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**LIGHTING EQUIPMENT: COSTS VS. TIME SAVINGS**

**TESTING AND TAGGING: MANY BREAK NEW LAWS**

ISSN 1320-5595



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**MARKET REPORT:**  
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\*OH&S for Production and Venues can't be purchased alone, it must be bought in conjunction with at least one other stream.

## From the editor... Changing Times

The preparation for this month's edition has had me thinking about the differences between our industry today, and ten years ago. If you think about it, there has been a vast amount of change. For example, the technology we use has jumped several generations and is now in the reach of smaller productions and studios. Also, the live performance scene went from being vibrant, with local and international acts always passing through, to virtually non-existent - and is now starting to claw its way back again.

On the music side of things, record companies went from being the mega money making companies to no longer having the monopoly on music distribution. Emergent technologies and designs have arrived, while other technologies have dwindled to obsolescence. While this is the natural way of things, it has just happened so much faster in the last decade than in any previous one.

This is the one hundredth edition of Connections magazine, and not far itself from turning ten years old. When Julius Grafton started this magazine, I do not think he thought about where it or this industry would be today.

Today, every company recognises that it needs to constantly adjust its dynamics to continue to survive in the constantly evolving marketplace. 2001-2 will probably be remembered as the years our industry had to make the transition to good OH&S practice and safe work environments. Pressures from insurance companies and increased legislation is fast curtailing the work of the 'hot shot' operators.

I wonder if this means it will be more difficult to start a company in the next ten years than it has been in the last. The natural progression of things to date has seen many companies in our industry come and go. However, with today's companies having to be smarter and more flexible, they are more likely to last longer.

Older companies and less new competition - the face of things to come? I guess we will all have to wait and see.

John Grimshaw  
john@conpub.com.au

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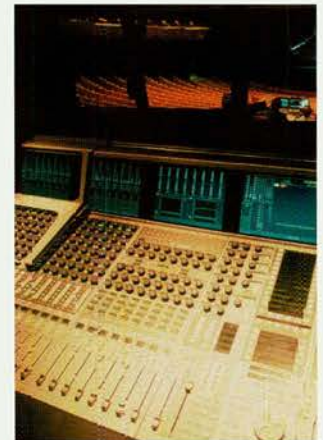
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Shure wireless



• Photo by Jario Gardiman  
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### NEXT ISSUE:

Cnsale 7 August, subscribers earlier. See pullout card for EASY cost saving sub!

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# Connections

The Asia/Pacific Professional Audio and Visual Technology Monthly

JULY 2002

## Union trouble for equipment installers

Melbourne militancy on the march. NSW firms 'to be warned off', new threat

The Electrical Trades Union of Australia will pursue contractors across state borders, according to a Melbourne audio contractor. He states that prohibitive labour conditions endured there will be imposed interstate, if interstate contractors compete with his firm.

The contractor says that Victorian building worksite conditions are prohibitive and out of step with the rest of Australia. In Melbourne, building site workers are compelled to join a union, despite laws against compulsory unionism. The ETU has a raft of employee beneficial benefits in place, including a pro forma 36 hour week, and extensive site allowances.

In Melbourne, an installation contract is almost impossible to complete without "capitulating to union practices". This means a favourable EBA (Enterprise Bargaining Agreement) needs to be in place, reflecting union conditions. These push labour costs up to a third higher than other states.

The ETU is aggressive in Victoria, where state secretary Dean Mighell has managed to obtain extensive benefits for his members. "They appoint a shop steward who the builder pays, and passes on the cost to us", said a major contractor who refuses to be named. "This person then shuts the site for any reason - like when it exceeds 36 degrees, despite the EBA saying workers can be relocated within the site. They say the first aid room may exceed 36 degrees, therefore the site is closed. We pay technicians for heaps of rostered days off per year, plus site allowances, plus 'safety' strikes. It's a mess."

With labour costs adding significantly to contractor costs, interstate audio visual contractors have won tenders against Victorian firms, sometimes incorrectly assuming similar costs to their home states. This has led to a Melbourne contractor allegedly coercing the ETU to sanction those

> please turn the page

When Euphonix designed the System 5 digital mixing platform they never imagined anyone would take advantage of the hot-swap, self contained modules to put part of the console in the stalls and use it as a remote! Well, here is Sydney Opera House sound engineer Severin Sieber doing just that. *Go to page 30.*



## Australian Concert Productions sold

It must be the friendliest of takeovers, because Brisbane firm Audio & Visual Innovations were a long standing customer - and competitor - of Mick Privitera's Australian Concert Productions. Then they took a huge bite - A&VI purchased ACP.

Now A&VI are hurtled from bit player to number one sound reinforcement company north of Sydney, just in time to fend off a foray from Sydney's 2nd largest live sound company Norwest.

Norwest are rumoured to be starting a Brisbane division.

Steve Grimes from A&VI told Connections at five minutes to deadline that it is business as usual for ACP, who own a new EV X-Line concert PA system, and a concert Turbosound Floodlight rig. A&VI also own Floodlight, plus some lighting inventory.

ACP's staff may stay, which was a major consideration of founder Mick Privitera, who is also contracted for two years.

"Steve made me an offer, then gave me a deposit. So I was listening." Mick says he was not thinking of selling, despite another recent offer 'out of the blue' which lead nowhere.

"It's a beautiful exit strategy" said Mick, who says he doesn't know what he will do when the two years are up.

Steve Grimes was level and realistic about his purchase when Connections called. Steve is 35, and in a former life was a detective.

ACP's inventory is world class, they recently did the Rod Stewart tour, and have extensive links to overseas touring networks. A&VI will now be a firm to watch.

## UNIONS AND THREATS

(from previous page)

firms – on their home turf.

Union activism knows no boundaries, particularly where new potential members and new employers arrive at the collective doorstep. Enter our enraged Melbourne contractor, who allegedly joined the ETU into a deal. "Any interstate contractor who wins work against me will have the full weight of the ETU applied against them", he states. He went on to say this means that Melbourne labour costs and conditions could be applied against interstate sites on their home turf.

NSW contractors report reasonably benign conditions on their home state sites, and were aghast to learn they may endure strong ETU tactics which deliver many installation technicians pay of over \$1,000 clear per week.

A major Victorian contractor told Connections that the ETU had no concerns about his viability, and that if unchecked the current climate would force some builders out of business. "Maggie Thatcher beat the unions in the 1980s, and the worst pommy shop stewards all migrated to Melbourne", he claimed.

## Audio Telex reorganised

Audio Telex will now operate its domestic sales force as two separate divisions.

The Commercial Audio Division will be headed up by former Audio Telex NSW Manager **Chris Smith** and this division features products based primarily around small – medium sized installations.

The Pro Audio Division will be headed up by **Don McConnell** and will focus primarily on high end Turbosound, Lab Gruppen and MediaMatrix products for hire, touring and large installations.

A third division for International Sales has also been set up and will be run by **Stuart Craig**.

A separate catalogue has been published for each division.

- **Audio Telex +61 2 9647 1411**  
[www.audiotelex.com.au](http://www.audiotelex.com.au)



Pic by Ian Wilkinson

## Lance Stewart's personal hell

### Disease hobbles lighting business

A profile in Connections May painted the idyllic work life that was Lance Stewart's, but a recently diagnosed disease has cramped the future plans of the Queensland lighting identity.

Lance suffers from Crohn's disease, a nasty manifestation afflicting the intestines and bowel that has no cure. It is an inflammation coupled with abscesses, and doesn't really respond to treatment. Sufferers endure a lifetime of surgery interspersed with occasional remission. Lance's version is amongst the worst.

Life now is all about short term for Lance, finding comfort and relief from bad periods, searching and hoping for remission, clinging to small mercies.

So his Ipswich based business, Creative Lighting is for sale. The ravages of the disease make work increasingly difficult, much to Lance's chagrin. He was a foundation partner in the Lightmoves empire, taking over the Brisbane arm when the corporate umbrella blew out in the fiscal gale of the late 1980's.

Lance appears stoic in the face of adversity, his trauma insurance doesn't kick in as he isn't about to die, but he has some income protection. The frustration of not finishing what he started must be galling.

"I had hoped that one of my children would be able to take over, if they wanted to, in the future. I have been working for some years to add to our distribution of products and design and construct projects by also making and exporting some of our own products" Lance told us.

Lance and Kerry Stewart have 3 children - Patrick (13), David (10) and Sophie (8).

- Julius Grafton

## Soundtracs to be reborn as Midas men jump ship

The story came to light with the chance photo of a prototype digital live console on the Rod Stewart tour in March Connections. Soundtracs founder Todd Wells confirmed our speculation that their DS-3 film console does have a future live sound variant coming. "I wouldn't read too much into it" was his parting comment.

Now it transpires a large shift was under way, with the Soundtracs business suddenly sold out of the public company, leaving Soundtracs PLC as a 'cash shell'.

Not only that, but at the same time the team responsible for much of the sizzle at

M i d a s were preparing ahead of a  to jump ship, new look Soundtracs which will trade as DiGiCo.

Bob Doyle will head the new firm, with Dave Webster as marketing director. DiGiCo will launch at PLASA in September, and offer a new live digital console not unlike what you saw in March Connections.

Soundtracs the brand will continue, with their range of digital consoles for film and post. The hard work is done, the platform established, the operating system and user interface all working. Now it is up to Doyle and Webster to make the new brand sexy, and they are probably better equipped than most to do just that.

## 200 DRUMMERS GET DOWN

The Ultimate Drummers Weekend featured over 200 drummers in Melbourne recently. An EAW KF760 line Array rig was provided and operated by Dave Rees of Deluxe Audio.

Part of Dave's system is shown below, with a nifty ground stack frame that enables the normally flown KF760's to be used in smaller environments.

Deluxe also own a respectable number of EAW KF 750 cabinets.





## APRA Awards: make it bright and loud, says Peter Rix

Showcorp's Colin Baldwin talks about production of the music industry awards

The Australian Performing Rights Association awards were held at The Regent of Sydney. Colin Baldwin and Rocky McKenzie did the lighting design with Rocky the programming and operating on the night. Ray O'Sullivan and Dean Stevenson operated the video playback and camera switching. Grant Walsh did FOH sound while Chris Kennedy pushed the video playback faders up and down as Event Producer Peter Rix called the show.

The bump-in occurred the day prior. Because there was no rigging where the stage was placed, we had to build a truss grid from the ground up, like a Mecano set of super stands and truss. We installed 6 super stands and once the truss was bolted together, we manoeuvred it into position so that it created two areas each side of the stage for the RF screens and a wrap around of the performance area. Once we got the grid into position, Staging Rentals jumped onto the thing and hung the drapes.

Rix wanted a French Bordello look, so SR provided Gold, Blue and Maroon drapes with an APRA logo behind the podium. Large APRA foam letters were placed at the back of the live performance stage.

While the drapes were going into position, we rigged the lights. 8 x Mac 500 on the back truss with vertical bars of raylights. 6 x Mac 300 on the floor, 48 x par 64 lamps for front and side wash, new Selecon Pacific spots for podium front light and 1.2k Selecon Fresnels for back light. The space was pretty tight, so we had to be flexible without making it look over cluttered. Production Manager Nick

Mazzone and I moved the back lights several times before we were happy.

Given the tight squeeze of the performance area, Rocky and I decided to use bars of rays hung vertically under the back truss. This gave us both key back light and beam effects.

Rocky stayed up late programming the show with the assistance of a CD of the performance tracks. Room lighting for the dinner utilised the 50 Martin Pro 518 moving mirror lights which Staging Connections installed in the ceiling. SC must have shares in Martin by now, given the number of venues that have these lights installed!

Two Sony FX200 video projectors were placed on towers behind the side screens and two Mitsubishi LCD projectors provided additional viewing onto screens positioned on the side walls of the room. Showcorp also provided video cameras and playback equipment and installed an editing studio in the Bio box so that the highlights of the event could be cut together at the end of the night for release to Television the next day.

The show day afternoon was spent sound checking the bands while the venue moved the tables into position under the direction of John Rohanra.

Rix wanted a show that left the audience feeling that they had been to a live show, not an awards dinner show, so the sound was loud, very loud. The room was pumped, the awards went off, even Michael Chugg was grinning from ear to ear.

*Picture: They can't call themselves Little River Band, but they can do sound-heck!*

### CANNON , SMITHY SPLIT

Cannon Sound and Neil Smith have parted ways. Neil's company Rock'N'Roll Music Pty Ltd has purchased all of the remaining second hand, and everyone is happy, says Neil and his former partner Daniel Trevor.

### RUTLEDGE NSW MOVES

Rutledge Engineering in Sydney consists of a team now numbering 12, and have moved to:- Unit 1, 102-112 Edinburgh Rd Marrickville NSW 2204  
Ph: + 61 2 8596 5800  
Fax: + 61 2 8596 5888  
Web: <http://www.rutledge.com.au>

### ULA OPEN THIRD OFFICE

ULA has added a third office in Australia, with Sydney opening in June. The Sydney office is headed up by ULA Sales Manager, Justin Knox.  
Contact details for Sydney are:  
Phone 9818-4677  
Fax 9818-2477  
Email [syd@ula.com.au](mailto:syd@ula.com.au)

### CMC GROWING

CMC Music have also expanded, citing extra Phonic business, they move on July 22 to 30 Roger Street, Brookvale, 2100. Their postage address remains as PO Box 1119, Brookvale, 2100. Phone and fax numbers remain the same - Phone: 9905 2511, Fax: 9905 1089  
Email: [cmcmusic@cmcmusic.com.au](mailto:cmcmusic@cmcmusic.com.au)

### SELECON MOVE FACTORY

Selecon NZ has also moved into considerably larger premises at 19-21 Kawana Street Northcote, Auckland 1310.  
Tel: 649 481 0100  
Fax: 649 4810101

### STAGWORKS GROWS

Stageworks Australia has relocated and appointed a General Manager, Robyn Bruce-Mullins. Peter Hassall will remain as Managing Director along with Dior Yarwood as Operations Manager, Mark Jennings as Event Sales Manager and Janelle Sim as Marketing Manager. The company has an office in Port Douglas and soon in Townsville.  
• 240 Hartley Street, Cairns (PO Box 7814, Cairns, QLD 4870) +61 7 40479200 [www.stageworks.com.au](http://www.stageworks.com.au)

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### PACIFY THE BAND?

This home made platform holds a DVD capable laptop in place for the back rows of a Tarago. Then use multiple (cheap) headphones. It keeps them amused! • **Inventor**

### BRUCE JACKSON WRITES:

Julius, your magazine has lost some of its edge now you have become the fat publisher with feet up on the table. Where is the piss and vinegar?

Filled with piss and vinegar is a fitting American expression for youthful enthusiasm, drive and bleeding edge behavior!

I'm referring to when you were hands on editor versus your currently wealthy status which allows you to become a corporate director. I don't see anywhere near the same level of slendercuss comments and entertaining slants on life.

• **Bruce Jackson, Legend, LA**

### Re: 30 YEARS FEATURE

Nice to reminisce via Yog's piece - more of it!

• **Phil Eastick, Consultant, Adelaide**

### ORLAND FIRES BACK

My thanks to Jeff Morgan, (*Letters, June Connections*) for his concerns for my occupational Health and Safety.

Now class, please open your *Connections* May to page 45 and let's review the photo in question (it's not a fuzzy photo; I'm afraid I really do look like that).

So there's me standing on stage on one of my JBL Array cabinets. (Confession: I suffer from Vertigo. I could no more balance on a 3 RU sleeve than I could flap my arms and fly to the moon) Look again. The PA stack is in front of a column. No possible rear ladder access.

See that roll of gaff in my hand? That was me gaffing chocks of wood between the tapered backs of my Array cabinets prior to threading ratchet strapping through their handles and subsequently anchoring them to the subs. As Julius reported, the 1kg side lights are then bolted into the cabinets flying points. After which, nothing short of a hijacked plane would bring those towers down.

Of course all my cables and appliances are tagged. My 3 phase cable is superflex. My distribution box is 100% legal. I carry cable guards for public walkways. I have an unblemished safety record spanning more than a quarter of a century.

Jeff's assumption that because I work alone from a legally loaded 1 ton van, it must be otherwise, is, um, puzzling. I welcome any inspection, any time. Plenty of opportunity. I have a very full production diary.

One other inaccuracy Jeff, you used the term "almost boast". Actually, there's no almost about it. I'm damn proud of my current set ups, and, as threatened as some may feel by them, I'm having a ball operating them.

Frankly, nothing cheers me quite like hearing yesterday's roosters (tomorrow's feather dusters) telling me: "No son, that's not how you make a paper plane! That'll...never...fly..."

• **Michael Orland, T-pac Sound and Light**

### TRIPP RE STEVE DEFINA & TOM

*Phil Tripp refers here to the letter from Steve Defina from Studio 301, Connections June*

I can't remember ever having offered Steve (Defina) advertising. I may have spoken to him once when he joined (301) but not to advertise as I know Tom's petty attitude about yanking ads from people who are not part of his master plan.

As far as we know, most all the major and minor studios in the country have the ability to return a listing form and get a free listing and free copy of the (Australasian Music Industry) Directory. Though Steve would like to point the finger elsewhere, the only reason Tom's ventures are not listed are his choice.

And yes, we're happy not to have his ads. Somehow, we have managed to survive nicely over 15 years without having to kiss Tom's tush. I hope Steve enjoys the time he spends polishing it.

• **Phil Tripp, Immedia, NSW**

### JANDS AND NIDA THEATRE

The May 2002 edition of *Connections* noted in an article on the new NIDA Theatre at UNSW that the counterweight flylines were "installed by Salken Engineering", which is incorrect.

Jands Theatre Projects was the principal design and installation stage contractor for stage machinery on this theatre and the specification and designs for all this equipment were developed in conjunction with Mr Tony Youlden, from NIDA.

Salken is the preferred supplier of components for many of the systems and equipment Jands Theatre Projects installs, which includes counterweight systems and heavy engineering components Jands do not have the capacity to fabricate in-house.

• **Chris Johnston, Theatre Projects Manager, Jands Electronics, Sydney.**

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A GUI-based operation with, in most cases, the same familiar GUIs as used within the DMX-R100 itself.

Channel controls, including faders, knobs and buttons are individually adjustable off-line. EQ and Dynamics sections can be switched in/out and copied as complete blocks.

Timeline-based automation data for individual controls is adjustable by familiar click and drag with copy-paste and time shifting of individual functions to single or multiple channels.

Snapshots can be modified on a channel-by-channel basis and with access to DMX-R100 set-up parameters the Automation Editor adds operational control and user convenience to the highly successful DMX-R100.

**...Oh! ...And it's FREE for V2.xx users.**

*\*Multiple Audio Digital Interface (AES 10). 48 Ch I/O via DMBK-R109 option*

**Call 1800 017 669 for further details or check-out [www.sony.com.au/proaudio](http://www.sony.com.au/proaudio)**

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**SONY**

## Who is doing what?

### News from Lots of Watts:

**Scott & Margaret Waller** have had a beautiful new baby boy **Tyler William Waller**.

**Ron Josephs** (previously employed by The P.A. People) has joined the Sales Department.

### NEC changes:

New account manager in NEC Plasma Division: **Joel Pilgrim** (previously from A Brighter Image); New account manager in LCD Display Division: **Elisa Reynolds** (from BCA IT (PC dealer) and a new marketing staff member: **Mia Steengaard** (previously from Seiko).

The National Senior Account Manager for NEC Projector Division, **Steven MacDonald** has just had a baby boy, born 17/06/02, named **Mitchel**.

### Changing Command Systems

Command Systems have announced a company restructuring which has resulted in **Nicholas Hall** being appointed as the new Managing Director.

- Command Systems +61 2 9938 4811 [www.commandsys.com.au](http://www.commandsys.com.au)

### New Switchcraft Distribution in NZ and Aust

The US manufacturer Switchcraft has appointed Connection Technologies Limited as its new authorised distributor for New Zealand.

- Connection Technologies +64 4 5665 345

Former Australian distributor, Audio Telex, has decided to opt out of importing Switchcraft. As a result, distribution has been picked up by Clarke & Severn Electronics.

- Clarke & Severn Electronics +61 2 9482 1944 [www.clarke.com.au](http://www.clarke.com.au)

### Smaller I-COM

Infocomm 2002 was smaller, attendance was down and there were no real surprises in the new technology stakes, but the show did have its highlights. Gary Kaaye has written his review of the trade show, and it is available through our website. Link up from our site at [www.conpub.com.au](http://www.conpub.com.au)

## AAV & ISIS MERGE

According to AAV Australia CEO, Ted Gregory, "The merged companies will provide a more complete range of services to a wider client base, and will provide a platform for future expansion while achieving synergy savings within operating divisions."

AAV has a consistent record of revenue and profit growth and revenue for the year ended 30th June 2002 is expected to be about \$62 million.

## Antenna Network Chair Steps Down

David Grinstead, the chairman of the NSW based association of Technical and Venue Managers - Antenna - has regretfully resigned due to work overload reasons. While he will still be an active member of this important information network, the duties of the chair will be covered by Greg Diamantis and the Secretary (Craig Brighton) until the next AGM later this year.

More information about Antenna can be found at [www.antennanetwork.com.au](http://www.antennanetwork.com.au)

## Shout Tour Announced

Kevin Jacobsen have announced that "Shout! The Musical of The Wild One" is set to tour regional centres using the big top tent originally used by Cats. After playing to almost 500,000 people in Melbourne, Sydney, Brisbane, Adelaide and Perth, Shout certainly has been a successful musical.

The Australian tour is scheduled to play 39 weeks across 30 cities commencing in October 2002 with Penrith and Canberra. Jacobsen Entertainment and Really Useful Productions have joined forces to bring the show on tour. Jacobsen.

The Big Top is set to undergo an overhaul for the project, with comfortable restructured seating, air conditioning, and carpeted walkways.

## KLOTZ DIGITAL AUST.

...was awarded a 4 studio radio station contract by DMG Radio Australia. The project was recently installed in Melbourne and is already on air.

KLOTZ supplied DMG Radio Australia with their VADIS AudioMedia platform. DMG purchased 15 VADIS 880 Frames, 4 VADIS D.C.II Digital Audio Broadcasting Consoles and 9 LCD Routing Selector Panels for its new Melbourne facility. DMG own NOVA FM.

## WA co wins export award

The Western Australian Emerging Exporter Award was won by AV Communications, now known as Tieline Technology. Tieline Technology Founding Director, Rod Henderson said the last year had been a record year for the company.

"The staff and management got a real buzz out of winning an award. The enormous cost and massive task of going overseas is considerable for any small business."

## Correction

Last month's market report on small speaker PA systems omitted one of the submitted brands. Information on the FBT speaker options can be sourced directly from the distributor: LSW +61 2 9568 2100. Connections apologises for this unintended omission.

## The Best Gig?

Connections would like to hear about what you think is the best gig you have ever worked on. One of the best we have have of so far this year is the Bytecraft boys, sent to provide mid-match and post-match lighting for television interviews at the various Worldcup Soccer matches. You may have seen them. They are the blokes sitting on the sidelines of the games - on the pitch - waiting to do their job once the game has finished!

Tell us about your dream gig - [mail@conpub.com.au](mailto:mail@conpub.com.au)

## New EVO Firmware

ENTTEC has just released a new firmware version for their EVO Australian made lighting control desk. This new firmware has over 100 improvements over the previous release. Many new shortcuts have been implemented to drastically reduce the number of keypresses. Users can also perform the same task many different ways offering real flexibility, says the firm.



**THE PERFORMANCE AND RELIABILITY YOU DEMAND.  
NOW AT A PRICE YOU NEVER EXPECTED.**



THE **RMX**  
SERIES

Now you can truly have it all. Superior-quality sound. Industry-leading features. Unbeatable reliability. And an unheard of price tag! RMX are QSC's most cost effective amplifiers ever but they are certainly no compromise, in fact RMX incorporates the same facilities and rugged reliability that won QSC four ENTECH awards in a row and accolades around the world. The new RMX 1850HD with its advanced thermal management system for higher continuous

power in 2-ohm stereo or 4-ohm bridged applications extends the RMX range to four. All models deliver road-proven performance in a compact, rock-solid design.

And all are backed by QSC's peerless 30-year reputation. At QSC Audio, you've never had to pay more for superior quality. Now you can pay even less! Which RMX amplifier is right for you? Investigate [www.qscaudio.com](http://www.qscaudio.com) or head for your favorite dealer.



**RMX SERIES FEATURES**

- Road-proven QSC circuitry delivers low distortion (<0.05% THD) and maximum 2-ohm performance
- Built-in clip limiters and low-frequency filters reduce distortion and protect speakers
- Balanced 1/4" and XLR inputs plus Speakon™ and binding post outputs provide versatile I/O options
- Compact size—1800 watts in a 2 rack space, 40cm deep chassis
- 3-year warranty plus optional 3-year extension available
- Extended thermal performance in 2Ω stereo or 4Ω bridged mono applications (a RMX 1850HD exclusive!)

**RMX SERIES POWER CHART AND PRICE**

RMX	8Ω	4Ω	2Ω	Bridged 4Ω	\$ AUS
RMX 850	200W	300W	430W	830W	\$1,395
RMX 1450	280W	450W	700W	1400W	\$1,595
NEW! RMX 1850HD	360W	600W	900W	1800W	\$1,995
RMX 2450	500W	750W	1200W	2400W	\$2,195

8Ω and 4Ω: 0.1% THD @ 1 kHz    2Ω: 1.0% THD @ 1 kHz



## Technology Update

## Mackie Release New SDR24/96 24-Track 24-Bit Hard Disk Recorder



The SDR24/96 is the third variant in the HD line. It's got the usual features such as cut/copy/paste track editing, multiple un-dos, Sony 9-pin support, and compatibility with multiple remote controllers.

