amp produces 200 watts.

Quest also offer a reinforced grille that would make the box suitable for installations in school gymnasiums, where extra protection from errant netballs is desired.

FBT offer the Jolly 8b a, funny name but we guess the '8' refers to the woofer size, and the 'b' maybe means box? The 'a'

we presume means 'amplified'. It is the smallest and lightest of the three, by a small margin, and has a neat handle on top.

It also has a small stand mount socket in the bottom, and a rigging bolt thread up top. FBT offer the very handy Combo connector for the input, this is an XLR connector that accepts a 6.5mm jack in the middle. There is a Mic/Line switch, a link out XLR, and controls for volume, bass and treble. It is the only box to offer a ground lift switch, useful for killing earth loops.

FBT claim the amplifier component produces 150 watts to the 8" woofer, and 50 watts to the 1" horn device..

OUTCOME

Our frequency response measurements show the FBT starts to roll out (become less functional) at 12.5k (high) and 150Hz (low) and is registering a minus 10dB point of 55Hz.

The Quest starts to roll out at 12k (high) and 120Hz (low) and is -10dB at 65Hz.

Finally, the Yamaha starts to roll out at 12k (high) and 85Hz low, and is -10dB at 42Hz. The Yamaha provided most bass.

On to the Subjective test.

This is where you listen to familiar CD tracks through each box. We also spoke through a Shure SM 58 microphone, and both know what our voice sounds like through various systems - good, bad and indifferent.

The FBT and the Quest were relatively similar in response, whereas the sound of the Yamaha reflected what it looked like on the graph. The Yamaha lacked a little presence, it is prominent in the low mids, which muddies up just a little. This is easily correctible with mild EQ.

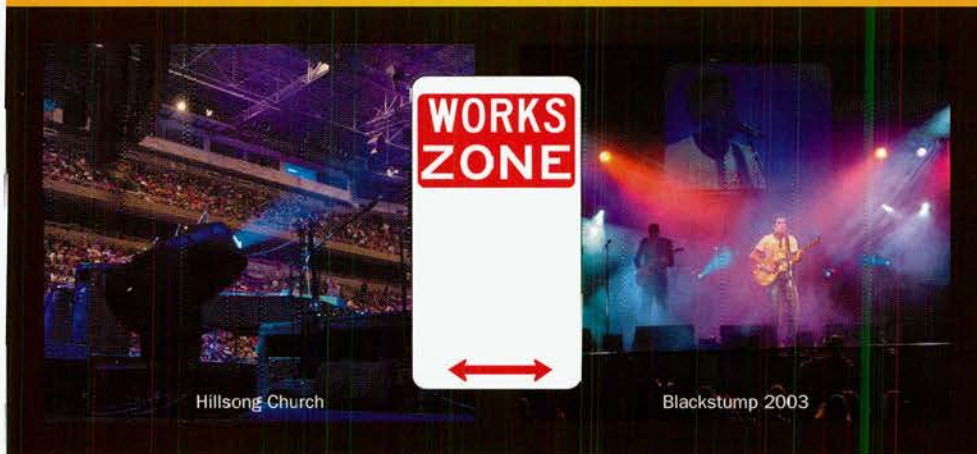
At first blush, the Yamaha sounds the best, before you start trying to reference some detail. That's when the FBT starts to appeal.

If your application is speech and low level music: go FBT. If you want lots of music needing a more natural bottom end: go Yamaha. If short of money, or needing exotic installation options, go Quest.

The FBT is the best box. But there's not a lot between all 3, which makes it interesting!

- Julius Grafton

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Allen and Heath ML5000

Top of the line for Allen and Heath, the ML 5000 has been around a couple of years now. It sits in the upper segment of the live mixing console market, and serves on the front line for professional production firms and venues. CX took one for a test drive recently within our magnificent headquarters.

Every console has a surprise feature, ML 5000 is no exception. Beware this little select switch. If moved right to enable the RS 242 port, it will freeze the console at bootup if there is no computer plugged in to the port. This only becomes a problem if you have a power interruption - whereupon you'll spend 35 seconds looking at a console with every mute light illuminated, and no audio will pass! Leave the switch pointing to MCI, and the problem is no more.

Big analogue consoles still rule the live scene, where stakes are high and mistakes are not allowed. Digital consoles are starting to encroach, but at this time you still get more for your money with a conventional mixing console.

Allen and Heath are from England, and many people feel that the old country still makes superior mixing consoles. Other UK console makers of note are Midas and Soundcraft. The UK makers probably get more high end console sales than any other nation.

Soundcraft were under the same ownership as Allen and Heath for quite a while. Ferran had a juggle positioning the two firms who effectively sold to the same market. They ended up selling out Allen and Heath, who are now independent.

Somehow Allen and Heath have managed to produce consoles at attractive price points, probably by understanding volumes and also

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by taking a pragmatic approach, such as not installing individual channel strips.

Nowadays most upper end console makers offer consoles with modules that are 8 channels wide. It's cheaper to build, but also better because you don't need lots of individual plugs and wiring looms from each channel strip. Less can go wrong.

ML 5000 is a professional console made to a price point, and it packs some serious features into a modest footprint. The 48 channel version weighs in at 110kg - manageable in a world where consoles can weigh over 400 killer grams!

So what constitutes a serious professional console?

Lots of busses for a start, and ML 5000 has 27 of them. A buss is a discrete continuous path from the channel to an output. ML 5000 makes up its 27 as follows:

- 16 auxiliary outputs
- 8 VCA outputs
- Left, Right and Centre

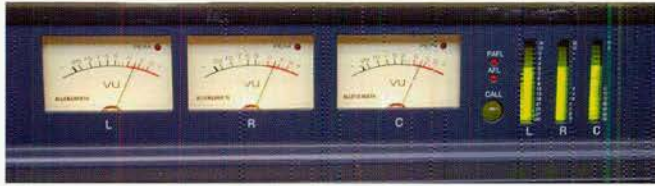
This last trio of outputs reflects the modern desire to do all things for all people. A theatre show will most often have a left - centre - right system, where much of the dialogue is sent to the centre cluster. This feature is also quite useful for larger venues where little speakers are set along the stage front, as the front rows may not hear much of the main left and right system.

Last issue we had a handy pictorial spread, showing the SIS ('send it somewhere') possibilities that Midas have offered with their new Verona console. SIS is a Midas tag for their version of left - centre - right assignment. Verona is priced under the ML 5000, and Verona doesn't have VCA groups, nor anywhere near as many busses.

Allen and Heath have a simpler

▶ please turn to next page





Main mix button selected, Pan selected, both controls centred. (See detail pic of the buttons and controls at bottom of page) Signal flows to all 3 outputs. All is well.



Main mix button selected, Pan selected, but the LRC blend control is swung hard left. Centre signal now absent. Predictable.



Main mix button selected, Pan selected, but the LRC blend control is swung hard right. Centre signal now is the only output. Also predictable.



Main mix button selected, Pan selected and stereo pan is hard left, the LRC blend control is centred. Get the idea?



Main mix button selected, Pan selected and stereo pan is hard right, the LRC blend control is centred. All normal. We strongly suggest all engineers obtain a simple test tone generator (we use an NT Minirator, which does tones plus a lot more and etc) with any new console for a while, seeing where the signal goes, using the output displays. This part should be obvious - there is no need to have the rest of the system working - so you don't need to deafen yourself and start other people complaining about the wall of pink noise or the 1kHz tone!



These are the assignment controls for the L-R-C positioning of each channel in the mix. Looking at the overhead view of the console (previous page), you'll notice there is no group assignment for each channel. Instead, you can select a channel to one or more VCA masters, using the 'MUTE' button when the VCA edit switch is selected. It is an easy way to 'split' groups a variety of channels.

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left - centre - right deal with the ML 5000, as our pictures show!

Since we started our review by talking about channel outputs, let's carry on along that path. Signal can go direct from the channel to the L-R-C outputs, or be selected to a VCA group. VCA groups are a little hard to explain, so try this.....

VCA's explained

- A VCA is a Voltage Controlled Amplifier. It is switched in to the PRE PAN part of the channel signal path.
- Because of this, a SINGLE VCA fader can control one, or a group of channels, BEFORE the L-R-C pan.
- This provides very effective control over one, or a group of channels, centralised at the master fader area.
- Using 'sub groups' is less effective, because you need one for each output, meaning one for Left, one for Right, and one for Centre output assignments.
- A channel can be sent to more than one VCA.
- A VCA fader could be used for 'sub mixing' of - say - all vocals, all drums, all brass - as well as for just one channel, like the main 'star' vocal.
- VCA's let you better organise your mix!

ML 5000 - the rest!

The console has powerful EQ, with four bands and two of these have 'Q', meaning you can alter the 'width' of the boost and cut. It has a variable high pass filter, you can select the frequency 'bottom' point for each channel - so if you have a vocal channel, you may dial up 100Hz as the point where nothing below can pass, or go as high as 400Hz if it is - say - an overhead or a woodwind channel.

There are 16 auxiliary sends, the first 12 are organised as mono sends, the final four can be stereo. Each has a PRE/POST fader assignment switch, essential if you wish to use the

console in stage monitor mode.

Snapshot memories are possible, where the console can be programmed to remember different combinations of MUTE settings. This is most common in large theatre shows, where you have defined people coming on and off at set times in defined scenes. It helps avoid rude noises when wireless packs are turned on and off, or inadvertent signals. The console has memory for 128 snapshot scenes.

There are no on/off MUTE buttons for the individual channel auxiliary sends, but there are for the main auxiliary outputs, and the 8 x 8 matrix outputs.

You can buss a sidecar on to the ML 5000 and have a master/slave relationship. Worth trying, especially if you are timid. There is a 16 channel sidecar available.

There are four stereo channels fitted as standard, and a new version of the console is available with a further four, situated at the hard left of the console.

Like all professional consoles, it has an external power supply, and we recommend two of these be used, they can be ganged together so if one fails, its cousin takes over.

The frame is reasonably rigid, and withstands the Juliusmedia flex and twist test, where we pick up one corner of the console and try to twist it. We also put the palm of a hand over the middle of each module, and gently press down. This shows any flex across the surface of the module. Our final mechanical test is to see if any of the rotary controls wiggle from side to side. ML 5000 passed our test.

User reports indicate the console sounds good, it doesn't have quite the equalisation precision of a Midas, and to my ears doesn't quite match the Soundcraft ML 4 EQ either.

But bang for buck, or features for dollar speak volumes. ML 5000 is a lot of console, for a moderate price.

- Julius Grafton



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A Friendly Guide to Lighting for Video and TV

By Matthew Dorn



Not happy. Light from one side at 70 degrees. Bad nose shadow. Good reading light.



Light at 30 degrees - straight in 'yer face! Too flat.



Combining both above is best, not so good for bald guys.



Usual theatre crosskeyed. eg: 2 lights, each at 45 deg up and out to the front. No good for TV - eye sockets still not filled in AND two sets of shadows.

Gentle reader, maybe you have had to deal with Television production and been frustrated by the attitude and strange way the "Vidiots" operate. A gap seems to exist between theatrical and concert production routines and those of Television production.

Here is good news. It doesn't have to be like this. Here are some simple keys to understanding and taming the TV beast.

A Man Apart

Ever had to deal with a Television Director? Unco-operative probably doesn't cover it. Why? How could this be? They are probably as focussed on doing a good job as you. But they don't seem to get it. They want to do things their own way. The key to this is understanding the different goals of your work and theirs.

Say you are a lighting dude (professional) and have planned and rigged a magnificent lightshow. Eyeballs are bulging from heads all over the room. Ecstasy couldn't make it look better. Your corporate event design has increased their stock prices 10%.

So why is TV bugging you for more light? Open white at that!? Backlight too. The difference is the camera, the TV (video monitor) and the viewing experience itself.

Gripes

Let's go through some video bellyaches:

"More light!"

The magic word here is contrast. All video cameras are capable of shooting in the most minimal of light. It has been decades since anything visible to a human eye couldn't be made into a video signal. Recently there has been more emphasis on shooting what the human eye cannot (or would rather not!) see. Ah technology...

Dark, mid-tones and bright areas to the eye are dealt with automatically by a combination of physiological and psychologically cued responses: Iris, night perception, learned assumptions, context. It is when we fool or overload these that we see the power and magic of theatrical lighting.

Viewing a TV screen is a very different experience: The camera is dumb, the screen is dumb, nay even the average viewer is dumb. This equipment needs to be TOLD what to see. This does not mean that it is without aesthetics, just that they are different, and for easily comprehensible reasons. Let's start with a simple situation and analyse it.

Get Your Head on Camera (Nicely)

Your VIP (probably the client or someone who can delay the invoice payment) is at the

lectern. "More light!" say the VidiotsTV types. "Less light please" says the boss. More tears are the result. Why? Ignore the Vidiots TV Director now and when the tape is viewed YCU get the phone call later. Ignore the boss and you get fried alive now. Here is some misunderstanding at work. Video almost certainly does not need more light. The boss probably doesn't need less light. What they both need is less contrast.

We are attempting 3 things here: Lighting the stage, lighting the face and lighting to see. Let us go in reverse order as the client needs to go away happy for us to have an easy life.

"Lighting to see" means casting a general illumination over everything that needs to be seen and minimising direct light to the viewer's eyes. A professional presenter or an actor is used to being semi-blinded on stage but too many situations involve people who are alien to the stage. Down-lights please!

Lighting the face means casting illumination from a controlled direction. Softening that source of light by broadening it (ie not a point source) is more flattering and makes light angle and subject movement less critical.

Lighting the stage is meant to focus the attention of the audience, hiding what would otherwise distract. This means tight beams of light carefully focussed. Minimal spill is the goal and point sources (profile lights) are best.

The observer in the audience is free to look at whatever they want, including the back of their eyelids. They browse the scene presented to them. They see dark areas and assume they are not important. Bright areas draw the eyes. Unless the audience are all seated really close to the stage then detail like dark pools in the eye sockets of the speaker are relatively small concern. The mind fills in details: He must have eyes even though I can't see them...

Conversely the camera is capturing only a part of the scene and is therefore already focussing attention. The viewer of the TV screen has little of the visual information that those present in the room with our subject have. Detail assumes great significance, unintended things distract: Why are his eyes just inky black holes? Is his nose really that big? It's casting a shadow onto his chest...

Give You What You Need

I really hate to have to say this but in this situation the most useful sequence in which to consider these conflicting requirements in

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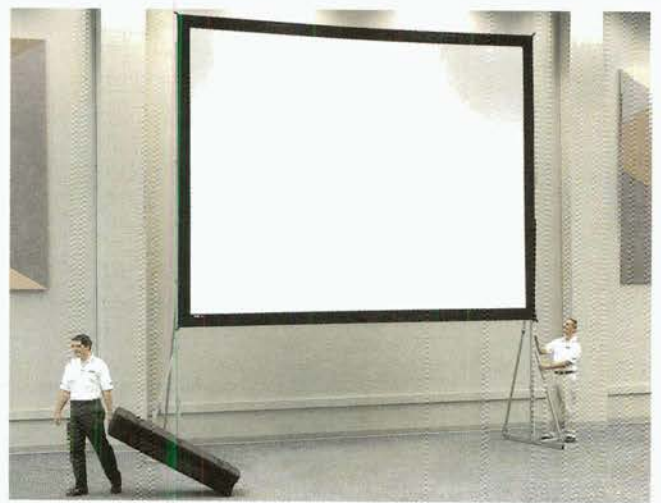
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LX for video

is stage lighting last. This is because the audience is the most forgiving, visually speaking. Attention can be directed in other ways. The modern camera can operate in low light but can't change the angle from which it comes. The reason this is important is illustrated by considering light hitting a person's face from, say 45° and from 70° or more on the same line as the direction of the camera that is shooting it.

Everyone's face casts shadows on itself. Eye sockets and noses cast shadows that cue the observer to the direction of the light source and have aesthetic consequences. If there is no other light to fill these shadows then their size has to be reduced. This is achieved by moving the light so that it is shining from closer to the same angle from which the camera is observing. If the camera is at the same height as the face in question then a light at 45° will cast smaller shadows than one at 70°.

Iris to the Rescue, Not

If there is no light to fill the shadow areas then no matter how the exposure of the camera is set (with the iris control) the shadows will still be black and pushing the exposure up will "burn out" the flesh tones. In passing, an interesting effect of fogging the stage is to both provide fill light to the shadows by light scattering and lifting the brightness of the dark areas, and by the camera observing that scattered light and adding it to the image. Fill light can also come from other light in the room unintentionally but usefully. Bounce from light on the front row of the audience for example.

Blinded By the Light

Lighting to see directly conflicts with what we are attempting for the camera. When the only thing lit is you and the light is right in your face it's difficult to see anything else. What do you do? Light what the subject has to see, eg the audience, and illuminate it to a level comparable to the light shining on the subject.

This directly conflicts with what we are trying to achieve by lighting the stage... Sigh.

Skin Your Cat Nine Ways

Mixing metaphors here, now its time to pull rabbits out of hats... Here we reach into Felix's bag of tricks and find other ways of focussing attention.

- Colour: Higher colour temperatures. Cooler light draws attention. If everything has to be lit then light it different colours. Warm wash for the room, 5600°K for the speaker.

- Minimalist: Let the available room light do most of the work, then fill from a suitable direction. I have seen 500W lights almost alongside the camera position work very effectively. The level from the fill lights could be set so low that where the beam finally landed on the set behind the speaker it was washed completely out and invisible. This prefigures a personal rule of staging. If you want to light things separately move them away from each other. Suggest (nicely) to the event or show director that the lectern doesn't have to be squash up against the cyc or drapes if there is 2 metres of free stage in front of it. This prefigures a third rule or phenomena. Amateur presenters often like being way upstage.

- Fortuitous Bounce: White table cloth to the rescue. Not one that I would rely on but it has made many a blind LD look like they had a plan.

- Key light from left field: A common scenario. Presenter with a projected video image adjacent. Try cross keying almost from the wings of the stage. TV directors often like to shoot from way off axis anyway, especially when trying to make a 2-shoot of screen and dude. You may find your key light directly over the camera where it belongs by accident. An added bonus is that the light is not in the presenters eyes at all when they address the audience.

- Shoot the moving target: Don't we love the roaming presenter. Another personal observation: Less content equals more movement. Let us avoid cynical thoughts and find a workable approach.

Bitter Experience:

Control What You Can to Match What You Can't

It still amazes me how common it is for a lighting specialist to think video equals heaps of light. Only recently I worked on a major launch event and the LD had 4000W+ available on one lectern and offered me more from moving lights. Meanwhile we were struggling to see the video-wall in wide shots. Here is the message: ITS NOT NEEDED.

Balance is everything to television cameras. A 2:1 difference in light level is huge on the screen. Remember that the camera has already focussed attention by shooting only the face and worlds of mood can be created with small changes of light.

This is the power and fun of TV lighting. •

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Hillsong Conference – production stream powers!

More than 150 people crammed each of the dozen production workshops and seminars at the enormous Hillsong Conference recently – after they actually found the lecture rooms, spread over the crowded Olympic Bay precinct in Sydney.

Hillsong Conference has maximized the possibilities at the Olympic site, with the Superdome fully utilised for five days and filled to capacity at night. An overflow rally was held over at the State Sports centre, with the ingenious use of coloured wrist bands forcing delegates to experience both venues on different days.

Production was a small stream in a massive schedule of lectures, workshops, seminars and sessions, intermingled with rallies and power events for people of all persuasions but united in faith. It was a festival, a convention, and a virtual city for the 20,000 plus delegates who gridlocked traffic on Silverwater road and mobbed the trains by virtually all arriving at 0900 each day.

Devised by Dave Watson (pictured, above) and his team, the production sessions gave valuable info back to the church community. Hillsong are the technology leaders in the

worship scene in this part of the world.

Sessions were broadly lighting and audio based, without much in the way of multimedia and TV, which is a different department at Hillsong, and whose team members were presumably too swamped with conference duties to contribute actual content. This could be a booming add-on for the future, as many of the visitors from all over, including overseas, were keen to build knowledge on



vision capture, edit and display. This stems from growing demand for content across growing numbers of cable and TV mediums, and strong growth of the charismatic faiths.

