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november

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COMING NEXT MONTH:

- RECORDING EQUIPMENT and SOFTWARE
GIANT Audio Buyer's Guide.
- HUGE 1999 wall planner, 8 times larger than
this page - free in our December/January issue!
- December issue mailed 3rd December, on sale
December 9th.

COMING UP SOON:

FEBRUARY: Hire, AV & Production Directory.
Buyer's Guides: Studio Monitors, Truss & Rigging.

MARCH: Buyer's Guides: Wireless microphones;
Moving Lights.

Call +61 2 9876-3530 for listings.

Extra value this month!

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Connections

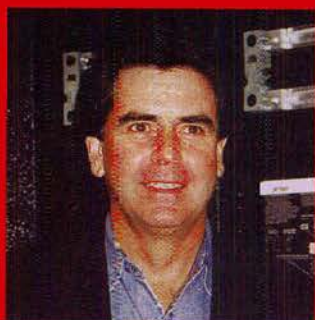
THE PRESENTATION & ENTERTAINMENT TECHNOLOGY MAGAZINE - NOVEMBER 1998 #60

Page home for Bee Gees

Bee Gees engineer Howard Page will use a Jands PA for the group's concert at the new Sydney Olympic Stadium next March. The concert is a one-off, so importing a ShowCo Prism system, Page's natural first choice as he is a senior VP at ShowCo, isn't viable.

Page told *Connections* that he had just completed a show at Wembley Stadium in London, and that, by careful system design and judicious use of drapes, he had overcome some of that venue's classic acoustic problems. Patrons of other recent concerts have demanded refunds due to lack of intelligibility, but the Bee Gees had no such problem, states Page.

Sydney's new Olympic Stadium is scheduled for a February opening, a tight time frame which worries Page. "I asked Chris Dodds if it was going to happen, and he assured me it will open on time," he says. Dodds is CEO of The PA People, who are installing the house sound system into the Stadium. He is familiar with the



construction, being involved on site. Dodds and Page met in San Francisco to review plans of the Stadium, so that Page can specify a system from Jands.

"Jands are the only company that can do an arena show that size," Page told me, commenting that no one else had enough EAW or Flashlight on hand. He wasn't signing off on a Jands system straight away, however. Promoter Paul Dainty may have other ideas.

Some acoustic treatment across the new Stadium's upper glass windows will be required. "It is important to break the slap-

please turn to page 10

GST partially welcomed

Still confusion, so we take a wider look at the new order

AUSTRALIA: Recording studios hate the idea of charging 10% extra, so do hire and production firms, theatres, clubs and promoters. *Connections* will also cost you 10% extra.

But anyone who buys equipment can see considerable merit in the new goods and services tax (GST) to be introduced in Australia from June 2000.

This is because there are five effective rates of sales tax currently applied on equipment. Some items are exempt of tax, like cables used within a building project. The 12% wholesale sales tax (WST) rate is applied against some light fittings used in buildings. The vast majority of equipment featured in *Connections* is sold with a 22% sales tax rate embedded in the price.

Much recording equipment carries a still more onerous 32% sales tax rate. "The ruling originally applied to what was deemed a luxury item in the 50's but it has been changed by the ATO so that it applies to recent

technology," says Tascam distributor Travers Falkner.

To further confuse the sales tax issue, some studios involved in film work, schools, churches and government bodies are all currently exempt of sales tax.

What is and what is not taxed and at which rate has always been the bugbear of the system.

For example, according to Herkes CEO Garth Tanswell, building cable and power points are currently exempt, but to make an extension lead you need cable (taxed at 12% if under 15 amps, 22% if over), a plug (exempt) and socket (22%).

Under GST, most equipment will cost about 10% less, although a rise in inflation and some input costs will force a slight rise in the cost of goods - not reflected in the chart below.

Wholesale sales tax is also subject to evasion, as will be GST. But with every seller and service provider obliged to charge and collect GST, evasion will be easier to detect. *JG

HOW A 10% GST WILL AFFECT YOUR NEW EQUIPMENT PURCHASE IN JUNE 2000

Cost to build	GST on parts	Factory sell	+ GST 10%	Factory sell inc GST	Distributor sell	+ GST 10%	Distributor sell inc GST	Retail sell	+GST 10%	Retail sell inc GST
45.00	4.50	90.00	9.00	99.00	135.00	13.50	148.50	202.50	20.25	222.75

Compared with today's 22% wholesale sales tax (WST)

Cost to build	Factory sell	Distributor sell	+ 22% sales tax	Distributor sell inc tax	Retail sell
45.00	90.00	135.00	43.20	178.20	247.05

GST OUTCOME:

NEW RETAIL with 10% GST: \$222
CURRENT RETAIL with 22% WST: \$247
CURRENT RETAIL with 32% WST: \$267

Notes: Each item is passed on with the same markup, less GST. Not widely understood, the GST is paid at each transaction in the chain, but the earlier amount of GST is deducted. So the retailer pays the trade distributor \$13.50 in GST on the cost of the item, then marks up the item and charges \$20.25 GST. However the retailer pays the government \$20.25 - \$3.50 = \$16.75, or put another way, the GST on the selling price is paid in two parts, \$13.50 when buying the goods for resale, then \$6.75 when sold. Together they equal the 10% GST applied to the final selling price. *Of course, it is possible that the savings will NOT be passed on!

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1. We shall report and interpret the news with scrupulous honesty by striving to disclose all essential facts and by not suppressing relevant, available facts or by distorting by wrong or improper emphasis;
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3. In all circumstances we shall respect all confidences received in the course of their calling;
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industry NEWS



Bruce Jackson (God), Philip Hart (Harman Pro), Mark Gander (JBL), Paul Mulholland, Sue Mulholland and Dean Standing (Rane) at the View Lounge, level 38, San Francisco Marriot Hotel on Fourth Street. Try it!

Jands duo score mutual century

San Francisco: While having a quiet drink or six and admiring the sunset in one of his all time favourite bars, your editor stumbled over a celebration in progress Jands co-owner **Paul Mulholland** had just turned 50, and a surprise party had been arranged in his honour during the AES Convention. Local legend **Bruce Jackson** (Jands founder, Elvis soundman, creator of Apogee Electronics, digital audio inventor and confidante of Barbara Striesand) was there, hotly denying a press report that he was, in fact, God.

Others raised the glass to an embarrassed Mulholland who confirmed his age and then hastily changed the subject.