It offers professional-level features in a very easy-to-use interface. All analog and digital I/O are built into the back panel, so integration with mixing consoles and/or digital audio workstations is easy. The SDR is also small and portable enough to be carried from gig to gig. The SDR supports Mackie Media back-up drives, which makes all media interchangeable from one Mackie recorder to the other. RRP \$6995 • Australian Audio Supplies 1800 50 20 15 [www.ausaudio.com.au](http://www.ausaudio.com.au)

## Mac2000s for hire. grandMAs too.



Not that sort of Grandma! We mean the new grandMA lighting console from MA Lighting. grandMA features 3x touch screens, motorized faders, 2024 channels, 4 DMX outputs, built in UPS, keyboard, mouse and trackball. Control includes audio input, SMPTE Timecode entry, MIDI in/out/thru and DMX in.

The Martin Mac2000 is a 1200 watt automated profile which features CMY colour mixing, indexable rotating gobos, strobe, smooth dimming, prism, frost, colour correction and much more.

**grandMA and Mac2000. The perfect pair — available for hire at Lots of Watts.**

**The company everyone else uses**

2 Bridge Street, Rydalmere NSW 2116 Tel: +61 2 9638-0302 Fax: +61 2 9638-0331  
Email: [sales@lotsofwatts.com.au](mailto:sales@lotsofwatts.com.au) Hire: [hire@lotsofwatts.com.au](mailto:hire@lotsofwatts.com.au) Web: [www.lotsofwatts.com.au](http://www.lotsofwatts.com.au)

**Lots  
of  
Watts**  
Pty Ltd

## MiniMAC Maestro

The Martin MiniMAC Maestro is aimed at quality image projection of logos, text patterns & messages.

The MiniMAC Maestro features four larger diameter gobos and a long life (6000hour) 150W CDM metal halide lamp. The four gobos are interchangeable and can be rotated and fully indexed for repeated alignment in any position.

The MiniMAC Maestro offers a smooth pan of 540° and 270° of tilt. A colour flag can be inserted, and the unit has an in-built mechanical shutter.

The MiniMAC Maestro can be operated via DMX or the on-board memory for stand-alone programming. Interestingly, there is an optional infrared remote control for remote programming and control of up to ten units at a time. Multiple units can be also synchronised in a master/slave configuration.

The MiniMAC Maestro is also available in white or titanium finishes and can store up to 20 scenes on-board, with the IR control able to activate these scenes from up to 20m away. \$4,599 inc lamp.

• Show Technology  
+61 2 9748 1122



# i12 T12

## PROFESSIONAL LOUDSPEAKERS



The Tannoy i12 and T12 professional loudspeakers are designed for a wide variety of sound reinforcement applications requiring extended frequency response from a compact system, capable of delivering high sound pressure levels with extremely low distortion. The result is outstanding articulation, definition and detail.

The i12 and T12 comprises one 12-inch Dual Concentric™ driver in which the low-frequency and high-frequency sources are coincidentally aligned to a point source, resulting in a homogenous, uniform frequency response over a wide area of coverage, either as a portable, stand-alone system or in a multi-cabinet array. This point source system yields a seamless, more musical reproduction than conventional multi-driver configurations. These unique features are inherent in Tannoy Dual Concentric™ systems and achieved without the aid of electronic signal processing.

The i12 (installation) cabinets are manufactured from inert MDF panels for maximum acoustic damping, while the T12 (portable) is constructed from rugged, multiply hardwood to increase its durability for the knock of everyday transport and rental use. Both systems offer internal steel bracing that doubles as the flying points, accepting M3 eye bolts strategically placed to distribute the weight of the enclosure evenly. The T12 is further enhanced by an integral pole mount and a recessed carry handle. The T12 can also be used as a low-profile stage monitor. Its corical coverage pattern gives the performer greater freedom of movement than allowed by conventional horn-loaded designs.

For applications requiring extended bass, the rugged T40 companion sub is the ideal choice. Multiply hardwood construction, durable 15"

transducer and high sensitivity and SPL make the T40 an outstanding value.

*All-weather versions available*



i8 loudspeaker



i15 loudspeaker

The installation series features a size and performance for all applications i8, i12, i15 and the optional TX2 stereo control extends HF and LF and includes an internal sub out.



TX2 stereo control



T-40 Sub



**Contact Syntec International**  
**Phone: (02) 9417 4700**  
**Web: [www.syntec.com.au](http://www.syntec.com.au)**



## Technology Update



## Tourmate Multilock

The new Tourmate Multilock power connector series are manufactured from hard plated, machined alloy, and are intended for the professional touring and theatre industry.

Incorporating identification for six circuits, integral backshell insulation and *first mate - last break* ground contacts, Tourmate Multilock is watertight to IP67 when mated. Kinky.

Tourmate Multilock connectors are available in Line Male, Line Female, Panel Male and Panel Female versions with a choice of solder or removable crimp connections. They are fully compatible with Socapex and Veam products.

The unique Spider Clamp version makes the fabrication of six-circuit cable assemblies simple. It provides positive grip and seals each individual cable, making it the ideal choice particularly at outside events.

Global distribution of this product is by AC Lighting (UK).

• +44 1494 446 000

## Selecon Redesign a Fresnel

The Selecon R&D team recently turned its attentions to their Selecon ARENA - a 200mm Theatre Fresnel. Now sporting a stylish new front casting (existing bamdoors and colourframes are still able to be used) and squared off side opening tray, this general purpose theatre fresnel now has the ability to house 2 different lamp bases in our market - G22 and GY16.

The luminaire will shortly be available with a new lead screw focus action for pole-operated versions. Pricing is \$830rrp (inc GST)

• Selecon (NZ) +64 9 360 1718



## Kupo – New Stands and Clamps

Kupo have some new products for free-standing and rigging lights. Their new Follow Spot Stand is a chrome-plated steel and aluminium stand in 2 sections with an adjustable leg for levelling on uneven surfaces. The stand weighs 8.7kg, has a safe (vertical) working load of 40kg, and can be extended to a maximum height of 147cm. \$469.

The new KUPO Winch Up Stand is intended for a variety of different lightweight applications - up to 30kg. This stand is made of chrome plated steel with geared columns in three sections. Like the follow spot stand, this unit has an adjustable leg for leveling on uneven surfaces. The stand itself weighs 22.4kg. \$1,299.

The Kupo Trigger Clamp is a new design for rigging heavy fixtures safely. The feature of this clamp is that it holds the fixture on the lighting bar/truss while you fasten and lock it off to the pipe. Constructed of high strength structural aluminium, the Clamp attaches securely to tubes with an OD of 48-51mm. It mounts with M12 bolt & lock nut as standard. Double levels countersunk channels for M10 & M12 hex head



bolts. Certified with a safe vertical working load rating of 200kg. TUV Approved. \$59.

• Show Technology +61 2 9748 1122

## PC-based Audio Testing



Vicom have introduced two new products from Audio Precision - the new ATS-2 Audio Test System and the System Two Cascade Plus.

The ATS-2 is a PC-based audio test and measurement system. Analysis capabilities include both harmonic distortion and multi-tone analyzers. The Harmonic Distortion Analyser decreases engineer or technician test time by quickly isolating and identifying circuit problems.

The ATS-2 provides design engineers with Audio Precision quality and the ability to choose performance capabilities to match specific needs and budgets. The ATS-2 offers new features that reduce time to market through simple set-up and faster testing.

The Multi-tone Analyzer enables fast analysis of frequency response, crosstalk, noise and distortion, eliminating errors, improving accuracy and reducing costs associated with test time. This series of performance tests is carried out in less than one second with a single acquisition. Audio Precision also offers a performance option that increases measurement bandwidth to



120 KHz and includes complete digital audio interface tests including waveform and eye pattern displays.

Cascade Plus is a PC-based high performance audio test and measurement system based on Audio Precision's flagship System Two Cascade. FFT acquisition memory is increased to four mega-samples per channel, or about 1.5 minutes of acquisition at 48 kilo-samples. A new Programmable Serial Interface Adapter with full, soft programmable operation is available as an option. Additional improvements include N-th octave smoothing on FFTs, which allows users to more quickly interpret test results. A 6 to 7 dB reduction in Audio Precision's already low residual distortion will be a requirement for testing next generation converters.

More information is available from Vicom, provider of telecommunications test and measurement solutions, equipment service and NATA accredited calibration within Australia, New Zealand and the South West Pacific region.

• Vicom Australia +61 3 9563 7844  
www.vicom.com.au

# MAC 2000 ON TOUR:

**With:**

Lenny Kravitz

Paul McCartney

Nestlife

Depeche Mode

Crosby, Stills, Nash & Young

Blink 182

Green Day

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Incubus

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Garth Brooks

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Dido

Human League

Atomic Kitten

Bare Naked Ladies

Brooks and Dunn

Alanis Morissette

Goo Goo Dolls

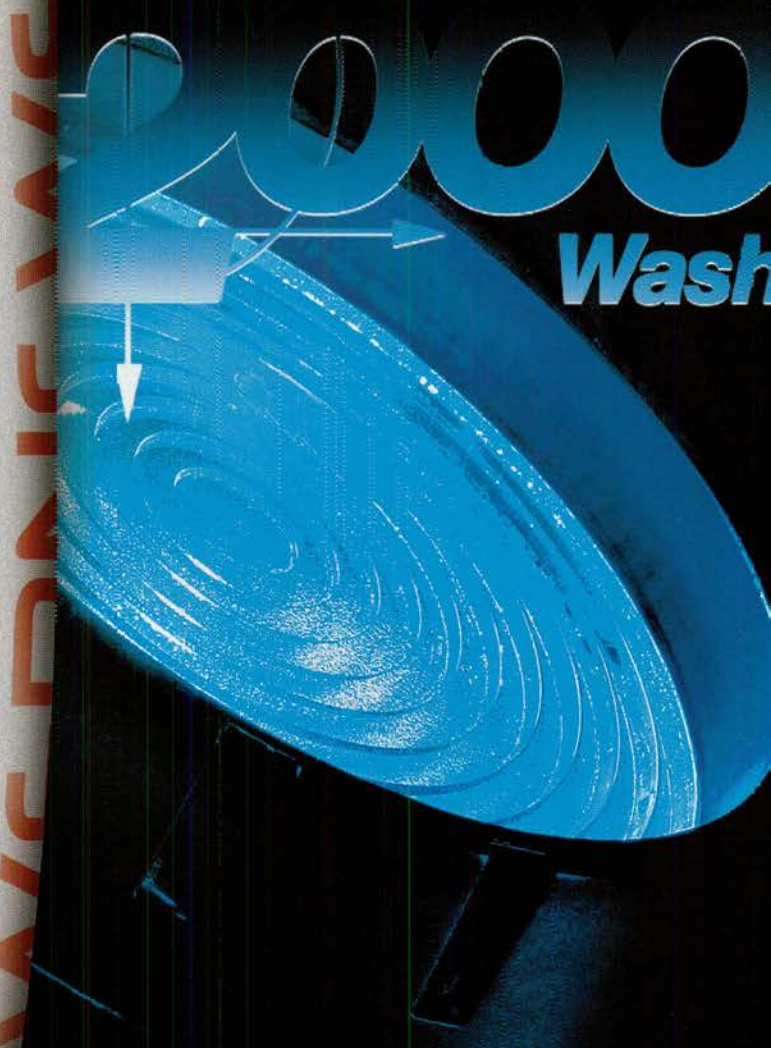
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and many more!

**Martin**

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540° Pan / 270° Tilt

Variable color temperature  
correction

Fresnel lens as standard  
(12° to 43° zoom range)

1200 Watt HMI short arc  
discharge lamp

Motorized barn door option

Electronic ballast and hot  
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Specifications are subject to change without notice

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**SHOW**technology

Technology Update

## Coemar ProWash 575 LX

The new high output ProWash 575 LX is designed for applications requiring intelligent moving yoke colour wash facilities. Using either the MSD 575w or MSR/2 575w lamp, this unit features full CMY colour mixing, separate six colour wheel, CTO & CTB filters, strobe, fade pulse effect, blackout, rotatable beam shaping, a mechanical dimmer and a progressive zoom – Beam angles are from 9.5° to 23°, (field angle from 19° to 34°).

- Weighs 35.8 Kg. Priced at \$6,940 (inc GST)
- Coemar DeSisti Australia +61 3 9467 8666



## Avolites Software

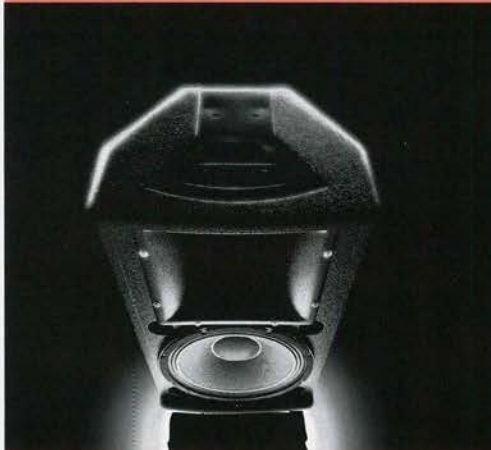
Avolites have launched the Pearl Simulator, a free software download ([www.avolites.com](http://www.avolites.com)) which provides a virtual interface for Avolites' Pearl 2000 console. This enables LD's, programmers and operators to start programming a Pearl without a console, or to edit existing shows, saving data to a Pearl compatible floppy.

It is also a good way to learn how to use the Pearl 2000 Console!

The Software will also work with the Avolites Visualiser emulation system. A fully working "Visualiser Lighting Rig" is now bundled as part of the free Pearl Simulator download.

- Universal Lighting and Audio +61 7 5510 1333

## C-Series: less is more.



If you think big is beautiful, the d&b C-Series will convince you otherwise. The C6, C690 and C7 systems are extremely compact, economical and well proven as sound reinforcement solutions. They show their surprising strengths in a diversity of roles: as discrete public address systems, centre clusters, delays or infills and in venues ranging from theatres and convention centres to arenas and sports stadiums. In fact in any situation where full sound and well-defined dispersion over an extended frequency range is required. For speech reinforcement

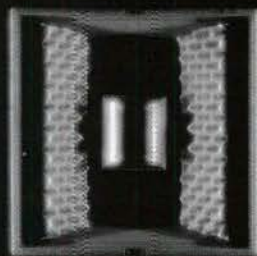
and light music they provide enough bass output without the addition of a subwoofer. However, when coupled with the C7-SUB they are extremely powerful music systems with ample headroom. With the d&b C-Series less really is more which we will happily demonstrate.

Australian Partners -



nationalaudiosystems

National Audio Systems Pty.Ltd, PO Box 250 Rosanna, 3084 Victoria, Australia  
phone 03-94341888, fax 03-94341866, e-mail: [sales@nationalaudio.com.au](mailto:sales@nationalaudio.com.au)



d&b  
audiotechnik

## ARX Release CentreMIXX Centre Channel Processor

ARX Systems have released another signal processing solution - the CentreMIXX Centre Channel creator for Speaker systems requiring a Central Cluster.

Central loudspeaker clusters are now becoming a standard in installations and live sound reinforcement systems. They provide the operator with the ability to centre the voice and acoustic program material, while at the same time retaining the Stereo image across the Left and Right Loudspeakers.

The ARX CentreMIXX, allows even a very simple system to derive a Centre Channel from a summed mono mix of Left and Right, with a L-R mix accuracy of 0.1 dB. The unit likely to be priced under \$800 rrp (inc GST), and stock will become available after the end of the month.

- The Resource Corporation  
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Designed to meet the multichannel audio needs of a wide variety of businesses and

venues, the new Cloud

CX-A850 is equipped to fulfil its assigned role perfectly, hour after hour, day after day. Its eight individually assignable channels of amplification come with many useful control and routing options,

all in a neat, 2U, format.

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[www.cloud.co.uk](http://www.cloud.co.uk)

Clearly better sound

## Technology Update



### More NEC MT Series Increased functionality and brightness

NEC Australia Pty Ltd introduced its latest projector, the MT1056. Designed to improve on the MT50 Series, the projector is aimed at both portable and fixed installation use, particularly in conference room and classroom applications.

The 6.0kg, LCD-based MT1056 has a specified brightness of 3000 ANSI lumens as well as XGA native resolution. It also adds a cabinet control panel lock feature enabling users to prevent unauthorised projector setting access and adjustments. The MT1056 employs NEC's VORTEX Technology - an enhanced image control system that, amongst other things, allows users to fine-tune image colouring.

The projector has a built-in presentation viewer, allowing for downloaded presentations from a PC card. There is also an Eco-Mode, which optionally gives users a lower light output option, extending the projector's lamp life from 1500 to 2500hrs.

The MT1056 is available now for \$13,500 rrp (inc GST).

• **NEC Australia 131 632**  
[www.nec.com.au](http://www.nec.com.au)

## Coming Soon - Martin MAC 2000 Wash Light

### The brightest Martin fixture ever

The MAC 2000 Wash is the latest lantern preparing to come off the Martin production line.

It is an automated wash light with an unprecedented light output and full CMY colour mixing. Produced as a reaction to market demands for a powerful 1200-watt MAC wash light, the goal was to produce a fixture that was consistent with the look and quality of existing MAC 2000 products and to provide a flexible solution for a large scale washlight capable of long throw projection. The MAC 2000 Wash uses the HMI 1200-watt lamp at its light source and also features variable colour temperature correction filters.

The MAC 2000 Wash is also fitted with 2x four colour wheels, of which the second can be swapped for a number of other available colour options. The zoom operates in conjunction with three different front lens options to provide different beam spreads.

The fixture comes fitted with a fresnel lens as standard giving a zoom range of 13° to 45°. For added flexibility, a PC lens comes supplied with the fixture. As an option, a super wide-angle lens is available, which gives a zoom range of approximately 80° to 130°.

The MAC 2000 Wash comes with a combined dimmer/shutter system that provides both microstep dimming and a variable strobe (it can be dimmed while running). 3 phase motors provide smooth and accurate 16-bit movement at both fast and slow speeds.

The zoom lens system has been built in such



a way as to allow its removal from the optical path for fixed narrow angle lighting requirements. In this mode the light output of the fixture increases to approximately 32,000 lumens - a staggering amount of light for a 1200-watt source fixture.

The MAC 2000 Wash comes with an electronic ballast for flicker free operation, hot lamp restrike, reduced weight and noise, extended lamp life and a power saving mode.

A motorised barn door system is on the way too. MAC 2000 Wash is coming after July.

• **Show Technology +61 2 9898 1111**

## Altronic update 16ch diversity system

Altronic Distributors have released their Redback brand 16ch UHF radio mic system. The PLL synthesized diversity system is available in a half 19" rack size receiver and handheld or lavalier system with options for tie clip, lecture, aerobics or guitar pick ups. The system operates in the frequency range 790-806 MHz and up to 6 systems can be used in the one location at the one time. The frequency is selectable via dip switches located on the front panel of the receiver, and contained in the battery compartments of the transmitters.

Removable rear mounted aerials, and optional rack ears (for single and 2 system rack mount-

ing) for the receiver making it suitable for hire or fixed installations. The unit has unbalanced jack and balanced line level 3pin XLR sockets.

The transmitters feature high quality inserts with the handheld having a cardioid electret insert. The tie-clip microphone fitted to the belt pack via a mini XLR socket also contains a unidirectional electret insert allowing high gain with low feedback. Full systems start at \$860rrp, and all components can be individually supplied.

• **The Redback range of products are available via Internet [www.altronic.com.au](http://www.altronic.com.au) - or phone 1300 780 999 for your nearest dealer.**



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- www.reelefx.com

# Something to **RAVE** about!

Rave is the new addition to Compulite's acclaimed line of lighting control consoles.

With enhanced playback controls coupled with an easy-to-use intuitive user interface, the Rave is perfect for live applications ranging from clubs right through to live-venues and concerts - wherever enhanced hands-on operation is needed.

Rave allows you to control up to 40 Moving Lights, 100 Channels and 20 Extras through one integral DMX512 output. It supports advanced features such as Ethernet, Sound-to-Light, SMPTE and MIDI, making it easy to synch and communicate with the outside world. Rave also features an internal Auto-Saving Flash Disk for on board storage.

Check out the new Rave now at CDA. It will give you something to Rave about!



**COMPULITE**

M E L B O U R N E • S Y D N E Y • B R I S B A N E

## Technology Update

## Petzl Tikka and Zippa - ultra lightweight



Check these - the new ultra lightweight TIKKA headlamp from Petzl (\$86.48) uses high intensity LEDs to give an even, bright white light, with a lifetime of several years continuous use. It weighs just 70g, including the 3 AAA batteries. Very small, the unit comes with the traditional Petzl elastic headband. It is small enough to easily fit in a pocket, handbag or glovebox.

The Zippa (\$110.28) is even smaller and lighter. With a similar design to the Tikka, the Zippa incorporates a roll-up strap system to replace the elastic headband. [www.ths.com.au](http://www.ths.com.au)

• Total Height Safety (THS) +61 2 9966 9070

## Firehawk Screen

At recent product launches in Melbourne and Sydney, Visual Fidelity introduced two new projection screen products from Stewart Filmscreen: the front projection FireHawk surface and the rear projection Graphite 100 surface.

FireHawk follows on from last year's release of the GrayHawk surface that has since become Stewart's most popular surface. With its neutral grey base and specular coating, FireHawk increases black levels, shadow detailing and colour saturation and is particularly ideal for single chip DLP projection devices.

FireHawk preserves image contrast by

dampening cross light reflection by as much as 90 percent and outperforms conventional white based screens in high ambient light conditions.

Those in attendance at the launches were able to witness the superior ambient light and contrast performance of both the FireHawk and the GrayHawk by two unique split screens that compared these two surfaces with similar gain white based surfaces.

Technically speaking, the FireHawk has a gain of 1.35, a viewing angle of 100 degrees and is available in both fixed frame and retractable models.

Graphite 100 is the first acrylic rear projection screen line embedded with new contrast enhancing technology. It has excellent wide angle viewing cones, deep black levels and high ambient light resistance.

This screen uses a specifically formulated diffusion layer fused on an elite acrylic substrate. In this new technology, Stewart Filmscreen have designed a way for the screen to actually absorb backscatter.

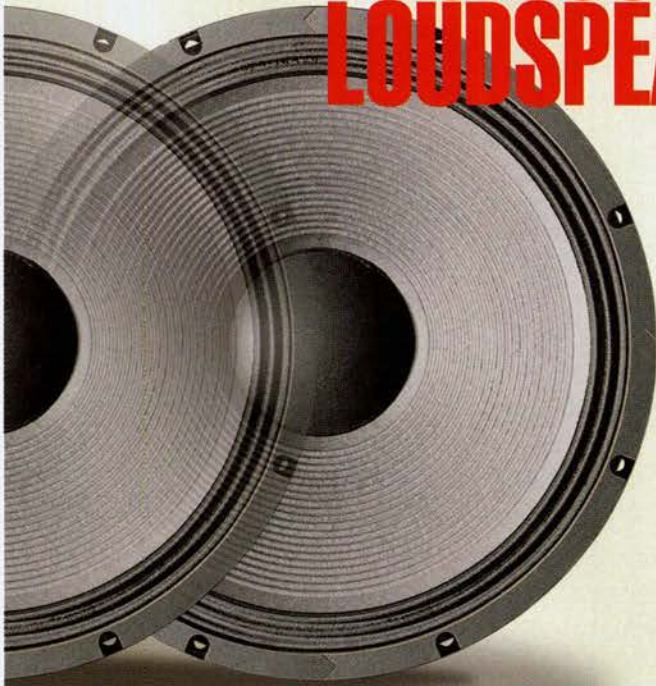
According to the company, the Graphite 100 increases contrast and resolution by 30 percent while also decreasing the chances of halo effects.

It is available in large scale production runs, for identical gain and colour temperature for videowall and simulation systems.

Graphite 100 has excellent white field uniformity, a gain of 1.0 with a half gain viewing angle of  $\pm 50$  degrees and is available in sizes up to 1.83m x 3.05m.

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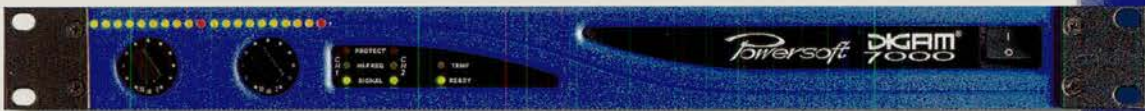
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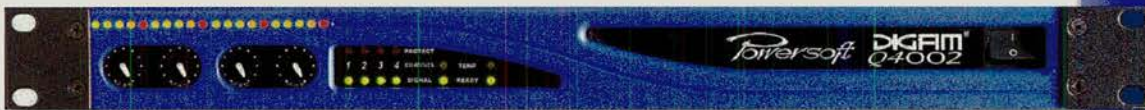
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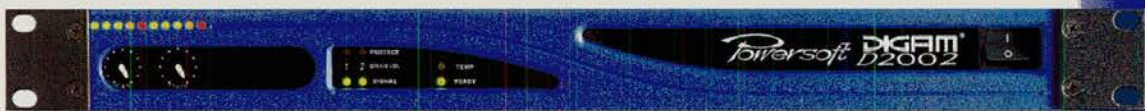
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Q4002 1000W (2Ω), 600W (4Ω), 350W (8Ω)  
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## AVALON FEATURES AT BRISBANE'S FAMILY



Avalon is voiced different to concert loudspeakers, installer tells Julius Graftor.

DCS-1 (top, right) is one mean box. Four 15-in woofers, horn-loaded 10-in cone MF section w/ radial phase plug, and a horn-loaded 2-in exit HF compression driver. The system comprises three separate enclosures – a central mid/high section and two LF enclosures either side. The mid/high horn dispersion is vertically asymmetrical (+10°, -30°). Each pair of woofers is mounted in a push/pull configuration to minimize mechanical distortion. DCS-1 (below) does that swirling high's thang, and the DCS-2 sub (right) proves it's the length of your horn that counts!