A common thread through the sessions was the need to manage a team of servants and volunteers. Hillsong technical manager

Kevin Watts had insightful words on this topic. "Our staff managerial team look after volunteers more than operate equipment. There is more focus on the team. If you (the team) are attractive on the inside, people will want to join".

David Watson noted that the conference was also a place where the team could impact positively on secular engineers, some of whom we observed in the Superdome looked positively bewildered and confused at the enthusiasm of the praise and worship.

Likewise he was wary about team burnout. "We have to guard against it. The servant heart is fantastic, always full of spiritual output, sometimes without input. If you keep this up too long, the heart – the effort – could go bankrupt. It's simple maths. There are seasons for everything – you need to move beyond it, not get depressed about it, and implement a plan."

SOME TECH TIPS FROM Dave Watson:

Never put guitarists on opposite sides of the stage. They work better in 'a clump', says Dave.

Asked why the two percussionists were set high and wide upstage at the Superdome, he replied, "because it looked cool!"

Avoid lapel microphones, but if the pastor

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or speaker insist, use a good one. Currently he favours the Shure WL184 lavalier electret condenser microphone. "It has a cardioid pattern, a slightly warmer sound, and is a little larger than usual. With Joyce Meyer (a leading conference speaker) we could hear her earrings rattle sometimes."

If a headset mic is the go, then the choices are the Countryman Isomax E6 and the DPA omnidirectional headband miniature condenser microphone.

A clone of both would be nice – the E6 sounds better, says Dave, but needs the dual ear headband of the DPA to be practical.

His pastor is very animated, and the single ear supported headband doesn't hold the mic in position. And, position is everything!

IN EAR MONITORS

The hot topic at Hillsong was monitor mixes, with Hillsong church itself generating up to 40 sends from its dedicated Yamaha PM1D stage monitor console for a regular service.

The conference week saw two PM1D control surfaces used together, to enable two engineers to better mix the 112 inputs to 40 sends. This is a major attraction of a digital mixing solution like Yamaha's, where two or more surfaces can operate in mirror mode across a common set of inputs at the mix engine – with all the analog mic connections patched in elsewhere on stage.

Once all those mixes depart the Yamaha, they usually end up in a Shure E1 earpiece system, which Dave says has had a difficult service life. "We use about 150 sets, and we use them well beyond normal. We are only getting about 2 to 3 months life out of them, and they cost about \$350 a set. The problem is sweat – the ear itself doesn't sweat, but sweat runs down the cable where it goes over the ear, and hydroscopic-ally seeps into the cable retention."

"It's quite personal when you look at someone's ears. People have goobers in there. Some people need to pick the ear wax out with a hook! But ear wax isn't dirty, it's natural", enthuses David. The seminar crowd are in various stages of grimace.

Dave recommends custom ear moulds be made for specific performers, and this might indeed be a good personal investment for many performers. "The guy pours liquid plastic stuff into the ear, lets it set for five minutes, then 'sh-h-h-hlock's' it out. He makes the mould from that."

Shure also offer a dual driver ear set, with better bass response, according to Dave. At the ultra high end of the market, you can buy custom made dual driver transducers for a couple of thousand dollars. These can also have a hearing aid built into the outside of the mould, with a switch so the performer can turn it on to hear what's happening outside their head.

But: "With dual drivers, sometimes I just can't hear the extra money", advised Dave.



Phil Webb from EVI Audio Australia is a popular Hillsong Conference speaker each year. He does a basic audio for church lecture which brings the topic down to novice level in a way people can relate to.

There is a big deal to be dealt with once you plug someone's ears with an in ear monitor ear set. They feel isolated from outside. They are cut off from locating where a casual comment, or a call, for an audience is actually coming from in 3 dimensional space.

"A pair of ambience microphones on each person's head would be best", joked Dave.

Around about this point in the seminar, it was clear some of the delegates from smaller churches were glazing over at the cost of it all.

"Look, keep it simple" said Dave. "Try headphones. Musicians don't like them because they don't look cool. But if it's a keyboard player, or a drummer, it's a good option. Plus in ear monitors tend to squish frequencies a little, and we are having a lot of cymbals break because the drummers are hitting them harder. With headphones, you can just turn it up, and turn it up, until you see the blood trickle from their ears! But drummers don't seem to respond anyway!"

It's good to see drummer jokes have transcended into the Christian world!

Dave suggests a 'butt thumper' or shaker stool is a good idea to get some kick program back to the drummer, since an IEM will not handle low bass.

Batteries are good for one pair of services only, according to Dave. He recycles them to the youth department where a failure during a youth show is less crucial. "The more you pay, the longer they last", he says, referring to the batteries!

LIGHTING FOR CHURCH

Another popular session at Hillsong Conference was hosted by Ian Anderson (above). Ian is the lighting designer for the conference, and assists Hillsong with its lighting.

"I compare church lighting to TV lighting. The way I light TV is all about balance:- foreground, background, and the angles that



you light in TV, are all for a camera to see."

"In Church, the primary thing to light for is the teaching, and the preaching, and I light it like I do for TV. It just doesn't compare to theatre."

"I try to explain, it's not rocket science. You put the light here to light someone over there. You get the balance right, and then bring up the congregation (lighting). It's just as important for the preacher / pastor to see what he is preaching at".

Proper audience lighting is not always successful or a priority. "You don't want it too 'toppy', so no evil shadow look. At Hillsong every audience section has a front light and a back light".

Ian noted a lot more questions from his seminar audience this year, and a lot more girls asking them. An encouraging trend!

"Rigging always stuffs people up – if you're designing a building, get someone in who knows where these things - video, lighting bars - should be."

"We also talked about set dressings, getting creative. You can't light a set if it's crap. We fight against that in TV. They just say throw a gobo on it! In the end, sometimes you don't light the set! You throw smoke, point lights down stage. It looks better in the dark!"

"If you've got a green wall, cover it up."

Ian does consulting work through his firm, Mitech Design. Email ianand@bigpond.net.au

-By Abimelech

Big Country

Julius Grafton goes outback with The Croc Festival

It is a winter's day in Katherine, 300k south of Darwin. You get there on a road with no speed limits. Peter Sjoquist is sitting in the Croc Festival production office at the town oval at his \$49 Bunning trestle table. It is 34 degrees outside and unseasonally muggy. It even rained briefly last night, off cue for the dry season. Sjoquist is firing off a rocket letter to some tardy government factotum somewhere, muttering under his breath as he does it. Croc is his creation, and he guards it closely. It is tightly funded by government and sponsors, runs on a shoestring, and everyone associated with it are working at virtual cost.

The 8 town outback tour, spread across 6 states of Australia is run on a budget of about \$3 million. There is no money in it for Sjoquist. Just costs.

Sjoquist also runs the Rock Eisteddfod which he co-founded, and a variety of similar concepts elsewhere across the world. He is firmly passionate, 24 hours a day, about advancing the cause of youth. He is not afraid to pick up the phone and chase down the highest levels of government, or big business, to pitch his cause.

His organization is based in Sydney. It has about 20 people working long hours, preparing, planning and promoting the Croc Festival and all the other events the organization runs. It is incorporated as a not for profit foundation.



BIG country

Like some committed people you meet in education, Sjoquist appears ready to battle anyone to get a better deal for kids. He is using the performing arts to give kids a creative outlet. Countless people in entertainment today started in the biz at school via a Rock Eisteddfod event.

Croc Festival is like a Rock Eisteddfod only much, much more complex.

It is a traveling performing arts and education festival. It has a massive tent village, an army like infrastructure. Thousands of kids from a massive catchment area travel to the Croc. They are catered, they go to sessions, they see and learn.

I saw an example of the impact of the festival on the faces of the kids from Nyirрпи, north west of Alice Springs in the Tanami desert. It is one of the more isolated communities scattered through the seven deserts of Australia. Men in Nyirрпи hunt emu and kangaroo, women hunt grubs. The older women can find, dig out, and kill feral cats with their hands.

The local dialect is Walpiri.

Their trip to Katherine took four days. For many of the kids from Nyirрпи it was their first visit to a big town. Katherine isn't big. The fireworks display at the end of the festival had the most rapturous audience.

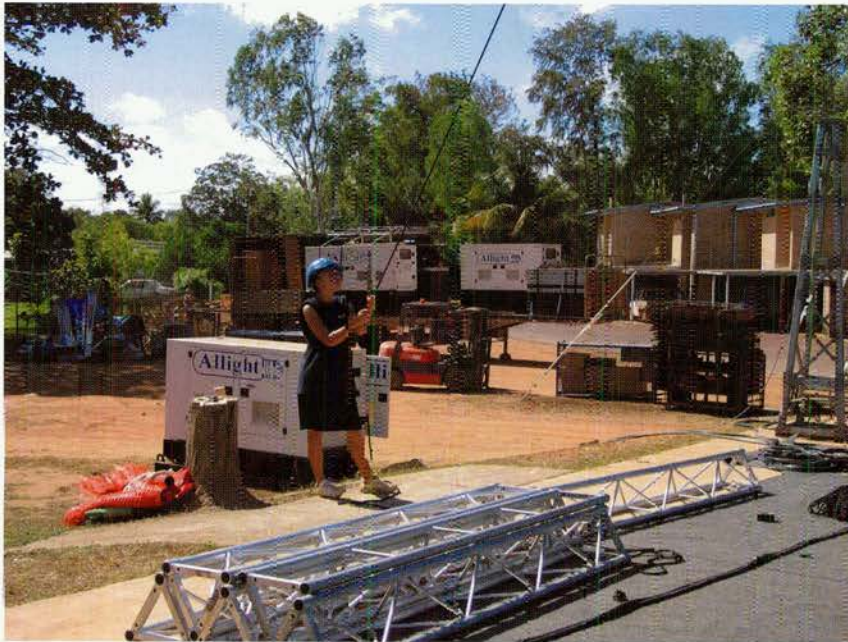
Things to do at the Croc Festival include workshops - 39 in total at Katherine. The site is a showground. The appearance of the Festival is like a large regional agriculture show at first glance when you drive by. The main stage is the focal point. It hosts a disco on the first night,

▶ *please turn to next page*



Helen and Peter Sjoquist
The Croc (tent) village, home to thousands





Juliusmedia were appointed by the Department of Education, Science and Training to provide training for indigenous students at each of eight Croc Fest venues. We taught the new Certificate II Theatre and Events, and customised the training into units that would be useful.

Modules we chose included ropes and knots, using tools, communications, teamwork, basic scaffolding, and overall we worked hard at having everyone work together. The O.H. & S training was a biggie. To date we've had no injuries during the tour.

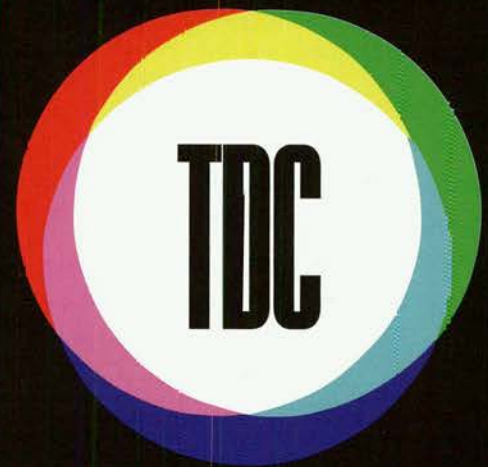
The students got a golden opportunity - the chance to actually put together an entire festival event.

They had the chance to work on the shows, choosing different aspects like lights, sound or stagehand.

It was a terrific vote of confidence to be given the contract, and a huge responsibility. We've really enjoyed the training - and making new friends.



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BIG country

then two nights of performances, free to attend. Most people in town turn up to see the show.

THE PRODUCTION

James Instrell-Walker (pictured, opposite) of JP Entertainment Group is the production contractor for the Croc Festival. He is a practical kind of a guy, based out of Adelaide.

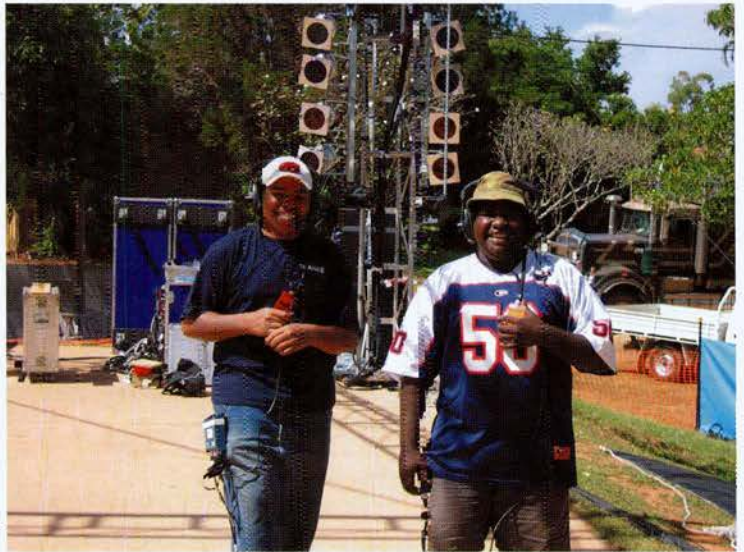
He put together a coalition of the willing, based around Adelaide firms, to assemble and hire all the detritus that makes up a complete outdoor festival touring production. His various collaborators include Tim Marshman of Go Light, Pro Stage, and Novatech Productions - amongst others.

James is a smart entrepreneur, and a skilled production and event manager.

He has the right stuff for the job - plenty of endurance, plenty of local knowledge in regional Australian ways, and enough patience - tempered with the mild aggression required to make things happen. He spacks out and yells when he thinks he needs to.

The show is travelling heavy with a road train loaded with anything needed for an outback tour. It is made up of a 42' and a 45' trailer, grossing at 72 tonnes all up, including the truck. One trailer has a 20' container on board for the sound and lights.

Jason Cain drives the Kenworth 501 Brute, a 550 horsepower off road spec prime mover, rated for 120 tonnes. The Cat engine and 18 speed road ranger let him maintain a 67 to 75 km average



speed. This makes runs like Geraldton to Port Augusta a 52 hour transit, allowing for a legal break every 5 hours and 8 hours sleep each 24.

"It's so boring", he complains about driving a truck. "Now they are building trucks with auto selectors, 'cos guys don't have the skills to shift manually. I can work all 18 gears without using the clutch. I know the synchro."

Jason has a bewildering array of kit scattered through the rig. The 52" sleeper box is deluxe sized. There are two fridges in the truck. A roof box lid opens to become a table. There is a BBC inside. Plus tucker



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boxes. "I don't eat red meat, so I buy some chicken shaslicks and cook them up. I got pasta, baked beans, little cans of tuna, fresh noodles." All home comforts.

Driving a road train is a lonely life. Jason doesn't take amphetamines. "I know plenty of guys do though, and they get addicted real quick. Like with cigarettes. I don't smoke either." He is a big, hairy bearded guy who prefers to wander around barefooted, or in thongs.

The kind of guy you like to have on your side.

The way he tells it, a trip is simply a numbers exercise, take the kilometers to run, divide by 70 (the average speed), figure the hours, allocate 14 per 24 hour period, and start. Drive

CREW

There are four crew on the road. They rely on a fifth professional – the trainer, John Grimshaw – and his trainees in each town. Jamie Schmidt is the lighting guy. He comes from Townsville. His wife has

• please turn to next page



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BIG country

just created a new Schmidt, their first baby and a girl at that. Jamie is missing them terribly.

"I'm trying not to tour, but the money makes it worth while. Croc let me fly home each break, so I'm not away more than a couple of weeks at a time. I've done a lot of Croc Festivals over the years."

Setup starts on Sunday, when the road train arrives.

The generators come off first, provided the local fork lift rental has arrived on time. There is a 120 and a 70kva generator set. Then the stage site is measured and marked out. The two heavy steel ground trusses that support the roof are laid and leveled, set parallel an exact distance apart.

Each has a crane jib, set like a tower, about 4 metres high at the back.

The six leg, three arch Matrix roof (made by Pro Stage) will sit on top of the floor truss.

Three roof arches are bolted together from alloy truss on the grass. When formed they are lifted into position, still horizontal to the ground, and bolted to hinged plates on the ground truss. Then the crane comes into action, and an electric hoist pulls the arch vertical. This is done three times. The three arches are then cross braced with truss, hauled up by third crew member Michael Faulner. He was a trainee at the last Croc Festival. Now he has a paid gig.

With the roof structure set, the stage is laid out. It is a modular Pro Stage, made in Adelaide. It folds into shape, and the floor is laid and locked into place. Stairs are set. The stage is 20m wide and 10m deep.

Then the lighting rig is wheeled out of a very tightly packed 20' shipping container. There are 8 Clay Paky HPE 1200 moving lights, 2 Cyber Lights, and 3 Clay Paky Stage 300 wash fixtures working in Katherine when I arrived.

There are some more, but the road trip to and from Weipa, the previous date, has rendered some moving lights out of action.

According to the truck driver, some sections of the unsealed road, in fact much of 1000 kilometers of it, are badly corrugated. The average speed full to under 50kmh for much of the trip each way. This pulverized the production equipment, much of which came out more than slightly disheveled at Katherine. The Jands Echelon lighting desk was working fine at the DMX output for the lights, but not displaying reality on the Martin Show Designer screen or even on the patch screen. Luckily the actual desk functions still worked.

James spent a lot of time screwing things back together, before rigging his show.

There were 32 Par 64 on the front truss, and two follow spots. A pair of Jem smoke machines and a bunch of audience blinders made up the rig. Jamie made it all look a lot bigger than it was. He is skilled.

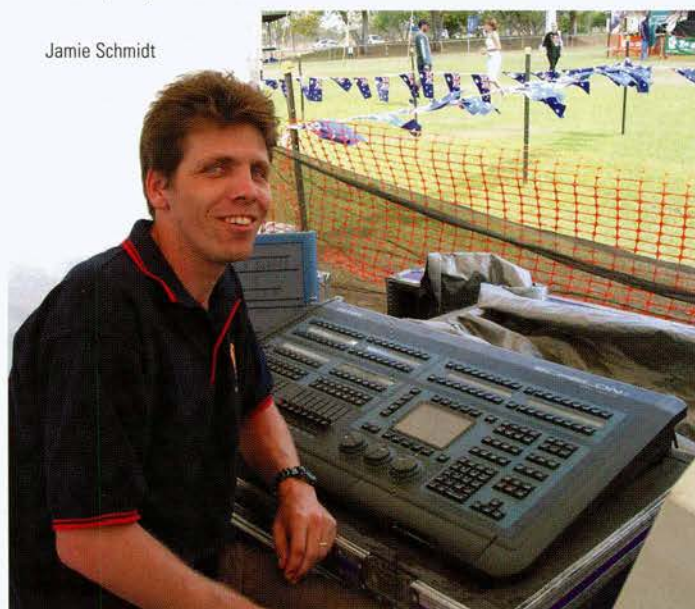
Because space on the road train was at a premium, the production had been refined and condensed. The sound system is more than adequate but compact.

Out front, James has a Behringer digital mixer. On each side of the stage is a DAS speaker system - one ST 218 dual 18" subwoofer; and 2 x St 112 composite boxes on top. They are powered with QSC Powerlite amps.

When I first saw the system, I thought 'no way', but having heard it, I now say 'yes, way'. It is used for voice announcements, CD replay, and at most an acoustic guitar and didgeridoo.

The tour started in early July at Weipa, then went to Katherine, Derby, Geraldton, Port Augusta, Swan Hill, Moree and it will finish in Alice Springs in late October.

Jamie Schmidt



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Who's left

Who's left the PA system behind?

BY DUNCAN FRY



Although I'm a child of the 60's, unlike most of my peers I've held out for many years against joining my fellow baby boomers and going to see reformed 60s and 70s bands on their unending runs of 'Going Through the Motions' or 'Paying off the Mortgage' comeback tours. Mainly I suppose because I prefer to remember the bands as they were when I first saw them back in the 60's and 70's; young, vibrant and enthusiastic, not wrinkled old men as most of them are today. I prefer to remember me that way too, so at least I'm consistent!

So when some friends said, "Hey Dunk, let's go and see The Who when they come out," I was somewhat ambivalent. "We-e-ell," I hesitated.

