

... includes giant plastic coated 2001 wall planner

Connections

The Entertainment Technology Magazine

DECEMBER/JANUARY 2001 A\$5.50 (inc GST)

WIRELESS MICROPHONE MARKET REPORT



PROJECTION PREDICTIONS FOR 2001

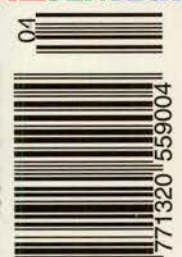
... dmx devices compared

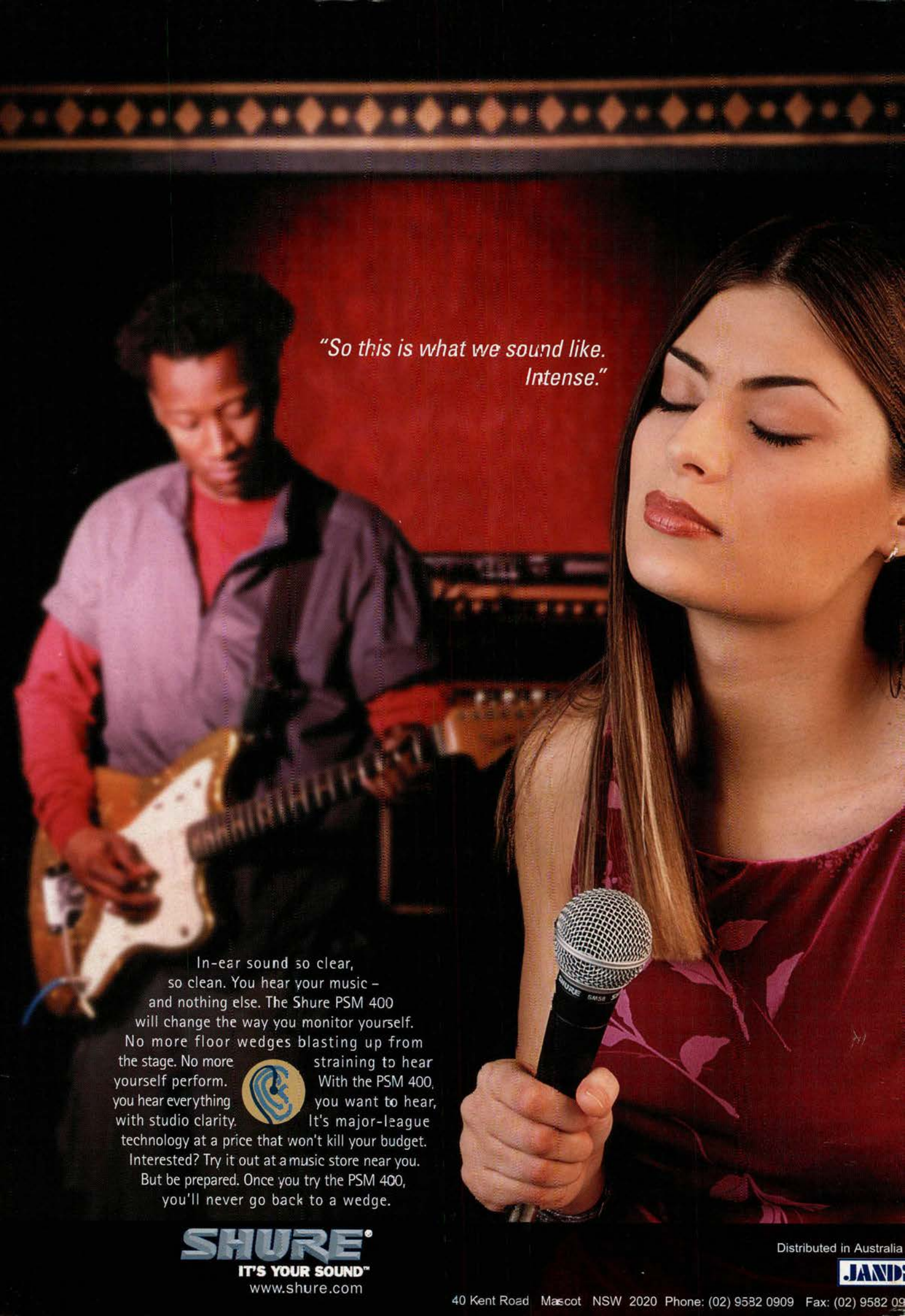
YAMAHA 16 TRACK HD RECORDER
INNOVA SON SENSORY DESK

... touring: Farnham and Quo


HISTORY: SOH LIGHTING

with
PRESENTTECH





*"So this is what we sound like.
Intense."*

In-ear sound so clear,
so clean. You hear your music –
and nothing else. The Shure PSM 400
will change the way you monitor yourself.
No more floor wedges blasting up from
the stage. No more straining to hear
yourself perform.  With the PSM 400,
you hear everything you want to hear,
with studio clarity. It's major-league
technology at a price that won't kill your budget.
Interested? Try it out at a music store near you.
But be prepared. Once you try the PSM 400,
you'll never go back to a wedge.

SHURE[®]
IT'S YOUR SOUND™
www.shure.com

Distributed in Australia

JANDI

40 Kent Road Mascot NSW 2020 Phone: (02) 9532 0909 Fax: (02) 9582 09

HOT Summer Special



Buy any **EV N/DYM**® wireless system featuring Clearscan valued to \$1199^{RRP} and RECEIVE 1 x **EV N/DYM**® N/D767A VOCAL MICROPHONE VALUED AT \$459^{RRP}

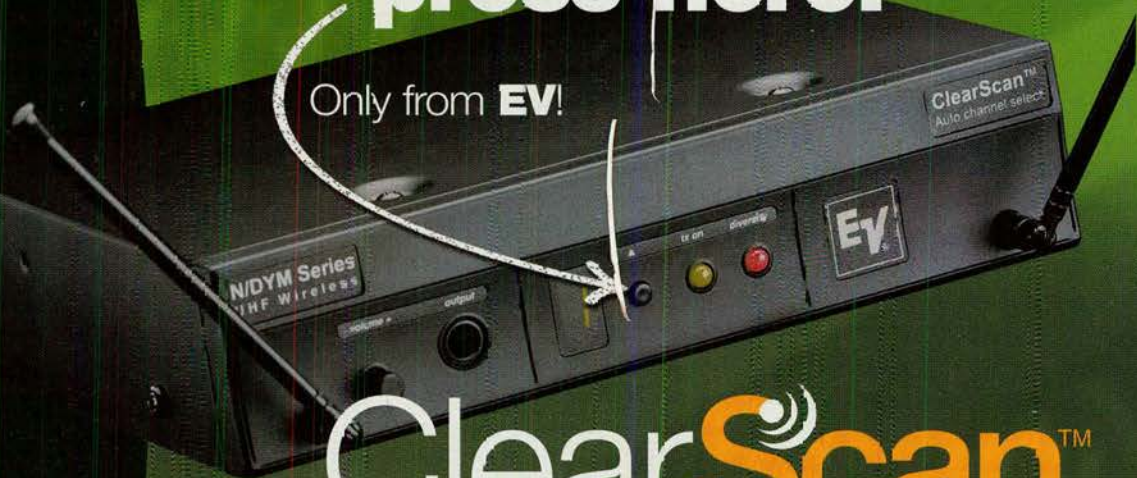
FREE

Offer expires
January 31, 2001

For a clear wireless microphone channel...

press here.

Only from **EV!**



ClearScan™

Grab A Free Channel Fast

**7 different
system
configurations
available**

With the simple touch of a button, EV's new ClearScan™ technology automatically searches the airwaves and quickly selects the best of 10 UHF channels – so you can give your best, worry-free performance.



EVERYWHERE™

The **EV N/DYM**® Wireless Series from EV... automatic channel selection and so much more. Phenomenal ClearScan™ technology, awesome EV sound, easy set-up, and all at a price that's right for you.

For more information or your nearest Electro-Voice Dealer contact **EV Audio (Aust) Pty Ltd.**

Head Office: Tel: 02 9648 3455 Fax: 02 9648 5585 Email: sales@eviaudio.com.au

In Victoria: Tel: 03 9796 7777 Fax: 03 9796 0861 Email: vic-sales@eviaudio.com.au



Giotto Spot 250: beats them all!

- Philips MSD 250/2 lamp
- Linear zoom (9° - 24°)
- Extremely powerful (6,000 lumens)
- Absolutely silent
- Fast smooth iris
- Electronic and automatic focus
- Linear dimmer (0-100%)
- Shutter / Strobo: 12 flashes per second with music sync
- 9 dichroic colors + white + filter - a total of 20 colors
- 8 indexable rotating gobos + 3 easily interchangeable fixed gobos
- Gobo scrolling with variable speed
- Gobo shake
- Minimum gobo rotation speed 10.1 rps)
- Colourchanger and gobochanger with blackout
- Colourchanger and gobochanger with music sync



- 2-tone beam, analog color selection and 16-speed rainbow effect
- 2 rotating 4-faceted prisms with variable speed in both directions
- Frost filter smoothly variable from soft-edge to full-wash
- Wood filter, CTO filter.
- Electronic ballast 90-245 V
- Automatic repositioning with black-out
- 16 bit movement, 540° Pan (2.8 sec) and 270° Tilt (1.7 sec)
- Power Factor Correction.
- Safety cooling fans only operate in the event of overheating
- Macro
- Remote lamp on/off and reset via DMX
- Microcomputer with display for setting fixture functions and status



From the Editor

Technology Briefings Run Amok

Either it is that time of year, or numerous of the industry's marketing executives have decided that the month just gone would be a wonderful time to hold a seminar, have a product demonstration or simply get a bunch of people in a room and blab at them.

I briefly attended Jands' audio workshop, found some interesting new products and chatted to some interesting people. Likewise, the Group Technologies function was a low key, but informative and interesting event. Julius said the Clay Paky gig was good too.

However, then came a completely different type of event that had me asking exactly why it was run in the first place.

You would think that Dolby Inc would be able to run the most interesting of any of these type of functions. Not only are they a very big, important and influential American company, but their product is inherently interesting (at least to me it is).

Sadly, what I saw of the Sydney Dolby Conference was a staggering waste of time. Invitations went out to every broadcast and cable television network, equipment dealers, audio engineers and some journalists.

Dolby managed to gather quite a sizeable group of technical people who already knew quite a bit about surround sound.

Imagine my surprise when the first two hours of the full day program was spent describing "What Is Dolby" - as if the presentation was being made to an end user that was about to buy their first home surround amp, as opposed to the technical elite that surrounded me. After the first two speakers talked about exactly the same things, I knew it was time to leave.

I do not know what the third speaker said, nor what was presented after lunch, but I sincerely hope that they used more wisely the time of the people that stayed. As for me, I could not afford to waste an entire day on more of what had happened for the first two hours, so I decided to forgo the free lunch (I am obviously not a true journalist yet) and go back to work.

-John Grimshaw, Editor.
email john@conpub.com.au
or call +61 2 9876-3530.

Inside your news magazine:



Remote DMX Compared
Page 26



MARKET REPORT
Wireless Microphones
Page 34



Olympic Projection
Page 60



Yamaha AW4416
Page 78

News

Wireless Audio Systems face license charge	7
Barry White leaves the audience wanting more	7
AES hope to revive local convention	7
Comdex trade show set to grow	8
Gearhouse denies rumours	8
Turbosound distribution moves to Audio Telex	9
Trade Shows 2001 - list of world trade show events coming up	10

New Products

Martin release the Exterior 300	12
Color Kinetics to re-release the MR16	12
Seagate release two new hard drives ranges	12
Shure release the KSM-44 vocal recording mic	14
Leem Tri-amp mixer	14
TC-Helicon's Voice Prism audio processor	16
Stanton's new valve based DJ mixer	16
QSC release DSP module for amplifiers	16
ARX introduce 8-way audio level matching box	18
Shure sub-miniature microphones	18
Pioneer have two new DVD-RW devices	22
Altinex Tilt'n'Plug	22
Clarity Lion 67" XGA display	30
JVC's AVP1000E - technology replaces the OHP	30
Mitsubishi's new projector - LVP-X400U	30
Canopus DVRExRT - non-linear video editing	33

Features

Group Technologies' Seminars - Meet Nexo and Camco	20
DMX Remote Control - two products compared	26
Gary Kaye's predictions for AV in 2001	32
MARKET REPORT - Wireless Microphones	34
John Farnham's new tour	50
Witches Of Eastwick - UK musical hit	56
PIGI projectors at the Olympics	60
Lighting Control at the Sydney Opera House	63
Innovason Digital live mixing console reviewed	71
Status Quo tour comes to Australia	74
Glennelg Jazz Concert	77
Yamaha AW4416 - multitrack recorder and mixer	78

Regular Features

Letters	24
Graham Walne - Stand and Deliver	70
Duncan Fry - The Cheque's In The (e)mail	73
EMTEC Tracking Guide	78
Live Sound Mixing Extract	84
Classified	85
Connections Shop	88

World's easiest subscriptions!

Au \$52 1 year inc gst (Save \$8.50) Au \$86 2 years inc gst (Save \$35 on normal cover price!)

NEW ZED:
 AU \$80 1 yr
 AU \$120 2 yrs
 ASIA:
 AU \$80 1 yr
 AU \$140 2 yrs
 USA:
 AU \$115 1 yr
 AU \$199 2 yr
 EURO:
 AU \$125 1 yr
 AU \$240 2 yr

Step one. Decide to save up to 28% on our cover price!

Step two. **You want your mag early, before the newsagent!**

Step three. You know we are very trusted to do this right!

3 VERY EASY WAYS TO SUBSCRIBE:

(A) Use our online form at www.conpub.com.au ; or -

(b) Call Sarah on 1-800-635-514 in business hours ; or -

(c) Fax us your name, address, phone and email, and creditcard details. Just note if you want one or two years. (2 years saves even more!)



BIRKART FAIRS & EVENTS

Member of Birkart Globistics plc

60 offices worldwide



- Total World Tour Planning
- Airfreight & Air Charters
- Sound and Lighting Logistics
- 48' Concert Touring Vans
- Major Event Logistics
- Carnet Specialists
- Offices Worldwide



Let us perform for you!



BIRKART FAIRS & EVENTS PTY. LTD.

MELBOURNE:

28 Clarendon St. Southbank 3006 Vic. Australia
Ph: 03 9696 3607 Fax: 03 9696 5927
Email: phocking@iaccess.com.au

SYDNEY:

Level 2, Suite 4, Centrum Place 6-8 Crewe Place,
Rosebery 2018 NSW Australia
Ph: 02 9313 8694 Fax: 02 9313 8695
Email: chris@birkart.com.au

Check out our website
at www.birkartfairs.com

*Proud to be associated with
our travel partners*



EXHIBITION
AND EVENT
Association
of Australia

Connections

The Asia/Pacific Entertainment Technology Monthly **DECEMBER/JANUARY**

Wireless Audio systems face license charge

By John Grimshaw

The Australian Communications Authority (ACA) may investigate the possibility of charging for licences to use wireless audio devices. Currently, these may be used where there is no other requirement for the frequency by a TV broadcaster.

The ACA is the regulatory federal government body that allocates radio spectrum in Australia. They became interested in the prolific use of radio microphones and in-ear monitors (IEMs) during the Olympic Games, where a reported 813

different wireless frequencies were used.

Colin Christianson of the ACA said that the situation regarding the "Low Interference Potential Devices" class license gets regularly reviewed, and the next review is likely to happen in 2001. This class licence currently allows radio microphones to be used in the 174 to 230 MHz range (VHF) or 526 to 820MHz (UHF) where the device is not being used in an area where a broadcast

MARKETREPORT

WHAT IS AVAILABLE? See page 34



television station is operation.

The other major limitation that was brought to the attention of the ACA was the 3mW transmission power restriction. Indications are that it would be worthwhile for the entertainment industry to lobby for the specific requirements that could be built into a re-drafted license. With the introduction of digital television taking up seemingly random frequencies in the UHF spectrum, a formal license may soon become a necessity to guarantee the availability of spectrum for wireless audio use.

AES hope to revive local convention

SYDNEY: The AES (Audio Engineering Society) is looking at stepping up interest in its activities in the region. The AES International Secretary and microphone guru Ron Streicher was in Australia for a technical lecture tour last month.

"It was very good" says Sid Kidman, who attended the Brisbane session one recent Saturday with about 30 others. The one day session was in two halves, and cost nothing to attend. "Many people would have learned a lot from this", says Sid.

"I'm sorry the grapevine didn't include your publication" said Ron Streicher when we contacted him afterwards. "The tour included five cities. As well as Brisbane and Melbourne, I also have given presentations in Adelaide and Perth."

Mr. Streicher said the AES was keen to revitalise membership, and hopefully conduct an Australian convention in the next year or so. He said that the option of holding a convention alongside an existing event, such as SMPTE or ENTECH, was a possibility - despite the AES rejecting co-operative offers of this kind on numerous occasions.

The AES operates successful sections in Brisbane and Adelaide. A new section in Perth is looking favourable following interest created by Tom Lubin. Likewise, the dormant Sydney section may be reborn due to the efforts of Australian digital audio pioneer David McGrath and others.

Melbourne's section is in need of new members and enthusiasm.

The Audio Engineering Society is the standards body for professional audio worldwide. • www.aes.org

Revolting audience demand revolving Love God

Australian promoter **Paul Dainty** must regret his public relations team hyping the Barry White show as the 'concert of the year' - after some of the Sydney opening night audience stormed the box office demanding refunds.

Mr. White sat static on a fixed stage and played forwards, leaving some in-the-round audience looking at his back.

Also, a tight production budget and limited rehearsal left the crew struggling to cope with a mumbling lacklustre performer and poor sightlines. Which is unfair on them.

• *Connections always tries to assist. Our artist Brett Bower has come up with a low cost solution for future shows of this kind. Just pick a caption:*

- I just need some lovin'!
- It appears to be stuck!
- Ugggh! This fricken thing is REALLY HEAVY!
- Damn - I wish we could afford a motor....
- It turned fine in rehearsal - but he wasn't here!



CONNECTIONS

ISBN: 1320-5595

CONNECTIONS is published monthly - except January - by Connections Publishing Pty Ltd
Australian Company number 058 443 182
ABN 66 058 443 182

Mail: PO BOX 439, EPPING
NSW 2121 AUSTRALIA.

Deliveries: 16 Willoughby street.

Web: www.conpub.com.au

Email: mail@conpub.com.au

Phone: +61 2 9876-3530

Fax: +61 2 9876-5715

Lazy Hours: 0900 - 1700 Sydney.
After hours try any of the mobile numbers below, email, or fax.

Advertising:

Julius Grafton, (Publisher)
julius@conpub.com.au,
call toll free 1-800-635-514
or +61 2 9876-3530.
Mobile 0408 498-180

Subscriptions: call toll free
1-800-635-514 or +61 2 9876-3530
or email sarah@conpub.com.au

Bulk sales, dealer sales: toll free
1-800-635-514 or +61 2 9876-3530
or email sarah@conpub.com.au

Newsagent sales: NDD code CNC.

Publisher: Julius Grafton
julius@conpub.com.au
mobile 0408 498-180

Acting editor: John Grimshaw
john@conpub.com.au
mobile 0408 833-394

Melbourne bureau: Mandy Jones
mandaj@deakin.edu.au
mobile 0414 537-847

Contributors: Worldwide.

Write for us: We welcome your unsolicited material, however rough, and we don't mind spelling mistakes. If your stuff is exactly grammatically correct and gorgeously spelled, we reserve the right to introduce *small errors*, to maintain our track record....

Legals: Nothing herein to be reproduced or transmitted by any means without the express written approval of the publishers. All contents copyright of Connections Publishing Pty Ltd. All material thought to be correct at time of publication, but we accept no legal responsibility if it isn't. You can always take legal action against us, but in any case we always prefer to run a correction in the very next available issue if anything published herein is faulty in fact. We have made every reasonable effort to track original copyright holders.

Lawyers: Depends.

Why do you want to know?

Accountants: Partlett, Chave and Rowland, Sydney.

Printed in Sydney by: John and Garry and crew at Superfine

Reprographics: Omicron. 8th year.

IT consultant: Brendan King

Platform: Apple Mac G3, G4 (Page Maker 5) on a Win 2000 server.

Superb advertising production: shazartshop: Sharon McGuire
call +61 2 9981-2891 or email
smiceli@one.net.au

Who is doing what?

COMDEX grows as AV meets IT

By Sherrie Morreall

Las Vegas: Although the vast COMDEX trade show is focused primarily on the business of information technology, the AV Industry was on hand like a red-headed-step-child, reminding everyone of the advancements and necessity of presentation technology in almost every business application.

Its presence was subtle, but it was there. Amid an array of the latest in wireless products, including Handsprings, Palm-Pilots, and free T-shirts, everyone with a wireless do-hickey mentioned the Presenter's best friend, PowerPoint. As various international industries continue to merge, we see that we are all tainted with technology - and what

better way to show off technology than with technology? As digital cameras increase to a holding capacity of 128MB of RAM and laptops are prepared to connect to nearly any projection unit, the up and coming power of the presentation industry is evident.

Kim Myhre, Executive Vice President, Key3Media Events, Inc. said: "The three themes now driving COMDEX are: Pure Content, Naked Commerce and Wall-to-Wall Community." Go figure.

Virtually every product shown, from handheld wireless devices to LAN servers, listed compatibility with Audio-Visual hardware connections and the ability to host large presentation type, complete with audio and visual clips.

The presentation industry is inter-dependent on the growing multimedia industry as well. In recognition of this, Multimedia Victoria (www.mmv.vic.gov.au) was on site to promote Information and Communication Technology (ICT) with the goal of increasing e-commerce and enticing overseas investors with Victoria's growing ICT knowledge base. Most recently they announced a series of initiatives to further encourage school children into ICT careers. "One of the biggest challenges facing the IT industry is the shortage of skilled people," John Brumby, Minister, said. "Over the next three years 100,000 new IT jobs will be created in Australia, but up to half of those will remain unfilled unless action is taken now."

Useful stuff? Try this. Connection by Boeing was announced to ease your flight path - at least through North America and Northern Europe. A planned satellite will be used to provide internet connectivity to flights over the US. The booth (*below*) was decked out- literally, like an airplane cabin, complete with multi-functional computers built into each seatback, to make a more enjoyable flying experience. Each mounted computer is complete with a DVD player!

Gearhouse CEO lashes Mebourne exit rumours

Gearhouse Group Australia Managing Director **John Bond** has lashed out at rumours the group may quit the Melbourne market. Copies of a report by a major accounting group have circulated, where the opinion expressed is that Gearhouse plan to quit Melbourne.

Nothing could be further from the truth, according to John Bond, who says he understands the report was commissioned to provide a court valuation of a competitors business. Legal action by Gearhouse is contemplated.

Pro Audio Supplies sold

The Canberra store that is widely held to be one of the most successful M.I. (musical instrument) and pro audio outlets in Australia has been sold. **Nunzio Gambale** and family have operated Pro Audio Supplies since 1983, and dominated the Australian M.I. mail order catalogue business since. Their catalogue is an A to Z of the industry, and although challenged, it has prevailed.

Ivan Stefanchuk of Beta Music in Canberra is the new owner, and according to Nunzio all existing staff have agreed to stay on. The business was sold in November.

"To tell the truth, I started to get bored with the business in 1994" Nuzio said, "and developed several other things since". Primary of these is QX Corporation which has just obtained a large research and development grant to produce a chipset of its concept, a secret product described as a 'disruptive technology' by a major US I.T. firm.



Turbosound distribution moves to Audio Telex Communications

In a surprise move, the UK's largest maker of loudspeaker systems, Turbosound, have announced they are shifting distribution of their products in the Australian market.

Audio Telex Communications have been appointed, from January.

"Turbosound offers Audio Telex and its dealers a wealth of opportunity. The huge appeal of Turbosound for us, was not just their reputation and status in the industry, but also the huge range of products they offer" said Stuart Craig, National Sales, Marketing and Export Manager for Audio Telex.

"With Australian Monitor, Turbosound, MediaMatrix, Sabine, Symetrix and our other ten or so agencies, we feel we offer our dealers and their customer's a host of opportunities and a depth of choice. We have been offered a number of speaker brands over the past couple of years, but we knew what we wanted and we knew Turbosound was just the right brand for us and our customers. Prestige, heritage, a broad range and a very dynamic company who last year proved that by releasing almost 20 new products."



Pro Light and Sound have opened a new 2000 square foot AV, pro audio and lighting showroom in Melbourne. Visit them at the corner of Clayton and Whiteside Roads, Clayton. Call +61 3 9562-7211

Show Technology recently hosted a Clay Paky product tour of Australia. We caught up with Angelo Cavenati and Renato Ferrari of Clay Paky at Lots of Watts in Sydney. Pictured are Lots of Watts CEO Greg Kean, Picton High School music teacher Suzi Brandstater, Graduate Natalie Weaver, and Don Jones of Thirlmere Visible Solutions.



Factory expands

Factory Sound owner Warren Eales gave Connections the grand tour of his expanded premises recently.

It is now the largest audio showroom in the region, and has grown to occupy all the former rehearsal studios at the famous 75 - 85 York street South Melbourne address. They have something for everyone, including a coffee shop. Well worth a visit, we say!

People & Moves

● Unconfirmable rumours just keep on reaching us that Clair Brothers have purchased Showco. These two companies are number one and two in the US sound reinforcement market. Showco is a business unit of Vari-Lite Inc., which has struggled against shrinking margins in recent years.

● Legal skirmish: at presstime Connections Publisher Julius Grafton was served with a Subpoena as a witness to give evidence in a case involving former Show Technology director Rod Salmon. The case is listed at Parramatta Local Court, and involves an Interim Apprehended Violence Order, Police vs. Salmon.



● Changes at Osram Australia, with Terry Lynch (left) moving into the Sales Specialist role for NSW, while Warner Lulof (right) moves to Queensland to serve that market and New Zealand.

● Audio and Visual Innovations are pleased to welcome Russell Stork to the company as Sales and Marketing Manager. He can be contacted on + 61 7 3252-4022.

● Lex Strauss, General Manager of Grafton's Production Services in Sydney recently got married to Julie Hance, a neighbour of ours here at Connections. Congrats!

● ICIA (Australia) Have Moved... New contact details:
Telephone +61 2 9785 4577
Facsimile +61 2 9785 4578
Postal: PO Box 643, Padstow NSW 2211. Email jseller@iciahq.org

● Syncrotech Systems Design welcome their new product manager, Brent Heber. Brent is a post audio / live sound guy. Call +61 2 9879-0800.

Who is doing what?

People & Moves

● **David Wright** joins the rapidly expanding Resolution X in Melbourne as Operations Manager. Contact David: +61 3 9813 4666.

● **Ron Easden** has been appointed AMA (The Australian Music Association) President and The Morton Group has been selected to take over the administration of the Australian Music Association. Both **Ian Harvey** and **Sara Hood** are experienced in the industry. The new association contacts are:
AMA, Box 148, 45 Glenferrie Road, Malvern VIC 3144
PH: +61 3 9527 6658
FAX: +61 3 9507 2316

● **ARX Systems** announces the release of the new updated ARX CD ROM V4.0. Register online at: - www.arx.com.au/CD_ROM_form.htm or send your mailing address to email:- info@arx.com.au or fax:- 61-3-9555-6747

● **Alan Brown** in the UK manufactures a fibre optic starcloth; either a heavy serge type or a new lightweight cloth- and wonders if anyone would be interested in distributing them in the region? Contact Allan at high@spec38.fsnet.co.uk

● **Show Tech Australia** have a new, up to date website including information about rigging courses and lots of other interesting information. www.showtechaustralia.com.au

Night-Shift Go Lamba

Sydney company Night-Shift Entertainment Services has changed its name to the Lamba Audio Visual Lighting Group.

The main reason why this change has taken place is that there has been an increasing demand for their services in new areas, including the installation of 100V Line Systems and Background Music Systems.

To coincide with the name change, they will also be changing their operating hours to 8.30am – 5.30pm, Monday to Friday.

However they will still be operating from 9am-2pm on Saturdays.

Norwest Miles of Cables

Norwest Productions ended up with the rights (and obligation) to remove all the SOBO cabling from Stadium Australia and now have around 6kms of Belden 12-pair and 10kms of Belden mic cable. They also have many kilometres of video cables (triacs, BNC, HDTV etc) and a lot of CAT 5 (shielded and unshielded) which they plan to sell off over the Summer.

CLS settled in new digs

History is the flavour at the new-ish home of CLS (Concert Lighting Systems) on The Kingsway at Southbank. CLS owner **Trevor Lloyd** purchased the landmark old Klarion building which in more recent times was a home to Strand Lighting. With 23,000 square feet and 55 car spaces, Trevor probably has a keen eye on the property market.

He still works hard, driving the company truck to Sydney every other month, keeping the fledgling Sydney branch stocked.

CLS are one of the oldest lighting companies in Australia, and make an increasing variety of truss, as well as hiring, doing productions, and retailing lighting. Ask nicely and you may be able to view the collection of ancient lighting equipment upstairs.

Trade shows 2001

- **NAMM (M.I./Audio)** 18 - 21 January 2001. Anaheim, LA. www.namm.org
- **MusikMesse (Sound/Light/M.I.)** 7 - 11 March, Frankfurt. www.messefrankfurt.com
- **NSCA (Audio)** 8-10 March - Orlando Florida. www.nasca.org
- **INFOCOMM Asia.** 21-23 March - Singapore
- **PLASA (China)** 4 - 6 April. Shanghai. www.lightandsound-shanghai.com
- **NAB** 21 - 26 April. Las Vegas. www.nab.org
- **AES 110th (Audio)** 12 - 15 May, Amsterdam. www.aes.org
- **INFOCOMM International (AV)** 13-15 June - Sands Expo And Convention Center, Las Vegas
- **SMPTA (Broadcast)** July 10-13. Sydney. www.smpte.org
- **Plasa (Lighting and Sound)** 9-12 September. London. www.plasa.org.uk
- **AES 111th (Audio)** 21 - 24 September. New York. www.aes.org
- **LDI (Lighting)** 2 - 4 November. Orlando USA. www.ldishow.com



GEAR TO MOVE?

IF YOU'VE GOT GEAR TO MOVE,
CALL STAGE & SCREEN ON (02) 9383-4544

STAGE & SCREEN
TRAVEL & FREIGHT SERVICES PTY LTD



EAW has something new for your audio toolbox. Power.

E-Powered

With our new *E-Powered* line, you can now have the same professional, high quality performance you've come to expect from EAW in a powered loudspeaker.

E-Powered loudspeakers are built for flying and ergonomically designed for flexible usage and portability. The *E-Powered* amplifier module, which is optimized specifically for each product type, includes such unique features as circuit breakers, locking power connectors and automatic voltage selection.

E-Powered products EP1, EP2 and EP3 are powerful additions to the EAW family and one more option for you when it comes to expanding your audio toolbox.

For more information about the new *E-Powered* Series, be sure to check out **Powered Tools** at www.eaw.com/epowered. In addition to full product descriptions and technical data for the *E-Powered* Series, you will also find QuickTime clips, customer testimonials and relevant download information. Or, call 508-234-6158 and request the *E-Powered* Tool Kit.

EAW
EASTERN ACOUSTIC WORKS

The Laws of Physics The Art of Listening

One Main Street, Whitinsville, MA 0158E

800 992 5013 / 508 234 6158

www.eaw.com

AUSTRALIA: Production Audio Services Pty Ltd 6-8 Elizabeth Street, Richmond, VIC 3121, tel (03) 9415 1585 fax: (03) 9415 1595 web: www.productionaudio.com.au

EAW is the world's pre-technological and market leader in the design and manufacture of high-performance, professional loudspeaker systems.

What will you be using soon?

Seagate Barracuda & Cheetah Drives



Seagate has delivered a new low-cost disc drive for entry-level servers and high-performance personal computers.

The Barracuda 36ES is an Ultra160 SCSI performance drive that comes in 18 and 36 Gbyte sizes. Designed to be affordable, scalable the drive would be ideal in a number of markets and applications. It is well suited for bandwidth-intensive applications such as video, CAD/CAM, and multimedia.

The drive is also available with the single-ended narrow and wide SCSI interface solutions for those legacy systems needing additional storage resources. It has an average seek times of 8.5 milliseconds, a "Mean Time Between Failure" (MTBF) rating of 800,000 hours, three-year warranty and non-op shock rating of 350 Gs.

The single-unit suggested retail price (SRP) is US\$319 and US\$519

For each size respectively. Australian actual retail prices will vary, and will be determined by Seagate authorised resellers. The Barracuda 36ES will be in volume production by the end of the year.

Seagate have also announced two new members of its Cheetah family of 10K disc drives - The Cheetah 36XL and Cheetah 73LP.

The devices have fast seek times, 4 Mbyte or 16 Mbyte V-code cache options, low power requirements and acoustics, and with both Ultra160 SCSI and 2 Gbit Fibre Channel options. The new Cheetahs will ship during the first quarter of 2001.

More information can be found at www.seagate.com

Martin Professional introduces short throw Exterior 300

Martin has recently launched a new outdoor luminaire, the Exterior 300, which was soon after granted the Architectural Lighting Product of the Year accolade at LDI this year.

The new Exterior 300 is a conveniently compact and powerful short throw CMY color changer in a specially designed weatherproof housing. Designed for outdoor use, its asymmetrical wide throw flood beam makes it perfect for applications where projection distance is limited.

The Exterior 300 can be tucked discreetly into architectural design details of buildings or any other illumination structure. An IP 65 rating means the Exterior 300 can withstand very tough outdoor conditions. A built-in light sensor, memory presets and DMX controllability add to its independent functionality.

Created as an economical alternative to the Martin Exterior 600, the Exterior 300 incorporates many of the same useful features such as full-range continuous dimming.

The Exterior 300 also has a manual beam-shaping function and is designed to complement to the long throw characteristics of the Exterior 600. A convection cooling system ensures silent and trouble-free use for indoor applications as well.



Specifications include

- Full CMY color mixing
- Smooth full field dimming
- Convection cooled
- Asymmetrical beam output
- Optional symmetrical beam angle options
- Based on MSD 250/2 lamp
- DMX control
- On-board programmable memory presets
- Built-in light sensor
- Remote lamp ON/OFF

Martin is distributed in Australia by **Stow Technology Australia** ph +61 2 9898 1111

Colorkinetics set to Re-release the iColor MR

After an international recall of the above product some time ago, Color Kinetics Inc of Boston, USA are close to going back into distribution of this very popular architectural lighting product. With a reported 30,000 units in back order world-wide, Color Kinetics had to recall the device to make it capable of working in enclosed fittings. Apparently the original model was susceptible to failure if used in situations where it could not cool itself. Which sounds like a slight problem...

The MR is a DMX controllable, RGB color mixing, LED based lamp that is designed to be used in standard dichroic MR16 sized fittings. The DMX signal is fed to the device along with power on the same supply cable. This special "powered DMX" hybrid supply is created by the Color Kinetics Juicebox.

The iColor MR is expected to retail at around \$350 when stocks of the new version arrive early next year.

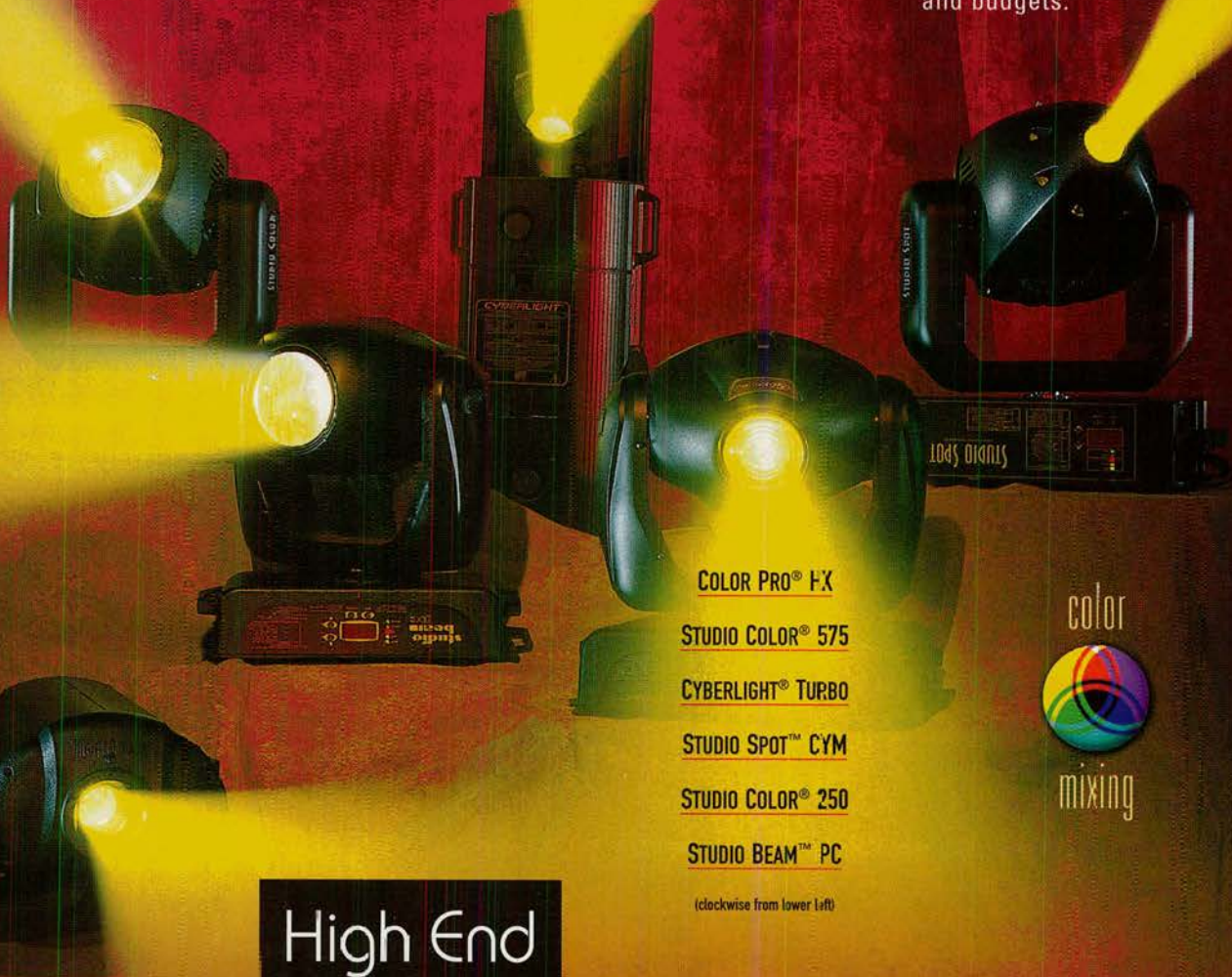
Australian distributor,
Primesite +61 2 9553-1959.



mix & match

With High End Systems' full spectrum of color mixing tools.

We manufacture a complete range of color mixing fixtures for all applications and budgets.



COLOR PRO® FX

STUDIO COLOR® 575

CYBERLIGHT® TURBO

STUDIO SPOT™ CYM

STUDIO COLOR® 250

STUDIO BEAM™ PC

(clockwise from lower left)



High End



SYSTEMS
LIGHTING • WORLDWIDE

BECAUSE QUALITY IS ALWAYS THE BEST INVESTMENT.

High End Systems Singapore Pte. Ltd.

Cencon 1, 1 Tannery Road, Singapore 347719

Tel: 65.742.8266, Fax: 65.743.9322

sales@highend.com

AUSTIN • NEW YORK • LONDON • LOS ANGELES • TORONTO • GERMANY
www.highend.com

What will you be using soon?



SHURE RELEASES FLAGSHIP STUDIO MICROPHONE

Shure has released a top-of-the-line microphone for vocal recording, the KSM44. The new (roughly A\$2,500) condenser mic offers multiple polar patterns - omni, cardioid and bi-directional, and a frequency response of 20Hz-20kHz.

The class A transformerless preamplifier circuitry is designed to virtually eliminate crossover distortion and bring improved linearity across the microphone's entire operating range. Dual one-inch gold-layered Mylar diaphragms provide added low frequency response and improved environmental stability, while the extra-thin diaphragm design (2.5 micrometers) ensures accurate

reproduction of any sound source with extremely low self-noise of 7dB.