• Go to [www.eaw.com](http://www.eaw.com) for more.



**F**amily Nightclub is one of those audio contracts that most installers can only dream about. The club owners just wanted the best, for what is probably the best club in Brisbane. Money no object. They called **Ivan Simon** from IJS Concert Sound.

"They wanted either JBL or EAW. I gave them some contacts and they went around the world – to New York and London. EAW got them in to the re-opening of the Avalon Club in Boston."

Avalon (the club) is owned by a former audio designer, who went to EAW and worked on a collaboration to produce a complete range of dance music loudspeaker systems. EAW named the line 'Avalon', and this is what ended up installed at Family.

So what is the difference between industrial strength concert sound loudspeaker systems and 'dance music' loudspeakers? Plenty, according to Ivan.

"They are tuned for dance culture sound. Take the sub-woofers. With a dual 18" concert sub, it kicks you in the chest. For

Avalon, EAW use a dual 12 sub with a 13' folded horn. It takes longer to develop (the soundwave), making it more of a surround sound, (kind of bass). It's a big sound, a 'sensation' kind of sound. More like hi-fi."

EAW are more succinct. "It's not the

size of your driver – it's the length of your horn that counts", they state!

Avalon is made up of ten models, some designed to fit in corners, and some wedge shaped to butt up against ceilings. The subwoofers are said to be dancer-proof, so they can be jumped on.

Most dance clubs seek to enhance response in the top two octaves to maximize the psychedelic, filter-driven HF effects that characterize the genre almost as much the beat. Many clubs employ dedicated super tweeter systems that provide additional reinforcement in this range employed either on or near full range systems or suspended above the dancefloor.

To cater to this the Avalon product range includes two super HF arrays – one comprising three drivers intended for mounting near full range systems and another comprising four drivers intended for suspension directly above the dancefloor. When super HF arrays are suspended directly

above the dancefloor with full range systems mounted along the sides, dancers will notice especially enhanced effects in an area more-or-less centered between the two. Under optimum conditions a distinct swirling effect is observed.

There are 66 Avalon boxes at Family, powered by Crest amps, with BSS Soundweb and XTA audio routing.





# 400

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*Behind every great show there are great products.*



#### GIOTTO SPOT 400

- Hot restrike 400W MSR lamp
- Motorized 9°/24° zoom
- Motorized focus
- Variable iris
- CTO and 1/2 CTO filters
- 30 colour combinations
- Effect wheel (customizable)
- 8 indexable rotating gobos
- Variable frost
- 2 rotating prisms
- Strobe/shutter
- Electronic ballast
- Absolutely silent operation

#### GIOTTO WASH 400

- Hot restrike 400W MSR lamp
- Motorized 9°/24° zoom
- Advanced CMY colour generation
- Linear colour conversion filter
- Colour wheel
- Variable dimmer
- Internal rotating shutters (0°-180°)
- Strobe/shutter
- Electronic ballast
- Absolutely silent operation

#### GIOTTO PROFILE 400

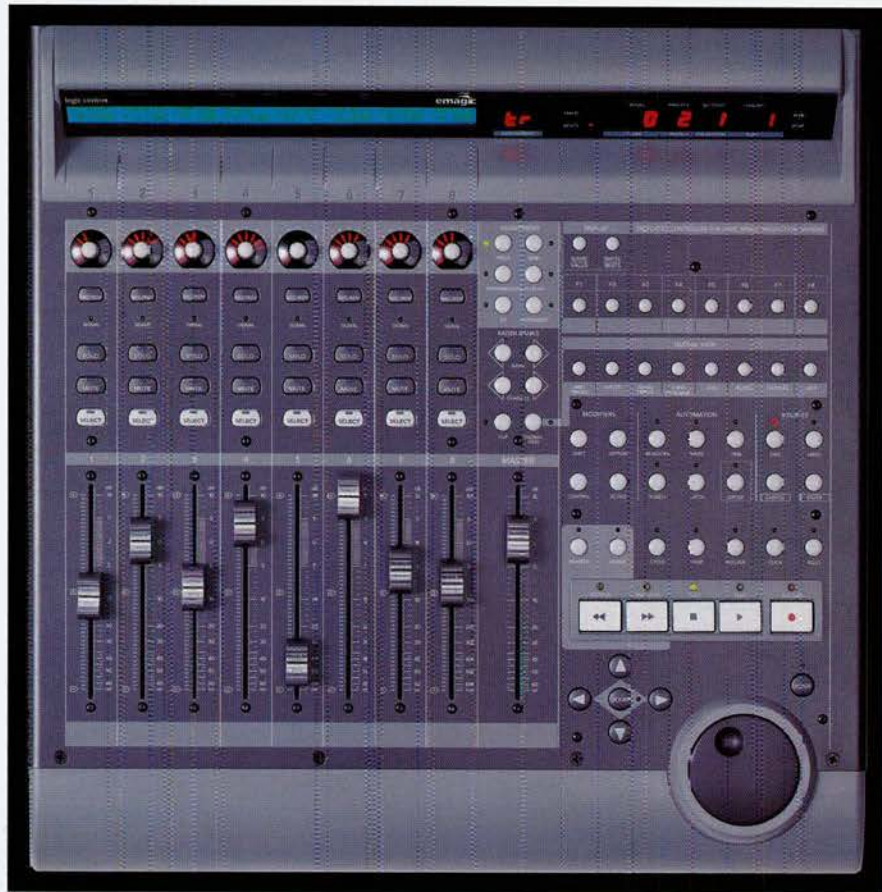
- Hot restrike 400W MSR lamp
- Motorized 9°/24° zoom
- Internal rotating shaper
- Motorized focus
- Variable iris
- CTO filter
- Colour wheel
- Indexable rotating gobos
- Strobe/shutter
- Electronic ballast
- Absolutely silent operation



LIGHT TECHNOLOGY

Studio Options

# Logic Control for Emagic



by Mike Rowntree

The three big music software packages - ProTools, Cubase and Logic - are currently fighting for international dominance. Not that the lesser known programs don't rate, they're mostly brilliant too - but I'm talking the big guns here. As in other marketplaces, the 'anything they can do - we can do better' philosophy reigns.

The buzzwords here are 'control surfaces' - ProTools (Digidesign) have the Pro Control and Control 24; Cubase (Steinberg) have the VST Studio Controller 'Hcuston'; and now Emagic have the Logic Control. Regardless of the manufacturer, the concept is the same - to make the complex studio emulation software physically user friendly. Operating virtual mixing consoles and interactive software with a mouse is a pain - that is, trying to mix one fader at a time is a pain - indisputable. The key to installation is ...

For the last week I have had a Logic Control to tinker with, though first I had to find out that it doesn't do a darn thing without Logic Platinum Version 5 (Mac + PC). A copy of the software does come with the control surface, but not an XSKey - the new USB copy protect

key that comes with Version 5. So buyer, beware! If you want a control surface for the \$3199 (rrp) asking price, then you will also need to buy Logic Audio Platinum 5 for \$2199 (rrp). \$6K for both soft- and hardware sounds a lot, but for the savvy, technically alert muso with a project studio client base Logic Control looks tasty - especially financially. (Note: The Platinum upgrade for 4.X users is \$399 and Emagic importers Electric Factory expect the majority of purchasers in the first year of Control being on the market are likely to be 4.X users already.)

The new key is rather groovy - it's literally like a key and can 'store' Emagic product licenses. My mind wandered to a dream sequence of a very trendy Logic user in a leather jacket wandering into an internet kiosk in New York, plugging in his or her USB XSkey and inserting their Logic CD-ROM... no? Alright, onwards.

Once the Logic Version 5.0.1 arrived I installed the software and key on the Mac G4 and zip... well not really. More OMS (Mac MIDI manager software) crashes every time I tried to boot the program. Oh well, nothing good works straight away out of the box anymore right? Time to look at the Emagic website ([www.emagic.de](http://www.emagic.de)). Sure enough after downloading Logic Platinum ver5.1.3 and updating the firmware it finally came alive - thank god for the internet, Emagic and Elvis in that order.

Firmware, for those of you with speedy investigative minds (typical Logic users!), is a form of updateable software stored on an EEPROM chip in the Logic Control. This dog can learn new tricks all the way into the future!

So what's it like? I have to say... it's like a HUI - Mackie's Human User Interface for ProTools that is. The power supply does say Mackie on it, and when you first turn it on and

it does its snappy little 'I've got flying faders - aren't I smart' startup routine, and the LCD says Emagic Logic Control by Mackie Designs V1.00.

Still, according to Emagic it's not a HUI! The Emagic web site FAQ has the following to say about the difference between the Hui and the Logic Control surface:

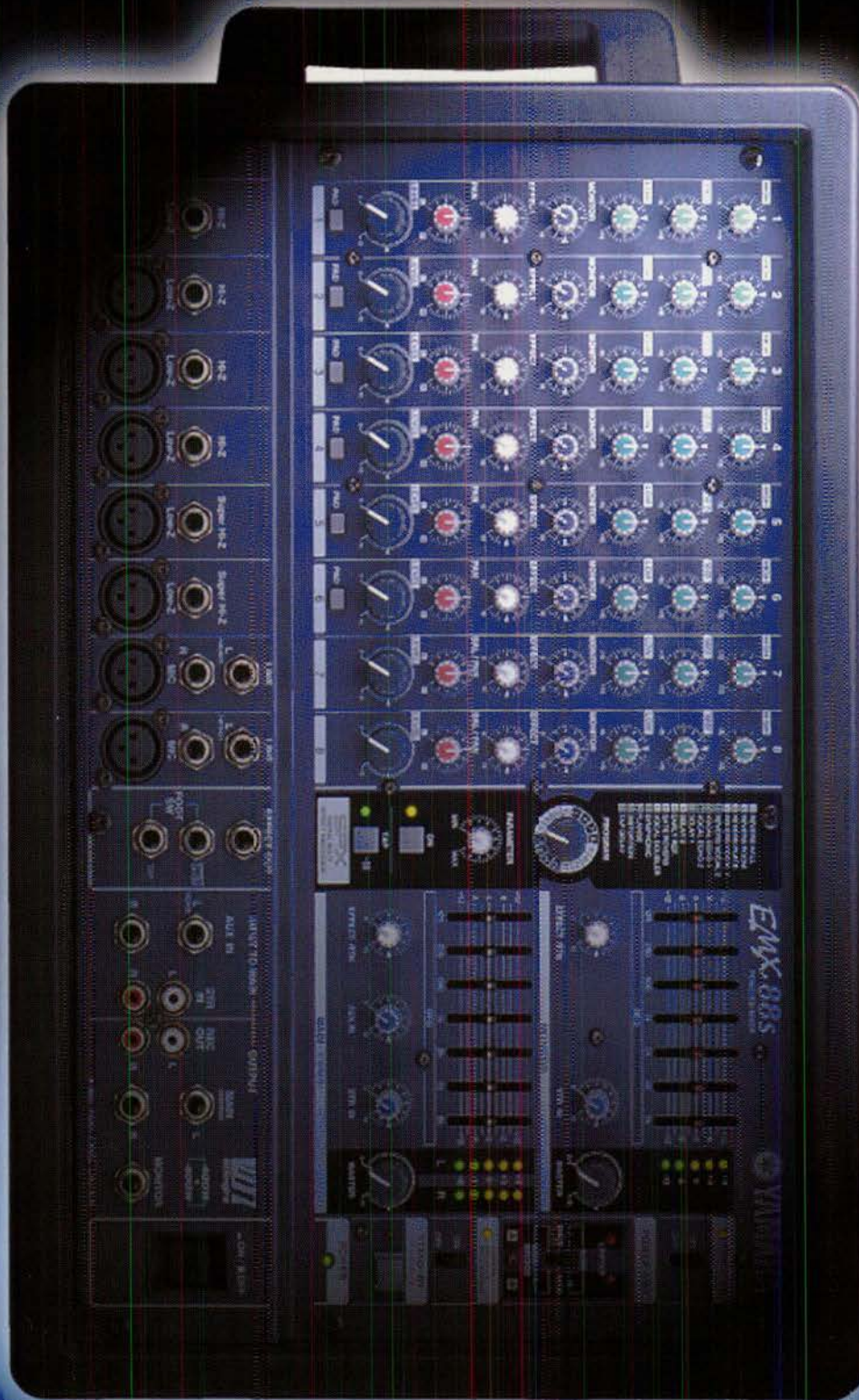
"No. Contrary to Internet rumours, or the opinion of so-called experts, Logic Control is not a development of, nor was it based on, Mackie's HUI.

Logic Control and Logic Control XT are new products, specifically designed and optimised for use with Logic Platinum. Jointly developed from the ground up by Emagic and Mackie, the displays, V-Pots, jog wheel, circuitry, housing and firmware are unique to Logic Control."

"...Contrary to Internet rumours, or the opinion of so-called experts, Logic Control is not a development of, nor was it based on, Mackie's HUI."

Mike Rowntree is Program Co-ordinator of the Certificate in Audio Engineering and Music Production at MAINZ' new Christchurch campus.

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EMX5000/20 • 24ins • 1000watts • \$2895



CREATING 'KANDO' TOGETHER

## Studio Options



The XT option is an 'extension' fader section pack (see picture on left) which is the same thing minus the transport and buttons section and priced at \$2749 (rrp). Add as many as you like to expand your channel count say Emagic. Cost? One MIDI In and Out per XT.

From the same source ([www.emagic.de/english/products/logic/control/faq.html](http://www.emagic.de/english/products/logic/control/faq.html)) I learned that ProTools for Mac and any other software which support OMS and the Mackie HUI is now supported by

the new Logic Control HUI Emulator.

Okay then, so what is a Hui emulator exactly? 'In a nutshell', answers Electric Factory's Scott Bulloch, "it is an Emagic software development that enables Logic Control to be used with applications other than Emagic Logic Audio Platinum. We recognise that customers may use multiple types of software to complete their project, sometimes Logic, sometimes ProTools etc. The fact that Logic Control is a MIDI device makes the application options endless. It becomes much more of a 'what do you want me to be today' device.

Logic Control then is a more universally friendly product than its competitors, allowing it to be a creative tool for however the user wants to use it. On the front you find a 55 x two digit backlit multi-function LCD, a two digit assignment display and a 10 digit timecode/beats and bars display. Eight channels that each offer eight V (for virtual) POTs (their functions change depending on what their assigned to); eight motorised 100mm touch sensitive faders; four switches per channel - rec/ready, solo, mute and select. There is also a master section with 51 little white switches for functions as diverse as automation and V-POT assignment, big chunky transport keys and an excellent jog wheel, and a scrub button. (It scrubs perfectly - very handy.)

The zoom keys are really great - one thing I've never liked about Logic is the zoom tools whereas these hardware equivalents are brilliant and fast to use. Basically pretty much anything you can do in Logic, you can do using real touchy-feely hardware on the Control surface! This is good, very good. How does it communicate with Logic? Yes it is MIDI not Ethernet (Digidesign's Pro Control and Control 24 use Ethernet which has a far higher resolution than MIDI), but it's also a hell of lot cheaper than a Pro Control.

The Emagic website has this to say about the difference in resolution: 'Depending on the situation, MIDI is capable of providing better performance than an Ethernet connection, especially in respect to latency. As a practicality, we recommend that all those interested make a direct comparison with other available devices.'

On the back all you have is a MIDI In and Out, two footswitch jacks, one for start and stop and one for record, and an external control jack for an

expression pedal to control the master fader. Note there are no audio inputs or outputs on the back, in other words. Logic Control does not replace your audio interfaces. You will need a second MIDI interface or a multiple port MIDI interface for MIDI.

The control takes up one MIDI In and Out all to itself and the manual says daisy chaining the control will result in errors. So don't do it. And what's it like to use? Easy initially, all the transport controls are the same and the zoom keys are easy. I couldn't find a way to move the horizontal scroll bar of a window - the first time I'd had to revert to the mouse for 10 minutes which is not bad really. Cycle, drop, replace, click and solo - the usual transport buttons are straight above the hardware transport, so goodbye virtual transport which is cool.

It does not work well with the windows of Logic, other than the mixers and the arrange window. I tried to tie a hardware button to a command in the sample editing window using key commands to no avail - you will need to keep the mouse and keyboard. I have a feeling that further software revisions will allow the Control to take over more of Logic's other windows specifically. That is my one gripe anyway - and you've got to find one otherwise they'll think they got it right first time!

Track view is the most intuitive of the View modes. You simply see the tracks in the arrange window left to right on the console's LCD. Global view separates out the channels/LCD to display certain 'classes' of Logic environment objects - meaning MIDI tracks, audio tracks, buses, outputs etc. A bit like getting the console to 'solo' a group of similar parts of logic and quite handy.

The assignment switches let you look at six main areas of Logic: Tracks; sends; pan/surround (yes it'll do surround - you just need the outputs, the amps, the speakers, the fat wallet etc); plugins (it edits all plugin settings effortlessly); EQ and instruments. Each area can display two view modes by toggling the assignment button of choice. Channel strip view shows eight or more parameters of the selected track whereas multi channel view shows a parameter per track.

Finally you can switch the faders to display/control banks of eight tracks at a time or you can toggle through your tracks incrementing the display one channel at a time. You can even use the traditional inline console 'flip' function. It has a comprehensive automation section with touch sensitive faders - this section reminds me of ProTools actually, funny that.

So that's about it really. Sadly, I didn't have the time between receiving the unit and delivering this epistle to actually use it to record anything of any depth. It would have been nice to record some of the students' masterpieces for example, but after opening the bonnet and snuffling around under the hood... I want one for home and one for Diploma next year - so make that two!!

NZ Musician

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## Euphonix in The House

*How and why Sydney Opera House chose the System Five digital mixing system.*

*By Julius Grafton*

**W**hen Euphonix released the System 5 digital mixing system they did not really visualise a live sound application. It was primarily designed for post and music recording. Then Sydney Opera House and a performing arts complex in Taipei bought the console and changed all that, so now System 5 is a contender to control almost any complex audio environment.

It's a comprehensive mixing platform that is enormously powerful. In operation its work surface doesn't function like Innovason and Yamaha's PM1D do. System 5 is different. It does a lot more than just emulate an analogue console.

In basic terms, System 5's work surface lets you assign inputs and outputs almost anywhere. All channels are the same. Above the motorized fader are eight rotary encoders with a bunch of push buttons that select what the encoders will do next. Hit a button and turn the eight encoders into EQ, or dynamics controllers, or auxiliary sends. The work surface is future proofed, future software versions will almost always find a knob or a button in the right place to do things users ask for, or dream up, later on.

Your audio is not running through the work surface. It is elsewhere, almost anywhere, running in and out of a processing rack, made up of core processors, and input and output boxes. In the case of the Sydney Opera House Opera Theatre, the rack is behind the mixing control room at the back of the stalls. In theory, the console can be very distant from the racks.

System 5 has the sexiest work surface in audio. The encoders have central lighting which changes

colour according to usage, and more than 20 little LEDs around the perimeter as a pointer. There are back lit LEDs and scribble strips everywhere. And at the top of each section, a TFT screen like in the latest airplanes. The screens make life easy, since a full channel description, all routing, LED ramps, and parameter displays are all shown.

It's beyond the scope of this story to fully detail the features of the system, these can be found in great detail on the Euphonix website at [www.euphonix.com](http://www.euphonix.com). Rather, I thought it would be good to see how the Opera House use the console, and how simple or otherwise it is from an operator's perspective. I chose me as the simple operator!

Enter head of audio at SOH, David Claringbold, and Opera Theatre sound supervisor Severin Sieben. We found an unusual break in the venue timetable and went in side to play. Briefly, the Opera Theatre is very heavily utilised. It hosts Opera, Ballet, Dance, and occasional music concerts. The Opera House itself is an intense performance environment with over 2,300 events yearly staged in or around the site.

Severin is the dude whose hands spend the most time on the System 5, 'It's exceeding all our expectations. Because the opera works in reparatory there are rehearsals every morning and different shows going on every night, up to six every week. Previously we actually had to write down in great detail the position of every knob, switch and fader and then manually reset the entire console. With the System 5 we can store set ups and then flick between shows, scenes, recall old shows - all with the greatest of ease. It means we can guarantee a client that the same thing is going to happen at





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Through centuries of rigorous meditation practices, the Gyuto Monks have developed a chant in which a single voice produces an entire chord. The intonation has been described as a "remarkable, transcendently beautiful sound." Reinforcement that captures the subtle intonations and delicate nuances of the Gyuto Monks' rituals requires a system that has both power and a delicate sensitivity. At 136 dB, with a range of 60 Hz to 16 kHz, and designed with Meyer Sound's legendary attention to quality, the Self-Powered M2D Compact Curvilinear Array is the system of choice for the Gyuto Monks' worldwide tour. [www.meyersound.com/mseries](http://www.meyersound.com/mseries)



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## Using the big 5



SOH Team: L-R: Lana Lazareff, David Claringbold, David Turnbull, Severin Seiben, Neil McGarry

every show and that nothing will go wrong."

"We've spent lots of time exploring the automation and machine control options so that during a show we can integrate our playback for sound effects and recorded music for dance shows. Being able to operate playback machines from the desk means that everything is set up so you can just sit at the console and hit a button. That's another thing that will make life a lot easier."

One exciting bonus of System 5 is its modular hot swap construction which as a by-product enables the whole master section to be lifted out, a 85 x 30 x 35cm core, complete with TFT screen, faders and assignable 'Super Channel'. Each module, or 'bucket' as they call it, is a self powered, self contained unit with its own internal computer. They are connected to the processing rack with a single Ethernet connector!

"With a roll of Ethernet cable and a power cord we can literally sit anywhere in the venue and mix the show!" explained Severin. "So now we're sitting in the stalls with the producer and his creative and technical staff with the master section right in front and we're making adjustments according to their comments and instructions. We're all hearing the same thing, it's easy and immediate and it just makes perfect sense."

When I arrived, two 'buckets' were sitting out in the circle, innocently wired to an Ethernet point. Severin had been mixing foot mics, wireless and shotguns for a tech run through. The only slightly fiddly aspect was that a PFL feed needed to be run out of the control room through a line to a nearby point, since the buckets lifted out of the main control surface enclosure do not have a headphone jack. The PFL feed was then plugged into a headphone amp, and preso - PFL in the circle!

It's interesting to note how sound for traditional opera works. None of the orchestra or the voices are actually reinforced, unless the production specifically demands it as in the use of radio mics for Operas with English dialogue. The sound task is complex, however, since there is a lot of foldback and feeds to monitors. Orchestra mixes are sent to

the stage, and voice mixes to the orchestra, full mixes to foyer spaces and for media. Sound effects are played out through the main left - centre - right house system, but that's about all that goes to the audience. But, the Ballet do reinforce the orchestra. It's a delicate art.

Nevertheless, the Opera Theatre System 5 boasts 106 channels available on the control surface, and more at the processing core. Presently they have 72 mic inputs, 24 line inputs and 24 AES/EBU inputs. Outputs include 96 analogue and 24 digital.

In the control room I took a crash course in System 5 control law. It's unlike anything digital I know, because I am limited to Yamaha, Innovason, Soundtracs and Soundcraft logic, where the desk usually has one 'super channel' that allows control of EQ, auxiliary sends, and dynamics. On System 5 it's different because every work surface channel allows full access to all parameters through the eight rotary encoders and raft of push buttons. I managed to select and control channels, without any problems in terms of EQ, dynamics and auxiliary sends. Channel control, and output control is relatively easy - once someone in the know has set the desk up to be what you want it to be.

A 'channel' has an alternate 'flip' channel available via a button, and the alternate channel (or, the one 'underneath') is labelled on the TFT screen and on a second scribble strip under the first. You can see straight away which is which, because the readout is way brighter for the channel in use. Or, you can see the TFT display. You are in no doubt where you are.

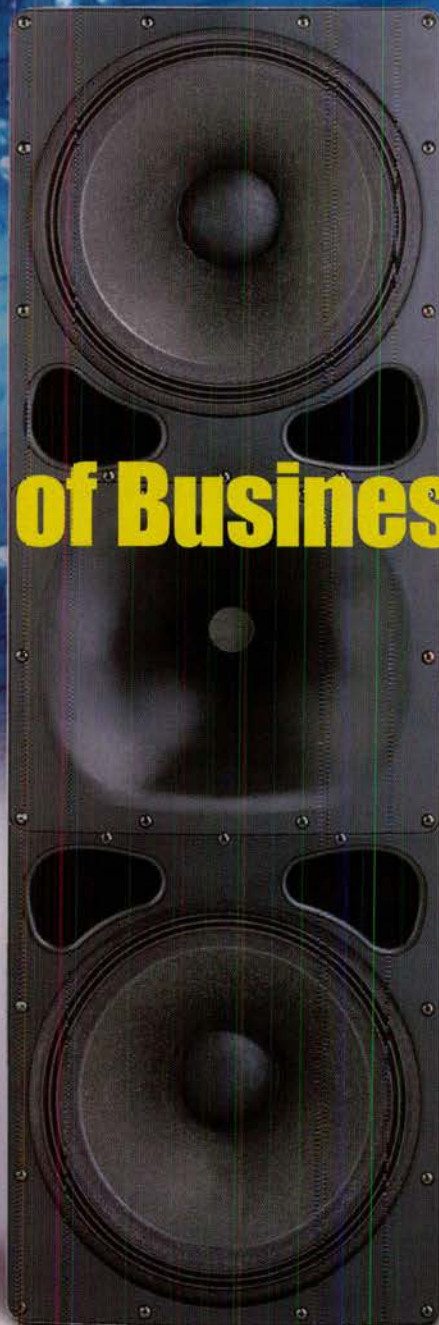
Snapshot automation is reasonably easy to use, the desk will store up to 240 scenes per show file, which can include any combination of parameters. You can lock out things you don't wish to store too. The show file is a key difference between System 5 and other consoles, according to the SOH team, because all show parameters are contained within one file on the eMix management software. This program runs on a separate screen and keyboard near the console. Other consoles evaluated by the Opera House - and there were quite a few, some costing more than System 5 - had less elegant show file structures, they say.