Meanwhile as this issue wings its way around the region, the

other Jands owner **Eric Robinson** is celebrating his 50th at an exclusive function in Bali. (There are two Jands companies: Jands Electronics and Jands Production Services.) Organised by wife Patty Mostyn, the event was notable, a who's who of the entertainment industry.

Connections waited ... and waited ... for the invitation. The sunblock was packed, new swimming togs chosen, and several important Indonesian phrases committed to memory.

Alas, it seems my invitation was lost in the mail. Which is sad, as I was actually looking forward to hearing Robinson say, once again, "Weasel - what are YOU doing here?"

Happy birthday to both!

-Julius Grafton



AES in San Francisco attracted considerably less attendance from our region this year. But we caught up with DigiDesign regional guru **David Corazza** (left), along with an unusually happy looking **Lewis Mallia** (Sound Devices director). **Tricia Maddock** is an ex-pat working for Fairlight in LA - who are on a roll, and did well at AES.



Inaugural Screen Sound Awards a knockout!

Fraternal night a sellout at Sebel, as trade embraces Awards, run by Australian Screen Sound Guild

The inaugural Screen Sound Awards were held in Sydney last month at a sold out dinner in the Sebel. From first drinks until *way after* the band finished after midnight, audio types and their partners revelled in an atmosphere of well lubricated high humour.

"Post sound is the last chance you have to get the picture right" said film producer David Hannay, before announcing two lifetime achievement awards.

Ron Purvis and **Peter Fenton** then took the stage to a standing ovation, and the night took a turn for the funnier, mixed with tears from some in the audience. "These guys put up with a lot of those of us who were major substance abusers" joked Hannay. The room was full of cigarette smoke by now, and to punctuate the passive rebellion of the screen sound industry, a reefer was lit up somewhere at the back of the venue.

"I've taken 44 years working to get up here" said Ron, "so I guess a few more minutes won't hurt! We were born at the perfect time for all this, and to see the rebirth now of the Australian film industry".

Ron Purvis went on to captivate the audience with some memories and memorable lines.

"We've had to mix without going backwards or even stopping!" On technology: "I got into trouble once valves got nine pins....."

"Many names are etched in the pathway towards tonight" he announced, and then quipped that lifetime achievement awards are usually given posthumously. Peter Fenton, usually the talker, stood aside struck for words at Ron's eloquence.

Earlier, actors Jay Laga'aia and Steve Bisley had set the scene with memories of particu-

lar sound recordists. "Can you please move your sound carts, you're blocking the car park" joked Jay.

**AUSTRALIAN
SCREEN SOUND
Guild Inc.**

Steve Bisley recalled a scene where a recordist (present at the awards) had shut himself in the boot of a Torana SLR 5000 with an ookie strap over the catch and through his mouth holding the lid down. He had two microphones sticking out the back to record the exhaust tones as the car careened about.

Bisley recollected a famous moment when



Ron Purvis and Peter Fenton, Lifetime achievers

a script writer (who possibly *hates* actors) presented him with a seven page monologue, to be read straight through in one take. The recordist on location sidled up just prior and said: "There's a tram track over there, and if we get a tram through this, we're fucked!"

Awards for Television sound were handed out, with each person responsible for a winning project being handed an award. Later, five Feature Film awards were similarly presented. All winners are listed here. > more

WINNERS

TELEVISION CATEGORY

The 1998 Screen Sound Awards Winners for Best Sound in a Television Commercial are: **Ross Linton** - Recordist; **Karl Sodersten** - Editor; **Jon Marsh** - Mixer, for Telecom New Zealand "Lost" - HAT Productions.

The 1998 Screen Sound Awards Winners for Best Sound in a Television Documentary are: **Predrag Malesev**, **Rob Beck** and **Tony Clunes** - Recordists; **Philip Purcell** - Editor and Mixer; for RPA Episode 98/2 - TCN Nine.

The 1993 Screen Sound Awards Winners for Best Sound in a Television Lifestyle Program are: **Serge Lacroix** - Editor and Mixer; **Shaun Cefai** - Recordist; for Who Dares Wins "Jet Fighter" - Mason Brant.

The 1998 Screen Sound Awards Winners for Best Sound in a Television Drama are: **Grant Shepherd** - Recordist; **Todd Kirkness** and **Steven Jackson-Vaughan** - Boom Operators; **Peter Hall** and **Jon Hemming** - Dialogue Editors; **Ian Neilson** and **Justine Angus** - FX Editors; **Ian Donato** - Foley Recordist; **Sonia Bible** - Foley Artist; **Sasha Madon** and **Julie Sommerfelot** - Assistant Editors; **Peter Purcell** - Mixer; **David Hemming** and **Peter Best** - Music Engineers; for Wildside Episodes 35 & 36 - Gannon Jenkins TV.

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Screen Sound Awards

(from previous page)

The Australian Screen Sound Guild ran the awards, their first. Members undertook a laborious voting procedure. "The jurors voted impartially" stated president Ross Linton. The audience were certainly very happy with the probity of proceedings, and no sore losers were detected.

Extensive sponsorships assisted staging the awards, which still ran a slight loss as these events do. Some 20 plus sponsors tipped in money, services and

equipment.

The night proved that screen sound comprises a fraternity of fantastic people, working in a section of the audio industry which is enjoying boom days.

It was the first time the various screen sound crafts have truly come together. The roaring of laughter continued past dawn as the Sebel bar soldiered into the next morning. Not too many projects were mixed that day.

-Julius Grafton

Lifetime achievement awards

Ron Purvis remembers installing the first stereo sound cinema in Australia for Cinemascope. He founded Natec Sound Studios in 1961, then Visound in 1969. Some time was spent in Hollywood, where he learned techniques from the Glen Glenn Sound Company. More recently he operated Producers Sound Service, based at Film Australia.

Peter Fenton crossed paths with Ron Purvis at Supreme Sound in Paddington in 1958. They then worked together on and off, over 35 years. Peter was chief mixer on Paradise Road, Lightning Jack and countless movies. He has worked with many contemporaries and jokes that he isn't sure if he taught them much more than how to drink, swear - and eat Chinese food.