While the KSM44's frequency response is tailored for the vivid reproduction of vocals, its capacity for managing high SPLs accommodates loud sound sources such as drums and guitar amplifiers as well. Unwanted mechanical noise can be held in check with the use of a three-position low frequency filter function, which is also useful for controlling proximity effect. As a further safeguard, an internal shockmount attempts to stem stand-related noise.

The KSM44 is housed in a durable zinc die-cast chassis with a champagne coloured finish. A hardened low-carbon steel grille shields the dual capsules from accidental damage and misuse, and accessories included with each mic include a locking aluminium carry case, a ShureLock elastic suspension shock mount, a swivel mount, and a protective pouch.

Shure is distributed by Jands Electronics - +61 2 9582 0909.

LEEM Tri-Amp mixer

Leem say their Powered Mixer series are designed to run all night into brutally-low impedance and sound clean at places of worship, schools, theatres clubs, bars.

A new built-in digital multi effector (DSP) is a key feature.

The PM-860T boasts three internal 200w power amplifiers for left and right stereo main and monitor speakers.

It has three selectable DSP reverbs, 7 band EQ for left & right, and 7 band EQ for monitor, along with 8 input channels. Channels 1 to 6 have balanced XLRs with TRS jacks, and Channels 7 & 8 have balanced XLRs with 2 x Mono Jacks.

• A\$1,249

For more information on Leem, contact CMI on +61 3 9315 2244



Lots of PACKAGE DEALS!

READY TO USE WITH STANDS AND LEADS

YAMAHA EMX 660 MIXER AMP

COMPLETE SYSTEM
\$2999
SAVE \$1200



- 2 x Yamaha S115IV speakers
- Sennheiser mics and K7M stands

MACKIE CFX 12CH MIXER

- 2 x SRM450 powered speakers
- 2 x Shure SM58s K&M stands

COMPLETE SYSTEM
\$5499
SAVE \$2406



2 Bridge Street, Rydalmere NSW 2116
Phone +61 2 9638-0302, fax 9638-0331
sales@lotsofwatts.com.au
hire@lotsofwatts.com.au
www.lotsofwatts.com.au

The company everyone else uses



You don't have to be an expert to sound like one

You no longer need to possess the "golden ear" to be an expert. Our qualified team at NEXO have done all the hard work for you leaving you to concentrate on being gracious in accepting the compliments.

Using proprietary technology, the two-way passive PS-8 loudspeaker and PS-8TD controller require only a single amplifier channel but perform like bi-amped loudspeakers twice the size, reducing system cost and complexity. Our unique, rotatable *Asymmetrical Dispersion Constant Directivity Horn* and cabinet design means the PS-8 can perform standalone, in arrays or as a wedge monitor without compromise. New topology neodymium drivers incorporating NEXO designed magnetic shielding make the PS-8 extremely light and permits installation next to sensitive video equipment without interference.

Without compromise, the entire NEXO PS Series makes it super-easy for the experts to get the best sound available... and the for rest of us? Life's suddenly got a whole lot easier.

NEXO

SONIC INNOVATION THAT WORKS



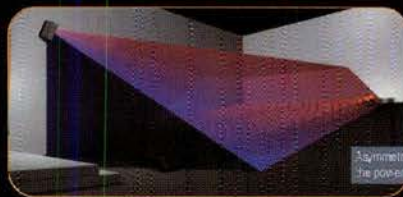
PS

The PS-E system comprises the PS-8, the PS-8TD controller or even the LS-400 sub-Bass (optional).

- Single Channel, Two-Way Passive Design Using Neodymium 8" Woofer and 1" Compression Driver.
- Ultra-Small and Lightweight, Low Magnetic Spill.
- Rotatable, *Asymmetrical Dispersion Horn* and Multi-Use Cabinet Design.
- Exceptional Power Handling: 126dB Peak.



The PS-8 loudspeaker is only 40.5cm (13" tall) and weighs just 1.3 kg (2.8lbs).



Asymmetrical Dispersion puts the power where it's needed.

www.nexo-sa.com



For more information or the location of your nearest NEXO reseller please contact:
Group Technologies (Australasia): 11/41-49 Morca Rd Nunawading Victoria 3131
telephone (+613) 3872 5000 facsimile (+613) 3873 2922 • www.gtaust.com

What will you be using soon?

TC-HELICON UNVEILS "VoicePrism" VOCAL PROCESSOR



Unveiled at the recent Los Angeles AES, TC-Helicon's new VoicePrism Voice Formant & Pitch Processor made an impression with many visitors to the show.

TC-Helicon Vocal Technologies Inc. is a new joint venture between Denmark's TC Electronic and IVL Technologies, a Canadian company specialising in human voice modeling & processing systems. The VoicePrism is the first product release from the new partnership and is intended as a full solution vocal processor for both stage and studio.

"The VoicePrism represents an enormous breakthrough in the control and processing of vocals for everyone from audio professionals to hobbyists," commented Fred Speckeen, MD of TC-Helicon.

"As a revolutionary advance in voice processing, the VoicePrism contains a complete complement of tools designed to expand what is possible to achieve with the most beautiful of all instruments, the human voice."

Unlike simple harmony processors, the VoicePrism has a full range of both lead & backing-voice processing under presets. Both stage and studio performers can easily add a 4 piece backing-vocal harmony section (including gender control) or lead-voice doubling. There are many other creative possibilities.

Designed as a complete vocal processing system, VoicePrism includes a front-panel mic input and high performance 48V mic preamp with 24-bit digital converters. In addition to the advanced vocal harmony & doubling tools, a wide selection of digital dynamics and effects can also be applied - including Compression, Parametric EQ, Delay, Reverb, Chorus, Flanging and more. Vocal setups can then be stored as presets for instant recall.

Operation of the VoicePrism has been designed to be extremely simple & straightforward with most system information available at a glance from the large LCD display. The system even includes a context-sensitive Help and Preset browser. The compact 2U package provides balanced analog I/O's as well as digital S/PDIF. The next few months will also see the release of an optional VoicePrism Expansion Card with a host of additional voice-shaping tools, digital effects and AES/EBU digital I/O's.

The VoicePrism costs \$2,495.

TC-Helicon advanced vocal processors are exclusively distributed in Australia by Amber Technology.
Call +61 2 9452 8600 or
www.ambertech.com.au

STANTON RELEASE DJ MIXER WITH VALVE PREAMPS

The VRM-10 is a DJ mixer that uses valve preamps - which can add a depth and warmth to the sound not found in other DJ mixers. The new model also uses VCA crossfaders and channel faders for long, trouble-free life, with full curve control on the crossfaders to cater to all DJs.

Creative options such as reverb, pitch shift, flange and digital delay are provided by a comprehensive DSP section which includes fully adjustable level, feedback, speed, factor and depth.

Stanton's popular, fully-analogue DJF-1 filter is built in and offers band and notch pass filtering to produce filter sweeps and breakdowns over favourite tracks. Further features include three-band EQ with parametric mids, eight line and four phone inputs over four channels, a fully assignable send and return effects loop and two mic inputs.

Stanton is distributed by Jands, +61 2 9532 0909



DSP MODULE FROM QSC

QSC have released a digital signal processing solution that literally bolts to the back of QSC DataPort-equipped amplifiers or via a mounting plate to any other amplifier - QSC or not!

Simply put, the module, called DSP-3, allows the laptop armed audio engineer to configure and lock, via password protection, an amplifiers' signal processing settings for a tour or installation. Each two-channel unit, measuring just 137x131x48mm, can perform a wide variety of digital signal processing functions such as crossover, shelf and parametric filtering as well as signal delay, compression and peak limiting.

Configuration is made with simple user-friendly 'drag-and-drop' software. Users can access a DSP 'toolbox' with icons and simple drawing tools to configure processing functions and signal flow. The software package also offers real-time control and set-and-forget convenience, as configurations can be saved and recalled for future use.

The DSP-3 also features 0.1 dB steps for precision attenuation, selectable 1.5v/4v/9v/18v input sensitivity, 24-bit, 48kHz converters, contact closures to trigger configuration presets, post-DSP output signal for daisy-chaining signal to other amplifier inputs, memory backup, and power and signal presence LEDs. The module's capabilities will be continually expanded as users download the latest versions of firmware via the RS-232 serial port.

More advanced real-time processing functions are also available with the use of QSC Control II components. Retail price of the DSP-3 (Incl GST) is \$1,495.

QSC is distributed in Australia by Technical Audio Group, +61 2 9810 5300. www.tag.au.com

MAC 2000

Profile

Extreme Light

Power

Intense and pure light output is generated from an ultra-efficient optical system and powerful HMI 1200-watt source.

Color

A full spectrum CMY color palette combines with an innovative CTC system for complete color temperature flexibility to yield a nearly unlimited variety of color choices.

Graphics

An infinite variety of unique graphic looks are possible from two indexable, dual-rotational pattern wheels (5 replaceable pattern slots each), 3-facet prism, iris, variable frost and additional all-replaceable 7-slot color/effect wheel.

Optics

An extraordinary multi-coated 10-lens optical system produces extremely high output and the highest quality projection characteristics available. Easy beam size and beam angle adjustments are possible via a 10 to 26 degree motorized zoom and electronic focus.

Martin
MAC 2000
Series



Martin



Distributed in Australia by Show Technology Australia Pty Ltd • 13-15 Bridge Street • PO Box 480 • RYDALMERE NSW 2116
Phone 61 2 9898 1111 • Fax 61 2 9898 1222 • E-mail: Martin@showtech.com.au • Website: <http://www.showtech.com.au>

What will you be using soon?

ARX Sets the Level



ARX announce the release of the new Level 8, 8 Channel Audio Balancer and Level Optimizer. The unit is designed to interface -10dB unbalanced consumer electronics to +4dB Balanced Professional equipment and is the ideal tool for the critical task of impedance and level conversion.

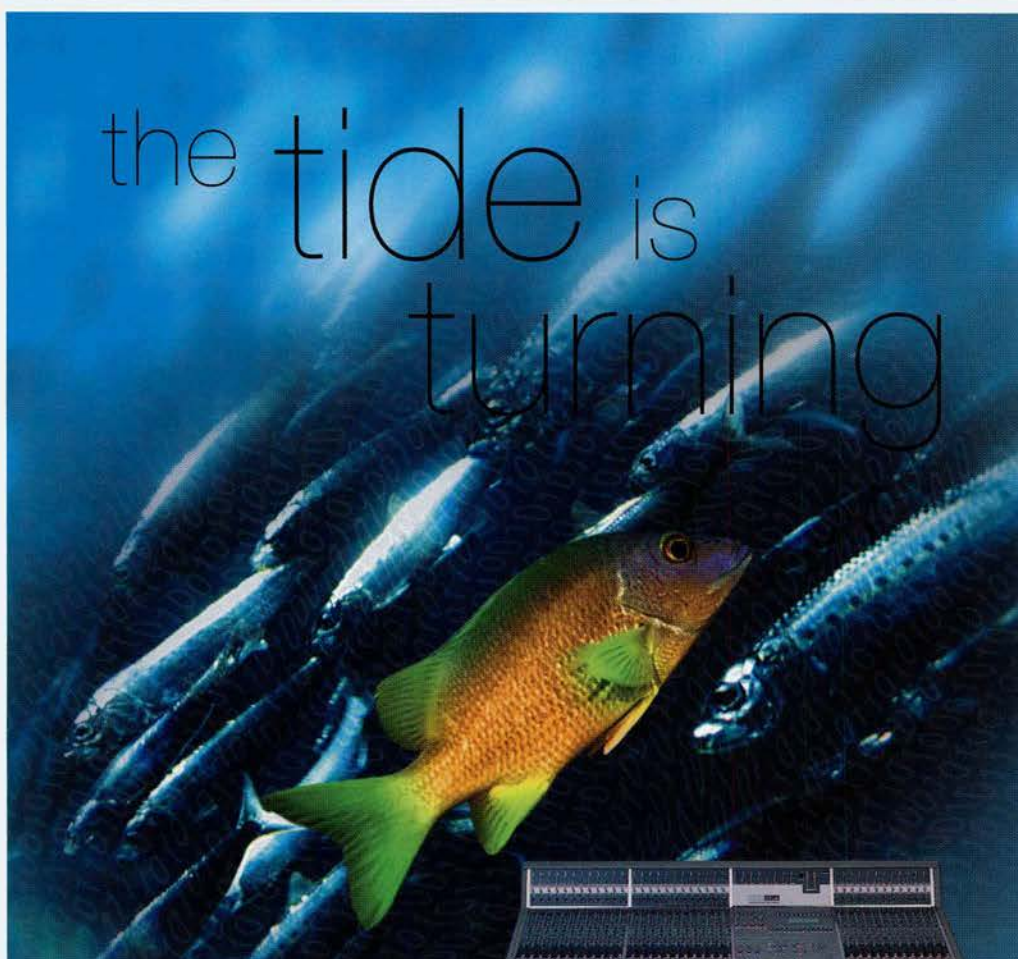
A gain mode switch allows the Level 8 to be used as a unity gain balancer or as a level optimizer, convert-

ing -10dB signal levels to +4dB (a +14dB overall gain). It features unbalanced 6.5mm Jack Inputs and balanced +4dB XLR Outputs.

Silently interfacing -10dB unbalanced consumer electronics with +4 dB Balanced professional equipment has always been a problem. Hum and noise generated by a mismatch at this point will be amplified.

A Gain Mode switch on the rear panel lets you select unity gain through the LEVEL 8, using the device as a balancer only, or as a level optimizer as well, bringing the -10 dB levels up to +4 dB (1 14dB overall gain).

• A\$639 from ARX Systems, +61-3-9555-7859



In an ocean of digital consoles the latest competitor is **analogue**.

The ASP8024 boasts exceptional sonic performance, with an arsenal of features normally found on far more costly consoles.

Just what you would expect from Audient Analogue Signal Processing technology.

ASP 8024
HIGH RESOLUTION MIXING CONSOLE

audient

Corporate Audio Services A.C.N. 988 463 629
188 Plenty Road Preston Victoria 3072
Ph. 03 9474 1067 Fax. 03 9474 1070
URL www.corporateaudio.com.au
Email rowlands@corporateaudio.com.au

SHURE SUBMINIATURE MICROPHONES

Weighing just 0.34 grams with a diameter of 5.8mm, the high performance omnidirectional WL50 is designed specifically for unobtrusive use in theatre, broadcast and event production.

The WL50 comes with two types of equalisation caps that can be interchanged for optimal sound and clarity in different applications. The silver mesh caps provide a mild 4dB boost from 8 to 18kHz and are typically used when the mic is headmounted, while the gold-mesh caps deliver a 10dB boost centred at 12kHz and are ideal for chest-worn mics.

For further flexibility, reduced sensitivity versions are available which provide 10dB more headroom for theatre applications.

Available in black, tan and white, the WL50 has a frequency response of 20Hz to 20kHz. Each model comes with one of two termination options: a pigtailed (unterminated) cable, or a TA4F connector which is compatible with all Shure wireless transmitters.

The WL50 is available on its own from \$660 rrp, or with Shure UHF, UC, SC and LX wireless systems.

The model made an impressive debut at the Olympics ceremonies where it was used for sound effects on the lead horse and the lawn mowers, while pre-release versions of the directional version, the WL51, were used by key speakers including Juan Antonio Samaranch and Michael Knight.

Shure is distributed by Jands Electronics +61 2 9582 0909.





voice

Passionately inspired by the human voice, TC-Helicon introduces a dedicated Vocal Pitch and Formant processor. VoicePrism combines enhanced harmonizing features with integrated Pro Audio effects. For the world's most inspiring instrument - the human voice.

VoicePrism

VOCAL FORMANT | PITCH PROCESSOR

Passionate to get the best out of a track or performance?

The quickest route from imagination to creation of fabulous vocal sounds is VoicePrism. From a rocking compressed double-tracked, slap-backed lead vocal to a smokey jazz vocal sextet in a club. **It's at your fingertips!**

VoicePrism routes your stage, studio or pre-recorded vocals directly from a high quality 48V phantom powered mic or line Input through Compression, EQ, Double-tracking, 4-voice Harmony Processing with Gender and Humanizing controls, Chorus, Delay, Flange and Reverb to analog and digital stereo Outputs. The results? Truly inspiring and inspired!

Put VoicePrism through its paces today!

YOUR inspiration



For details of your nearest TC-Helicon Authorised Dealer, please contact:

Amber Technology Pty Ltd ACN 003 231 187 ABN 86 063 231 187

www.ambertech.com.au

Sydney Unit B, 5 Skyline Place, Frenchs Forest NSW 2086
Melbourne Level 6, 10 Queens Road, Melbourne VIC 3004
Brisbane Unit 1, 220 Boundary Street, Spring Hill QLD 4000
National Toll Free Customer Service Tel 1800 25 1367

Tel (02) 9452 8600 Fax (02) 9975 1368
Tel (03) 9867 7111 Fax (03) 9867 8277
Tel (07) 3831 8444 Fax (07) 3831 8455
Email: sales@ambertech.com.au



TC-HELICON
VOCAL TECHNOLOGIES

Group Technologies introduce Nexo and Camco

by John Grimshaw

Nexo and Camco have had a quiet introduction into the Australian audio scene – something which is a bit odd for manufacturers that build speakers and amps respectively.

Group Technologies, the new Australian distributor of Nexo and Camco products, held seminars in Sydney and Melbourne to introduce the products to installers, dealers and engineers. At the seminars, a representative from each manufacturer spoke, and both had some very interesting things to say.

Reinhard Steger from Camco (which is a German company) gave a very brief overview of what Camco does – amplifiers, dimmers and rigging equipment. This is a bit of a strange mix, and the seminar did not focus at all on the dimming equipment, and only mentioned “in passing” the rigging side of the business.

Reinhard moved on to the amps, and again quickly overviewed the range they build so that he could focus on the Vortex series amplifiers. It quickly became apparent what the haste was about. Any manufacturer that dares you to side-by-side one of their product ranges against a Crown VZ 5000 must have a good product – either that or they do not intend to be around very long.

Their new Vortex 4 and 6 switch-mode amps that are aimed at making some serious in-roads into larger scale amplification, and they come with good specifications.

Try a 2RU, 12.4kg box capable of delivering 2x 3000W RMS into 2ohms, or 2x 2100W RMS into 4ohms. Now think about this box also having a seriously good signal-to-noise ratio of greater 110dB (A weighted), distortion (THD+N) of less than 0.01%, and an onboard microprocessor controller to monitor and manage the entire system.

Camco have obviously spent a great deal of time developing the onboard processing, and they have come up with some very interesting design elements. For example, the outputs from thermal sensors are not used simply to control the speed of a fan. These temperature levels are constantly being compared against what the known values should be, given the workload the amp is performing and ambient conditions.

Also, if the main transformer and/or the heat sinks get hotter than 85 degrees, the input signal to that channel is gradually attenuated. The attenuation reaches its maximum at 90 degrees. At 95 degrees, the signal is muted and finally, at 110 degrees the unit is switched off. Other temp controls include a fan that is run at its slowest speed, and is ramped up in speed as the temp increases from 40 to 60 degrees.

Similar checks, comparisons and controls are made to voltage and current levels at various different points in the amp, and this is where the “intelligence” built into the amp really shows its face. When power first enters the unit, it reaches an unregulated switch mode power supply, which chops the frequency of the AC signal at a much higher rate than the 50Hz coming out of the wall. Then, on to a mains transformer, from which six taps are made to produce the three-stage supply voltage used in the device. These three stages are then intelligently used to considerably reduce the amount of energy dissipation that the signal semiconductors have to cope with as the audio signal is amplified. In any amp, this energy is

dissipated as heat through the heat sinks, so designing the system to reduce the heat before it is generated is a smart move.

On the back of the unit you will notice a little JP45 connector with CAI printed next to it. This stands for “Camco Audio Interface”, and is a way for a PC to monitor and control what is happening to up to 99 amps at the same time. The data protocol is RS485, which is the same protocol on which lighting DMX is based, so sourcing the correct impedance data cable should not be difficult – but you will have to make your own adaptors.

The Vortex 6 sells at A\$8,595.

With the world of speaker fashion looking towards line-array systems, Mick Anderson of Nexo is confident their product will stand the test of time. However, Mick’s presentation at the Group Technologies seminar began by focusing on his work in the system hire business.

According to Mick, in the UK over the last ten years the cost in capital outlay for high end sound systems has increased by 40 to 70%, but many hire and production companies still only make the same profit they did ten years ago – if that.

Prior to working for Nexo, Mick was the General Manager of Concert Sound for a major UK hire and production company, and he could see that the reason why they were all gradually losing money was the cut-throat nature of the business. There would always be another company that

would under-cut your price to try and get the job. With the gradually reducing profit margin, and the ever increasing cost of equipment, Mick decided to pick up the phone and talk to his competitors before he was forced out of business.

What he and five other companies decided to do was to talk openly about hire pricing, and agree on prices at a level where not only would they actually start to make a profit back on their respective businesses, but provide a stable and reasonable price for their clients. While all of this smacks of illegal price fixing, they were able to achieve the desired results without

breaking the law. Don’t try it in Australia, though.

Very soon, the companies involved were able to see a 30% increase in their guaranteed income. Mick’s idea was that each company would be able to concentrate on how they provide their services, and it would be up to the client to choose the company they wanted to work with based on what they wanted from the company.

“The one thing money can buy is service,” says Mick.

The main reason why Mick was promoting this idea was that he knew if he could get it to fly, he would do well because he saw service as the main reason why you get repeat business and great referrals. This was not out of any sense of duty to the customer, it was all about good business sense. It all grew from a concept that he discovered early in the hire business. Most company directors of this type of business focus their priorities on Brand, Company and Self in that order – which according to Mick is entirely the wrong way round.

continued over



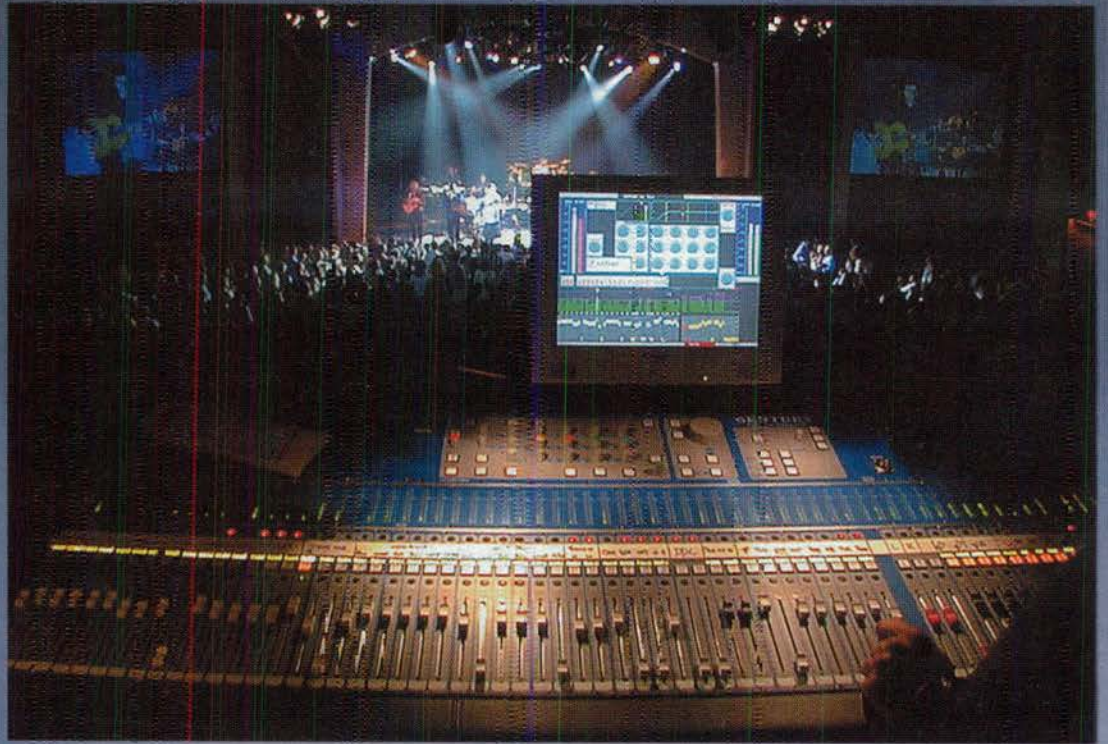
Reinhard Steger



Mick Anderson

sensory reality check:

PROVEN DIGITAL MIXING FOR LIVE SOUND - AVAILABLE NOW



Innova-Son Sensory Live Console as used on the Gypsy Kings' 1999 world tour. Sound Company: Audio Denver

Innova-Son proudly presents the Sensory Live Series range of digital live-sound consoles. Specifically designed to meet the needs of live mixing, the Sensory Live Series can easily handle your toughest mixing tasks, including FOH, stage monitoring and live broadcast feeds. Each is fully digital and available with 48 digital channels (up to 72 inputs) with full dynamics and snapshot reset of all parameters. Distributed in Australia by Production Audio Services Pty Ltd, Innova-Son's Sensory Live Series is your only choice for high-quality digital mixing. The future is here and it's available now. Call Production Audio Services for further information.

LIVE SERIES
Sensory
innova
SON

The New Way To Watch Sound

Distributed in Australia by Production Audio Services Pty Ltd

6-8 Elizabeth Street, Richmond VIC 3121

Te : (03) 9415 1585 Fax: (03) 9415 1595

www.innovason.com

Email: gsteve@productionaudio.com.au Web: www.productionaudio.com.au

What will you be using soon?

GT Seminar (cont)

"Self" comes first – otherwise why would you be in business?

However, to make money with your company, the business needs to be able to generate happy customers. While one way to get a happy customer is to get cheap services, this won't make the hire business last too long, so Mick's intention was to make the customer happy through service.

Finally, Brand comes third because while clients feel better when they are using a familiar brand, it would never be the brand alone that would bring the customers back.

On brands, Mick related an interesting story on one particular incident when he was in the hire business. One particular brand wanted to offer him an exclusive arrangement for using and distributing their gear. Mick turned around and told the company that he would like as many other hire companies as possible to also have the equipment. His reasoning was simple – for jobs that require more equipment than he had, he would then be able to cross-hire the same type of gear, avoiding the problems involved in inter-mixing types and brands.

This kind of philosophy encourages smaller business to survive against the bigger ones, and this is the kind of thing many small businesses across this country need to hear.

How does this relate to Nexo? Mick went on to relate how these concepts apply to Nexo. As a brand, Nexo has actually been around for sometime but they are only recently making in-roads into the Australian market.

Essentially, they build speakers designed for large and medium sized venues, and have some very interesting products. We will endeavour to look at the Nexo range in more depth in some time in the future (there were no demonstration systems working at the seminar), but by all reports it is a very high quality sounding system.

In addition, there are numerous advantages in design that make this speaker range easy to rig, store, move and pack.

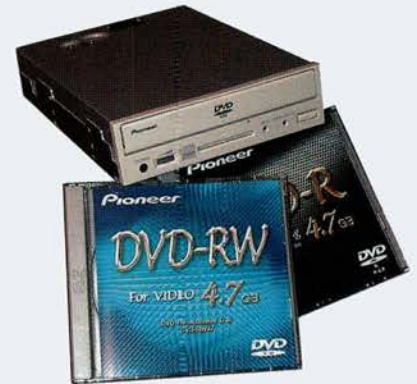
Pioneer Taking DVD-RW By The Horns

In the last month, Pioneer have released two new products, each of which have the potential the revolutionise video and data storage in their own ways. While their are no specifics about when these will be available in Australia, neither of the items are far away.

DVR-2000 DVD Recorder

This is a domestic style DVD recorder that offers playback compatibility of recorded video on many existing DVD players and DVD-ROM drives. In Tokyo, Pioneer Corporation announced its introduction of the company's 2nd generation DVD Recorder, the "DVR-2000", to the Japanese domestic market. The DVR-2000 is a DVD recorder that enables playback of both recorded DVD-R discs and DVD-RW discs on many existing DVD players and DVD-ROM drives.

This device is a sign of things to come, with the aim of the unit to replace tape based video recorders, and to have compatibility between this and stand DVD players. The built-in tuner is designed for the NTSC broadcast system used in Japan – there is no word yet from Pioneer world models designed for other regions (or digital television) will be available. You can pick up one of these in Japan for about 250,000 yen – or about A\$4,350.



DVD-RW for PC Use

This unprecedented drive is going to offer DVD-R, DVD-RW, CD-R and CD-RW capabilities. Pioneer New Media Technologies, Inc., have announced their latest combination recordable DVD/CD drive for PC use. The third generation drive reads and writes four recordable formats including DVD-R (write once), DVD-RW (re-recordable), CD-R and CD-RW, and offers up to 4.7GB of storage capacity per DVD side. In addition, the new drive is capable of recording DVD-R discs at twice normal speed (2X). The new unit will begin shipping to the world OEM market in the first quarter, 2001.

With its expected low cost and compact design, Pioneer's DVD-R/RW drive targets digital video editing and archiving as its "killer application" as well as traditional data and digital image storage applications.

Key features

- Writes and reads DVD-R/RW and CD-R/RW formats
- DVD data capacity of 4.7GB per single-sided disc
- 2X writing speed for DVD-R
- 2X and 1X (DVD-R)
- 1X (DVD-RW)
- 8X and 4X (CD-R)
- 4X (CD-RW)

Tabletop Interconnect Solution



ALTINEX have addressed the problem of table top outlets with their new Tilt 'N Plug Interconnect Box, a device that provides access to

computer, audio, video, network and AC Power connections when you need them and hides them when you don't.

The input plate of the Tilt 'N Plug can either "tilt up" into a raised position to provide access to input connectors or it can be lowered flush into the table when not in use. The input panel is raised by lifting the front lip of the unit and closed by applying pressure to the top panel. A pneumatic spring inside the tower provides pressure to insure smooth and easy lifting and lowering action.

• www.altinex.com or contact the Australian distributor, Axis Audio Visual on +61 3 97612688

ROCK-IT SCIENCE



Crown's powerful CE 4000 amplifier is rocking the industry and redefining efficiency! The advanced patented technology of the CE 4000 allows you to place twice as many amplifiers on any given power output. Don't be a player, be a performer.

Whether it's for a mobile DJ, nightclub, or touring rig, the CE 4000 has the power to meet your application needs. See your authorized Crown dealer or contact Crown direct for more details on the revolutionary CE 4000 and the entire line of legendary Crown amplifiers.

CROWN CE 4000 MAJOR FEATURES

- Patented and award winning, Crown's Balanced Current Amplifier (BCA) switching technology is an engineering advancement. BCA will generate more power and less heat than traditional linear amplifiers
- Crown's Switch Mode Power Supply allows enormous power and performance with much less weight—it's only 34 pounds!
- Power Factor Correction (PFC) for global power compatibility means your CE 4000 will work with nearly any line voltage
- The new Crown CE 4000 will deliver 1800 watts per channel (both driven) into 2 Ohms*, 1200 watts into 4 Ohms, and 600 watts into 8 Ohms—now that's Powerful!
- Compatible with Crown's system solution topologies (GST) input modules for added flexibility
- Choice of three dual output connector modules (CE4D, CE4C and CE4E)

* $\geq 200V$ line voltage

© 2001 Crown International
www.crown.com

Distributed in Australia by

JANIS

40 Kent Road Mascot NSW 2020 Phone: (02) 9582 0909 Fax: (02) 9582 0999

 **CROWN**



Industry feedback

Lighting psychosis

Having worked in various positions in the stage lighting industry, I ask, are all lighting people mentally unstable? Never in my life have I met so many precious, substance abusing, aggressive, neurotic people, most of whom cannot sustain relationships.

sheba_girl@hotmail.com

• Responses direct? Or to us! -Ed

Let's OUT 'Furious'

Everyone where I work is guessing the name and gender of Furious, But I know who it is. He is xxxxxxxxxx and from Melbourne.

- Circuitmaximus, email

• We are obliged to protect the identity of letter writers who, like you, hide behind a pseudonym. -Ed

☐ Sorry, we don't run letters unless we can establish your address and identity. We get several letters a month that we just cannot run. -Ed

The Boy George Incident

Hey! is it safe? The Industry across all disciplines is becoming more aware of doing it right and making sure its safe. But there always seems to one forgotten thing. It's there, in the centre of the Dance floor or high in the arch over the orchestra, in prime place poised to do untold damage, and injury.

It's often held in place by 1000 kg straps and 5 ton shackles - even though it may only weigh 10 kgs.

It's there in all its glory, the Rosetta stone of the industry - found in all nations all over the world.

But the question I can never get an answer to is...

"Pretty heavy mirror ball mate, what is the safe working load on the motor?"

What can be done to establish a rating on the motors, instead of just a best guess? I think more users should ask the question.

What is the SWL?

- Moz, email

• Like Boy George said, if you have to die, what a way to go. Seriously, we hear of mirror balls falling out of the roof reasonably often. -Ed

Quality - can you spell it?

Had to laugh at the editorial credits in your magazine, where you say the sub editor is missing in action. It's obvious, try the contents page last issue, which is riddled with errors. What does 'sponor aidio seminars' mean? Or, 'accilm'? Nice magazine though!

-Vanessa Samson, Hobart

Crystal Mastering

In regards to John Ruberto's comments in last issue's 'Dream Time' article, "We have so many pieces of equipment, but when it comes down to it, they're useless without the computer." John wanted to make it quite clear that he was referring to the final authoring and editing process that the Sonic Solutions is invaluable for, not the actual mastering process which is strictly performed in the analogue domain.

I hope that's clear as

- Joseph Carra, Crystal Mastering, Melb

• Send Letters (with contact details) to mail@conpub.com.au or fax +61 2 9876-5715.

evolution wireless

Distributed in Australia by:
SYNTEC INTERNATIONAL
60 Gibbes Street,
Chatswood, NSW 2067
Phone (02) 9417 4700
http://www.syntec.com.au

IEM
IN EAR MONITOR



Keeping It Personal

- FOCUS function switches stereo monitoring to "dual mono" mode, enabling performers to individually separate their voice or instrument from the total mix
- Safety mode: protects performers from excessive in ear sound pressure levels



- High quality in ear monitoring for even greater on-stage freedom for artists and performers
- Reduced risk of on-stage feedback allows higher sound pressure levels
- Create personalized in ear monitor mixes for each performer
- Eight switchable preset frequencies enable several In Ear Monitors to be operated simultaneously



SENNHEISER

Alone, the SRM450 Active SR speaker kicks serious butt. With our new SRS1500 Active Subwoofer, it violates strategic arms limitation treaties.

SRM450. Activus Accuratus

SPM100 Pole not included, but then you probably knew that already

SRS1500. Stompus YoRumpus Activus

Our SRM450 has redefined compact active speaker sound quality. Now the first 2-way system accurate enough to be called a monitor is joined by the bone-shaking SRS1500 Active Subwoofer.

Thanks to 600 watts of internal amplification, electronic equalisation and weapons-grade 15" LF transducer, it has the most low bass output of any "small" SR subwoofer. You get tight, baseball-bat-to-the-gut response down to 35Hz at -10dB, at up to 127dB SPL! A special 3" surround-wound voice coil dissipates heat and lets the SRS1500 crank all night at max volume.

Plus it has a built-in electronic crossover system so you can sure up passive systems' low end, too.

Hear the SRS1500/SRM450 combo at a Mackie dealer today. And then start showing your audience around.

SRS1500 Active Subwoofer

- Takes up less than 3 sq. ft. of stage space
- 600 watts of high-current FR Series amp power built-in
- 15" LF transducer with 3" inside-outside-wound high temp voice coil
- Electronic phase and time correction circuitry
- Built-in electronic crossover for active or passive systems
- Level and phase controls
- Built-in pole socket and carry handles

SRM450 Active 2-Way SR Speaker

- 400 watts of bi-amped FR Series amp power, 300 watts for lows/mids, 100 watts for highs
- Ultra-wide audience coverage via multi-cell high-dispersion horn
- Damped titanium HF transducer
- Easy to carry - three balanced ergonomic handles
- Easy set up - pole mount + multiple fly points



The new SRS1500. Think of it as portable mosh pit in a 14.7 cubic foot enclosure with balanced carrying handles

A perfect match with our CFX Series mixers...



Some of the gentle, sensitive Mackoids who make our active SR speakers in scenic Woodinville, USA and Reggio Emilia, Italy



www.mackie.com

For more information...

Australian Audio
SUPPLIES

Australian Audio Supplies
Phone (02) 4388 4666
Email sales@ausaudio.com.au
Web www.ausaudio.com.au

Remote DMX Control



As most experienced lighting technicians would realise, the ideal companion for any focusing session is a "Riggers" control. The ability to bring up any channel from the stage so it can be focused means that you do not have to pay a board operator to be a bored operator.

The one big disadvantage to a rigger's control is that it is usually wired, so you have a limited distance you can travel around the stage. Thus the stage was set for the inventors to create a wireless DMX riggers control.



Recently, two of these devices that have been released to the market:

- the **Focus120** by Deltatronics, a locally made system that is designed for smaller systems and budgets
 - the **Focus Brain** by ELC, an American designed and built system which is aimed at bigger venues and events
- With the help of Sydney Theatre Company's facilities, and a collection of technicians and a lighting designer, we put the two devices through their paces. John Grimshaw was the moderator.

The Focus120

This device is an upgraded version of the Focus60 released more than a year ago. As per the name, the Focus120 is only capable of controlling 120 channels. The receiver is a simple plastic box, with two 5pin XLRs - in and out for DMX, and a number of indicator LEDs that show power, transmission receive and DMX present (at input).

Installing the system is easy enough – simply put the receiver box had the head of your DMX chain. A DMX input is included on the box so a standard control desk can still send data as required. The data from the desk is merged with the data from the remote using a "Higher Takes Precedence" (HTP) system – the highest level for each channel from either control system is the level that channel goes to.

The remote is simple and intuitive to operate. Once turned on, a large LED display shows the channel to be controlled. The control channel is changed by scrolling through the available 120 channels, and then the level can then be changed by the Level Up, Level Down, Full and Off controls. Any number of channels can be left up at the same time by the remote.

The system also features a single scene

memory recall function. This is achieved by bringing up the desired channels on the remote, and then with a combination of buttons, the receiver is told by the remote to "Record" this scene into the memory position. That scene can then be recalled at any time by the remote. Only the channels activated by the remote are recorded to the memory – any data from the DMX input is ignored.

Unlike its predecessor, the Focus120 features a "Thru" control for controlling a group of channels at the same time, as well as "Next" and "Prev" controls for quickly flashing through the channels

The lack of tactile control buttons remains a problem – particularly if you consider that the most likely time the device will be used is when focussing. When focussing, typically you only have one lamp up at a time, and the rest of the venue is pitch black. Take that one lamp out and it become difficult to feel the controls to bring up the next channel. Being built into a plastic case, the unit is very light. To protect the remote from damage by extreme deceleration (dropping it), a carabina for attaching the unit to your belt is included.

continued over



Those that have purchased the original Focus60 can upgrade their unit for the cost of A\$140 +GST by contacting the manufacturer directly at Deltatronics, PO Box 3647, Marsfield 2122 NSW Australia.



professional training for your sound future

W W W . S A E . E D U

CERTIFICATE - DIPLOMA - DEGREE*

It has always been the policy of SAE to allow all our students **individual** access to our extensive range of equipment.

Only SAE has **professional** recording studios.

Only SAE has a **network** of over 30 schools around the world which guarantee you **recognition** and industry acceptance.

SAE has been running an international, active **job placement** program, since we started back in 1976.

Studios 301, Australia's **largest** recording studio complex, only employs successful SAE graduates.

After all, SAE was the **first practical** audio institute on the planet, we invented practical audio education.

SAE the **only** professional choice!

SYDNEY (02) 9211 3711 MELBOURNE (03) 9521 4055
ADELAIDE (08) 8410 6599 PERTH (08) 9325 4533
HOBART (03) 6224 1416 BRISBANE (07) 3367 0143

VETAB APPROVED, CRICOS REGISTERED, AUST. JDY APPLICABLE * Degree is issued by our partner universities:
University of Western Sydney, Southern Cross University -Lismore, Middlesex University-London



SAE
COLLEGE

Main Institutes in: • New York (212) 944 9121 • Nashville (615) 244 5848 • London (0207) 609 2653 • Munich (089) 67 51 67
• Paris (01) 4811 9696 • Amsterdam (020) 622 8790 • Athens (01)321 7661 • Milano (02) 8912 0540 • Singapore (65)741 1257
• Zurich (01) 445 2040 • Auckland (09) 373 4712 • Madras (044) 821 4227 • Vienna (01)961 03C3
• Kuala Lumpur (03) 737 0935 • Stockholm(08) 730 5100.