At the point of evaluating the snapshot recall, I stumbled over my only point of difference with the System 5, namely with the scene recall feature. The scenes are all dutifully listed on the Master Panel, a place where 24 buttons and 24 electronic scribble strips can select whatever you tell the desk you wish to select. You scroll through pages of scenes, and push a button to select your scene. The only problem is there is no 'next' and 'previous' button, so you can't load scenes in sequence and recall them, rather you go choose a scene and select it. This is almost certainly changeable with a future software revision, because under the Master Panel, and closer to the action, is another mini Master Panel with unused buttons that could be assigned to this task.

Overall, David Claringbold and his team are very happy with the '5'. "It's a chameleon, it will be what you want it to be" he says. "Don't forget to mention the transparency of the sound - that was a major factor in our choice!"



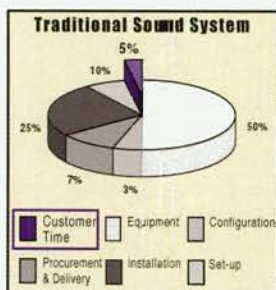
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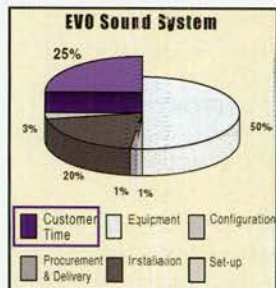
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# Conventional Vs Intelligent Lighting

## ...are there better options for new venues today?

Connections takes a look at the capital and running costs of two very different lighting systems to see what the ultimate costs really are.

by John Grimshaw

**I**n one corner you have the conventional rig - sixty odd conventional fittings and their associated bits and pieces. In the other corner, an intelligent rig of 22 lights and their various bits and pieces.

Typical theatrical type venues continue to stick to the tried and true methods of lighting, with its complex infrastructure, time consuming, labour intensive bump-in and

simpler ongoing maintenance. However, if you were contemplating a brand new venue, where all of the infrastructure had to be designed and installed for the first time, are there still the long term benefits to be had from keeping a conventional style design?

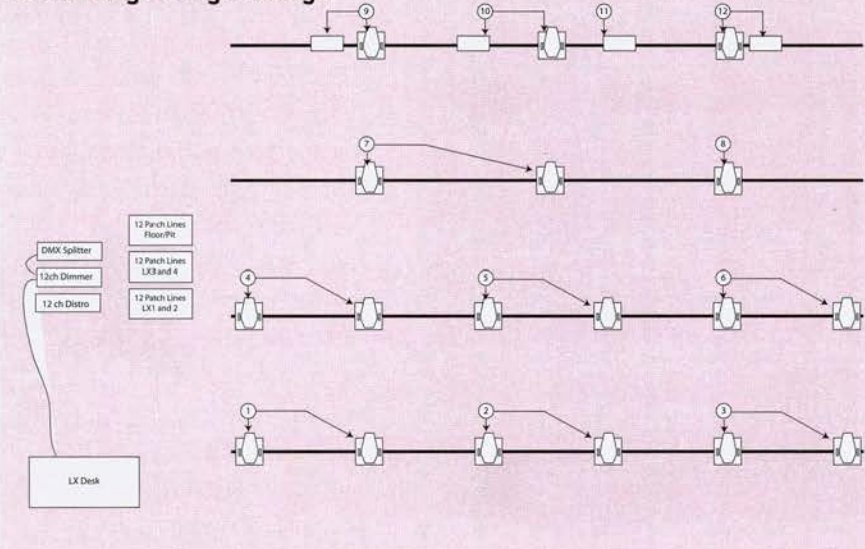
Let us take the example of a small to medium, 400 seat venue. Our architect has provided us with a plan of the room, and we have designed two basic lighting rigs that will cover the purposes of the room. You can see them here on this page

The conventional lighting system uses 32x profile lanterns, 12x Fresnel or PC lanterns and 4x 4way cyc lights. This is a minimalist design, allowing the stage to be washed completely twice, the cyc can have up to four colours, and there are eight floating specials that can be used however any particular show needs them. In reality, most of the lights are likely to be re-tasked to different jobs for each show. Different lighting designers lighting different sets in different ways means that this system needs the flexibility of being able to move any light anywhere as required. In addition, it would be expected that numerous small specials and other fixtures would be gradually added to the inventory, as each show tries to do something that the existing stock can not quite cover. The additional stock, and the dimmer(s) to drive that stock have not been included in this analysis.

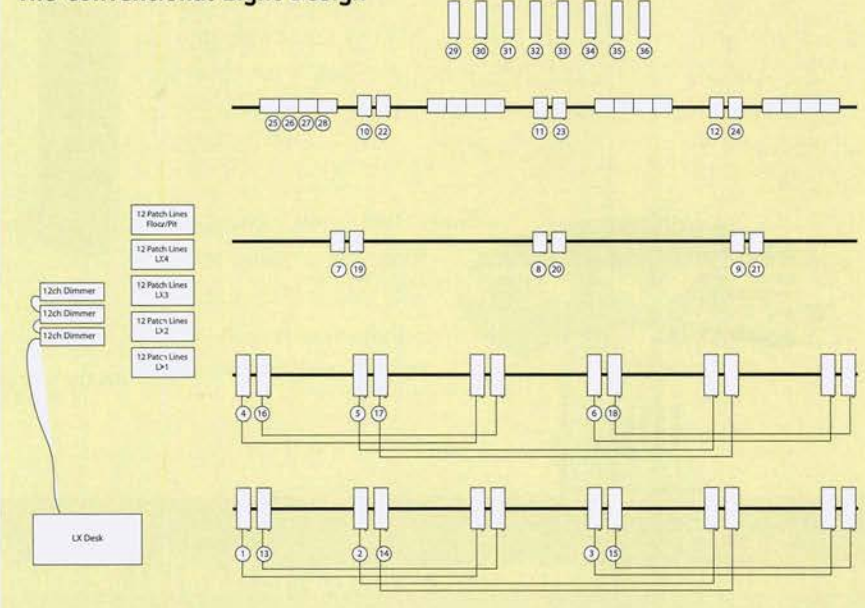
The moving light system allows a different kind of flexibility. While one or two of the units may be shifted to suit the requirements of a particular show, you would have to expect that, for the most part, the lights would not be moved very often at all. Good designing should result in most shows not really requiring additional specials like a conventional rig often does. Our intelligent rig also includes some DMX distribution, providing an isolated DMX signal to each bar.

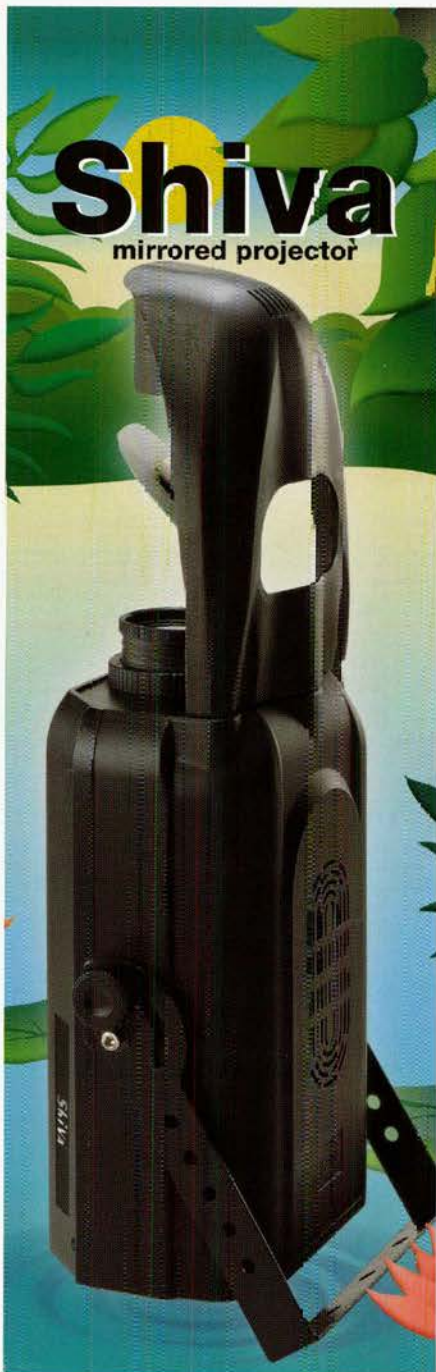
The first step in this cost analysis is to look at the differences in the capital costs for purchasing these systems. On the next page, you will see the figures we have come up with. As we are specifically focussing on the differences between the systems, you will see there are numerous items that would be common to both designs that have not been included in the pricing.

### The Intelligent Light Design



### The Conventional Light Design





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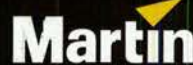
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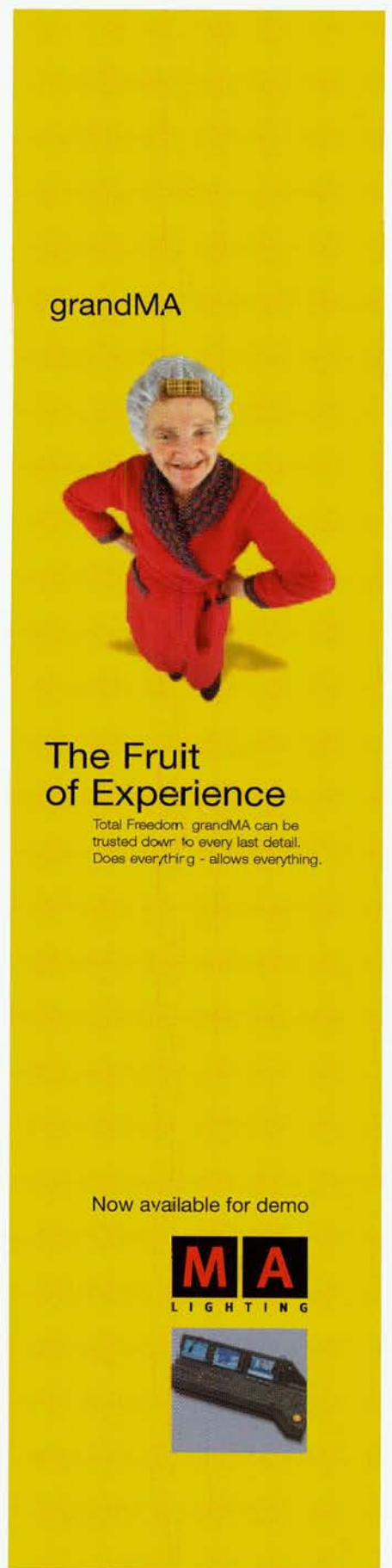
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## Venue Lighting

### MOVING LIGHT INSTALLATION

Capital Costs		Each	Total
18	Moving Lights	5000	90,000
4	Colour Changing Cyc light	5600	22,400
1	DMX Splitter	800	800
20	Extension Leads	20	400
3	12way Patch Bays (and install)	1000	3,000
1	12ch Distro	600	600
2	3 Phase Outlets	400	800
<b>Capital Equipment Cost</b>		<b>\$ 118,000</b>	

Running Costs (per show)	Weeks per show: 6	
Re-rig lights to suit design	2 people x 4hrs	160
Lighting Plot	Operator x 8hrs	160
Lamp Use	24hrs per week	609.84
<b>Moving Light Running Costs</b>		<b>\$ 929.84</b>

Running Costs (per year)		
Show seasons per year:	8	7,438.72
Test and tag 22 items every twelve months		44
Test and tag 20 items every six months		40
Clean and check 22 moving lights (labor)		146.67
Fixture Repairs - % of capital cost:	2	2,248
<b>Yearly Cost</b>		<b>\$ 9,917.39</b>

### CONVENTIONAL LIGHTING INSTALLATION

Capital Costs		Each	Total
32	Profiles	1000	32,000
12	Fres/PC	500	6,000
4	4way Cyc Lights	1800	7,200
60	Extension Leads	20	1,200
5	12way Patch Bays (and install)	1000	5,000
3	Dimmers	2500	7,500
4	3 Phase Outlets	400	1,600
<b>Capital Equipment Cost</b>		<b>\$ 60,500</b>	

Running Costs (per show)	Weeks per show: 6	
Re-rig lights to suit design	4 people x 8hrs	640
Lighting Focus	3 people x 8hrs	480
Lighting Plot	Operator x 4hrs	80
Lamp Use	8hrs per week	518.40
Other Consumables (gel/gobos etc)		250
<b>Conventional Light Running Costs</b>		<b>\$ 1,968.40</b>

Running Costs (per year)		
Show seasons per year:	8	15,747.20
Test and tag 120 items every six months		240
Clean and check 48 conventional lights (labor)		160
Fixture Repairs - % of capital cost:	1	452
<b>Yearly Cost</b>		<b>\$ 16,599.20</b>

By taking a look at the figures we have come up with, you can immediately see a massive difference of close to \$60,000 purely in the purchasing of the equipment.

The prices of the items listed are based on recommended retail pricing on devices we thought were suitable for the job. These items were certainly not the cheapest of the available options, and nor were they the most expensive. For the purposes of our calculations, we will use these figures, but it is worth noting that there is potentially quite a bit of flexibility here. Pricing between brands can vary dramatically, and the street prices of intelligent lights are often more 'negotiable' than their conventional counterparts.

Next, you need to look at what it costs to run each system. As a result, we have made several assumptions about how often the equipment will be used. Our numbers are based on the venue running eight performance season in a year. Each season runs eight shows a week, and runs for six weeks. Interestingly, the high cost of the lamps in moving lights is well balanced against their long life, making the lamp cost almost a moot point in this analysis, regardless of the system chosen. (the methods used for calculating these numbers are shown on the next page).

Also shown are maintenance figures, including the 'guesstimate' repairs figure, and the test and tag differences between the 'large' conventional system and the 'small' moving system.

Looking at these figures you can quickly see where the benefits of a moving light system can be shown - in the labour costs. Therefore, the more shows that are performed, the more justifiable a moving

light system becomes.

Once you have all of these numbers, you can then see how long it will take before the moving light system equals the cost of a conventional system. (See table on opposite page).

In our example, nine years after the initial purchase, the conventional system becomes more expensive. With some moving lights looking like they could last this long in a touring/hire environment, the fixed installation moving lights should have life well beyond this nine year mark.

## Pros and Cons to Consider

Because every installation and requirements for that installation will be different, there are numerous pros and cons that may help to make your decision one way or the other.

**System Maintenance** - a moving light system needs to be well managed. If keeping the venue reasonably 'dust free' is possible, then this could potentially remove future problems of faulty equipment. Before purchasing the equipment, you should also look at negotiating a system maintenance contract.

On the flip side to this problem is the extensive installation required for the conventional lighting system. This complex system will need ongoing maintenance after a couple of years of use. The 60ch patch system will need to be tested and tagged (usually every five years depending on state law), as will the dimmers.

**One person operation** - in the simplest sense, it is possible for a single person to look after the transitions between shows. These labour savings can be significant, and can become especially useful if a large number of

very short run, or one performance shows go into the venue. This can also cause other savings in purchasing and replacing height access equipment like harnesses. A good harness and fall arrest device could cost as much as around \$600, and needs to be replaced every five years. If you need one of these for every person in the air, then that is an important cost to consider.

**Fan Noise** - Conventional systems do not have any fan noise, and the smaller the venue the more likely this could become a problem. These days, moving light manufacturers have brought out silent versions of their stock, using basic air convection where possible to maintain operating temperatures. If this is a serious issue for you to consider, it may be worth identifying exactly what moving light would suit your purposes and re-calculating these figures for yourself.

**Storage** - a large conventional stock will occasionally mean the need to store lights when not in use or being serviced. While only a smaller consideration, equipment storage should be designed into the venue, and a smaller stock of equipment requiring this space could be good additional justification to the bean counters.

**Image** - a new moving light system makes your venue contemporary in the eyes of hirers. Plus, the moving light rig is MUCH BRIGHTER.

## Lamp Use

**Moving Lights** - The lamp use was calculated as each lamp running for 3hrs on every show, eight shows a week for six weeks (22x3x8x6=3168 lamp hours). We also added 3x 8hr days of running for the setup of the show (528hrs). With the average lamp cost being \$330 for a 2000hr lamp, the cost of the lamp life expended would be (3168+528)/2000 x \$330 = \$609.84

**Conventional Lights** - In this case, the lamp use was calculated as averaging 1hr per lamp for each of eight performances per week for six weeks (48x1x8x6=2304 lamp hours). This is because incandescent lamps are not 'on' all the

Total Cost of the System (Accumulative per year)		
Year	Moving Light	Conventional
1*	\$ 125,669	\$ 76,647
2	\$ 135,587	\$ 93,246
3	\$ 145,504	\$ 109,846
4	\$ 155,422	\$ 126,445
5	\$ 165,339	\$ 143,044
6	\$ 175,256	\$ 159,643
7	\$ 185,174	\$ 176,242
8	\$ 195,091	\$ 192,842
9	\$ 205,008	\$ 209,441
10	\$ 214,926	\$ 226,040

\*The first year does not include "Fixture Repair" figures as it is assumed that a warranty will apply.

time like the moving lights are. We also added 3x 2hr days for the setup of the show (288hrs). With the average cost of a lamp being \$60 for a 300hr lamp, the cost of the lamp life would be: (2304+288)/300 x \$60 = \$518.40.

So there you go!

## Download the Cost Analysis Spreadsheet

The excel spreadsheet Connections used to write this article is available for download so that you can adjust it to suit your own situation. Go to the following location to download the zipped file:

[www.conpub.com.au/info/cost\\_analysis.zip](http://www.conpub.com.au/info/cost_analysis.zip)

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By John Grimshaw

**MORE NEW DISPLAYS...**

**SHARP PLASMA**

Sharp Corporation are recent entrants to the Plasma market.

Two new sharp models are the PZ-50HV2 and PZ-43HV2. Both are capable of true native XGA display, and are around 3" deep. They have dual picture capability, and are able to display the Australian 1080I-interlaced signal standard. They come with detachable speakers and a stand. Interestingly, a separate, standalone Audio Video Computer system (AVC) houses all inputs and outputs.

Prices start from \$17,995 rrp for the 43" unit, and \$23,995 rrp for the 50".

- Sharp Corporation  
1300 135 530 [www.sharp.net.au](http://www.sharp.net.au)

**Projection PLUS**

After releasing perhaps the world's Smallest Data Projector the 900gram V series data projector, PLUS has announced the arrival of the PIANO HE-3100.



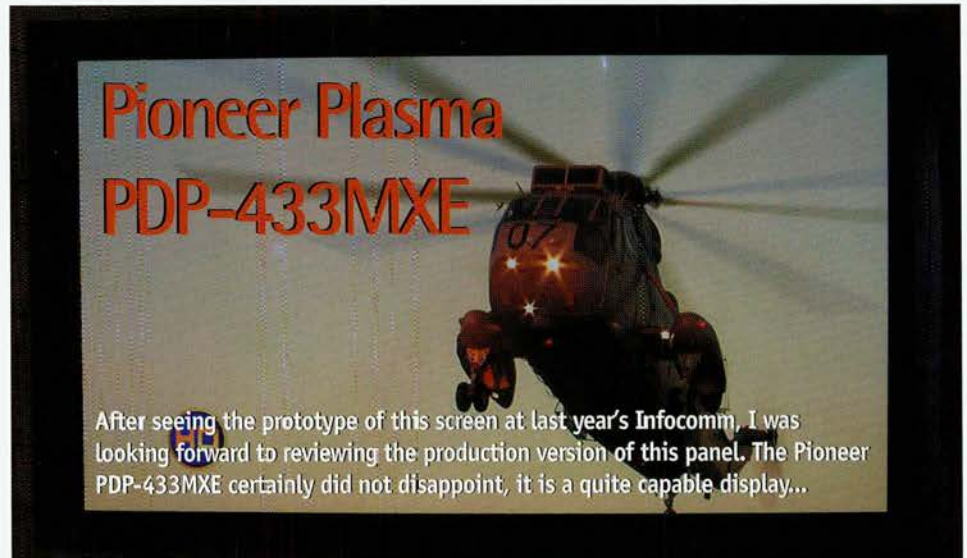
Measuring just 91x236x198 and weighing just 2 kg, the HE-3100 includes a "spec contrast" of 700:1 and 4x speed colour wheel technology with integrated frame doubler.

The new DLP Wide screen Component Set, features a native 848 x 480, and inputs include DVI-D, composite, S-Video and component inputs. The HE-3100 comes as a complete package that includes a compact and easy-to-use remote control, all required connector cables, and a soft carrying case and has an Australian RRP of A\$7,499.

- Amber Technology Australia  
1800 251 367 [www.ambertech.com.au](http://www.ambertech.com.au)

<b>Resolution:</b>	1024 x 768 pixels
<b>Active area (W/H):</b>	950x535 mm
<b>Viewable area:</b>	43"/1090mm (diag)
<b>Weight:</b>	31.5kg
<b>Dimensions:</b>	1070x630x98 (WxHxD)
<b>Vision Inputs:</b>	5 total - 2x RGB, 1x DVI, Video and S-Video
<b>Vision Outputs:</b>	loop out on composite video and 15pin RGB
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This review used • DisplayMate - software for display evaluation ([www.displaymate.com](http://www.displaymate.com)) and • DGTEC Set Top Box from Anderson Audiovisual +61 2 9586 3230 ([www.andersonsav.com.au](http://www.andersonsav.com.au))



The Pioneer PDP-433MXE is a 43" 1024x768 display, with the 15:9 aspect ratio achieved by slightly rectangular pixels (the 50" model uses square 1280x768 pixels - an industry 15:9 ratio).

Testing at the native resolution showed this plasma to be a quality device. Initial setup of the brightness and contrast led to the discovery of the built-in power saving features. There are two power saving modes which reduce the brightness of the image, while the standard setting gives the image a very clear and bright image. All testing was done with the display in this 'standard' setting.

As you would expect from any plasma, the colour saturation was very good. In this display, the contrast is certainly improved over Pioneer's previous model, with blacks looking very dark indeed. Subsequent testing of the grey scales showed that the darker greys were also very well displayed. Typical plasmas often use dithering effects to create some very dark grey shades - each to varying degrees of success (last month's look at the large Fujitsu panel showed this effect to be one of that panel's problems).

However, the Pioneer model handles this very well - and this was particularly obvious in the 256 grey scale ramps. There was almost no striations in the ramp - an excellent image! This ability was further born out in moving image testing, where very little of the effect I call 'image stain' occurs - where you see defined edges on graduated colours.

Another feature of all Plasmas is the effect on the image when a mostly white image is displayed - the screen dims. This is partly deliberate (to extend the life of the panel), and partly a result of the fact that an all white image causes a voltage drop to the circuits driving the pixels - thus a less bright image across the whole surface.

Some panels I have reviewed and seen in the past do not cope very well with sudden changes in average brightness levels, and the viewer can actually become aware that the image is not as bright as it should be. The Pioneer must have some tricky circuitry in this area, as this effect is significantly reduced. While the brightness dampening still occurs, it happens at a level that is not really noticeable by the viewer (this effect can be easily tested by flashing half of the screen to full white, while actually

watching a small white box on the other side of the image)

Resolution and pixel accuracy test results were as expected - quite precise at native resolutions and reasonably well estimated at non-native resolutions. The panel displays computer images quite well, and could not be faulted in moving image testing (HDTV, component DVD and composite broadcast).

On the composite video front, I was surprised to see that it did not have an automatic aspect adjustment option (great for consumers who do not want to reach for the remote every time the image goes from full screen to letterbox), but its 'wide' mode for displaying 4:3 aspect images in 16:9 is intelligently created (and not just stretched) for a quite satisfying result.

With hardware, this panel makes some interesting choices, making life for the installer much easier. The display comes standard with pedestal feet to free-stand the unit. Also there are 16x M8 threaded holes on the back, with the instructions saying that at least four must be used for wall mounting. There is an optional wall bracket that can be purchased, but I would expect most installers would use the threaded holes and their own bracket to mount the unit. All of the vision and power connections are located along the lower inside edge of the unit, and can be reasonably easily re-plugged when fitted on a wall (I discovered this the hard way). There are no front facing buttons, and one tiny unobtrusive LED, making the unit ideal for retail/trade show displays. All control buttons are located flush to the surface on the right hand side, and (obviously) all functions can be remote controlled.

The consumer version of this display replaces the DVI input with an RF input and includes an analogue TV tuner (it costs \$1000 more!)

All in all, it is not hard to recommend this device - and it should be well placed to take on the top brands in the install market. Really, the only gripe I can come up with is that it would have been good if it was a true 16:9 native resolution like its 50" brother. Its features, coupled with this very low price will certainly make this display a viable option for installers.