WINNERS (CONTINUED)

The 1998 Screen Sound Awards Winners for Best Sound in a Telemovie are: **Ross Linton** - Recordist; **Robert Cutcher** - Boom Operator; **Dino Giacomini** and **Mark Franken** - Supervisors/ADR; **Gavin Myers** and **Stephen Witherow** - Dialogue Editors; **Fabian Sanjurjo** - FX Editor; **Tracey Grimshaw** - Foley Artist; **Rory Martin** - Assistant Editor; **Robert Sullivan** - Mixer; **Karl Akers**, **Kim Lord** and **Chris White** - Music Engineers; for Kings in Grass Castles - Baron Entertainment/Crannog.

FEATURE FILM CATEGORY

The 1998 Screen Sound Awards Winners for Best Achievement in Location Recording for a Feature Film are: **Peter Grace** - Recordist; **Michael Taylor** - Boom Operator; **Serge Stanley** - Sound Assistant; for The Boys.

The 1998 Screen Sound Awards Winners for Best Achievement in Dialogue Editing for a Feature Film are: **Libby Villa**, **Wayne Pashley** and **Rick Lisle** for Oscar & Lucinda.

The 1998 Screen Sound Awards Winners for Best Achievement in Sound Design & FX Editing for a Feature Film are: **John Patterson** and **Craig Butters** for Radiance.

The 1998 Screen Sound Awards Winners for Best Achievement in Foley for a Feature Film are: **Les Fiddess** - Foley Artist; **Rob Sullivan** and **Julie Pearce** - Foley Engineers; for Paws.

The 1998 Screen Sound Awards Winners for Best Achievement in Mixing for a Feature Film are **Gethin Creagh** and **Martin Oswin**; for Oscar & Lucinda.

Baby!

Michael Horn (Director, Sound Devices Sydney) and wife announce baby James.

Wedding!

Popular industry types, **Tiny Good** and **Robyn Hart** (who together run ShowTech Rigging in Melbourne) have tied the knot. Congratulations!

People

Cameron Howie is now sales manager at Sound Devices in Sydney. **David Richards** joins the team of pro audio sales consultants, with many years of studio knowledge. The shop has had a makeover, with more products on display. Call +61 2 9283-2077.

Matthew Robinson has joined the sales force at Anything Audio. Call +61 2 9818-8000.

Moves

Caribiner are now located in their new place at 33 Mountain

Street Ultimo NSW 2007- the telephone numbers last issue were subsequently fouled up by Telstra, so another number is now offered: +61 2 8218-2000, or fax +61 2 8218-1000.

PAGE (from 7)

of a snare" states Page, "you can't remove the echo but you must break it down".

Commenting on the Gibb brothers vocal projection, Page says he couldn't mix the show without a Sabine ADX 4000 feedback eliminator. "There are many tricks I use" he says, in response to the question of getting gain on vocal styles like the Bee Gees.

Howard Page is an expatriate Australian who works for ShowCo, based in Dallas. He is now considered one of the top ten live sound engineers in the world today. -JG

Editorial

I went to the AES (Audio Engineering Society) convention last month in San Francisco, and once again enjoyed four days of PR hype and industry speculation. But, some trends emerged:

- Pro audio equipment sales static. Contracting audio is the only sector growing, the recording studio as it was known is near death. Arriving back in Australia this became more apparent as Nichole Morris from Connections laboured extremely hard to get studios to respond to our free Studio Directory this issue.

The message we are getting is that no recording studio in this part of the world is viable UNLESS they mix surround. This was reinforced by the bouyant Australian Screen Sound Guild awards I attended at presstime. TV and film is an export industry which also enjoys a tax break. If you mix sound for vision or presentation, your job is OK. But otherwise.....

- Moving through the industry, audio visual is doing OK despite a slowdown in corporate presentation work over winter. The message is that more customers are cutting out the 'event manager' and going straight to the AV firm— or the venue.

- Lighting show budgets stopped growing almost 18 months ago worldwide, which has torpedoed outfits like Vari*Lite International. The firm's share price has fallen dramatically, signalling tough times for the Dallas outfit. Show Management everywhere now know what it costs to buy and hire moving lights. Lighting designers now try to make less look like more.....

- Connections' Cat Forcer will attend the LDI trade show in Phoenix this month, where the lighting industry will moan at the low takeup of architectural lighting as a concept. It is starting to happen, but not as fast as the manufacturers and sellers would like. Smart technology exporters like Bytecraft and Jands are doing well, Europe can't get enough of our dimmers. -JG

Moves

Nova Hire are in bigger premises at: 38 Isabella st, Moorabbin 3189. Call +61 3 9555-4766, fax +61 3 9553-2381.

The MIDI People (a division of AusMidi) are now at PO Box 270, Janali NSW 2226, call +61 2 9542-4105, fax +61 2 9542-4125.

CD Makers is now at CD-ROM Services, Shop 8.06, Northpoint, 100 Miller st, North Sydney NSW 2060. Ph +61 2 9460-0677, fax +61 2 9922-4801.

EVI AUDIO VICTORIA has a new state office, at Unit 3, 313 Burwood Rd, Hawthorn VIC 3122. Call +61 3 9810-4511, fax +61 3 9810-4849. Shane Bailly is in charge.

IJS Concert Sound & Lighting recently moved to larger premises, at 66 Abbotsford Rd Bowen Hills QLD 4006. call +61 7 3852-2646 or fax +61 7 3854-1608.

Changes

GUET have reorganised their national workforce ahead of expansion moves. The firm almost controls the cinema installation market, but is increasingly active in other installation work. Eight positions were made redundant in the reshuffle, including that of Techscape general manager Noel Bourne, and GUET Sydney sales person Terry Goodhew. GUET CEO Russell Scott told Connections that the organisation would pursue new directions, starting soon. They remain committed to distribution of lighting products, despite having merged the Techscape arm back into the parent company, which originally was the importer/distributor for High End Systems when it was known as GUVT.

Free education (love that word!)

Aside from ENTECH which doesn't run again until March 2000, there are two other great (almost) free education opportunities available in Australia. **JANDS** are to continue their free Industry Nights next year, the last edition having been run as this issue hits the streets. Last month the topic was Live Sound, hosted by Wyn Milsom and Greg Rosman. The next night is to be held February 2nd,

thence the first Tuesday each month. Held at The Globe in Newtown.

Then there is the **AES**, (Audio Engineering Society) who host Section Meetings throughout the year. The Brisbane and Adelaide Sections both hold meetings semi-regularly, Sydney and Melbourne less often. Paying membership of about US \$70 gets you the AES Journal each month - valuable for any serious practitioner or student of audio. Contact numbers for the Australian sections (there is none in NZ) are: (02) 9517-3200, (08) 8348-4267, (07) 3857-6564 and (03) 9887-4538.