Control Accessories

When the Focus Brain was first removed from packaging for the test, one of the testers said, "Oh, a focus brain. I could definitely do with one of those!"

In the interests of future testing possibilities with STC, we will not reveal who made the comment!



The Focus Brain

ELC's Focus Brain comes with both the remote and receiver built into solid metal boxes. The receiver is a 1RU device with only the power switch and indicator LEDs on the front. The LEDs show power, transmission receive, DMX present (at input) and if the unit's remote is active. The receiver two main functional improvements over the Focus120 - the DMX input/output connected through on power off, and a remote antenna.

Having the feature of DMX through on power of has two major implications. The first (and obvious) is that if the unit fails in some way, the DMX stream is not interrupted. The second result is that the unit can be turned off when not in use, increasing the long-term longevity of the device.

The antenna for the device is connected via a 3pin XLR on the back. This is designed so that the little blue box, which is an active (or powered) antenna can be moved up to 100m from the receiver to a position closer to the transmit area. This can be done using standard mic cables.

The fact that the receiver is built into a 1RU metal box makes the unit easy to install into permanent situations.

The remote comes with a little leather pouch and belt clip, and the buttons are used through a clear plastic wall in the case. Two little tricks with this system are that the on/off switch is hidden under the main flap on the pouch, and that the remote does not do anything until it "Activates" the remote features on the receiver. Once activated, channels can be selected using the numeric panel, and then told to go to a specific level or

What the testers thought

It was generally decided that the Focus120 would certainly be preferable in situations were less than 120 channels were going to be controlled. This was because the displays make the system easier to use. Also the controls are very simple and intuitive - which is important because you can almost guarantee that it will be the Lighting Designer that will be operating the unit (they were attempting to subtly suggest that explaining how to use a complex remote to a simple designer would be painful).

The Focus Brain was definitely shown to be a very capable and well-designed device with only two real limitations - the lack of display on the remote and the price. There was some concern that because the belt pack used a belt-clip there was some potential from damage by dropping.

faded up/down.

A lack of number display, or any kind of LEDs meant that when we were initially unable to get the remote to work at STC, we were not sure if there was power in the battery, the remote had "activated" the receiver, or the remote was actually transmitting. Once we had sorted out where the on/off switch was, checked the battery, and activated the receiver the test was off and running.

At the point of activating the unit, you have the choice of whether or not you want to allow the unit to merge the DMX input with the data from the unit. Both situations could be useful in different situations, and it is nice to have the choice.

There are a considerable number of additional functions this remote can access. These include recording up to 30 memories, which records the actual output of the device. If "Merged Data" was selected when the remote was activated then this data is also recorded. These thirty memories make this unit potentially useful for recording scenes from the desk or in corporate or other special events that require simple memory operation - including moving light control.

There is a 31st memory position, which can hold a backup state that is activated when the unit is turned on.

The unit's specifications say that the transmission distance indoors is around 70m. Solid walls tend to impede signals at this frequency, but in most scenarios the normal control desk would be within 70m to the stage, so the unit can be installed in what would be the most convenient position.

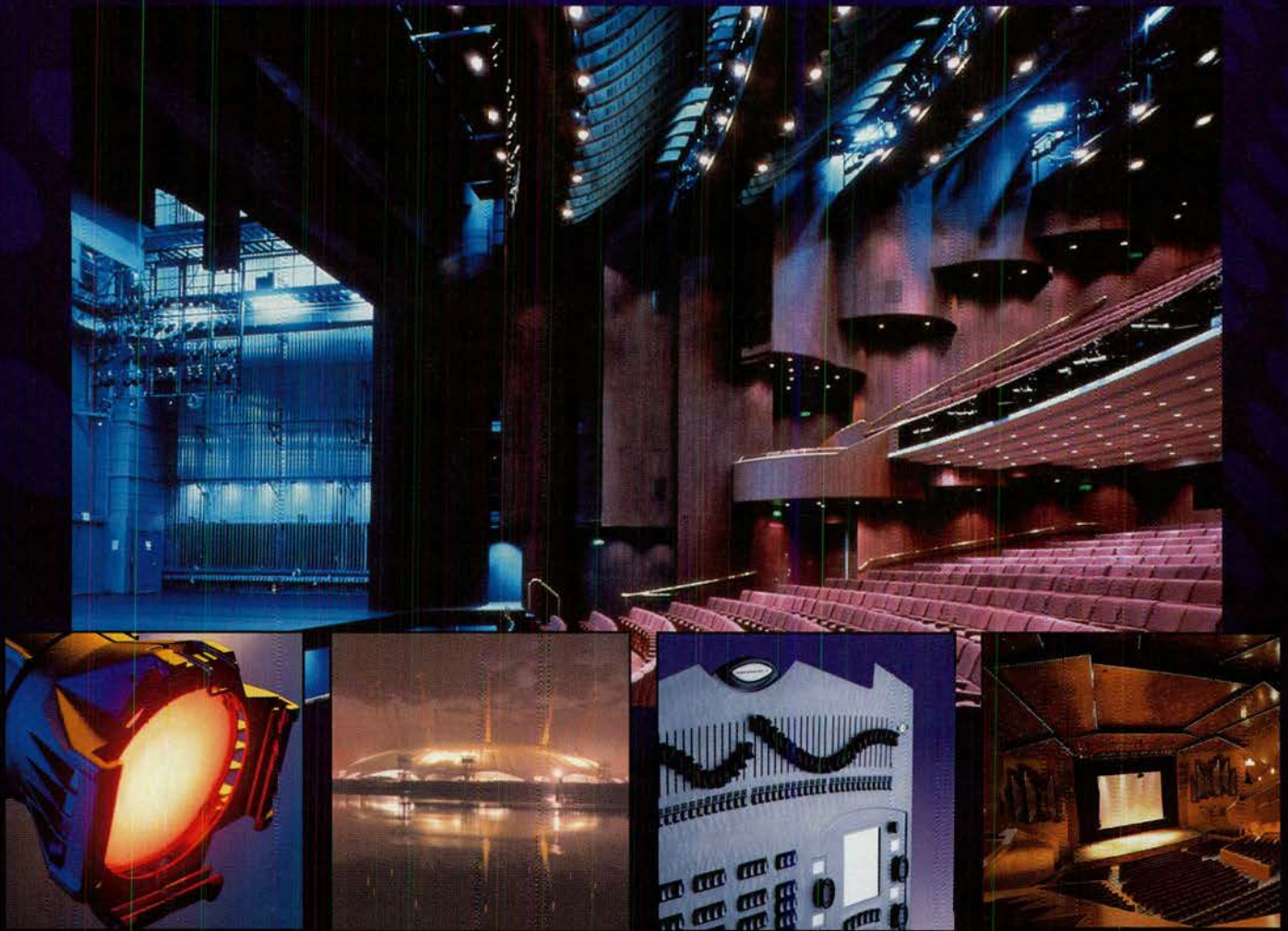
	Focus120	Focus Brain
DMX Channels	120	512
DMX through on power fail	No	Yes
DMX Merged Output	Yes	Selectable
Numeric Display	Yes	No
Memories	1	30
Frequency (MHz)	433.92	433.92
Price (inc GST)	A\$704	A\$3,500
Additional Remotes	A\$275	

Focus120 Distributor - Herkes Professional Lighting +61 2 9319 3133
 Focus Brain Distributor - Clearlight Shows Pty Ltd +61 3 9553 1688



The Testing team - Dimitri Levie, Tristan Taylor, Martin Kinnane & Toni Glynn

ETC ENTERTAINMENT



Remember when you first saw ETC's **Source Four**? The crisp, clear beam, the power, the coolness, the efficiency.

And what's behind it?

The ETC **Expression** range of consoles set the standard for flexible control with ease of use. Our **Obsession II** console is synonymous with the power needed for the world's greatest performances.

Even our dimmers redefined the industry: **Sensor** is the first truly high-density, modular, fully load reporting dimming system available for standard or the most sophisticated of installations. **Unison** provides powerful modular dimming for the smaller application.

Innovation not imitation. The best lighting solutions in the business.

World Wide. World Class.

Distributed in Australia by

JANDS

40 Kent Road Mascot NSW 2020 Phone: (02) 9582 0909 Fax: (02) 9582 0999



JVC NEW TECHNOLOGY FOR THE PRESENTER

JVC have introduced a new presentation tool – the AV-P1000E. This digital presenter lets you mix and match computer data and real 3D objects to produce a high-quality presentation. The AV-P1000E produces high-resolution SXGA images equivalent to 1280 X 960 pixel's without degradation or flicker, and it can be output to a variety of computer displays or to NTSC/PAL video monitors, allowing easy integration into any system.

The freeze function and three picture memory allows for the current image to remain on the screen, as the next image is setup for presentation. The 4x electronic zoom allows you to magnify images by up to 20x when combined with the 5x-power zoom. Precision that is good enough to display woven fabric or even intricate paintings. Other features include 5-position arm with panning camera, on-screen display, wireless remote, side and back lights.

The AV-P1000E is priced at around \$10,000 including GST.

• For JVC product enquires contact HAGEMeyer ph +61 2 9370 8888, or web:t www.jvc-australia.com.

Clarity Lion 67" SXGA Display



Image Design Technology Pty Ltd have announced the arrival of the first Clarity Lion 67" SXGA Display into Australia. The Clarity Lion was first unveiled at Infocomm 2000 in Anaheim, Ca. earlier this year. This industry first, is a 1230 x 1024 (SXGA) LCD rear-projection display. This new display can be used as a stand-alone presentation device or can be configured in multiples to form an array of virtually any size. Incorporating Clarity's Advanced Performance LCD Technology (AP/LCD), excellent optics, and a high-performance glass screen ("BlackScreen" by Jenmar Visual Systems), the Lion represents the new standard in large format rear-projection displays.

The display will suit a wide range of applications from business and institutional command and control, to data visualisation, and entertainment. Specific uses will range from digital walls in network operation centres, financial trading rooms and stock exchanges as well as company boardrooms, theatrettes and training rooms.

Mitsubishi LVP-X400U Projector



Mitsubishi Electric is launching what it believes is the lightest and brightest multimedia projector in its class. With 3000 ANSI lumens they say there is no need to dim the lights or lower the blinds in a room.

The projector certainly has a good ratio of brightness to weight and size. A newly developed optical system has been designed to enhance light output from a 250watt NSH Lamp.

Mitsubishi's 'New Natural Colour Matrix' allows the presenter to adjust all six colour signals individually and adds a Saturation control to make it possible to tweak images. Digital Interface (DVI) makes the projector compatible with both analogue PC's and digital RGB connector-equipped PC's. With true XGA resolution, the unit measures 299x143x367mm at an overall weight of 6.7 kg.

• The Mitsubishi Electric LVP-X400U is priced at A \$15,999. For more information, contact Mitsubishi Electric on +61 2 9684 7777, or: www.mitsubishi-electric.com.au



AW4416 and the full range of Yamaha Digital Products are available at these Premium Yamaha Dealers

ACT

Pro Audio 02 6249 7766

Better Music 02 6282 3199

NSW

Sound on Stage 02 9281 0077

Sound Devices 02 9283 2077

Turrumurra 02 9449 8487

Hutchings 02 9387 5011

VIC

Soundcorp 03 9488 1555

Warehouse Sound 03 9417 4866

Manny's Fitzroy 03 9416 1564

Manny's Prahran 03 9529 7241

SA

Derringers 08 8371 1884

WA

Music Park 08 9470 1020

QLD

Musiclab 07 3252 2188

Brisbane Sound 07 3257 1040

Buzz Music Cairns 07 4051 9666



Yamaha Music Australia

PO Box 268 South Melbourne Vic 3205

Toll Free: 1800 331 130

or visit us at www.yamaha.co.jp/product/proaudio
Email: aust_pasupport@infomta.post.yamaha.co.jp

ABN 84 004 259 527

AW4416 HAS LANDED

O2R
inside!



Register your
AW4416
purchase with Yamaha and receive
the following software FREE!!
• Scud Forge K² • Acid Style
• Siren Jukebox Kpress
Forward a copy of your proof of purchase with
serial number to Yamaha Professional
Audio Department

The Yamaha AW4416 professional audio workstation.
24-bit digital hard disk recording - **12 Gig Hard drive included**
(all 16 tracks at once with no compression)
32-bit digital mixing (at the level of our infamous
O2R, including moving fader automation)
16-bit sampling (phrases from hard disk, CD or
computer assignable to eight, dual-level trigger pads)
32-bit effects processing (two assignable to any track)
Onboard CD burner (option...but who wouldn't get it?)
Dual card slots for optional digital I/O of your choice
(export/import up to 16 tracks simultaneously)
Dedicated metering
Unbelievable price!

WWW.AW4416.COM

Once again, Yamaha gives you more for less.



AW4416 shown fitted
with optional adat cards

YAMAHA PROFESSIONAL AUDIO DEPARTMENT MADE IN JAPAN



by Gary Kayye

Projection + AV Predictions for 2001

OK, if I could really predict the future, I'd be writing this from a beach in Tahiti; but, instead, I'm doing this from Chapel Hill, North Carolina. But, Here's My 2001 Predictions Anyway.

Well, we had yet another amazing year. No one can say the ProAV market is trite! It's December again and time for my yearly round up-and coming year prediction column.

Projectors

We will see them get smaller, brighter, lighter and faster.

Smaller: Micro-portables will be 2.5-pounds (1.1kg) by year's end, and we'll even see a 3-pound (1.4kg) LCD hit the market. So far, the only micro-portables are DLP, but new projection technologies like LCoS (Liquid Crystal on Silicon) - a reflective LCD



imaging technology, which will make that size and weight barrier possible. In addition, watch for the debut of a 1.5-pound (0.7kg) hand-held projector. Yep, 1.5-pounds.

On the fixed-install front, 15-pounds (6.8kg) will be on the heavy side of the

average projector going in a boardroom or conference room.

There's no need for something 5000 ANSI lumens in most, if not all, small to medium installs, but the 15-pounders will garner 3000 ANSI lumens just fine and that's PLENTY bright enough.

Brighter: The upper-tier fixed install boxes will be 5000 ANSI lumens, and Sanyo, Eiki and Proxima will even debut a 7000 ANSI lumens UXGA projector aimed at the rental/staging and digital cinema markets. This will REALLY make it hard for companies like Christie, Barco and DPI, as they will now be directly competing with the Japanese. But, warriors lead those three companies, and I expect them to easily survive at the high-end. Their image quality can't be beat, and the Sanyo won't be at that level for a while.

Lighter: Well, we addressed the weight in the Smaller section, but can you believe 1.5-pounds?

Faster: Right now, everyone is installing projectors the slow way - using RGBHV cabling, distribution and routing. It's slow, but extremely reliable. But, watch for manufacturers of projectors to really push their network (Ethernet and standard Cat5 conversion systems) integration feature on dealers. It WILL succeed. Why? Well, if ProAV dealers choose to install projectors the old-fashioned way (i.e. RGB way), the manufacturers will turn to the IT (Info Technology) market and leaders for an acceptance of this new way of looking at the boardroom, conference room and training room market. It won't happen overnight, but it will happen over the next three years.

VTC

Videoconferencing is still far from mainstream. It is difficult to integrate, manage, and make reliable. It seems as though every time I videoconference with anyone, it's something you have to count on taking anywhere from 10 to 30 minutes to set-up and get ready for. For VTC technology to be mainstream and unassuming as well as less intimidating, it MUST be an "oh, by the way" type of device. It's not. Will it ever be? Not in 2001. Sure we are getting closer. It only costs between 24 and 40cents per minute to make a VTC call, but it's a pain in the neck to set up the call. In addition, if you've ever tried to control a VTC unit in a larger

system, you know it's truly an art that Crestron and Panja have while many of the rest of us are standing on the sidelines wondering how. But, 2001 will be the year that all that changes. OK, that's an exaggeration, but I will tell you that Polycom will make it a lot easier by year's end.

Plasmas

We've now got a 60" and soon will have a 70+". Plasmas are finally coming into their own by creating unique identity and solving both aesthetic and application problems with placement in unusual venues such as malls, airports, and even elevators. NEC has led the way in promoting those unique applications and currently has the largest family of products on the market. But, watch for even larger plasmas, more plasmas, and HDTV plasmas to reach the Circuit City crowd by year's end.



Screens

With the wider availability of DVD (thanks for things like AUS\$350 players and Sony's PlayStation2), we'll see an increased interest in addressing the plethora of image aspect ratio (size) formats. Most computer images are 4:3 (I say most as SXGA - 1280 x 1024 - is actually 5:4) and even PAL video is 4:3 - or 1.33:1, HDTV is 16:9 - or 1.78:1, but DVD movies have at least four aspect ratio formats including 4:3, 16:9 as well as Widescreen/Anamorphic (2.35:1), in which Star Wars was filmed; Letterboxed (1.85:1), in which Jurassic Park was filmed, and some DVD releases of old movies even have Panavision (2.76:1), in which Ben Hur was filmed.

This creates a problem in many installs as the size of the image changes depending on what is being projected and thus, more blank, white screen area is seen - some say it's distracting. But, every major screen manufacturer, Da-Lite, Draper and Stewart, all have multi-aspect ratio screens that physically change sizes at the push of a button. Installing these screens will become a trend in 2001 with at least 50% of the Home Theater market and even 25% of the ProAV market.



Distribution

The market has been forever transformed by MCSi's growth, Intellisys' bankruptcy, Proxima's merger with InFocus, and the emergence of the mega-dealers: AVI, Whitlock Group, MCSi, and SPL. But, the market has and will survive. It's just evolving and, ultimately, this will all lead to an eventual shakeout - one that many dealers and manufacturers have been predicting since the early 1990's. We will probably see the product distribution split more in 2001. For example, there will be a better defined distribution difference between projectors marketed and sold through PC integrators, PC distributors, and PC dealers and those sold through traditional ProAV dealers versus box-houses. All will coexist probably even more cohesively - less stress and direct competitiveness. How? Watch for manufacturers to come out with product lines totally aimed at one channel or another and possibly without the other channel even having access to the product. This is a good thing, by the way. Systems products sold to systems-houses and boxes sold to box-houses, etc. But, also watch for more mergers and acquisitions. MCSi isn't done (it's obvious where - they will

plug holes), but more mergers among manufacturers are likely as well. Keep your eye on the accessory manufacturers in the market. One is already in talks with another to form a company what will merge two system accessories into one supplier (not competitive manufacturers, but complimentary). Will this be good? Probably, yes. But, it depends on who's at the top as one company has great upper management and the other needs great executive management.

People

It is becoming increasingly clear (actually, alarmingly clear) that we have a major problem on our hands. In fact, it IS hands. We have a labor shortage that's on the verge of stifling growth. Not taking it seriously? Well, you will once your competitor gets the next big job [contract] and steals away your best installers and project managers.

So, what's the solution?

Well, the REAL, truly good, long-term solution is education. But, that takes time. Training is the key to moving new hires from being new hires to contributors to the bottom line by being in the field. Mentoring is one way to accomplish this. Mentoring, however, is unreliable and creates situations where your best people are trying to "train" new employees instead of working. In some cases this works, but in most, it doesn't work well. Your best installer isn't necessarily the best person to train the rest of the installers. I am sure you agree and can even site examples where this has failed miserably. However, if you have a simple, documented training program that outlines the skills-set required to be in the field (or on the job) and then trains to give the new-hire that skills-set, you've got it! That simple. Please do that as opposed to stealing people because it's shorting our market growth.

Finally, Kayye Consulting may even surprise the market. We are in the midst of a change that may shock the market as we grow. The deal is already in the works and may be public by the time you read this, but if it's not, then you'll only have to wait a month or so. But, it will be good, overall.

Gary Kayye is Principal of Kayye Consulting, a firm that specialises in providing marketing consulting, telephony integration and training development to the professional audiovisual industry.

His company also markets a software suite that is commonly used to set-up projection displays for optimised viewing quality as well as one used to project pretty pictures to make projectors lock better and easier to sell.

In January, he will be teaching The Perfect Image 2 at the ICIA Institute held in Melbourne.

To sign up for the course, call ICIA's Australian office at +61 2 9531-6777 or e-mail ICIA at icia_sydney@msn.com.au

• Gary can be reached at www.kayye.com

DVRexRT Professional



Canopus Corporation, makers of DV Non-linear editors (NLE), have announced DVRexRT Professional, a full-featured, professional-level NLE that boasts extensive real-time capabilities.

The DVRexRT Professional delivers the features required by video professionals to capture and blend DV and high-end analog footage. With its component video I/C, balanced audio I/O and RS-422 analog deck control, DVRexRT Professional allows capture of professional-level analog material without compromising quality. DVRexRT Professional includes real-time editing, MPEG encoding, DVD authoring, soundtrack creation and Internet streaming tools to provide professional videographers with a complete NLE solution in one package.

The DVRexRT Professional comes with Adobe Premiere 5.1, Canopus RexEdit nonlinear editing software and an Adobe Premiere RT plug-in that brings RexEdit's collection of real-time filters and transitions, including picture-in-picture, slow motion, movie look, color correction and chroma key.

DVRexRT Professional offers native DV editing with real-time analog and DV output for greater quality and timesavings. DVRexRT Professional supports camera control of DV, DVCAM and RS-422 devices to give the user stable and accurate batch capture and timeline output for both DV and analog decks.

Canopus is including its hardware MPEG Module, a real-time MPEG encoder that creates MPEG-1 or MPEG-2 streams directly from Adobe Premiere or RexEdit nonlinear editing software.

This allows video professionals to convert DV format to MPEG-2 format directly, resulting in exceptional video quality. By using Main Profile at Main Level MPEG-2, also called MP@ML, the Canopus encoder delivers the high-quality video and audio MPEG-2 output essential for CD-ROM, DVD authoring and network transmission.

While other MPEG-2 systems use I-frame or IP-frame only, MP@ML features true IBP frame format, providing the highest quality video at the lowest bandwidth. In addition, the encoder's variable bit rate capability is one of the most effective techniques used to maintain video quality while reducing file size.

DVRexRT Professional supports single- and dual-processor systems running Windows 2000 or NT 4.0.

A\$9995.

• For more information contact the Australian and New Zealand Distributor; New Magic Pty Ltd, www.newmagic.com.au Ph: +61 3 9885 5888 or sales@newmagic.com.au



Save Time Visuals

SALES • RENTAL • HIRE
SERVICE • INSTALLATION

Audio Visual
Multimedia &
Presentation Specialists

1800 888 089

www.savetimevisuals.com.au

63 Wadham Parade
Mount Waverley
VIC 3149
Telephone (03) 9888 2111
Facsimile (03) 9888 2904
Email savetime@wire.net.au

WIRELESS MICS

January marks the start of Digital Television in Australia which will soak up a fair percentage of spectrum previously used by wireless audio. John Grimshaw attempts to clear the airwaves:

With the introduction to Australia of Digital Television broadcasting from January 1, 2001, a raft of previously "unused" frequencies are about to be used up by the simultaneous broadcast of this new television medium. Frequencies used by almost every part of the entertainment industry will be affected – but exactly how will they change?

This question is VERY difficult to answer because there are so many variables involved. The first (and most obvious) effect is that the new frequencies being used do make use of frequencies not previously used for TV, every city in Australia will be affected slightly differently. As you can see from the chart opposite, there are vast swathes of frequencies that will now be filled.

There are two frequency ranges that you can buy wireless audio products in. The area commonly known in pro-audio as VHF only refers to the frequency range 174 to 230 MHz. Pro-audio UHF devices can span the entire 526 to 820MHz range. In capital cities, there will be very few VHF channels that will be freely available, but does this mean that you will have to sell your wireless gear that falls in this range?

(continued page 36)

Welcome to our Market Report on Wireless microphones. Some points to consider - wireless microphone systems and in-ear monitoring systems coexist in the same spectrum. Connections profiled the IEM (In-Ear Monitoring) market back in August, so those systems are not included here. But the frequency information is pertinent - and with the proliferation of IEM systems and the reduction in available frequencies, many problems are arising in an exponential fashion out there.

It is simply crucial to audit every system in use nearby and know exactly what frequencies are used by whom, and when. Otherwise: **splat, blam, carrier wave.....**

This market report is compiled with words supplied by the vendors of these systems, so some subjective claims should be taken with a small grain of salt. Also, the unabated rise and rise of the US dollar means that the prices shown here are likely to increase by as much as 20%, if they haven't already.

Finally, talking of prices, this is a very competitive sector of the market, so we see retail prices starting well under A\$1000 - when the price to beat was A\$1699 less than a year ago. You will pay more for systems that sound better, can work in narrower bandwidth, and which drop out less. Naturally, the choice of microphone element is crucial too. Be sure to ask a lot of questions, audition carefully, and preferably rent a system to check it on your own stage before buying.

All units shown operate in UHF only. Prices INCLUDE GST and are in Australian dollars. We detail four representative systems here, there are more available.

AKG
Distributed by Audio Products Australia
1800 642 922

HOT SELLER
WMS40 HT / PT

The WMS40 is an entry level (non Diversity) professional wireless system available in either handheld microphone or belt pack versions. The WMS40 is suitable for all applications requiring high quality audio with a limited budget. The system is ideal for small stages, clubs, small touring systems, places of worship, hotels, gyms etc. The WMS40 operates in the UHF frequency range.

It uses highly selective SAW filters and advanced circuitry to ensure interference free operation and excellent quality sound even under difficult conditions.

plug and play concept and preset frequency lets you set up and operate the system immediately.

- WMS40HT \$599.00 (pictured left & below)
- WMS40PT (without Mic) \$549.00

AKG WMS80 HT / PT

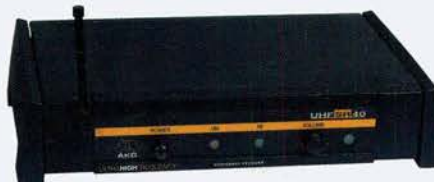
The WMS80 is a professional wireless system available in either handheld microphone or belt pack versions. The WMS80 is suitable for all applications requiring high quality audio.

The system is ideal for small to medium size stages, clubs, theatres, places of worship, small and medium size conference venues, open air performances, sporting facilities etc. The WMS80 uses highly selective SAW filters and 15 selectable frequencies to ensure interference free operation. Interchangeable microphone elements provide greater flexibility for desired acoustics. The system is complete with all rack mounting hardware.

- WMS80HT (without mic head) \$999.00
- WMS80PT (without Mic) \$1,049.00



The



(continued page 36)

Which TV station is on What frequency?

VHF	Ch	Freq range	Adel. SA	Batch. NT	Brisb. QLD	Canb. ACT	Darwin NT	Hobart TAS	Melb VIC	Newc'l NSW	Perth WA	Sydney NSW	Toowoomba QLD	W/gong NSW
BAND I	0	45-52 MHz												
	1	56-63 MHz												
	2	63-70 MHz	ABS (a)		ABQ (a)			ABD (a)	ABV (a)		ABW (a)	ABN (a)		
BAND II	3	85-92 MHz								NBN (a)				
	4	94-101 MHz												
	5	101-108 MHz												
BAND III	5A	137-144 MHz								ABHN (a)				
	6	174-181 MHz	SAS (d)		BTQ (d)	CTC (d)	ABD (a)	TVT (a)	HSV (d)		TVW (d)	ATN (d)		
	7	181-188 MHz	SAS (a)		BTQ (a)	CTC (a)		TVT (d)	HSV (a)		TVW (a)	ATN (a)		
	8	188-195 MHz	NWS (d)		QTQ (d)		NTD (a)	ABD (d)	GTV (d)		STW (d)	TCN (d)		
	9	195-202 MHz	NWS (a)		QTQ (a)	ABC (a)			GTV (a)		STW (a)	TCN (a)		
	9A	202-209 MHz				ABC (d)		SBS (d)						
	10	209-216 MHz*	ADS (d)		TVQ (d)			TNT (d)	ATV (a)		NEW (a)	TEN (a)		
	11	216-223 MHz*	ADS (a)		TVQ (a)	WIN (d)			ATV (d)		NEW (d)	TEN (d)		
	12	223-230 MHz	ABS (d)		ABQ (d)	CBN (d)			ABV (d)		ABW (d)	ABN (d)		
UHF														
BAND IV	28	526-533 MHz	SBS (a)		SBS (a)	SBS (a)	SBS (a)	SBS (a)	SBS (a)		SBS (a)	SBS (a)		
	29	533-540 MHz					SBS (d)		SBS (d)		SBS (d)	reserved		
	30	540-547 MHz	SBS (d)			SBS (d)	ABD (d)							
	31	547-554 MHz	CTV (a)		CTV (a)	WIN (a)	NTD (d)	TNT (a)	CTV (a)		CTV (a)	CTV (a)		
	32	554-561 MHz					TND (d)		reserved		reserved			
	33	561-568 MHz	reserved				reserved							
	34	568-575 MHz	reserved			CBN (a)	TND (a)					SBS (d)		
	35	575-582 MHz					reserved		reserved		reserved			CBN (d)
BAND V	36	582-589 MHz			SBS (d)		reserved			NBN (d)				WIN (d)
	37	589-596 MHz								ABHN (d)				CTC (d)
	38	596-603 MHz			reserved					SBS (d)	reserved			
	39	603-610 MHz												
	40	610-617 MHz				reserved								
	41	617-624 MHz				reserved								
	42	624-631 MHz												
	43	631-638 MHz												
	44	638-645 MHz												
	45	645-652 MHz								SBS (a)				
	46	652-659 MHz										ABN (a)		
	47	659-666 MHz		reserved										
	48	666-673 MHz		reserved						ABHN (a)				
	49	673-680 MHz		reserved								ATN (a)		
	50	680-687 MHz		QQQ (d)										reserved
	51	687-694 MHz		QQQ (a)						NRN (d)				ABWN (d)
	52	694-701 MHz										TCN (a)	SBS (d)	
	53	701-708 MHz		SBS (d)						NEN (d)			SBS (a)	SBS (a)
	54	708-715 MHz		SBS (a)						NEN (a)				SBS (d)
	55	715-722 MHz										TEN (a)	ABQ (d)	
	56	722-729 MHz		ABD (d)						reserved			ABQ (a)	ABWN (a)
	57	729-736 MHz								NRN (a)				reserved
	58	736-743 MHz										SBS (a)	STQ (d)	
	59	743-750 MHz		NTD (d)									STQ (a)	WIN (a)
	60	750-757 MHz		NTD (a)										
	61	757-764 MHz											TNQ (d)	
	62	764-771 MHz											TNQ (a)	CTC (a)
	63	771-778 MHz												
	64	778-785 MHz												RTQ (d)
	65	785-792 MHz		IMP (d)										RTQ (a)
	66	792-799 MHz		IMP (a)										reserved
	67	799-806 MHz												reserved
	68	806-813 MHz												reserved
	69	813-820 MHz		ABD (a)										

(a) : existing analogue transmission. (d) : new digital transmission. For further info, check out www.aca.gov.au and www.aba.gov.au

Wireless Mic Systems

SPECTRUM (continued)

Legally, the ACA Communications Legislation states that for any wireless audio product, "transmission in a TV channel must not originate in the licence area of a TV broadcasting station (including a repeater or translator station) operating in the same channel"

But even if you are just outside the license area, it will still depend on how well your gear is protected from RF interference, how close you are to the television transmitters, how far the pro-audio equipment needs to transmit and how good your batteries are. The only real way to know is to test the gear when the transmission begins, but be warned... If your wireless system manages to screen out the unwanted transmission so it can "listen" exclusively to the correct receiver, and then your transmitter turns off, goes out of range or the battery runs down, be ready to jump on the level faders because your receiver will lock into the "white noise" sounding digital television broadcast.

This is probably not the effect you want to have happen in the middle of a gig.

While some of the better wireless systems transmit a tone to let the receiver know that it is the correct signal to receive, the ideal solution is to get off a frequency being used by a television station.

Because of the nature of the class licence that allows wireless microphones in Australia, theoretically it would be quite difficult to have one gig affect another that is happening in the same city. Though you would rarely find a situation were you would want to transmit more than 10m from the source to

(continued page 38)

WMS81 HT / PT

The WMS81 is a professional wireless system available in either handheld microphone or belt pack versions. The WMS81 is suitable for all applications requiring high quality audio. The modular system architecture, external antenna provision and multiple unit power supply, provides custom solutions for every conceivable application. It uses highly selective SAW filters and 15 selectable frequencies to ensure interference free operation. An intelligent battery management system monitors the transmitter battery voltage and computes residual capacity. A pilot tone system transmits battery data, tone code squelch and automuting functions. Interchangeable microphone elements provide greater flexibility for desired acoustics. The system is complete with all rack mounting hardware.

- WMS81HT (without mic head) \$1,199.00
- WMS81PT (without mic) \$1,249.00



WMS300 HT / PT

The WMS300 is a professional wireless system available in either handheld microphone or belt pack versions. The WMS300 system has been designed specifically for the professional users and provides an outstanding price / performance ratio. The modular system architecture, external antenna provision and multiple unit power supply, provides custom solutions for every conceivable application. The WMS300 will thus meet the requirements of the most discriminating professional user. A user friendly frequency management system makes it easy to switch to an interference free channel and setup multichannel systems.

- WMS300HT (without mic head) \$1,699.00
- WMS300PT (without Mic) \$1,899.00

AUDIO-TECHNICA

Distributed by Yamaha Music Australia, Ph. +61 3 9693-5111.

ATW-1451

Belt pack system allowing for the use of a variety of miniature microphones as the transmitter source including lavaliers, headsets and instrument models. UHF true diversity operation using two independent receivers reducing dropouts. The half rack receiver has a ground lift switch and adjustable squelch making it ideal for real-world conditions. The receiver is ruggedly designed using an all metal casing,

underlining the professional feel of the system.

ATW1451 offers the build quality and performance normally associated with more expensive radio systems. A variety of optional miniature microphones are available to suit the application at hand, including the ATM35cw designed for Brass & Woodwind instruments. The optional AT8319 guitar cable offers a high impedance load to ensure that the sound quality of the instrument is maintained.

- \$745.

ATW-1452

Hand-Held system with three way power switch (on, stand-by, off) for increased transmitter battery life. UHF true diversity operation using two independent receivers reducing dropouts. Half Rack receiver has a ground lift switch and adjustable squelch making it ideal for real-world conditions. The receiver is ruggedly designed using an all metal casing, underlining the professional feel of the system.

The ATW1451 offers the build quality and performance normally associated with more expensive radio systems. The hand-held microphone transmitter has been designed to lower the handling noise sometimes associated with less expensive radio microphones and includes a STANDBY mode that saves battery life without causing any 'pops' or 'thumps' when switched to the 'ON' position.

- \$845

Beyerdynamic

Distributed by Syncrotech Systems

Design. Ph: +61-2- 9879-0800

OPUS 181 Handheld system

Using the same dual antenna diversity receiver as the Opus 154, the Opus 181 contains an electret condenser radio microphone, the SEM 181. Based on the system design of the Opus 81, this handset uses condenser elements to provide a wide linear frequency response.

- \$1077

OPUS 154 Neck worn system

The TGX-45 microphone is included in the

(continued page 38)



AKG.WIRELESS.UHF WIRELESS MICROPHONE SYSTEM

"I want fun, to make music and move the audience."

For vocalists, instrumentalists, or presenters.

The days of the microphone cable are numbered. Use the airwaves instead and forget about plugs and wires.

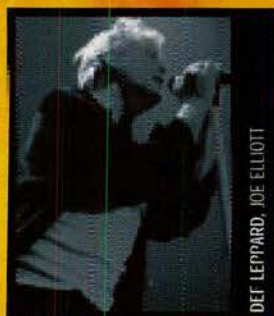
Enjoy AKG Wireless sound and the benefits of UHF transmission at a sensationally inviting price.



WMS 40 ULTRA-HIGH FREQUENCY

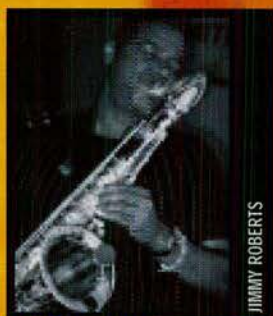
FEATURE HIGHLIGHTS

- Operates for more than 35 hours off the same set of batteries.
- Lowest operating costs in its class.
- SAW filters for interference-free operation.
- 100% AKG Acoustics



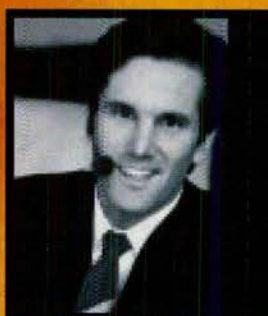
DEF LEPPARD, JOE ELLIOTT

VOCALISTS



JIMMY ROBERTS

INSTRUMENTALISTS



PRESENTERS

For detailed information on the WMS 40 and other products from AKG contact Audio Products Australia. Freecall 1800 642 922 or visit www.akg-acoustics.com

H A Harman International Company

ADV 888/1E



AKG.SOUNDS.BETTER

Wireless Mic Systems

SPECTRUM (continued)

the receiver, the typical output power of pro-audio wireless equipment should limit the transmission distance to well under 1000m line of sight, and closer to 200m indoors. However, it is not unknown for the wireless system in one venue to be able to receive the signals from a nearby venue if the nearest transmitter is turned off.

The biggest headache all of this will cause is for touring shows, as you will need to find out exactly what the broadcast frequencies will be used in the areas that you will travel. This will involve contacting the Australian Broadcasting Authority, and purchasing/downloading the most recent information on the areas you are going to. The easiest way to get this information in online from www.aba.gov.au

Not only that, you will need to go through this process every time you tour for at least the next ten years as the digital broadcasts systems across the country gradually come on-line.

Just hope that you do not have to tour or work in Toowoomba – where the allocated and reserved frequencies remove all of the options available for wireless audio in the frequency range 778 to 813MHz – which affects more than 95% of all UHF mics made and sold today.

Opus 154 system and has been specifically designed to provide comfort and security during hands-free stage applications. The TGX-45 is a cardioid neckworn microphone with a slim flexible gooseneck which allows easy and precise positioning of the microphone capsule.

• \$1126

OPUS 569 Handheld system

The Opus 500 series is a true diversity multi-channel system with 16 selectable frequencies to choose from. LCD displays show the frequencies and receiver status as well as the audio and RF levels to monitor the transmitters. The SDM 569 handset is based on our longstanding M 69 dynamic capsule, with a response pattern that suppresses feedback and produces a crisp, 'real' sound. The body has all of the switching and frequency information on an LCD as well as a battery status indicator.

• \$1798

OPUS 550 Pocketpack system

For theatre, film and TV, where lavalier microphones are commonly used, the Opus 550 system combines a fully-featured 16 frequency body-pack with the Beyer MCE 50 microphone. The mic is extremely small and unobtrusive, however the sound is both brilliant and accurate, with a wide frequency response.

• \$1979

Chiayo

Distributed by NSCA P/L.

Ph +61 3 9434 1888



DR809 Receiver/Q809C mic

This is what some would call the modern UHF version of the Legendary Chiayo DR505A receiver & Q309 VHF mic combination, which is arguably the largest selling wireless system in Australia. It has been sold into Schools, Churches, lecture theatres, conference rooms, major hire companies and music stores for the last 10 years. This ever popular combination is loved by all for its robustness and its ease of operation with clever ergonomics and a simple to use switch.

• \$899

SDR816/ SQ916C 16 Channel receiver, new Hand mic.

This is a very popular 16 Channel model which is in high demand for those on the move or in need of 1 to 16 frequencies in one location. Many units offer a lot of channels but few will run so many together as Chiayo. Chiayo has continued to offer a wide selection of useable frequencies for Australia and has numerous mutli channel sites operating around the country.

• \$1,370

Chiayo SDR932: Dual 16 Channel receiver with 2 SQ916C Hand mic's.

This dual channel single rack unit in a strong metal chassis has many advantages. It has a built in antenna splitter so their is only need for one set of antenna an a single power supply. A common set up can have 4 dual units (total of 8 receivers - 16 channel selectable) combined in a rack with a AD85 4 way antenna splitter. Altogether 8 channels of wireless with a splitter one set of aerial and all in a 5 RU Rack space.



dB Technologies

Distributed by CMI. +61 3 9315-2244.