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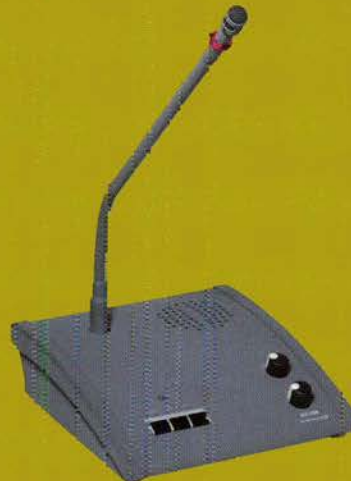


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**Altinex DA1920SX/DA1921SX/MT103-115/MT103-116;** Mix and match transmitters and receivers to send VGA-UXGA over CAT-5; Transmitters - VGA (up to 120 m) thru UXGA (up to 75 m); receivers - CAT-5; equalization on all CAT-5 outputs and inputs; Plug&Play on 15-pin HD input; \$935 ea

**Altinex MultiTasker (Multiple; read on...);** 8- and 19-slot card cage signal management solution; Cards for composite, Y/C, Y/Pb/Pr, RGBHV/15-pin HD, CAT-5, DVI & audio; Completely modular, flexible, expandable system; single point of control; Pricing varies

**Altinex Table Buddy and DA2000TM (TBL100 + DA2000TM);** highly modular/removable tabletop connectivity with tiny active line driver; VGA-UXGA video and stereo audio; composite with DA3000; Variety of input plates available with TBL100; DA2000 can be used alone; \$1,947

**Autopatch Cat 5 System;** Transmission of Composite or Y/C Video and Stereo Audio on Cat 5 cable; Video on BNC or Mini Din, Audio on RCA or Terminal Block; Transmission distance of over 300 metres; 825/Pair

**Command Systems RLMU-TX (ZVR0019);** Sends video, audio & data over 1km+ UTP cable -no loss quality; Composite Video, Audio and return data; Active drivers, 2 input mic/ line mixer with AGC; \$396

**Command Systems RLMU-RX (ZVR0009);** Receives video, audio & data over 1km+ UTP cable -no loss quality; Composite Video, Audio and return data; Active receivers with adaptive equalisation; \$396

**Command Systems LTMU-RX & LTMU-TX (ZVLO201 & ZVLO204);** 8 Channel versions of above. Can mix & match; Composite Video, Audio and return data; Can be used standalone or with Video Commander routers; 880 & 1320

**Command Systems Smart RLMU (ZVR0020);** As above with programmable controller for AV devices(projector dvd etc); Composite Video, Audio & return data; Ideal for the smart classroom- complete control of lights,AV etc; \$797

**Extron avda 6 mx;** distribution of video and audio up to 45 metres; composite video and balanced or unbalanced audio; metal enclosure, rack mountable, internal power; \$2,101

**Extron TP T BNC DA 4;** RGBHV or Video distribution via Twisted Pair cable; single input on BNC Connectors to Twisted pair cable 4 outputs; 4 receivers needed at other end of signal; \$2,189

**Extron Versatools;** Each model is designed for the distribution of a single input to multiple outputs; Dist Amplifiers for composite video, S-video, SDI, and/or audio; Quarter Rack Width, External Power, Various combinations; \$1,163.80

**Folsom Research Presentation Master;** Seamless cut, fade, dissolve, wipe of multiple A/V sources, pre/main o/p; 8 universal video, s-video, component, computer, HDTV and stereo audio; Independently programmable inputs with main and preview; \$24,502.50

**Folsom Research PresentationPro;** Seamless cut, fade, dissolve, wipe of multiple A/V sources and image store; 7 universal video, s-video, component, computer, HDTV and stereo audio; Independently programmable inputs with non-volatile logo store; \$13,172.50

**Folsom Research Smart VIEW;** Converts data to broadcast video with pan and zoom; Video and Data up to 1600x1280; Camera like pan and zoom; from \$10,890

**Folsom Research ViewMAX;** Converts data to broadcast video with pan, zoom and key/mix; Video and Data up to 1600x1280; Camera like pan and zoom with key/chroma; from \$14,795

**Inline DAG152-1;** 1 in 2 out RGBHV Distribution Amplifier; RGBHV on 5 x BNC connectors; With internal power supply, designed for staging and permanent applications; \$1,095

**Inline DAT101-1;** DFP/DVI Line Driver; DFP/DVI Digital Signal on DFP (Digital Flat Panel) connector; Compact enclosure with external power supply, can be daisy chained; \$985

**Inline DAV101;** Compact VGA Line driver with USB power option and adjustable peaking; VGA input on Male 15Pin HD VGA connector; Compact design for use with notebook computers and portable data projectors; \$522.50

**Inline DAV101CM;** Wall Mount VGA Line Driver; VGA input on Female 15Pin HD VGA connector; Designed for wall mounting in permanent installations; \$544

**Kramer SD-7816;** 1:16 Digital Audio Distribution Amplifier; BNC and Terminal Block Connector models available; Can also operate as 2 x 1:8 Distribution Amplifiers; \$2,750

**Kramer VM-10YCxI;** 1:10 Composite and YC Distribution Amplifier; Composite on BNC, Y/C on Mini Din, Audio on RCA; Distributes Y/C and Composite signals and features internal transcoding; \$1,595

**Kramer VM-54;** 1:54 Video Dist Amplifier; Composite on BNC connectors; Can be used as 3 x 1:18 DAs; \$2,475

**Kramer VP-12xI;** 1:12 VGA Distribution Amplifier; Female VGA connectors; Single Rack Mount Enclosure; \$1,650

**Altinex Homerun Series (Several);** from 8x8 to 16x16 video & audio switching; Video - BNC connectors, 200MHz Broadcast, 300MHz-Computer video; GLI ground loop protection; Sync Delay or VIS; Bal./unbal. audio; \$3630 to \$32890

**Altinex MAX Series (Several);** from 4x2 to 8x4 Broadcast & computer video and audio matrix switchers; Broadcast video: 100 MHz; Computer Video: 400 Mhz; Term. Blocks for audio; 2 RS-232 ports; IR control option; audio break-away; VIS for broadcast; \$5511 to \$8041

Point to Point Video Distribution and Distribution Amplifiers

This month's vision report looks at the devices used to get vision from one point to the next...

There are three categories for the report - Point to Point Video Distribution and Distribution Amplifiers, Matrix Type Distribution or Switching Systems, and Devices for Live Vision Switching of high resolution (computer) images.

We have deliberately not included the video broadcast or editing areas, because the intention is to look at Visual Technology (formerly "AV") contracting and installation.

There are a great deal of products out there, so use this Market report as a guide to where you might find the video distribution solution you need.

Inline DAT101-1



Altinex VGAToUXGA over Cat5



Autopatch Cat 5 System



Matrix & Switching

Altinex MAX Series



BRAND	Distributor	Phone	Web	P2P	Mix
Altinex	Axis Audio Visual	+61 3 9761 2688	www.axisav.com.au	50+	50+
Analog Way	Axis Audio Visual	+61 3 9761 2688	www.axisav.com.au		4
Autopatch	AV Technology	+61 7 5531 3103	www.avtechnology.com.au	8	14+
Command Systems	Command Systems	1300 132 667	www.commandsys.com.au	5	3
Extron	RGB Integration Pty Ltd	+61 8 8299 0799	www.rgbintegration.com	15+	40+
Folsom Research	Technical Direction Company	+61 2 9698 5588	www.tdc.com.au	4	6
Inline	AV Technology	+61 7 5531 3103	www.avtechnology.com.au	25	35
Kramer	AV Technology	+61 7 5531 3103	www.avtechnology.com.au	50+	30+

Autopatch Epica



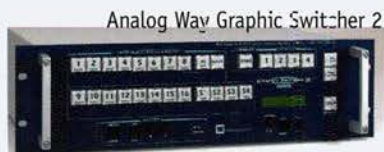
Autopatch Precis



Inline MSC0603



Kramer VS-1616A



Analog Way Graphic Switcher 2

All distributors were invited to give us some additional information about their products or services. Here is what they had to say:

A leading manufacturer of signal management solutions, **ALTINEX** offers a complete line of computer video interfaces, distribution amplifiers, switchers, matrix switchers, special application products, cables and related accessories. New products for 2002 include modular versions of their tabletop connectivity solutions (Table Buddy, modular Pop N Plug & Cable Nook), the highly versatile V-Matrix, CAT-5 solutions, and the tiny DA2000TM and DA3000TM line drivers. Also introduced this year are 44 new audio, video and control cards for the MultiTasker card cage signal management system, as well as a new 8-slot card cage, and several new front panels with various control options.

**Analog Way's** range of seamless switchers is fast becoming one of the preferred vision tools for staging companies. They introduced the concept of seamless switching back in 1997 with the use of several of their off the shelf products, but started to manufacture a standalone product in 1999 with the introduction of the first Smart Cut. Since then several more seamless switchers have been added including the leading Graphic Switcher 2. Taking live vision mixing to an entire new level, the GSW2 now has the ability to provide edge blending which allows flawless wide screen presentations of up to 3 projectors making for a very unique visual display. This creative use of projection is proving very popular in the USA and Europe.

**Folsom Research** products are constantly under development. The New Blend Pro for blending multiple images across up to 16 screens. See [www.folsom.com](http://www.folsom.com) - All switchers soon to be upgraded to 6 screen outputs

**Model; Primary Function; Signal Input; Special Features; Price**

Matrix type Distribution or Switching Systems

<b>Altinex MT Matrix Switchers (MT105-, MT110-series);</b> Cards to perform 8x8 and 16x8 matrix switching; Composite, Y/C, HDTV, RGBHV, 15-pin HD, balanced or unbalanced audio; Up to 350 MHz (425 MHz upon request); very competitively priced...; <i>Pricing varies</i>
<b>Altinex V-Matrix ((Modular; components ordered seperately));</b> from 8x8 to 128x128 video and audio switching; Composite, S-Video (Y/C), HDTV, RGBHV, balanced or unbalanced audio; versatile, modular mission-critical matrix: strip & re-build in-rack; <i>Pricing varies</i>
<b>Autopatch 1YDM/16;</b> Modular Matrix Switching System for Video, Audio and Control Signals; BNC for Video, Terminal Block for Audio; RS-232 Control, modular design for flexibility, expandable; <i>From \$3,500</i>
<b>Autopatch Epica;</b> From 16x16 to 256x256 in Video and/or Audio; Video on BNC, Audio on Terminal Block; RS 232 Control, for large scale video reticulation systems; <i>POA</i>
<b>Autopatch Modula;</b> Up to 32x32 also 4x60 and 60x4 skewed matrix configurations; RGBHV on BNC, Stereo Audio on Phoenix Connectors; RS 232 Control, Cat 5 In/Out Boards for use with Cat 5 TX/RX Boxes; <i>From \$12,000</i>
<b>Autopatch Precis;</b> 8x4 and 12x8 Video and Audio Matrix Switchers; Video on BNC, Audio on Terminal Block; RS 232 Control Digital Volume Control Option; <i>From \$4,000</i>
<b>Command Systems Modular Switcher ZTR0100;</b> A simple switcher/router you can build to your exact requirements; Video, audio, VGA (RGBHV to 350MHz); Simple-3 parts- input card, output card, cardframe; <i>\$610.50</i>
<b>Command Systems Video Commander MCU3 (ZVS0301);</b> AV router with universal source device control; Video / audio and control data with optional intercom; Expands to over 2000x16,000. Windows software. Uses any cable; <i>\$1,707</i>
<b>Command Systems Video Commander MCU4 (ZVS0102);</b> As above with source selection from destination; <i>\$1,920</i>
<b>Extron CrossPoint;</b> RGBHV and Audio Matrix Switcher; RGBHV sizes from 4x2 to 16x16 200MHz bandwidth, buffered inputs and outputs; audio gain attenuation, audio follow or breakaway; <i>from 6204</i>
<b>Extron Digital CrossPoint;</b> Serial digital video Matrix switcher; 8x8 and 4x4 with equalised buffered loop-throughs; automatic rate selection, rs 232/422 control, 1 RU width, internal power; <i>from 4851</i>
<b>Extron ISM;</b> RGBHV Scaling Matrix switcher with audio; RGBHV (will accept to composite) and scale each output independently; ISM 182 has 17 res, ISM 482 has 32 Res. Including Plasma. 5 test patterns
<b>Extron MAV;</b> Matrix switcher; S-video, composite, HDTV/Component, audio in sizes from 6x2 to 16x16; 150MHz bandwidth, balanced and unbalanced audio, rs 232 control; <i>from 7909</i>
<b>Folsom Research ScreenPro Plus 1202;</b> Programmable seamless transitions of multiple sources, pre/main matrix out; 12 universal inputs with 2 matrix pre/main outputs; Fully programmable with PIP and keying functions; <i>\$90,706</i>
<b>Folsom Research ScreenPro Plus 1203;</b> 12 universal inputs with 3 matrix pre/main outputs; Fully programmable with PIP and keying functions; <i>\$108,262</i>
<b>Folsom Research ScreenPro Plus 1602;</b> 16 universal inputs with 2 matrix pre/main outputs; Fully programmable with PIP and keying functions; <i>\$105,380</i>
<b>Folsom Research ScreenPro Plus 1603;</b> 16 universal inputs with 2 matrix pre/main outputs; Fully programmable with PIP and keying functions; <i>\$122,980</i>
<b>Inline MSC0603;</b> 6x3 Composite or S-Video Matrix Switcher with Balanced Stereo Audio; Composite Video and S-Video (Y/C) on BNC; RS 232 controllable for switching, audio volume and video / audio breakaway; <i>\$2,395</i>
<b>Inline MSG Series;</b> 8x4 and 8x8 RGBHV Stereo Audio Matrix Switchers; RGBHV on BNC, Stereo Audio on Phoenix Connectors; Available in 225 MHz and 475MHz models, RS232/422/485 control; <i>TBA</i>
<b>Inline MSV0502;</b> 5x2 VGA Matrix Switcher with Balanced Stereo Audio; VGA Signals on Female Connectors, Audio on Phoenix Connectors; RS 232 controllable for switching, audio volume and video / audio breakaway; <i>\$3,385</i>
<b>Inline MSX Series;</b> 16x16 and 32x16 Matrix Sizes for Composite, S-Video, YUV, RGB and RGBHV; Video Signals on BNC Audio on Phoenix Connectors; RS232/422/485 controllable, switching and volume control; <i>From \$8,000</i>
<b>Kramer SD-7388;</b> 8x8 SDI Matrix Switcher; SDI on BNC connectors, reclocking outputs; RS 232 Control; <i>\$4,345</i>
<b>Kramer VP-4x4;</b> 4x4 VGA Matrix with Stereo Balanced Audio; VGA Signals on Female Connectors, Audio on Phoenix Connectors; RS 232 controllable for switching and video / audio breakaway; <i>\$2,175</i>
<b>Kramer VS-1616A;</b> 16x16 Balanced Stereo Audio Matrix; Stereo Balanced Audio on Phoenix Connectors; RS 232 Control, supplied with PC Control Software; <i>\$3,245</i>
<b>Kramer VS-808xl;</b> 8x8 Composite Video and Stereo Audio Matrix; Composite Video on BNC audio on RCA; RS 232 controllable for switching video / audio breakaway; <i>\$2,800</i>
<b>Analog Way Graphic Switcher 1 (GSW611R);</b> RGB vision mixer with user selectable output rates; Up to 6 Inputs/VGA (640x480 to 1600x1280); Cross fades, title and freeze control; <i>\$28,875</i>
<b>Analog Way Graphic Switcher 2 (GSW2811R);</b> RGB vision mixer with user selectable output rates; Up to 16 Inputs. SDI, composite & component video, Y/C, VGA up to 1600x1280; Transition effects, PIP with fading, Optional edge blending for widescreen; <i>\$40,150</i>
<b>Analog Way Smart Cut 2 (S-Cut2);</b> Seamless Switcher; 2 composite, 2 Y/C, 2 PC and 1 component input; User selectable cut times, audio (balanced/unbalanced) with breakaway; <i>\$7,502</i>
<b>Analog Way Smart Fade (SMF251);</b> Seamless switching with RGB cross fade ability; 2 composite, 2 Y/C, 2 PC and 1 component input; Title function for text overlay, user selectable fade/cut times; <i>\$10,978</i>
<b>Extron DVS 406;</b> Video Scaler with Seamless switching, key capability, variable dissolve; RGBHV down to composite video, SDI & audio. Output on BNC or 15HD Female; 33 different output rates, Vertical blanking, rs 232 control; <i>\$10,098</i>
<b>Extron SGS 408;</b> Seamless RGBHV & component video graphic switcher; 8 input to program or preview on bnc or 15HD, test pattern, key capability; 12 dissolve, wipe and title effects, adjustable settings up to 5 sec; <i>\$46,211</i>
<b>Folsom Research ScreenPro;</b> Seamless cut, fade, dissolve, wipe of multiple sources, pre/main o/p; 8 universal inputs with pre/main outputs, plus 13 programmable effects; Preview and main outputs, PIP and Key with remote controller; <i>from \$35,475</i>
<b>Folsom Research ScreenPro Plus;</b> Programmable seamless transitions of multiple sources, pre/main matrix o/p; Multiple universal inputs with matrix pre/main outputs; Matrix preview and main outputs, PIP and Key with remote controller; <i>from \$73,150</i>

Devices for Live Vision Switching



**S**ome people responsible for lighting and audio equipment in the workplace have no idea that there are stringent requirements for testing and tagging these devices. Other people know that their venues are not entirely compliant with requirements for testing and tagging electrical equipment. Further people think that the issues of testing and tagging equipment have been dealt with by their company, and they are compliant with state requirements and national standards.

All of these people could be in for some brutal and expensive surprises if they ever have an accident. For example, there is no coordination

between state governments to have the same rules apply to all equipment users across the country - so beware the touring show?

Also, the Queensland rules, where there is a simple system of Class 2 devices requiring an tag not less than six months old, are not the same as the national safety guidelines written by the MEAA/AEMA - and endorsed by all of the state workers' compensation authority.

Another example, the standard adopted by the film and television segment of the entertainment industry specifically cannot be applied to theatres and concerts. (See next page, left)

by John Grimshaw

*Are you  
breaking  
the law?*

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## Film and Television

Did you know that the special Film and Television electrical standard specifically states that: "This Standard indicates the minimum safety requirements for temporary electrical installations which supply electricity to appliances and equipment on film, video and television sites and for the in-service testing of portable and transportable equipment used on these installations. This Standard does not apply to electrical installations on theatre stages, concert locations and permanent television studios, except for additional equipment supplied through a temporary distribution system for film and television work."

## Tagging Stories

• Connections is not sure if this story is true, but even if not it is an interesting tale...

A crew is working on a large gig that involved numerous hire companies. Because of the nature of the job, the crew from all companies would work on one part of the site (regardless of the originating hire company) if another part could not be used for some reason. However, the one crew refused to rig untagged equipment as a direct result of their OH&S training. They said they cannot rig that equipment.

- Many venues have long refused to allow hired equipment on the premises without an up-to-date tag.
- Hire companies should not hire any piece of

And ANOTHER example - managers of the venue being built points to the wiring rule book about lighting and RCD protection to buy cheaper, non-protected dimmers for the installation, but again the previously mentioned national safety guidelines tell a different story.

Who is at fault? Which system will be applied in the coronial enquiry or the damages lawsuit? Which system does your public liability insurer want you to follow? It would seem that the question of testing and tagging is fast becoming part of the insurance paper trail, which will complicate matters further.

Undoubtedly, protecting workers and the public against electrical shock is an obvious and important component of the technicians' work. Testing and tagging of electrical equipment and leads in the workplace is the means by which the government can ensure this safety is maintained.

In construction (which is the main source of the electrical safety protection legislation), the typical electrical situation is a few powered tools, temporary power supplies, and large scale (unpowered) electrical wiring being installed. Extremely little of what they have to do requires the handling of live cabling and equipment. In fact, where possible it is designed to avoid it. It is a dangerous environment with large potential for serious injury from numerous situations. Thus the extremely draconian level of testing and tagging is essential to ensure that the limited amounts of hired and any hand-held equipment is as safe as can be expected in that rough environment.

The work involved in a large event bump-in is not dissimilar to the construction environment - with a couple of significant differences:

- *An extremely high number of portable electrical devices (lights etc) are used, with nearly all of them having to be manipulated while live during the installation.*
- *The theatrical construction period is extremely short, and MUST be contained within specified deadlines.*
- *The theatrical construction may have to be repeated in different venues, in different states.*
- *The working environment is typically not a rough as conventional construction.*

To further complicate matters, governments has put the onus of 'safe work practices' back on the employers, mostly leaving them to decide what is safe, and prosecuting when it is not.

Thus it is not surprising that some in the industry are questioning what is an appropriate

testing regime for different items of the equipment we use.

Non-specific legislation, conflicting guidelines and different standards makes it an impossible task to be absolutely sure that you are doing the 'right' thing. So, with no clear list of rules to follow, the testing and tagging issues become matters of interpretation for each company.

Sure, the relevant worker's compensation authority will drop in and issue you with infringement notes and/or fines if you are doing something wrong. However, for the most part it would not be until someone is (or nearly) killed or injured before your risk analysis is really

checked - and by then it is far too late.

In the hire world, these issues are being directly addressed by the smarter companies. Comprehensive testing regimes are being (or have been) introduced, usually in conjunction with a thorough 'risk analysis' of how their business operates. Full OH&S procedures and being introduced, including staff training,

workplace inductions for bump-ins and ensuring all employees are conforming to the new rules. It is not an unrealistic prediction that if a company is not working towards implementing all of this now, they probably will not be here in five years time.

So, we are stuck in a situation where some individual companies have to look at investing hundreds of thousands of dollars every year in salary time and professional consultants to develop and maintain their own company guidelines.

This is not just to get an advantage over their competitors, but to actually continue trading. As one hirer (who declined to be named) puts it, "That is a lot of Par 56 hires". The result will certainly be that each company will do things slightly differently. That means that for a technician on the ground, working for multiple companies will mean duplication in forced training - yet another cost for the hire/venue companies in lost working time.

Venues seem to be much slower on the implementation of a test and tag system than the hire companies. School and community venues are even worse off.

At least the venues only have to deal with one state regulatory body, but today some casual workers are becoming smarter about their personal liabilities. There are already cases of technicians refusing to work with incorrectly tagged equipment, and venues will soon be forced into either eliminating their inventories

<h1 style="margin: 0;">CAUTION</h1> <p style="font-size: small; margin: 0;">ENSURE TEST IS CURRENT BEFORE OPERATING IF APPLIANCE IS DEFECTIVE IN ANY WAY PLEASE INFORM YOUR SAFETY OFFICER</p>	
INSPECTION No.	TESTING Co. NAME
CERT./LIC. No.	PLANT No. /ITEM
TEST DATE / /	TEST DUE / /

in favour of hiring only, or implementing a testing regime which today involves serious time and research.

From what Connections has been able to gather from various sources, here is an overview of what type of testing and tagging regimes have been implemented in New South Wales and Victoria:

**Venue based equipment**

- Fixed and non-moveable installed equipment - every five years.
- Control room and any other equipment that is not generally moved (including control desks) - every year.
- All other in-house equipment that is rigged when required - every six months.
- All electrical leads - every six months.

**Hire Equipment**

On hire, every electrical item must have been tagged within the last three or six months (some companies use the three month limit, but most currently use the six month one). The expiry date of the tag should not be reached within the duration of the hire.

There are some special considerations that can alter the tagging frequency for hired equipment:

- If the hired item is being permanently installed for duration of a long running show, it will not require re-tagging for one year.
- If an item was permanently installed for duration of a long running show, and for any reason the item is removed after the three/six month point, it must be retagged before reuse.
- If the item is to be re-used in numerous

venues or: a tour lasting longer than three/six months, then the item must be re-tagged during the tour and before the expiry of three/six month point.

Any item should be re-tagged after repair and before it is used. Typically, single phase can be tested by anyone that has completed an appropriate course for that state (NSW TAFE offer a half day course), and uses the specified test equipment. Three phase items like dimmers and distribution boards can ONLY be tested and tagged by a licensed electrician.

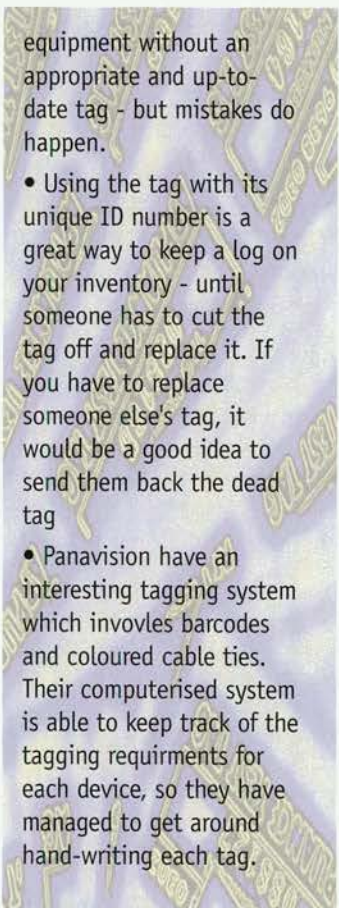
**Short Term Options**

What do you do if you are in charge of a venue that needs a great deal of tagging to be done?

There are two alternatives, you or one of your tech staff can get the testing and tagging license. Then you can buy or hire the test device and start a regular, controlled tagging program. Alternatively, you could contact a crewing company and get them to supply the staff and equipment for a mass re-tagging exercise as required. If you did this, you would be well advised to start some kind of inventory management program so that you can schedule and plan each subsequent mass re-tagging.

**Long Term Options**

That is up to the industry, and what they are prepared to do. If some of the larger companies see that this expense is big and only likely to get bigger, then they may drive the industry into drafting and proposing a national standard. Connections has already seen forecasts of \$250,000 in salary time at one place JUST for testing and tagging, and this 'percentage of overall expenses' is simply not a tenable situation.



equipment without an appropriate and up-to-date tag - but mistakes do happen.

- Using the tag with its unique ID number is a great way to keep a log on your inventory - until someone has to cut the tag off and replace it. If you have to replace someone else's tag, it would be a good idea to send them back the dead tag
- Panavision have an interesting tagging system which involves barcodes and coloured cable ties. Their computerised system is able to keep track of the tagging requirements for each device, so they have managed to get around hand-writing each tag.

**Connections will keep an eye on the issue as it continues to develop, and we certainly welcome any comments you have to share.**  
[mail@conpub.com.au](mailto:mail@conpub.com.au)



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NSW - 4/1-15 Rosebery Avenue Rosebery 2018 Tel: 02 8344 3800 Fax: 02 8344 3801

This report is one of the most complex we have yet done. Encompassing ALL wireless audio product, we have divided the report into three sections - Wireless Mics, Wireless In Ear Monitors and Other Wireless Products and Accessories.