As regular readers know, I was a big Who fan early on, and went to every show back in 1968. But it wasn't really going to be The Real Who but more like Who's Left. Moonie kicked over his last drumkit back in 1978, and John Entwistle recently expired in true rock star style, with a hooker and one too many snorts in a Las Vegas hotel room. So it was going to be just Pete and Roger plus some backing guys.

What really swung it for me was seeing Roger Daltrey in the Ultimate Rock Symphony a couple of years ago. One of the few high points of that concert was his voice - still in great shape, and this version of The Who also would have Zak Starkey on drums, from the same tour.

"Come on," my friends insisted, and in the end I said yes, reluctantly handing over a hundred bucks for a ticket. A big jump from the \$4 it cost me back in 1968! The last thing I thought I'd have to worry about was the sound, but I was wrong.

The venue was Vodafone Arena in Melbourne, and as a concert venue it makes a good bike track. But

I've been to concerts at worse venues, so I wasn't overly worried.

Our seats were on the left-hand side of the arena about half way down the room. Pretty good views of the stage, and a line array sound system. There were about 12 or 14 boxes hung each side and a bunch of subs on the floor. Although we weren't sitting straight in front of the line array, we were well within the claimed dispersion. As well, there was a secondary line of about 3 boxes hung to the left of the main line, and it was facing us directly. So at least we would be able to hear everything.

The first concerns arose when the support band, You Am I, came on. I'd been looking forward to seeing them live, as I rather like their recorded stuff. But self confessed Who fans that they are, they can't have been remotely happy with their sound that night.

Support bands typically don't get use of the full light show, and maybe 90% power on the sound system. But

if you know that, then you've got to make sure when you're mixing that you don't fill up that 90% with kick drum! We couldn't hear any guitars, and vocals only when there was no music, just bloody kick drum all through the set.

Nature called, as it often does after a couple of drinks, so as I answered it, I walked behind the mixing position so I was directly on axis from the speakers, but the mix wasn't much better. The only difference was that you could hear the guitars off the stage. You really know the sound is bad when guys are talking about it in the dunny!

Finally The Who came on and our hopes went up, and to be fair the sound was marginally better. But not by much. All we seemed to be getting were a lot of highs, so the sssibilance factor was annoying, and a lot of lows, but not much in between.

Once again, the mix was way too kick drum oriented. I've never thought of Who music as having a one-note kick drum based sound, but more the opposite, a rumbling wall of sound with edgy bass, big guitar chords and loads of drum fills. Well, if that's what the band was playing it certainly wasn't getting out to the audience. Where was the much-vaunted even coverage promised by line arrays? Whatever happened to every seat being a good seat? We weren't very far off axis, and we weren't high up in the nose bleed areas, but we might as well have been outside.

What was causing the problem? Was the second line array pointing directly towards us causing the lack of mids? Were we right in a zone where overlapping coverage with the main hang was creating nulls in the midrange? If so, then why was the system flown in that configuration? Every major concert sound system comes with a computer program that enables you to configure the system to match the room exactly. Isn't that what all the advances in system design have been telling us for the last ten years or more? And isn't that what these super-expensive Emperor's New Clothes are supposed to provide?

As I sat there stewing I found myself yearning for a wall of S4s.

And, it pains me to say this, but it just wasn't loud enough. Who would have thought that anyone would come away from a Who concert saying that? A band that featured in the Guinness Book of Records as the World's loudest. In fact, were all the problems simply a case of not enough system?

On the other hand, the light show was superb. As a sound person, it's not often that the light show impacts on me that much, but credit where credit's due. It was simple, dramatic and very effective, and complemented the band's playing perfectly. And the band did play well. For a couple of old grogans they showed that they had lost none of their fire nor their ability to rock.

If the quality of the sound had matched the lights, I would have come away happy and considered it a hundred bucks well spent. I went to the concert not as an industry person, but as a regular punter in a regular seat in an audience full of people exactly like me, and I was shortchanged.

Not Happy, Jack!



1968 and 2004 tickets compared. The new tickets are bigger – that must be why they cost so much more!

Big Bang Theory

By Chris Venn

When using a hydraulic lifting platform, for example a Biljax Cougar, there are many safety considerations to keep in mind. Operators are usually thinking of issues to do with maneuvering on a firm and level surface; traveling it appropriately; using outriggers; dealing with obstacles and avoiding the dangers of personal injury.

Hydraulic lifting platforms are typically powered by one or more lead cell batteries; at the end of the day they are usually parked judiciously in the wings or other convenient place and placed on charge to be ready for the next days work.

At this point it is not usually considered further, but even in this seemingly passive state it is a potential safety hazard, in fact an acid bomb needing only a spark to be triggered. Over 250 people each year in Australia are hospitalised because of battery explosions. Batteries give off hydrogen, which can ignite and cause the battery to explode. Open flames, incorrect jumper lead connections and loose battery connections are the main cause.

Assessing the safety risk we see that the theatre environment is not a place where naked flame is commonplace. When used in productions in the form of a lit candle for example, it is under close surveillance; even so there is potential risk if a battery is on charge nearby.

Sparks however are another matter. I have witnessed the result of a battery explosion, which took place some years ago on a stage in a major Sydney venue.

It happened during a bump in; there was lots of crew around and a cougar parked on the OP side of stage. Because the theatre was dark the opportunity was taken to make some structural changes to lighting bars, which involved the use of grinding and welding equipment.

Engineers had designed the upgrade.

All the correct safety procedures were observed; hot work permit; appropriate

screening and clearing other personnel from the immediate area. Thankfully this last safeguard was the reason no one was badly hurt, as personnel were mostly clear of the immediate work zone.

No one considered the Cougar, which was on charge some four meters away.

I was traveling in a lift almost at stage level when I heard a massive explosion and felt the shock wave. Within a couple of seconds the lift reached stage level, the door opened to a scene of stunned confusion. The Cougar battery had exploded; luckily no one was hurt. Crew were cleared from the stage, evaluation made of the damage and a clean up ensued.

From that experience I gained a renewed respect for the lead acid battery and advise the following precautions:

- Take great care when charging batteries or using jumper leads. Read all warnings and directions on the label. Do not allow metallic materials to simultaneously contact both terminals.
- All smoking, open flames and spark producing items such as grinders, welders or other electrical equipment, should be kept well clear of batteries.
- Ensure adequate ventilation around the battery.
- When handling batteries gloves and eye protection is recommended.
- Battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to cause cancer and birth defects or other reproductive harm. Wash hands after handling.
- Switch off the battery charger before connecting or disconnecting any battery. Disconnect the negative terminal FIRST and the positive terminal LAST.
- Avoid prolonged or excessive overcharging, which may create Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen.
- In the event of fire: CO2 may be used, but

not directly on the cell. The thermal shock may cause cracking of the battery case

- If the battery case is broken, avoid direct contact with internal components. Lead acid batteries contain sulphuric acid, which can cause severe burns or even blindness.
- Do not open battery; avoid contact with internal components. Internal components include lead and absorbed electrolyte. Electrolyte is corrosive and contact may cause skin irritation and chemical burns.

Emergency and First Aid Procedures: (contact with electrolyte)

- 1) Flush contacted area with large amounts of water for at least 15 minutes. Remove contaminated clothing and obtain medical attention if necessary. Eye wash and/or emergency shower should be readily available. With potential eye injury even seconds can make the difference in minimising serious injury
 - 2) If swallowed, give large volumes of water. DO NOT induce vomiting; obtain medical treatment.
- There are numerous other precautions for those handling and installing batteries that go beyond this article.

Wind & weights

Col West went North from Perth many years ago and ended up establishing Top End Sound in Darwin. Now it is a powerhouse.

Decades of working seven days a week, smoking Dunhill's and enjoying running the business almost came to an end earlier this year.

Top End had moved into stages and structures. The pride of the fleet is a 25 x 145m Hoecker - a rigid framed tent, large enough for a large state dinner.

As many Australian's know, the railway to Darwin was finished this year. The ceremony at Darwin Port would include the Prime



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Framed up, weights added



Roof goes on

Miniature, and a Hoecker full of VIP's.

"We were dealing with two levels of government - local and federal", Col told CX. "They required a Plan A, a plan B, and a plan C, in case of every contingency. Including terrorist attack, or the train not making it."

Col says he always has a plan B anyway, just in case. "We are so far away, we can't call anyone to order stuff or get things. We have to either make it ourselves, or plan ahead.

Friday prior to the rail ceremony the Hoecker was framed up, and concrete weights placed under each leg. An engineer had calculated 4 x 1.7 tonne weights, with the balance all to be 600kg. With the frame all rigid and secure, the task of sheeting the roof and walls started.

"I got a call from my guy there, I could hear he was puffing, running. He said 'you'd better get down here, Col, it's going over'"

The entire Hoecker, complete with concrete blocks in tow, had blown over and was destroyed on the otherwise empty wharf. The wind was blowing under 30 knots, average for summer in Darwin, the wet season.

"The gig was over, at least that's what people were telling me when I got there", says Col. He survived his loss - the structure cost \$800,000 to buy.

It was insured. "Remember, every insurance claim is initially denied", says Col, "until it is properly investigated" Luckily the blame did not land at Col's feet, he eventually was paid out.

The blame lay elsewhere.

The immediate task was to make the show happen. Top End had enough smaller structures in stock that they could join them all, and get them set up after the wreckage was removed.

Imagine if the event had been underway at the time?

Airborne \$800,000 Hoecker

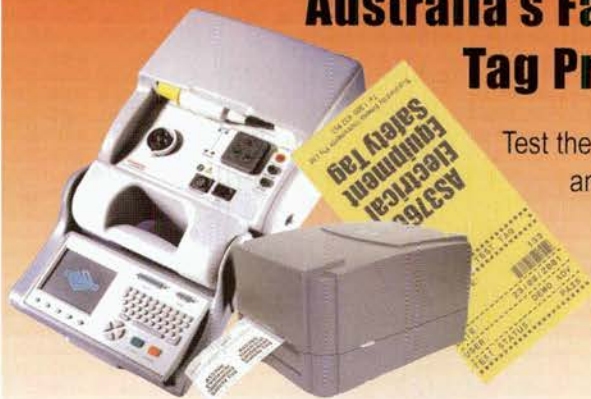


Weights thrown around



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Walter Gerin dies

Sydney audio industry identity Walter Gerin died in July at Calvary Nursing Hospice in Sydney. Walter had terminal cancer. He was in denial until his death. His story is told by Jeff Stewart, a friend and a former employee. Jeff was forced to close the doors at Anything Audio, Walter's company.

"He had a cancer 18 months ago – and an operation. Then he got a lump in his groin, we suspect it was going on longer than he admitted, he is a typical male with the 'I'm OK' type thing. It wasn't until the lump got bigger and painful that he got serious about it. The doctor's gave him a bit of a runaround, and he didn't follow up as well as he could."

"By the time he went in for pre surgery inspection the cancer had gone too far. He told everyone the cancer had receded. He told me some days he felt the lump was bigger, some days smaller."

"He'd been in St George Hospital for a month and a half, he checked himself out and went home for a week. He went back for a doctor's appointment and they said he wasn't going anywhere. He rang me in tears and said he wasn't able to go out, and could we pick up his car which was parked in a 15 minute spot outside."

"We went and turned off his TV, shut up his home, parked his car."

"He was in ridiculous denial – even after I resigned I suppose you could say I was forcing my hand – I couldn't go on ordering stock off suppliers when I knew they wouldn't be paid. I love the guy, but how long – at some point you got to think about what's going on".

"I spoke to him on Sunday and we had a good old cry together, but even at that point he said if I get out of here and get the business back will you come back. His (lack of) strength was shocking, it was like holding a conversation with a 120 year old man who was drunk."

"Jim Morton was working one day a week (with us) as a book keeper – he used to work with Walter at Dunlop before he started in the industry. Jim went to see the bank and took the paper work in, they are going to appoint a receiver."

"Walter ended up with nothing. The bank is owed \$75,000, they'll probably auction off the stock. The creditors may not get anything."

"Walter always wanted to grow the business."

Jeff Stewart was sombre and reflective as he narrated this story. He spent many years working with Walter, and is genuinely torn up to see it all go to waste.

TRIBUTES

► It serves as a warning to all of us, 23 to 53, that our health is our prime and perhaps only resource. • Steve Leiter

► The sadness felt by everyone at our company over Walter's condition is very great. To say this was a shock is an understatement. Walter was a real friend with everyone he dealt with and nothing was ever too much trouble. • Chad Ross

► I've known Walter for at least 17 years and I would call him a friend. He was always interested in what I was up to, how my family was, pictures of the children and how business was going and took the time to listen. • Stephen Wilkinson (Debbie, Megan & Kate)

► Thankyou for writing this story, a life surrounded by such sadness and sickness yet whenever you spoke or saw Walter he never lost faith in life, business and particularly love, which is more than most of us can say. I shared tea at his house which always brought on tears of happiness and laughter. We would spend hours discussing love, life and business. He encouraged me with my business from the beginning and supported me through very hard times. • Mardelle Collins

► I am very disappointed to hear of this. I went to high school with Walter, and was close friends with him for many years, during that period, and for some years after, till I moved to Melbourne. We drifted

apart (as you do), particularly as we live quite different lives (I am gay, he was not). But we did get together a few times after I came back to Sydney.

He was SUCH a nice man, with a kind and gentle temperament.

• Gordon (Ruby) Richmond

► Too many of our industry people go suddenly and far too early and lets be honest, we ain't all necessarily stacking it away for the future like we should be! • Mark Gibson.

► He will be remembered for his reputation as an accomplished retailer who survived difficulties that would have shattered most of us, including the death of his wife, Valerie, from cancer two years ago.

• Grahame Harrison.

► Walter Gerin was a rarity. And not just in our business. He was passionate about everything he did. He was generous with everyone he met. He was always optimistic, positive, and encouraging. He cared. • David & Jo Betteridge

► I always remember his coffee cup was the size of him. It was a bloody bucket not a cup! He would always ask me about the family, about my job and how the company was travelling. He would share with me his successes and we would talk shop. He did tell me that he had a cancer but implied that it was not that serious. • Lex Strauss

► He was a genuine character with a friendly and polite manner. What he may have lacked in audio knowledge in his early days of the business he well and truly made up for in customer service. Walter certainly had his share of hard knocks in life yet from our occasional chats he stayed positive in his direction and worked hard to grow the business. It is unfortunate his vision was never fulfilled. • Dave Croxton

► He liked to go out and have fun but mainly if it had anything to do with sound, lighting etc...then he was always the first one there and the last one to leave - no matter the kind of function - I mean he even played the DJ at a party my sister and I had. • Belinda Gerin

► Walter employed me for 12 months after I left Bose and you could not wish for a better boss. He had vast experience and nothing flustered him. I never heard Walter say a bad word about anybody and both my wife and I will miss him greatly. • Guy Newson.

Closer to home.... Julius Grafton writes:

The passing of my mum Margaret Grafton came suddenly and mercifully in her sleep at age 73, like I mentioned in the editorial on page 7.

Talking to her friends, and my brothers, I am reflecting that our modern culture doesn't really talk about death. We were flailing around trying to make sense of our loss, and not really sure how to manage the details part.

These are some of the things that can happen when someone dies:

- We needed to find a doctor in the middle of the night to come to the house to issue a death certificate, so the police and the morgue could do their thing.
- The bare essentials funeral and cremation cost \$5,253.60, and White Lady Funerals made us pay upfront. Later on the executor of the estate said he could have paid for it out of the estate, which would have been much better and fairer for us.
- The minimum cost of a coffin at White Lady Funerals is \$1,361 plus gst. We also realised early on that the reason why they asked for some of mum's clothes was so they would charge us extra for embalming for a 'viewing'. We declined.
- I asked if a roadcase could be used as a coffin in the future, thinking of my own arrangements, and it appears this is not possible.
- We found the will, and lucky for us mum had chosen the Public Trustee. They are (in NSW) a government executor who seem on the ball. We know of some terrible cases where lawyers appointed as executors have rorted the estate.

Swampy's Auction

Last year the entertainment industry lost one of our favourite sons, Wane 'Swampy' Jarvis. He died a bankrupt through no clear fault of his own. This is an important thread to this story, with a shock ending.

Recently an auction of memorabilia was held in his honour in Sydney. It was big news, and many people - including us at CX - went and had a trip down memory lane viewing all the exhibits.

Hearing Swampy's story will help others avoid a similar fate. His widow, Kerrie Jarvis wrote these words:

In the 80s we were living in Coffs Harbour. We also did about 10 outdoor concerts at the Coffs Harbour Showground one of which we promoted ourselves - Easter Jam 1984. We had two financial backers, a local publican and a building contractor. The backers said that they would cover the insurances under their existing policies.

On the day of the show, a (security) guy decided to leave his post, hop on a motorbike, ride like a madman and then he hit a rock, had a fall and broke his shoulder. Eventually a pin had to be put in his shoulder and he claimed workers compensation against Wane Jarvis trading as Stageline Productions.

We immediately contacted the backers, but as the concert had lost some money, not very much just a few thousand, they took the hard line, said that there was no insurance and that it was up to us.

We were eventually served with legal papers and engaged a Sydney law firm. At the conclusion of the trial the Judge awarded \$11,000 in damages. We did not have the money so we were advised by our lawyers that the Uninsured Public Liability Fund would pay and probably we would never hear anything about this again.

This court case took place in 1987. In 1996 we received a letter from Workcover saying that we owed this money and it was payable immediately. I sent a copy of the letter to the lawyers, they replied that they would handle it and be in touch. We heard nothing more until three months after our son had committed suicide in 1999. There was a knock on the door and Wane was served with Bankruptcy papers.

Again we enlisted the services of the lawyers - another \$3,500 legal bill. They felt that we had a good case what with Wane having had triple by-pass surgery in 1995, work falling off over the prevailing years as the promoters felt he had 'lost it somewhat' and work was scarce, then we lost our Son. They pleaded our case but the end result was that they felt there was some 'beancounter' in the bowels of Workcover who reckoned that we were lying what with all the glamorous names we had worked with. They would not budge so finally we agreed to pay the full amount, which by now was \$25,000 as the interest had incurred on the original debt of \$11,000 over all those years.

We agreed to pay \$5,000 as a first payment and then \$500 a month. I sent the cheque to Hunt & Hunt and literally the same day walked out into my living room and found Wane lying on the floor in a pool of black



Tamara Jarvis (left) and Kerrie Jarvis (right), with a friend at the preview of the memorabilia auction. Their smiles didn't last for long.

blood, internally haemorrhaging. He was rushed to emergency and some days later I was informed by the specialist that Wane should take a long break. We moved to the Central Coast for a year to give him that break, but obviously he could not work. I called the lawyers, explained the situation, cancelled the cheque and said that we could no longer meet the agreement, that was in July 2001. In February 2002, Wane was declared bankrupt and a trustee, Giles Woodgate of Woodgate & Co. was appointed by the Court.

Wane had \$52 in the bank when he died. The first panic was what am I going to do, how will I pay the rent, how will we eat, panic panic panic. The first thing Tamara and I knew was that we had to get rid of all the junk in the double garage that Wane used to cart around with him for years, he was a hoarder not a collector, plus there was all of Robbie's stuff, plus lots of mine and Tamara's that we had saved over the years.

Over the past 14 months 24/7 we have carted, carried, lifted, created and turned a whole lot of junk into something with some value both nostalgic and monetary.

It was a load of junk that had no real value until we created, designed, mounted, boarded, framed, got signatures and worked our butts off and spent a lot of time, lost income, and money getting it into a viable state to interest an auctioneer.

Over the years Wane, Robbie and I worked in the industry and the numerous outdoor concerts that we did, we never ever had an injury or a problem - this was the only one, and I might add the only time that there was no insurance coverage, we always made sure of that. Wane was very picky of his safety record.

This story has an even sadder ending. At presstime CX has learned that the proceeds of the auction have been frozen in a legal dispute.



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The Art of Recording:

1 Acoustic Magic

Simple techniques for recording acoustic guitar

Recording an acoustic guitar is easy: Set up a mic, press record and play, and lay down the soul. But to capture a great acoustic guitar sound takes a bit more effort. How you approach recording a stellar tone depends on the guitar, the room, the player, the style of playing, and the track's context.

by Mitch Gallagher

First, note that any standard round-hole acoustic guitar has a danger zone: The sound hole pumps out a solid column of boomy low end. Avoid placing a mic in that column, or even aiming one directly at the sound hole, and you'll get better results.