PRO-2000M range

The UHF 2000 Pro is a professional 16 channel Wireless microphone system operating between 770 and 920 MHz. It consists of a full micro-processor controlled, PLL - synthesised, TRUE DIVERSITY receiver, the 2000R. Transmitter options are: 2000M handheld mic with integrated double suspended condenser microphone capsule, and the 2 pocket transmitters, the 2000P-L for lavalier microphone (included) or the 2000P-G for instrument application. Both use NEUTRIK Nano-Con input connectors. Double frequency conversion allows a switching band width of 20 MHz. Frequencies are country specifically programmed. With the UHF 2000 Pro system you may operate up to 12 systems on one 8 MHz TV-channel.

Receiver includes 2 whip antennas.

• All systems \$1,099



SONY®

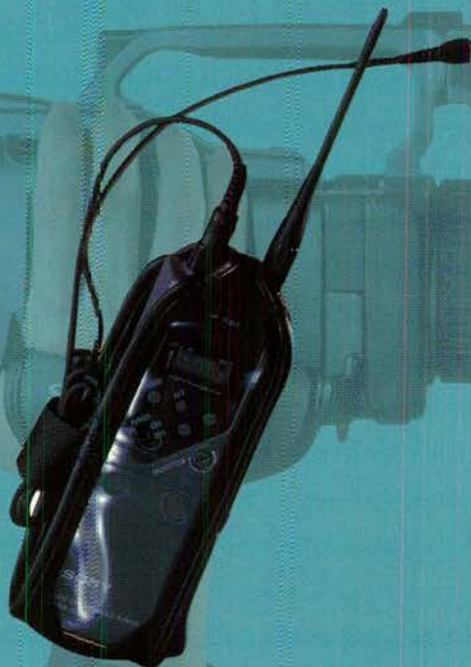
They're used in broadcasting for everything from network news, to talk shows, to soap operas. They're used when rock'n'roll headliners hit the stadium circuit, and for Broadway musicals. Sony's 800 Series UHF Wireless Microphone Systems are the stuff of pro audio legend. But until now this high performance has only been available to musicians and producers with deep pockets. Now Sony changes all that with the latest additions to the 800MHz UHF Wireless Microphone family - The Freedom series.



Freedom™

With Sony "Freedom" UHF wireless, you're free from the interference, distortion and assorted hash of the crowded VHF band.

You're free to mix and match mics, body packs and receivers. And you're free to step up to the UHF world, even if your budget is firmly rooted in the real world.



Sony Australia Limited A.C.N. 001 615 354
Head office: 33 Talavera Road, North Ryde NSW 2113 Web: www.sony.com.au
Sydney (02) 9837 5666 Melbourne (03) 9264 0200 Brisbane (07) 3334 4000
Adelaide (08) 8234 3777 Perth (08) 9202 2555 New Zealand +64 9 486 6130



Wireless Mic Systems

Wireless Myths and Misconceptions

• Just because you have 16 frequencies available on your wireless system, it does not mean that you can use all 16 at the same time. Things like frequency harmonics, space between channels and external interference can all affect how many of the 16 channels can be used at the same time. Talk to your supplier about how you want to use the system BEFORE you buy it.

• The mis-use of antennas is a very common fault for causing bad or non-existent signal strength. There is not enough space here to describe the issues involved in ground-planes, antenna coupling, splitting, amplifying, moving etc. Ideally, you have a system designed to suit it application – then you simply plug A into B to make it work. Of course, the more you understand about how radio works, the better you can tweak your system. You can either get an electronic engineering degree, or start talking to as many professionals as possible.

DB-PU150M

The PERFORMER SERIES of wireless microphones is a perfect partner for musicians of all kinds. The hand transmitter UT 150 L is the same size as a standard vocal microphone, fitted with the renowned Beyer dynamic capsule TG-X58. An alternate option: ultra miniaturisation has made the pocket transmitter, the UT150 L, one of the smallest of the industry. Available as lavalier (included) or guitar pack. UT-150R UHF Diversity Receiver features Ch A and Ch B diversity indicator, Squelch control, Output volume control, Two Telescopic Antennas and Audio output XLR socket.



• All systems \$799.

Electro-Voice from E.V.I. Audio Australia. Ph +61 2 9648-3455

Electro-Voice N/Dym Wireless featuring **HOT SELLER** Clearscan

Clearscan auto channel select is the latest in wireless technical innovations unique to EV. Frequency agility means flexibility in dealing with the many different RF situations out there. However, it also means making choices which aren't always easy - such as choosing the best channel for system operation. That's where Clearscan comes in. Clearscan automates the process of finding the best channel to set your system to. Simply activate Clearscan and it scans all 10 operating frequencies to find the



clearest channel for system set-up and use. All you have to do is set the transmitter to match the channel number displayed on the receiver and you're ready to go. Clearscan gives you the best channel frequency for your environment so you can rest assured that you'll be able to operate without the danger of interference or radio traffic.

7 different system configurations are available. All transmitters have gain adjustment and low battery indicator.

Advantages: Lowest noise floor and best dynamic range at its price point. Fully manufactured in the USA. Guitar system is specifically designed and set up to reproduce the attack of electric guitar and handles active pick-ups without any induced noise. Clearscan option allows for available frequencies to be scanned to select clearest available channel.

Hand Held Systems have these mic options: N/D 167, N/D 257a, N/D 767a capsule. Beltpack System options: Omni lavalier capsule, Cardioid capsule & HM2 Headset.

• Starts at \$1 059 (guitar beltpack)

TASCAM

SOUTHERN REGIONAL DISTRIBUTION

Now available through TASCAM srd:

- BASF audio tapes, MD, DAT, and CDR.
- VERGENCE audio monitors (NHT Pro).
- SABRA pop-filters and universal shock mounts.
- Cable-Up pro audio cables, multi-core, digital etc.



The great MX-2424 24-track HDR NOW ON DISPLAY

TASCAM Southern Regional Distribution is proud to announce the opening of its new marketing and sales facility which incorporates a fully functional recording studio/show room, sales consultancy office and customer support centre.

We display the full range of TASCAM products as well as VERGENCE monitors (now used exclusively by the NBC) and other complimentary accessories. This is the only facility in Australia where you can see everything in the range in one place and all up and running.

The MX-2424 is connected to and controlled by the TMD8000 Digital Console with the ViewNet editing system, displayed on a 14 inch LCD monitor. Full 5.1 Monitoring is also a feature of the facility.

TASCAM srd., 116 Moray Street, South Melbourne, Victoria 3205

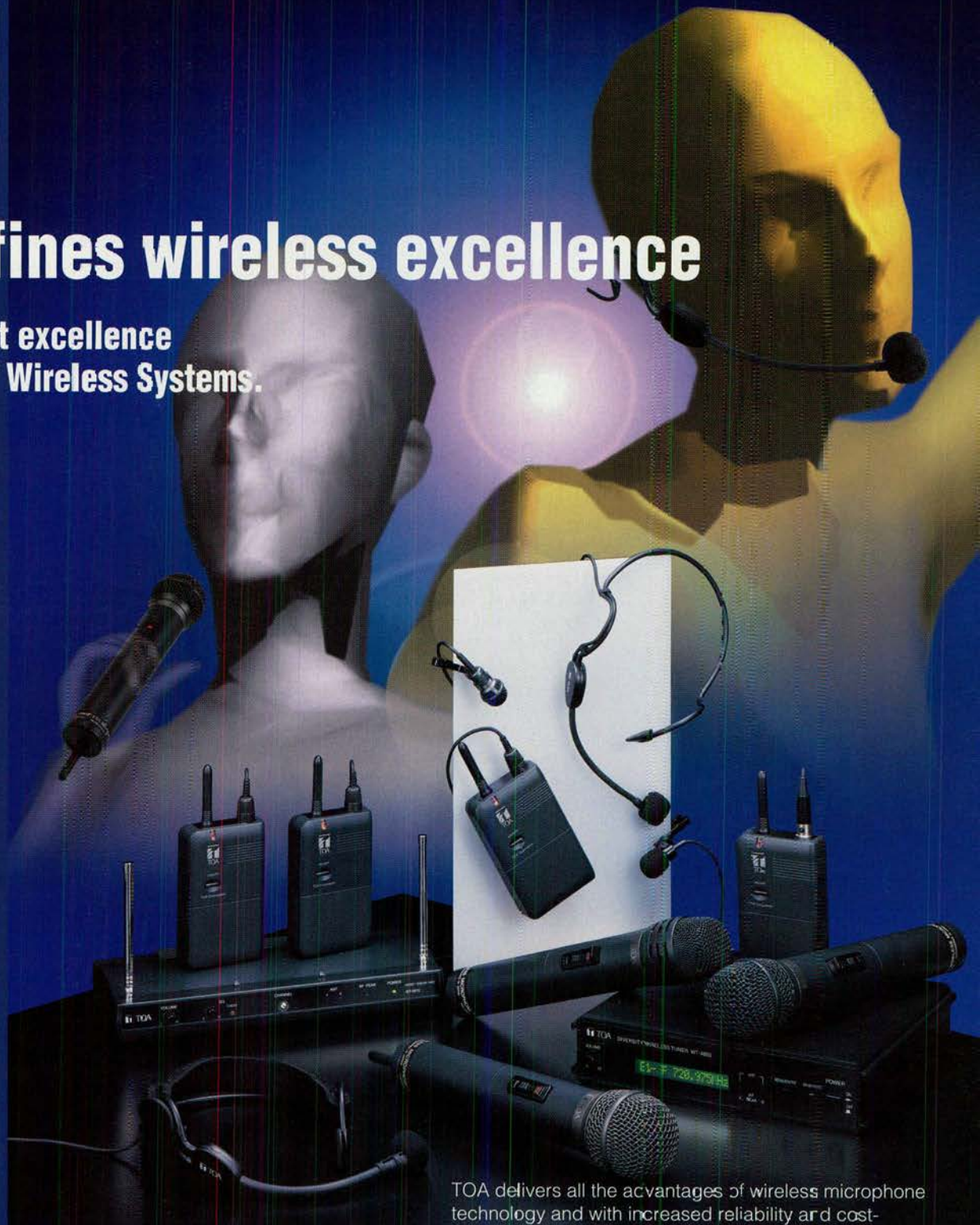
Phone: (03) 9682 0411, Fax: (03) 9682 5884 E-mail: sales@tascamsrd.com.au

Office hours: 9.00am - 5.30pm weekdays. Access to the studio is by appointment only. After hours consultancy and dealer training by arrangement.



TOA defines wireless excellence

Experience that excellence
in the new UHF Wireless Systems.



TOA delivers all the advantages of wireless microphone technology and with increased reliability and cost-effectiveness to suit your specific reinforcement requirements. Configure your ideal system from handheld and headset mics, two tuners as well as a power/antenna distributor and accessories. No matter which components you choose for your wireless microphone system, you'll get all the benefits of advanced TOA technologies which result in better coverage with simpler circuitry and increased reliability compared to conventional wireless systems.

Now it's easier than ever before to effectively reinforce any vocal application whether vocal recital, lecture, speech or sermon. And the flexibility of TOA systems make it a cinch to use even in difficult situations such as aerobics and other vigorous activities. TOA's performance and cost-effectiveness opens up a new world of wireless possibilities.

FOR YOUR NEAREST DEALER CONTACT

audioproducts
Australia
Freecall 1800 642 922

TOA Corporation

URL : <http://www.toa.co.jp/>

Wireless Mic Systems

Wireless Myths and Misconceptions

- Mic capsules make a BIG difference. Particularly in the case of lapel and miniature mics, this is a classic example of "bang for buck" because the best mic capsules will cost you serious bucks.

- Yum Cha brand batteries may be cheap, but you would have to have rocks in your head to stake your reputation as a good technician by using cheap batteries. Golden rule: change batteries before EVERY show.

- You cannot have two transmitters on the same frequencies and expect to receive both on the one transmitter. There are no "ifs", "buts", or "maybes". What will happen is your transmitter will lock into whichever signal is the stronger. This effect was actually used to great advantage during the Olympic games where two systems, operating at either end of the stadium, each locked into the proper receiver because it was only 4m away (the other transmitter was more than 120m away)

- Diversity means that the receiver has two separate antennas for receiving the transmitted signal. Whichever signal is the stronger is the one that the receiver will listen to. It is not uncommon to see a receiver regularly jump between the two antenna options.



Electro Voice R200 Wireless Systems

Diversity Radio Microphone system. System is available on choice of eight fixed frequencies between 710 and 722 Mhz. Receiver features AF and RF led indicators with a level pot over a 6.5 line output on front panel with a balanced XLR Microphone output on the rear panel. Optional rack mount kit for two receivers 7 different system configurations are available.

All transmitters have gain adjustment and low battery indicator.

Hand Held Systems optional with N/D 167 or N/D 267 Capsule. Beltpack system options- Cardioid Lapel capsule or HM 2 Headset

- From \$769. (Beltpack System with no microphone)

Mipro
From Audio Telex Communications.
Ph + 61 2 9647-1411

Mipro MR801

The Mipro MR801 is a single channel, UHF wireless microphone system, renowned not just for excellent audio performance, but phenomenal reliability. The MR801 features industry standard balanced and unbalanced outputs, low handling noise and a huge range of accessories such as miniature lapel microphones, aerobic headsets and rack mount kits.

Full metering, removable antennas, excellent AF & RF performance and a reliability record other manufactures can only dream of, has seen Mipro become one of the worlds largest and fastest growing manufactures in the world. The MR801 is their entry level UHF product but with all the features and performance of systems 3 and 4 times the price

- \$1,027 (Hand held system)

Mipro MR588

The Mipro MR588 wireless microphone system features 30 UHF channels which are easily selectable by the user. This 30 channel high performance diversity system uses phase locked loop (PLL) technology combined with Pilotone and Noise Lock circuitry to ensure superb selectivity and interference free operation. Full metering removable antennas and two very well featured transmitters are just some of the reasons this 30 channel system is the most popular frequency agile system in the

range.

The MR588 offers unparalleled flexibility. With a host of accessories such as UHF boosters, antenna dividers and extension aerials and you have a wireless microphone system that can handle any application. Full metering, PLL, Pilotone and Noise lock circuitry and removable antennas, makes the Mipro MR588 a truly 'pro' product. The Mipro MR588 surely sets a new benchmark for other systems in this price category.

- From \$1,579 (Range pictured below)



Mipro MR822

Mipro MR822 is a dual, 30 channel UHF wireless microphone system. From one single, 1ru chassis you can access two thirty channel receivers, a built in battery charger for continuous transmitter operation, full metering – removable antennas. The MR822 also features an in built – switch mode power supply, ensuring its suitability for the hire market.

The two receivers in one lightweight chassis is a significant advantage in the hire & installation markets. The inbuilt battery charger allows the user to access a constant supply of charged batteries for their transmitters. Add to this Mipro's now famous range of extension antennas, boosters & dividers, and you have a truly flexible system.

- \$3,199 (Dual receiver and 2 hand held transmitters).

Sabine
From Audio Telex Communications.
Ph + 61 2 9647-1411

SWM3000H wireless mic system

HOT SELLER

Sabine were the original ground breakers in feedback exterminator technology. Today they are clearly the market leaders with a host of products utilising their patented technology. Over the years the FBX algorithm has become



BREAKING THE SOUND BARRIER:

FLEXIBILITY, PERFORMANCE AND PRICE

BlackLine packs 30 years of Martin Audio concert speaker design into an all new range. Designed for both portable applications and fixed installation BlackLine provides the flexibility of multi-angled cabinets, rotatable Mid/HF sections for horizontal or vertical alignment and pole, wall or flying fixture options. Engineered 'Road Ready,' BlackLine incorporates multi laminate birch ply and perforated steel grille construction, Speakon inputs and compact external dimensions.

*Left to Right (clockwise): H3 Full Range 3-Way Biamped, H2 Mid/High 2-Way Active, F15 Full Range 15" 2-Way, F12 Full Range 12" 2-Way, S*5 Single 15" Sub, S218 Double 18" Sub, S18 Single 18" Sub (not shown).*



TECHNICAL AUDIO GROUP

TECHNICAL AUDIO GROUP

558 Darling St, Balmain NSW 2041, Ph: (02) 9810 5300 Fx: (02) 9810 5355, Email:sales@tag.au.com Web: www.tag.au.com

Wireless Mic Systems

Mini microphones for wireless systems

Aeromic Pro Audio Microphones
Handmade in Sydney by Peter Paisley and distributed by Aerobic Microphones Australia +61 2 9313 4995



AM15HL Hairline Mic

A small, handmade omni for Musical Theatre Productions and is 100% serviceable. It can be secured on the ear with spirit gum and cable clips (not supplied). The mechanically isolated capsule minimises clothing noise and, with a tie clip, works well with worship leaders, lecturers and professional presenters. Flat response with a natural sound. Nude cable available.
• \$297



quicker and more accurate. The result, Sabine are the industry standard for feedback exterminator technology and offer their clients exceptionally high quality products such as the SWM3000H wireless microphone system.

Sabine SWM3000H Features: Sabine (USA) offer a truly unique wireless microphone product. Featuring their patented FBX feedback exterminator, auto de-esser and compressor/limiter, in built battery charger and power supply this 30 channel UHF is simply the best featured system on the market.

Feedback has always been a major problem/issue with wireless microphones. The 'talent' remains dangerously close to speaker systems and the resulting feedback can simply destroy a performance/presentation. The Sabine SWM3000H automatically prevents and kills that feedback and offers exceptional audio performance. It is for this reason that Sabine say they offer their customers 'True Mobility' in a wireless microphone system.

- \$3,099 Hand held system.

Samson
From Corporate Audio Services,

+61 3 9474-1067

Samson Micro Diversity Series

Systems of choice in professional wireless for video cameras. The receiver is compact enough to easily mount onto any professional video camera and feature dual-function RF level and battery life meter, audio peak led indicator, variable squelch control, balanced lockable mini XLR o/p connector, balanced and unbalanced o/p with level switches, headphone o/p with level control and DC input for external power. Models include single or 32 channel versions.



Both ranges offers a wide variety of handheld, headphone and lapel capsules from Shure, Audio-Technica, Audix, Sennheiser, Electro-Voice and Sony, as well as Samson's popular Q Series.
• Single channel lapel systems from \$1,599.

Samson Synth-32 Series

32 channel, frequency agile, diversity UHF wireless system. The range features a customised

CHIAYO Cost Effective Quality Audio

Digital TV.

Will your wireless system be OK?

January 1, 2001 will see the commencement of Digital TV transmissions. Are you Ready? How will the new frequencies effect your wireless system? Call NSCA - experts in UHF wireless - for up to date information and assistance (03) 9434 1888.

Chiayo Wireless Microphones are ready now.
Call us for information on the complete range.

N | S | C | A

National Systems Corporation of Australia Pty Ltd

Ph: (03) 9434 1888 Fax: (03) 9434 1866 Interstate:1800 441 440 Email:sales@nsca.au.com



Wireless Mic Systems

VCO in the transmitter and SAW (surface acoustic wave) filter in the receiver to significantly reduce spurious RF content. The receiver has a large, easy-to-read LCD display that indicates the status of key functions such as Channel, Group, Audio and RF level, Diversity A/B antenna and Mute. The range offers a wide variety of handheld, headphone and lapel capsules from Shure, Audio-Technica, Audix, Sennheiser, Electro-Voice and Sony, as well as Samson's popular Q Series.

- Lapel systems from \$1,799

Samson Synth-6 Series

High performance synthesised UHF system that lets you run up to 96 simultaneous channels in the one environment. Two independent synthesised receivers housed in 1-RU. A vivid back-lit LCD displays information including RF and AF levels, frequency, user defined channel names, antenna attenuation and audio o/p level. Bundled Dbx Noise Reduction tracks program material with exceptional accuracy to reproduce audio without noise or col-



oration. Accessories include distribution amplifiers, powered antennas and computer control of an entire network via Samson's Wireless System Manager. The range offers a wide variety of handheld, headphone and lapel capsules from Shure, Audio-Technica, Audix, Sennheiser, Electro-Voice and Sony, as well as Samson's popular Q Series.

- Dual combination lapel and handheld systems from \$9,999.

UHF AirLine Series

A Revolution in Wireless Technology. The whole point of wireless microphone and instrument systems is to eliminate cables for complete freedom of movement. AirLine takes this idea to the next level with miniaturised transmitters that eliminate conventional body pack transmitters and connecting cables. These miniaturised transmitters are featherweight and run on a tiny AAA size battery with 14-hour battery life. Select from the AR1 micro receiver or the UR1 true diversity compact half-rack chassis that can be mounted in an optional standard 19" rack kit. Besides making wireless easier than ever, AirLine gives you transparent sound and reliable wireless reception over long ranges wherever you use it. • From \$799.

Sennheiser
From Syntec International,
+61 2 9417-4700

Sennheiser 100 series HOT SELLER

Sennheiser 100 series is the cheapest of the evolution range of wireless systems. This is a true diversity system. The four frequency presets

AM12H Headworn Voice mic with omni-directional AM10 Cartridge

Users include Theatre productions, Dance Instructors, Auctioneers, Platform Speakers and Lecturers in AV presentations. Ideal for voice rehab systems as it is so light and comfortable to wear for long periods. TA3F or TA4F connectors fitted.

- \$396

AM22HB Professional Headworn Vocal Microphone

....with electret cardioid capsule featuring our exclusive EVS (Even Voltage Swing) Circuit. The benefits of this circuit are unheard of elsewhere with nicely predictable mixer settings as each mic delivers high sensitivity, high output and high SPL too! Slim profile, supplied with windscreen.

TA3F or TA4F connectors fitted.

- \$495

Countryman microphones
From Production Audio Services
Ph +61-3-9415 1585

Countryman B3

The B3 lavalier microphone is very small, round, omnidirectional and electret. Able to withstand moisture & make-up this mic is ideal for theatre and music

Keep It Simple - Make It Tough!

That's our philosophy and it's soundly based - if it's easy to operate and tough enough for Aerobics Instructors to use daily without falling apart, then it's better than most for other non-audio professionals that use sound systems every day in their real work.

Next time you spec a job that needs one wireless mic mixed over one stereo line input, or two balanced mics or wireless sets over two stereo sound sources, then think about using an Aeromix Audio Mixer, the two matching Aeropower Power Bricks or the new 2+2 Powered Mixer. They're not just for Aerobics sound systems, but also Shops, Clubs, Pubs, Function Centres and Schools where the client's brief is:

"Keep it simple, make it tough, and I don't want it costing too much!"

If you sell or install sound equipment, call AMA today for trade pricing.

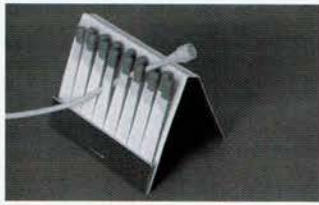
Aeromix and Aeropower - designed and manufactured in Australia - and from \$396 sell they're on the money!

Aerobic Microphones Australia P/L Email: johnp@eromic.com.au
Phone 02 9313 4995 Fax 02 9313 5569 www.aeromic.com.au



AEROMIX

Wireless Mic Systems



productions. Designed to operate with any wireless transmitter that can supply positive polarity power.
 • \$540

Countryman B6

The B6 is only 2.5mm in diameter and features replaceable cap which change its colour, frequency and also prevents sweat and make-up entering the mic element. Designed to operate with any wireless transmitter that can supply microphone power.
 • \$937

DPA microphones from Studio Supplies, +61 2 9957-5389

DPA4060

The DPA4060 is a prepolarized omnidirectional Miniature Condenser Microphone with a 5.4mm vertical diaphragm. A double vent protection system together with water resistant materials inside the microphone makes it very difficult for humidity to cause the DPA4060 to fail. By changing the protection grids, the Miniature Microphones can be acoustically modified. Noise floor of 23dB(A) re. 20µPa, an impressive sensitivity of 20mV/Pa and if powered correctly, the microphone will be able to handle levels up to 134dB SPL. The DPA4060 is winner of Product of the Year Award 1997 from TCI.
 • \$502

DPA4061

The DPA4061 is acoustically identical with the award winning DPA4060, but the sensitivity is adjusted to 6mV/Pa to match some of the more sensitive transmitters on the market. The noise floor of the Type 4061 is 26dB(A) re. 20µPa and if powered correctly the microphone will be able to handle sound pressure levels up to 144dB SPL before clipping occurs. Terminated with the B&K Microdot connector for use with a wide range of adapters



can be set to anywhere inside of five UHF frequency bands (all four presets must be in the same band). These bands are 32MHz wide, and are spread from 513 to 870MHz. Transmitting power of 30mW give a typical battery life of at least 8hrs when using recommended batteries. Headset and clip-on mics, plug-in transmitter for wired mics, and belt-pack receivers are some of the options available.
 • \$1099 SKM135 handheld mic and EM100D receiver.

Sennheiser 500 series

Sennheiser 500 series is the "best optioned" of the evolution range of wireless mics. All of the features of the 100 series are available, with the addition of 16 frequency presets instead of only four. Also there are "battery low" warnings on the receiver, as well as the ability to name the frequency presets with things like "lead vocal". Soundcheck mode allows you to make RF and AF level checks unassisted.
 • Priced at \$1899 for SKM535 handheld mic and EM500 receiver.

Sennheiser 3000 series

Sennheiser 3000 series is designed to be able to cope with multi-transmitter systems. The EM3031 can have up to 32 switchable preset frequencies. These frequencies can be set to anywhere in the UHF spectrum of 450 to 960MHz. This receiver can be used with a computer interface to monitor a numerous systems simultaneously. Excellent frequency response and transmission distance capabilities have seen this system used in numerous professional productions worldwide. A wide array of accessories is also available.
 • Priced at \$5500 for SKM3072-U handheld mic and EM3031 receiver.

Sennheiser 5000 series

Sennheiser 5000 series is the "state of the art" system offered by Sennheiser. This rack-mounted system is specifically designed to be used in large, multi-transmitter systems. The component-based design allows the user to build a system in exactly the way required for a given situation without taking vast amounts of rack space. A computer interface for moni-

toring the system is standard. The 5000 series of belt-packs and hand-held mics are also the height of Sennheiser engineering, and these are supported with a considerable array of accessories. Pricing a single system is indicative only, as the 5000 series would only be used in multiple arrays. (Pictured below).
 • Priced at approx \$8000 per channel for SKM5000 hand held and EM1046 receiver.



Shure
From Jands Electronics,
+61 2 9582-0909

Shure UHF Series

Full metal construction, 188 channels available, channels grouped for ease of compatible frequency selection, full networking, security and monitoring facilities, remote battery monitoring. Supplied with microphone elements that performers know and trust.
 • Priced from \$5,275.

Shure UC Series **HOT SELLER**

UC Series has the most features for the asking price. UC Series systems can run up to 16 frequencies simultaneously, and provide a cost effective solution for those requiring complete system.
 160 channels available, channels grouped for ease of compatible frequency selection, in-built low cut and high shelf EQ in receiver, remote





USE HAFLER. GET IT RIGHT.

sr2600



sr2300



- SR-Touring
- SR-Cinema
- SR-Contractor



Distributed by

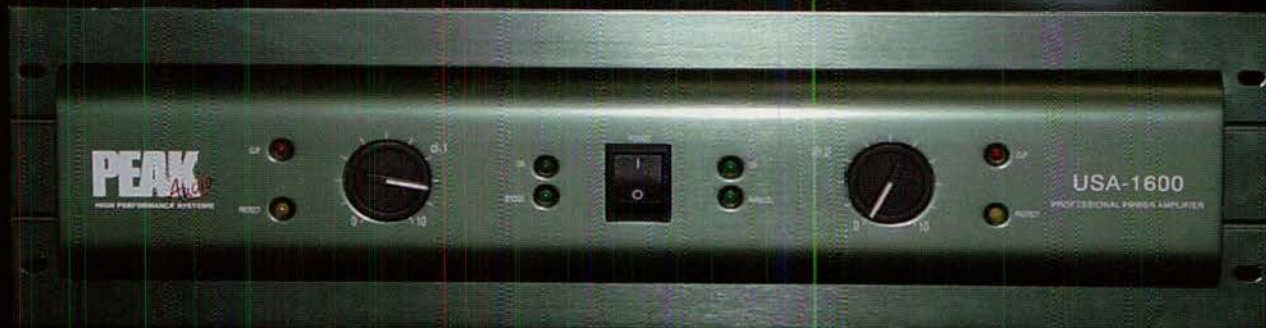


Ph: 1800 645 681
Email: sales@guet.com.au

HIGHER INTELLIGENCE



USA-1600
USA-1600
USA-1600
USA-1600



A close encounter of the affordable kind.

Wireless Mic Systems

for wireless systems and 48V Phantom.

- \$502



DPA4065

The 4065 is a headband mounted condenser microphone (above) using a prepared omnidirectional cartridge element with a 5.4mm vertical diaphragm which is acoustically identical with the cartridge used in the 4061. It is specially designed for maximum performance under the often difficult conditions when mounted directly on the human body. The band is easily bent to fit any head shape, in a tight fixed position.

Special attention has been paid in the design to the humidity problems that often occur in theatrical applications and to the light weight construction of the headband itself. The sensitivity is 6mV/Pa to match the level of the human voice to the general input sensitivity of most wireless transmitters. The noise floor of the Type 4065 is 26dB(A) re. 20µPa and if powered correctly the microphone will handle sound pressure levels up to 144dB SPL before clipping. A wide range of connect on adapters makes it possible to use Type 4065 with most of the professional wireless systems available plus 48V phantom. • \$792

Lectret Precision

Made in Singapore and distributed by Aerobic Microphones Australia 02 9313 4995

L5200-PT

Full frequency range true clip mic for amateur dramatics and

battery low indicator and logic I/O for integration into control systems. Supplied with microphone elements that performers know and trust.

- From \$3,480.

Shure UT Series

Legendary Shure wireless microphone system at an affordable price. Supplied with microphone elements that performers know and trust. Like all Shure microphones, they are subject to rigorous environmental testing to ensure years of trouble free performance.

- Priced from \$1,130



SONY

From Sony Australia: +61 2 9887 6674

FREEDOM RANGE

The WRT805A body pack transmitter has an easy-to-read LCD built into its curved body design. Selected channel, RF & AF levels and operating time readout are displayed. Options include a guitar cable, lavalier and headset microphones.

- \$744

The WRT-807A handheld with Super-Cardioid dynamic capsule is designed for demanding vocal applications. Copper Clad Aluminium Wire (CCAW) and a powerful AlNiCO magnet deliver crisp and clear sound superb presence. The rugged, solid design also includes LCD status.

- \$1,289

Single channel portable diversity receiver WRR-



802A has a pre-programmed CPU providing intermodulation-free frequency groups. The LCD displays AF, RF, selected channel and transmitter battery alarm. The mic/line switchable



balanced output level is adjustable.

- \$1,339

The MB806A modular diversity receiver system has a built-in antenna divider for up to six WRU806 receiver modules with LCD for AF, RF, selected channel and transmitter battery alarm. Output include individual switchable mic/line balanced and mixed. Sony's Freedom UHF wireless range is proving popular with quality sonic performance, six-hour battery life (AA) and operational indications to ensure freedom from interruption.

- \$744

Telex From E.V.I. Audio Australia. Call +61 2 9648-3455

Telex ENG 100

Agile Diversity ENG system with 100 on-board channels. Battery Powered receiver operating on two AA batteries available in two frequency splits between 668 and 746 Mhz. Features DC socket for remote powering from Camera with Audio out on balanced XLR at Mic level with level adjust. Separate headphone out with level control.

Beltpack transmitter supplied as standard with optional Hand Held's available. Beltpack terminates on TA-4F with EV RE90TX capsule supplied as standard. Transmitter features gain adjustment and low battery indicator.

- Bodypack system inc. lapel capsule \$2,267

TOA

Distributed by Audio Products Australia 1800 642 922

WM4200

TOA hand held dynamic cardioid microphone designed for vocal use. Features that include input sensitivity, 64 selectable frequencies, rubber coating to reduce handling noise, on off switch to prevent accidental activation, hours battery life, LED low battery indicator.

- \$559

WT4800

TOA wireless receiver with features that include Fast Setup and Simple Operation, Clear, Intelligible Audio, Frequency-Agile, 64 user-selectable channels, TOA Space Diversity Reception, two built-in switching antennas for

Wireless Mic Systems



freedom from dropouts, On-Board Scanner checks for potential interference and suggests clear channels. Dual Squelch Protection (Noise AND Tone Key) prevents unwanted radio frequency. WM4210 is a TOA hand held cardioid microphone designed for vocal use. Features that include 16 selectable frequencies, on off switch that stops the microphone rolling off bench, 10 hours battery life, LED low battery indicator.

- \$1120 together or separately

WM4220

TOA hand held condenser microphone for Speech with features that include input level:125dB SPL, 16 selectable frequencies, on off switch that stops the microphone rolling off bench, 10 hours battery life, LED low battery indicator.

- \$396

WM4310

TOA lavalier wireless microphone with features that include 16 selectable frequencies, input sensitivity control, belt clip rotatable ±60 degrees, lock quipped mini plug microphone jack, 10 hours battery life, LED low battery indicator.

- \$327

WT4810

TOA wireless receiver with features that include 16 selectable frequencies, TOA space diversity technology, simple set up, balanced and unbalanced out, cascade 3 WT4810 up to one microphone input on the amplifier.

- \$444

Vega From E.V.I. Audio Australia. Call +61 2 9648-3455

Vega U2020

Diversity Frequency Agile system with 100 on board frequencies. Available in four splits between 708 and 782 Mhz with diversity indication as well as AF and RF meter ramps. Outputs are available on 6.5 or XLR with Mic/Line switch and externally accessible squelch control. Antennas can be mounted on either front or rear of receiver.

4 different system configurations are available. All transmitters have gain adjustment and low battery indicator. Four system multicoupler available. Rack mount kits available

Advantages: Exceptional RF performance, extended range, wide dynamic audio range makes the system suitable for professional applications. Allows for larger number of channels to be used together than comparable brands. Also available as individual components.

Hand Held System mic options: N/D 267A, N/D 767A Capsule, Beta 87 Capsule.

- Prices start at \$2,569 (U2020BP Beltpack System without capsule)

places of worship. Pigtail format, ideal replacement for old hard wired lavalier mic/pack sets. Available in black or skin colours.

- \$132

HT-747-PT

Headworn Vocalists Mic featuring a Super Cardioid Capsule, adjustable fitting, flexible boom arm, pigtail format.

- \$198

HT-746WP-PT

Headworn Pro Voice User Mic, Waterproofed Noise Cancelling capsule, suitable for low sweat activity instruction and other speaking applications in high background noise situations - pigtail format.

- \$253

Leon Audio Mini Mics

Handmade in Adelaide by Ian Du Rieu and distributed by Aerobic Microphones Australia 02 9313 4995

LSM900 is a phantom powered electret condenser omni-directional microphone. It has a medium level output and suits the majority of wireless mic production uses - good for vocal work - speaking or singing with choirs. Pigtail format

- \$240

Connections 2001 **MARKETREPORT** schedule

Video

- Feb Installation Projectors
- April Digital Video
- June Video Distribution Devices
- Aug Portable projectors
- Oct Control systems Systems for the remote Dec/
- Jan Live vision mixers

Lighting

- Feb Dimmers
- Mar DMX devices and networks
- May Luminaires
- July Small Moving Lights
- Sept Outdoor LX equipment
- Nov LX Desks

Communications systems

- Sept Performance Communications Systems

DJ / CLUB GEAR

- April DJ & Club Equipment

Professional Audio

- Feb Recorders, multitrack & stereo
- Mar Microphones
- April Commercial audio
- May Amplifiers
- June Small PA boxes
- July Effects and effectors
- Aug Analogue mixers
- Sept Signal processing and control
- Oct Studio Monitors
- Nov Digital automated mixing consoles
- Dec Big PA Boxes

WHAT TO DO!

IF you distribute one of the products (left) in Australia, we will consider running editorial. This is not paid coverage. The DEADLINE is one month and one day before, so Feb closes Dec 31, March January 31, etc. CONTACT US! GET AN INFORMATION SHEET which is available a few months ahead of the feature. Web: www.conpub.com.au/marketreport.htm

INFOSHEETS: Sarah, +61 2 9876-3530 sarah@conpub.com.au
EDITOR: John Grimshaw, +61 2 9876-3530 john@conpub.com.au
AD SALES: Julius Grafton, +61 2 9876-3530 julius@conpub.com.au



Man of the Hour Tour

High production values keep the audience coming back. Mandy Jones reports:



Chris Newman Lighting Director

Chris Newman's lighting design needed two distinct looks - a static sentimental feel for the first half of the show, and then a big concert look for the greatest hits section in part 2.

Chris designed a huge Vari*Lite rig comprising 3E VL2s, 25 VL Arcs, 22 VL5Bs and 16 VL5s. The analogue rig was made up of 140 par cans, 6 x 4 cell groundrows, 10 x 10° Source Fours, 9 x 8-lite DWEs, 4 truss spots and 4 FOH spots. Chris also used 3 x 10° fresnel shells with 5k lamps and 2 x 5k fresnel shells with 2k lamps as a decorative feature to the stage design.

During the show, Chris operated the analogue fixtures off a WholeHog as well as called all the followspot cues.

The song goes "If there's a fool born every minute, then I'm the man of the hour," but John Farnham's latest concert tour has once again proved he is no fool when it comes to giving audiences what they want. The *Man of the Hour* tour (or MOTH as it was dubbed by the crew) was a no-expense-spared multi-media experience.

With a base working crew of around 35 people, the Rod Laver arena was a hectic scene on the day of the first Melbourne concert. The ambitious production design included enormous red velvet curtains large enough to enclose the entire stage, and in doing so allowed for a major set transformation to occur during interval.

To compensate for the loss of intimacy in a venue the size of the Tennis Centre, screens were placed around the arena to enable close up views of Farnham and his band. The camera and video system was supplied by Big Picture Australia Pty Ltd who are no strangers to Farnham concerts.

Providing five camera coverage of the concert, images were fed to five screens as well as to the main Clipsal 9mm pitch LED 'Superscreen' on stage.

Divided into three distinct sections the first part of the show was dominated by material from the new album *33 1/3*. A retro rock was created by simple staging elements and the soul feel of the album was captured by the three piece brass section and the smooth backing vocals of Lindsay Field and Lisa Edwards.

Chris Newman's lighting design was subtle and restrained relying on naturalistic tungsten looks interspersed with bold flares of colour on the band and the set pieces.

At the conclusion of the first section the motorised curtains enveloped the stage for a twenty minute interval. Following a couple of Telstra Mobilenet ads shown on the big screen featuring Farnham and his 'Paul Hogan look-alike' Manager Glenn Wheatley,

Farnham came back on stage with his guitarist Brett Garsed for an acoustic set. Dwarfed against the enormity of the velvet curtains and flooded by followspots, Farnham made numerous comparisons to RSL club stages.

The third part of the concert was the long awaited greatest hits set. The curtains parted to reveal the band, new set pieces and the superscreen in 'ready to rock' mode. Combining video footage and live feeds from the cameras, the superscreen became a key player in the show providing graphics, text and close-ups.

Chris Newman's and Peter Lothian's Vari*Lite design was nothing short of spectacular, and in the capable hands of Grant 'Tosh' Walsh using the new VDOSC system the sound was crisp and clean.

Throughout the two and a half hour show, screams of women moved to the front of the stage to shake Farnham's hand, give him some flowers, try for a kiss or to souvenir some sweat. In typical nice-guy style, all efforts were rewarded wherever he could, graciously making contact with his fans and even joking with the audience, "I think I've met just about everybody!"

The MOTH tour is testament to the high production standards of John Farnham and his management team. Referring to them as "the best lighting and sound crew in the world" Farnham showed genuine appreciation for the professionalism of his technical support crew and their efforts in making such a challenging tour come together so seamlessly.

And perhaps most significantly, by providing the little extras such as additional screens for the audience, the Farnham team have secured fan loyalty for years to come by giving the audiences a quality and memorable concert experience that bridges an all too often widening gap between value and money. ●

John Farham's *MOTH*

V-DOSC on tour

By Julius Grafton

What a difference a PA makes. Last year's John Farnham tour copped a bit of flack in our pages due to uneven distribution of sound, where the traditional multi cabinet system failed to serve every seat with uniformity. It's a problem which has always existed, and happens every where, every day, but audiences are increasingly much more fussy.

Ask any promoter. Aida co-promoter Guiseppe Raffa says 'Audiences are totally influenced by the compact disk quality of sound'. Plus, they tend to like to see the act, as Barry White discovered to his great personal cost last month.