Product, Price Moves, & Sales

Audio Assemblers have announced that the amplifiers they built under the AmPower brand are now available branded as 'Ebony' from all the usual places. Call Ken on +61 3 9357-8595 to find out what is happening.

Beyerdynamic microphone prices have been reduced in Australia. Example: the M88 (was A\$938) now retails at A\$699. Contact Syncrotech Systems Design on +61 2 9879-0800 for more.

Newsdesk: Fax +61 2 9876-5715 or email to mail@conpub.com.au

MAJOR TRADE EVENTS

Contemplating a study trip, possibly tax deductible, to any of these overseas shows? Feel free to call the editor if you need further information. Email julius@conpub.com.au, or call +61 2 9876-3530.

- **IES 42rd**, Lighting Convention Nov 9-11 '98, Brisbane. www.iesanzq.asn.au/light98
- **LDI**, Nov 13 - 15 '98, Phoenix. Ph +1 212 229-2965 web: www.etecync.net
- **NAMM**, 28-31 Jan 1999. LA. www.namm.com
- **REPLitech Europe**, 23-26 Feb, Vienna. Fax +1 914-328-2020
- **MusikMesse**, 3 - 7 March 1999. Frankfurt. www.messefrankfurt.com
- **NAB**, 19 - 22 April, 1999, Vegas, USA. www.nab.com
- **Music Convention**, 29 April - 2 May. Gold Coast QLD. web: www.australianmusic.asn.au
- **PLASA SHANGHAI**, 13 - 15 April 1999. Ph +44 171 370-8231. web: www.eco.co.uk
- **NSCA**, April 27 - May 1, 1999. Nashville. Ph +1 904 273-2760, web: www.nasca.org
- **AES 106th, *NEW DATES**: 8-11 MAY, Munich. Fax +1 212 682-0477. web: www.aes.org
- **InfoComm**, June 10-12, 1999. Orlando. Info fax +61 2 9531-6777, www.icia.org
- **PALA**, July 8-10, 1999. Suntec City, Singapore. Ph. +65 227-0688.
- **SMPTE**, July 13-16 th, 1999. Sydney, Ph. +61 2 9977-0888.
- **AES 107th**, September 24-27, 1999. New York. Fax +1 212 682-0477. web: www.aes.org
- **LDI** November 19 - 21st, 1999. Orlando. Ph +1 212 229-2965 web: www.etecync.net
- **NAMM**, 3 - 6 Feb 2000. LA. www.namm.com
- **ENTECH 2000**, March 5th - 7th, 2000. Venue: Sydney Exhibition Complex at the Olympic site, Homebush. Show onsale from March. Fax + 61 2 9876-5715. web: www.conpub.com.au
- **MusikMesse**, March 15- 19th 2000, Frankfurt. www.messefrankfurt.com
- **SIB**, March 26 - 29th, 2000. Rimini, Italy. Ph +39 541 711711. web: www.fierarimini.it
- **NAB**, April 8-13th, 2000, Vegas, USA. www.nab.com
- **NSCA**, April 27 - May 1, 2000. Las Vegas. Ph +1 904 273-2760, web: www.nasca.org



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DS 15	45 Hz - 20 kHz	300 W	600 W	100 dB SPL	8 Ω
SUB 18	35 Hz - 500 Hz	500 W	1000 W	100 dB SPL	8 Ω

All enclosure material is Polypropylene

The Sub 18 combined with the DS 15 enclosure makes for an EXPLOSIVE 800 W (RMS) SYSTEM COMBINATION

SPEAKER TYPE	FREQUENCY RESPONSE	POWER RMS	PROGRAM POWER	SENSITIVITY (1W/1M)	NOMINAL IMPEDANCE
PF-215	40 Hz - 20 kHz	500 W	1000 W	102 dB	4 Ω
PF-015	55 Hz - 20 kHz	300 W	600 W	100 dB	8 Ω
PF-012	60 Hz - 20 kHz	250 W	500 W	99 dB	8 Ω
PF-112	60 Hz - 20 kHz	250 W	500 W	99 dB	8 Ω
SUB-15	40 Hz - 1.8 kHz	300 W	600 W	100 dB	8 Ω

All enclosure material is Polypropylene

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15" & Horn	50 Hz - 20 kHz (Max. SPL @ 1M 121 dB)	Rated RMS Low Freq. Amp 150 W RMS High Freq. Amp 50 W RMS	Line - 20 KΩ Mic - 2 KΩ

Enclosure material is Polypropylene



SPEAKER TYPE	FREQUENCY RESPONSE	POWER RMS	PROGRAM POWER	SENSITIVITY (1W/1M)	NOMINAL IMPEDANCE
FACTOR 5	70 Hz - 20 kHz	80 W	160 W	90 dB SPL	4 Ω
FACTOR 8	45 Hz - 20 kHz	100 W	200 W	91 dB SPL	8 Ω
FACTOR 12	35 Hz - 20 kHz	200 W	400 W	94 dB SPL	8 Ω

All enclosure material is Polypropylene

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Write in Reader Service Number: 144

PRO AUDIO NEWS

NOVEMBER 1998

Crest sold to Peavey

By Buck Freeman

DETROIT: Although announced as an alliance, Crest Audio has been taken over by Peavey. The move gives Peavey a major brand name in live audio, an area where the company has not met its potential.

Peavey is now expected to feed loudspeaker products into Crest, which will be badge engineered for the Crest dealer network. There is also speculation that some Peavey amplifiers may make the journey cross-country to Crest, who lack a lower priced alternative amplifier.

Crest are well regarded for their amplifiers and live sound mixing consoles, and it is expected that Peavey will continue the Crest brand and separate dealer network. A Crest insider told Connections that Peavey and Crest already sell to the same retailers in most cases, so it is a natural fit.

The economies of manufacturing scale that Peavey enjoy will likely result in Crest production moving to Peavey, who have four automated surface mount component lines. Industry analysts were positive about the move.



ProTools goes NT on PC

DigiDesign have announced ProTools will soon run on PC as well as Mac, flagging a major change in approach. A Windows NT version of ProTools was demonstrated at AES in San Francisco last month, albeit briefly and without plug-ins.

With the latest software version of ProTools 24, users can use a PC. Existing PCI cards will slot into a PC, so choice of computer platform may change if a user decides. One element which will influence forward computer purchase choice is whether or not all or most TDM Plug In's will be made available for PC.