The wireless mic section is the most complex, and it will pay to understand the formula we have applied to the information. After the Brand and model information in **bold** comes the frequency info, of which there are three key pieces of information - the number of channels the unit is capable of selecting, the frequency range, and whether the system is agile (can select most frequencies in the range) or fixed (frequencies predetermined by manufacturer). Next comes info about the receiver and using receivers as a system. Then, there is BPT (Belt pack transmitter) and finally HH (Hand held transmitter) information and their respective prices.

The IEM section should be much easier to follow (and it helps that there are not many options in the marketplace today). Finally, even those not really looking to replace their existing systems should take a look at the accessories section, with numerous do-dads like sweat proof PVC pouches (Loud and Clear) being shown for the first time in Connections.

## Wireless Microphone Systems

**Mic System - Frequency Information, RX (receiver):** Single, Systems (other info), **BPT (belt pack transmitter):** Features (Batt), Mic **Price**, **HH (Hand Held):** Features (Batt) , Capsule options **Price**

**AKG WMS300 (Models: HT, PT)** Ch: 16, Band (MHz): 800-820, Freq Steps:Fixed RX: Antenna diversity receiver, detachable antennas; Systems: Up to 8 systems simultaneously (1RU, half rack width) BPT: On/Off and Mute Switches, Metal Body (2x AA), Mic: AKG MicroMic Range From \$1999 HH: On/Off and Mute Switches (3x AA) , Mic: Changeable heads D880, D3700, D3800, C5900, C537 From \$2,018

**AKG WMS40 (Models: HT, PT, GB, SO, MP)** Ch: 1, Band (MHz): 802.525 and 812.800 , Freq Steps:Fixed RX: Single channel receiver; Systems: 2 systems only (1RU, half rack width) BPT: Microtools, Guitar Bug, Snap-On, Micro Pen (2x AA), Mic: AKG MicroMic Range From \$549 HH: External On/Off Switch (2x AA) , Mic: AKG D880 capsule \$599

**AKG WMS80 (Models: HT, PT)** Ch: 15, Band (MHz): 813.100-815 , Freq Steps:Fixed RX: Antenna diversity receiver; Systems: Up to 8 systems simultaneously (1RU, half rack width), BPT: On/Off and Mute Switches (2x AA), Mic: AKG MicroMic Range, From \$949 HH: On/Off and Mute Switches (2x AA) , Mic: Changeable heads D880, D3700, D3800, C5900, C535 From \$998

**AKG WMS81 (Models: HT, PT)** Ch: 15, Band (MHz): 813.100-815 , Freq Steps:Fixed RX: Antenna diversity receiver, detachable antennas; Systems: Up to 8 systems simultaneously (1RU, half rack width) BPT: On/Off and Mute Switches (2x AA), Mic: AKG MicroMic Range From \$1349 HH: On/Off and Mute Switches (2x AA) , Mic: Changeable heads D3700, D3800, C5900, C535 From \$1,398

**Audio LTD HX2000 & DX2020** Ch: 32, Band (MHz): 470-1000 , Freq Steps:Fixed BPT: Hard anodised & anoprinted case (DL123A lithium), Mic: Schoeps Collette range HH: Transmitter housing as slim as the capsule (DL123A lithium) , Mic: Schoeps Collette range \$11,068

**Audio LTD HXIR & CXIR** Ch: 32, Band (MHz): 470-1000 , Freq Steps:Fixed BPT: Designed for latest digital cameras (AA), Mic: Schoeps Collette range \$8,920 HH: Settings accessible via infra red R/C (like CxIR) (AA), Mic: Schoeps Collette range

**Audio LTD TX Blue & CXIR RX** Ch: 32, Band (MHz): 470-1000 , Freq Steps:Fixed RX: Free use adaptor or camcorder interface; Systems: (Smallest true diversity receiver in world) BPT: CXIR eliminates mechanical switching (9v for TX, external for RX), Mic: Camera link or Sanken, Voice Technologies, Tram \$7,600

**Audio LTD TX2020 & DX2020** Ch: 32, Band (MHz): 470-1000 , Freq Steps:Fixed BPT: Robust aluminium extruded case (9v), Mic: Sanken, Voice Technologies, Tram, PSC, Sony \$9,839

**Audio Technica 1400 Series (Models: ATW-1451 Unipak)** Ch: 1, Band (MHz): Available in 6 freqs, Freq Steps:Fixed, RX: Full diversity, dual independent receivers; Systems: (95db signal to noise) BPT: "unipak" connectors (9v), Mic: Over 12 specialist application mic options \$795

**Audio Technica 1400 Series (Models: ATW1452 HandHeld)** Ch: 1, Band (MHz): Available in 6 frequencies , Freq Steps:Fixed \$895 HH: ATW-T52 hand held mic (9v) , Mic:

**Audio Technica U100 Series (Models: ATW-T102)** Ch: 100, Band (MHz): 728.125-740.5 , Freq Steps:Agile \$1,195 HH: Standard 3 Pin XLR converts any mic to wireless (9v) , Mic:

**Audio Technica U100 Series (Models: ATW-U101)** Ch: 100, Band (MHz): 728.125-740.5 , Freq Steps:Agile RX: Full diversity, dual independent receivers; Systems: (107db signal to noise) BPT: 5-pin input. Mic input or Hi-Z line ins. (9v), Mic: Industry standard mic connections \$1,995

**Beyerdynamic OPUS (Models: 100U)** Ch: 1, Band (MHz): 799.475-806.750 , Freq Steps:Fixed RX: Squelch, Volume, XLR out; Systems: N/A (Half rack) BPT: Compact, mute, on/off, volume (1x 9v), Mic: MCE50, OPUS54, 64 \$1,199 HH: Lightweight, mute, on/off (AAA x2) , Mic: OPUS 59, 69, 81 \$999

**Beyerdynamic OPUS (Models: 200U)** Ch: 16, Band (MHz): 799.475-806.750 , Freq Steps:Fixed RX: 16 Ch, Squelch, Vol, XLR out; Systems: N/A (Half rack) BPT: Compact, mute, on/off, volume (9v), Mic: MCE50, OPUS54, 64 \$1,499 HH: PLL Synth Pilottone (9v) , Mic: OPUS 59, 69, 81 \$1,499

**Beyerdynamic OPUS (Models: 500U)** Ch: 16, Band (MHz): 798-814 , Freq Steps:Fixed RX: 16 Ch, LCD display, Vol, XLR out; Systems: N/A (Half rack) BPT: Compact, mute, on/off, volume (1x 9v), Mic: MCE50, OPUS54, 64 \$2,499 HH: PLL Synth, muteless design (9v x 1) , Mic: OPUS 69, 81 \$2,399

**Chiayo DR800 Series (Models: DR809)** Ch: 1, Band (MHz): 750-900, Freq Steps:16x Fixed RX: 1x Receiver in 1/2 rack chassis; Systems: 20 channels in can be used one location () BPT: TA4F connector (3x AA), Mic: Headworn, Lapel, Guitar, Line level \$849 HH: UHF, 56K deviation (9v) , Mic: Dynamic or condenser \$849

**Chiayo UDR Series (Models: UDR1000)** Ch: 1, Band (MHz): 470-900, Freq Steps:Agile RX: 1 Receiver in one RU chassis; Systems: 25 channels in can be used one location () BPT: LED display of all functions (2x AA), Mic: Headworn, Lapel, Guitar, Line level \$1,399 HH: UHF Vol, User name assignable, RF&AF level (2x AA) , Mic: Dynamic or condenser \$1,399

**Chiayo UDR Series (Models: UDR2000)** Ch: 2, Band (MHz): 470-900, Freq Steps:Agile RX: 2x Receivers in one RU chassis; Systems: 25 channels in can be used one location () BPT: LED display of all functions (2x AA), Mic: Headworn, Lapel, Guitar, Line

BRAND	DISTRIBUTOR	PHONE	WEB	Mic	IEM	Acc
<b>AKG</b>	Audio Products Australia	1800 642 922	www.audioproducts.com.au	4	1	
<b>Audio LTD</b>	John Barry Sales	+61 2 9439 6955	www.johnbarry.com.au	4		2
<b>Audio Technica</b>	Yamaha Music Australia	1800 805 413	www.audio-technica.com	2		
<b>Beyerdynamic</b>	Network Ent. Technology	+61 2 9905 5997	www.network-et.com	3		
<b>Chiayo</b>	National Audio Systems	+61 3 9434 1888	www.nationalaudio.com.au	4		
<b>DB Technologies</b>	CFI	+61 3 9315 2244	www.cmi.com.au	2	2	
<b>Electro Voice</b>	EVI Audio	+61 2 9648 3455	www.eviaudio.com.au	10		2
<b>Garwood</b>	ATT Audio Controls	+61 3 9379 1511	www.attaudiocontrols.com		4	
<b>Lectrosonics</b>	Soundequip Pty Ltd	+61 3 9593 2000	www.soundequip.com.au			
<b>Lectrosonics</b>	John Barry Sales	+61 2 9439 6955	www.johnbarry.com.au	7	3	
<b>Loud And Clear</b>	Loud And Clear	0418 295 086	www.loud-and-clear.com.au			3
<b>Mipro</b>	Audio Telex	+61 2 9647 1411	www.audiotelex.com.au	7		
<b>Nady</b>	Pro Music	+61 7 3375 6400	www.promusicaustralia.com	10		
<b>Philips</b>	Stentofon Australia	+61 2 96072497	www.philipscsi.com			2
<b>Redback</b>	Altronic distributors	1300 780 999	www.altronic.com.au			
<b>Samson</b>	Corporate Audio Services	+61 3 9474 1066	www.corporateaudio.com.au	4	1	
<b>Samson Wireless</b>	Electric Factory	+61 3 9480 5988	www.elfa.com.au	4		
<b>Sanha</b>	Magna Systems	+61 2 9417-1111	(new models coming, not shown here)			
<b>Seco</b>	LSW	+61 2 9568 2100	www.lswonline.com.au	1		3
<b>Sennheiser</b>	Syntec International	+61 2 9417 4700	www.syntec.com.au	40	2	lots!
<b>Show</b>	LSW	+61 2 95682100	www.lswonline.com.au	3		3
<b>Shure</b>	Jands	+61 2 9582 0909	www.jands.com.au	4	3	4
<b>Sony</b>	Sony Australia Limited	+61 2 9887 6666	www.sony.com.au	12		
<b>Telex</b>	EVI Audio	+61 2 9648 3455	www.eviaudio.com.au	5		4
<b>TOA Corporation</b>	Audio Products Australia	1800 642 922	www.audioproducts.com.au	2		2
<b>Trantec</b>	The Resource Corporation	+61 3 9877 8233	www.trc.com.au	4	3	4

# WIRELESS AUDIO

Wireless Microphone Systems

level \$2,399	HH: UHF Vol, User name assignable, RF&AF level (2x AA) , Mic: Dynamic or condenser	\$2,399
<b>Chiayo UDR Series (Models: UDR500)</b>	Ch: 1, Band (MHz): 470-900, Freq Steps:Agile RX: 1 Receiver in 1/2 rack chassis; Systems: 25 channels in can be used one location ( ) BPT: LED display of all functions (2x AA), Mic: Headworn, Lapel, Guitar, Line level	\$1,199
<b>DB TECHNOLOGIES (Models: DB-PU150M)</b>	Ch: 1, Band (MHz): 774.00-820.650, Freq Steps:16x Fixed RX: XLR balanced O/P front panel controls (Squelch and volume controls on front panel) BPT: Peak-led, phantom powered input connector (9v), Mic: Headset/lavalier/instrument	\$799
<b>DB TECHNOLOGIES (Models: PRO-2000M)</b>	Ch: 16, Band (MHz): 774.00-820.650, Freq Steps:Fixed RX: XLR balanced O/P ; Systems: 16 selectable frequencies (True 2 channel diversity) BPT: Microprocessor controlled PLL design (9v), Mic: N/A	\$1,099
<b>Electro Voice Cobalt (Models: R200UHC7)</b>	Ch: 8, Band (MHz): 710.100-721.350, Freq Steps:Fixed RX: Balanced XLR out, diversity; Systems: (Half rack, dual rack kit available)	\$849
<b>Electro Voice Cobalt (Models: R200UL)</b>	Ch: 8, Band (MHz): 710.100-721.350, Freq Steps:Fixed, RX: Balanced XLR out, diversity; (Half rack, dual rack kit available), BPT: Capsule connect on TA4F (9v), Mic: ULM 20,OLM 10, RE 90TX	\$899
<b>Electro Voice N/Dym (Models: NRSCU-H1)</b>	Ch: 10, Band (MHz): 710.500-714.250, Freq Steps:Agile RX: Balanced XLR out, diversity; Systems: Remote-able antenna's (Half rack, includes rack hardware) BPT: Capsule connect on TA4F (9v), Mic: HM 2, HM 7, HM 1 Headset	\$1,401
<b>Electro Voice N/Dym (Models: NRU-N7)</b>	Ch: 10, Band (MHz): 710.500-714.250, Freq Steps:Agile RX: Balanced XLR out, diversity; (Half rack, dual rack kit available) HH: Low battery LED (9v) , Mic: N/Dym 767A	\$1,578
<b>Electrosonics UH200D/UCR211</b>	Ch: 256 (in one freq block), Band (MHz): 11x 25.5MHz blocks available from 537-819, Freq Steps:Agile RX: Built-in spectrum analyser; Systems: Rack-mountable or portable QuadUHF (2x 9v or external DC) BPT: Portable analog frequency-agile (9v alkaline or lithium), HH: Plugpack (9v alkaline or lithium) , Mic: XLR with P48 / dynamic / 5V lavalier powering	\$7,095
<b>Electrosonics UM400/UCR411</b>	Ch: 256 (in one freq block), Band (MHz): 11x 25.5MHz blocks available from 537-819, Freq Steps:Agile RX: Built-in spectrum analyser; Systems: Rack-mountable or portable QuadUHF (2x 9v or external DC) BPT: Portable digital-audio frequency-agile, Bodypack digital 20Hz-20kHz (9v alkaline or lithium), Mic: Pos & neg bias lavaliers, dynamic, line level	\$7,575
<b>Electrosonics UM100/UCR100</b>	Ch: 256 assignable, Band (MHz): 512-870 , Freq Steps:Agile BPT: Ultra rugged tempered alloy antenna (9v), Mic: Sanken, Voice Technologies, Tram, PSC	\$2,933
<b>Electrosonics UM200/UCR210D</b>	Ch: 256 assignable, Band (MHz): 512-870 , Freq Steps:Agile BPT: Ultra rugged tempered alloy antenna (9v in TX & AA in RX), Mic: Sanken, Voice Technologies, Tram, PSC	\$7,568
<b>Mipro ACT Series (Models: ACT707C)</b>	Ch: 100 Channels, Band (MHz): 786-815, Freq Steps:Agile RX: Automatic channel targeting and software; Systems: (Up to four modules in 1RU frame), BPT: IR loading of frequency (9v), Mic: Mipro insert	\$999
<b>Mipro MR Series (Models: MR588)</b>	Ch: 30 Channel, Band (MHz): 786-815, Freq Steps:Fixed RX: Diversity, noise lock squelch circuitry; Systems: (Half rack, 1 RU) BPT: Compact, lightweight, battery condition indicator (9v), Mic: Mipro insert	\$1,499
<b>Mipro MR Series (Models: MR801)</b>	Ch: Single Channel, Band (MHz): 782-796, Freq Steps:Fixed RX: Diversity, noise lock squelch circuitry; Systems: (Half rack, 1 RU) BPT: Compact, lightweight, battery condition indicator (9v), Mic: Mipro insert	\$886
<b>Nady NAUHF10</b>	Ch: 8, Band (MHz): 794.9-804.9 , Freq Steps:Fixed RX: Diversity system; Systems: ( ) BPT: Compact belt pack (9 v), Mic: Guitar, headset and lavalier	\$599
<b>Nady NAURR10</b>	Ch: 8, Band (MHz): 749.9-804.9 , Freq Steps:Fixed, RX: Diversity system; Systems: (Rack mountable) BPT: Compact belt pack (9 v), Mic: Guitar, headset and lavalier	\$799
<b>Redback C 8854</b>	Ch: 16, Band (MHz): 790-806, Freq Steps:Fixed RX: 50m operation, 16 freq; Systems: (Half rack, Desk or rack mountable) BPT: Guitar, lapel and desk-style available. (9v), Mic: Condenser	\$944
<b>Redback C 8870A</b>	Ch: 16, Band (MHz): 790-806, Freq Steps:Fixed RX: 70m operation, 6 freq, mic/aux output, 1RU; Systems: (Half rack, Desk or rack mountable) BPT: Guitar or lapel style microphones available. (9v), Mic: Condenser	\$945
<b>Redback C 8900</b>	Ch: 1, Band (MHz): 800.6-813.30, Freq Steps:6x Fixed RX: 100m operation, 16 freq, mic/aux output, 1RU; Systems: (1RU) BPT: Guitar or lapel style microphones available. (9v), Mic: Condenser	\$1,045
<b>Samson Airline-1</b>	Ch: 6, Band (MHz): 801-805, Freq Steps:Fixed RX: Full diversity, mic/line switch, 1/2 rack size; Systems: Rack adaptors available (200mm(1/2RU)(W)x 42mm(1RU)(H)x 140mm(D)) BPT: Sep Mute (ext) & Pwr (int) switches, AF trim pot (1x AAA), Mic: Audio Technica MT350	\$1,399
<b>Samson Series-1</b>	Ch: 6, Band (MHz): 801-805, Freq Steps:Fixed RX: Full diversity, mic/line switch, 1/2 rack size; Systems: Rack adaptors available (200mm(1/2RU)(W)x 42mm(1RU)(H)x 140mm(D)) BPT: Sep Mute (ext) & Pwr (int) switches, AF trim pot (9v), Mic: Audio Technica MT350 & AT831, Sony ECM44	\$1,649
<b>Samson Synth-32</b>	Ch: 32, Band (MHz): 778-858, Freq Steps:Agile RX: Mic/line switch, molded antennas, 1/2 rack size; Systems: Rack adaptors available (200mm(1/2RU)(W)x 42mm(1RU)(H)x 140mm(D)) BPT: Sep Mute (ext) & Pwr (int) switches, AF trim pot (9v), Mic: Audio Technica MT350 & AT831, Sony ECM44	\$2,599



Audio Technica U100 Series



DB TECHNOLOGIES DB-PU150M

Electrosonics UCR210D Receiver



Electrosonics UM400 Transmitter

Each of the distributors were invited to provide additional information about their brand, or other related information. Here is what they had to say:

**AKG** today provides wireless systems for all customer requirements and for every budget, from the WMS300 professional system to smaller systems such as the WMS81 and WMS80. The newest addition is the WMS40 Microtools system. This system provides more flexibility and versatility than any other system before. With a single receiver you can transmit from a conventional Hand held mic or a Body pack. New additions include new transmitters like a direct connecting Guitar bug, Snap-On transmitter for any Dynamic microphone or a flexible Micropen for conference situations.

**Altronic**s have had tremendous success with their REDBACK range of radio receivers for many years. Famous for both their affordability and performance the range has been very well received industry wide. In the words of one satisfied customer "it worked very well. The distances I was getting were fantastic and the audio quality was very



Seco DIGIQ7000



Sennheiser Professional 3000



Shure UC Series



Sony Freedom WRR802

good needless to say I'll be buying it off you" Steve Pannan, Steves Pro Audio.

The **Audio Technica U100 Series** professional UHF wireless system is designed for Broadcast, Film & ENG applications. The U100 series features: 100 PLL synthesised switch-able channels, true diversity reception, full FM deviation for improved S/N ratio, higher headroom & greater dynamic range. Both TX & RX are of rugged metal construction. Receiver features: LEDs to indicate A or B channel status, AF peak & power status. RX includes XLR balanced output with level control & stereo headphone output on 1/4" phone jacks, RX operates on 2\* 9V batteries or external 12VDC camera output.

The revolutionary new **Lectrosonics 400-series** combines digital audio with an analog RF link, providing clean audio up to 20kHz. The analog RF link reduces the potential for spectral noise and multichannel interference that a digital-RF system can produce. Both the 200-series analog-audio and the 400-series digital-audio receivers provide a spectrum analyser with an LCD display to identify clear frequencies, as well as giving operational levels. Frequency-agility in these systems allow users to move away from adjacent tv channels within the freq block. Optional water-resistant transmitters, the MM200 and MM400, are available for either the 200-series & 400-series.

Wireless Microphone Systems

<b>Mic System - Frequency Information, RX (receiver):</b> Single, Systems (other info), <b>BPT (belt pack transmitter):</b> Features (Batt), Mic <b>Price</b> , <b>HH (Hand Held):</b> Features (Batt) , Capsule options <b>Price</b>
<b>Samson Synth-6</b> Ch: 96, Band (MHz): 778-810, Freq Steps:Agile RX: PLL VCO technology, Dbx noise reduction; Systems: Dist amp & Wireless System Manager software (2 ch rx - 479mm(W)x 44mm(1RU)(H)x 213mm(D)) BPT: Mute, inst&mic trim pots, RF pwr switch-hi/lo o/p (2x AA), Mic: Audio Technica MT350 & AT831, Sennheiser MKE2 \$8,999 HH: Built-in antenna, lightweight (312g), (2x AA) , Mic: Shure Beta-87 & SM-58, Samson QMIC \$7,999
<b>Seco DIGIQ (Models: DIGIQ7000)</b> Ch: 8, Band (MHz): 433.050-434.790, Freq Steps:Agile RX: Anti-interference tone squelch; Systems: 8 Ch switchable (240 (w)x 40 (H)x 155 (D)) BPT: Digital Receiver, 7 segment LED Display (1x 9v) , Mic: HH: Built-in antenna, auto off low battery, (1x 9v) , Mic: \$698
<b>Sennheiser Evolution (Models: 100)</b> Ch: 4, Band (MHz): 790-822, Freq Steps:Agile RX: 1/4" AF O/P, simple menu and LCD display; Systems: Rack kit, antenna splitters etc avail (2 to 1 rack space, 1100 gms) BPT: Simple menu, LCD display, 30mW RF, mic on/off (Standard 9v), Mic: ME2 Omni, ME4 Cardioid, ME3 Headset mic \$1,299 HH: Simple menu, LCD display, 30mW RF, mic on/off (Standard 9v) , Mic: Dyn Cardioid/SCard; Cond'r: S/Card.Shock M'ted. \$1,249
<b>Sennheiser Evolution (Models: 300)</b> Ch: 8, Band (MHz): 790-822, Freq Steps:Agile RX: As above, plus 1/4" h/phone socket; Systems: Rack kit, antenna splitters etc avail (2 to 1 rack space, 1100 gms) BPT: As above + name, store and recall of channels (Standard 9v), Mic: ME2 Omni, ME4 Cardioid, ME3 Headset mic \$1,599 HH: as above, plus name, store and recall of channels (Standard 9v) , Mic: Dyn Cardioid/SCard; Cond'r: S/Card.Shock M'ted. \$1,549
<b>Sennheiser Evolution (Models: 500)</b> Ch: 16, Band (MHz): 790-822, Freq Steps:Agile RX: As above, plus 'Sound Check' feature, and XLR o'put; Systems: Rack kit, antenna splitters etc avail (2 to 1 rack space, 1100 gms) BPT: As above + 'Sound Check' feature (Standard 9v), Mic: ME2 Omni, ME4 Cardioid, ME3 Headset mic \$2,099 HH: as above, plus 'Sound Check' feature (Standard 9v) , Mic: Dyn Cardioid/SCard; Cond'r: S/Card.Shock M'ted. \$2,049
<b>Sennheiser Professional (Models: 1000, 3000, 5000)</b> Ch: 16, Band (MHz): 790-822, Freq Steps:Agile RX: AF and RF levels, plus others; Systems: As above, plus antenna mounts etc (3 to 1 rack space, 1100 gms) BPT: 50mW RF, mic on/off, Sensitivity sw. (Standard 9v), Mic: MKE2 Omni, ME04 Cardioid 1000 Transmitter (SKM1072) \$1954 HH: 50mW RF, mic on/off, sensitivity switch (Standard 9v) , Mic: Dynamic Cardioid/SuperCardioid; Condenser: S/Card EM3031U Receiver \$4159
<b>Show WR211R</b> Ch: 1, Band (MHz): 202-204, Freq Steps:Fixed RX: Squelch control, with level selector; Systems: (130 (w)x 193 (D)x 44 (H) mm) BPT: Single Channel VHF System (1x 9v) , Mic: VXM168 Bodypack Optional HH: Strong transmission power (1x AA size 1.5v) , Mic: \$399
<b>Show WR411R</b> Ch: 1, Band (MHz): 433.05-434.8 , Freq Steps:Fixed RX: Squelch control, with level selector; Systems: (130 (w)x 193 (D)x 44 (H) mm) BPT: Single Channel UHF System (1x 9v) , Mic: VXM168 Bodypack Optional \$499 HH: Strong transmission power (1x AA size 1.5v) , Mic: \$399
<b>Show WR422R</b> Ch: 1, Band (MHz): 433.05-434.8, Freq Steps:Fixed RX: Squelch control, with level selector; Systems: (210 (w)x 232 (D)x 44 (H) mm) BPT: Single Channel Dual Mic System (1x 9v) , Mic: VXM168 bodypack Optional HH: Strong transmission power (1x AA size 1.5v) , Mic: \$999
<b>Shure U Series</b> Ch: 140, Band (MHz): 554-584,662-692,692-716,782-806, Freq Steps:Agile RX: Touring Series. Control lockout, computer control; Systems: Up to 78 simultaneous systems over 4 bands (Remote battery gauge, Dual 1RU receiver) BPT: Programmable channels and/or power lock (2x AA), Mic: Numerous (standard TA4 connector) \$6,445 HH: Control lock, interchangeable heads (2x AA) , Mic: SM58, SM87, Beta58, Beta87 \$6,725
<b>Shure UC Series</b> Ch: 120, Band (MHz): 692-717,782-806, Freq Steps:Agile RX: Contractor Series. Logic I/O, 2 band EQ; Systems: Up to 32 simultaneous systems over 2 bands (Remote battery gauge rack wide) BPT: Silent power on, remote mute jack (1x 9v) , Mic: Numerous (standard TA4 connector) \$3,395 HH: Silent switch on. Interchangeable heads (1x 9v) , Mic: SM58, SM87, Beta58, Beta87A, Beta87C \$3,595
<b>Shure ULX Series</b> Ch: 1400, Band (MHz): 554-865, Freq Steps:Agile RX: Performance Series. Auto channel select; Systems: Up to 20 simultaneous systems (Remote battery gauge rack wide) BPT: Silent power on, power lock ( ), Mic: Numerous (standard TA4 connector) \$2,695 HH: Control lock, interchangeable heads (1x 9v) , Mic: SM58, SM87, Beta58, Beta87A, Beta87C \$2,995
<b>Shure UT Series</b> Ch: 1, Band (MHz): 598-781, Freq Steps:8x Fixed RX: Budget series. Simple operation; Systems: 8 simultaneous systems ( rack wide) BPT: Silent power on. ( ), Mic: Numerous (standard TA4 connector) \$1,095 HH: Silent switch on. Interchangeable heads (1x 9v) , Mic: SM58, SM87, Beta58 \$1,295
<b>Sony Freedom (Models: WRR802)</b> Ch: 102, Band (MHz): 792-805, Freq Steps:Agile RX: Mute functions, Tx Battery indicator; Systems: (Half rack, Diversity receiver, XLR outputs) \$1339 (Receiver)
<b>Sony Freedom (Models: WRR805)</b> Ch: 102, Band (MHz): 792-805, Freq Steps:Agile RX: Flexible camera mounting, Headphone monitor; Systems: (Portable videographer receiver) \$1041 (Receiver)
<b>Sony Freedom (Models: WRT805)</b> Ch: 102, Band (MHz): 792-805, Freq Steps:Agile BPT: 10mW RF power, mute control (AA), Mic: ECM-77/44/122/166/350/310 \$1,790
<b>Sony Freedom (Models: WRT807)</b> Ch: 102, Band (MHz): 792-805, Freq Steps:Agile HH: CCAW Voice coil, AlNiCo magnet (AA) , Mic: Dynamic UNI \$2,290
<b>Telex RE 1 (Models: CSR 1000B)</b> Ch: 950, Band (MHz): 722.00-746.00, Freq Steps:Agile RX: XLR out, diversity; Systems: (Half rack, rack hardware incl.) BPT: TA4F, Cast magnesium (9v), Mic: RE 90TX,CS 200TX,HM1TX \$2,799
<b>Telex RE 1 (Models: CSR 1000HC)</b> Ch: 950, Band (MHz): 722.00-746.00, Freq Steps:Agile RX: Balanced XLR out, diversity; Systems: (Half rack, rack hardware incl.) HH: Changeable capsules (9v) , Mic: RE 510 \$3,049
<b>Telex RE 1 (Models: CSR 1000HD)</b> Ch: 950, Band (MHz): 722.00-746.00, Freq Steps:Agile RX: Balanced XLR out, diversity; Systems: (Half rack, rack hardware incl.) HH: Changeable capsules (9v) , Mic: N/D 767a \$2,999
<b>Telex RE 1 (Models: CSR 1000UG)</b> Ch: 950, Band (MHz): 722.00-746.00, Freq Steps:Agile RX: Balanced XLR out, diversity; Systems: (Half rack, rack hardware incl.) BPT: TA4F, Cast magnesium (9v), Mic: \$2,899