STRUMMED

How you mike a strummed steel-string guitar depends largely on how the track will be used. These types of tracks can range from gentle strumming accompanying a vocal to hard-driving strumming in a rhythm section.

Many engineers start with the "standard" position: a large-diaphragm cardioid condenser mic placed 12–24" away, at guitar neck level, slightly to the player's left (assuming a right-handed player), and aimed at the point where the neck meets the guitar's body. If the strummed guitar will be solo, you may

want to add a second mic slightly off to the right of the player. Aim the second mic at or behind the guitar's bridge — sometimes you might even aim slightly in front of the bridge for a brighter sound with more pick attack. If you're in a decent room, consider adding a spaced pair of distant mics to add depth to the sound.

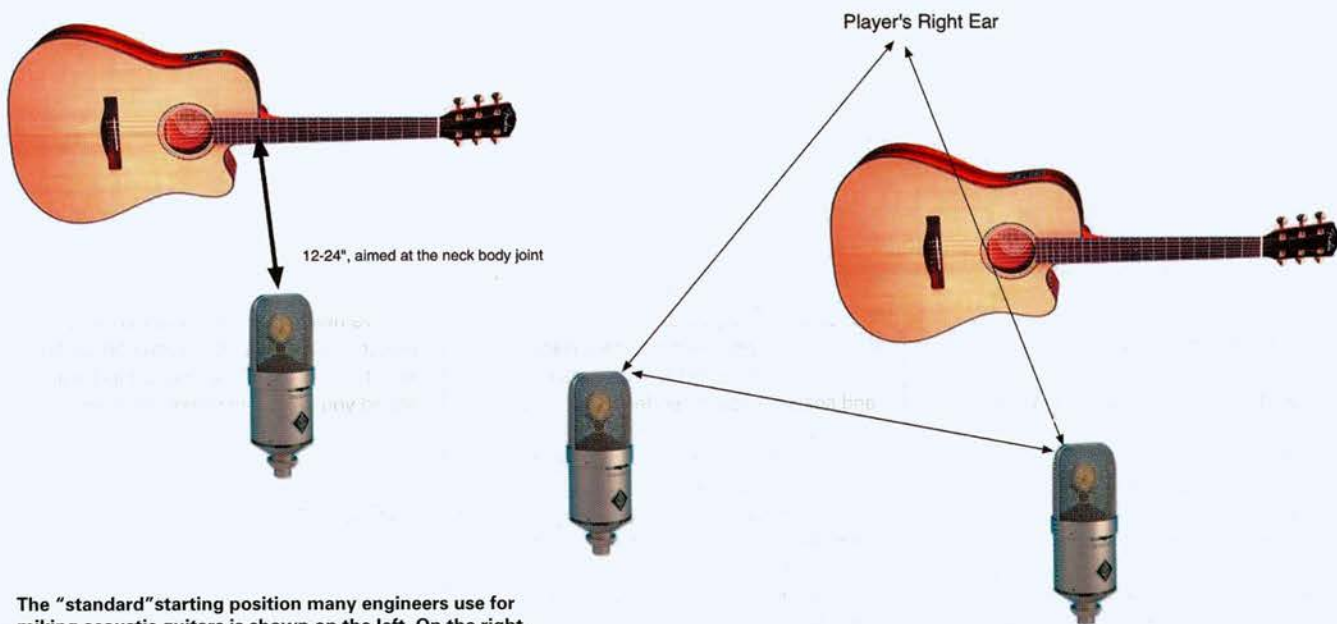
For a hard-strummed part, you could use a condenser mic in the standard position aimed at the neck/body joint, but also try using a dynamic mic — I've had good results with a Shure SM-57 and similar models. You won't get as much detail or bottom, but you'll hear a full, midrange sound with a lot of attack and drive. This can be perfect for rock styles where fidelity is less important than punch. In general, one mic is fine for this style; you want the guitar to sit in the track and drive it. The subtleties of room or fancy stereo miking will be

lost or clutter up the track.

FINGERPICKED

For a fingerpicked guitar, especially one that will be used solo, you want to capture all the detail of the performance, with good dynamics, solid midrange presence, and full bottom end. For this, large-diaphragm condenser mics work best, although I've also had good results using small-diaphragm condenser models. Fingerpicked guitar can be quiet and delicate; look for a clean mic and a preamp with plenty of gain.

The "standard" acoustic mic position mentioned previously is generally a good starting point. In some cases, with a little adjustment of the mic position, this may be all you need, especially if the guitar will be in a mix with other instruments. I often augment that mic with a stereo pair pulled back to get some room sound, and give sonic depth and space.



The "standard" starting position many engineers use for miking acoustic guitars is shown on the left. On the right, the front mic captures most of the sound while the other mic reinforces lows and adds depth.

But lately I've found a new favorite approach, especially for tracks that want a big sound or if the guitar is detuned and I need deep bottom end. To give credit where credit is due, I picked up the basics of this technique from one of Nashville's acoustic recording masters: Bil VornDick (Bela Fleck, Alison Kraus, Russ Barenburg, Ralph Stanley, Jerry Douglas, and many others).

Place one mic in front of the guitar, a bit further back than the "standard" position. Position a second mic to the player's right, and slightly in front, so it forms an equilateral triangle with the player's right ear and the front microphone. Experiment with the right mic's position; try it at knee level, looking up toward the guitar body behind the bridge, or at ear level looking down at the guitar body behind the bridge. The "meat" of the sound will come from the front mic, but placed correctly (move it around, you'll know when you hit the right spot) the right-hand mic will fill out the bottom end with tight, full, round lows. I've used this approach with steel- and nylon-string guitars; for nylon, pull the right-hand mic back, or turn it down in the mix a bit.

Here are a few other approaches to try

- Stereo small-diaphragm mics, 18–24" back, the same distance apart, with the mics pointing a few degrees in toward the guitar body.

- Mid-side from a few feet back.

- For those into overkill: one large-diaphragm condenser mic centered on the guitar, two spaced small diaphragm condensers a few feet back and a few feet apart. Two room mics, pulled back enough to capture a balance of guitar and room. For added versatility, track a pickup on the guitar as well. Use the large-diaphragm with some of the pickup as the main sound, use the spaced small diaphragms to give the sound width and

richness, then add in the room mics for spaciousness and depth. This setup also works well for surround applications.

Warning: Getting all those tracks in-phase may take some work.

CLASSICAL GUITAR

If you're doing a true classical guitar recording (as opposed to a nylon-string guitar played in another style, such as jazz or pop), purity is your priority. With a classical recording, documenting the performance is usually the goal. So, choose mics and preamps that are clean and uncolored — we don't want high-end hype or too much midrange presence boost. Often classical recordings have mics set farther away from the instrument/player than recordings for other styles. This means that the room will play a big part in the sound — try to record in a good one.

You'll see classical guitars miked in mono and stereo with the mic(s) placed as far as five or six feet away, pretty much directly in front of the instrument. The idea is to capture what someone in the audience would hear. But classical guitar is a low-volume, delicate instrument. Get too far back, and you'll have too much room. You may also be forced to use so much gain that mic or preamp noise become an issue.

Lately I've been having good luck recording classical guitar with a spaced stereo pair of large diaphragm condenser mics in cardioid or omni pattern placed back about three feet from the instrument, and spaced about three feet apart. The result is bigger and more present than many "traditional" classical recordings, but it works for me. I've also been experimenting with mid/side recordings from three or four feet back — nice if you want control over the stereo width of the final tracks, and are set up for mid/side decoding.

I prefer to mic in stereo if the guitar will be solo; if it's a duet with another instrument, such as flute, I'll sometimes go with one mic for a tighter sound.

WHAT ABOUT PICKUPS?

While few listeners would confuse a piezo or magnetic pickup — or even one of those internal body mics — with a "real" microphone positioned well to capture the instrument, that doesn't mean a pickup can't be useful.

I've never found a pickup that could carry the entire guitar sound, despite years of trying different pickups and EQ and processing techniques. But if the guitar has a pickup in it, I almost always record it to its own track; with a DAW, there's little concern about burning up an extra track.

Depending on the guitar, the pickup sound, and the part being played, I'll mix the pickup in, often with heavy EQ — basically I'll use the pickup to reinforce a weak spot in the tone. For example, I'll use the pickup to fill in the bottom on a detuned guitar that needs help in the low end. I lowpass the pickup track, so that it's almost serving as a "subwoofer." Especially with bridge-mounted piezo pickups, I find the lows speak fast and tight, without getting boomy or mushy. With the right EQ, and proper phase alignment of the pickup with the mics — you'll often have to delay the pickup track by a few samples — the pickup should roll smoothly into the guitar tone, and not be audible as a separate component of the sound.

I've heard that some engineers use pickups to reinforce the midrange; to my ears this is too audible, but it may be a sound you like. Regardless, track the pickup along with the mics. You never know when it might be useful.

STRUM AWAY

Learning to track a great acoustic guitar sound — one that fits the song — isn't difficult. Like everything, it requires a bit of knowledge, a lot of practice, and some critical listening. Throw some mics up and start experimenting; before long you'll be hearing stellar acoustic guitar tracks of your own. **EQ**

How to Tune Your Control Room

It's not just for instruments anymore

by Ethan Winer

Few project studio owners enjoy the luxury of a purpose-built control room. So, it's common to see people mixing in bedrooms, basements, or whatever space is available. While you can certainly get good results in almost any room if it has enough acoustic treatment, you'll get even better results if you can optimize the room's size and shape. In this article I'll explain how the dimensions of a control room affect its accuracy, then show how to get the best results from whatever room you have available.

“Contrary to conventional wisdom, tuning a control room does not necessarily mean adding an equalizer to the monitor chain”

MODES DEFINE THE ROOM

At the most basic level, a room is simply a bandpass filter. Or more accurately, three bandpass filters, with one filter corresponding to each of the three dimensions — length, width, and height. Not unlike music played through a graphic equalizer with three of the bands boosted all the way, a room imparts its unique sonic signature on all sound produced within it.

The filter frequencies are determined by the room dimensions. So for a room that's 12' x 10' x 8' high, the three filters are tuned to approximately 47Hz, 57Hz, and 71Hz, respectively. Additional level boosts occur at harmonically related multiples: 94Hz, 141Hz, 188Hz, and so forth for the 12' length, and likewise for the two other dimensions. These boosts are the result of natural resonance — or *modes* in acoustic lingo — which is short for *modes of vibration*. Besides increasing the level of those frequencies, room modes also increase their decay time, so notes at those pitches linger after the musician stops playing.

There's nothing we can do about room modes — they're a fact of life — but it's definitely possible to minimize the inevitable coloration they add by choosing optimum dimensions. One way to reduce the effect of room modes is to space them as evenly as possible. If a room is a perfect cube, say, 8' in all dimensions, there will be a huge resonance at 72Hz, with other lesser resonances at every multiple of 72Hz. Therefore, a room where all three dimensions are different is better than a cube, because there will be in-between resonant frequencies instead of one enormous peak. Even better is to design the room to have more resonances that are closer together. This is done simply by making the room larger while keeping the proportions the same.

Compared to large rooms of the same proportions, small rooms have fewer modes that are spaced farther apart. This is because the first mode in a small room is at a higher frequency. For example, when the longest dimension in a room is only 8', the modes for that

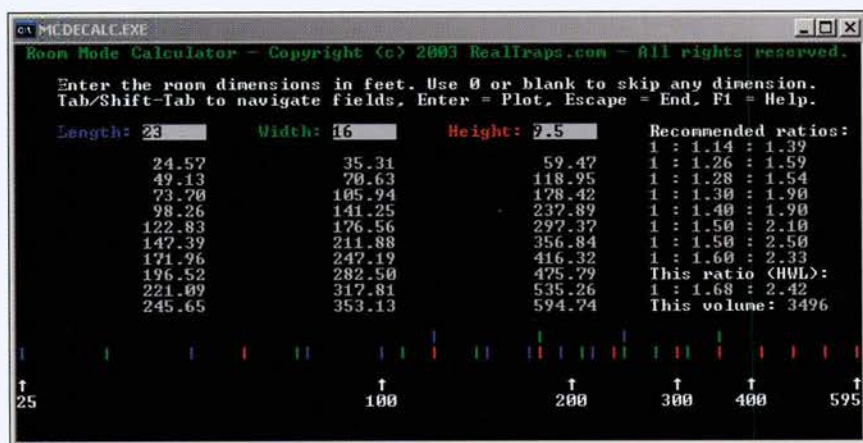


Figure 2: You can download the ModeCalc program from the author's web site to assess the mode frequencies and spacing for any rectangular room. The online Help explains how to use the program and interpret its results.

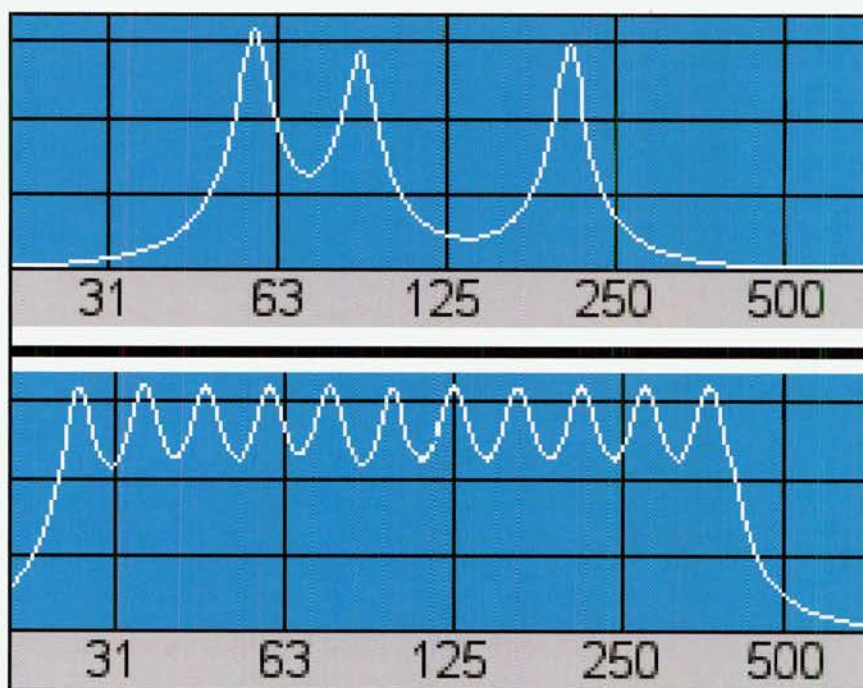


Figure 1: When comparing small room resonances (upper graph) to larger room resonances (lower graph), it's clear the larger room has a more even frequency response. The natural response in a small room has resonant peaks that start higher in frequency and are sparser than for a larger room.

dimension start at 72Hz and are 72Hz apart. In larger rooms the first mode is at a lower frequency so the subsequent modes are closer together too. Therefore, a large room has a flatter low frequency response because it has more total modes, and they're spaced more closely. Since the modes begin at a lower frequency, the additional boosts also give more overall output at those lower frequencies.

Playing music in a room with poor mode distribution is like listening through a 5-band graphic equalizer with two or three bands turned up all the way. A room with good mode spacing is more like having a 31-band equalizer with all the bands turned up. The frequency response still isn't perfect, but all those peaks combine to yield an overall response that's reasonably flat.

The upper graph in Figure 1 shows the low frequency response created by the first few modes in a poorly shaped small room; the lower plot reflects a larger room having better dimensions and thus more modes, more evenly spaced, and with less distance between them. Since the larger room's modes start at a lower frequency, and occur at more closely spaced intervals, the result is an overall flatter and more extended low frequency response.

If you're designing a room and want to see the acoustic effect of varying the dimensions, or you need to choose which of several existing rooms would be the best to mix in, you can download my free Graphical Mode Calculator program (see Figure 2): www.ethanwiner.com/modecal.exe. This program runs on any DOS or Windows computer, and displays the



modes as numbers and also graphically so you can easily see how evenly they're spaced.

ROOM TUNING

Contrary to conventional wisdom, tuning a control room does *not* necessarily mean adding an equalizer to the monitor chain. Although control room monitor EQ was common years ago, these days most acousticians reject equalization as a way to achieve a flat low frequency response. The main reason EQ is not useful for correcting a room's low end is because the response can change a lot depending on where you sit. I've measured changes as large as 15dB across a physical span of only four inches at 100Hz. So any EQ correction you apply is valid for a very small area only.

As every location in the room is different, no single EQ curve can give a flat response everywhere. Even if you hope to correct the response only at the mix position, there's a bigger problem — it's impossible to counter very large cancellations. For example, if acoustic interference causes a 25dB null at 50Hz, adding that much boost with an equalizer will cause your power amplifier to clip on loud passages, or will damage your speakers or at least increase their distortion. And at other locations where 50Hz is already too loud, applying EQ boost will make the problem even worse.

EQ cannot always help at higher frequencies either. If a room has ringing tones that continue after the sound stops, EQ can make the ringing a little softer but it will still be present. The same is true for low frequency reverb and ringing, which obscure clarity as bass notes ring out and overlap into subsequent notes. EQ can

How to Tune Your Control Room

help to reduce the most blatant modal peaks, though not peaks created by acoustic interference from a nearby boundary. To reduce modal peaks properly, you need a parametric EQ and also a way to measure the room to a resolution of 1Hz or finer. Even then, EQ helps only a little because the amount of boost varies around the room. So the best you can hope for is to lower the average level a little at that frequency.

A much better way to tune a room is with absorption that reduces the response-skewing reflections that are the root of all these problems. Besides improving the frequency response of the room, absorption also helps by making the reverb time more uniform at different frequencies. Previous articles in this series introduced the use of absorber panels and bass traps, which is the correct way to tune a room because it attacks the problem itself, rather than the symptoms created by that underlying problem. I distinguish absorbers based on the range of frequencies over which they operate, using a "crossover frequency" of about 300Hz. This dictates both the type of absorbers you'll use, and also where you place them.

Mid and high frequencies are easy to tame using thin panels made of foam or rigid fiberglass mounted in various places on the walls and ceiling. Low frequencies are a different matter entirely — for effective bass trapping, acoustic panels need to be very thick, and placed in the room corners including the wall-ceiling junctions. Other types of bass traps can be used, including membrane traps, wood panel traps, slat resonators, and thick blocks of foam shaped for corner installation. A Google search on "bass traps" will yield a month's worth of further reading, plus links to commercial acoustic treatment vendors, and plans to build your own panels and traps.

Adding bass traps to a room improves its low end response and makes it more like a larger room for two reasons: The modal peaks are reduced, and reflections that skew the response up or down are also reduced. Because substantial low

frequency absorption is needed in all rooms, it's important to use a mix of bass traps and mid/high frequency absorbers, not just thin materials that absorb mainly mid and high frequencies. Rooms treated using only thin panels made of foam or rigid fiberglass are often too dead sounding, yet boomy at the same time. This is why blankets, carpet, egg cartons, and other such "room treatment" usually make a room sound worse than if it had no treatment at all.

"As every location in the room is different, no single EQ curve can give a flat response everywhere."

THIS MUST BE THE PLACE

Now that you know what types of absorbers you need, let's look at where to place them. As I already explained, bass traps should be mounted in the room corners. This is the best place for bass traps because this is where low frequencies tend to collect in a room. However, mid- and high-frequency absorption should be placed more evenly around the room, as well as at the points of first reflection.

"Improve Your Monitoring" (May 2004 issue) explained the importance of using absorption or diffusion to avoid early reflections and thus ensure good stereo imaging, so I won't belabor that here. In many rooms, once you've installed enough bass traps and placed absorption

at the early reflection points, little additional treatment is needed. However, if your room has large areas of bare wall, or a reflective floor and also a bare ceiling, additional mid/high frequency absorption is needed. Since the goal is for sound to be balanced evenly around the room, I prefer some mid/high frequency absorbers on each surface, rather than covering one entire wall only. You can do this by placing 2'x2' or 2'x4' acoustic panels in a striped or checkerboard pattern. If you have a reflective floor, you'll need additional absorption on the ceiling.

SO NOW WHAT?