While the hardware remains the same for either the Mac or

PC version, Digi have spent 18 months re-writing ProTools code for PC. It will only run on NT, not Windows, which augurs well for future networking options. NT is considered more stable than Windows by most users.

Dealers reacted with mixed feelings to the news. Currently a dealer can talk a new user through the installation and configuration process when installing ProTools 24 on a Mac. This takes less than 30 minutes over the phone. NT support will be somewhat more challenging.

"I'd have to sell it with a support contract" stated Lewis Mallia of Sound Devices, DigiDesign's leading Aus dealer.

DVD audio skips as Super Audio CD spins up

By Buck Freeman

SAN FRANCISCO: Sony and Philips have stolen the initiative as DVD audio has tested the patience of the pro audio industry, with the final DVD surround sound specification still not confirmed.

In July Connections reported the draft DVD specification, which has become mired in politics within the DVD consortium committee.

Sony and Philips meanwhile have proposed that their Super Audio CD format is the logical replacement format for today's common music CD - as Super CD features backward compatibility with current CD players.

This is due to a standard CD layer, read by your current CD deck. A high definition layer is bonded underneath, readable by the next generation 'Super CD' players.

Three versions of music can be stored on one Super CD-CD compatible stereo, high resolution stereo, and six channel surround. The high density layer will store up to 4.7GB of material. Play time is currently limited to 74 minutes in all formats.

DVD video is on track to replace VHS video, and DVD data drives will eventually overtake CD-R drives in computers. But DVD audio now looks like a long shot for mass consumer acceptance, thanks to Super CD.

Industry insiders at AES last month slammed the DVD consortium, stating that large committees of pro audio people were now proven as incapable of forward motion.

thismonth

- TASCAM TAKE ON 02R** new console has - wait for it - automated faders! page 16
- EAW** intro new ultra compact full range KF 700 range, and they're POWERED! page 16
- JINXED!** the production we cannot name! page 22
- YAMAHA DEBUT MDM!** This may well be the 'next' DA-XX and will certainly bother ADAT page 24
- SCREEN SOUND EXTRA:** LEE SMITH gives us the 'Tricks of the trade' and talks film sound page 24

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MiniDisk set to replace cassette

More talk behind the scenes at AES last month has tended to confirm what Sony and others have been saying for a few months now: that MiniDisk is set to replace the common audio cassette.

While MD failed to take off as a data storage medium for PC, it has proven a versatile and reasonably cheap audio storage format. **-JG**