<b>TOA Password Series (Models: WT-4800)</b>	Ch: 64, Band (MHz): 690-865, UHF, Freq Steps:Agile	RX: Audio mixing i/p function, Antenna cascade o/p; Systems: Up to 14 simultaneous systems (210x44.6x180, tone squelch function)	\$724 tuner only
<b>TOA Scout Series (Models: WT-4810)</b>	Ch: 16, Band (MHz): 690-865, UHF, Freq Steps:Agile	RX: 16 Channel dual diversity tuner; Systems: Up to 14 simultaneous systems (240x35x110)	\$444 tuner only
<b>TOA WM-4220</b>	Ch: 16, Band (MHz): 690-865, UHF, Freq Steps:Agile	RX: All 64 channel mics compatible w/ 16 Chan tuner; Systems: Squelch function (Rack mount brackets available)	HH: Inc Mic clip and storage case, low bat indicator (9v/10 hours continuous), Mic: Electret Condenser Cardioid element \$840
<b>TOA WM-4300</b>	Ch: 64, Band (MHz): 690-865, UHF, Freq Steps:Agile	RX: Usable frequencies scanning check; Systems: (Rack mount brackets available)	BPT: Low battery indicator, Input sensitivity control (9v10 hours continuous), Mic: Electret Condenser Cardioid Element \$1,358
<b>Trantec S4.5UHF</b>	Ch: 4, Band (MHz): 700-722, Freq Steps:Agile	RX: Rack-mount.; Systems: Local frequency programming available (RX: 210x165x30 (900g) TX: 60x25x95(100g))	BPT: Made in UK, 4 frequency, long bat.Life (9v Alkaline), Mic: Lavalier (lemo)Guitar(Jack)Headset(Lemo) Lapel system (excl. mic) \$1195 HH: Audio Technica capsules (9v Alkaline), Mic: Dynamic, lavalier or headworn Dynamic \$1340 Condenser \$1595
<b>Trantec S4000UHF</b>	Ch: 32, Band (MHz): 700-722, Freq Steps:Agile	RX: Rack-mnt. Avail. Power & Antennae Dist. available; Systems: Local frequency programming available (RX: 210x165x30 (900g) TX: 60x25x95(100g))	BPT: Made in UK, 32 frequency, long bat.Life (9v), Mic: Lavalier (lemo)Guitar(Jack)Headset(Lemo) Lapel system (excl. mic) \$1795 HH: Audio Technica capsules (9v Alkaline), Mic: Condenser, dynamic, lapel, headworn Dynamic \$1925 Condenser \$2240
<b>Trantec S5000ENG</b>	Ch: 64, Band (MHz): 700-722, Freq Steps:Agile	RX: Use with any Trantec S5000 RX; Systems: Local frequency programming available (80x54x23)	BPT: Broadcast Quality, Made in UK, 64 frequency (9v Alkaline), Mic: Designed for use in ENG/EFP situations ENG Only \$3195 HH: Balanced out to camera, LCD display, metal case, ENG TX with RX \$6995
<b>Trantec S5000UHF</b>	Ch: 64, Band (MHz): 700-722, Freq Steps:Agile	RX: Rack mnt. Avail. Power & Antennae Dist. available; Systems: Local frequency programming available (RX: 217x275x44 (2,100g) TX: 80x54x30 (157g))	BPT: Broadcast Quality, Made in UK, 64 frequency (9v), Mic: Lavalier (lemo)Guitar(Jack)Headset(Lemo) Lapel system (excl. mic) \$7975 HH: Audio Technica capsules (9v), Mic: Dynamic, lavalier or headworn Dynamic \$7995 Condenser \$8395
<b>IEM System</b>	<b>Frequency Range</b>	<b>TX: Transmitter Features</b>	<b>RX: Receiver Features</b> <b>Price</b>
<b>AKG IVM</b>	Ch: 16, Band (MHz): 800.000-820.000, Freq Steps:Fixed	TX: World first with individual virtual acoustics; Systems: Up to 8 systems simultaneously (1RU, half rack width) Features: On/off and mute switches, metal body, vol control	RX: Standard or custom (2x AA) From \$4,899
<b>DB Technologies IEM-1000 (Models: IEM-1000)</b>	Ch: 1, Band (MHz): 774.00-865.00, Freq Steps:16x Fixed	TX: RF LEDs, solid metal casing; Systems: N/A (Stereo XLR inputs) Features: L/R panning & volume control	RX: Can use custom ear pieces (9v) \$1,099
<b>DB Technologies IEM-2000 (Models: IEM-2000)</b>	Ch: 16, Band (MHz): 774.00-865.00, Freq Steps:Agile	TX: LCD display, 6.3 & 3.5 monitor outputs; Systems: (19" 1RU) Features: L/R panning, mix mode & volume controls	RX: Can use custom ear pieces (9v) \$1,995
<b>Garwood Monitor Systems LV (Models: LV-1 &amp; LV-2)</b>	TX: ; Systems: Features: Lightweight, configurable unit for studio talkback	RX: 2 channel crystal based, any frequency (1.5v AA)	\$2,845
<b>Garwood Monitor Systems APM T24</b>	Ch: 24, Band (MHz): Any 25 Band between 516-910 (to order), Freq Steps:Fixed	TX: With APM wired IEM; a total stage solution; Systems: (APM main station integrates w/less & APM wired IEM) Features:	RX: Use with any Garwood receiver (NA) \$4,985
<b>Garwood Monitor Systems Radio Station IDS</b>	Ch: 51, Band (MHz): 516-865, Freq Steps:Fixed	TX: RTS or Clearcom interface; Systems: Features: Intermodulation free sets grouped by country	RX: (9v MN1604 (PP3)) \$7BA
<b>Garwood Monitor Systems System 24</b>	Ch: 51, Band (MHz): Any 25 Band between 516-910 (to order), Freq Steps:Fixed	TX: Optional 12v operation; Systems: Features: Standard or custom Intermod free sets to order	RX: L or R mono listen, limiter in/out switch (9v MN1604 (PP3)) \$5,685
<b>Lectrosonics R1A receiver</b>	Ch: 256 (in one freq block), Band (MHz): 11x 25.5 blocks available from 537-819, Freq Steps:Agile	TX: ; Systems: Receivers easily switched to another TX (Milled aluminium case) Features: Scarfs to find transmitter carrier	RX: Headphones or earpiece (9v alkaline or lithium) \$1140 (receiver only)
<b>Lectrosonics T2 transmitter</b>	Ch: 256 (in one freq block), Band (MHz): 11x 25.5 blocks available from 537-819, Freq Steps:Agile	TX: ; Systems: (Milled aluminium case)	\$1820 (transmitter only)
<b>Lectrosonics R5</b>	Ch: 256, Band (MHz): 512-870, Freq Steps:Agile	TX: ; Systems: Features: Rugged machined aluminium	RX: (9v) \$1089 RX only
<b>Lectrosonics T5</b>	Ch: 256, Band (MHz): 512-870, Freq Steps:Agile	Features: Rugged machined aluminium (External power)	\$2189 TX only
<b>Nady NAPEM500</b>	Ch: 16, Band (MHz): 696-865, Freq Steps:Agile	TX: Up to 8 systems at once; Systems: N/A (Half rack mount) Features: Stereo with volume and limiter	RX: 3 sizes (9v) \$1,295
<b>Samson Wireless Earamp</b>	Ch: 182, Band (MHz): 774-864, Freq Steps:Agile	TX: AUX I/p on L&R, limiter, ; Systems: Daisy-chain out connector for multiple TX (479mm(W)x 44mm(1RU)(H)x 160mm(D))	Features: Diversity RX, dual mono&stereo, limiter, 2-band EQ RX: Any std 3rd party earpiece (Samson buds supplied) (9v) \$3,499
<b>Sennheiser Evolution (Models: IEM300)</b>	Ch: 8, Band (MHz): 790-822, Freq Steps:Agile	TX: Rack mount, H'phone socket, menu; Systems: Rack kit, antenna combiners etc avail (System kit weight 3kgs)	Features: Lock mode, focus, limiter on/off, menu and LCD RX: FutureSonics earpieces option (9v) \$2,799
<b>Sennheiser Sennheiser Professional (Models: 3000)</b>	Ch: 16, Band (MHz): 790-822, Freq Steps:Agile	TX: Rack mount, H'phone socket, menu; Systems: Also avail as a dual RX unit	Features: Stereo/focus, limiter on/off, squelch RX:

Wireless Microphone Systems



TOA Password Series WT-4800



Trantec S5000LHF



Garwood Radio Station IDS



DB Technologies IEM-2000

Wireless In Ear Monitor Systems

Sennheiser from Germany have a 50 year history of producing classic mics such as the MD421 and MD441. In the late 90s the Evolution range was released, covering a range of wired mics, wireless systems, In Ear Monitors and Headphones. For the Wireless series there are 3 ranges: the 100, 300 and 500. The hardware is all the same, but software and features are added as you go up the range to suit different users' needs and budgets. Where Sennheiser Evolution RF systems are different is that you are not limited to the one frequency when you buy a system. Even with the entry level 100 model, you are able to have 4 preset channels, choosing from 1280 UHF frequencies, allowing flexibility on stage when working with other RF systems. The 4 channels are pre-configured allowing the first time user to 'plug in and go'. Receivers and transmitters are all of solid metal construction, not plastic. A body pack receiver is available in the 100 and 500 range for camera operators. Also all models use HX compander technology for crystal clear sound. All transmitters have a low battery indicator. More battery info is available on the 300 and 500 models.

All Shure wireless microphone systems feature ready to use frequency sets. Each unit's channels are divided into groups, each group contains a pre-calculated and tested intermod free set of frequencies. In other words the engineers at Shure have done the

Trantec S4000IEM



Loud And Clear -  
Waist belt (above)  
and TX Protector



Trantec EMA custom moulds



hard work for you. Don't confuse "channels" with "compatible systems". Just because a system boasts 100 frequencies does not mean you can run 100 units!

Toa UHF Wireless Systems are available in 16 channels and 64 channels. Available are Vocal and Speech handheld microphones, Lavalier Headset and Aerobics microphones. 7 in total. Sold separately a system can be tailor made to meet exact requirements. Since the first 15 selectable frequencies are the same on both receivers, all microphones can be used on either receiver. Added features on the WT-4800 include the optional Distribution unit and Wireless dipole antenna. (75 ohm coax wiring utilised) A maximum of 8 antennas can be used in a system thereby a large area coverage can be achieved. Clear, intelligible audio and Toa's reputation for reliability are features expected with Toa products.

The Resource Corporation (TRC) has been appointed the exclusive Australian distributor of Trantec LHF Systems. The London based company Trantec, is now the largest manufacturer of DTI approved radio microphones in Europe. Historically Trantec have manufactured OEM systems for other well known brand names. To fully support the Trantec range of products TRC is also distributing a range of Custom In-Ear- Driver Sets. These IEM driver sets manufactured in Australia by EMA (as used by Silverchair, Ben Harper, Midnight Oil, The Living End to name but a few!) compliment the Trantec systems and enable the end user to hear the full quality potential of the Trantec product.

**Wireless In Ear Monitor Systems**

FutureSonic earpieces standard (EK3052: 2x 1.5v AA, EK3053: 9v) R/mount stereo transmitter (SR3054) \$3964. Body pack EK3052U receiver \$2400			
<b>Shure PSM (Models: PSM 400)</b>	Ch: 16, Band (MHz): 722-745, Freq Steps:16x Fixed	TX: 16 selectable channels, stereo/mono/mix mode; Systems: Up to 8 simultaneous systems (half rack width) Features: Mix Mode, in built limiterRX: Shure E1 or E5 (1x 9v)	\$2,990
<b>Shure PSM (Models: PSM 600)</b>	Ch: 2, Band (MHz): 626-656, Freq Steps:10x Fixed	TX: 2 selectable channels, stereo/mono/mix mode; Systems: Up to 10 simultaneous systems (half rack width) Features: Mix Mode, in built limiterRX: Shure E1 or E5 (1x 9v)	\$4,190
<b>Shure PSM (Models: PSM 700)</b>	Ch: 32, Band (MHz): 722-745, Freq Steps:32x Fixed	TX: 32 selectable channels, stereo/mono/mix mode; Systems: Up to 16 simultaneous systems (half rack width) Features: Mix Mode, in built limiterRX: Shure E1 or E5 (1x 9v)	\$6,785
<b>Trantec PT-1</b>	Ch: 32, Band (MHz): 700 -722, Freq Steps:Agile	TX: LCD display, rack mnt, CD quality transmission; Systems: 1x TX can supply 14 RX (RX: 60x25x95 (95g) TX: 210x165x30) Features: 14 RX from 1 TRX, fast rechargeable batt option RX: Generic, custom moulds, or headphones available (Built in rechargeable system) <b>NEW</b>	
<b>Trantec S4000IEM</b>	Ch: 32, Band (MHz): 700 -722, Freq Steps:Agile	TX: LCD display, rack mnt option, mono or stereo; Systems: Local frequency programming option (RX: 60x25x92 (100g) TX: 210x165x30) Features: 2x RX & 1x TX as standard RX: Generic or custom moulds, single or dual drivers (9v Alkaline) 2x RX 1x TX	\$1995
<b>Trantec S5000IEM</b>	Ch: 64, Band (MHz): 700 -722, Freq Steps:Agile	TX: LCD display, rack mnt, mono/stereo, ant.dist avail; Systems: Local frequency programming option (RX: 80x54x30 (157g) TX: 217x275x44(2100g)) Features: PC WIN98-Programmable EQ, metal case on RX RX: Generic or custom moulds, single or dual drivers (9v Alkaline)	

**Other Wireless Accessories**

Device	Features	List Price
<b>Audio LTD RK2</b>	Houses 2 x DX2020, uses common power & aerials Solid aluminium.RK2 is regulated&power protected	\$2,189
<b>Audio LTD RK4</b>	Houses 4 x DX2020, uses common power & aerials, 5 LED bar graph displays rack supply & RF levels	\$6,208
<b>Electro Voice BTR (Models: BTR 500)</b>	Radio comms Full duplex, UHF	\$9,328
<b>Electro Voice BTR (Models: BTR 600)</b>	Radio comms Encrypted, full duplex, UHF	\$11,226
<b>Electro Voice BTR (Models: BTR 700)</b>	Radio comms Duplex, UH, freq. Agile	\$16,495
<b>LECTROSONICS UM200C/UCR201 (Models: Camera link system)</b>	Video camera link for failsafe audio spectrum analyser	UHF diversity, \$5,495
<b>LECTROSONICS QuadUHF (Models: Portable multi-channel)</b>	Portable RF & power multicoupler	Internal/external power \$5,640
<b>LECTROSONICS UMC200D (Models: Rack-mount multi-channel)</b>	Rack-mount RF multicoupler, External DC or mains,	\$2,720
<b>LECTROSONICS MM400 (Models: Water-resistant transmitter)</b>	Digital-audio transmitter (for UCR411)	\$2,475
<b>Loud And Clear TX pouch (Models: Heavy duty pouch for belt-pack transmitters)</b>	Flesh coloured 3 layer laminate with Velcro closure	\$12.50
<b>Loud And Clear TX protector (Models: Sweat resistant cover for belt-packs)</b>	Heat welded PVC with Velcro closure	\$8.80
<b>Loud And Clear Waist belt (Models: Heavy duty elastic waist belt)</b>	2 layer 75mm HD elastic w/large Velcro closure	\$19.70
<b>Philips LBC2705/00</b>	Antenna divider Antenna coupling allows a 4 receiver system	\$478
<b>Philips LBC2706/00</b>	Remote antenna Allows antenna installation away from receiver	\$75
<b>Seco Beltpack (Models: DIGIQ7I)</b>	Bodypack for use with DIGIQ7 receiverPower switch activated squelch	\$179
<b>Seco Headset (Models: DIGIQ7H)</b>	Headset for use with DIGIQ7000 receiver	Slim line design, lightweight \$79
<b>Seco Lapel (Models: DIGIQ7L)</b>	Lapel mic for DIGIQ700 receiver, Strong tie clip, screw on locking connector	\$59
<b>Sennheiser Evolution (Models: AB1-D)</b>	Antenna booster 10dB gain, powered via ASP1	\$302
<b>Sennheiser Evolution (Models: AM1)</b>	Antenna mount kit 2 antennas for front mounting	\$152
<b>Sennheiser Evolution (Models: ASP1)</b>	Antenna splitter kit Provides RF & power to 4 receivers	\$899
<b>Sennheiser Evolution (Models: GA1) 19"</b>	Rack mount kit Will hold 2 x Rx	\$79
<b>Show Hand held mic (Models: WT201)</b>	Wireless handheld mic LED low battery warning.	\$199
<b>Show Lapel microphone (Models: LM10)</b>	Lapel mic for use with LM10 Comes with windshield	\$15
<b>Show VHF bodypack transmitter (Models: VXM168)</b>	VHF transmitter LED low battery warning.	\$199
<b>Shure Computer interface (Models: UA888)</b>	Computer control of U series receivers 8 receivers per UA888. Networked for larger systems	\$5,795
<b>Shure Directional antenna (Models: UA870)</b>	Active directional antenna Includes active pre-amp with switchable 3/10dB gain	\$985
<b>Shure Distribution amp (Models: UA845)</b>	Active antenna distribution amplifier Single pair of antennas can feed up to 4 receivers	\$3,095
<b>Shure Pre-amplifier (Models: UA830)</b>	Active in-line preamplifier Switchable 3/10dB gain for losses on long coax. runs	\$545
<b>Telex ALP (Models: ALP 450)</b>	Antenna Log periodic antenna	\$452
<b>Telex ALP (Models: CLA 5)</b>	Antenna Half wave antenna	\$105
<b>Telex BTR (Models: BTR 800)</b>	Radio comms Duplex, UHF, freq. agile	\$21,450
<b>Telex RE 1/NRSCU (Models: APD-4)</b>	Antenna split Four ch, power distribution	\$1,599
<b>TOA WD-4800 (Models: Power/antenna distribution unit)</b>	Dual antenna inputs with DC power o/p's	Up to 8 YW-4500s' antennas can be networked \$526
<b>TOA YW-4500 (Models: Wall-mount wireless antenna (for WT-4800 and/or WD-4800))</b>	Phantom power supplied from WT-4800 or WD-4800 Dipole ratio relative gain: >8dB	\$229
<b>Trantec EMA</b>	Assorted model custom IEM driver sets Generic or custom mould single/dual driver sets	From \$995
<b>Trantec PT-1</b>	Fitness centre group music wireless system	14 RX from 1 TRX, fast recharge. batt option <b>NEW</b>
<b>Trantec S4000ADU</b>	Antennae distribution Half rack width 1RU unit	\$1,440
<b>Trantec S4000PDU</b>	Power distribution Half rack width 1RU unit, can supply 4 units plus ADU	\$990

## Tracking Guide

ARTIST	PRODUCER	ENGINEER	SESSION
<b>A# Sharp</b> +61 2 9153 9988 Jeff Cripps (jeff@asharp.com.au) www.asharp.com.au			
Powerhead	Jeff Cripps	Jeff Cripps	Album
MFJ	Jeff Cripps	Jeff Cripps	Album
The Kami Kids	Jeff Cripps	Jeff Cripps	Album
The Shoes	Jeff Cripps	Jeff Cripps	Album
The Groove Kings	Jeff Cripps	Jeff Cripps	Album
<b>Bush Traks</b> +61 2 6689 1290 Ruth Miller (ruth@bushtraks.com) www.bushtraks.com Airconditioned multitrack digital studio.			
Durga Babies	Michael Turner/Tim Tonkin	Dave Highet	Album
Asia Lee	Brian Lee/Dave Highet	Dave Highet	Album
Old Spice Boys	Azo Bell	Dave Highet	Mixdown
David Reeve	David Reeve	Dave Highet	Mastering
<b>Damien Gerard Sound Studios</b> +61 2 9555 1710 Marshall or Di (dgss@opt.usnet.com.au) www.damiengerard.com 2" 24 track analog / Protools Digital. Mastering w th William Bowden. Special EP & Album Packages. Celebrating 20 years in the business.			
Shifter	Shifter	Russ Pilling	6 track EP
Steve Grieve	Steve Grieve	Russ Pilling	album tracking
Littlelunch	Russ Pilling & band	Russ Pilling	single
Blasting Process	Blasting Process	Russ Pilling	album
Noogie	Russ & Band	Russ Pilling	extra album track (aus release)
<b>Feral Studios</b> +61 2 6299 3224 Jon (replicate@austarmetro.com.au) 32 track recording and mixing			
Juggernaut 101	Band	Pricey	Demos
Maliki	Jon	Jon	Demos
The rUg	Jon/band	Jon	EP
<b>Gangstar Studios</b> +61 2 4739 0451 Dave Dwyer (gangstar.records@bigpond.com) www.gangstar.com.au 96 track digital studio & mastering suite			
Glister	Dave Dwyer	Dave Dwyer	Album
Sarah Charwood	Dave Dwyer/Rebecca Dwyer	Dave Dwyer	Demo
Bernie Segedin	Dave Dwyer	Dave Dwyer	Album
Julie Woodward	Dave Dwyer	Dave Dwyer	Single
<b>Nu-Town Studios</b> +61 2 9516 1312 Greg Hopping (nutown@yahoo.com) Botique Music Production Facility. Recording In Both Digital And Annalogue Formats			
Groovy D	Sofie Loizou	Sofie Loizou	Single
K.E.L.	Greg Hopping	Greg Hopping	Album
Sammy Deratta	Sofie Loizou	Sofie Loizou	Demos
Aladin	Greg Hopping	Mark Worrall	Album
<b>Post for Film and Television</b>			
Tea Stampede	Chris Schu	Sofie Loizou	Score
<b>Rockinghorse</b> +61 2 6688 4005 Anthony Lycenko (rockingh@norex.com.au / alycenko@ozemail.com.au) www.rockinghorse.com.au Neve V series console, ProTools Mix 24 Studer 24trk, Genelec monitoring.			
Women In Docs	Anthony Lycenko / Ben McCarthy	Anthony Lycenko / Ben McCarthy	
Album Mixing			
Uncle Bully	Artist	Jim Arnold	Album Mixing
The Informants	Artist	Jeff Lovejoy	Album Mixing
Floodboy	Steve James	Steve James	Single Tracking / Mixing
<b>Soundwarp</b> +61 2 9905 7144 Meredith Brooks (mastering@soundwarp.com.au) www.soundwarp.com.au Audio Mastering, Restoration			
Cringe	Ryan	Meredith Brooks	Album
Willow Connection	Monica	Meredith Brooks	Compilation
Clay Soldiers	Dean	Meredith Brooks	Single
The Denvermen	Canetoad	Meredith Brooks	Album
Danny Decay & The Molars	Victor	Meredith Brooks	EP
<b>The Vault</b> +61 2 9555 8298 James Cadsky (Cadsky@Ozemail.Com.Au) Mixdown Studio, 40 Channel E Series Ssl G Automation Pro Tools Mix Plus 24 I/O 2 X 24 Trk Machines Top Spot			
Tinkerbellslutbaby	Band	James Cadsky	Album
Tim Hall	Tim	James Cadsky	Album Mixes
<b>Trackdown Digital</b> +61 2 9550 6890 Mike Duffy (tdmail@trackdown.com.au) www.trackdown.com.au 64 track Protools digital music and audio post			
Melchizadeck	Band & Scott Ryan	Scott Ryan	Demo Recording
<b>Post for Film and Television</b>			
Oz	HBO	Torei Lista	Adr
Crocodile Hunter: Collision Course	MGM Tim Ryan, Simon Leadley, Katrina Schiller		Score Mix, Music Edit
Fairy Tale Police Department	Yg-Emtv Torei Lista, Scott Ryan, Katrina Sciller, Erica Bell		All Audio Post
Tabaluga	Yg-Emtv Scott Ryan, Katrina Schiller		Dialogue Record

NSW

NEWS



### Damien Gerard Sound Studios

Connections dropped in to take a quick look at the new "Red Stairs" studio. Running a new Pro-Tools suite, this studio is on the same site as the main Damien Gerard studio in Balmain. Built into a corner of an old warehouse, the studio gets its name from a set of cement stairs that run up one side - it seems it was easier to build the studio around the stairs rather than remove them! The studio includes a voice over booth, and numerous insertable effects. Pictured is Kristian Hill, who is in the process of composing, re-working and mastering some Shakahachi flute music into dance music.