Okay, now you know what you need and where to put it, but how can you tell when a room has enough absorption? The "free" way is to simply clap your hands while standing in different parts of the room and listen for excess ambience and obvious echoes. If you can hear any specific tones ring out right after clapping, that means more absorption is needed. In particular, look for parallel opposing surfaces that are both bare. Again, don't treat just one surface; rather, put less absorption on *both* surfaces.

Even better than hand claps is to actually measure the room's decay time at 1/3-octave intervals. This requires a dedicated audio analyzer — either hardware or software — that can display the reverb time separately for each 1/3-octave band. I use the ETF program from www.acoustisoft.com because it's affordable and performs all of the important tests needed to analyze a room. However, other packages are available to do the same sorts of measurements, including Smaart (www.siasoft.com), SpectraFoo (www.spectrafoo.com), TEF (www.gold-line.com), and Terrasonde (www.terrasonde.com), among others.

Besides heading up RealTraps (www.realtraps.com) where he designs acoustic treatment, Ethan Winer also moderates the Acoustics forum at www.musicplayer.com. Stop by any time with your acoustic questions, or just to say hello. EQ

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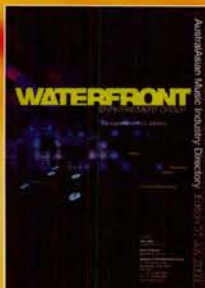
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"Coming Attractions" are previews of new products that haven't arrived in the marketplace. These aren't product reviews, but are designed to bring you up-to-the-minute information on the next generation of cool recording tools.

COMING ATTRACTIONS

Sony ProDATA

by Mitch Gallagher

23GB of archiving and backup on a single disc

What is it? High-capacity blue laser-based optical disc storage/backup system

Who needs it? Anyone who needs to store, backup, or archive large amounts of data.

Why is it a big deal? Blue laser technology allows 23GB of data storage on a single-sided optical disc, with projected archival life of up to 50 years.

Shipping: July, 2004

Retail Price: Internal SCSI, US\$2,995. External SCSI or USB 2.0, US\$3,299. Write-once or rewritable discs, US\$45 each.

Contact: www.sony.com/prodata

Check the online discussion forums and message boards; one of the biggest

concerns facing those of us who work with digital data is backup and archiving. What do you do with all that data your computer has churned out in the process of making a CD or some other audio project?

The move toward higher resolutions and sample rates, and the need to keep alternate takes and mixes, material for different edits and versions, as well as rendered versions of tracks featuring soft synths and plug-ins only make the backup and archiving situation worse.

Yes, you could back up to CD-R — but be prepared to burn through (pun intended) a lot of discs to store even a moderately sized project. DVD-R is also a possibility, although some audio projects are getting too large even for that media. Tape drives are an option for high-capacity storage, but they can be slow,

and the mechanical nature of tapes doesn't sit well with some as an archival medium.

To address this problem, Sony has launched the ProDATA drives, which can record up to 23 gigabytes on a single-sided optical disc. (Nearly five times the capacity of a 4.7GB DVD-R and almost 32 times the capacity of a 700MB CD-R.) The discs are designed for pro storage and archiving applications.

The drives utilize blue laser technology, which can write data much more densely on a disc than previous optical storage technologies. Read speeds can reach 11MB/second, while write speeds top out at 9MB/second. The ProDATA drives have a 16MB cache — much larger than on other optical drives — which eases the load on the host computer, and reduces errors. A dual-shutter mechanism creates an airtight drive, even when media is in the drive. This resistance to dust

and other contaminants is said to increase data integrity as well as hardware durability. The disc itself, which is the size of a standard DVD, is encased in a resin cartridge to protect it from fingerprints and other contaminants. Sony's projected life for the disc media is 50 years.

Three models will be on the market by the time you read this. An internal model (BW-F101A) will interface with the host computer using SCSI-3 LVD 160, while two external models, BW-RS101 and BW-RU101, will interface to the computer using SCSI-3 LVD 160 and USB 2.0, respectively. Drivers are available for both Windows and Macintosh computers.

Two versions of the data storage media will be offered, a write-once version and a rewritable version. The ProDATA drives will ship with disc formatting and backup software packages for Mac and PC, as well as one disc. **EQ**



Zero-G Morphology

by Craig Anderton

Price: US \$219.95
Contact: East West,
www.soundsonline.com

Strengths:

- Wonderful, evolving synth patches
- 3GB library of 24-bit sounds
- Kompakt playback engine offers extensive tweaking options
- ASIO/DirectSound/MME/SoundManager/CoreAudio, VST/DXi2/RTAS compatible
- Excellent VST automation

Limitations:

- Can control only four Kompakt controllers via MIDI (volume, pan, bend, wheel)
- No Sonar automation except recording controllers as MIDI data

This plug-in sound library uses Native Instruments' Kompakt sample player engine (OS 9, OS X, Windows 98/ME/2000/XP) to play back superb atmospheric sounds, as well as add useful processing (filtering, envelopes, effects including reverb, and more). Kompakt loads up to eight instruments at a time, which for even more possibilities can be treated multitimbrally, layered, transpose, split, or sent to separate outs. A free, downloadable extension

allows streaming samples from hard disk.

Kompakt has some limitations (however, an update is due): virtually no external MIDI control, fixed mod wheel assignment per patch, and occasional stability issues. However, the library can also be accessed by NI's more powerful Kontakt sample (v1.5 or above), which opens up many more options.

The 24-bit sounds are an outstanding collection of atmospheres, drones, FX, harmonic loops, industrial noises, pads, synths, a virtual synth, and voices. Many of these are rich, high-carrier sounds that can be background soundscapes or dessert toppings for your tracks, but some rude and scary noises round out the collection. And remember, these aren't static samples because Kompakt can do significant editing.

It appears that Ian Boddy, the library's creator, put a lot of thought into the categories and titles because I found them genuinely useful for finding appropriate sounds. The vocal patch called "Approaching Heaven" is, well, downright heavenly, while "Edge of Chaos" does indeed sound like you're standing at a cliff and looking down into a place where strange things happen. "Delicate C Dorian" could probably be used for crowd control — pump this over a PA, and wait for everyone to enter a state of bliss.

Especially given the price, if you're doing soundtracks, ambient, chillout, game sounds, need some cool transitions, or just want some truly inspirational soundscapes, this is a great collection — you could record a very credible "Hearts of Space"-type CD with this library alone. **EQ**



by Mitch Gallagher

Radial Engineering X-Amp

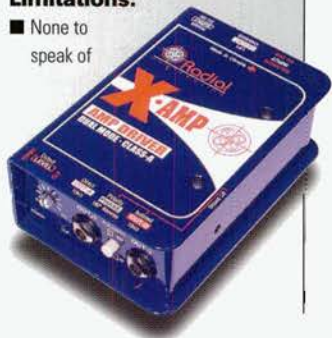
Price: US \$199
Contact: Radial Engineering,
www.radialeng.com

Strengths:

- Two amp outputs, one transformer-isolated
- Output level control with overload LED
- Input and output ground lifts
- Indestructible
- Can be used with a preamp as a "line driver" for long cable runs

Limitations:

- None to speak of



The quest to capture the ultimate guitar tone can be a long and arduous one.

It's especially difficult if you're trying to dial in the tone in the "heat of the moment" — as the guitar player is laying down the track. If you want the most control over the tone you're recording, then the best solution is to re-ampify: record the direct guitar to a track, then play the track back through guitar amp(s) so you can dial in the sound and mic selection/placement to perfection. The problem is interfacing your recorder/DAW to the guitar amp. The solution is Radial Engineering's X-Amp.

X-Amp is descended from the JD7 (reviewed July '02); it employs the same Class A

design and active balanced input. There's an output level control and an overload LED. The unit has two guitar-level outs for feeding two amps at once. The polarity of the second, which is transformer-isolated, can be flipped.

Putting X-Amp to work is easy: hook up the wallwart power supply, run a balanced (XLR) line from your recorder to the input. Hook the 1/4" outs to your amp or stomp boxes. I connected X-Amp to my Pro Tools rig and to my Mesa-Boogie amp. Initially it appeared I would have noise problems — there was fairly high amount of hash in the amp. A flick of the input ground lift solved the problem. The amp was dead silent, even at high gain. I connected my

Marshall to Output 2 for a layered tone. Again, a blissful lack of background hum or hiss.

The best thing you can say about X-Amp is that it sounds like you're plugged straight into your amp. The second best thing is that it's so simple to use, but has cool features, such as multiple ground lifts and an output level control. The third is that it's clearly built to last a lifetime.

"Re-amping" is a way of life for me — as a back-up, I track all guitars direct so if necessary I can go back and re-record with a different tone. With the X-Amp, Radial has provided an outstanding tool for re-amping — and the price is right. Chalk up another winning creative tool for the Radial crew. **EQ**

by Mitch Gallagher

AKG C 414B-XLS and C 414B-XL II

AKG's classic mics move into the new millennium

Type: Large-diaphragm condenser microphones

Price: C 414B-ULS, A\$2,299; C 414B-XL II, A\$2,299

Contact: www.audioproducts.com.au

Polar pattern: Omni, wide cardioid, cardioid, hypercardioid, figure 8

Capsule: 1-inch dual diaphragm

Type: Pressure gradient

Frequency range: 20 – 20,000Hz

Bass cut filter: 0, 40, 80, 160Hz (40 and 80Hz have 12dB/octave slope, 160Hz has 6dB/octave slope)

Pad: 0, -6, -12, -18dB

Sensitivity: 23mV/Pa

Self noise: 6dB, A-weighted

Signal to Noise: 88dB

Maximum SPL: 140dB @ < 0.5%

THD (up to 158dB

with pad

engaged)

Dynamic range:

134dB

The AKG C 414 has been a studio-standard microphone for more than 30 years. In the course of those years, AKG has released five incarnations of the mic (see sidebar), all of which have been enormously successful. Now the company has created new

versions of the last generation C 414: the C 414B-XLS and the C 414B-XL II. According to AKG, the goal was to leave the mics' well-respected sonics the same, while upgrading the performance to a higher level.

The new models look much like their predecessors, but

with smooth rounded edges, which are said to reduce bothersome reflections. They're also slightly larger than older models, and feel very solid without being so heavy that they unbalance a mic stand.

The XLS has a silver grille, while the XL II has a gold grille. Both models are transformerless and utilize surface-mount electronics. The XL II is said to be identical to the XLS except for a "slight high-frequency peak above 3kHz." AKG recommends it for solo vocals or instruments, as well as for distant miking.

Taking a look at the frequency response graphs for the cardioid polar pattern, both mics have a slight dip in response (about 2dB) centered around 1,500Hz. The XLS is fairly flat until around 9,000Hz, where there's a 2–3dB peak between 10,000 and 15,000Hz.



THE NEW C 414B-XLS INCORPORATES 15 NEW FEATURES. THE MOST OBVIOUS ARE THE NEW PUSHBUTTON SWITCHES WITH LED INDICATORS, AND THE ADDITION OF A FIFTH POLAR PATTERN — BUT THERE'S LOTS MORE COOL STUFF UNDER THE HOOD.



THE NEW C 414B-XLS AND C 414B-XL II BOTH FEATURE THE NEW "WIDE CARDIOID" POLAR PATTERN, WHICH EXTENDS THE NORMAL CARDIOID PATTERN TO THE REAR AND TO THE SIDES.

THE C 414B-XL II IS IDENTICAL TO THE C 414B-XLS EXCEPT FOR A MID-/HIGH-FREQUENCY BOOST.

Through the Years

The new "X" generation C 414B microphones represent the first changes to the model since 1993 — but the lineage runs long.

The XL II has a 2dB rise in the mids and highs starting around 2kHz, with an extra 2dB peak between 5,000 and 6,000Hz.

Both versions can be purchased in matched stereo pairs.

CONTROLS

The new XLS and XL II offer more sonic control than their predecessors. Each mic has a bass-cut filter with four settings; 0, 40, 80, and 160Hz. The 40 and 80Hz settings have a 12dB/octave slope, while the 160Hz setting has a 6dB/octave slope. The old models had three filter settings: 0, 75, and 150Hz, all with a 12dB/octave slope.

There are four pad settings: 0, -6, -12, -18dB. On the previous models, there were three settings: 0, -10, and -20dB.

On the old C 414s, there were four polar patterns: omnidirectional, cardioid, hypercardioid, and figure 8. The new C414s have five polar patterns: omnidirectional, wide cardioid, cardioid, hypercardioid, and figure 8. Wide cardioid is like a cross between cardioid and omni, with more pickup from the rear and the slightly more from the sides.

Rather than small slider switches, the XLS and XL II have new pushbutton switches for stepping through settings. LEDs indicate which position each switch is in. When the phantom power is turned off, the last settings are remembered. If you grab the mic carelessly, it's easy to inadvertently press one of these switches and change a setting.

The LEDs serve multiple purposes: The center polar pattern LED, for example, turns red to indicate overload in the microphone's output stage. The polar pattern selector switch indicator

LEDs also help the user to visually maintain on-axis orientation when distance miking.

All switching — filter, pad, and polar pattern — is in low-impedance circuits — this is said to reduce the mics' sensitivity to humidity, whether from the environment or from moisture from a singer's mouth.

SO WHAT ELSE IS NEW?

Besides the look of the new models and the control/sound tailoring capabilities, what else has changed? AKG lists a total of 15 differences between the old and the new versions; here are a few improved specs that will be immediately appreciated.

- 6dB increase in sensitivity.
- 8dB lower self-noise.
- The 1" dual diaphragm is suspended in an elastic shockmount, which reduces handling and stand-borne noise.
- Ready for remote operation with the soon-to-be-released R 414 remote control, which operates over regular XLR mic cables.
- The list prices have come down from previous models.

THE PACKAGE

The XLS and XL II come with the PF-80 pop filter, H 85 shockmount, and a foam windscreen. The compact metal mic case has room for the pop filter, which is mounted on a gooseneck with an integrated stand clamp, the shockmount, the windscreen, and the microphone. Everything is held securely in fitted foam except the pop filter, which sits in the lid of the case.

The new H 85 shockmount is smaller than the older H 100 mount. The C 414 solidly locks in place, so you can orient the mic at any angle or upside down. The shockmount is easy to

position, and is lightweight enough that it doesn't overbalance boom stands.

The manual is quite good, with a list of recommended applications for each mic, as well as brief guides to mic placement with common sound sources and instruments.

In broad strokes, AKG recommends the XLS for acoustic instruments and the XL II for vocals. (See the sidebar for more on the recommended applications for each mic.) Of course either mic can be used on whatever source you want to put it in front of. It's got plenty of SPL-handling

capability for even the loudest sound (up to 158dB with the pad at its highest setting).

IN USE

The XLS has the familiar C414 sound — if you've used a C 414B before, you'll feel right at home. There's full bottom end, present midrange, smooth top end, and controlled proximity effect. The XL II has a nice high-end boost that gives the sound a little lift; but it's not overdone or hyped; just a bit of a rise.

Both mics work well in most applications, but when you compare them side-by-



■ The C 414 COMB was introduced in 1971. The first solid-state AKG large-diaphragm recording microphone; it had a hard-wired cable.



■ The 414 was reduced in size in 1976, and renamed the C 414EB. The first C 414 with XLR connectors, which were becoming the industry standard.



■ 1980 saw the introduction of the C 414EB-P48. The electronics were redesigned to accommodate 48-volt phantom power.



■ The longest running version of the mic, the C 414B-ULS, was unveiled in 1986. It was a constant in AKG's catalog until the introduction of the "X" series earlier this year. The "ULS" electronics optimized noise, distortion, and transient response.



■ In 1993, AKG brought out the C 414B-TL II, a transformerless version of the 414 that harkened back to the original C 12 in its sound.

■ 2004: The X-generation C 414s make their debut.

AKG C 414B-XLS and C 414B-XL II

Recommended Applications

While you can put any mic in front of any source you want (or dare) to, microphone manufacturers usually have an application or two in mind for each mic model. In very general terms, for example, AKG aims the C 414B-XLS toward instrument applications, and the C 414B-XL II toward solo vocals and vocal-like solo instruments. Not sure whether the C 414B-XLS and C 414B-XL II is the right mic for you? Here are AKG's recommended applications for the two mics. There's overlap, but in most cases, the manufacturer recommends one mic over the other. This is, of course, just a guide. If you want to deviate from it, feel free! (Legend: "•" indicates that AKG recommends the model for this application, "••" indicates that AKG highly recommends it.)

SOUND SOURCE	C 414B-XLS	C 414B-XL II
Solo vocal	•	••
Backing vocal/choir	••	
Speech	•	••
Acoustic guitar	••	••
Electric guitar		••
Electric bass	•	
Upright bass	••	
Violin	••	•
Cello	••	•
Zither	•	••
Grand piano (classical)	••	
Piano (rock/jazz)	••	••
Organ	••	•
Trumpet	••	••
Trombone	••	•
French horn	••	••
Tuba	••	•
Saxophone	••	••
Flute	••	••
Clarinet	••	••
Harmonica	•	••
Kick drum	••	
Toms	•	•
Cymbals	•	
Bongos/congas	•	

side, you'll start to appreciate the differences and strengths in the two models. As recommended by AKG, the C 414B-XL II is the first choice for vocals. The slight high-end boost brings vocals forward nicely, helping them sit in the mix without making them strident or sibilant. For nylon-string classical guitar, I preferred the C 414B-XLS, which has smoother top end. The guitar sounded real and dynamic, without excess top end noise. On fingerstyle steel-string guitar, however, I liked the C 414B-XL II, for the added top-end detail and openness. I

liked both mics on electric guitar, although the XLS was more true to the original, and the XL II could be slightly "fizzy" on heavy distortion tones.

On percussion, both mics work well; if you need more top end to bring out sizzle or impact, the XL II is the way to go. For smoother, natural top, go with the XLS.

The wide cardioid polar pattern is a useful addition. In some cases, a full omnidirectional pattern is too open, but a cardioid pattern doesn't get enough room. The wide cardioid offers a compromise, with solid pickup from the rear, and slightly more pickup from the sides. If you have a nice-sounding room, you'll find yourself using this pattern.

The improved self-noise allows you to cleanly capture very quiet sound sources without worry of too much hiss — you'll probably hear preamp noise before you hear mic noise. On the other end of the scale, you'll have trouble finding a source loud enough to top out the C 414s; at 158dB with the pad fully on, they can handle pretty much anything you throw at them.

The bass-cut filter is flexible. The 40 and 80Hz settings work well for vocals, etc., and provide tight bottom end. Generally I'm not a fan of low-cut filters that operate over 100Hz. But with its

gentle 6dB/octave roll-off, the 160Hz setting on the XLS and XL II is usable on many sources.

NEW AND IMPROVED

The C 414B-XLS and C 414B-XL II represent a nice step forward for the venerable C 414 family. The improved specs will be appreciated in this 24-bit age, as will the new features, such as the more-flexible filter and pad, LED indicators, output stage overload indication, and more. The new wide cardioid polar pattern provides a nice option for when omni is too much and cardioid is too tight. The package is complete, including a shockmount, pop filter, and foam windscreens in a fitted metal case.

But the bottom line is the sound, and the new models deliver the well known C 414 timbre — the XL II adds a nice presence in the mid and high frequencies, which makes it even better for solo voices and instruments.

If you already own a C 414B-ULS or a C 414B-TL II, you'll want to carefully consider whether the improved performance and new features make it worthwhile to move up. But if you're buying your first C 414, the new models are the way to go.

Which one should you choose? The XLS, with its smooth, flat response is ideal for general purpose and instrument applications. The XL II, with its high-frequency boost, is great for vocals, solo instruments — anyplace you want a bit more high end flavor without resorting to EQ.

Whichever version you choose, you can't go too far wrong. You'll be getting a time-tested mic that performs well in almost any situation, with a complete selection of accessories. And maybe best of all, the price is down from the last generation.