John Farnham's *MOTH* tour sounded almost like a big stereo, because it used a V-DOSC line source- the latest and most refined variety of large sound reinforcement systems. Jands Production Services are very proud owners of V-DOSC, and Audio System Engineer Pat Richardson was kind enough to show Connections over the system.

This new system is based on a vertical array of rectangular elements. This single column creates a line array for every inci-

(continued on next page)



**Peter Lothian
Vari*lite Operator**

Peter was happy because he got to use his favourite desk, an Artisan. He had planned to use the Artisan Virtuoso but couldn't get his hands on one. The Vari*lite show was programmed over 3 nights in Adelaide just prior to the commencement of the tour.

"We used WYSIWYG to work out the exact looks and then manually transferred the individual settings into the Artisan. It took a while but it was the only way I could properly get my head around the rig."

While most of the show was fully programmed, Peter operated a couple of songs manually to allow for some spontaneity.

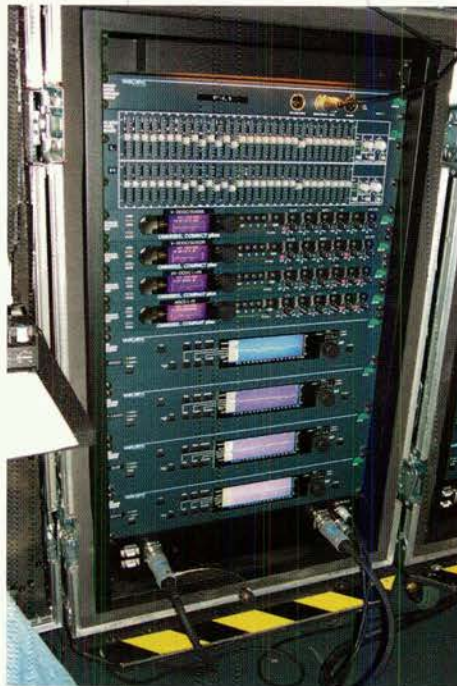
**Trent O'Connor
Lighting Crew Chief**

The *MOTH* tour was Trent's third stint as a Lighting Crew Chief.

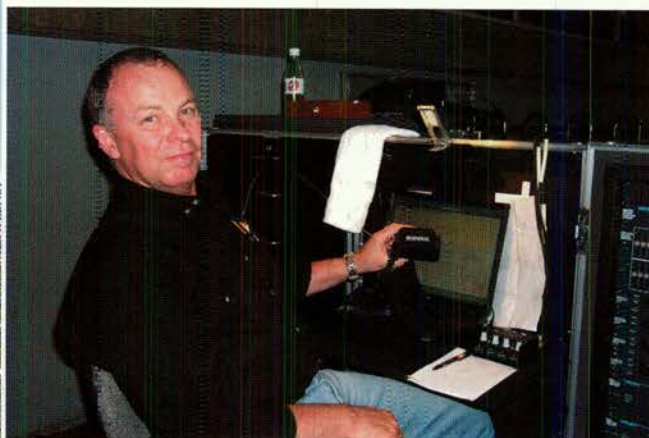
"I rely on my crew a lot. They're all amazing and we work together as a great team. Basically my role is to represent Jands in regards to all the lighting used on the tour. I'm there to make Chris Newman's job easier so if anything goes wrong he can come directly to me.

"Taking this on has been a huge challenge, but it's been fantastic. It's such a good show I'll do whatever it takes to make it work. And so will my crew. Especially guys like Rohan Harrison who looks after the moving lights. I couldn't have done this without him."

Trent O'Connor and Rohan Harrison



V-DOSC outdoors (left), BSS drive rack (right), and Pat Richardson (below).





**Michael 'Shackles' Kent
Rigger and Safety Officer**

"My standard comments are 'it's been fantastic' and 'it's been a huge challenge'.

"After the Olympics I was pretty keyed up for what I'd been told would be a simple gig... then I saw the plans for this... then I had three or four Valiums."

One of the biggest challenges for Michael was developing the mechanism to enable the superscreen to travel several metres down-stage for the first half of the show.

"All of the truss and rigging points were built around that happening."

32 metres of red velvet (11 metre drop) was used to conceal the stage during the interval when the major staging changes were made. Utilising two double motor controls the curtain was referred to as "the shroud of touring".

"We're using a Schonberg console to keep track off all the hoists and to make sure everything is doing what it's supposed to. Sometimes it's the only way to see if things are moving, by actually checking the readings on the console."



**Dennis Murphy
Director - Big Picture Australia**

"This is the third time we've supplied camera and video production for a John Farnham concert tour. On this one we've got three operated cameras as well as two mini cameras on stage providing coverage of the show. We've got a crew of five working on it.

"We look after the five screens

vidual component loaded in each cabinet. A V-DOSC cabinet has two 15" bass drivers, one on each side, with 4 x 7" mid drivers situated in pairs on each side of two patented high frequency DOSC wave guides in the centre.

These all line up into a complete vertical line, high frequency components in the middle, mids on each side, and bass drivers on the outside. It is an active three way system, and where required V-DOSC subwoofers may be added on, making a four way system.

"Everything is absolutely predictable" says Pat, showing me the software. It's called the L'Acoustics Array Prediction Program, and it is an Excel file which showed the dispersion of the system in the Melbourne venue. Pat has room dimensions for all the venues on the tour, and updates them at each venue using a laser finder which is accurate to within a few centimetres.

At the MOTH show there were two flown arrays each side of the proscenium stage in Melbourne, and they were operated as 'left' and 'right' sends, so that the stereo image was more evenly distributed through the venue. The main pair of arrays comprised a dozen elements each side.

The outside pair of arrays comprised 6 elements, and they were offset about 40 degrees out away from the main system, to cover the side seating. Each array has a horizontal dispersion of 90 degrees, and the fact that you may overlap them isn't widely understood. Pat's Excel screen showed the areas of overlap in the venue, and audibly this didn't create a problem.

The way the system works, elements (cabinets) are flown together in a vertical array. Each element is arrayed slightly, with angles ranging from 0.75° to 5.5°. Regardless of the height of the array, a cylindrical wavefront is created with 90 degree horizontal coverage from the centre axis of the array.

"Before this, the attitude was to put up 64 big black boxes and go to catering, saying 'it'll rock'" says Pat. "There was only so much you could do" (to the sound) "because of lack of pattern control. To some degree, the manufacturers had us fooled too, because they would keep coming up with variations of the same thing. They would tighten up the pattern of the horn. It always got a little better, but wasn't a leap of faith".

L'ACOUSTICS from France, makers of V-DOSC, have strict specifications and staff training requirements. For example, only XTA or BSS signal processing equipment may be used. Jands have built nice new drive racks of BSS devices. (See picture)

The processor rack accepts a left/right feed from the mixing console, which runs through an FCS 960 dual third octave equaliser. Note the minimal system EQ, which is wholly

venue related. Thence, the signal runs into four FCS-966 Vari-Curves, (at the bottom of the rack).

Finally, there are four FDS-366 OmniDrive Compact processors, these are digital fully programmable processors with custom L'ACOUSTICS presets, including EQ, crossover, time alignment and limiting.

There was a flown array of subwoofers between each pair of arrays too. Eight SB 218 dual 18" subs, made by L'ACOUSTICS were flown complete with their amp racks. This is because L'ACOUSTICS have strict limits on length of speaker cables used with the system - 25 metres for the V-DOSC cabinets, and 15 metres for sub cabinets. Jands have designed and built some heavily engineered amp racks complete with flying hardware, each rack houses four Crown 5002VZ amplifiers and weighs in at 240kg. Four amplifiers power six V-DOSC cabinets, or 8 SB 218 cabinets.

Finally, there is a 2 way variant of V-DOSC, known as dV-DOSC cabinets. They have a 120 degree horizontal dispersion and are beneficial for nearfield coverage. ●

V-DOSC Operating Philosophy

The line array is the first key to the V-DOSC operating principle- and also establishes another concept, that of Coplanar Symmetry.

The second key to V-DOSC is the cylindrical sound wave. Until now, all contemporary speaker cabinets have created a spherical wavefront. That is, the wavefront moves outward from the cabinets with an ever-expanding horizontal and vertical dimension. By arraying cabinets together in a large configuration, one is simply overlapping sound waves, thereby creating phase incoherencies between each adjacent cabinet, or source. Increasing the number of sound sources raises interference problems that become uncontrollable.

Today's theoretical trend is to couple a number of enclosures in a fan-shaped array, following an angle determined by the horizontal directivity of each enclosure, in order to avoid the overlapping zones that create destructive interference patterns. A major shortcoming of this type of arrangement is that the maximum power available in one direction can only be provided by the enclosure facing this direction, and cannot be increased.

Another shortcoming is that a correct coupling of the enclosures implies that the shape of each enclosure is trapezoidal, with exactly the same angle as the horizontal directivity. It also requires that the horn is exactly the same width as the enclosure. This

Your 'One Stop' Rigging Shop.



Jands Production Services V-DOSC amp racks are designed to be flown when required. One rack of four amps powers 6 V-DOSC cabinets.

tends to induce some ergonomic design and manufacturing problems, which can only be solved at the expense of suppressing the commercially-requested versatility of the product. Typically, these phenomena are either ignored by manufacturers or, at best, give rise to tradeoffs which cannot solve the acoustical problem of coupling multiple sound sources.

If we had the ability to combine multiple cabinets in a large array so that these sources were not infringing on adjacent fields, we would deliver a wavefront that is a single horizontal coherent arc. This is achieved when you can produce a cylindrical wavefront.

At the heart of the cylindrical wavefront phenomenon is the correct coupling of individual components and the adjacent elements. It's best to summarise two of the key issues in Dr. Heil and Pr. Urban's AES findings in order to understand these principles.

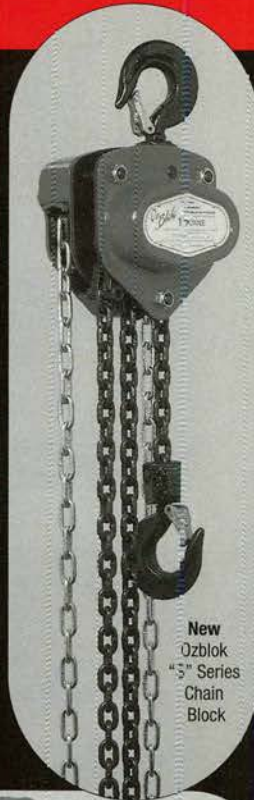
In their research, they established that there is an optimum distance that should be maintained between the acoustic centres of adjacent speakers that are operating within the same bandwidth. They identified that distance as the STEP distance.

A plane and even array of (#) identical sound sources is equivalent to a single sound source having the same shape, provided one of the following conditions is fulfilled:

(Continued on next page)

At Hoisting Equipment Specialists, we have the most comprehensive range of rigging, lifting and materials handling equipment in Australia. As suppliers to the Entertainment Industry for more than 15 years, H.E.S. has the staff with the knowledge of your requirements. We understand you have deadlines and you will have peace of mind knowing your order will arrive on time, everytime. We guarantee it!

"Hoisting Equipment Specialists" the name to remember for quality, service and advice, at the right price!



New Ozblok "S" Series Chain Block



Black Polyester Slings

- Ozblok range of products, including the new generation "S" Series chain blocks, girder clamps and trolleys.
- C.M. Lodestar, G.S, Kito and Hitachi chain motors.
- Galvanised and stainless steel wire rope and fittings.
- Standard wire and Superflex steels and bridles made to your requirements.
- Manual and electric winches.
- Extensive range of rigging hardware including rated shackles, rigging screws, eyebolts etc.
- Black polyester round slings.
- C.M. Stac chain.
- Height safety equipment and fall arrest systems.

Ozblok

- Industrial and recreational harnesses, carabiners, dynamic and static climbing ropes.
- Tri-lite pocket laser levels.
- Canvas chain bags.
- Bowknot caving ladders.
- Endless webbing ratchet straps and load restraint systems.
- Sisal and manilla rope.



HOISTING EQUIPMENT SPECIALISTS PTY. LTD.

12/63 Norman Street
Peakhurst NSW 2210
Phone: (02) 9584 1177
Fax: (02) 9584 1201
Email: HOISTEQJIP@bigpond.com

39 Raglan Street
Preston VIC 3072
Phone: (03) 9480 5577
Fax: (03) 9480 0855
Email: hesvic@ocean.com.au



Ray O'Sullivan (VTR Operator)



Paul Woofe (Senior Camera operator)



David Hendy (Camera Operator)



Toby Waley (CCU and communications)

spread around the venue – two 20 x 15m screens on either side of the stage, and three 12 x 9m screens down the other end of the arena. We also send a signal to the Clipsal Superscreen on-stage.

"We worked closely with John Farnham's producer Ross Fraser to create some vision which is played during certain songs so it's a matter of synchronising with the band, or them synch'ing with us.

"After the last tour we did with John, he came up to me at the party and basically told us that even though we're not quite in the Farnham family, we're surgically attached so any time he goes out on tour, we go with him. Which is great for the fans. He doesn't need to provide all these screens, but it adds so much more to the show."

a) The wavelength is larger Step of the array, that is: $\{1\}$ ($f < 1/3$ step).

b) The filling coefficient of the array (assuming each source is flat and isophase) is more than 80 percent. (That is, the total area of the radiating sources should be at least equal to 80 percent of the total area of the array).

These conditions are both fulfilled in the V-DOSC system.

The distance between the acoustic centre of two V-DOSC units is 0.45m in the L.F. region. The distance between two acoustic centres in the midrange is 0.22m.

According to criterion (a), the coupling of the L.F. is perfect for all frequencies below 730Hz. and the coupling for the M.F. is perfect for all frequencies below 1460Hz. With the crossover frequencies for V-DOSC set at 200Hz. and 1300Hz., criterion (a) has been fulfilled.

The coupling of the H.F. waves is achieved by the vertical alignment, edge to edge, of the two output areas of the DOSC waveguides, providing a ribbon-shaped flat isophase wavefront, satisfying criterion (b).

A V-DOSC "element", or cabinet, is thus designed as a part of a larger ensemble, with each cabinet being an identical component of the larger array, perfectly joined at their edges to create a continuous line array.

In two standard configurations, the coupling is extrapolated to establish the line-array.

The first configuration is a simple block of four or more enclosures. This is especially applicable to long throw applications. The system actually functions as a pure cylindrical wave generator. This "coupled" stack is typically incorporated as the top layer of cabinets in a large, "arena" presentation to focus the greatest amount of power to the rear of the venue.

The second configuration is a slightly curved vertical array, the enclosures being stacked, or "flown", with an angle between elements varying from zero to five degrees maximum. In practice, 0.75, 1.3, 2, 3, 4 and 5.5 degree angles are typically used, according to coverage requirements. From a theoretical approach, and by means of a computer simulation, it has been seen that setting up the system with an angle between each allows a perfectly coherent coupling at any frequency lower than a limit frequency, which varies with the angle.

With a 5 degree angle, the limit frequency occurs at 12kHz, and as the angle diminishes, that frequency increases to infinity at zero degrees of angle. Therefore, vertically stacked or flown assemblies of V-DOSC enclosures

can be set up, providing perfectly coherent sound sources with a vertical coverage varying between 0 degrees (in this case the sound field has the same height as the stack) and $(N) \times 5^\circ$, with the horizontal coverage remaining at 90° . If a wider horizontal coverage is required, other arrays can be set up at a *prescribed distance* to avoid obvious interference problems.

Here is comparative data based on the acoustic pressure (SPL) produced by a traditional system versus the SPL produced by a V-DOSC system. As a reference, the two systems are tuned to produce an SPL of 120dB @ 10m.

Each cabinet:

A stack of four V-DOSC elements is required to create a true cylindrical wavefront, so the basic footprint of an initial array of four is 174cm tall X 130cm wide" X 51cm deep. Within that volume are (8) 15" cones, (16) 7" cones, and (8) 2" drivers. Now consider that the total number of amplifiers required to drive this stack is four.

The enclosures travel face down on a front dolly plate which eases handling and set-up. Cabinets are joined in this position with two pivoting struts fitted on the back of each enclosure, which are then connected to the next and so on, as a train. The angle between each element is determined by an aluminium bar, with two Aeroquip fittings "ratcheting" the boxes apart to the desired angle.

A reversible, "dual purpose" bumper is available, and eases the set-up operation in two configurations:

1. When the system is flown, the bumper is mechanically connected to the top enclosure and simply lifted with two motors.

2. When the system is stacked, the bumper is inverted and acts as a base connected to the bottom enclosure, providing perfect stability for the stack with four optional screw jacks.

Grant 'Tosh' Walsh, FOH Engineer



Rohan Thornton

Television Lighting Director – GTV9

"We do this kind of thing in our sleep. We know the venue so well and we know what's needed to make it work for TV so it's not difficult. I haven't added anything to the stage or touched Chris' design in any way I've just brought in 400 par cans and 40 movers to fill in the holes, mainly in the audience."



Rohan operated the broadcast rig off his new Compulite SparkToGo console which he describes as the ultimate in briefcase lighting desks.

"All it needs is an in-built cappuccino maker, then I'd be really happy."

Michael Tait and Paul Buck

Lighting Technicians for the broadcast – GTV9



"We're the lighting tech's for the broadcast of the show so we've mainly been rigging up til now. We've had to change a few things because of sightlines and because of the screens hanging down the far end of the arena, but apart from that it's our job to work in with the stage design to maintain the integrity of the show."

Ross Fraser, legendary producer (right), **Adrian Smith**, Production Manager (below left), **John Henderson** (Monitor engineer) below right.



CREW CREDITS: John Phillips, Tour Manager. Michelle Dunlop, Asst. Tour Manager. Adrian Smith, Production Manager. Elena Eremin, Asst. Production Manager. Grant Walsh, FOH Engineer. Chris Newman, Lighting Director. Peter Lothian, Moving light Op/Tech. John Henderson, Monitor Engineer. Gary Radbourn, Keys Technician. Frank Iskra, Drums Technician. Barry Woods, Guitar Technician. Michael Kent, Rigger / Safety Officer. Wayne Rafferty, Staging. Dean McFadden, Staging. John Cooper, Staging. Pat Richardson, Audio Tech Chief. Graeme Whitehouse, Nick Giameos, Jonathon Dunlop, Audio Tech's. Trent O'Connor, Lighting Crew Chief. Ben Reick, Rohan Harrison, Chris Skala, Lighting Tech's. Grant Neutroski, Moving Light Tech 1. Dennis Murphy, David Hendy, Toby Waley, Ray O'Sullivan, Paul Woofe, Video. Michael Shinkfield, Peter McIntosh, Danny Garde, Clipsal. Adrian Carbone, Merchandising. PRODUCTION BY JPS.

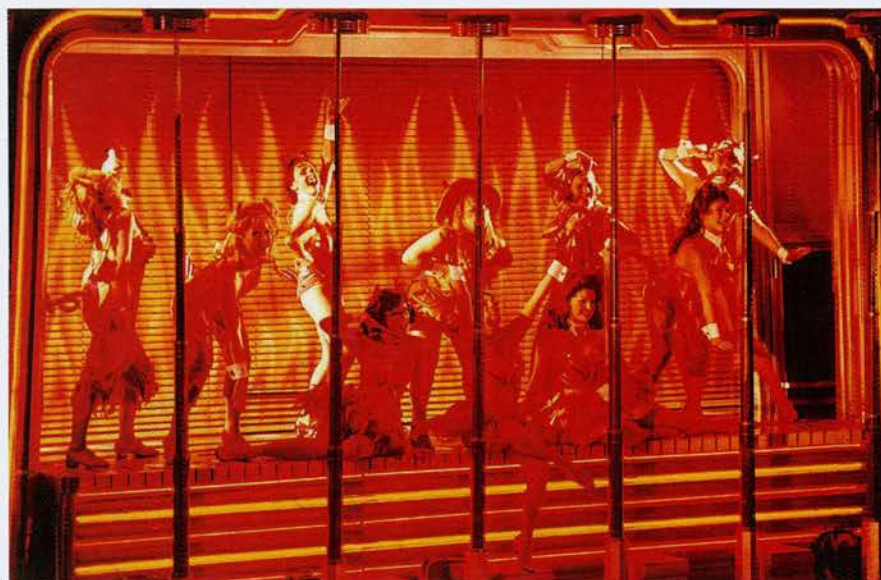
GOT A HEADACHE?

Take LSC Dimmers as prescribed for constant relief



www.lscighting.com.au

LSC Lighting Systems (Aust) Pty. Ltd.
7 University Place, Clayton VIC, 3168 Australia
Tel: +61 3 9561 5255 Fax: +61 3 9561 5277
email: info@lscighting.com.au



Dancing With The Devil - THE WITCHES OF EASTWICK

Theatre Royal, Drury Lane

Mark Cunningham & Sadie Hasler explore the artistic and technical merits of this eagerly anticipated West End stage musical adaptation of the best-selling book and hit Hollywood movie

John Dempsey and Dana Rowe had the enviable position of, when given a Warner Brothers catalogue, being asked to choose. And by Cameron Mackintosh no less. Not to say that the range was not extensive, but they didn't find inspiration until the last page, when *The Witches Of Eastwick* proffered up its endless possibilities. It had all the important elements: contemporary humour, an overriding theme, interesting setting and wonderful characters. Not forgetting the nod from Mackintosh.

Aided by the original novel by John Updike, Dempsey and Rowe commenced their year-long process of writing the score and book. Pausing only for coffee, and perhaps a little sleep, they turned out song after song, whose fate was then regularly decided by an intimidating one-man audience, flown in from the UK to watch the writers' nervous cabaret. Then with almost magical ease, the team expanded to include some of Theatreland's most prolific talent and the rest, as they say, is history.

When it comes to theatre sound, few professionals can rival Andrew Bruce - the co-founder of leading rental company Autograph Sound Recording.

It was Cameron Mackintosh himself who, after hearing the V-DOSC line array on another Bruce-designed show, *Mamma Mia!*, and noting its neat profile, recommended the L-Acoustics system for use on *Witches*. The Theatre Royal's dimensions, however, ruled this out but Bruce's cunning plan was to use

14 of the smaller DV-DOSC boxes per side of the proscenium, as the main house vocal and orchestral system.

"The DV-DOSC was only really designed for use as a complementary downfill to the larger system, but it's certainly held its own," commented Simon Baker, Associate Sound Designer, who joined Autograph 18 months ago. "The size of it means that it's missing a chunk of the bottom end, which we've made up for by using a separate L-Acoustics bass as well as the V-DOSC sub bass."

Above the stage is a central vocal cluster of L-Acoustics ARCS loudspeakers; the front fills are D&B E3s and front fill effects are Meyer Sound UPM-1s. The delays are also UPM-1s and the crucial and extensive sound effects system, driven by Crown and Cyberlogic amps and Meyer Sound controllers, comprises 70 Meyer speakers - namely, the 650-R2, UM-1, UPA-1 and UPM-1.

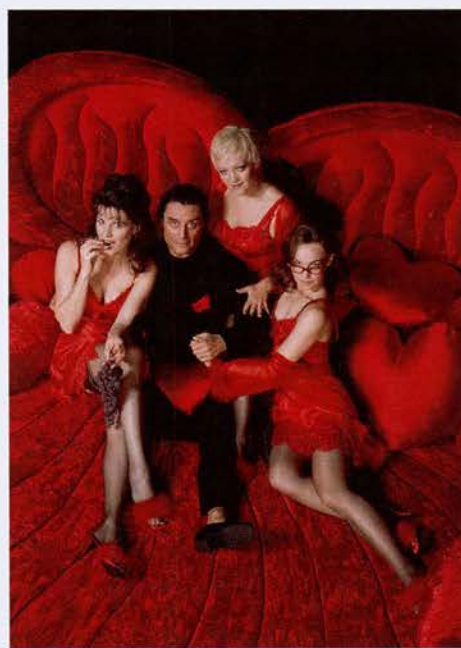
Said Baker: "The system is phenomenally neat. One of our restrictions here is we couldn't hang a big array - because of the sightline problems here we had to break it down into three smaller entities."

One of the larger West End venues, the Theatre Royal's size presented a number of sound design challenges. "It's enormous!" observed Baker. "Where the mix position is you have a very narrow view of the stage, and from the front to back of the auditorium, it does sound very different. We've now ironed that out and it does sound fairly constant all over."

The main vocal and orchestral speaker systems are powered by Lab Gruppen amplifiers and processed via XTA DP-226 controllers. "The great thing about the XTA system is the front-end software," said Baker.



Sound Designer Andrew Bruce - the co-founder of leading rental company Autograph Sound Recording



Sonus001 Dual 15" 3 way high power loudspeaker

Quality you can afford



- + 950 WRMS
- 1900 W programme
- + Stacking corners
- + Dual Speakon connectors
- + Black carpet finish
- + Recessed handles
- + Curved steel mesh grille

- Available in
- + Fully passive
 - + 2 way passive/active
 - + 3 way active

"Has to be heard to be believed"

Dealer enquires welcome

interlink@cia.com.au
 ph : 1800 638 077
 fax : (02) 9638 0749

INTERLINK
 SYSTEM SOLUTIONS

AON Risk Services

AUSTRALIA LIMITED
 ACN 000 434 720

presents

Entertainment Protection Plus

- INSURANCE FOR ALL YOUR ENTERTAINMENT RISKS**
- Equipment
 - Travel
 - Non appearance
 - Cancellation or abandonment
 - Public liability
 - Personal accident
 - Vehicles
 - Workers' Compensation
- Email: ken.killen@aon.com.au

Call Ken Killen or Daniel Kenny
TOLL FREE 1800 806 584
 for free quotations & advice

Level 27, AON Tower, 201 Kent Street, SYDNEY, 2000 Tel (02) 9253 7570

GMT LIGHTING STOCKS THE BEST RANGE OF LIGHTING



EXCLUSIVE AUSTRALIAN DISTRIBUTOR OF LDR, STAGE, STUDIO, THEATRE LANTERN RANGE

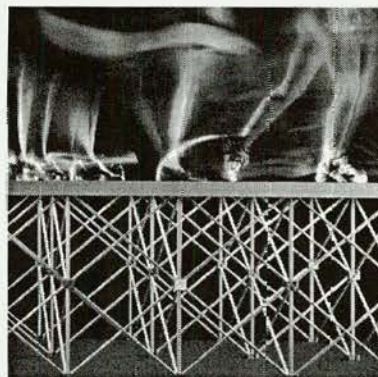
- GENERAL SERVICE LAMPS
- FLUORESCENT TUBES
- LOCATION PHOTOGRAPHY
- THEATRE, STUDIO LAMPS
- PROJECTION LAMPS
- MINIATURE LAMPS

VIC
9819 1777
 Fax: 9818 0398
 7 THOMAS ST HAWTHORN



NSW
9683 6488
 Fax: 9683 6409
 23 WINDSOR RD NORTHMEAD

Staging CAN'T get any easier than this...



2m² of staging set up in 30 seconds by one person.
 Sound good? Then consider also these benefits:

- Lightweight** - 60cm leg section weighs 5kg
- Strong** - will support 1000kg per m²
- Fast & Easy** - legs can be set up with one hand!
- Versatile** - multiple heights let you build steps, multi-level staging, in fact you are only limited by your imagination!

SC Systems - distributed in Australia by:

trc The Resource Corporation Pty Ltd
 tel: (03) 9877 8233
 fax: (03) 9877 8244
www.trc.com.au

Musical Audio



Cadac J-Type console

"We have a computer dedicated to looking after the XTAs. The current settings are downloaded on to the computer which are still on-line to the machine so that we can work on the system. They also gave us Fujitsu tablet remote control pads, like big Psion organisers, and actually walk around the auditorium to adjust the system curve and delay times."

Sound Operator Borneo Brown mans a dual input module Cadac J-Type console that had grown from 95 channels to 100 in the fortnight prior to the show's premiere.

EFFECTS

Witches demanded much of Bruce in terms of sound effects design. The effects appear never-ending and represent a huge part of the show's appeal. Baker commented: "Every time Darryl appears he's accompanied by a magical thunder. The script itself requires an awful lot of effects."

Nearly every truck contains hidden speakers, such as Yamaha NS-10s built into kitchen cabinets. The kitchen truck is one of the best examples of 'undercover audio'. "There's not enough space to get one (NS-10) into the set piece itself. So we've used some NXT flat panel speakers for the first time, which enables the designers to paint over them. It's not hi-fi but it's enough to be able to project telephone rings."

Darryl's seduction of Jane sees the couple sat on chairs playing a violin/cello duet. When they get up and dance, their instruments magically keep playing. "Because you physically see the instruments on stage, the sound has to be in the right place, so after dealing with the complications of building speakers into the violin and cello, we decided to build them into custom chairs and it does sound pretty convincing."

AUDIO CONTROL

On most productions of this size, there is normally one central control area, which inevitably is based around a computer system. With Witches and its various audio demands, this would have led to chaos amongst the crew, said Baker. The answer was to split the control of the Cadac J-Type console and the effects into two separate areas. The Cadac sends simple MIDI program change commands to Matt McKenzie's software which then triggers all the FX in turn, interprets the information and sends out complex MIDI commands to all the equipment.

The spot effects, like telephone rings and thunder, are all contained on two Akai S6000 samplers (with two back-ups), while a DAR TheatrePlay system, based on DAR's OMR8 eight-track disk recorder, is used for playback of other material.

Coming out of the playback system are 16

outputs that patch into the ingenious Out Board Electronics TiMax level/delay matrix system. This delivers 32 inputs to the Cadac console, from which the 200 or so effects cues are sent to pre-set output loudspeaker destinations around the house. Each of the 32 inputs to the matrix has its own unique level and delay relationship to each of the system outputs, enabling multiple sound-source localisation and animation using the psychoacoustic principles of Precedence and Haas effects, which Out Board describes as Source Oriented Reinforcement (SOR).

Production Sound Engineer Andy Brown, who oversaw the technical installation, commented: "The beauty of TiMax is the speed at which the effects can be changed or routed from any of the 16 inputs to the 32 outputs, at the touch of a button."

IN-EARS

In-ear monitoring was brought as a practical trouble-shooter for the flying sequence in which the three witches fly out above the audience at the end of Act One. Initially, Production Manager Mick Harris wanted a means of communicating to the actresses in the event of a flying system failure. Said Baker: "We went down the Sennheiser IEM route using just the generic plug in the ear, so that the DSM, completely independent of the rest of the sound system, could hit a button and talk into the witches, should there be a problem with the flying sequence."

"However, late in the rehearsals we noted that a couple of the songs were made tricky by the nature of the wide stage. One girl's stage left, one stage right and one centre stage, and they sing a very difficult group harmony. David Caddick, the Musical Supervisor, was very concerned that they were never going to be able to pitch against each other because they couldn't hear each other, purely because of the distance. We didn't want to use regular foldback, because Andrew firmly believes that's the death of any theatre production, so we looked expanding on the IEM system use."

All went swimmingly, until it was realised that some additional control was needed. "We thought we could just send them an orchestra feed and a vocal feed, but in the end we had to introduce another console purely for the [four channel] IEM system, and it needed to be MIDI-controllable for the programming of mutes. While the witches are singing above the stalls, we play these deafening thunder-claps and we had to be able to mute out their mix so they don't get deafened."

"We started with a Yamaha 02R but found we couldn't monitor the aux outputs properly, so we turned to a Soundcraft specifically to get over this muting problem. The girls are now very happy." ●

EEEngine

6150
600 Watts, 16 Ohms

XM6150 ÷ 3U = 6 x 150W RMS @ 4 Ω + HPF

- XLR & Euro-block inputs
- Binding post outputs
- Amps bridgeable in pairs
- Precision rear attenuators
- Individual high pass filters (switchable)
- Variable speed fans
- Individual amp status indicators
- 18 Kilograms

YAMAHA

PO Box 268, South Melbourne Vic 3205
Toll Free 1800 331 130 Fax: 03 9696 4579
www.yamaha.com/proaudio www.audio-technica.com
Email: aust_pasupport@infomta.post.yamaha.co.jp
A.B.N. 84 004 229 527

300mm Alloy Box Truss

300mm Alloy Tri Truss

400mm Alloy Box Truss

500mm Alloy Box Truss

CLS SYDNEY
23 Hickson Road
Millers Point NSW 2000
Ph. 02 9247 3222
Fax. 02 9247 3229

CLS MELBOURNE
63 - 65 Kingsway
Southbank Vic 3006
Ph. 03 9682 6111
Fax. 03 9682 6777

email: info@cls.com.au
web: www.cls.com.au
AEN 14 006 422 319

Elegant Efficiency

4065 Miniature Microphone Headband
Available in black and beige

STUDIO SUPPLIES PTY. LTD.
5 Anyric Street,
Crows Nest,
NSW 2085
Tel 32 9957-5389
Fax 02 9222-2043
Email: lisanhart@stusup.com.au
ACN 033184503

Series 4000 Microphones from DPA

eurocable does DMX

We're proud to announce 3 new additions to our DMX range...

NEW! DMX CC
single-pair control cable & 2 conductor power.

NEW! DMX S
single-pair control cable

NEW! DMX D
double-pair control cable

DMX 1
one balanced line & one 3 core power

DMX 2
two balanced lines & one 3 core power

DMX R Us! Call now for the full story

trc The Resource Corporation
6 King Street Blackburn Vic 3130
tel: (03) 9877 8233
fax: (03) 9877 8244
email: sales@trc.com.au

how do your speakers stand up?

if you're clever, you'll be using the world-class quality stands and accessories from Konig & Meyer. There are models to suit all uses (and all budgets) plus a broad range of accessories to help you mount just about anything.

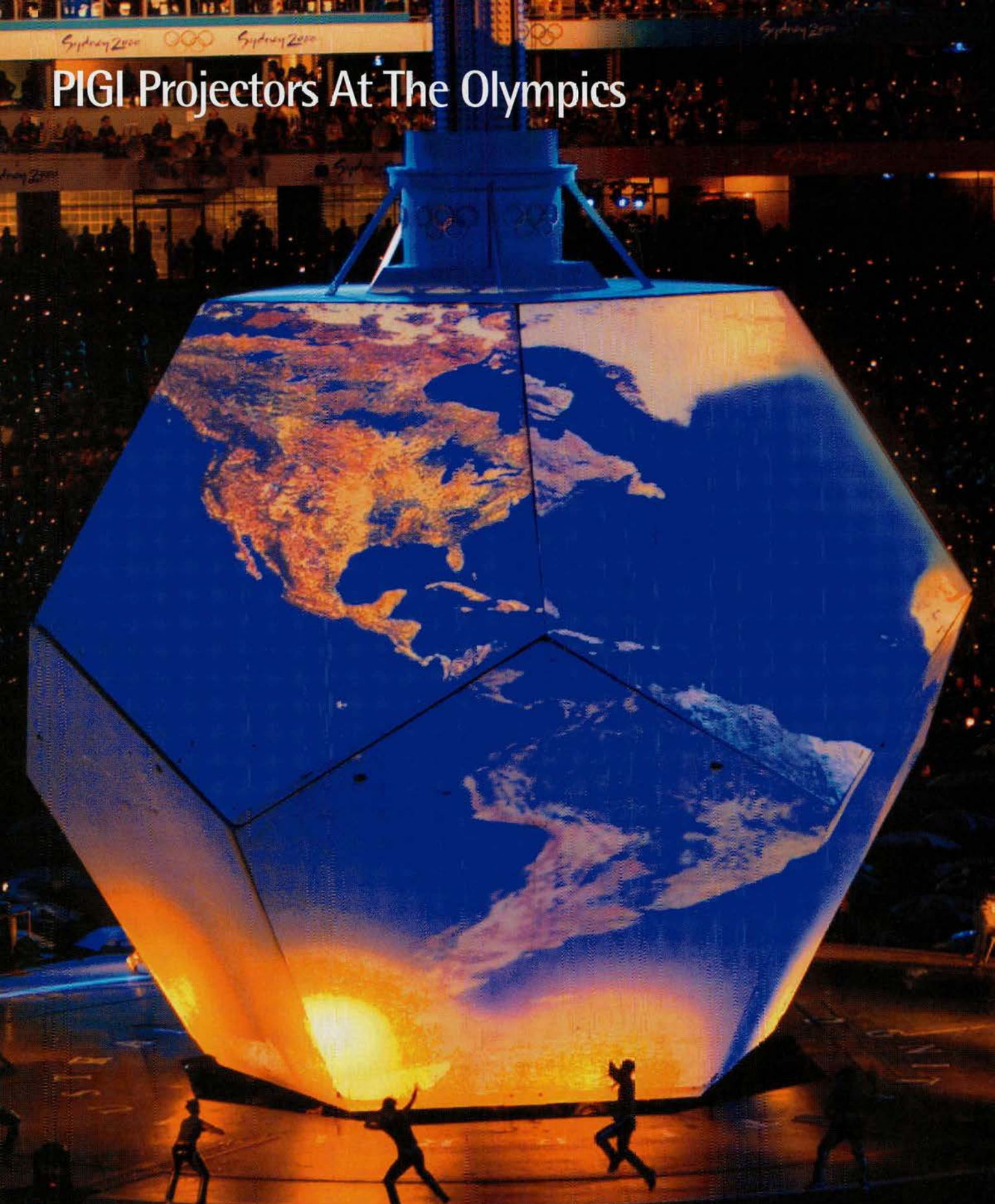
K&M
K&M - Celebrating 50 years in 1999

call us now for details of the full range of KM speaker stands and accessories.

YES! we have K&M lighting stands and accessories as well...

trc The Resource Corporation Pty Ltd
tel: (03) 9877 8233
fax: (03) 9877 8244
email: sales@trc.com.au

PIGI Projectors At The Olympics



Many will remember the dove-of-peace that was projected onto the huge white flag held above the heads of 10,000 athletes during the opening ceremony of the Sydney 2000 Olympic games. At 120m x 85m, the flag is believed to be the largest ever made.

Sydney-based projection company, The Electric Canvas, was approached to undertake the task of projecting the 70m long dove as well as projecting images of Olympic heroes onto the cloth as it was revealed at the top of the Southern seating stand and passed hand-to-hand by the audience on its way down to the field of athletes below.

Big Projection

Four 7kw Xenon "PIGI" large format scrolling film projectors were used to project the sporting heroes from a temporary platform affixed above the roof of the eastern grandstand. The images were corrected for key-stoning to compensate for the considerable horizontal offset as well as the layback angle of the stand itself. All four projectors carried the same set of nine images that were overlaid to achieve the necessary brightness for the 70m high pictures.

The projection of the dove required careful design and calculation due to rigging limitations and the position of the flag that would be held approximately 2m (6') above the surface of the field. Of course it would be impossible to emulate the final result as there would be 10,000 athletes holding this enormous flag aloft.

The Electric Canvas nominated three positions on each of the eastern and western roof gantries for the location of six 7kw PIGIs each of which would project an overlapping portion of the dove image. Control data for the projectors was linked using optical fibre between the two opposing gantries. The angle from each projector to the field centre was about 35° below horizontal resulting in considerable vertical keystone distortion that would need to be corrected after the image had been split into six parts.

Although the company had often used merged image splits and keystone correction, it was the first time they had combined both techniques with, in this instance, half of the image projected from the east and half from the west. Footprint predictions and correction solutions were plotted entirely in CAD using Vectorworks. The results were tested in miniature using overhead projectors (OHPs) to simulate the projection angles.

Due to the short lead time of the project, there would be no opportunity to carry out on-site tests until after the projector positions had been nominated, approved by the engineers, and the equipment installed two weeks before the opening ceremony. By the time the system was running available dark time in the stadium was limited to coffee breaks in the busy lighting programming schedule.

These short opportunities usually occurred on a moment's notice and mostly after 3am in the morning. The team was faced with hours of waiting on the freezing catwalks followed by sudden bursts of intense activity in an attempt to test film and perform trial line-ups onto the surface of the field. Naturally a line-up onto the ground was not going to work for a surface that would be 2m higher during the show.

Although the producers allowed for a smaller, "practice" flag to be made available at the end of two massed rehearsals, these opportunities evaporated as a result of these rehearsals running overtime with the subsequent loss of the cast numbers required to hold the practice cloth at head height for long enough to line up the projectors and to program the show. In the end, the team was forced to use a golf cart with a plywood sheet lashed to its roof to achieve the final line-up by driving around the field looking for the

merge points between each projector. This was a time-consuming and less than perfect technique that had to be carried out with the co-operation of the lighting designer.