### Rockinghorse

New Equipment - 24 Neve 1272 to Mic Pre rebuilds and Mods. 4 Neve 1064 Mic Pre Eq rebuilds.

### Velvet Sound

New Equipment - Amek Media 51 console, ProTools HD3 w/ 3x 192 I/O & Sync I/O. 2x Focusrite ISA-220's & 2x Brook F-96 valve compressors.

### Domenic Sound Recording Studio

New Equipment - Joe Meek VC1 Studio Channel - Superb tracking box for direct recording. They absolutely love it!

## Tracking Guide

## CHARTS



## Kasey Chambers

## Million Tears

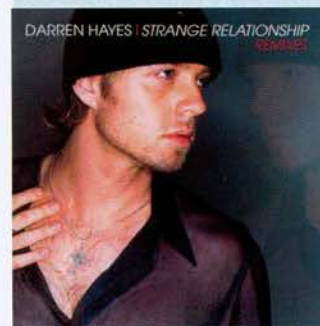
Produced by Nash Chambers



## Shakaya

## Sublime

Produced and Arranged by Reno Nicastro at Megatrax Digital Studios. Mixed by Craig Portellis at Studios 301. Mastered by Chris Gehringer at Sterling Sound, NY



## Darren Hayes

## Strange Relationship

Produced by Darren Hayes and Walter Afanasief. Mixed by Chris Lord Alge.

## NSW

ARTIST	PRODUCER	ENGINEER	SESSION
<b>Velvet Sound</b> +61 2 9267 2915 Anthony The (mail@velvetsound.com.au) www.velvetsound.com.au 2 <sup>nd</sup> 24 track & ProTools HD3 studio.			
Thirty Odd Foot of Grunts	Dave Wilkins	Craig Portells & Adrian Grigorieff	Album
Bob Sledge	Dave Reynolds	Adrian Grigorieff	EP
Ides of Space	Wayne Connolly	Wayne Connolly	Album
Anthony Bautovich	Daniel Clinch		Album
Annie Frances	Craig Portells	Craig Portells & Daniel Clinch	Single

## VIC

ARTIST	PRODUCER	ENGINEER	SESSION
<b>Crystal Mastering</b> +61 3 9326 2318 Joe Carra/John Ruberto () www.crystalmastering.com.au Mastering studio			
Icecream Hands	Band	Joe Carra	Mastering Single
James Ash	Andy Van	John Ruberto	Mastering Vinyl Single
Mach Pelican	Band/G.Long	Joe Carra	Mastering Album
From The Inside	Band/Therron	John Ruberto	Mastering Ep
Kim Salmon	Kim Salmon	John Ruberto	Mastering Album

ARTIST	PRODUCER	ENGINEER	SESSION
<b>Lo Ricco Sound Studios</b> +61 3 9701 6220 Marcello Lo Ricco (info@lssproductions.com) Recording Studio			
The Direct Influence	Band	Marcello Lo Ricco	EP
Bernadette Conlon	Bernadette Conlon	Marcello Lo Ricco	Album
Bleier	Bleier	Marcello Lo Ricco	Demos
Danielle Foenander	Marcello Lo Ricco	Marcello Lo Ricco	Demo

ARTIST	PRODUCER	ENGINEER	SESSION
<b>True Form Recording</b> +61 3 9391 0907 Neil Gray (trueform87@hotmail.com) Mackie 24Tk Digital Editor/Recorder, Classic Analogue Console and Outboard			
Sacred Cowz	Band	Dean Fisher	Demos
Groundswell	Simon/Justin/Band	Simon Banko	Mix Album
Roger That	Neil/Band	Neil Gray	Single

## QLD

ARTIST	PRODUCER	ENGINEER	SESSION
<b>Domenic Sound Recording Studio</b> +61 7 3216 5187 Shane Hughes (domsound@powerup.com.au) www.powerup.com.au/~domsound 24track adat/24 track Pro tools Tascam M5000 console/huge outboard rack			
Satin Mist	Band/Shane Hughes	Shane Hughes	album edit/remix
Sven Swenson/Playwright	Sven/Shane Hughes	Shane Hughes	Stage Play songs
Radio B105 FM	Shane Hughes	Shane Hughes	Jingle Demos
Shane Domenic	Artist	Artist	Album Tracking
Franco	Franco/Shane Hughes	Shane Hughes	Album mixing

ARTIST	PRODUCER	ENGINEER	SESSION
<b>Select Sound/Coral Sea Studios</b> +61 7 4031 1554 B. McCarty (selectsound@austarnet.com.au) Cairns' only acoustically designed studio - full digital/Protools48/MX2424			
Maori/NZ Tourist Board	Indigeneous Australia	Nigel Pegrum	8 album series
Andy Collins	Jimmy Mann	Nigel Pegrum	Album mix
ABC Qld Talent CD	ABC/Nigel Pegrum	Nigel Pegrum	CD
Hot Rubber Glove	Morgan Quinn	Nigel Pegrum	Tracking/Mixing

ARTIST	PRODUCER	ENGINEER	SESSION
<b>Stargate Music Productions</b> +61 7 3260 6294 Dash Mclvor (Dash.Stargate@bigpond.com) www.users.bigpond.com/dash.stargate Coffee to kill for!			
Sarah Collett	Dash Mclvor	Dash Mclvor	Single
Jim MacDonald	Dash Mclvor	Dash Mclvor	Corporate Audio
Jim Cooper	Dash Mclvor	Dash Mclvor	Album
Lance Galloway	Galloway / Mclvor	Dash Mclvor	Album
Billy Vaughn	Dash Mclvor	Dash Mclvor	Album

## SA

ARTIST	PRODUCER	ENGINEER	SESSION
<b>EarSight</b> 0407 970 425 Steve Fieldhouse (earsight@senet.com.au) ProTools TDM Mix Plus environment available for Mixing, Tracking, Editing, Remixing and Soundtracks.			
Found Objects	S. Fieldhouse/Chris Lambert	Steve Fieldhouse	CD Tracking + 5.1 Mixes
Peter Gelling	Peter Gelling	Steve Fieldhouse	CD Tracking

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Michelle Roget	Michelle Roget	Darren Halifax	Demo
Paul Moylan	Paul Moylan	Darren Halifax	Demo

# 30 YEARS OF ROCK LIGHTING AND SOUND

By Grahame 'Yogi' Harrison and Julius Grafton

This page shows just how primitive technical life was, way back when crew were paid \$ 5 to \$10 a day. If they were paid at all, because many of us did it for love. Of whom, or what, we are unsure! Or can't remember.

The first Sunbury rock festival in 1973 reinforced the need for large scale sound and lighting, which barely existed. The picture (below) shows a youthful Howard Page (Denim legend) from Jands close miking Max Merrit and the Meteors' drum kit with oversized mic booms and some very dodgy old Shure microphones. The lighting tower at top left is over populated by sun worshipping hippies, along with some Patt 223 1000w frensels, and a Pattern 293 2k incandescent followspot. Tungsten Halogen was, like, far out, man - and not yet common!



If you went to a suburban dance, you'd see a Lightshow, with great gear like Colin Baldwin's VIBE lighting inventory, above.

Everything was built from pineboard, or chipboard, weighed far too much, and chipped easily.

Jands expanded into Chalder Road, Marrickville in 1974 and kept on adding JBL inventory. The stack at left is topped with ultra heavy radial horns powered by 2482 drivers than went to 8k - so the ring radiators at the top did the 8k - 15k task.

The trucking of this era was totally atrocious, Ford 350 or D series pantechs, or Bedford if you were particularly unlucky, all petrol powered and all with 4 speed gearboxes without syncro on first. Heaters, demisters and radios were not usually fitted. •

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Hollerith built on Jacquard's work for data processing in the 1880s and then in 1943 Thomas Flowers and Alan Turing built the first computer we would recognise, this was based on Turing's paper of seven years earlier. Closer to home Fred Bentham's Light Console (1935) is generally regarded as being the first lighting desk to provide the ability to record a selection of channels. More recently again Rank Strand's Modular Memory System (MMS) following hard on the heels of the revolutionary Thorn Q-File (1971), brought memory controls within the reach of many.

We've therefore had devices to help us remember things for a long time - why then do we still have such a problem working with many of today's memory lighting desks?

My gripes, in no particular order are; why do we still produce memory desks which can't record the show onto disc and therefore require manually written plots as backup? Why do we still accept desks that lack a numeric keypad so that the plus and minus button has to be pressed manically to get to the desired channel? Why produce a desk on which inserted cues then renumber the subsequent ones? Why is editing states so hard on some desks, pushing faders higher than the set level in order to capture the channel and play with it? Why on some desks do we have to copy an existing state as a new one before we can alter it to make the next state? Why do we now have to 'enter' information when the early memory desks didn't need to? Why do we need a 'release' key? Why do we need to re-enter the fade times every time an adjustment is made to a state? Why can't we standardise on which cue the 'in' and 'out' times apply to? Why on some desks is it so complex to plot subs? Why do I need a screen to tell me everything so that I now have to look in two places for information, the desk and the screen.

For a brief and enjoyable period of my life whilst at (then) Rank Strand in the early 70's I trained operators on the MMS. This much loved desk was the work of genius in its simplicity. Firstly each section of the desk was on a separate plug-in module and so the desk could be configured as you wished. Left handed? No problem, simply switch the modules around. Secondly, since video monitors weren't on offer the desk itself contained large numerical LED's above the channel and playback controls so that it was always clear what was being used. One place to look, where one's hand was about to go to do the cue. And easy to see in low light

s - and all the pushes illuminated too with engraved titles. Another long lost asset was the playback faders were of the quadrant type so that it was easier to achieve a smooth fader than the current flat types - although I suspect these are irrelevant in many quarters because of the prevalence of timed fades, (however I'm sorry but a manually ganged crossfader simply can't deliver smooth fades in all situations, sometimes up and down faders need to be operated by both hands). Another handy facility was separate keypads for channels and memories.

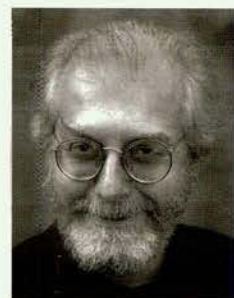
The MMS and its successors simplified the lighting process and removed the director's question "what's the board here? Oh." Of course I accept that operating colour wheels and semaphores (scrollers hadn't been invented then) and remote pan and tilt of the few remote instruments around, were carried out on separate devices and not on the desk itself. Soft and proportional patching hadn't arrived and so overall less was being asked of the desks so they could be simpler.

But in general the desks of the 70's and early 80's were designed by engineers who also operated lighting in theatres during their time off, partially for the fun, and partially to learn. Since then, the software people have taken over and we've arrived at the equivalent of the video recorder which few people can program totally. Interestingly, this applies to theatre but not rock-and-roll which has steadfastly refused follow theatre downmarket into the cheapies range and still produces desks well designed by the operators themselves. Cheap desks often take longer to figure out - false economy therefore. For many small venues a manual preset system would be preferable. No training needed, less maintenance, less risk, more hands-on and you can tell what you've got at a glance. Plus, small venues often receive small shows staffed by one stage manager - how do we train these people - whose prime function is not in lighting - if desks are getting more and more complex?

Why can't we simplify the main actions and differentiate these from the more complex ones which we accept might require more key pushes? Why can't we standardise on the terminology from one supplier to the next? Why are instruction manuals written for people who already know how to operate the desk?

Today the obscurity of functionality on lighting desks is slowing and over simplifying plotting sessions, ironically putting at risk the very complex options the desks are designed to deliver. The issues are not the sophistication of desks or the training of operators but the lack of understanding by desk designers of what operators (and lighting designers) need. Decades after others produced legendary systems it's time we got it right.

"...the desks of the 70's and early 80's were designed by engineers who also operated lighting in theatres during their time off..."



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## Momma's Little Coffee Cup of Horrors

One more cup of coffee (literally) on the road

There's nothing like a nice cup of coffee when you get to work to get the day started. Sit down, check the email while sipping on a cup of liquid speed. I used to have a cup of tea with breakfast, but with the onset of the early foothills of imminent middle age I found that by the time I got half way to work, what with the jolting of stop-start driving and the rumble of the big V8 vibrating my kidneys I was starting to feel a distinctive build up of water pressure. So much so that when I finally reached the factory my back teeth were starting to dissolve.

Rather than get arrested for watering the horses in a public place, I now wait until I'm actually at work before commencing encaffeination.

Back in the old days we used to have a Café Bar machine. Remember them? I imagine they're still going, but probably in a more modern version than ours was. This must have been an early prototype - a large hammertone green sheet metal monstrosity we picked up at a factory auction for about \$20. We basically used it as a hot water urn, since the cost of buying the coffee powder from the distributor outweighed the cost of International Roast by about five to one. We placed it down the back of the factory near the wash basin, in an area we euphemistically called the kitchen, and after cleaning the dirt, dust and dead wildlife out of its tank, we left a mixture of thinners and Pine-o-Kleen bubbling away in it for a day or so, and then it was ready for action.

For a while it was quite a luxury.

"Like a cup of coffee?" we'd say to visitors, and instead of waiting for the old electric jug to boil, a steaming hot cup would be in their hands within a few seconds. People who knew us from the electric jug days were mightily impressed, and convinced we were on our way to corporate success.

One day while Col had gone home for a bite of lunch, a rep from an electronics component firm came calling. He had some new chips to show Col, but he wasn't due back from lunch for ten minutes. There was no point in showing them to either Dave or myself, since the only chips I was familiar with came wrapped up with a greasy chunk of deep fried gummy shark flavoured batter.

"He won't be long," I said. "Why don't you have a cup of coffee while you wait?"

"Gee thanks mate" he replied, so I grabbed a spare mug off the top of the Café Bar, put in a teaspoon of Home Brand, some hot water and handed him the milk and sugar to add himself. We nattered for a few minutes, sipping at our brews, and I noticed that he would grimace slightly at every sip.

Finally he could restrain himself no longer.

"Mate, I've gotta tell you, this is worst cup of coffee I've ever tasted."

He stood up. "It tastes vile - I just can't drink any more." And he opened the front door and threw the contents of his mug out into the car park. He looked into the mug.

"Aagh Jeez look what's in here!" he groaned.

I peered inside. A mouldy green chunk of something was festering away nicely at the bottom of the mug. Obviously someone about a month ago hadn't washed out the mug and just left it sitting on top of the machine, out of eye level until just now.

"Well, look on the bright side," I said cheerfully, trying to put the best spin possible on the matter. "At least it's not a dead mouse or something!"

His complexion turned a matching shade of green to the mug's contents, and he dashed out of the door and heaved his heart out into the gutter. I closed the door to give him some privacy, and a few minutes later heard his car start up and drive away.

He never ever came back again!

From that time on we agreed upon a system where everyone had to wash their own mug out, and also that of their guest if they'd made a coffee for them. Otherwise we'd become known amongst the reps as Momma's Little Coffee Cup of Horrors.

Then, slowly but inexorably, over a period of weeks the temperature of the water started to drop. Even though we wound the thermostat off the dial, it just wasn't getting to that heartwarming hot jolt necessary for a good cuppa. When it finally hit lukewarm on our personal temperature gauges, Col decided he'd had enough.

"That's it," he yelled, hurling his coffee at the work experience kid, "I'm going to fix it."

Armed with a soldering station, multimeter, screwdrivers, wire and a hammer, he disappeared down the back of the factory.

We could hear him banging away down there for about half an hour or so, and then he returned, beaming over a steaming hot cup of Java.

"All fixed" he announced in between slurps.

We grabbed our mugs and started down the back, but were only halfway there when there was an enormous "WHUMP!" sound, and a mushroom shaped cloud of hot water and steam exploded through the kitchen door.

"Oops," said Col, sheepishly, "Is that the time? Gotta run!" and out the door he went in a hail of thrown coffee mugs.

From then on we bought a succession of Kambrook urns, and now we have a Black & Decker Urnie, and I'm pleased to say we haven't lost a rep since!



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60mm wide x 20mm tall	\$56 mono	\$72 colour
60mm wide x 30mm tall <b>A</b>	\$84 mono	\$108 colour
60mm wide x 40mm tall	\$112 mono	\$144 colour
60mm wide x 60mm tall	\$168 mono	\$216 colour
90mm wide x 40mm tall	\$168 mono	\$216 colour
90mm wide x 60mm tall <b>B</b>	\$252 mono	\$324 colour
90mm wide x 90mm tall	\$378 mono	\$485 colour
Page wide x 30mm tall	\$252 mono	\$324 colour
Page wide x 50mm tall	\$420 mono	\$540 colour

**Classified display box size EXAMPLE A**

< 60mm wide >      ^  
   30mm tall  
   v

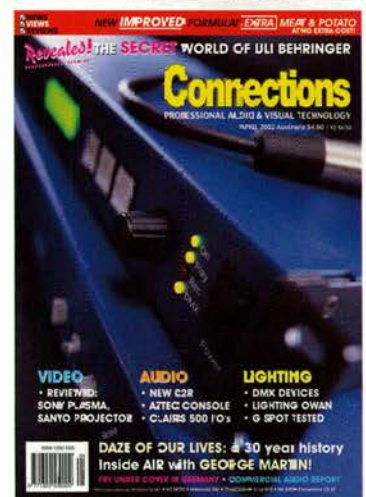
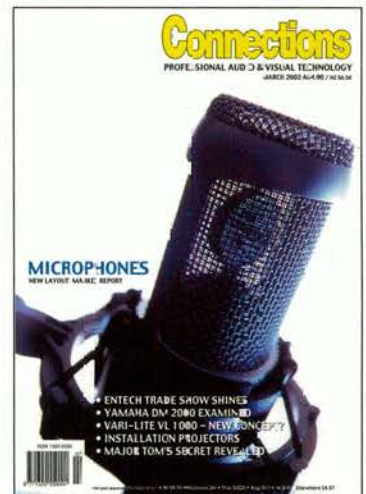
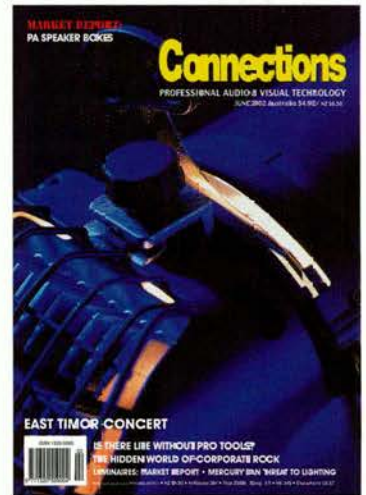
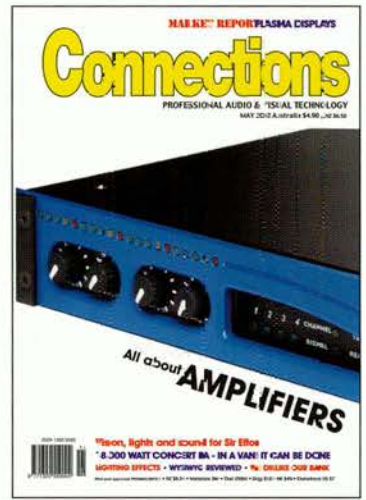
**This size \$84 mono or \$108 colour**  
\$28 per 10mm mono, \$36 per 10mm colour

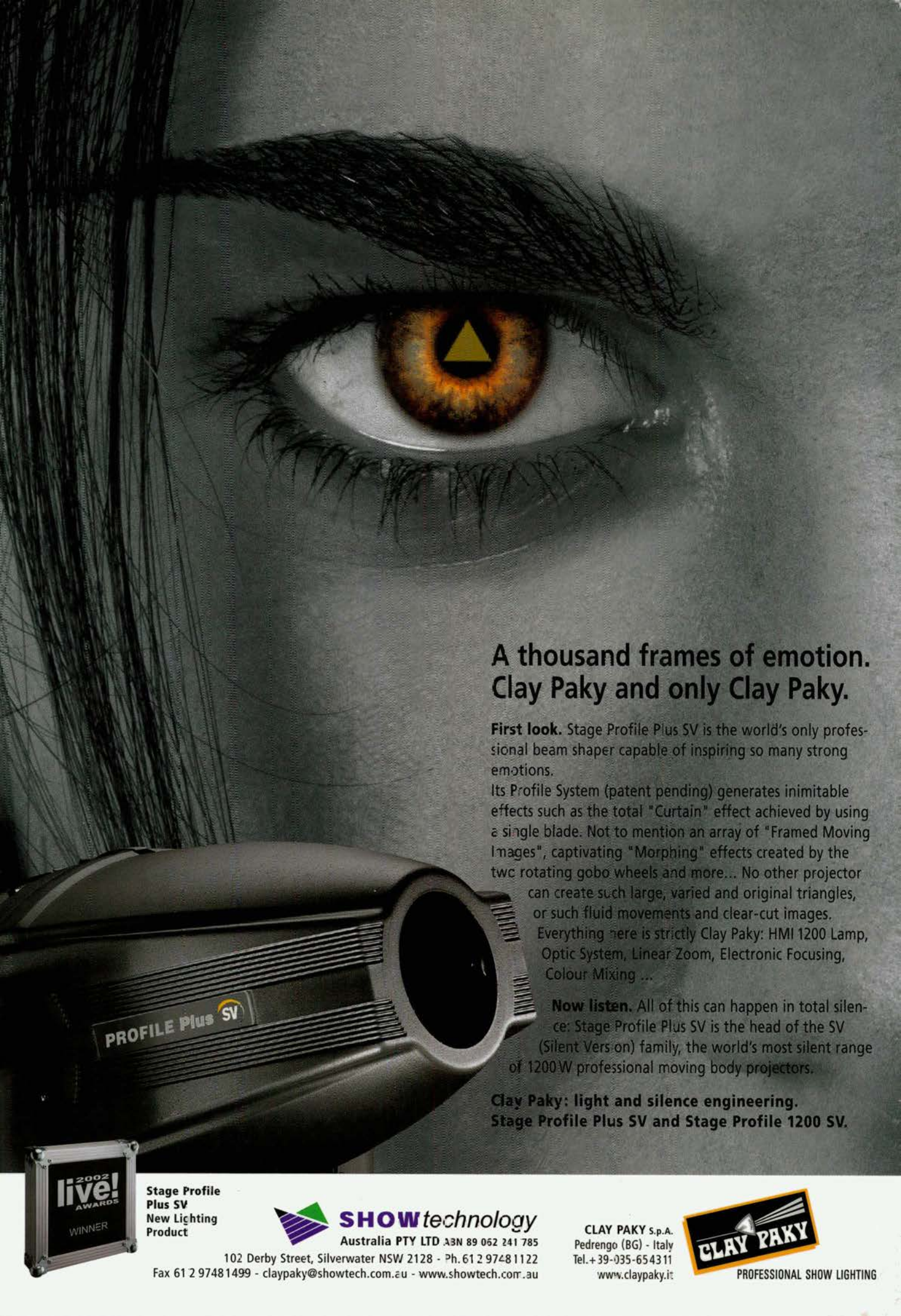
Simply email text or art and billing info to [rrail@conpub.com.au](mailto:rrail@conpub.com.au) by the 20th of the month.

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THIS WIDTH, HEIGHT/PRICE	Classified display box size EXAMPLE B
10mm = \$42/\$54	<p>&lt; 90mm wide &gt;      ^    60mm tall    v</p> <p><b>This size \$252 mono or \$324 colour</b> Priced per 10mm of height. EG: for this width it costs \$42 per 10mm of height mono, or \$54 per 10mm if in colour. See prices at left to calculate. Any height advert is possible, as long as width is one of these: 60mm, 90mm or 180mm (full page).</p>
20mm = \$84/\$108	
30mm = \$126/\$162	
40mm = \$168/\$216	
50mm = \$210/\$270	
60mm = \$252/\$324	

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