A new C 414 with improved features and specs for less money? We're talking a good deal, folks! **EQ**



Strengths:

- Same great 414 sound quality
- 4-position bass cut and 4-position pad
- Five polar patterns
- Very low self- and handling-noise
- Comes with pop filter and shockmount
- Lower prices than predecessors

Limitations:

- Pushbutton switches make it easy to accidentally change settings (the switches can be locked to prevent this)

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by Phil O'Keefe

Yamaha 01X

This do-it-all box brings mLAN to the fore

Type: Audio/MIDI interface, control surface, digital mixer

Platforms: Windows XP, Mac OS 9/X

Price: A \$3,995

Contact: www.yamahamusic.com.au

Inputs: 8 mic/line ins (2 with XLR connectors and switchable phantom power, 6 balanced 1/4" jacks; input 8 has a second "hi-Z" input for guitar and bass)

Digital I/O: Dual mLAN connectors, coax S/PDIF

Outputs: 1/4" stereo (unbalanced) -10dBV monitor outs, 2 assignable 1/4" -10dBV aux outs, stereo headphone jack.

Number of mixing channels: 28

Expandability: Up to 16 additional analog channels via mLAN

Computer interface: IEEE-1394 (FireWire)

Internal sample rate: 96kHz

Driver resolution: 24-bit, 96kHz

Plug-in format: VST

Faders: 60mm motorized faders (8 channel faders, 1 stereo master fader)

MIDI: 2-port MIDI interface (32 channels)

DSP: Dynamics control and 4-band parametric EQ on all 28 digital mixing channels, dual 32-bit effects processors

Footswitch jacks: Transport, punch in/out

Supported programs: Cubase SX, Nuendo, Sonar, Logic, Digital Performer, more.

Bundled software: Studio Manager, SQ01 Sequencer, 01X Channel Module, Vocal Rack, Final Master multiband dynamics, Pitch Fix formant-accurate pitch correction, demos of Native Instruments Pro53 and B4 soft synths

Tested with: Athlon 64 3400 DAW computer, Sonar 3, Cubase SX 2

When I first saw Yamaha's 01X, I thought it was just another DAW control surface with audio/MIDI interface. Turns out I was only partially correct: While the 01X is certainly those things, there's a lot more under the surface.

The 01X connects to your computer via a single FireWire cable — install, configure the software, and you're good to go. The main controls (aside from the motorized faders) include a scrub wheel, transport controls, and various selection switches. All of the switches are generously sized and have a solid feel; many also have an LED that indicates the currently active mode.

Eight continuously variable, detented rotary controls (they

click slightly when turned) also have built-in push switches that control several functions. For example, there are no

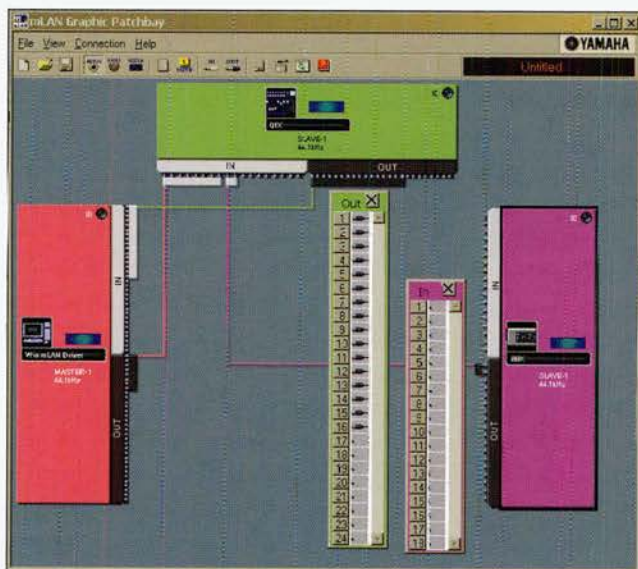
"yes/no" type buttons; instead, the LCD lists those options, and the rotary knob switches act as select buttons



THE STUDIO MANAGER SOFTWARE PROVIDES ADDITIONAL VIEWS OF WHAT'S HAPPENING IN THE MIXER.



IT'S AN AUDIO/MIDI INTERFACE... IT'S A DIGITAL MIXER... IT'S A CONTROL SURFACE... IT'S YAMAHA'S 01X, WHICH WORKS AS PART OF AN mLAN SYSTEM OR STANDALONE.



THIS SIMPLE APPLICATION SETS UP YOUR MLAN SYSTEM WITH A FEW MOUSE CLICKS.



CLEAN UP PITCH PROBLEMS AND WRONG NOTES WITH PITCH FIX.

— pretty neat. I was a bit concerned about pressing down on knobs, because the knobs themselves wiggle slightly. But in practice, they worked without any problems.

In general, I liked the mic pres; for general duty with dynamic and condenser mics, they have plenty of gain and sound fine. I'd place them somewhere between those on the Yamaha AW series standalone DAWs and the 01V96 mixer. They're fairly neutral, which is exactly what I prefer. As something of a torture test, I plugged in a Beyer M160 ribbon mic, which has a fairly low output, and recorded my Taylor 510 acoustic at a distance of around 8" from the 14th fret. While the Taylor isn't a particularly loud guitar, there was enough gain available for a useful recording, but just barely. I'd recommend an outboard preamp for low output ribbon mics, as the 01X preamps can get a little hissy at extreme gain settings.

The monitor and

headphone outs share a common volume control. I would have preferred separate controls, but as most 01X users I rely won't have separate control and tracking rooms, it won't be much of an issue.

CONTROL SURFACE OR MIXER?

The 01X is also a digital mixer with dynamics control and 4-band EQ. I could route unprocessed tracks directly out of Scnar into the 01X for processing; this meant fewer plug-ins needed with Sonar, reducing the load on the computer's CPU.

The S/PDIF I/O is flexible: You can assign it to any of the eight main input channels, or even to aux sends for use with hardware processors. There are also four aux sends (pre- or post-fader), and two onboard effects processors with dedicated stereo returns. These stereo return channels also have 4-band EQ, but no dynamics processors.

Overall the effects are usable, sound better than many plug in effects, and their

inclusion allows taking even more of the "load" off your DAW's computer. Standouts are the early reflection and room reverb presets. The dual pitch effect is also great for adding de-tuning to, say background vocals. With libraries for EQ, dynamics, effects, and scenes included, you can use the 01X *seris* computer as a digital mixer for small group live gigs.

MLAN

You can expand I/O via mLAN, a powerful open source interface standard that uses standard FireWire cables to carry audio, MIDI, and word clock data among devices in the system (see the "mLAN Primer" article in the 5/04 EQ). You can even "cascade" two 01X units together via FireWire for more faders and I/O. The 01X mixer accepts up to 16 channels of mLAN audio ins (8 at the 88.2/96kHz sample rates), and each channel has the same EQ and dynamics processing as the analog ins. Speaking of sample rates, apparently the 88.2kHz option only works with Macs, although a PC runs at the 96kHz sample rate just fine.

i88X

As this was my first in-depth mLAN experience, I was

glad Yamaha also sent an i88X audio/MIDI interface. It has eight analog ins (two with mic pres and inserts), eight analog outs, Toslink stereo/ADAT lightpipe, coax S/PDIF digital I/O, and MIDI I/O connectors. The lightpipe connector handles high sample rates, and worked fine with my 01V96 mixer. However, at about 14" deep, the i88X might not fit easily in some racks.

With the exception of the first two mic/line ins (on combo Neutrik connectors), all connectors are on the rear panel, while all switches and controls are on the front. It's great that you don't have to reach around the back to, for example, turn the phantom power on or off.

Connecting the i88X to the 01X was simple — a single FireWire cable. You configure the setup with Yamaha's mLAN Manager applet, which makes it easy to adjust the settings for the audio, MIDI, and word clock routing with a graphic patchbay. Click on the source, click on the destination — done.

That's a big reason why mLAN so cool: by simply connecting two FireWire cables between three devices — computer, 01X and i88X — all three could

Yamaha 01X



talk to each other in any direction. There's no plugging and unplugging dozens of cables behind your rack, and a major reduction in the overall amount and types of cables needed.

Regarding the mLAN computer drivers, the latency was an amazingly low 1.1ms in Sonar with a 44.1kHz/24-bit song. I have a fast computer, but that's still remarkable. In Sonar (and Cubase SX 2.0, which I also tested), all of the I/O appeared as normal ASIO drivers. I had 16 channels of audio routed out of the 01X into the computer, an additional eight routed out of the computer back into the 01X, and the i88X feeding another eight channels of audio into the 01X's mixer. That's a lot of audio for just two cables — that it all worked with no pops or clicks at such a low latency setting blew me away. Routing more channels would place greater demands on your system, but with a fairly fast computer you should be able to meet any reasonable real-world demand.

The other really big i88X news is the mic pre quality. Using the Taylor and the Beyer, and then a Soundelux ELUX 251 on a male vocalist, produced some very clean and detailed recordings. These aren't "flavored" pres, but they rank with some of the best I've heard for transparency and clarity. The unit is worth the price for the mic pres alone; toss in the extra I/O, nice-sounding converters, and mLAN connectivity, and it's a really good deal.

FADER FINESSE?

The 60mm faders were smooth enough (and moving faders are always welcome anyway), but I've been spoiled by 100mm faders — especially those with 0.1dB resolution. The resolution on the 01X's faders is coarser, and I felt the shorter faders made precise moves more difficult. I also had to adjust the fader timeout settings in Sonar. The first time I tried to do some moves, I pulled the faders down and after a few moments they "jumped" back up to their original values. As you can adjust the time before that occurs in software, it's not a big issue. On the other hand, Cubase SX's "touch tracks" feature works fine with the 01X, and Yamaha is about to release a patch to improve remote

capabilities with Sonar.

However, while longer faders would be nice, they would also add to the unit's cost. So would more analog I/O on the 01X, or more mic pres on the i88X. At these price points, I feel Yamaha made the right design decisions.

SOFTWARE AND DOCUMENTATION

The indexed manuals are generally clear, and a DVD offers over two hours of instructional material. Some of the material was out of date, but Yamaha's 01X support site www.01Xray.com has updated setup information for various DAWs, as well as a user forum.

Bundled software includes SQ01, a basic multitrack recording program (it will get you up and running, although most users will want a more full-featured DAW), Yamaha Motif synth editor (edit Motif programs on the 01X control surface), demos of Native Instruments Pro 53 and B4 soft synths, and Yamaha's handy Studio Manager application. This is available for all of Yamaha's current digital mixers, and provides a graphic representation ("virtual onscreen mixer") of all 01X parameters. Control the 01X via the onscreen controls — move a fader in Studio Manager, and the physical fader on the 01X responds — and vice-versa.

Even though the whole point of a hardware control surface is "hands on" control, the software simplifies setting up channel assignments and routing, and displays compression and EQ curves — the 01X's LCD doesn't. Studio Manager is a cool program, and a fine addition.

Of the Yamaha VST plug-ins, my favorite is the 01X Channel Module — a native VST plug-in version of a 01X channel, including compression and EQ. This allows you to set up a mix "in the box" that replicates the mix you have with the 01X. Unlike Antares' Autotune, the Pitch Fix plug-in has no graphic mode, but pitch can be controlled with MIDI data. However, Pitch Fix preserves formants

while shifting, which is important for getting natural sounds. Vocal Rack is a 3-band EQ, highpass filter, and compressor designed for vocal tracks, although I used it on other sources with good results.

Final Master is a multiband dynamics processor with soft clipping.

THE VERDICT

After using the 01X for a few months, the coolest aspect is that it blurs the lines between a traditional digital mixer, control surface, and audio/MIDI interface — it's all three. In conjunction with a DAW and mLAN synth, this becomes a system that allows for much flexibility in how you choose to work. Adding the VST plugs and Studio Manager blurs the software/hardware line even more. Yamaha calls it "total integration," and that's not an overstatement. Couple that with the benefits of mLAN connectivity and expansion options, and you have one very powerful package. **EQ**

Phil O'Keefe is a Southern California-based producer, engineer, and studio owner. In his spare time, he's recently launched his own microlabel (www.lurkermusic.com), and moderates EQ's online project studio forum. Contact him at www.philokeefe.com.

Strengths:

- mLAN connectivity
- Integrates digital mixer/DAW control surface/audio+MIDI interface
- Very useful software plug-in bundle
- Studio Manager control software
- DVD "getting started" guide
- 01X's onboard DSP lightens the load on your computer
- Extremely low latency with fast computers
- Excellent mic preamps in i88X

Limitations:

- Short (60mm) faders
- Manual short on current application setup information
- 01X mic preamps hissy at high gain settings

by Mitch Gallagher

JBL LSR6300

Active monitor system with an acoustic twist

Type: Active monitors and subwoofer
Price: LSR6328P, A\$2,999 (each); LSR6312SP, A\$3,395; RMC Calibration Kit, A\$295, included free with LSR6312SP or a pair of LSR6328P speakers
Contact: www.jands.com.au

LSR6328P

Drivers: 8" woofer, 1" tweeter
Power amps: Low—250 watts, High—120 watts
Frequency response: 50Hz–20kHz, +1/–1.5dB
Maximum peak SPL: >111dB, 80Hz–20kHz @ 1m
Crossover frequency: 1.7kHz
Connections: XLR+1/4" combi input, 1/4" RMC bypass
Controls: Input trim, DIP switch for sensitivity, HF level, and boundary compensation, RMC Width, Frequency, and Depth, RMC enable

Cabinet design: rear port
Dimensions: 16 x 13 x 12.8 inches
Weight: 39 lbs.

LSR6312SP

Driver: 12"
Power amp: 260 watts
Frequency response: 28–80 Hz (L/C/R inputs), 28–20C Hz (Direct Input)
Maximum peak SPL: >115dB, 35Hz–80Hz @ 1m
Crossover frequency: 80Hz
Connections: Left, Center, Right, and Sub-Direct (LFE) XLR+1/4" combi inputs; Left, Center, Right, and Summed XLR outputs; 1/4" RMC bypass, LCR (bass management) bypass
Controls: Input trim, DIP switch for input trim, sensitivity, signal polarity invert, –4dB bass alignment (@50 Hz), and RMC defeat; RMC Width, Frequency, Depth, and Make-up Gain; Sub-Direct (LFE) Sensitivity
Dimensions: 25 x 15.5 x 11.5 inches
Weight: 39 lbs.

Y our studio works acoustically as one big system: the room, the monitors and their placement, acoustic treatment, wall/ceiling/floor construction and materials, and so on. Two of the models in JBL's LSR6300 series — the LSR6328P and LSR6312SP are designed to compensate for some of the acoustic anomalies in the system.

The LSR6328P is an active 2-way design offering ±1dB of high frequency

adjustment, 0, –1.5, –3, or –4.5dB of low frequency "boundary" compensation, and RMC (Room Mode Correction); a single-band of parametric EQ designed to correct for the worst room mode. The 6328 handles it easily to move and position.

The LSR6312SF is a 12", 260-watt subwoofer with –4dB boundary compensation and RMC. The 6312 has bass management for front left,

right, and center (if you're doing surround) speakers, but none for the rears. For surround work it has a Sub-Direct (LFE) input, which can be set for 0 or +10dB sensitivity. A Sum out allows more than one 6312 to be chained. A big plus is the footswitch jack for bypassing the unit.

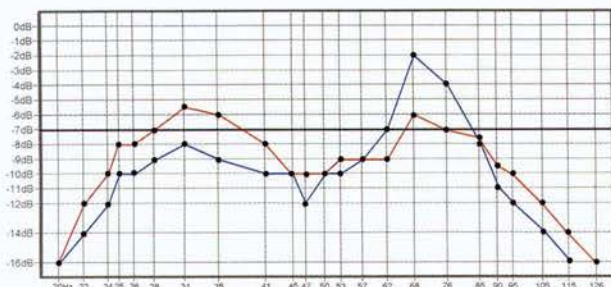
Before digging into RMC, I set the monitors up and did some listening. I have to admit to going in with some bias; I've used a lot of JBL

THE LSR6328P AND LSR6312SP MONITORS FEATURE EXTENSIVE TONE-SHAPING CONTROL, WHICH CAN BE USED TO HELP FLATTEN THE SPEAKER RESPONSE IN THE ROOM. THE BACK PANEL OF THE LSR6328P SHOWS THE ROOM MODE CORRECTION AND DIP SWITCH CONTROLS.



THE LSR6328P MAY LOOK LIKE ANY OTHER ACTIVE MONITOR FROM THE FRONT, BUT WORK YOUR WAY AROUND TO THE BACK AND THE DIFFERENCE BECOMES CLEAR. BONUS: HANDLES ARE BUILT INTO THE SIDES OF THE CABINET.

JBL LSR6300



THIS IS THE RESPONSE CHART FOR THE LSR6312SP SUB IN MY STUDIO. THE BLUE LINE SHOWS BEFORE RMC CORRECTION, THE RED LINE SHOWS AFTER. IT WAS NO PROBLEM TO TUNE THE SUB TO WITHIN ± 1.5 -3DB FROM 24 TO 95HZ — QUITE EXCELLENT RESPONSE.

monitors over the years, and found many of the older models to be fatiguing to my ears. In contrast, the 6328 is smooth, clear, and nicely balanced. Taken as a "straight" monitor, the LSR6328P is first rate. It has particularly impressive low frequency abilities, and present, detailed midrange. The high frequency and boundary adjustments provide enough power to dial in the basics, although I didn't feel the need in my studio.

The LSR6312SP offers tons of low-end thump. It had no problem filling my largish control room without sounding strained. It transitions smoothly to the 6328. Being able to bypass the sub is a godsend.

SCALING THE PEAK

The Room Mode Correction in the 6328 and 6312 provides

parametric EQ for taming a single room mode (resonant peak) between 24 and 95Hz. But wait, what if you don't know what frequency the worst mode in your room occurs at? And how do you set the bandwidth and depth?

Trust that JBL thought things through. They offer the RMC calibration kit, which includes a test CD, level meter, chart paper, width template, and a momentary switch for bypassing RMC in the speakers.

Here's the drill: one speaker at a time, you play the test tones on the CD. Using the level meter, you measure the level of each tone, and mark it on the chart paper. When you're finished, connect the dots and you have a basic idea of the response of the speaker in the room.

With the Width Template, you measure the largest peak on the page, and using a look-up table in the manual, find the corresponding settings for the RMC frequency, width, and depth. Make the adjustments on the speaker and move on to the next one or the sub (if you have one).

It's easy, and almost foolproof — the only problem I had was that the flimsy plastic Width Template has a lot of slack in its action. I found it good for a rough guesstimate at best. But by looking at the peak on the chart and the lookup table, I was able to get where I needed to go.

I tried the speakers in three positions in my room, and the sub in six places — which reminds me, make photocopies of the chart paper before you start. Once you start fooling with measuring different speaker positions, you'll go through charts fast. You'll learn a lot about your room doing this. For example, the right speaker in my studio had a peak, but the left didn't. It's also revealing to see how small of a distance you need to move the sub to make a big difference in response.

I'm proud to say that my room was virtually peak free, but then again, it's heavily bass-trapped. I finally manufactured a peak in the right speaker and the sub by putting them right against the wall, creating a moderate peak at around 68Hz. I couldn't get a significant peak in the left speaker regardless of placement. RMC was easily able to tame the peaks and even out the response.

The CD and meter will also help to calibrate the sub level — at least it will get you close. To really

dial in any sub, you need to use your ears. I find it best to be conservative; I use just enough sub to fill out an octave or so below the main speakers. You don't notice when it's there, but you miss it when it's gone.

CORRECTED

With or without RMC, the LSR6328P offers top-notch monitor performance. Even without the sub, there's loads of full bottom end. I'm impressed. With RMC dialed in, you'll find the lows tighten up and get more solid, and the mids gain clarity.

Add the LSR6312SP sub with RMC to the equation, and you have a flexible, powerful, full-range system that can serve either near- or midfield needs.

Some may argue that the measurement resolution of the room modes is too broad, or that one band of EQ isn't enough. But I'm here to tell you that RMC makes a big difference — this system works, and works well. EQ



THE LSR6312SP SUBWOOFER OFFERS PLENTY OF POWER FOR DRIVING THE LOW END. IT HAS BUILT-IN BASS MANAGEMENT FOR UP TO THREE SPEAKERS.