CueStation™ 2.0

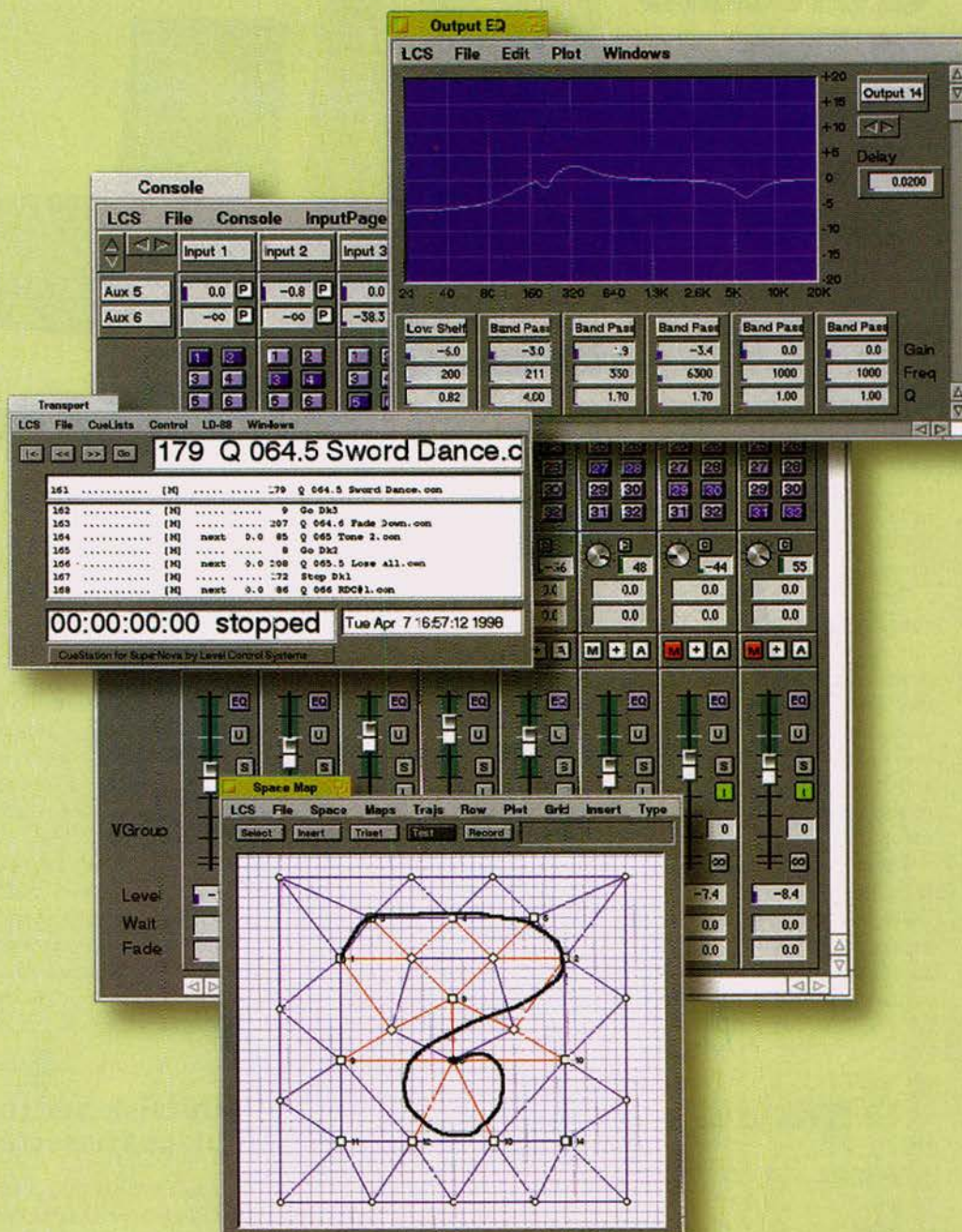
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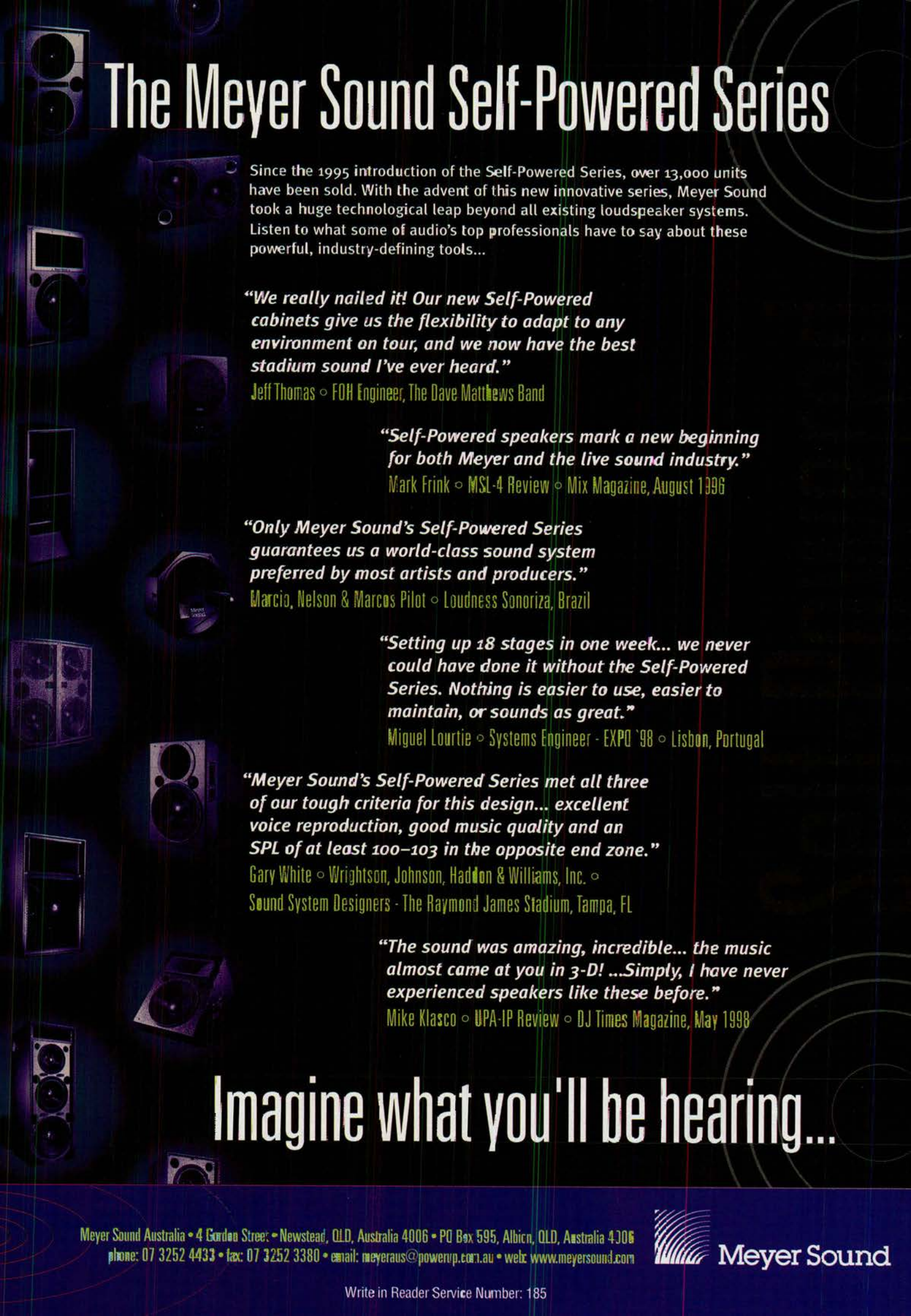
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The Meyer Sound Self-Powered Series

Since the 1995 introduction of the Self-Powered Series, over 13,000 units have been sold. With the advent of this new innovative series, Meyer Sound took a huge technological leap beyond all existing loudspeaker systems. Listen to what some of audio's top professionals have to say about these powerful, industry-defining tools...

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Jeff Thomas ◊ FOH Engineer, The Dave Matthews Band

"Self-Powered speakers mark a new beginning for both Meyer and the live sound industry."

Mark Frink ◊ MSL-4 Review ◊ Mix Magazine, August 1996

"Only Meyer Sound's Self-Powered Series guarantees us a world-class sound system preferred by most artists and producers."

Marcio, Nelson & Marcos Pilot ◊ Loudness Sonoriza, Brazil

"Setting up 18 stages in one week... we never could have done it without the Self-Powered Series. Nothing is easier to use, easier to maintain, or sounds as great."

Miguel Lourtie ◊ Systems Engineer - EXPO '98 ◊ Lisbon, Portugal

"Meyer Sound's Self-Powered Series met all three of our tough criteria for this design... excellent voice reproduction, good music quality and an SPL of at least 100-103 in the opposite end zone."

Gary White ◊ Wrightson, Johnson, Hadmon & Williams, Inc. ◊
Sound System Designers - The Raymond James Stadium, Tampa, FL

"The sound was amazing, incredible... the music almost came at you in 3-D! ...Simply, I have never experienced speakers like these before."

Mike Klasco ◊ UPA-IP Review ◊ DJ Times Magazine, May 1998

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Meyer Sound

Finally! Tascam automates faders, & takes on 02R

New console pitched at small post users



San Francisco: Tascam have built a digital mixing console with automated faders, aimed square against Yamaha's market leading 02R. Tascam's TM-D4000 is similar in approach and style to the Yamaha, and also Ramsa's DA-7. Now you see a feature set which, if sales of 02R's are any indicator, people like.

This new class of mixer has 16 faders for 32 inputs, which you flip. They have a moderately useable LCD display built on and situated centre or right of the control surface. And they have options for whatever kind of digital recorder you use.

Tascam's mixer has three optional card slots in the rear, so you may purchase interface cards for your Tascam DA-XX series MDM, or for ADAT. Tascam will make an ADAT card. They told me so. An AES/EBU optional card will also be available.

You can slave up to four D4000 mixers via a slave connector, without using and losing a card slot.