The first of the public dress rehearsals was to be the first real opportunity to test and adjust the lineup of the dove onto the actual flag. Unfortunately as the flag flowed off the southern stand and onto the field, it became snagged on a camera platform and was torn to shreds despite all attempts to halt its progress. By the second public rehearsal four days later, however, the flag had been repaired albeit without the large inflatable rings that were to reveal themselves once the flag was in its final position covering the athletes. The rehearsal went well and the dove looked great with only minimal adjustment required.

The creative team were much relieved but were faced with the decision of whether to add the inflatable rings and run the risk of further complications without the benefit of a further rehearsal. The show was two days away and the Electric Canvas team were asked to provide projected rings as an alternative. They reluctantly agreed and went to work creating the split, corrected artwork and film to be spliced into the show scrolls in time for a golf cart line-up the night before the show. As witnessed by the world's largest ever television audience, the show was spectacular and the projections worked well although the projection director, Peter Milne, tells of adjusting individual projectors on-the-fly to fine tune the line-up during each cue. Not for the faint hearted!

The commencement of the games saw the projection team move, without a breath, to an abandoned airfield that was being used as the secret rehearsal site for various ceremonies segments. The centrepiece of the closing ceremony was a large geodesic stage structure consisting of twelve pentagonal sides (a dodecahedron).

The "geodome", as it was dubbed, was constructed around the skeleton of a hydraulic amusement ride that

Equipment

10 x PIGI 7kw rotating Double scrolling projectors. Lenses:- 1000mm, 400mm, 460mm



Big Projection



would allow the structure to form several different shapes from a multi-bladed flat stage, to a full "globe" that could ascend the vertical mast and also rotate. There were various in-between modes used to stage various key segments and artists during the show. The

geodome was white and perfect for projection; with the exception of one small detail: Access to the stadium for set up of the closing ceremony could only commence at midnight the night before the show. All programming, rehearsals and preparations had to take place off site.

The Electric Canvas had been asked to project both onto the ten vertical sides of the geodome globe as well as onto the multi-leaf flat mode. For the sides of the structure, four PIGI's with long optics were used from corner locations in the lower seating areas of the stadium. For the flat mode, two pairs of projectors were located at the centre of both the eastern and western roof gantries. These roof machines would have no opportunity to project onto the stage until show time.

CAD modeling had to be exclusively relied upon to develop masks so that art could be positioned accurately into each of the five leaves of the flat stage. Line up and programming of the roof projectors had to be approximated using a cloth rigged on wires stretched between the east and west seating area late one night during competition time.

Projection onto the side faces was another unique challenge. Each of the four corner PIGIs would need to be able to project keystone-corrected images accurately onto each face in a variety of modes and positions. Two machines illuminated three faces whilst two were to light two faces each. The projector locations had to be chosen with a minimum seat-kill impact.

The Electric Canvas determined that the positions and their relationship to the geodome also needed to be replicable at the rehearsal field in every detail.

Fortunately there were some suitable positions in the stadium that could be emulated using scissor lifts. A surveyor was brought in to survey the projector locations and to replicate the layout at the airfield where the geodome was being set up and tested. With the scissor lifts set at around 12m high, film masks were created and tested and production of the film was fast-tracked and completed in four days allowing just enough time to fully program the four projectors (in between heavy rain, dangerous wind gusts, and fog) before the structure had to be dismantled for its journey to the stadium.

One of the more interesting effects required a 360° image of the earth that would rotate around the geodome by scrolling the film to create a transition between clear skies and the classic "blue planet" cloudy image of the earth. Various other images were designed and corrected to fit each face including a scene that had to follow the geodome as it rose to its top height during the show's finale (achieved by creating a timed cue for the programmable rear foot on each projector).

Back at the stadium, the platforms and projectors were installed two days before the end of competition allowing the team to take time in the careful re-assembly of the projectors and testing of data and power connections. After conclusion of sporting competition on the evening of the 30th September, the bump-in of the geodome could commence. By 3am it was obvious that construction was well behind time. The projection team had organised a fifteen minute window of reduced stadium lighting just prior to sunrise in order to line up the overhead "flat-mode" projectors. Unfortunately there was little of the base structure completed in time to take full advantage of this window.

A night-time opportunity for line up of the projectors on the full three-dimensional geodome mode was never anticipated, so a unique daytime line up strategy had been developed by Peter Milne to allow each of the four lower projectors to be accurately pointed at the structure when it finally became operational later in the day. The technique involved focussing available light back along the optical path of the projector, in effect turning each machine into a giant camera.

It was 4.30 pm and the gates had been opened to the public before the geodome was ready for the team to test this approach in situ. It was at this point that tensions were relieved as all the lineups fell nicely into place confirming that the surveyors had also done a good job. With high expectations that only minimum adjustments would be required during the show, it was time to pull up a piece of soft concrete for an hour of much needed sleep prior to showtime.

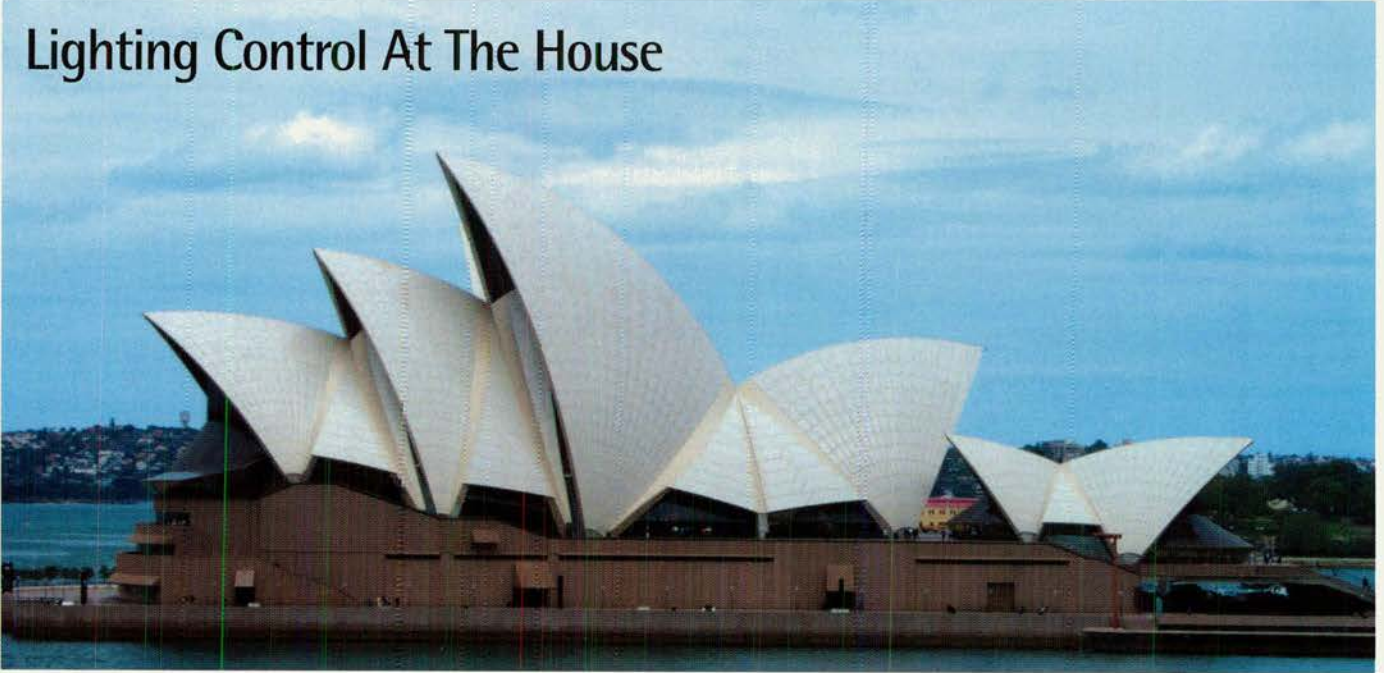
Confidence quickly turned to satisfaction when the first cue required no lineup adjustment at all. The many hours of theoretical and practical testing and double checking had paid off with the results matching those obtained in the off-site mock ups.

The whole Olympic project gave this small Australian company the opportunity to develop innovative solutions to a tricky brief and to notch up a few world firsts for large-format projection. Home-grown Aussie ingenuity is alive and well. ●



Crew (left to right)
Peter Ross (Technician, Logistics), **Nicolas Manichon** (Chief Technician), **Glenn Williams** (Technician, Crew Boss), **Peter Milne** (Projection Director), **Joe Murray** (Technician)
Others involved - **Jenny Dowling** (Production Assistant), Art Department - **Vanessa McDonald** & **Brigitta Eidum**

Lighting Control At The House



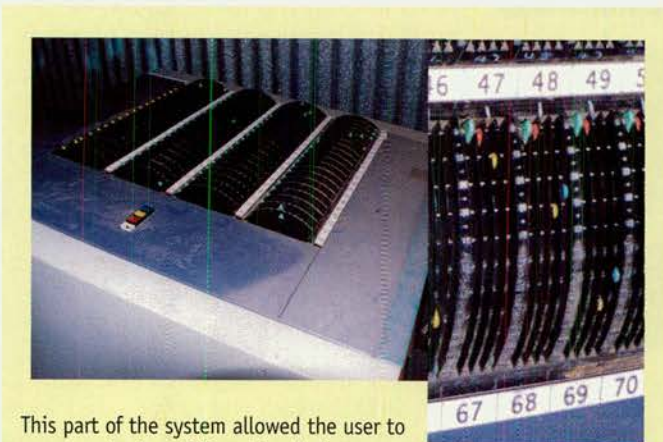
The Sydney Opera House has long been an Australian icon, recognised all over the world and visited by countless numbers of people. Since the early seventies many theatrical and concert events have been staged in the "House" (as it is affectionately called by its workers). Controlling the lighting on those productions has been a challenge met largely by three different control systems over the years.

The original tender had two Siemens' Sitalux and a Presetter system installed into the venues. This was followed by Strand Galaxy desks in various incarnations, and now all of the venues have Strand 500 series desks installed. The main theatre – the Opera Theatre – was upgraded to the new control system last month during an unprecedented four-week refurbishment of the venue. That leaves only the Concert Hall Galaxy - and that one to be removed in Feb, 2001.

The journey that the SOH's lighting control has taken over the last forty years has been an interesting and complicated one. So it is very timely that now the SOH has chosen its control system for the foreseeable future, that we look back at this path to see just how it all happened...

In The Beginning

In the early sixties, tenders were sought for the lighting control systems to be installed at the new Sydney Opera House, which was well under construction and the centre of controversy at the



This part of the system allowed the user to preset up to four different levels for each channel. Each of these was colour coded. To change a preset a large wheel on the right hand side was turned through 90 degrees. This caused that colour preset to protrude across the eighty channels, and the user could then set the desired level.

time. In keeping with the controversial nature of the project, in 1963 the winning tender for supplying lighting control systems was awarded, and there was some speculation at the time in the industry that this was a forgone conclusion. There were four companies "invited" to tender, three of which actually offered tenders for the job. Of the three submissions, the most expensive tender received the contract.

The following figures stating the three quotes were published in Australian pounds at the time:

- Siemens (Germany) - £426,450
- Graham Brothers (Sweden) - £247,823
- Strand Electric (England) - £234,274

From this, it can be conjectured that one of three things happened - the Siemens product was far superior to the other tenders' product, the Siemens product fulfilled the tender requirements where the others did not, or there was never any intention to actually order anything other than the German product.

The original specification for the project was written by Professor Walther Unruh, who was a world-renowned German theatre consultant at the time. As this specification called for some "Siemens specific" technology, it has been suggested that the control system was decided before it went to tender.

Unruh had a reputation in Europe for exclusively using Siemens equipment, so it is not exactly clear why additional

Control Systems



This desk was the master control unit for the concert hall installation. From here, any of the four presets could be activated by engaging the motors in the Output Desk to drive to the levels as set on the Presetter Desk.

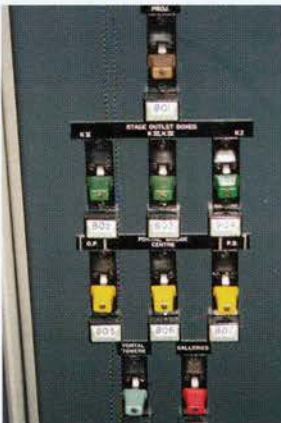
amplifier dimmers, this would have formed a major part of their submission.

Strand Electric for many years produced a well-known magazine that promoted theatre and technology. Called "Tabs", the 1963 issue in September had quite a bit to say about this tender process, ultimately suggesting that "our conclusion (is) that someone never intended that either Graham Bros or Strand Electric should obtain this contract."

In any case, Siemens won the contract, and they duly supplied the ordered equipment. With typical German efficiency, the system was delivered in time for the planned 1965 opening. It was stored in a warehouse to await installation, and there it waited for close to nine years. In the meantime, the world of lighting control technology continued to move forward.

By the time the House was ready to receive the control equipment, the original punch-card system for saving cues had been superseded by a memory storage ferrite core. So the "Master Desk" for both the Opera and Drama Theatres were returned to Siemens to be updated.

By 1973, the systems were returned and fully installed, and all of the venues were finally up and running.



This overhead panel of Siemens switches is still in use, in the Drama Theatre

tenders were called for. Possibly it was due to the fact that the NSW State government had (and still has) a policy that at least three tenders must be sought for large cost items. In any case, cost was not destined to be an issue, as the House was paid for by lottery. In fact, the NSW government had re-couped the cost of building the venue within three years of it opening – a feat rarely achieved anywhere in the world.

There is little record of exactly why Siemens was chosen. One of the stated reasons for going with the Siemens tender was that they used magnetic amplifier dimmers. While we have been unable to find out about very much of the Graham Brothers submission, it is known that they were leaders in design of the required magnetic

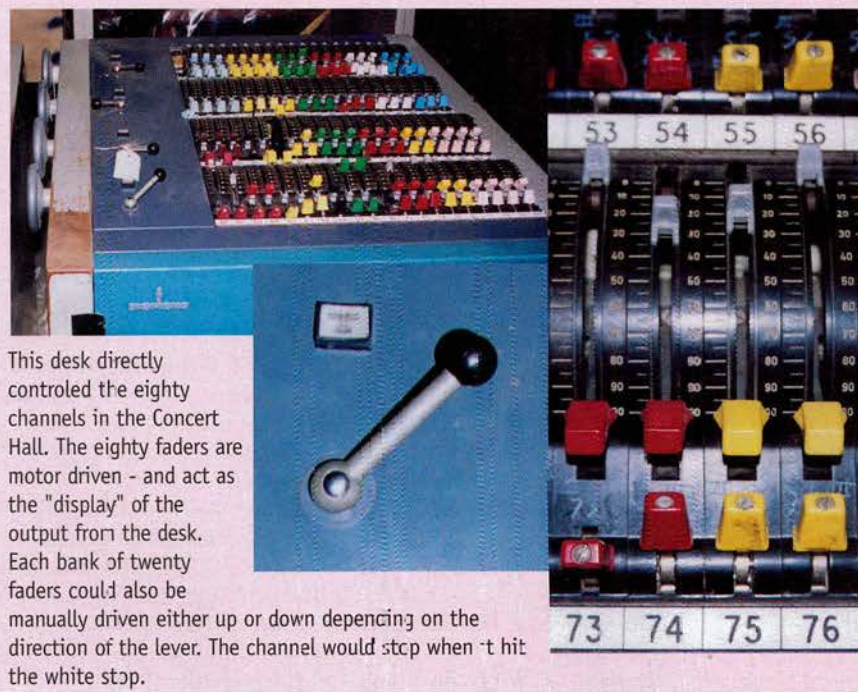
Siemens at the House

For the desk operators, controlling the Siemens control desks was a complex process. The first task of the new desk operator started with coming to terms with the fact that the faders were reversed – zero at the top and 100% at the bottom.

Bearing that in mind, the operator was then able to set the levels of all of the channels by moving the channel levers to the right positions. These wire-wound levers sent a 30V analogue control voltage to the dimmer room where the magnetic amplifier dimmers powered up the appropriate hard-wired circuit. Patching wasn't a problem because it couldn't happen.

For the Sitralux version desks installed in the Opera Theatre and the Drama Theatre, a scene was preset by setting the channel levers to the required settings, and the desk was then told to record the preset levels to the ferrite core. This was done by selecting a memory number and simply pushing the "RECORD" button, which was under a protective cover.

To activate a cue you selected the cue number and pushed the button "MEMORY TO LEVERS" which sent signals to each lever telling it what direction it should move in to get to its required level and you also selected the predetermined motor speed. When the GO was given you pushed the motor start button (either "MOTOR SLOW" or "MOTOR FAST") and the levers started moving.



This desk directly controlled the eighty channels in the Concert Hall. The eighty faders are motor driven - and act as the "display" of the output from the desk. Each bank of twenty faders could also be manually driven either up or down depending on the direction of the lever. The channel would stop when it hit the white stop.

The Electric Canvas can add an exciting new dimension to your outdoor spectacular, product launch, concert, theatre or special event. Let us help paint your next masterpiece.

- Large format scrolling projection for outdoor or indoor display
- Film design and production for all large format projectors
- Integrated lighting and projection designs
- Accurate architectural projections
- 20 years event experience



Sole Australian Agent & Distributor for ETC Audiovisual France



AUSTRALIAN MOTOR SPORT AWARDS Client: The Production Place



GOLDEN STYLUS AWARDS Client: Radio Marketing Bureau



THE ELECTRIC CANVAS

www.theelectriccanvas.com.au ph +61 2 9437 9588

PM PRODUCTION DESIGN & MANAGEMENT PTY LTD trading as THE ELECTRIC CANVAS

email: pmilne@hutch.com.au fx +61 2 9437 9984

PHONE FOR A BROCHURE OR DEMO TAPE

SLS Can Supply Your Total Lamp Solutions

- Specialist Lamp Distributor - over 3000 different lamp types
- Distribute reputable brands such as GE and Philips
- FIS (Free In Store) delivery Australia wide

For more information Phone: 1300 302 852 Fax: 1300 301 329 email: sls@teg.com.au

Unit 1/37-39 Ricketts Road, Mount Waverley, Victoria 3149



According to Denis Irving, the intended Strand system would have been the "System CD", using Auto-transformer type dimmers, and a motorised, electromagnetic servo-clutch system for moving the faders. It is unlikely that it would have had the memory capacity that the Siemens' systems did, but it was considerably more accurate. Had it sat in a crate on a wharf for nine years, the newest Strand system that could have been installed in 1972 was the DDM2 (same as the Adelaide Festival Centre which was installed in early 1973) the precursor to the Galaxy.

Q Engineering was at the time the distributor of Thorn UK products in Australia, and was keen to design a special system for the House. The Thorn Q-File was a lighting desk that Thorn had decided to end producing – Q Engineering was offering to build a custom designed system based on the Thorn design. Having been stuck with the Siemens desks, the House staff were really interested in "proven" technology rather than being a guinea pig for new technology. While Q Engineering still trades today, very little light can now be shed on what the system they offered the SOH was like.

As each lever reached its desired position the relay inside the lever de-energised and the lever stopped moving. In memory playback, each channel had roughly 34 definable levels for each channel, thus making each step a 3% increment. Incremental changes were simply not possible.

The Concert Hall's Siemens' Presetter, was not able to control as many channels as the Sitralux desks, but in some ways, it was a more complicated desk to run. The Concert Hall's eighty control channels were each duplicated in four rows of eighty levers. This created the four presets that could be set up.

To operate cues on this desk was the same as for the desks in the Opera and Drama except that you only had four memories. When one was live you stopped the motor and selected the next memory (red, blue, yellow or green) The memory you had just used could then be changed ready for its next cue.

The "little" desk in the Broadwalk Studio was a single preset desk, so it was a simple case of bringing the desired faders to the required levels.

In the earliest years, the complications involved in driving these systems led to the House getting a less than good reputation for its lighting abilities - in this situation, the good craftsmen had every right to blame poor tools. As a result, the technicians involved were quickly looking for a better control alternative to replace the much-despised system.

Galaxy at the House

During the early half of the seventies, Denis Irving was CEO of what was then Strand Electric (Australia) Pty Ltd. DDM/2 was the Strand control system of the day, and there were a few installations around country, including Adelaide Festival Centre and Sydney's Seymour Centre. When plans were being mounted for the building of the

Victorian Arts Centre, Irving was advising the building committee along with Bill Akers (at the time Production Director and Chief Lighting Designer for the Australian Ballet), and theatre consultant Tom Brown. They were looking for the best lighting control system to install in the centre, and the solution they decided upon was an upgraded version of Strand's DDM/2. At the same time, Canberra Theatre's Len Fisher was also looking for a new desk, so he joined in the VAC's desk design discussions.

In consultation with Strand UK, these people designed modifications to the DDM/2 system to suit the VAC requirements. With the design complete, and the contract won, Irving placed the order with UK, and was surprised to discover that Rank UK had decided to stop development of any UK control system. Apparently, the US parent company had decided that UK Strand did not have the technical expertise to design and build lighting control systems. Irving was told to get the client to accept a Light Palette (from the US). Unfortunately, this option had already been considered and discarded early in the process because it was thought the Light Palette was operationally inferior and had numerous design issues the advisors were not happy with.

Faced with a potentially very embarrassing situation, Irving talked Rank/Strand into changing their minds. To make it happen, Strand Australia had to financially subsidise the development as well as placing an order for the first five of the desks. When they rolled out the production line, the new line of desks had the option of being called "DDM/3" or "Galaxy". Indeed the early labels were made with one of the names on each side and you made your choice before gluing it in place. It went on to be not only one of the world's most popular lighting control systems, but it also made Strand a significant amount of money. This success led to continuing research that developed the future





The dimmers for the original installation at the SOH were located in two dedicated rooms, and all of the circuits were run out to the various venues. The old Siemens dimmers were 17" rack mount devices (not the standard 19"), and stood in many floor to ceiling mounted rack frames. When the Galaxy systems were installed, they were made to operate the Siemens dimmers using its 30V analogue control voltage. When Bytecraft won the contract to replace these dimmers, it was more economical to design a 17" dimmer than to replace all of the racks, so these special dimmers were designed and installed. When Bytecraft was having them made, the intention was to have handles made for the front to help with ease of servicing. Bytecraft discovered that a nearby carpenter could make wooden ones cheaper than the metal equivalent – so now there are hundreds of "austere" looking handles locked away in a secluded dungeon in the House.



Strand desks.

To quote Denis, "If it wasn't for me thumping the table, the Galaxy would have not seen the light of day."

At that time, the then Lighting Master (Arno Leinas) let it be known that he was interested in finding a replacement for the Siemens systems installed only a few years earlier. Strand was one of two companies that courted for the job. The other was Q Engineering.

In late 1982, the Opera Theatre was upgraded to the Strand's Galaxy control system. This desk went on to be possibly the hardest worked Galaxy desk in the world, often being called on to run the equivalent of 16 shows a week in a

theatre that almost never goes dark. Over the years, this desk received every upgrade the Strand had to offer, and ultimately remained in use until last May. In all that time, there are no reports of a Galaxy in any SOH venue ever stopping a show due to desk failure.

The Galaxy desks were truly "a desk", designed to be built into

Some people may recall the old double sided, 500kB 5" computer discs. You can still see a few of these stuck



in the back of old office cabinets, just waiting to be tossed out. Well, for much of its life the Galaxy used the precursor – the 8" floppy. These were the days when a floppy disc was really "floppy". Interestingly, this huge disc only had a capacity of around 250kB, and was painfully slow – even by 1980's standards.



Tempus M24

This very early computer based lighting desk from Strand was used in the Playhouse and Broadwalk Studio - and quite unsuccessfully in the latter venue. Perhaps it was just the theatre's ghosts, but any M24 malfunctioned when installed in that venue - regardless of how reliable it had been elsewhere. It certainly is unusual that this robust little desk had such a flawed history at the House - Peter Marshall put it down it was some unknown spurious voltage spike dip surge malfunction. I don't think he knew exactly what the fault was. Borrowed a tempus from Marion St, fell over within about three hours



Drama Theatre Control Room



Playhouse Control Room

purpose built furniture. In most installations of Galaxys, the desk could not be physically removed from the control room. The system design would be vaguely familiar to anyone that has used a Strand desk, with keypad control of channels, monitor display of levels, memory playback, backup to floppy disc etc.

Over the years, Strand upgraded many aspects to the Galaxy desks, introducing remote controls, back-up systems, operating system updates etc. This desk was one of the best selling lighting desks worldwide, and every professional lighting technician had to know how to operate them to make it up through the hierarchies of any venue. Using the knowledge built up by developing the Galaxy desks, Strand has made numerous other desks - but the Galaxy was always the "flagship" product until it stopped production of them in about 1997.

The SOH soldiered on with their desks, keeping them very well maintained and installing all the relevant upgrades that Strand were able to offer (and some that Strand could not offer but were able to be done in Australia by Bytecraft who were to become the Strand agent for Australasia). In 1994 the new model Galaxy Nova replaced the Opera Theatre Galaxy - the Nova was ultimate Galaxy ever produced. With this upgrade, the House was able to resist the temptation to upgrade from this proven and reliable system - until now.

500 Series Now Playing At The House

A couple of years ago, it became obvious to Peter Marshall, then the Lighting Operations Manager, that the Galaxy was not going to be able to cope with the growing demands of designers. With the increasing use of moving lights in theatrical productions, the Galaxy was being quickly outpaced by the technology driving the rest of the industry. So, in 1998, Marshall went to the PLASA trade show in the UK for the purpose of beginning the process of choosing the next control system. In that visit, he was able to discuss in depth the pros and

cons of numerous systems. By the end of the show, he had narrowed the field to two manufacturers - the Strand and ETC.

Back in Australia, Marshall had organised for an extensive test of each of the manufacturer's top desk so that they could assess each desk in terms of how they would be used in the venue. The desks tested were the Strand 530, and the ETC Obsession II.

"The main problem with the ETC desk (apart from reliability issues that we faced while we were using it) was the fact that there was only one GO button where the 530 had two. This is vital for us in the Opera Theatre when we do changeovers between operas. When there are over 500 memorised "cues" used, we use two teams when re-focusing the lamps."

"There was also a compatibility issue of being able to swap disks with the VAC as well as other venues around Australia. The ETC system only would have been compatible with other Obsession IIs, which as far as I know, is only Brisbane. The Obsession disks are not compatible with other ETC systems. Also the Strand Network was far superior to the network that ETC was then offering. My discussions with 500 series operators also stressed the similarities with the Galaxy which makes training easier."

The first desk purchased was a 520 (with a 510 backup unit), which was installed in The Studio theatre when it opened in 1999. This desk was then evaluated as it was used over the next six months. This final "long term" test suggested that there was no reason why all of the other venues could not be upgraded, and so the order went out.

Planning for the upgrade of the control desks also included a major upgrade to data network for the whole of the SOH. A dedicated Ethernet system was implemented in each venue using Strand's Shownet system. Due to the size of the cable runs required, the installation employs a combination of optical and Cat5 cable, distributing the data in the venue and to the dimmer room, where dedicated Ethernet to DMX converters make the familiar five-pin XLR available.

The final stage of the installation has recently been completed during a major overhaul of the Opera Theatre. For the first time in the memory of the SOH technicians, the theatre will be dark for a period of four weeks when major repairs and upgrades will occur. In this time, Strand 550 desk will be properly installed, tested and commissioned - and the next era of lighting at the SOH will begin.

Desks currently installed in venues

Studio Theatre	520
Playhouse	530
Drama Theatre	530
Concert Hall	550
Opera Theatre	550 - Dual Control

All desks have a 510 installed for use as a backup of the show desk - the Opera theatre has dual 510s for a full tracking backup

Galaxy Farewelled in Style

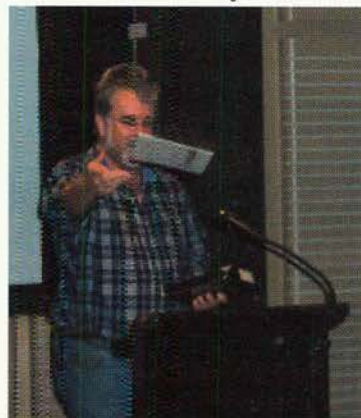
Aerodynamic demonstration
by Peter Marshal

The Sydney Opera House lighting staff held a wake to farewell the last of the Galaxy desks from the building. Inviting numerous previous users and repairers of the desk, the small, early evening crowd was respectful of the passing of a formidable control system. With so many operators in their time aspiring to be able to learn how to control a Galaxy, this desk inspired an unusual amount of sadness - it is perceived by staff as more than a mere upgrading of outdated equipment.

The farewell consisted of a tongue-in-cheek reading and slide show by one of the

house technicians, Chris Day. This was followed by Peter Marshall, who took us through the highs and lows of the Galaxy at the House, as well as demonstrating the "frisbee" capability of the old 8 inch discs. Finally, a former Strand service technician took the stand to "wax lyrical" about his experiences inside the Galaxy. That technician went on to start a company to service the needs of Galaxy users when Strand left Australia.

The young tech was named Stephen Found, and he called his company Bytecraft.



Peter Marshall (SOH Manager - Theatre Technical Services) and Arno Leinas (former SOH Lighting Master) with the Galaxy that was purchased in 1982.

Stephen Found (far left) with the Bytecraft team

The Galaxy

Presentation by Chris Day

In the beginning there was tram shed and all was good.
 Then there came the captain of the submariners who said let there be light and lo Sierrans' infested the building
 Time passed & a Tempest arose.
 But the cup spilled over & the gods ordained a Marshall & saw that it was not good.
 Thus came to the universe of the tram shed a Galaxy & it did multiply till it inhabited all parts of the shed & lo it was beheld & honoured & all those who partook of its fruits were mildly happy.
 The gods deemed those at the shed had it too easy & inflicted Scrollers & their denizens to complicate their lives.
 Galaxy gave forth a Nova in its issue & guise which spread throughout the land even to the place of wind & weather in Melbourne where it soon inhabited the Tent
 Approving of the new Child the creators listened & understood then promptly forgot those lessons.
 Meanwhile the world turned & the eyes of others turned away from Galaxy & its progeny Nova till all manners of standards were held throughout the realm.
 The gods smiled and deemed those at the shed still had it too easy & created moving lights & DMX protocols which thus confused the galaxy.
 The gods decided to force the shed into the outer world, by stopping

to make the food necessary for galaxy to survive & inflicted a virus throughout the shed called the Bytecraft.
 The Marshall looked & found the galaxy saddened & searched for a new universe to inhabit the shed while his followers continued to struggle on.
 Some suggested a flying wing from the bar of Deed Space Nine clouded by the name of Obsession.
 A venerable seer called Pratt voiced the future and saw a number & the Marshall saw the same number as did the outerworld & the number was 5 & was followed by the sign of infinity and the gods now only mysteriously talking through the Bytecraft being saw that it was good.
 The Shed was once again able to talk to the Tent in Melbourne, to a degree.
 So today we gather to bid a fond farewell to, this other universe which has served the shed, so moderately well.





Stand and Deliver

by Graham Walne

As much as we like to think that each show is different, in venues that have a substantial turnover of product there may not be the resources to re-rig for every production and a 'standing rig' may be a cost-effective alternative. Whilst this can apply equally to masking and sound, this article is concerned with lighting but the strengths and weaknesses here can also apply to the other disciplines too.

The idea of a venue having equipment in stock positions only works if those positions are suitable for the majority use and the equipment is equally appropriate. This implies that compromise is inevitable but the trade-off could be that the running cost of the venue is consequently reduced and passed on to the promoter of the production in question; perhaps instead of taking time to re-rig equipment, more rehearsal time is made available.

The idea fails if the standing rig becomes a straightjacket, which denies visiting companies the opportunity of producing some device that is intrinsic to their production. Thus a good standing rig is a balance between the commonly used equipment or positions and a pool of equipment that can be quickly deployed as required.

The design of a standing rig starts with an analysis of the needs of the productions and the styles of their designers. The narrower the range of either or both and the easier it is to design such a rig, consequently the more effective it will be.

In lighting the physical properties of the space will determine the positions and unless the production is a mega-musical then it is unlikely that significant building alterations are affordable.

A distinction needs to be made between the angle of light that the designer wants from a position and the instrument itself that produces it. Sometimes the result doesn't work but which is wrong, the position or the instrument? A resident designer or electrician has an opportunity to experiment with each production until the solutions to these questions are clear.

In more traditional auditoria the geography of the front-of-house positions can limit the choice of equipment, as light levels have increased on stage over the years we all search for that small but powerful profile to squeeze into slots and boxes.

Those lights furthest from the stage in the auditorium tend to be profiles because of their narrower angle and the degree of control over not only the beam but also the amount of spill around it. Soft-edged spots, such as fresnels and PARs and to a lesser extent PCs, produce more spill so that if a significant number of these are used in the auditorium then the ambient light level will increase and it will become difficult to isolate the stage and areas upon it. The same applies to any spot that is located adjacent to pale coloured or glossy architectural features.

However, some soft-edged units are useful from the auditorium because they provide the ability to wash

light over large areas and knit areas together. Equally some profiles on stage are essential to provide the opportunity to isolate areas and project patterns. In all but very special cases the profiles will not need to be focussed to provide their hard edge, actors don't look good going through unintentional lines of light, so the beams need to be thrown out of focus to soften them. Some profiles are better than others at this but it is generally not wise because the quality of the beam and the light output suffer in the process; this is why the diffusion filters are so useful.

If only basic control over the beam edge shape is needed then PCs (or 'pebble convexes') combine the wash ability of the Fresnel with the controlled softness of a diffused profile.

So a good standing rig provides PARs for raw punch of colour perhaps from backlights or high FOH sides, a predominance of fresnels and PCs on stage for a wide range of beam angles to give washes or tight pools, and a predominance of profiles in the auditorium for long throws, little spill and control over the beam edge. It's critical to be able to move the stage bars about even slightly, the mix of lamps might be right but if the position is wrong they're useless. Contradictorily for lamps which need to be refocussed regularly weigh up the pros and cons of placing these in the most accessible positions, even if these are not giving the precise angle desired here time might be more important than perfection.

Until the development of scrollers the choice and location of colour in standing rigs was limited. Larger theatres, especially those delivering a repertoire of opera and ballet, could afford semaphore units in key positions but even these only offered a handful of choices. Some theatres were (and still are) reluctant to change colours in cyc flood or backlight bars, especially for short run productions.

It's important to be objective about this. If a colour has been carefully chosen because of its effect on a set or a costume, or if it has some significance in the text, then clearly an alternative could be wrong. However, there is such a wide range of colours available today that many choices can have alternatives without serious damage to the design. I find this one way of learning new colours I might otherwise have avoided and sometimes this refreshes a particular scene.

If scrollers are available it's a good idea to work with 2 groups with one lamp in each group side by side at each position, this way crossfades from any colour to any other colour in the selection are possible. It would be impossible to select not only a range of colour but also more significantly a sequence of colour which would cater for every situation.

Experiment with your rig and make subtle changes from show to show until it settles. Incoming people might balk at not being able to rig anything anywhere anytime, but if the rig delivers good things in little time, it's doing its job.

Review

Innova Son Digital Mixer - full of surprises!

France has suddenly become an interesting breeding ground for innovative live audio products, judging by the activities of L'ACOUSTICS of V-DOSC fame, and now Innovason.

For several years now we have heard snippets of information about a new digital live mixing console which is priced like a top end Midas - but with all the benefits of digital. Very specifically, this means automation and remote control, where the actual audio is somewhere else. Like on stage. So the multicore becomes a simple run of video coax, up to 400m long.

The basic principle of digital audio should be now reasonably commonly known. At the stage or microphone end, you need to convert the analogue millivoltages from a microphone into a digital audio stream. You use an A/D converter for this. Then, after your digital device or desk has done its thing, you need to get the audio back into analogue form for amplification - using a D/A converter.

The standard form factor of a mixer as most of us know it, has all the inputs and outputs on the back of the desk. A digital mixer in small format, like Yamaha's 02R, has A/D and D/A's internal, so there are standard analogue connectors (XLRs and jacks) built onto the desk. But a larger format live console is always used at the end of a multicore, so analogue connections at the desk are less necessary.

This is where the brothers Christian and Philippe Royer started their company, Innovason, years ago. They wanted to make a digital multicore, to get away from running 48 twisted pairs from the stage and eight or more back the other way. Concert multicores are ridiculously flimsy, length limited, heavy, dangerous and vulnerable to nutcases with pocketknives. Yep, they do get cut...

The Royer's come out of the sound industry, and did indeed make their digital multicore system, called the Muxipaire. It



By Julius Grafton and Mandy Jones

was then obvious that a desk should follow. So it did. For the past three years they have sold their Sensory console, and it has been tried and proven in Europe. Now it is getting accelerating acceptance in the USA too. Clair Brothers have one, and are said to be ordering more. And the BBC have one, with more on order.

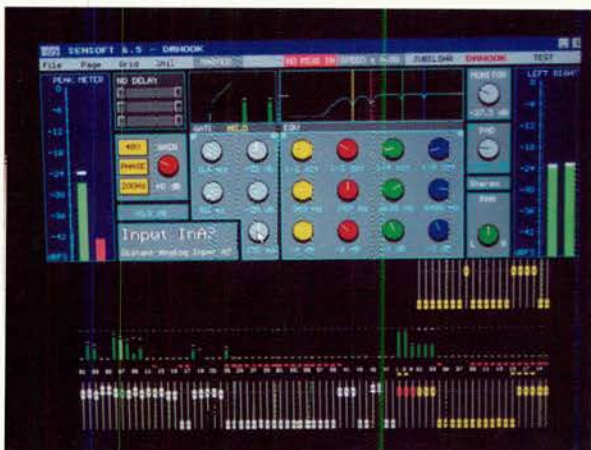
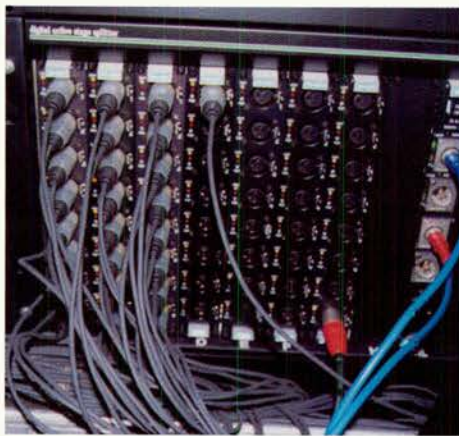
For 200 grand or so, you can cut serious weight and bulk out of your premium mixer, and have all the benefits of digital routing and automation. This is where Production Audio Services boss Colin Severson first realised the potential of the Sensory, because he was working with Tim Davies from the BBC on the Olympics in Sydney when he noticed Tim programming a show on his laptop. He was changing the routing and patching on a Sensory desk, before he got back to Birmingham. "I've got to have one of these" said Colin, and now he does. It is here in Australia, and on a demo tour.

"It looks nothing like a traditional console, but it essentially has all the same features" says Sound Engineer Glenn Helmut. He was using the console at a McLean Audio gig in Melbourne, with the guy from Dr. Hook.

"Every input has its own compressor and gate and its own equalisation - 4 bands parametric. Every output has eight bands of parametric



Sound Engineer Glenn Helmut



Review

ric equalisation plus compressors, gates and delay. The only thing it hasn't got is on-board effects so I just patch in a Lexicon."

It's the fact you can actually use analogue audio processors and effects with the desk that has impressed many engineers. The perception of the new breed of digital consoles like this, including the Harrison Show Console (A\$1,000,000 and counting) and the Yamaha PM 1d (maybe half a million) is that with all the converters on stage, no inserts or effects could be patched into the mixer.



Deceptively simple and intuitive to use. Even a Connections' journalist could mix a gig on this!

Sensory lets you do it, because a separate Audio Rack is located at the desk end, and it may be configured with as many local input or output converters as you like. It is this hardware simplicity that turned on the BBC and opened the door for Sensory to be a flavour of the month with outside broadcast engineers, since the mix rack could be optioned up with all inputs and outputs, and an external 'remote' Muxipaire rack could be wheeled out when required, on the end of up to 400m of coax.

The joyful aspect of such a console is that you can have inputs and outputs where you like, interconnected in a simple manner by the control coax. So, at the top end, you may have two stages, and two separate sets of inputs and outputs, but one desk. Like at a big festival.

"It's incredibly configurable - it has internal matrixes so you can soft-patch your inputs in any configuration. It would have to be the easiest digital console to operate. I can get around this as fast as an analogue console after only a week" Glenn said.

"This is the only digital console where the on-board dynamics and the mic pre-amps are good enough. It sounds as good if not better than any top of the line analogue console."