Strengths:

- Footswitch bypass on sub
- RMC can be bypassed
- Handles on LSR6328P
- Frequency and depth measurements are easy
- Powerful tone shaping
- RMC makes a real difference in how monitors perform in room
- Clear, balanced detailed sound
- Good dynamics

Limitations:

- Difficult to make accurate Width measurement
- No handles on subwoofer
- Only three channels of bass management (LSR6312SP)

by Craig Anderton

TASCAM 2488 Digital Portastudio

This is **not** your father's Portastudio

Type: All-in-one digital recording workstation
Price: AS\$2,699
Contact: TASCAM, www.elfa.com.au

Internal resolution: 16/24 bits (selectable per song)

Sampling rate: 44.1kHz

Number of tracks: 24

Virtual tracks: Up to 250 per song

Mixer channels: 36

Faders: Twenty 45-mm linear faders

EQ: 3-band with parametric mid for 24 channels and master bus

Analog ins: 8 mic/line (4 XLR+1/4" combo jacks with phantom power, four 1/4" phone); one is a high-impedance guitar in

Analog outs: Monitor out (1/4" balanced), stereo out (phono unbalanced), two effects sends (1/4" unbalanced)

Aux sends: 3 except on effects return

Digital I/O: Coax S/PDIF, MIDI in/out, USB 2.0

Drives: 40GB internal hard drive, CD-RW drive (record Red Book CDs in DAO or TAO mode, import/export WAV files, back up hard drive)

Computer compatibility: USB 2.0 or 1.1 with Mac OS 9.2/X 10.2, Windows ME/2000/XP

Tone generator: 64-voice General MIDI sound module

Effects: Loop effect (reverb, chorus, etc.) on aux send and return, assignable multi-effects processor, up to 8 assignable dynamics processors for recording/mixdown, dedicated stereo output: compressor and EQ

Display: Graphical backlit LCD

Sync: MTC master or slave, transmits MIDI clock, does tempo maps

When the cassette-based Portastudio (with four tracks) appeared in 1979, Q-Tips and alcohol were essential recording tools, backups always sounded worse than the original, and "editing" consisted of doing a part over. Yet people managed to make music with them.

Fast forward 25 years: For not many more bucks than the original, you get 24 tracks of 24-bit digital audio, an internal

digital mixer, eight tracks of simultaneous recording, virtually no noise, computer interfacing, a built-in General MIDI playback module, lots of editing options, and effects. When you're done with a project, burn it to an audio CD or back it up using the internal CD-RW drive, or save it to your computer.

Yes, times have changed — the "all-in-one" studio has gone from a handy sketchpad to a viable recording medium that can

do more than just record demos.

FIRST IMPRESSIONS

The 2488 feels substantial, as if there's a lot packed into its diminutive frame. Hitting a price point and size means some compromises, such as 45-mm faders instead of 60- or 100-mm. But there are pro-inspired touches, too — combo XLR/phone jacks and phantom power on four of the eight ins, digital I/O, and



THE REAR PANEL I/O BELIES THE LOW PRICE; THERE'S USB 2.0, SEVERAL AUDIO OUTS, MIDI, AND EIGHT AUDIO INS.



DESPITE ITS RELATIVELY SMALL SIZE, YOU SELDOM FEEL CRAMPED WORKING WITH THE 2488 — EVEN CONSIDERING THE 45MM FADERS.

TASCAM 2488 Digital Portastudio

a decent-sized backlit LCD.

The operating system is obvious; I could do most recording functions without cracking the manual, which is thorough and reasonably clear. (Do read the cautions, though, such as how to shut down the machine properly.)

While the interface is simple, it shows intelligence. For example, in the LCD menus, small pictures and text indicate a function — a picture of a hard drive for disk functions, a waveform for WAV, etc. Eye candy? Maybe, but in the heat of a session it can be easier to parse images than words.

EFFECTS

There are three effects types: "Mic" effects (compression, exciter, de-esser) you use while recording or insert into a channel; multieffects (distortion, amp model, modulation effects, delay, wah, etc.); and an internal send effect (reverb, delay, chorus, pitch shift, flanger, phaser, and gated reverb). Of course the mic effects will work with instruments, too, but you're limited to eight instances max, or four and the multieffects. To use a lot of effects either record with them, or bounce tracks.

There are also EQ and dynamics effects on the master stereo bus for "mastering" the overall sound.

COMPUTER GAMES

The internal hard drive is partitioned into one fixed, 4GB FAT-32 partition; up to four other partitions (4, 8, 16, or 32GB) are formatted in the 2488's native format. Only the FAT-32 partition communicates with a computer via USB 2.0 (USB 1.1 also works, it's just slower), so to back up a song, you save it to the FAT-32 partition first, then transfer it. (No computer? Back up to the 2488's CD drive.) Similarly, if you're importing files, WAV data, or SMFs, they must pass through the FAT-32 partition first.

Importing WAV data, from CD or USB, is weak. Files can't be within subfolders (root level only), and must be mono (44.1kHz, 16- or 24-bit) for compatibility with the virtual tracks into which they must be loaded. Want to load a sample CD, browse it, and import some loops? Sorry. To import a stereo WAV, you'll need a digital audio editor to break it into two mono files and import them separately. While doable, it's inconvenient.

SURPRISE!

It's worth noting some clever variations on standard features. For example, the 100 scene memories aren't dynamic automation, but nulling indicators let you match physical fader positions with stored positions — essential when punching in from a particular scene. Another useful feature: You can assign an input to multiple channels, and there are some handy assignment and bounce screens.

Linking two adjacent channels links EQ, fader, effects send levels, etc. Another cool feature, Sub Mix, isn't just for bouncing but also can bring, for example, hardware MIDI instruments synched to the 2488's MIDI clock in

the order of songs in a playlist-type fashion, as well as edit the silence between them before finalizing an audio CD.

AND SO . . .

TASCAM has reinvented the Portastudio for a new generation. This is all about price point, and the 2488 delivers the goods. You won't get dynamic automation, and being able to assign the multieffects to only one channel is a bit stingy, but this is a Portastudio — if you're not willing to do a bounce or two, go ahead and spend more.

TASCAM has reclaimed their heritage as the company that delivered multi-track recording to the

While the interface is simple, it shows intelligence . . . in the heat of a session it can be easier to parse images than words.

through the eight audio inputs, for 32 tracks total.

There's one MIDI mystery: I enabled response to continuous controllers, which although not detailed in the manual, implies that it can control mixer parameters. I sent the 2488 a variety of controller numbers and channels from a Peavey PC-1600, but nothing happened. A future update, perhaps? (And where's the MIDI implementation chart?)

I like the jog wheel function, and that you can see waveforms in the display — important when seeking precise in/out points for cut/copy/paste/insert operations (which have undo/redo). And there's varispeed ($\pm 6\%$) as well as a time-stretching mode that slows speed without changing pitch; this is designed mostly for rehearsal.

Finally, when recording audio CDs in Track At Once mode, you can change

masses. By delivering real value in an easy-to-use package, the 2488 has brought that lineage into a new century. **EQ**

Strengths:

- Extremely cost-effective
- Eight tracks of simultaneous recording, 24 playback tracks
- 16-/24-bit resolution
- Built-in CD-R/W drive
- No-stress user interface
- General MIDI module
- Communicates via USB 2.0

Limitations:

- Imports only mono WAV files
- Saving a song to computer requires transferring it to a special partition
- Scene automation only



Emagic Logic ES2 vector+wavetable synth

Vector envelope programming 101

Objective: Learn how to use a vector envelope to create step-sequence sounds and effects.

Background: Last issue we came to grips with the ES2's basic building blocks of sound generation. This issue we'll see how the vector envelope can be used to produce rhythmic sounds and effects. The vector envelope doesn't look like a typical grid or step sequencer, which makes it a bit tricky to understand at first. But after working through these steps you'll be well on your way to crafting all sorts of percolating synth patches.

Step by Step: It takes less than 10 steps to turn a static pad or sustained lead into a bubbling rhythm generator.

- 1 Start by initializing the ES2 by choosing Default from the patch menu. Then switch to the vector view by clicking on Vector. Click on Solo Point to turn it off (it should not be highlighted). With Solo Point turned on, we won't be able to hear the envelope loop.
- 2 Next, turn on Loop mode by choosing Forward.
- 3 Position the Sustain and Loop markers so the loop begins with the first point, and sustains at the last point (as shown in Step 3).
- 4 An envelope can have up to 15 control points; for demonstration purposes let's add one point for a total of four (three points are inserted by default). This will be the basis of a 16th-note rhythm. To add a point, Shift-click between the first two points.
- 5 There's no "snap-to" feature for inserting points. Instead, you must first insert the point(s), and then click Fix Timing to position the points evenly.
- 6 To correct the last portion of the loop, drag the timing value to match the timing of the other segments. Now you're ready to assign parameter values to each point.
- 7 Set the X Target, Loop Rate, Loop Mode, and Curve values to those shown in Step 7.
- 8 To assign a specific cutoff value to each envelope point, select the point you want to define, then move the cutoff value using the X/Y pad. When you're finished, the synth will be transformed into a rhythm machine.



Authorization Required

S

oftware authorization can be a confusing and frustrating, albeit necessary task. Here are a few tips for making the process go more smoothly.

How does it work?

Generally, the software looks for an indication that it's licensed to work on your computer. Authorization can come in various forms. Various authorization schemes are used. Two popular methods are challenge/response and hardware keys.

With the challenge/response method, you're presented with a request for the serial number or key code provided with the package. When you've entered this information, a "challenge" is given to you. The challenge is a unique string of letters or numbers the software generates by looking at your computer: the motherboard, hard drive, IP address, etc.

The next step in the process is to retrieve an authorization code or "response." In most cases, you'll visit the software developer's website to register and enter the challenge you've been given. The system generates a unique response code specific to your system and returns it to you either at the same site or by email. (You can sometimes perform this process by phone, fax, or mail; however, online registration is typically fastest.) Once the response is entered, a license file is created and placed on your hard drive.

The challenge/response method limits the software to use on a specific computer. In some cases, more than one challenge/response can be created for one package, and some developers allow a license to be moved from one computer to another.

Warning

Because defragmenting and optimization utilities move data around, license files can sometimes get "lost." When this happens, the software may not locate the file and may believe it's no longer authorized. Before defragmenting/optimizing your drive, check to make sure there are no issues.

The Key

Other authorizations work by storing the license on hardware keys, a.k.a. "dongles." These keys typically attach to USB ports on the computer. (In the past, keys also used serial, parallel, and ADB ports.) Because the license is stored on the key instead of the computer, it can be used on different computers (but only one computer at a time can use it). Another plus to hardware keys: If you decide to upgrade your computer, you can simply move the hardware key to the new machine (as long as the key and software are compatible with it).

Some software packages come with a hardware

key with the authorization already on it. Except for perhaps installing a simple driver package, the key's presence in the system is all that's required.

But many companies are using the iLok, created by Pace Anti-Piracy. This dongle makes it possible to store many software licenses on the same key. While some packages include iLoks, others require that you purchase one separately.

Double Duty

iLoks can be authorized in two ways. Some products come with a license card that is inserted into the iLok. By following a few instructions, you transfer the license from the card to the iLok. Usually this transfer removes the license from the card so that it only exists on the key.

The second method for licensing the iLok is Internet-based activation. This requires you to log on to the software developer's site and download a license to the attached iLok.

Some developers allow you to transfer licenses from one iLok to another. This can be handy if you have several iLoks, and wish to consolidate their licenses onto one key. Each software developer has their own policy on moving licenses from iLok to iLok.

It goes without saying that an iLok loaded with software licenses is a valuable thing. Be careful with it! It's pretty durable, but it's not indestructible. Don't forget that it's connected to your computer. Don't move a computer with an iLok still plugged in. One good knock into a wall or doorjamb, and you're in trouble.

A benefit to an iLok is that by creating an account at www.iLok.com you can register all of your licenses so if your iLok fails or is broken, Pace can help you retrieve the authorizations. Pace also offers a "Zero Downtime" service to help speed the recovery of iLok authorizations.

Getting It Done

The key to successful authorization is following the instructions. Sounds simple enough, but in our rush to try a new piece of software, we often skip over steps. Don't click that "OK" button in a dialog box until you really understand the prompts. If at first you don't succeed, try again. It's not uncommon to miss a step, or to enter one wrong character in a key code. If you have a problem even after you're sure you've done your part correctly, go straight to the software developer for help. Because developers typically generate authorizations with proprietary systems, retailers and computer manufacturers won't be able to do much for you.

One last tip: Always keep a printed copy of registration codes, serial numbers, challenges/responses, and authorization codes in a safe place. EQ

Todd G. Tatnall is the Senior Tech in Sweetwater's Technical Support department.

The key to successful authorization is following the instructions.

COLLEGE OPEN DAY:
Sat Sept 25
11am - 3pm. Free!

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Julius Media is an Australian Government Registered Training Organisation, specialising in entertainment and music production.

We train small groups, to a high standard. We are audited by VETAB, and operate at or above TAFE standards.

Julius Media courses come from National Training Packages, developed in conjunction with the industry.

We have partnerships with a variety of industry organisations, suppliers, manufacturers and associations.

Typical of these is our relationship with Riverside Theatres at Parramatta, a professional performing arts complex located just a few minutes away from campus.

CAMPUS LIFE

Full time students typically attend

college Monday - Friday, 10am until 2pm at our Rydalmere campus. This is located near the geographic centre of Sydney, approximately ten minutes east of Parramatta.

We offer student share housing in the nearby suburb of Epping. We have a free shuttle to and from Epping station timed for fulltime college hours.

Additional work placement, secondments and internships, both paid and unpaid, is part of full time study at Juliusmedia.

We are a small, specialist college dedicated to excellence.

Our students have access to personal and learning outcome counselling, and we have a wellness and fitness programme that all are encouraged to join. This includes twice weekly training at our gym, with initial fitness assessment and instruction. Gym fees are currently only A\$66 per month.

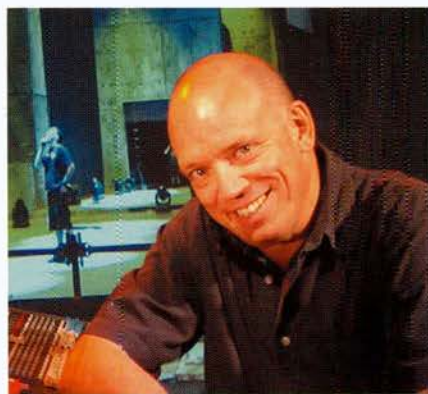
Full time enrollment at Juliusmedia is like joining a team, and we encourage group work through syndicate assignments and projects.

We aspire to bring out the best in all our students, and provide a transparent, honest environment for all stakeholders.

College owner and founder Julius Grafton has 32 years continual experience within the entertainment industry. He is here because he enjoys it.

To borrow a popular saying:

"The best is yet to come!"



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(15 days fulltime, 15 weeks part time)

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(15 days fulltime, 15 weeks part time)

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(Six months; full time)

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Advanced Diploma, Venue and Event Management (One year; full time)

Advanced Diploma, Technical Production (One year; full time)



Julius Media Pty Ltd ABN 62 098 850 036 RTO number 90888 CRICOS provider number 02583M

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~ Short Courses ~

WORSHIP SOUND

Learn the essentials from the ground up, for effective Church sound. Held across five Saturday mornings, 9.30am to midday. Juliusmedia will help demystify the complexity of acoustics, equipment and techniques. These small classes will allow participants to detail their own challenges, and will draw on solutions provided by audio professionals all too familiar with the compromises presented by low budgets and large reverberant spaces.

Class schedule: Saturday Nov 6 for a total of five weeks. 9.30am - midday.

Price: \$290 per person for the full five weeks, or \$250 each if three or more enrolled together.

STAGE OH&S

Our one day Stage OH&S course has proven very useful and popular since we first ran it in April 2002. You earn a formal Unit of Competency from the Entertainment Industry Training Package, and get a Statement of Attainment to reflect this.

The Juliusmedia modules you will cover in the one day course are:

OHM-01 Height Safety: Details kinds of safety equipment, arrest and rescue requirements, ladders and high reach devices. What is acceptable, what is not.



College student computers feature dual flat screens and DVD burners.

OHM-02 Manual Handling of Show Equipment: With practical component. What is your legal lifting limit? Shows the best and safest methods for handling large, heavy or un-usual items of equipment.

OHM-03 Show Electrical: Starts with basics, what is three phase, what is single phase, relationship between watts, amps and load, earth leakage breakers, and power essentials.

OHM-04 Show Practices: Jargon of the industry, glossary of terms, which is 'prompt', etiquette of the stage, etc.

OHM-05 The Induction, The Laws, and You: Gives individuals the shocking realisation they can be heavily fined, along with their employer. Details what to look for at a venue, or with a new show.

STAGE OHS COURSE DATES:

Sydney:

Monday September 27. 9am - 4pm.
Monday January 3rd. 9am - 4pm

Cost: \$180 including notes, morning and afternoon tea.

Current Government Contracts

- Juliusmedia is currently involved in training Indigenous Australian Youth in staging and events skills at remote locations. This project is funded by the federal Department of Education, Science and Training (DEST).

Juliusmedia were appointed by the federal minister for education, Dr. Brendan Nelson.

The training is underway at the Croc Festival, a touring performing arts festival who have been kind enough to allow their facilities and infrastructure to be used.

- Juliusmedia is currently approved to deliver Traineeship Training, with agreements in place with various state training authorities. This scheme provides employer subsidies for trainees.

BASICS. 5 days full time or 5 weeks part time (2 nights, 6.30 - 9.30pm)

We offer a one week (5 full day) course, in Stage Lighting basics, Vision Systems basics or in Live Sound (Engineering) basics. You can also do these courses part time, 2 nights weekly.

All 'Basics' courses are the first third of a Certificate III. Doing one of these is an excellent way to 'taste test' our training. Plus, you earn units of competency, which are nationally recognised.

For more information about what is contained within these courses, please check our website, at www.juliusmedia.com and go to the Training area.

The price of a one week BASICS course is \$875.

Stage Lighting Basics (code LXB) is an intensive 5 day course that is also delivered part time, 2 nights per week. It is designed to take a beginner from the start to having a working understanding of stage lighting.

Cost: A\$875. DATES:

- Sept 27 - Oct 1 (5 days)
- Jan. 3 - 7, 2005 (5 days)
- Part time from FEB 21 (2 nights/wk)

Live Sound Engineering Basics

(code SEB) is an intensive 5 day course that is also delivered part time, 2 nights per week. It is designed to take a beginner from the start to having a working understanding of live sound. Cost: A\$875. DATES:

- Sept 27 - Oct 1 (5 days)
- Jan. 3 - 7, 2005 (5 days)
- Part time from FEB 21 (2 nights/wk)

AV- Vision Systems

This is a new, one week course which when combined with Lighting Basics and Sound Basics, makes up one whole Certificate III - Audio Visual. Cost: A\$875. DATES:

- Oct 4 - 8 (5 days)
- Jan. 10 - 14, 2005 (5 days)
- Part time from FEB 21 (2 nights/wk)

~ Assessments ~

YOUR SKILLS ASSESSED

All registered training organisations are obliged to recognise prior learning or existing skills – whether from previous training, or skills obtained ‘on the job’. At Juliusmedia we are happy to undertake skills assessments.

You can get a formal qualification without having to do training.

RPL stands for Recognised Prior Learning, while RCC stands for Recognised Current Competencies. In the jargon heavy world of vocational training, they mean something quite similar.

An assessment can produce a trade qualification without the need to do a course. The full qualification you are assessed for is a Certificate Three, specialising in Sound, Lighting or Audio Visual.

You choose which one when you book your assessment.

How are you assessed?

It will depend on your previous skills and experience, and the recency and nature of your qualifications (if you have some). The form of assessment

could be a practical self assessment process on paper, followed by a brief written test, then a written project. We allow about 20 minutes for the first part, then after a break 2 hours for the project. After another break we may do some physical job tasks and trouble shooting. Finally, the assessor sits with you and discusses your assessment results. It's a positive experience.

What are the standards?

In the Entertainment Industry Training package there are a range of things called ‘Units of Competency’. Each of these is a ‘standard’ that you need to meet. It may be as simple as: “hang a profile spotlight on a bar, and properly connect”, or as complex as “equalise a stage monitor wedge with due regard to tonal balance and gain before feedback”.

There are a variety of standards in each units of competency. It's our job to ensure you are deemed ‘competent’ in each one. If you are not, then you are ‘not yet competent’.

What if you are deemed ‘not yet competent’?

The assessment will produce an

outcome. You may be assessed as competent in a range of units, but not in others. Each unit in which you are competent, is completed – and you obtain a Statement of Attainment for that unit. You don't have to re-do the unit.