32 mono and two stereo inputs are possible, they feed 8 busses. The input section features 6 auxiliary sends, and there are two inbuilt reverb type effectors, one of which is stereo. On board dynamics for every channel are mandatory in digital mixers

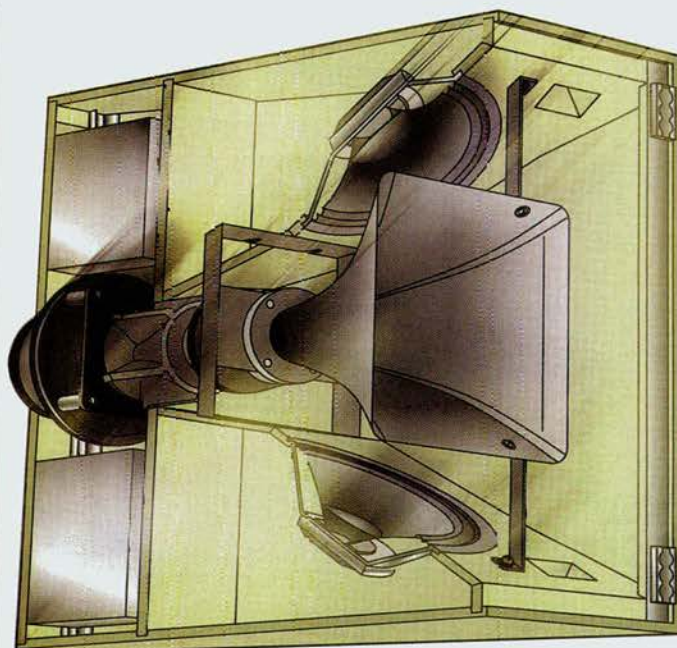
now, and D4000 obliges. Likewise full four band equalisation comes on each input.

A departure from Yamaha or Ramsa form: Tascam site the input and audio output connectors on the TOP of the desk - just behind where the (coming) meter bridge will sit. The back is where you find the card slots, and Sony P2 control, MIDI and serial ports.

Full midi machine control along side Sony control is a plus, a forthcoming Windows based software package will be an option soon, and the desk has 24 bit converters in and out.

With a US retail price of \$4,299, expect to pay about A\$9,999 locally once sales tax and low exchange rates are factored in, which will probably trigger price cuts on the 02R or whatever the next model is called.

A new Yamaha may arrive sooner than you think, as the Yamaha product cycle is shortening and we have already had the 02R Mk II for over a year now. We have not, however, had any hint from Yamaha as to forward planning regarding 02R.



EAW introduce new powered KF 700

Ultra compact, full range cabinet with CyberLogic amp module

San Francisco: EAW introduced the new EAW KF700 Series three-way concert touring array modules last month. They are acclaimed as the first speakers of their kind that act as a true point source.

The key is Acoustic Singularity, says EAW, a new EAW technology that creates a unified space-time origin over the entire audible spectrum eliminating temporal smearing. A broadband unified arrival enhances clarity and impact, they say.

In the 1980's, EAW KF850's Virtual Array Technology significantly reduced interaction between array modules in the horizontal plane. Today with EAW's VA4 Technology, the KF700 Series extends that same level of array control to the vertical plane. In addition, all of the drivers' acoustic centers - including the low-frequency dual woofers - are on the same line, so the entire broadband audio image originates from one specific location at one specific point in time.

The series includes the KF750 which serves as the primary building block along with exceptional long-throw capability, it possesses smooth power response and coherent tonal qual-

ity. At its core, the three-way KF750 is actually a very large mid-frequency horn filling nearly the entire front of the enclosure. This enhances pattern control in the lower midrange and minimizes interaction between adjacent modules. Coverage pattern is 35 degrees by 35 degrees.

The 10-inch mid-frequency cone transducer and phase plug assembly were developed specifically to enhance vocal intelligibility.

Both the high and low-frequency subsystems fit within the mid horn, minimising both size and weight. The high-frequency section includes a 2-inch exit compression driver on a constant directivity horn, while the low-frequency section includes two 12-inch woofers.

The KF755 model provides dedicated downfill coverage. It can be inverted to provide upfill to auditorium balconies and can even be used as a stand-alone system in certain applications. In addition to a single 12-in woofer loaded on a vertically asymmetrical horn, it contains the same mid and high-frequency transducers as the KF750.

Triumphed, KF700 Series

(please turn the page)

56 inputs

72 channels

25 motorised faders

12 aux sends per channel

24-bit D/A & A/D

Mackie Real Time OS™

Full dynamic and scene
automation of all
digital parameters

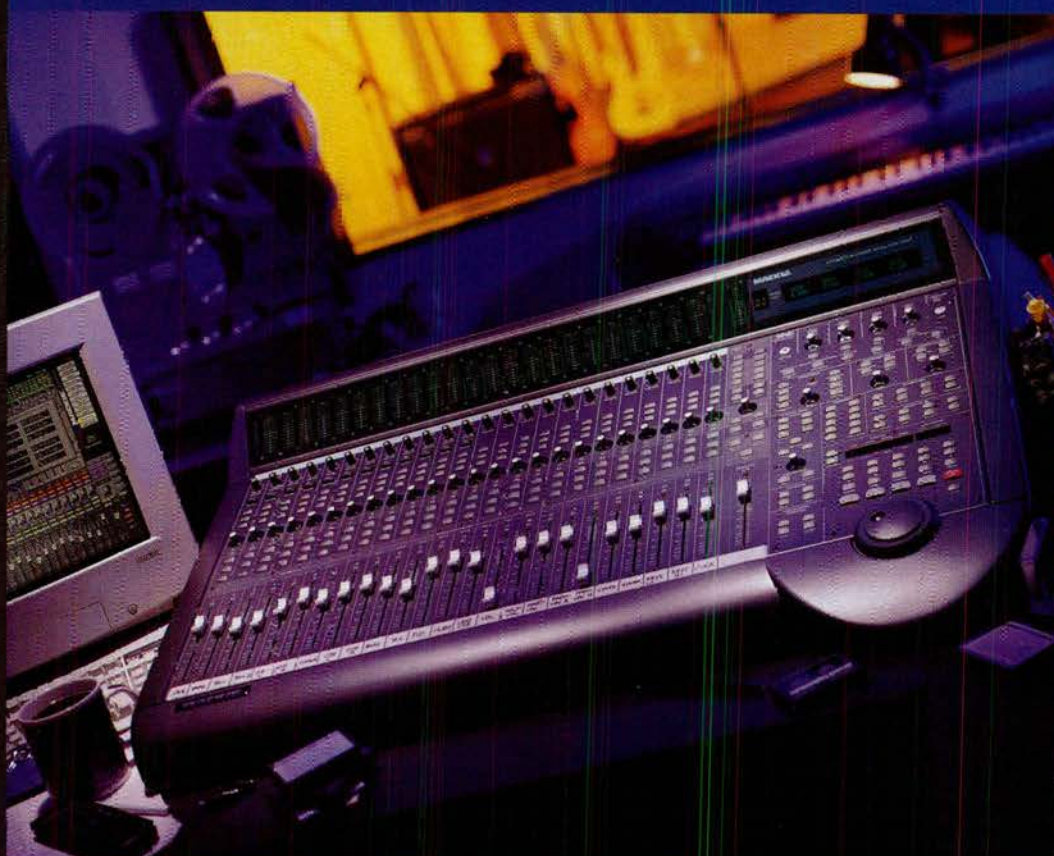
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Super CD processing