What you see is what you get. The console, or control surface, is devilishly simple. 48 channel faders on the left, 20 'gaux' faders on the right, with three main outputs - Left, M (which stands for mono or middle) and Right. The 'gaux' faders are whatever you want them to be - groups, or auxiliaries, or 'virtual' VCA's.

Above the faders is the control area for whatever channel or output is selected. This gives immediate hands on control of a wide variety of functions - more than you'd find on a conventional console. For example, four band parametric on each input is fully parametric, and allows you at access any frequency between 20Hz and 20kHz on each of the four bands. That's extreme control!

Outputs can be delayed, equalised, gated, compressed, limited, companded and routed every which way. All of this you can establish on your laptop beforehand too.

Touch a channel and that channel is shown on the flat panel monitor in front of you. All channels have a display to show what they control, like an electronic scribble strip.

The screen displays every channels LED ramp, plus the Left, M and Right, output displays. These never leave the screen


The software system is based on DOS, which keeps bootup times down. Audio processing is done at a 48khz sample rate, with internal 32 bit floating processing.

The A/D converters work at 20 bits, while the D/A's work at 24 bits.

There is a full users manual at www.innovason.com

● Australian distributors: Production Audio Services, Phone: +61 3 9415-1585.


The Next Generation In Rental Management Software



HIRE TRACK
Eclipse

For Win95/98/2000/NT.

- Multi Currency
- Multi Site
- Multi User



NAVIGATOR SYSTEMS
+44 (0) 7000 628797
info@navigator.co.uk
www.navigator.co.uk

Eclipse

- Job
- Hire
- Warehouse
- Equipment
- Diary
- Blanner
- Multi-site
- Addons

Distributed in Australia by Premier Technology Group, 32 Chester Street, Fortitude Valley QLD 4006.
Contact Craig Ryder Tel: (07) 3257 0443. Email craig@premierlighting.com.au

Dealer Sales: Active Audio, PO Box 1174, Capalaba QLD 4157. Contact Roger Kelly Tel: (07) 3257 7367. Email: mail@activeaudio.com.au



The cheque's in the (e)mail...

You've got to have an e-mail address these days. If you don't have at least one then you're a non person. More and more business is done via e-mail; more and more people use it for everyday conversation, especially if you're in different time zones.

And like most things, the more it's used the more it gets abused. Not just by users but by software corporations too. I've got nothing personal against Microsoft; probably everyone secretly wishes they were as rich and successful as Bill Gates, but I hate what they've done to e-mail. Everything you get from people who use Outlook as their e-mail program is at least triple the size of the equivalent text only version. It's all encoded like a web page, with about two or three lines of actual text for every ten lines of font/ size/ formatting code, which comes out as gibberish on anything non-Microsoft that doesn't read it. Plus you get an attachment that contains all the font/ size/ formatting code as well.

As everyone on 'net time knows – triple the size means triple the time wasted waiting for it!

All I really want to read is the message. If some fancy formatting needs to be involved to get the message across, then just give me a link to web page and I'll go and have a look if I want to.

And what about e-mail attachments, I hear you ask. Well, what about them indeed? Surely I'm not the only one who thinks it is very bad Netiquette to send anything over 50K without checking that it's OK in advance? Anything over 100K *really* pisses me off. So much so that I'm devising a program that will return any large attachments to the sender, maybe 5 or 10 times in a row. Let them see how they like that clogging up their e-mail server! And please, no more pictures involving a simple country girl, her donkey, and a tub of grease! (Unless the donkey is *really* good looking!)

Look, I don't get upset if people send me an e-mail trawling for business. I'm not that thin skinned, because I often do the same. But it should be just a few K of text, with hot links to anything larger. And no attachments. None. If you want to give people half a chance to respond favourably to your sales pitch, don't piss 'em off by making them sit through a half hour download before they can check the rest of their mail!

We have about 54 distributors around the world, and luckily not all of them are Christian. But even if only half of them send us an amusing 1 megabyte animated Christmas/ New Year/ Easter/ whatever card, that becomes a 27 megabyte log jam in our e-mail allowance of 5 megabyte! Sure, you can set your e-mail program to not download anything larger than 50K or whatever. But then those 27 megabytes just sit there on your e-mail server until they are flushed. And if your e-mail letterbox limit has been reached, all other mail gets bounced back to the sender until you do go and flush out the server.

Everybody gets spam, though. Unwanted stuff that is just sent out to millions of e-mail addresses in

the hope that some sucker will respond and make it all worthwhile. You'll know them when you get them. Free holidays, spying on your neighbours, gambling, get 40 grand by forwarding this e-mail from Bill Gates and/or Netscape (*as if!*). This last one in particular usually comes with a lo-o-ong list of forwardees – obviously the 200 most gullible people on the Internet! It would probably be worth spamming those people yourself with a 'send me twenty bucks and get ten of your friends to do the same and make me rich quick' letter!

Can I offer a word of advice, though? When you get spam, it often comes with reply details on how to stop receiving this unwanted mail sent in error. Do *not* reply to them. If you ignore them they will go away. If you reply, it's like saying "Yoo-hoo spammers – here's a hot one!" They are not bothered by you saying "Hey - don't send me any more of this unwanted tripe", they just want to know that 'here is a working e-mail address that I can SELL!'. Your volume of unwanted e-mail will explode as your name gets added to the spam tripemeisters' hotlist.

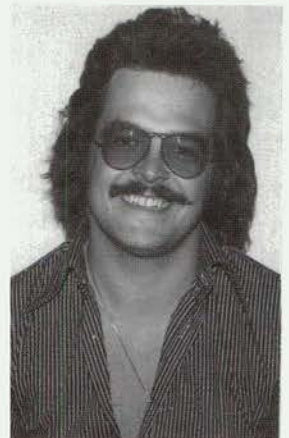
We used to get a regular weekly e-mail newsletter listing computer games from a dealer in Queensland, which was about 10K in size. That was fine – the prices were discounted and I bought some games from them occasionally, plus it was good to see what new ones had been released each week. Then all of a sudden one week they decided to attach a three and a half megabyte catalogue of their line of notebook computers. Unfortunately for them it arrived at work on Col's machine first, and after it had downloaded, was returned with a not-so-subtle 'ColinGram' giving some helpful advice on sex and travel. The medium certainly wasn't the message in this case!

But let's not whinge to excess about e-mail. It's a great invention, one that has nearly erased the Fax machine for world trading (something that no-one would have thought possible in the early 90's, that's for sure!). We used to get at least 30 to 40 faxes a day; now maybe we get one or two, and everything else is done via e-mail. Even the Nigerian oil dollars scam has gone hi-tech; no letters or faxes anymore, now Dr Owatun Ofmoney trawls for suckers by e-mail. The poor customer service rep from Ricoh who rings up checking if our plain paper fax needs any toner has missed out on a refill order for the last four sales calls. "Everyone sends us e-mails now," we tell her. "Umm, that's what they all say" she agrees morosely!

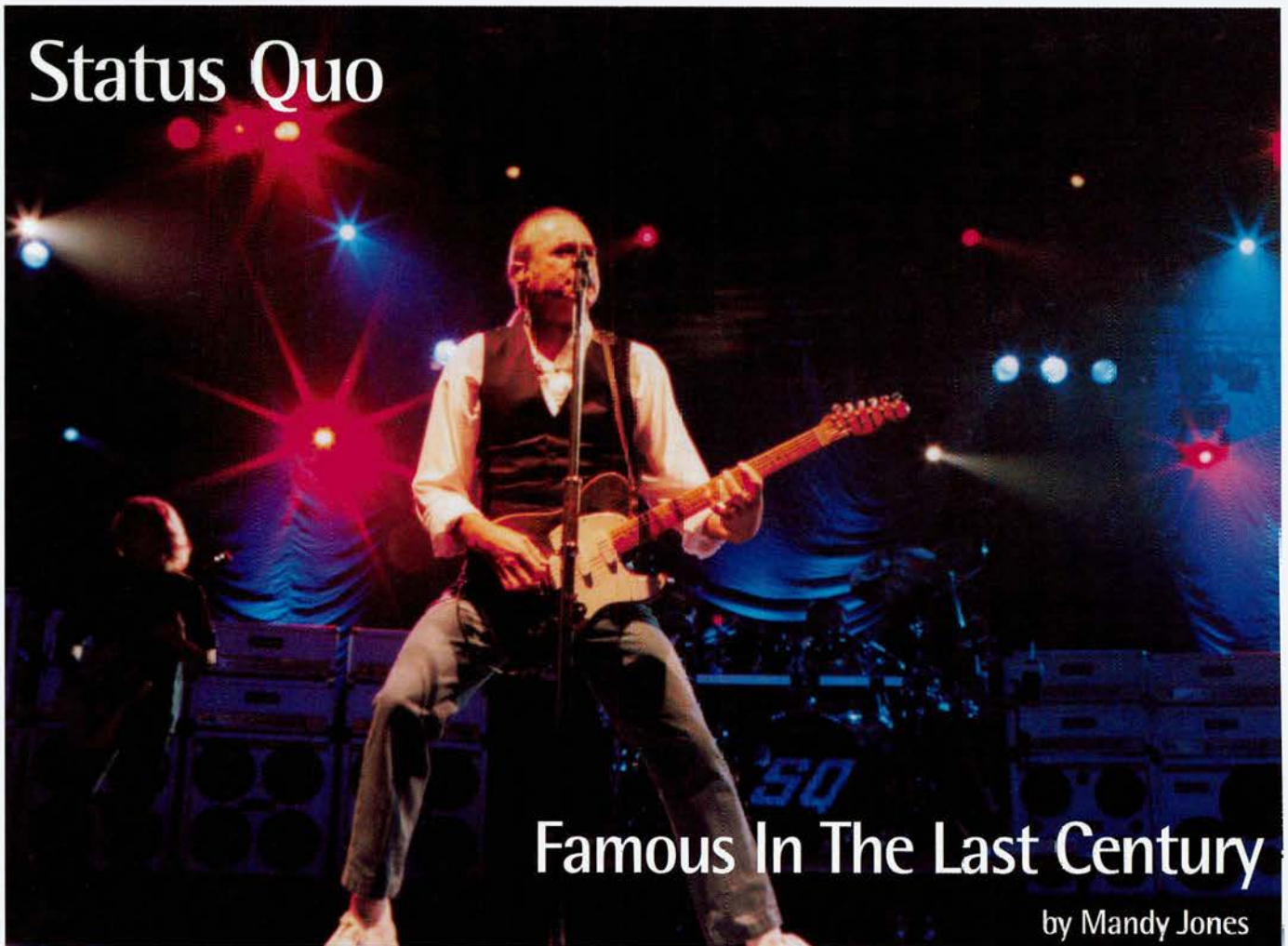
The Festive season is nearly upon us, and as the restoration of the RoadRunner with its monster 440 cubic inch (7.4 litres) engine reaches completion, I'm eagerly awaiting my regular Christmas card from Sheik Yermuni-Makir, Mustapha Drinq, Al Av Ernotha and all the other OPEC lads, saying "Cheers, Dunk, whatever you do don't sell that Plymouth!"

Have a happy and safe holiday season – I'll be back with more of the same next year! If you need some holiday reading, there are heaps of these stories on the www.dunkworld.com website. If your favorite is missing, email me: dunk@dunkworld.com. See ya!

A refugee from a long lost Cheech and Chong Movie? No, it's just Duncan. He says this was a passport photo from the '70s, but we think this is what he looks like on weekends.



Status Quo



Famous In The Last Century

by Mandy Jones

Thirty-five years on, Status Quo still know how to make a crowd scream for more. Fronted by original members Francis Rossi and Rick Parfitt, Status Quo recently toured Australia to flog their new album *Famous In The Last Century*.

Pat Marks has been Status Quo's LD for the last 12 years. After three years of avoiding them and declining numerous invitations preferring to design for "nice bands" like The Go Betweens and Mental As Anything, eventually Pat succumbed.

"They needed an LD for three weeks so I gave in and I had a ball," says Pat. "I just got on with them so well and I really enjoy them live. I'm not a Quo music fan and I don't particularly like them on album, but as a live band getting punters going they're great, I love it every night."

"Francis was very nervous as to what I was going to do when I came on board, so I took the bull by the horns and said 'As far as I'm concerned Francis, Status Quo isn't a heavy metal band, you're a 12 bar blues band and I'm going to light you accordingly'. He looked at me and said 'Where have you been for the last 20 years!' And he's had complete faith in me ever since."

For the Australian arena leg of their current world tour, Pat used a small rig of 12 Mac 500s, 6 StudioColors and around 140 par cans. He inherited the StudioColors in Europe and because he was touring a disk he decided to stick with them rather than switch to Mac 600s.

Due to budgetary constraints, Pat had to sacrifice a third on-stage truss in order to have his favourite desk (an Avolites Diamond III) supplied by hire company PowerWorks in Tasmania. Not only is the D3 his favourite desk, but Pat actually wrote the manual for it.

"I really like Avolites. I'm not very big on the WholeHog because it's a boffins desk not an operators desk. It's not for old LD's and I'm an old LD from the old school and we like to have faders."

"There's too much time spent chasing style and fashion in our industry. You have to be seen using the new VL7 because it's new or you have to be seen using the Icon desk because it looks sexy. There's a LD who I shall not name who complained about the red and blue faders on the Avo - he wanted all black faders because he thought the red and blue faders looked a bit 'poofy'. He's missing the point. The idea was not for him to pose behind a sexy looking desk out front, it's whether or not the piece of equipment will do the job."

As far as design goes, Pat said the show pretty much designs itself.

"When you've got a rig like this - two straight trusses, par cans, a few Marcons and some white silks up the back, it's a rock band, it's 12 bar, it designs itself! There's no great aesthetic behind it, I just try to make each picture suit what's happening at the time."

LD - Pat Marks



"The trick is to hold back and not fire a cue when you think. Too many LD's slavishly follow that snare and change on every snare beat which gets boring after two minutes, so you save your flashy bits for the big dynamics and then just try to keep it verse/chorus/solo. Sometimes it's just a static look for a whole number which can be hard with Quo because it's always driving you on to do something."

The only criteria for lighting set by the band is key light on each mic for which Pat uses a pair of Source Fours, plus lots of Six-lites with colour changers on the audience so Francis can see them at all times.

Pat uses rich bold colours. He said his inspiration is the vibrant saturated colours of DC Comics cartoons, which he juxtaposes, with lots of open white and straw from the par cans.

"There's a lot of old 80s par can looks but we've made them new. I use the moving lights quite a lot, sometimes I think too much. I look at it some nights and I wonder if it's a bit too busy because I'm a big believer in backing off on the moving lights. They're far too overused in concerts, but nowadays if you don't use them you've got a problem."

Pat's only gripe about many venues in Australia, is to do with air conditioning. Not only does it destroy his oil cracker effects but also he believes it ruins the entire atmosphere of a rock show.

"The venues just don't understand that when you've got a band like this, smoke is the show. Take that away and I've got some pretty colours on the silks at the back and that's about it. Plus the air conditioning makes it really cold on stage and Francis hates that. He always says 'Rock and roll is meant to be hot, it's meant to have people sweating' but when the audience is sitting there with coats on and Francis won't take his waistcoat off because it's so cold that the guitars are going out of tune, that can't be right."

Audio

Andy Taylor has been FOH Engineer for an impressive list of international acts including Eurhymics and Dave Stewart. For the last eight years he has toured with Status Quo as their live engineer. He describes their touring PA requirements as "straight forward" - nothing tricky, just good, old, reliable gear. In fact, Andy stressed how little has changed in terms of the band's basic requirements.

Supplied by Australian Concert Productions the PA was a Turbosound system comprising 36 Flashlight boxes, 32 Flashlight bass boxes and 8 underhangs. Andy mixed on his console of choice a Yamaha PM 4000.

At monitors the desk was a 48 channel Midas XL3 using Klark Teknik graphics, Drawmer noise-gates, 4 x BSS compressors and 2 x Roland digital delays.

Microphones were similarly standard - SM57's, SM98s and AKG451's on the kit, and Neumann U47s on Rick and Francis' guitar amps.

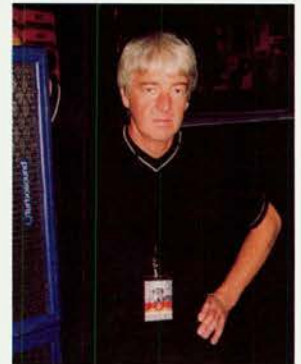
"I don't use Beta 58's on Rick or Francis' vocals because they're just a bit too crisp. Standard 58's tend to suit them better."

While the stacks of Marshall amps still line the back of the stage - this time a special 'white series', the front of the stage is considerably barer than previous Quo tours now that the band use in-ear monitors. Using a mixture of Shure and Garwood in-ear systems, Andy explained the only compromise was Rick and Francis needing their guitar amps louder so they can "feel" it up on stage.

"It's a very clean looking stage without the wedges everywhere, but there's nothing for them to put their foot on for their solos."

Andy was quite impressed with the acoustics of the Rod Laver Arena in Melbourne describing it as a "beautiful sounding room". He said he had been generally impressed by the standard of arena venues in Australia and their superiority to European venues.

FOH Engineer - Andy Taylor



NEW!

Coloured ABS



From PENN- prelaminated ABS plywood - 9mm +1mm laminate, quality 5 ply. Red, Blue Black in stock, 8 more colours coming!

- Surprisingly competitively priced
- Passed quality tests for delamination and strength.



Also new: FOAM! Open & closed cell models, varying thickness and densities.



+61 3 9335-6455

www.penn-fabrication.com

THE ULTIMATE

AUDIO & VISUAL TRADESHOW RETURNS TO
DARLING HARBOUR

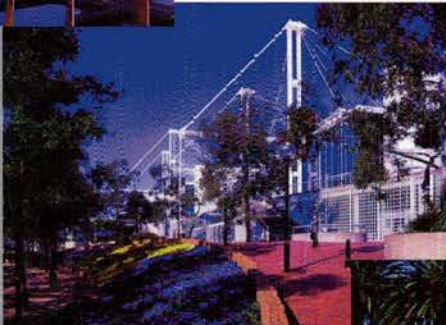


ENTECH 2002

Best stand positions at the best prices are on sale NOW



**PRICES RISE
DECEMBER 31 2000!**



*Floor plan, rates on the
web at www.conpub.com.au
or call for an info pack*



Contact Caroline Fitzmaurice, Show Director, on
+61 2 9869-4177 or email: caroline@conpub.com.au

Outdoor Installation

2000 BARTERCARD GLENELG JAZZ FESTIVAL

Twenty-seven degrees, no rain, no wind, golden beaches and technicolour sunsets contributed to three days of music festival heaven at Glenelg during the third weekend in October.

Winning the contract seemed simple enough. A tender document from the production contractor Pro-Stage Australia outlined the criteria very clearly: please supply good engineers and FA that can cut it within a manageable budget.

I have found a real need in Adelaide for technical brokerage as requirements can vary dramatically from show to show. Audio has become such a specialised field that it pays to really find out what the client needs and then to source the equipment and personnel that best suits that need without being restricted mainly to the resources that only your company own.

The festival, which is run by Events Oz for the city of Holdfast Bay, ran three main stages at Mosely square. A fourth venue on Jetty road, the Church and on Friday night only a Jazz Divas concert at Elder Hall featuring Lillian Boute, Lee Guinness and an 80 strong Gospel choir.

I sub contracted Golight to supply audio for three beach venues, Derringers supplied audio for the Church venue and Darren Scaresbrook supplied and operated for Elder Hall.

Tim Marshman of Golight supplied his proprietary double ten cabinets for all venues, a double in the two tent venues and a single for the open-air 5AD stage. These cabinets really must be heard to be believed. Needless to say I was very impressed with their capabilities.

Having said that, I received consistent pressure from Junior, Harry and Tim to spec EAW 850's next year to deal with the 50m throw.

Derringers supplied a pair of Mackie SR450's with a Mackie console. The Church, as the name suggests, was a cosy venue that required mainly a vocal PA for 200 patrons.

Darren Scaresbrook was (retrospectively) a good choice to supply and operate for Elder Hall. Darren supplied a pair of mongoose cabinets and system 80 subs. To be honest, not a glamorous rig to see on a spec sheet but for this particular event it was appropriate simply because of the result. I was concerned initially about the lack of a centre cluster for the balcony, which the budget simply didn't allow for. However, it wasn't an issue.

Other engineers on the team: Richard (Junior) Builder FOH, Bartercard; Harry Gum Fold Back, Bartercard; Michael Hoffmann, Stamford; Phil Bungey, 5AD; and Alan Mourant, Church.

by James Instrell-Walker

Acknowledgments

Backline was donated by John Reynolds and piano's by Allans Music. The Pro-Stage team: Kelvin; Jeremy; Keith; Jardine; Chris Iley and Chris Luscombe. The engineer's best performer award went unanimously to Lillian Boute and the Lee Guinness Band, who dished out generous quantities of passion.

The Crew from left: James Instrell-Walker; Phil Bungey; Harry Gum; Tim Marshman; Allan Mourant; Rachel Burton; Michael Hoffmann; Richard Builder and Jardine.



Radio DMX™

Wireless DMX Distribution System

NEXT GENERATION WIRELESS DMX. Interactive Technologies' RadioDMX wireless DMX Distribution system represents the state-of-the-art in wireless control of professional stage lighting equipment.

Using the RadioDMX system, lighting control networks can be seamlessly transmitted through the air. Such "cableless" transmission allows for the operation of lighting instruments in new and exciting locations and makes getting control signals to impractical or inconvenient places a snap.



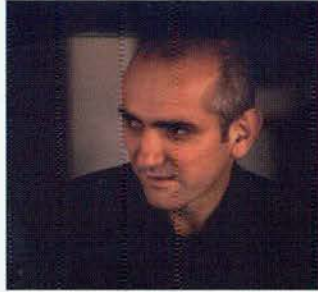
WANT MORE INFORMATION?

Contact Lighting Sales at
Bytecraft Pty Ltd

EMAIL: info@bytecraft.com.au WEBSITE: <http://www.bytecraft.com.au>
VIC - 23/31 Fonceca Street Mordialloc 3195 Tel: 03 9587 2555 Fax: 03 9587 5641
NSW - 5/31 Bridge Road Stanmore 2048 Tel: 02 9550 3955 Fax: 02 9519 3977



CHARTS



ARTIST: Paul Kelly
SONG TITLE: Roll On Summer EP
PRODUCER: Paul Kelly & Peter Luscombe
RECORDED: by Andy Baldwin & Paul Kelly @ The Shed & Sing Sing South. "Every Fucking City" recorded live at The Continental by Paul Petran & Russell Thompson for National Radio.
MIXING: Andy Baldwin Assisted by Jimi Maroucas
MASTERING: Don Bartley @ Studios 301



ARTIST: The Living End
SONG TITLE: Pictures in the Mirror
PRODUCER: Nick Launay
ENGINEER: Nick Launay assisted by David Davis
STUDIO: Sing Sing Studios, Melbourne
MASTERING: Tom Baker @ Precision Mastering, Hollywood



New South Wales

A# Sharp Recording Studio Jeff Cripps, 24 Track / 32 Track Digital +61 2 9153 9988 www.asharp.com.au
 The Bellhops Jeff Cripps Jeff Cripps Blues CD
 Wiley Park Public School Jeff Cripps Jeff Cripps CD
 Whose Muddy Shoes Jeff Cripps Jeff Cripps Compilation CD
 Oatley West Primary School Jeff Cripps Jeff Cripps CD
 Wollongong Blues Compilation Jeff Cripps Jeff Cripps CD

Bush Traks Recording & Multimedia Ruth Miller, Professional digital studio +61 2 6689 1290, www.bushtraks.com
 Monkey & the Fish Chris Fisher, Dave Highet Dave Highet Album "In Cahoots"

Damien Gerard's Marshall Cullen, 2" 24 Analogue /Pro Tools Digital, +61 2 95551710 www.damiengerard.com
 Dave Studdert Dave Russell Pilling Album
 Little Lunch Nick Sullivan Russell Pilling EP
 Fragile Simon Holmes Russell Pilling EP
 Sneeze Nick Dalton Russell Pilling EP
 Monique Roads Lloyd G Russell Pilling EP

Electric Mountain Studios Greg Clarke, music recording +61 2 9280 3766 http://move.to/the_groove
 Paralympic Games Opening Ceremony Peter Winkler Greg Clarke
 Our first full Pro Tools project. all recording editing and mixing was done in the TDM environment.

Feral Studios Jon Robertson, 30 track analogue studio and mastering +61 2 62993224 geocities.com/feralstudio
 Mr Fistar Jon Robertson Quin McQuin Debut Ep
 Exhibit A Jon Robertson Jon Robertson Album
 Kandi Doz It Jon Robertson Quin McQuin Album Tracks
 Pushka Quin McQuin Pre Production
 Paul Wesley Jon and Paul Jon Robertson Tracking

Festival Fishtank Studio Suzanne Hill, Logic Audio Platinum, Pro Tools 24 Mix plus (tons of plug ins) Over a dozen of the best synths of the 80's, Sony APR 24, Analogue multitrack, Drum Machines & Plenty of other assorted electronic gadgetry +61 2 9395 8070 www.festivalstudios.com.au
 Moulin Rouge- Post Production Josh Abrahams Film
 (love) tatoo Stephen Alkins/Justin Shave Justin Shave Album
 Juan Alban Juan Alban/Clare Manhood Clare Manhood Demos
 Dope Fantasy Land Mike Wells Trent Williamson/Clare Manhood Album

Festival Mastering Suzanne Hill, Sonic solutions-Genelec Monitoring -Neumann Mastering console-Plenty of analogue processing gear +61 2 9395 8070 www.festivalstudios.com.au
 Lime Mark Thomas William Bowden Single
 Lazy Susan Greg Wales/ Lazy Susan William Bowden Single - Canada
 Sarah Mitchell Tim Powells William Bowden Album
 B B William Bowden Album
 Snoop Dogg Presents Doggy's Angels(USA) Gary Kee W Bowden Remix

Festival Studio A Suzanne Hill, Analogue studio, Classic Neve Console + Pro Tools 24 Mix Plus version5 with loads of plugins, +61 2 9395 8070, www.festivalstudios.com.au
 Pico Paul Gommersall Paul Gommersall Demo
 Music for Film/TV Daniel Denholm Daniel Denholm Strings
 Ides of Space Wayne Connolly Wayne Connolly Album
 One Deollar Short Andrew Beck Andrew Beck Mixing Single
 Jay Smith David Nicholas Andy Shanahan/Daniel Denholm Album

Gangstar Studios Dave Dwyer, 24 track Digital Studio +61 2 9557 7116
 Bernie Segedin Dave Dwyer/Bernie Segedin Dave Dwyer Album
 Grover Dave Dwyer/Grover Dave Dwyer Album

Hindsong Studio David & Lyn Hinds, Digital Project +61 2 6582 7070
 BALANCE D & L Hinds D & L Hinds Album Tracking

JMF Recording Fran Esther, 24 Track 2" analogue, 24 Track ADAT, Paris Hard Drive Recording, Automated Console, Programming, Editing, Grand Piano, Vintage Fender Twin Amp, Cd burning +61 2 9790 4097 www.JMFrecording.com.au
 Roy Beach JMF Ralph Esther/Guy Saminaden Album
 Andy Giurtalis Andy Giurtalis Guy Saminaden Demo
 United Band Band Ralph Esther Album
 Sarah Anderson Artist Ralph Esther Demo
 Gervais Kofee Artist Guy Saminaden Album



STUDIO IN ONE

Yamaha
AW4416
Setting a
new
standard
by Julius Grafton

Yamaha's AW 4416 is a crossover product which at first glance makes you think amateur multitrack, then it corrects you and reveals it is a professional audio workstation with features you would expect on a high-end studio mixer.

Reland, Focus and Korg have all done the multitrack mixer all-in-one device before today, Yamaha's new beastly takes this genre to a new level.

Core are pretences about using Jaz, Zip, Minidisk, Magneto optical or other removable media. Yamaha fit the AW with a 2.5 inch IDE hard drive (like in a laptop) mounted on a card carrier parked in the hard drive slot at the back of the unit.

Standard at 12 gigabytes, new larger drives of up to 64Gb capacity can be slotted into the AW in seconds. This is your portable media for the foreseeable future, because an IDE drive is both relatively inexpensive and now reasonably handy as well. Storage time on a 12GB drive is a respectable 70 minutes for 16 tracks recorded at 48kHz sample rate in 24-bit resolution.

Drives, backups and ease of use have entered into a new phase with this product. We turned the AW on, and 35 seconds later the firmware had kicked in, interrogated the hard drive, and loaded the first song. From blackout to replay of 16 tracks in 35 seconds – we like that. Switching hard drives does require a shutdown and restart.

Still on the subject of drives and data, we plugged an old Yamaha CD burner into the SCSI port on the back of the AW, and were quickly able to play and import audio from the CD burner. Going the other way was equally

easy, we burned a song to CD-R without trouble.

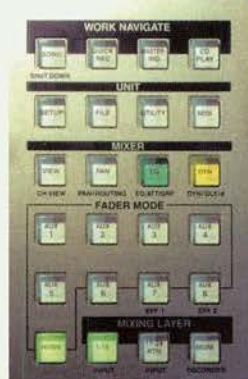
You could run an external hard drive from the SCSI port too, as a form of backup. There is an internal bay, at the front of AW sized to accept a CD-R – which internally connects to the SCSI chain. There is nothing stopping you from hooking up a full chain of 7 SCSI devices from the AW.

Out of the box, AW allows you to connect 8 inputs, and record them to any of the 16 tracks. Adding one of several optional YGDAI cards to one or both spare slots on the back gives you the extra 8 inputs you need for simultaneous 16 track recording, or even a full 16 outputs to complement the standard stereo and 4 Omni outputs. The YGDAI cards come in several different versions, including ADAT, Tascam, 8ch I/O in AES/EBU format, 8x Analogue input (phono), 4x Analogue Input (XLR), and 4x Analogue Output.

We won't do a blow by blow recount of the buttons and panel features, suffice to say it is all impressively 'pro' in feel, and quite tactile. For those experienced with the O2R, the familiar feel of the software will speed up the learning process. However, even an operator that has had no such experience can expect to find a reasonably intuitive interface that does not take long hours to learn. Physically, this is a very nice work surface.

In the studio, this device is designed to replace more than just the mixer and the multitrack recorder. The desk comes with a significant amount of audio signal processing control, including four band parametric EQ,

The intuitive control interface takes very little time to learn – particularly for O2R users



(continued over)

Review



List price • A\$6,995

compressor, expander, gate, compander and ducking. These can be applied to any input or recorded track. In addition, a library of reverb variations can be applied to the stereo mix and for the mastering stage.

The Yamaha AW4416 has some incredible features that make it obviously very useful in the studio, and its designers obviously foresaw considerable further potential for it in other areas of the entertainment industry.

A completely different use:

John Grimshaw writes: While many smaller theatrical companies will happily spend \$10,000+ on a lighting desk, audio tends to be a poor cousin. Some companies may spend a couple of grand on a few MD machines, a mixing desk a couple of amps and some speakers. Typically this is a motley collection of various brands and vintages that has built up over time, and as a result, a show's audio design becomes very simply executed.

This desk provides the opportunity to correct a significant amount of this problem. With a combination of its "Scene Memory" and "Automix" features, this desk provides all of the controllability that a theatrical lighting desk provides for lights. This includes live sound mixing of radio mics, and/or playback of internally loaded audio.

In addition, with the 16 sample pads that can be recorded for each song, this allows for 16 sound effects that can be instantly called up by pressing a button.

To give an example of how the desk could be used in a live situation, imagine a scenario where there are 4 radio mics, 2 Mini Disc machines and 6 different speaker channels. The eight discrete audio sources fill the built-in inputs, and the four "Omni" outputs as well as the main stereo out supply the six speaker positions.

The opening sequence requires that the pre-show music fade out and then multiple sound effects be played, surrounding the audience with numerous effects from different speakers. Then out of the middle of the cacophony, a piece of music lifts over the noise. One at a time, the cast joins in, singing with the music.

With the exception of the pre-show music playing through one of the MD machines, this entire sequence can be started and played with the

push of one button. It would be executed with all of the fades and EQ changes required for the external audio sources and internal playback. When the opening sequence concludes, the next "song" is loaded in the desk to await the next cue sequence.

All scene recalls happen instantaneously by default, but a "Fade Time" can be inserted in the Scene menu. This allows you to set up cross fades between scenes of up to 10 seconds (in 0.1 second steps). This is not quite long enough to be useful in all circumstances, but it will certainly be able to cope with the vast majority of crossfades that may be required. For longer crossfade times, the Automix function could be used to "real-time" record that change you want to make.

There are some limitations when using the desk in this way:

- there is a limit of 96 scenes (snapshots of faders, EQs etc) that can be recorded in any song
- recalling the next scene requires four button presses (it is not a case of simply hitting a "Go" button)
- Two or more cues cannot be played simultaneously (important for theatre as different cues can be triggered by different events at different times. Cues are regularly played over the top of one-another). However, any of the pads can be manually triggered during the playback of a song, allowing a limited form of over-tracking.
- Each song takes a few seconds to load.

If you were to use the desk in this way, it would be smart to take advantage of the mastering features to burn a back-up CD of the show, so it can be run in two track mode without the desk should the need arise.

Given the limitations, it is entirely possible to run a show using the "song" as a group of cues. This could be done by placing a "marker" at the start of each cue you have recorded into the song. Markers are different to scenes in that all they do is mark a point in a song to which you can jump to. A scene records the positions of signal path items (faders, EQs, channel on, etc).



Tracking Guide



Rockinghorse Studios Vern, 48 Ch. Neve V Series, Studer 2" 24 Track, Pro tools Album tracking + Mix/Down, Mastering Blue Room +61 2 6688 4005

Palladium	Magoo (E+P)	Jim Arnold (Assistant E)	Album tracks
Sunk Loto	Paul McKercher	Jim Arnold (Assistant E + P)	B/ single
Peter Murray	Anthony Lycenko + band	Anthony Lycenko (E)	Album Tracks
Two Dogs (From Resin Dogs)	Jeff Lovejoy/Band	Jim Arnold (Assistant E)	Album
Filler	Jeff Lovejoy/Dave Atkins	Jim Arnold (Assistant E)	EP Release

Sony Music Studios Ross A'hern, Multitrack recording & video prod'n +61 2 9383 6320, www.sonymusicstudios.com.au

Karma County	Tim Whitten	Tim Whitten	album tracking
Jimmy Little	Buz Bidstrup	Ben Hudson	
Charlie Chan	Charlie Chan	Louise Taylor	album tracking
M.I.B	Tod Deeley		album tracking & mixing
Black Mountain Jazz band	Louise Taylor		track, mix & master album

Soundwarp Meredith Brooks, Mastering, +61 2 9905 7144 www.soundwarp.com.au

Ice Cream Truck	Volcom	Bill Syratt	Album Ccompilation
Trish Watts	Trish	Meredith Brooks	Mastering
Anthony Wright	Anthony	Bill Syratt	Album
Reggie Norton	Trevor	Meredith Brooks	Restoration
Siaki	Siaki	Meredith Brooks	Demo

Studios 301 Marie Toparis, SSL G+, Neve VR, Genelec Monitoring (5.1) Studer analogue 24tk, Sony 48, ProTools +61 2 9698 5888 www.301.com.au

Lino	Lino	Wayne Connelly	String Recording
Max 22	Max 22	Richard Lush	Mix
Groove Terminator	GT	Brent Clark	Mix
Tom Curren	Rod Tamlyn	Gary King	Mix
Atari Baby	Atari Baby	Phil McKellar	Mix

Velvet Sound Recording Studios Dave McCunn, 24 track 2" Analogue & 64 track Pro Tools Digital +61 2 9267 2915 www.velvetsound.com.au

Skunkhour	Steve James	Tony Wall	Album Mixed
Thirty Odd Foot of Grunts	Dave Wilkins	Tony Wall	Album Tracked
Headlifter	Band	Adrian Grigorieff	Album Tracked
Lazy Susan	Greg Wales	Greg Wales	EP Track & Mix
Menteke	Band	Adrian Grigorieff	EP Track & Mix

Queensland

Foxhole Audio Productions Mick Rayner, Pro Tools + Analogue +61 7 3262 5150 www.foxhole.ts

Reid Elliot	Jeremy Allom	Jeremy Allom	
Margaret Priebe	Brad Moore	Mick Rayner	Mixing
Sedition	Band	Mick	Mixing EP
EL.F	Band	Mick Rayner	Mixing Album
Too Far Gone	Mick / Band	Mick Rayner	Ep Tracking / mixing

Taramalin Sound Allan Lahey, 32 Track Digital 16 Track Analogue 32 Track Digital +61 7 3208 9736 www.taramalin.com.au

Palma Rosa Poets Live	Mark Tempany	Allan Lahey	Australian Bush Poetry Album
Texas Dancefloor Massacre	Texas Dancefloor Masacre	Allan Lahey	EP Rec/Mast
Martin St James		Allan Lahey	Mastering
Wilful Damage	Wilful Damage	Allan Lahey	Live Demo/Rec & Mastering
Brian Jones	Brian Jones	Allan Lahey	Recording & Mastering

Vandersound Studios Eric Vandersande All Digital + Valve Rec/Mix/Master +61 7 5546 8100

www.vandersound.com.au

Blunt Object	Eric Vandersande	Eric Vandersande	EP Edit + Pre Master
Finger	Eric Vandersande	Sarah Howsen/ Eric Vandersande	Demo
Eat Like Flies	Eric Vandersande	Daryn Kennedy/ Eric Vandersande	Demo
Christian Poppe	Andrew Hines	Andrew Hines	Album Mix + Master

South Australia

Fat Trax David Grice, 64 Track Music and Post +61 8 8231 5199 www.fattrax.com.au

Tyrone Matt Williams	Matt Williams	Demo	
Harry	Matt Williams	Matt Williams	Single

CHARTS

ARTIST: Wendy Mathews

SONG TITLE: Free

PRODUCER: Michael Szumowski

ENGINEER: David Hemming

assisted by Danielle McWilliam

STUDIO: Tiger Studio

MASTERING: Don Bartley @

Studios 301



ARTIST: Human Nature

SONG TITLE: He Don't Love You

PRODUCER: Steve Mac

ENGINEER: Chris Laws

MIX ENGINEER: Matt Howe

ASSISTANT ENGINEER: Daniel

Pursey

STUDIO: Rokstone Studios, London

MASTERING: Tom Coyne @

Sterling Sound, New York



Tracking Guide

CHARTS

ARTIST: You Am I
SONG TITLE: Damage
PRODUCER: Clif Norrell
RECORDED: Clif Norrell @ Q
 Studios with assistant Mick Seage
MIXING: Skip Saylor Studios, LA
MASTERING: Steve Marcussen @ A
 & M Mastering



ARTIST: Killing Heidi
SONG TITLE: Superman/Supergirl
PRODUCER: Paul Kosky for Wah
 Wah Music
ENGINEER: Paul Kosky
STUDIO: Metropolis Audio,
 Periscope Studio, Sing Sing & Kiss
 Music Studios, Melbourne and @
 Southerntracks Studio, Atlanta
PROGRAMMING: Andy Baldwin
 assisted by Zar Hanley & Robin Mai
MASTERING: Leon Zervos @
 Absolute Audio, NY



J/Ded	David Grice	David Grice	EP
Zest	Matt Williams	Matt Williams	EP
Fred Grice	David Grice	David Grice	Album
Mixmasters Mick Wordley, 24 Tack 2" Pro Tools +61 8 8278 8506			
Pornland	Jack Housden	Jack Housden	Album Mix
David Seidel	David Seidel	Mick Wordley	Album Tracking
Eighth Degree	Jed Palmer	Jed Palmer	EP
Argon	Mick Wordley/Argon	Mick Wordley	Album
Indeeka	Chris Tennant	Steve Fieldhouse	Album

Victoria

AUDREY STUDIOS Craig Pilkington, Hard/Digital/Hard Disk recording +61 3 9415-8599			
Onslaught	Craig Pilkington	David Badrick	'For Real' Album
The Little Murders	Craig Pilkington	Craig Pilkington	Album
DEX MASTERING ADAM DEMPSEY, HIGH-END AUDIO MASTERING SINCE 1982 +61 3 9372 2266			
Various	Jamie Durrant	Adam Dempsey	Stop Jabiluka Compilation
Streamline	Arthur Howie	Ken Shulman	Album
Trickles	Band	Adam Dempsey	EP
Lloyd Speigel	Lloyd Speigel	Adam Dempsey	Live album
Various	Wes Jay	Adam Dempsey	Laugh Radio compilation
Honeyface Mark Hilton, Digital recording with Neumann mikes. Mastering & CD burning +61 3 9507 2067 http://www.honeyface.com			
Tom Griss	Mark Hilton	Mark Hilton	Solo Pop/Rock album
Dom Jurcec	Mark Hilton	Mark Hilton	Solo Pop/Funk album
Lo Ricco Sound Studios , Marcello Lo Ricco, 64 track Digital Recording Studio +61 3 9701 6220			
Trickles	Trickles/M. Lo Ricco	Marcello Lo Ricco	Album
Inanna	Inanna	Marcello Lo Ricco	Album
Zack Zodo	Zack Zodo	Marcello Lo Ricco	Album
Jason Crewes	J. Crewes/M. Lo Ricco	Marcello Lo Ricco	Film Soundtrack demo
Mixolydian	Mixolydian	Marcello Lo Ricco	Demos
Metropolis Audio Sally Rodrigues 48 Track Digital SSL Room			
The Living End	Dave Carter	E. Rose (E)/T. Faranda (E)	TV Spe/Web
The Superjesus	Dave Carter	E. Rose (E)/T. Faranda (E)	TV Spec/Web
The Screaming Jets	Brian McMahon (E)/Tony Faranda (E)		TV Special/Webcast
John Farnham	Ross Fraser/Grewg Burness	Doug Brady (E)	TV Special for GTV 9
Toyland Recording Studio Adam Calaitzis, 24 Track analogue & 128 track Digital +61 3 9482 2111, ozemail.com.au/~adamcal			
Sony Playstation2	Adam Calaitzis	Adam Calaitzis	Product Launch
Earth	Adam Calaitzis	Adam Calaitzis	Album
Without A Reason	Adam Calaitzis	Adam Calaitzis	Album
Vicious Circle	Adam Calaitzis	Adam Calaitzis	Album
Ikon	Adam Calaitzis	Adam Calaitzis	Album
True Form Recording Neil Gray, 24Tk. Analogue/Digital with H.D. Editing +61 3 -9391-0907			
Minotaur	Neil/Band	Neil Gray	Demos
Gogeryl	Ross/Dave	Ross O'Driscoll	E.P.
Brunswick Music Group	Band/Francis	Francis Cleary	Mix Album
Semi Kinda Even	Neil/Band	Neil Gray	Single
Wombat Road Recording Studio Barrie Clissold, 24 Track Digital + Full Digital Mastering +61 3 51454204			
Porkchop	Porkchop	B. Clissold	Cassette Duplication
The McFlys	Carl Dedic	B. Clissold	Album Tracking
Kiplah	D. Bowen	B. Clissold	Basic Tracking
Gimpoid	B. Clissold	B. Clissold	Demo C.D.
C.O.C. Sale	J. McIvor	B. Clissold	Album Mixing/Mastering (C.D.)