Where you've fallen short of a standard, your assessor must tell you. You then understand what it is that is deficient, and you can attempt to address this with additional training. The assessment will highlight which lesson modules at Juliusmedia you should do, in order to be assessed again.

Can I have an idea about the range of subjects covered in the assessment?

You can see all the modules in our Sound, A.V. and Lighting Certificate 3 courses on our website. There are descriptions there for each module. Reading them should give you an idea of what level you need to be at.

What are the logistics of the assessment?

The assessment process (with a few short breaks) usually takes around four hours. There usually are some other people undergoing assessment at the same time.

BOOK ASSESSMENT DATES:

Assessments are available in all states and territories of Australia.
COST: \$180 per person. Minimum numbers may apply in some locations.
Book now, call +61 2 9876-3530



3 VARIETIES OF CERTIFICATE III



NATIONALLY RECOGNISED
TRAINING

Certificate III - our most popular course

Stage Lighting Basics ^{LXB}	+	Live Sound Basics ^{SEB}	+	Vision Systems Basics ^{AVB}	=	Certificate III ^{C3VS} Live Production, Theatre and Events (Technical Operations) <i>~ with good general skillsets</i>
<p>LIGHTING (LXB) DATES</p> <p>5 full days: (Mon - Fri)</p> <ul style="list-style-type: none"> • Sept 27 - Oct 1 • Jan 3 - Jan 7 <p>5 weeks at night, 2 nights weekly, Mon + Wed, 6.30 - 9.30pm</p> <ul style="list-style-type: none"> • Feb 21 start <p>COST: \$875, gst free</p>		<p>SOUND (SEB) DATES</p> <p>5 full days: (Mon - Fri)</p> <ul style="list-style-type: none"> • Sept 27 - Oct 1 • Jan 3 - Jan 7 <p>5 weeks at night, 2 nights weekly, Mon + Wed, 6.30 - 9.30pm</p> <ul style="list-style-type: none"> • Oct 18 start • Feb 21 start <p>COST: \$875, gst free</p>		<p>Vision (AVB) DATES</p> <p>5 full days: (Mon - Fri)</p> <ul style="list-style-type: none"> • Oct 4 - 8 • Jan 10 - 14 <p>5 weeks at night, 2 nights weekly, Mon + Wed, 6.30 - 9.30pm</p> <ul style="list-style-type: none"> • Oct 18 start • Feb 21 start <p>COST: \$875, gst free</p>		<p>Complete this new qualification by collecting three sets of competencies. Do these three courses, in any order, and they equal the Certificate III. This is the most popular, multi purpose Certificate III we offer.</p> <p><i>You can COMBINE this Certificate III with a Live Sound or a Lighting specialty, by doing an Advanced Extension Course.</i></p>

Certificate III Live Sound Engineering Specialty

Live Sound Basics ^{SEB}	+	Certificate III Live Sound Advanced Extension Course ^{c3AUext}	=	Certificate III AU ^{C3AU} Live Production, Theatre and Events (Technical Operations) <i>~ live sound specialty</i>
<p>SOUND (SEB) DATES</p> <p>5 full days: (Mon - Fri)</p> <ul style="list-style-type: none"> • Sept 27 - Oct 1 • Jan 3 - Jan 7 <p>COST: \$875, gst free</p>		<p>C3AU extension DATES</p> <p>Prerequisite is SEB, or CPAU, or RPL/RCC assessment</p> <p>10 full days: (Mon - Fri) • Oct 4 - 8 <i>plus</i> Jan 10 - 14</p> <p>OR: 10 full days (Mon - Fri) • Jan 10 - Jan 23</p> <p>COST: \$1750, gst free</p>		<p>To obtain this Certificate III with a Live Sound specialty, you need to do these courses in order. Obtain the SEB (or sit an RPL/RCC assessment) first, then articulate on and do the Extension Course.</p>

Certificate III Lighting Specialty

Stage Lighting Basics ^{LXB}	+	Certificate III Lighting Advanced Extension Course ^{c3LXext}	=	Certificate III LX ^{C3LX} Live Production, Theatre and Events (Technical Operations) <i>~ lighting specialty</i>
<p>LIGHTING (LXB) DATES</p> <p>5 full days: (Mon - Fri)</p> <ul style="list-style-type: none"> • Sept 27 - Oct 1 • Jan 3 - Jan 7 <p>COST: \$875, gst free</p>		<p>C3LX extension DATES</p> <p>Prerequisite is LXB, or CPLX, or RPL/RCC assessment</p> <p>10 full days: (Mon - Fri) • Oct 4 - 8 <i>plus</i> Jan 10 - 14</p> <p>OR: 10 full days (Mon - Fri) • Jan 10 - Jan 23</p> <p>COST: \$1750, gst free</p>		<p>To obtain this Certificate III with a Lighting specialty, you need to do these courses in order. Obtain the LXB (or sit an RPL/RCC assessment) first, then articulate on and do the Extension Course.</p>

ABOUT THE CERTIFICATE III

Certificate III in Live Production, Theatre and Events (Technical Operations) CUE 30203



This is a new national qualification from the new Entertainment Industry Training Package (CUE03).

A Certificate III is THE starting point for working in the technical or management side of the entertainment industry. In times now gone, you used to just hammer the doors of employers until one of them gave you a job. These days with the implications of insurance and occupational health and safety in the workplace, they often won't even talk to you unless you have TRAINING.

A C3 will give you the actual hands on skills and background knowledge that employers will EXPECT you to have. A formal Certificate III is proof that you really do know - and care about - what you are doing.

C3 is the gateway to further training: it forms the foundation for Certificate IV and Advanced Diploma. The units of competency in the C3 are fully transportable and are recognised nation wide.

EMPLOYERS: All our C3 courses are registered for TRAINEESHIPS under the New Apprenticeship System. You can employ an indentured trainee, and attract government subsidies. It's easy! Call Juliusmedia, we arrange the paperwork.

COST:

A full Certificate III costs \$2,625. It is made up of elements that can be done individually at your own pace. See previous page for more detail.

DELIVERY:

3 weeks full time (5 days weekly) or 15 weeks - 2 nights weekly.

DATES: (Sydney)

- January 3 - 23 Summer School MON - FRI, 9am - 5pm daily. (3 wks)
- Part time, 2 nights per week: start October 18, or Feb 21

C3VS

Certificate III

Live Production, Theatre and Events (Technical Operations)

~ with good general skillsets

C3LX

Certificate III LX

Live Production, Theatre and Events (Technical Operations)

~ lighting specialty

C3AU

Certificate III AU

Live Production, Theatre and Events (Technical Operations)

~ live sound specialty

Certificate III

(C3VS) CUE 30203

UNITS OF COMPETENCY:

- CUFSAF01B: Follow health, safety and security procedures
- CUECOR01B: Manage own work and learning
- CUEIND01B: Source and apply entertainment industry knowledge
- CUECOR02B: Work with others
- CUEAUD06A: Apply a general knowledge of vision systems to work activities
- CUEAUD03B: Operate vision systems
- CUEAUD02B: Prepare, rig, test and modify vision systems
- MEM 18.1A B: Use hand tools
- CUESOU07A: Apply a general knowledge of audio to work activities
- CUELGT09A: Apply a general knowledge of lighting to work activities
- CUESTA05A: Apply a general knowledge of staging to work activities

Certificate III

(C3LX) CUE 30203 - Lighting

UNITS OF COMPETENCY:

- CUFSAF01B: Follow health, safety and security procedures
- CUECOR01B: Manage own work and learning
- CUEIND01B: Source and apply entertainment industry knowledge
- CUECOR02B: Work with others
- CUELGT09A: Apply a general knowledge of lighting to work activities
- CUFLGT02B: Prepare, install and test lighting equipment
- CUELGT05B: Record and operate standard lighting cues
- MEM 18.1A B: Use hand tools
- CUESTA05A: Apply a general knowledge of staging to work activities
- CUELGT03B: Install and operate follow spots
- CUFLGT05B: Repair and maintain lighting equipment

Certificate III

(C3AU) CUE 30203 - Live Sound

UNITS OF COMPETENCY:

- CUFSAF01B: Follow health, safety and security procedures
- CUECOR01B: Manage own work and learning
- CUEIND01B: Source and apply entertainment industry knowledge
- CUECOR02B: Work with others
- CUESOU07A: Apply a general knowledge of audio to work activities
- CUSSOU05B: Install, align and test audio equipment
- CUESOU09A: Manage and compile audio replay material
- CUESOU03B: Operate professional audio equipment
- CUESOU08A: Select and manage microphone and other audio input sources
- CUESTA05A: Apply a general knowledge of staging to work activities
- MEM 18.1A B: Use hand tools

* NOTE: These are not lesson modules! Every college delivers actual training against these unit titles in different ways. These units are recognised nationally. Juliusmedia delivers a variety of specific lessons and training that maps against these national units.

~ Certificate IV ~

Certificate IV in Live Production, Theatre and Events (Technical Production)

- **Full time course**
- **Enrol for February 2005**

CUE 40303 from the all new Entertainment Industry Training package.

This is the fast track to professional entertainment work.

The Certificate Four is the new national qualification for a Technician working unsupervised. It follows on from the Certificate Three, which is the new minimum trade qualification.

Our Certificate Four courses is nationally accredited - as far as we are aware, Juliusmedia were the first registered training organisation to offer this new qualification, which was formally endorsed by ANTA in February 2004.

We have chosen to incorporate sound, lighting and vision units so we are delivering a superior technical qualification loaded with hands-on experience. The Certificate IV includes our Certificate III - if you already have units from this course, we will grant you a credit.

The Certificate IV is a full time course, spanning almost six months. You start February 14, and work

Monday - Friday, 10am to 2pm daily. In addition we farm you out for internships and work experience - some of which will be paid.

The really exciting thing is that this Certificate IV is the first HALF of all of these Advanced Diploma's:

CUE60203 Advanced Diploma of Live Production, Theatre and Events (Technical Production)

CUE60303 Advanced Diploma of Stage Management

CUE60403 Advanced Diploma of Venues and Events

This means that you may have the opportunity to articulate into one of these Advanced Diploma qualifications at the end of your course.

COST: A\$6,600 (this course is not available for overseas students).

APPLICATION FEE: A\$300 (included)

ENTRY REQUIREMENTS: Year 10 equiv. completion, and a keen desire to work in the industry.

PRE-REQUISITES: We need you to demonstrate commitment. This course starts at Basics and works up.

CERTIFICATE IV UNITS, CUE 40303

CUETEMo1B: Coordinate production operations

CUEOHSo1B: Implement workplace health, safety and security procedures

BSBFLM404A: Lead work teams

CUETEMo6A: Organise and monitor bump in/bump out

CUEINDo1B: Source and apply entertainment industry knowledge

CUEFINo1B: Develop a budget

CUEFINo2B: Manage a budget

CUESOUo7A: Apply a general knowledge of audio to work activities

CUELGT09A: Apply a general knowledge of lighting to work activities

CUESTAo5A: Apply a general knowledge of staging to work activities

CUEAUDo6A: Apply a general knowledge of vision systems to work activities

CUEAUDo3B: Operate vision systems

CUEAUDo2B: Prepare, rig, test and modify vision systems

MEM 18.1A B: Use hand tools

** NOTE: Subject to ammendment. These are not lesson modules. Juliusmedia deliver a variety of lessons that map against these national units.*

COLLEGE LOCATION:

10 Bridge street, Rydalmere. Walk to railway station or Victoria road. College housing at Epping, with free shuttle.

FACILITIES:

Small cafe, student kitchen, free capuccino, library, computer lab, mix room, lx programming room. Optional fitness programme at our gym.



NATIONALLY RECOGNISED
TRAINING

~ The Advanced Diploma's ~

CUE 60303 Advanced Diploma of Stage Management

- **Full time course**
- **Enrol now for Feb 2005**

This is a new Qualification, from CUE03 – the Entertainment Industry Training Package. It is designed to produce a multi-skilled stage manager, who has obtained Lighting, A.V. (vision), Staging and Sound units as part of this qualification

The course is taught with equal emphasis on theatre, events and concert.

Aside from formal lessons and classes, many of which are conducted within a working performing arts centre, students are given internships with a variety of leading venues and producers. A work experience component is required to complete this qualification.

Generally, students would be expected to complete the course of study plus the internships within the year allocated.

Our Advanced Diploma's from the new Entertainment Industry Training Package include extensive management modules, including H.R., Strategic H.R., Show and Facility budgeting and accounting, and teamwork. The 'UNITS' shown on our website (www.juliusmedia.com) are statutory titles, and are not totally indicative of the content of the academic year. We choose to show them so that you can obtain credits for any existing units that you have already attained.

This Advanced Diploma also features a full Certificate III. The units for this qualification are completed at the start of the Advanced Diploma, to give every student a well rounded understanding of basic lighting, basic live sound, and vision systems. This trade qualification alone is a superb vocational outcome, and it is usually achieved within the first term of

study.

Classes occupy five days per week, between 10am and 2pm.

The academic year comprises two 17 week semesters.

This advanced diploma may be combined with one other, and the duration to obtain both is reduced to 18 months – due to units in common. If combined with our other two Advanced Diploma's, the duration for the entire curriculum is 2 years full time.

To become an even more effective stage and production manager, combine this Advanced Diploma with

- CUE 60203: Advanced Diploma of Live Production, Theatre and Events (Technical Production).

Then in addition to the Advanced Diploma's you have the equivalent of a Certificate IV - plus you will have three Vision units, making the equivalent of a Certificate III in Vision (AV).

- For the ultimate skills package, do the final Advanced Diploma; CUE 60403 Advanced Diploma of Venues and Events - and obtain management skills.

PRE-REQUISITES: Minimum age 17 (Australian student), or 18 (overseas student). Higher School (leaving) Certificate or equiv, unless extraordinary case.

Portfolio of work, experience, and evidence of a prior interest in entertainment generally and stage management specifically.

Entry interview - face to face for Australian students, video-conference (via ip) for overseas students.

DATES: This is a full time, full year course. Start February 14, 2005.

Timetable: 10am - 2pm, Monday to Friday.

* *Times may change to 9.30 - 1.30.*

CUE 60203 Advanced Diploma of Live Production, Theatre and Events (Technical Production)

This is a new Qualification designed to produce a multi-skilled production manager who has both Lighting and Sound speciality plus units in vision, staging and flying systems, as part of this qualification.

The course is taught with equal emphasis on theatre, events and concert.

Aside from formal lessons and classes, many of which are conducted within a working performing arts centre, students are given internships with a variety of leading venues and production companies. A work experience component is required to complete this qualification.

Generally, students would be expected to complete the course of study plus the internships within the year allocated.

Our Advanced Diploma's from the new Entertainment Industry Training Package include extensive management modules, including H.R., Strategic H.R., Show and Facility budgeting and accounting, and teamwork.

This Advanced Diploma also features a full Certificate III - Audio Visual. The units for this qualification are completed at the start of the Advanced Diploma, to give every student a well rounded understanding of basic lighting, basic live sound, and vision systems. This trade qualification alone is a superb vocational outcome, and it is usually achieved within the first term of study.

PRE-REQUISITES: Minimum age 17 (Australian student), or 18 (overseas student). Higher School (leaving) Certificate or equiv, unless extraordinary case. Portfolio of work, experience, and evidence of a prior interest in entertainment generally and stage management specifically.

~ The Advanced Diploma's ~

Entry interview required.

DATES: This is a full time, full year course. Start February 14, 2005.
Timetable: 10am - 2pm, Monday to Friday.

* *Times may change to 9.30 - 1.30.*

CUE 60203 UNITS:

CUETEM01B: Coordinate production operations
CUEFIN01B: Develop a budget
CUSADM06A: Develop and implement an operational plan
CUETEM03B: Establish and manage production requirements and resources
BSBFLM503A: Establish effective workplace relationships
CUEOHS01B: Implement workplace health, safety and security procedures
CUEFIN02B: Manage a budget
THHGLE22A: Manage risk
CUETEM06A: Organise and monitor bump in/bump out
CUETEM08A: Realise productions
CUEIND01B: Source and apply entertainment industry knowledge
CUESET11A: Develop set construction plans to meet design requirements
CUSADM10A: Establish and manage contracts
BSBFLM404A: Lead work teams
THHGLE16B: Manage physical assets
CUESTA03B: Operate flying systems
CUEAUD03B: Operate vision systems
CUEAUD02B: Prepare, rig, test and modify vision systems
CUSSOU05B: Install, align and test audio equipment
CUESOU04B: Mix live audio
CUESOU10A: Operate wireless audio equipment
CUFLGT02B: Prepare, install and test lighting equipment
CUELGT07B: Record and operate lighting using advanced techniques
CUELGT05B: Record and operate standard lighting cues
CUESOU11A: Set up and operate stage monitor systems
CUELGT06B: Set up, record and operate lighting cues and effects

CUE 60403: Advanced Diploma of Venues and Events

- **Full time course**
- **Enrol now for Feb 2005**

This is a new Qualification, from CUE03 – the Entertainment Industry Training Package. It is designed to produce a multi-skilled events manager or assistant venue manager who has obtained Lighting, A.V. (vision), Staging and Sound units as part of this qualification.

The course is taught with equal emphasis on theatre, events and concert.

Aside from formal lessons and classes, many of which are conducted within a working performing arts centre, students are given internships with a variety of leading venues and producers. A work experience component is required to complete this qualification.

Generally, students would be expected to complete the course of study plus the internships within the year allocated.

Our Advanced Diploma's from the new Entertainment Industry Training Package include extensive management modules, including H.R., Strategic H.R., Show and Facility budgeting and accounting, and teamwork. The 'UNITS' shown on our web site are statutory titles, and are not totally indicative of the content of the academic year. We choose to show them so that you can obtain credits for any existing units that you have attained.

This Advanced Diploma also features a full Certificate III - Audio Visual. The units for this qualification are completed at the start of the Advanced Diploma, to give every student a well rounded understanding of basic lighting, basic live sound, and vision systems. This trade qualification alone is a superb vocational outcome, and it is usually achieved within the first term of study.

Classes occupy five days per week, between 10am and 2pm.

The academic year comprises two 17 week semesters.

This advanced diploma may be combined with one other, and the duration to obtain both is reduced to 18 months – due to units in common.

To become an even more effective Events and Venue Manager, combine this Advanced Diploma with CUE 60203: Advanced Diploma of Live Production, Theatre and Events (Technical Production). Then you have the equivalent of a Certificate IV plus you will have three Vision units, making the equivalent of a Certificate III in Vision (AV).

For the ultimate skills package, do the final Advanced Diploma; CUE 60303

Advanced Diploma of Stage Management- and obtain stage management skills.

PRE-REQUISITES: Minimum age 17 (Australian student), or 18 (overseas student). Higher School (leaving) Certificate or equiv, unless extraordinary case.

Portfolio of work, experience, and evidence of a prior interest in entertainment generally and stage management specifically.

Entry interview - face to face for Australian students, video-conference (via ip) for overseas students.

DATES: This is a full time, full year course. Start February 14, 2005.

Timetable: 10am - 2pm, Monday to Friday.

* *Times may change to 9.30 - 1.30.*

E&OE. All course info correct at presstime. Prices, units, dates, times all subject to change without notice. Check website for more info, updates.

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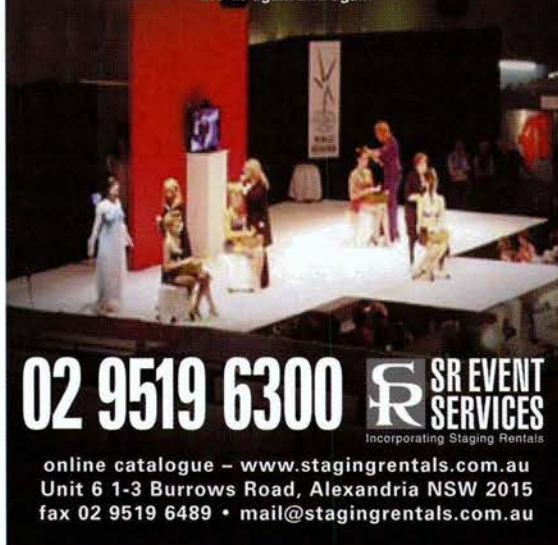
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