Western Australia

Poons Head Sam + Rob, Audio Recording / Production / Mastering +61 8 9339 4791			
Penelope	P) Rob Grant	E) Rob Grant	Album Mastering
Bob Batchelor	E) Rob Grant		Album Mastering

Tracking Guide



Skender	P) Rob Grant	E) Rob Grant	Album: Mixing
Crimes Of The Primary	P) Rob Grant	E) Rob Grant	Mastering
Cowboy John	P) Rob Grant	E) Rob Grant	Album Mastering

Satellite Recording Studio Darren Halifax, Pro Tools 64 Tracks x 24 bit +61 8 9472 8040
www.satelliterecording.com

Dave Hole	Dave Hole/James Hewgill	James Hewgill	Album
Billie Court	Billie Court	Darren Halifax	Album
Tony McKenna	J Hewgill / T McKenna.	James Hewgill	Album
George Vegas	Darren Halifax	Darren Halifax	Album
Waste Of Space	Band	Darren Halifax	Demo

The Sonic Lab Mark Whitehouse, Sonic Solution: Mastering Facility +61 8 9375 3902 www.procopy.com.au

Pickled Fairies	Mark Whitehouse	Graham Owens	CD master
New I Voci Singers	Mark Whitehouse	Karl Akers	New CD master/compilation
Men In Harmony	Mark Whitehouse	Cliff Blackburn	New Album Rec. session
Scouts Museum of WA	Mark Whitehouse	Mark Whitehouse	Restoration Project
Peter Walker	Mark Whitehouse	Graham Owens	Guitar CD

Post Production

Toyland Recording Studio Adam Calaitzis, 24 Track analogue & 128 track Digital, +61 3 9482 2111
Sony Playstation2 Adam Calaitzis Adam Calaitzis Product: Launch

TRACKDOWN DIGITAL P/L Mike Duffy, Audio post/64 Track Digital Recording, +61 2 9550 6890

Tabaluga II	Y Gross	T Ryan/T Lista/D Candusso/S Ryan	Post/Mix/TV Series
FLIPPER II	Y Gross	T Ryan/ T Lista / D Candusso /S Ryan	Post/Mix/TV Series
Old Tom	Y Gross	T Lista/S RYAN	DIALOG RECORDING/TV Series
National Gallery	Narrowcasters	T Lista	Dialog Rec/Mix Audio Guides
Arm & A Leg	M Denton/_imelight Media	D Candusso/T Lista	Foley/SFX Layup

Velvet Sound Recording Studios Dave McCunn 24 track 2" Analogue & 64 track Pro Tools Digital.
+61 2 9267 2915 www.velvetsound.com.au

Ihaka	Creature Feature	M. Sutherland/W. Scott	TV Soundtrack
Single Girls	Creature Feature	M. Sutherland/W. Scott.	TV Theme song
Good News Week	Mac & McDermott	Paul Mac	Music for TV series
Talk Australia	Aural Fix Productions	Adrian Grigorieff	Shorts for Internet TV



YOUR EMTEC EASF TRADE SALE OUTLETS:

NSW:

Audio Visual Designs (02) 9281-2444
Silver & Ballard (02) 9439-5355
Independent Tape Services (02) 9436-0666
MT&A (02) 9310-2799

VICTORIA:

CATS (03) 9529-3177
Chapple Tape (03) 9580-6620
DEX Audio (03) 9372-2266
MT&A (03) 9819-6455

SOUTH AUSTRALIA:

Adelaide Tape Duplicators (08) 8212-7111
Pro Media (08) 8276-6793

WEST AUSTRALIA:

Ausmag (08) 9314-1953
Pro Copy (08) 9375-3902

QUEENSLAND:

Musiclab (07) 3252-2188
Tek (07) 3239-4000

CHARTS



ARTIST: Josh Abrahams
TITLE: Rollin'
PRODUCER: Josh Abrahams
ENGINEER: Josh Abrahams
STUDIO: Fishtank Recording Studio
MASTERING: William Bowden @ Festival Mastering



ARTIST: George
SONG TITLE: Bastard Son
PRODUCER: Brendan Morley & George
ENGINEER: Brendan Morely for BAM Music Productions
STUDIO: Whitehouse Studios, Bowral
ADDITIONAL ENGINEERING & Pro Tools: Justin Tresidder
MASTERING: Oscar Gaona @ Studios 301

World's easiest subscriptions!

Au \$52 1 year inc gst (Save \$8.50) Au \$86 2 years inc gst (Save \$35 on normal cover price!)

\$29

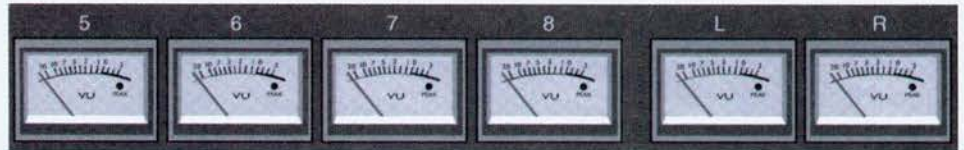
LIMITED TIME ONLY: 6 MONTHS
SUBSCRIPTION FOR JUST \$29 (INC GST!)
Australia only, A\$40 NZ 6 months

NEW ZED:
Au \$80 1 yr
Au \$120 2 yrs
ASIA:
Au \$80 1 yr
Au \$140 2 yrs

USA:
Au \$115 1 yr
Au \$199 2 yr
EURO:
Au \$125 1 yr
Au \$240 2 yr

METERS

(Effects, part 6, Extract 32)



Meters are there to give you an idea of relative levels. They come in 2 main types, the analogue VU (Volume Units) meter type, with the familiar bouncing needle, and the ramp of multi coloured LEDs which flash on and off as the levels change. This type is usually known as a PPM (Peak Program Meter).

Both have their good points. The VU meter is excellent at giving you an average level reading, much the same as our ears hear things. On the other hand, the needle won't move fast enough to catch sudden peaks.

LED PPM meters can respond to peaks instantly, and so have a fast attack time, but usually a slower release time. This is because the LED can turn on or off the instant the signal changes, often too fast for the eye to see. The slower release gives you time for your eyes to register the peak.

However, a word of warning: these meters can make your mix levels too low if you interpret them as average levels.

To compensate for the VU meter's deficiencies, many of them now have a built-in 'peak' LED, that flashes independently of the needle; the better LED meters are now switchable between VU meter and PPM characteristics. Either way, they are there to tell you what's going on.

I promised that there would be no compli-

cated audio theory, so without getting into technicalities, let's just say that on a piece of professional equipment, a constant level of more than +3 dB above 0 dB is probably too much, and less than -20 dB is not enough. This is a complicated area, so use this just as a general rule of thumb.

Unless you are absolutely sure what the meter is telling you, don't rely on it too much; use your ears to tell you if something doesn't sound right.

0dB

0 dB is not "nothing". 0 dB is a standard reference point/operating level for sound equipment. Consumer items like your home stereo have a nominal operating level of -10 dB, while pro audio equipment has a nominal level of +4 dB. Your mixing desk can handle peak levels of +10 dB or more quite happily; your cassette deck can't.

A lot of equipment available these days is also used for the home studio market, and has a -10 dB or +4 dB switch on the back. Use the +4 dB setting for all PA system use. Be especially careful with equalisers with these switches. If there are two switches, one for the input and one for the output, make sure they are both switched to +4 dB, otherwise you can run out of headroom and get a very distorted signal.

EXTRACTED FROM
DUNCAN FRY'S BEST
SELLING BOOK,
'LIVE SOUND MIXING'.

©Duncan Fry 1998.
ISBN 0 646 11235 X.
Retail price A\$39.

Available from book stores
and music shops around the
world, or from the
Connections Shop,
call 1-800-635-514.



ON COMPRESSORS, THE GAIN REDUCTION METER TELLS YOU HOW MUCH THE COMPRESSOR IS SQUEEZING

YOU CAN OFTEN SWITCH BETWEEN MONITORING THE INPUT OR THE OUTPUT LEVEL

THE LED METERING ON THE 160X IS PROBABLY THE INDUSTRY'S MOST WELL KNOWN



COMPRESSOR/LIMITER

BROWN'S

PRECISION WELDING PTY LTD

ALLOY TRI TRUSS • BOX TRUSS • CIRCULAR TRUSS
20 YEARS EXPERIENCE • AUSTRALIAN MADE
ENGINEER APPROVED

Quality assured competitive prices

56 Mologa Road, West Heidelberg VIC 3081

Ph (03) 94552899 Fax (03) 94575044

Mobile 0412 401 469

WE'RE STILL OPEN FOR BUSINESS
THANK YOU TO THE INDUSTRY FOR YOUR SUPPORT



DIRECTORY

WORK WANTED

Calling all studio owners Are you after an honest, hardworking, eager and recent SAE graduate with a passion for the industry? I have four years of home studio

experience, am Mac savvy, and a great problem solver. If you are interested and need a new studio assistant, call Paul on 0410 497 300 (Sydney) for more information.

WANTED

Yamaha 02r ver2 mixer must be in good order. Keen buyer +61 2 9957 6244

FOR SALE

AAAAfter a certain piece

of gear or have something to sell?? Call Neil @ Cannon Sound on (02) 9948 4440 or sales@cannonsound.com.au
Aftermarket quality replacement diaphragms. From \$60, to suit many popular 1", 1+1/2" and 2" drivers including: Altec, Acoustician, Coral, P.A.S., P.Audio, Zomax and around 20 different JBL models (ie. JBL 2416 [MR Series and EONs], 2440, 2441, 2445H, 2445J, 2446H, JBL LE85, 2470, 2421, 2421B, 2420, 2425H, 2426H, 2426J, 2412 [TR Series] etc) Next day delivery

Australia-wide. See Spec Table at www.cannonsound.com.au or phone (02) 9948 4440.

Amplifier. Crown Macro-Tech 2400 in excellent condition \$2400. Cannon Sound (02) 9948 4440 or sales@cannonsound.com.au

Aphex Exciter "C" Big Bottom \$330. Cannon Sound (02) 9948 4440 or sales@cannonsound.com.au

Assorted Weiland Bars. 48 in total, in varying condition \$600 the lot. Cannon Sound (02) 9948 4440 or sales@cannonsound.com.au

Countryman Isomax 0 Bug Mics x 28, Country-

man Isomax H Bug Mics x 6 and Countryman Isomax H Bug Mic Power Supplies x 9 - the whole lot for \$2200. Call now - Cannon Sound (02) 9948 4440 or sales@cannonsound.com.au.

Galaxy Audio Hotspot speakers \$100 each. Phone Cannon Sound (02) 9948 4440 or sales@cannonsound.com.au

Jands Event Lighting Consoles in Roadcases, Event 48 \$3850 & Event 60 Plus \$4950. Jands ESP 24 channel MkII in excellent condition out of install (no roadcase) \$2000. Call Cannon Sound (02) 9948 4440 or

EVI AUDIO

TECHNICAL SALES REPRESENTATIVE

EVI Audio (Aust) Pty Ltd is a fully owned subsidiary of Telex Communications Inc. - one of the world's leading Professional Audio Companies. An opportunity exists for a motivated professional to join our Sydney sales team.

Applicants will have a proven track record in Sales and Contracting within the Professional Audio market place. Good technical knowledge and computer literacy are essential. A competitive salary, good superannuation package and F/M company car is offered to the successful applicant.

Please forward your resume to: The Sales Manager, EVI Audio (Aust) Pty Ltd, PO Box 6427, Silverwater DC1811. or email: ian.johnstone@eviaudio.com.au



JANDS

ACCOUNT MANAGER PROFESSIONAL LIGHTING PRODUCTS

Jands Electronics Pty Ltd, Australia's leading manufacturer & distributor of professional audio and lighting equipment is seeking an experienced Account Manager specialising in Professional Lighting Equipment. Good communication skills & the ability to work in a team environment are the prime requisites for this position.

Responsibilities would include sales of Jands Professional Lighting Equipment, coordinating Jands existing Lighting Dealer Network & seeking out new business opportunities within the lighting industry.

An understanding of the Professional Lighting Industry and lighting control systems is preferred.

The successful applicant must be prepared to travel interstate periodically.

A fully maintained company vehicle will be provided for this position and salary will be negotiated dependant on experience.

Written applications can be forwarded to the following address or faxed to (02) 9582 0999.

The General Manager - Sales
Jands Electronics Pty Ltd
40 Kent Road
Mascot NSW 2020



Demonstration Products from Olympics

Sony Broadcast & Professional Products
1 x Sony Videocassette Player
RRP \$15,000 Sell Price: \$9,000
UVW-1200/1200P Betacam

Panasonic Production Mixer
1 x Digital Video Mixer
RRP \$10,000 Sell Price: \$6,000
WJ-MX50A

Both products come complete with manuals and original boxes. Manufacturers warranty.

TCP + 61 2 9648-3444

BUSINESS FOR SALE

Expressions of interest are invited for a major Melbourne workshop.

Major trade areas include:

- > Professional and Domestic Audio Repairs
- > Authorised Warranty Repair. Agent for most major brands
- > Speaker Design and Manufacture for regular clients
- > Current Professional Audio Speaker Range
- > Professional Audio Consultancy

The business has been established for over 17 years and offers fully functional and efficient service and manufacturing workshop. Includes CNC woodworking machine (operator can be included) and all other plant, equipment and stock at valuation plus goodwill.

Large range of PA Hire equipment available.

The business will suit a growing professional audio business looking to expand its manufacturing and technical divisions or an experienced technician looking for a solid business to grow.

Apply in first instance to:

RJ Hartnett
3rd floor, 11 Bank Place, Melbourne VIC 3000
Ph 03 9670-0206 Fax 03 9670-0985

DIRECTORY

sales@cannonsound.com.au Cannon Sound (02) 9948
JBL Control 5 Speakers 4440
 \$340 the pair. Control 5 **JBL/UREI 7110 Limiter/**
 Plus \$450 the pair. Compressor \$700 each.

Cannon Sound now (02) and Diaphragms. Quality
 9948 4440 or at a very affordable price.
 sales@cannonsound.com.au With most things in this
JBL D16R2405 world you only get what
 Diaphragms – brand new you pay for. With P.Audio
 @ \$100 each. Cannon you get much more... see
 Sound (02) 9948 4440 or on the Net at
 sales@cannonsound.com.au www.paudiossystem.com,
P.Audio Professional or call Cannon Sound (02)
 Loudspeaker Components. 9948 4440 or
 'Professional Sound for sales@cannonsound.com.au
 Professional People'. New for a catalogue and price
 10", 12", 15", 18" list.
 Speakers. 1 and 2" Hi **Musical Buy, Sell, Swap,**
 Frequency Drivers. Flares Jam @ Enthusi-Fest-

Melbourne. 17- February. Sound (02) 9948 4440 or
 89 Chapel Street. +61 3 sales@cannonsound.com.au
 955 9675. http:// **Reconditioned Strand**
 www.skyboom.com/ **JTM** dimmer modules \$95
 original/hbbyshow.html plus delivery +61 3 5668
PA/Lighting/Studio 7269
 Equipment. Sell or swap. **Rigging sale.** SRT body
 Wide variety of gear. Ring harnesses, wire rope
 For details +61 7 5529 ladders, SR 500MH load
 9969 arrestors, 2' chain motor
Patch Bays 48-way \$60 bags plus loads more.
 each. Phone Cannon From \$9000...(02) 9948

PRO-AUDIO
NEW & USED
 www.mixmasters.com.au
Exclusive Australian Distribution
AVALON, UA, JOEMEEK,
DISTRESSOR, RNC
 Always buying vintage equipment
08 8278-8506 MIXMASTERS / SHRAPE
 Email to be on list mixm@senet.com.au

B.S. Sound PA Hire
 3k PA with separate F/B. LX & crew. Driveway Vocal
 PA Systems & LX. Mics & components also available.
 Contact Mark Barry for free quote
(03) 9531 1403 or 041 999 3966
 www.bsosound.com.au
 mark@bsosound.com.au



NEOTEC
 AUDIO
 Tel: 02 9873 3994 Fax: 02 9873 3995
 www.neotec.com.au info@neotec.com.au
 •Aphex •Microtech Gefell •PMC •SADIE •Stedman

ROADCASES
 for
PROFESSIONALS

 STANDARD RANGE & CUSTOM MANUFACTURE
 LIMITED LIFETIME WARRANTY APPLIES TO ALL CASES
CALL US FOR A CATALOGUE & PRICE LIST
 PH: 07 3899 2971 FAX: 07 3899 0155
 Email: desine@powerup.com.au

Lighting Production Manager
 The Great Outdoor Lighting Company
 seeks an experienced lighting person with
 excellent communication and leadership
 abilities. Responsibilities include day to
 day management of dry hire and project
 based events. Salary is negotiable pend-
 ing level of experience.



Contact Colin
 Baldwin or Roger
 Hind during
business hours on
(02) 9966 9111

NEED CREW?
 Staging * Lighting * Sound
 LIVE CREWING can provide you with
 experienced crew for your Concert
 Productions, Press Conferences, Launches,
 Corporate Seminars etc.
 Office (02) 9792 7770 Fax (02) 9792 6660
 Contact Fred Ward Mobile 0418 212 431


FOR
CUSTOM CASES
SPEAKER ENCLOSURES
TUFFA
CASES & CABINETS PTY LTD
Ph (02) 9153 9373 Fax (02) 9153 9329
Unit 5, 15 Lorraine Street Peakhurst 2210

THE AUDIO DEPT.
 Wireless Microphone Specialists.
 20 years experience. Large inventory
 of **Sony UHF** systems, **Shure UHF**
 and **VHF** systems, and now
Garwood In-Ear monitors.
 Short or long term hire for all
 applications, sales and full service.
 Authorised Sony Wireless
 Service Centre.
Call for a quote.
(03) 9415 1868.

From production design and management to
 audiovisual system design, multi-image
 productions and industrial photography. Brite
 Lite Productions has been transforming clients'
 ideas into reality for more than 15 years...
 What can we do for you?
Brite Lite Productions
 Creativity is not an aim but a work practice
 03 9497 5623 / 041 337 449/lbevan@netstra.com.au

Graftons
Lighting & Sound
 Professional Equipment & Service
Hire, Sales, Installs
Production & Design
 6/890 Bourke St, Waterloo NSW 2017
Tel: (02) 9698 7777 Fax: (02) 9698 9999
 Lighting: graftons@idx.com.au
 Sound: info@productionsservices.com.au
 Sound: www.productionsservices.com.au

MAJOR NEW Version

 For A/V, Lighting &
 Audio Equipment
 rental & production,
 staging & business
 theatre.
 • **Australia's No.1** - Save your valuable
 time, look at the best software with local
 service first.
 • **Download a demo now!** www.rentp.com
RentalPoint Software
 (formerly HirePoint Software)
 Contact: Stephen Collard, SF Business
 Dev. Ph 0500 895 896 Mob 0407 541 290
RentalPoint2000 Hire Software

Drapes and Stages
 from **Staging Rentals**
 "Your complete staging service"
Big range Top quality On time
Friendly, professional advice
Ph: (02) 9519 6300
Fax: (02) 9519 6489
 1 Pyrmont Bridge Road
 Camperdown NSW 2050
 mail@stagingrentals.com.au
 www.stagingrentals.com.au


Sydney Digital Productions
& OB Services
 Offers competitive hire rates for the
 following equipment
 Sony Digital Betacam VTR's
 (DWW A500P)
 Time code Generator's
 Sync Pulse Generator's
 ADA's & VDA's (SDI)
 Delivery/pickup available
Ph: 0402 071 434 Fax: (02) 9619 2061
 www.sydneydigitalproductions.com.au

DIRECTORY

4440 or email
sales@cannonsound.com.au
for a complete list.

ROCKARD Coatings for
your PA and roadcases -
the true industry
standard. Available in
1,2,4 & 18 litres. Black as

well as custom colours
including various greys,
reds and blues etc. We
also can match colours
from any colour chart or
sample. Cannon Sound
(02) 9943 4440.
SKB 12RU Rack \$200.

Cannon Sound (02) 9948
4440 or
sales@cannonsound.com.au

Soundcraft mixers. 200
Deluxe with sweep EQ, 20
mono and 4 stereo
channels \$2800. 200SR
16 channel. Very clean -
no case straight out of
installation \$1000. Also
available Spirit Live 4 32
channel \$2200 and Spirit
Live 16 channel \$675.
Call! Cannon Sound (02)
9948 4440

Yamaha DDL3 Digital
Delay Line \$550. Cannon
Sound (02) 9948 4440 or
sales@cannonsound.com.au
Yamaha OIV digital
console, as new in carton
\$2,500. T-PAC PH: +61 2
9799 7219

YO HO HO...

All I want for Christmas is a new
workshop... with a new phone number.
(02) 9763 7777. We've moved. We got
evicted from our old place after the
owner discovered we were making porn
movies there... You know you have to pay
the bills somehow ...

www.electricsunshine.com.au



SOUND & LIGHTING

Hire, Design, Sales
Installations, Service

47 Auburn Street, Wollongong
Ph: (02) 4229 6010

EBTECH

PROFESSIONAL AUDIO PROBLEM SOLVERS



Swizz Army™

Multi-function Cable Tester displays the exact
wiring of any cable or adaptor. Allows testing
cables inside walls! Tests XLR, 1/4", RCA, 1.8",
TT, MIDI. With Test Tone, Par:orm detect. \$299 RRP

Hum Eliminator™

Silence AC Hum forever! No sound degradation.
HE2 (2 Ch.) \$199 RRP HEB (8 Ch.) \$599 RRP

Line Level Shifter™

Solves -10dBV to +4dBu problems!
LL2 (2 Ch.) \$249 RRP LL8 (8 Ch.) \$699 RRP

NEED MORE INFORMATION? CONTACT...
AUSTRALIAN AUDIO SUPPLIES (02) 4388 4666

The gobo Factory

GLASS  STAINLESS STEEL

*Custom-made and Catalogue Range
Customised Message & Theme Sets*

Quality, Service and Competitive prices

Ph: 61 3 5439 3770 Fax: 61 3 5439 3601

Email: gobos@netcon.net.au

Website: www.gobo.com.au

Professional Audio & Lighting Hire, Sales & Installation

2 Bridge street,
Rydalmere NSW 2116

Ph + 61 2 9638-0302

Fax +61 2 9638-0331

hire@lotsofwatts.com.au

www.lotsofwatts.com.au

**Lots
of
Watts**
Pty Ltd

MORE GREAT PEOPLE WANTED BY SHOW TECHNOLOGY

Show Technology is an importer and wholesaler of professional
lighting equipment for entertainment and architectural applica-
tions. Due to explosive growth our company needs more sales/
marketing people who are friendly, willing to learn and work
with the best team and product in the game. We currently have
two new positions in our sales department that we are willing to
develop to suit the right applicant for the new year.

Applicants should preferably have some industry experience
(ex roadies, ex-DJs, sound reps, musicians, ex hire store owners
are all welcome) and understand the professional scene - or be
very eager to learn quickly.

Applicants should have excellent PC skills, be organised and
efficient and care about doing the job right. We have an estab-
lished Australia wide client base but we are also looking to
develop new markets. The salary will vary to suit the applicant
and the position but you will be well rewarded.

Join a winning team as we reach new heights in 2001.

Apply via e-mail preferably direct to the
Managing Director: Emmanuel Ziino
eziino@showtech.com.au

or write to PO BOX 480 Rydalmere,
2116.

Show Technology Australia Pty Ltd
www.showtech.com.au



GOBO

Greyscale Glass, Colour & Steel

Lighting by Design

First with the glass technology to OZ
now standard in Martin 918 and Mac500.
Original designs & innovative ideas.

Tel: 0755 377 002 Sales@LBD.com.au
Fax: 0755 292 226 www.LBD.com.au

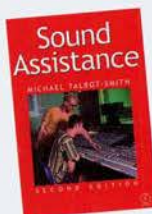
I've got 850+ books in stock NOW! -Julius Grafton

THESE ARE IN STOCK NOW!

• PRICES NOW INCLUDE AUSTRALIAN GST

A PRACTICAL GUIDE TO STAGE LIGHTING Stephen Shelley	\$80
AUDIO WORKSTATION HANDBOOK Francis Rumsey	\$82
A-Z OF LIGHTING TERMS Brian Fit	\$60
BASICS OF VIDEO LIGHTING Des Lyver/Graham Swainson	\$38
BASIC STAGE LIGHTING Mark Carpenter	\$18
CONCERT LIGHTING James Moody	\$77
CONCERT TOUR PRODUCTION MGMT John Vasey	\$42
CONTROL SYSTEMS FOR LIVE ENTERTAINMENT John Huntington	\$120
CREATING SPECIAL EFFECTS FOR TV AND VIDEO Bernard Wilkie	\$40
EFFECTIVE AUDIO VISUAL Robert Simpson	\$88
EFFECTS FOR THE THEATRE Edited by Graham Walne	\$53
ESTA ETHERNET GUIDE	\$38
GAFFERS HANDBOOK By Harry C. Box	\$99
HUMS & BUZZES EXPLAINED Laurie Nethercote	\$9
LIGHTING AND SOUND Neil Fraser	\$31
LIGHTING STENCIL SET FROM KILOWATT CO	\$99
LIGHTING TECHNOLOGY H'BOOK Brian Fit/Joe Thornley	\$124
LIGHTING THE STAGE Francis Reid	\$44
LIVE SOUND MIXING Duncan Fry	\$41
MAKING MUSIC WITH YOUR COMPUTER David (Rudy) Trubitt	\$20
MAKING THE ULTIMATE DEMO Michael Molenda	\$27
MIDI SYSTEMS & CONTROL Francis Rumsey	\$60
MIX TEST CD DELUXE EDITION	\$77
MOBILE DJ HANDBOOK Stacy Zeman	\$49
MUSIC & TECHNOLOGY H.P. Newquist	\$31
MUSIC PRODUCERS MIX Magazine	\$20
PRACTICAL STUDIO TECHNIQUES (with CD) Tom Misner	\$44
PROJECTION FOR THE PERFORMING ARTS Graham Walne	\$88
RECOMMENDED PRACTICE FOR DMX 512 Adam Bennette	\$20
SET LIGHTING TECHNICIAN'S HANDBOOK Harry C. Box	\$82
SOUND & MUSIC FOR THEATRE Kaye & LeBrecht	\$48
SOUND FOR PICTURE MIX Magazine	\$20
STAGE DESIGN & PROPERTIES Michael Holt	\$31
STAGE LIGHTING CONTROLS BY Ulf Sandstrom	\$97
STAGE LIGHTING HANDBOOK Francis Reid	\$42
STAGE MANAGEMENT & THEATRE ADMINISTRATION Pauline Menear/Terry Hawkins	\$31
STAGES FOR TOMORROW Francis Reid	\$41
STUDIO BASICS Richard Mansfield	\$37
TECH TERMS George Petersen/Steve Oppenheimer	\$20
THE BEST OF DUNCAN FRY	\$13
YAMAHA SOUND REINFORCEMENT HANDBOOK Gary Davis/Ralph Jones	\$75

For more info on the above titles,
visit www.conpub.com.au
or call Sarah on 1-800-635-514
or +61 2 9876-3530
or fax +61 2 9876-5715 and we
will send OR FAX you the webpage
with full description!

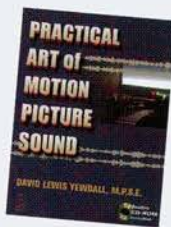


SOUND ASSISTANCE,
2nd edition \$56

By Michael Talbot Smith. Offers an easy-to-understand account of sound operations in radio and television studios. New edition covers microphone sensitivities, loudspeaker listening tests, stereo transmission in radio, stereo PPM interpretations, MiniDisc, and more. 250 pgs, 1999.

**PRACTICAL ART OF
MOTION PICTURE
SOUND** (with CD),
2nd edition \$84

By David Lewis Yewdall, MPSE. This book features such topics as: Pre-production planning, production tips, temp dubs and test screenings, custom recording sound effects, dialog editing, non-linear editing, music in film and television. The audio CD contains sound-effects and demonstration material. 265 pgs, 1999.



**CALL Freecall 1800-635-514 to place your
order or visit www.conpub.com.au**



PROJECT STUDIOS, a more
professional approach \$84

By Philip Newell. With a boom in so called 'bedroom studio' operations, lack of experience can lead to bad recording practices and an inability in getting the best performances from musicians. This book provide tips and advice on getting first class, professional results from project studio equipment. 274 pgs, 2000.

**ON-LOCATION RECORD-
ING TECHNIQUES**
\$64

By Bruce Bartlett, with Jenny Bartlett. Focuses exclusively on the special techniques used for recording outside the confines of a studio. Offers a clear explanation of stereo miking theory, along with specific techniques, procedures and hardware. Also covers mixing and editing a live gig tape, building a recording truck, surround-sound miking, binaural and transaural stereo. 278 pgs, 1999.



SPECIAL!

**MODULAR
DIGITAL
MULTITRACKS**

THE BOOK ABOUT ADAT
AND DA-88. NOW OBSO-
LETE, BUT USEFUL FOR
ANYONE NEW TO THESE
DEVICES. WAS \$27, NOW
ONLY

\$15!

WHILE STOCK LASTS ONLY. NO
RAINCHECKS. NO FUTHER
DISCOUNT.



**THE MIDI
MANUAL** 2nd
Edition \$64

By David Miles Huber. The book provides a close-up look at the industry's top products and teaches you how to integrate them with your computer. Illustrations and step-by-step lessons teach you how to set up an efficient MIDI system as well as how to use your PC to expand your musical recording and performance techniques. 255 pgs, 1999.

All prices in Australian dollars. Add freight for each order. Prices may change at any time of course! Current as of August 22, 2000. An activity of Connections Publishing P/L (ACN 058443182), PO Box 439 Epping NSW 2121

Connections Advertiser & Brand EASYFINDER!

Please.... tell
them you saw it
in Connections!

Company Name	Phone	Website address	Brand	Page Number
Aerobic Microphones	+61 2 9313-4995	www.aeromic.com.au	AeroMix	45
Amber Technology	+61 2 9975 1211	www.ambertech.com.au	TC	19
Audio Products Australia	1-800-642-922	www.toa.co.jp	Toa	41
Audio Products Australia	1-800-642-922	www.akg-acoustics.com	AKG	37
AON Risk Services	+61 2 9253 7000	www.aonrisk.com.au	Entertainment Insurances	57
Australian Audio Supplies	+61 2 4388 4666	www.ausaudio.com.au	Mackie	23
Birkart Concert Cargo	+61 3 9696 3607	www.birkart.com	Transport & Logistics	6
Browns Precision Welding	+61 3 9455 2899	not available	Truss	84
Bytecraft	+61 3 9587 2555	www.bytecraft.com.au	Strand	77
CLS	+61 3 9682 6111	www.clsa.com.au	Truss, Systems	59
CMI - Central Musical Instruments	+61 3 9315 2244	www.cmi.com.au	Peak amps	47
Connections Shop	1800 635 514	www.conpub.com.au	Merchandise	88,89
Corporate Audio Services	+61 3 9474 1067	www.corporateaudio.com.au	Audient	18
EAW	+61 3 9415 1585	www.eaw.com	EAW	11
Emtec Magnetics	1800 805 691	www.emtec-magnetics.com	EMTEC Tracking Guide	Starts 78
ENTECH 2002	1 800 635-514	www.conpub.com.au	ENTECH 2002	49
EVI Audio	+61 2 9648-3455	www.eviaudio.com.au	Wireless	3
GMT Agencies	+61 3 9819 1777	www.gmtlighting.com.au	LDR lanterns, lamps	57
Group Technologies	+61 3 9872 5000	www.gt-aust.com	Nexo	15
GUET	+61 2 9420 4888	www.guet.com.au	Hafler	47
High End Systems	+65 742 8266	www.highend.com	Studio Beam	13
Hoisting Equipment Specialists	+61 2 9584-1177	email hoistequip@bigpond.com	Rigging	53
Interlink System Solutions	+61 2 9638 0777	www.dbsound.com.au	Interlink	57
Jands	+61 2 9582 0909	www.jands.com.au	Shure	2
Jands	+61 2 9582 0909	www.jands.com.au	ETC	29
Jands	+61 2 9582 0909	www.jands.com.au	Crown	23
Jands	+61 2 9582 0909	www.jands.com.au	dbx	90
LSC Lighting Systems	+61 39561-5255	www.lscighting.com.au	LSC	55
Lots of Watts	+61 2 9638 0302	www.lotsofwatts.com.au	Rental	14
Navigator Systems	+44 7000 628 797	www.navigator.co.uk	Hiretrack	72
NSCA - National Systems Corp Australia	+61 3 9434 1888	www.chaiyo.com.tw	Audio	44
Penn Fabrication	+61 3 9335 6455	www.penn-fabrication.com	Colour ABS	75
Production Audio Services	+61 3 9415 1585	www.productionaudio.com.au	Innovason	21
SGM	1 800 648-111	www.sgm.it	Moving Lights	4
SAE	+61 2 9211 3711	www.sae.edu	Education	27
Save Time Visuals	+61 3 9888 2111	www.savetimevisuals.com.au	AV, M' media, Presentation Specialists	33
Show Technology	+61 2 9898 1111	www.showtech.com.au	Clay Paky	Back Cover
Show Technology	+61 2 9898 1111	www.showtech.com.au	MARTIN	17
Sony	+61 2 9887 6666	www.sony.com.au	Freedom wireless	39
Specialised Lamp Supplies	1300 302 852	not available at this time	Specialised Lamps	65
Stage & Screen	+61 2 9383-4544	www.stageandscreen.com.au	Travel & Freight	10
Syntec International	+612 9417 4700	www.syntec.com.au	Evolution IEM	24
TAG	+61 2 9810 5300	www.tag.com.au	Martin Audio	43
Tascam Southern Regional Distribution	+613 9682 0411	www.tascamsrd.com.au (pending)	Tascam, Vergence & more	40
The Electric Canvas	+61 2 9437-9588	www.theelectriccanvas.com.au	Huge projections	65
TRC - The Resource Corporation	+61 3 9877 8233	www.trc.com.au	Stage	57
TRC - The Resource Corporation	+61 3 9877 8233	www.trc.com.au	Eurocable	59
TRC - The Resource Corporation	+61 3 9877 8233	www.trc.com.au	LKS Connectors	59
Trader	1800 635 514	www.conpub.com.au	Trader	Starts 85
Yamaha Music Australia	+61 3 9693 5111	www.yamaha.co.jp/product/	Yamaha	31
Yamaha Music Australia	+61 3 9693 5111	www.yamaha.co.jp/product/	Yamaha	56

World's easiest subscriptions!

Au \$52 1 year inc gst (Save \$8.50) Au \$86 2 years inc gst (Save \$35 on normal cover price!)

\$29 LIMITED TIME ONLY: 6 MONTHS
SUBSCRIPTION FOR JUST \$29 (INC GST!)

Australia only, A\$40 NZ 6 months

NEW ZED:
Au \$80 1 yr
Au \$120 2 yrs
ASIA:
Au \$80 1 yr
Au \$140 2 yrs
USA:
Au \$115 1 yr
Au \$199 2 yr
EURO:
Au \$125 1 yr
Au \$240 2 yr

4 Inputs, 8 Outputs, 1 Rack Space, No Knobs!



dbx 481

DriveRack™

The one box DSP solution! It's what every contractor now looks for in a fixed installation audio application. The new **481 DriveRack™** Complete Equalization and Loudspeaker Management System from dbx Professional Products is the only all-inclusive toolbox required between the mixing console and the power amps. Standard features include: four 31-band graphic or 9-band parametric equalizers, 27 different crossovers, dual real time audio analyzers, dynamics processing, and the ability to all be controlled via the included GUI PC interface, the **481** is the only logical choice for optimizing sound quality in even the most demanding venues.

481 DriveRack™ Features

- 4 Inputs, 8 Outputs, with Routing and Summing
- (4) 31-band Graphic or 9-band Parametric EQs
- 26 Variable Crossovers
- Dynamics Processing with Compressor/Limiters on Each Output
- Dual Real Time Audio Analyzers
- Notch Filters
- Multi-level Security System
- Time Alignment and Transducer Alignment Digital Delays
- Euroblock Input and Output Connectors
- RS 485 Network Control Bus
- PC GUI Interface

dbx®

PROFESSIONAL PRODUCTS

A Harman International Company

www.dbxpro.com

Distributed in Australia by

JANDS

40 Kent Road Mascot NSW 2020

Phone: (02) 9582 0909 Fax: (02) 9582 0999

ABN 45 001 187 837

Stage Zoom 1200

Why?

Because of its Power, wide-ranging Graphics capabilities, Colour System with countless combinations and superior Optic System. And it is the most exclusive because...

Because it has interchangeable heads, allowing it to be used as a Spot or Wash.

Because it has the most uniform light beam.

Because it has variable progressive frosting, with extremely effective wide beam.

Because it has 4 indexed prisms, which can be combined with the indexed gobo system and continuous colour mixing.

Because it has hot lamp re-strike.

... Because the brightest heads can change the world.



Distributor: SHOW LIGHTING AUSTRALIA Pty Ltd
Adm. Office: 13-15 Bridge Street - Rydalmere NSW 2116 PO Box 480 Rydalmere NSW 1701
Tel. +61 (0) 29898 1111 - Fax +61 (0) 29898 1222 - E-mail: claypaky@showtech.com.au

Tel. +39-035-654311
Fax +39-035-665976
www.claypaky.it



PROFESSIONAL SHOW LIGHTING