WE'RE NOT SURE WHICH IS BIGGER NEWS: THE FACT THAT THE DIGITAL 8-BUS IS SO INCREDIBLY INTUITIVE AND EASY TO USE... OR THE FACT THAT IT'S FINALLY SHIPPING.



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L/R



"With the Digital 8-Bus, you just go for it. You can keep your mind on the music and the task at hand." STEVE BOYCE, ENGINEER, REDMOND, WA

"The Digital 8-Bus acts, walks and talks very much like an analog console." BRUCE NAZAFIAN, CO-OWNER, VIRTUAL POST, BURBANK, CA

"Right out of the box, it's so easy to use. The Digital 8-Bus allows you to experiment. It lets you go down different paths - the creative options are endless!" BRIAN FORAKER, ENGINEER, NASHVILLE, TN

If you want a mixing console that gives you the look and feel of analog - with the creativity and sound quality you'd expect from digital - check out the Mackie Digital 8-Bus. Call (02) 4388 4666 for the location of your nearest Authorised Mackie Digital Systems Dealer and arrange a demo.

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Rain, fire and age take toll. Historic Studio 20 fades to black

Better days saw Kerrie Biddell debut her recording career there. Max Merrit didn't pay his bill. And some group called Mental as Anything hold the record as 'the worst singers' ever.

Studio 20 was part of the sixties scene, but was already headed downhill when your editor walked past each day en route to school. Located in Bourke Street Darlinghurst, the building is today a ruin - thanks to decades of leaky roof, and a recent fire. But founder Ron Ayers, now a pensioner, lives on amongst the chaos.

The studio was created in the 1940's, when Ron scraped together the gear. It had several EMI BTR2 single track recorders, and the console (seen in the picture below) was hand built. A bout of ill health and the march of four track technology forced the closure of the facility, but it soldiered on as a rehearsal space through the 1970's.

Ron started buying and selling used valves and obscure electronic equipment - much of which remains today, piled haphazardly everywhere. It takes some navigational skill to negotiate the darkened

hallways, and fresh air is scarce.

But there are rare gems to be found, and Ron must sell it all and get out. "I want to live here" he said, "but council have other ideas". The place is probably worth a fortune in real estate terms, but Ron cares little about money.

For an old guy he is very sturdy, and has a sharp mind, full of recollections of another era.

"My ambition was to make good recordings" he says, and who can argue with that? Ron says he was never a businessman, which is why he had so many non payer's.

But people remember a favour. Rex Upton recorded there with his group, the Woodside Four in some bygone era. He lives locally and became alarmed at the state of the roof a while back. Rex arranged a new roof, at his own expense.

Then one day recently Ron was out, wearing his one good safari suit. He returned to find the whole of Oxford street closed and traffic chaos. His beloved studio, house, and life work was on fire.

If you'd like to talk to Ron about valves and equipment, call the editor, Julius Grafton on 1-800-635-514 for his number.

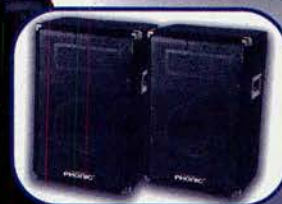
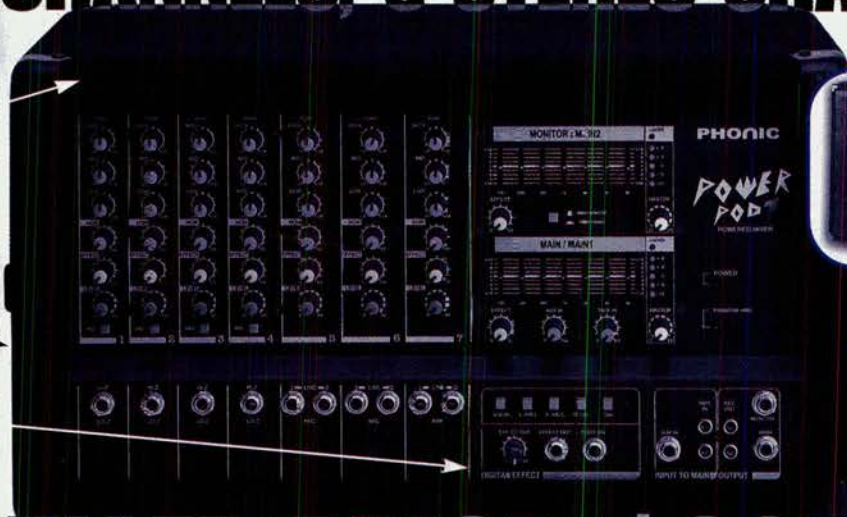


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Howard Jones, Shane Fahey and The Audio Dog on site. Will the box (above) keep thieves away? Will it overheat?

Outdoor Audio Challenge

Audio in a park means a system which'll work every day irrespective of conditions. Just be sure you have electricity. But before a recent installation in Sydney was commissioned, the equipment was stolen. Security is a burning issue.

Why audio in a park? This park is harbourside and features a ship building past. A major art statement was commissioned featuring two steel sections of ship hull.

Megahpon Studio boss Shane Fahey was approached to make a sound portrait, comprising three one hour audio tracks for the park. Sound sources included

an industrial engineering yard, Shane spent time recording on his portable DAT with a pair of Octavia pencil mic's, via a Brook portable preamp.

Bose speakers are inside steel boxes with one face as an open grille, welded to the hulls. They reproduce the sounds from CD's, three run at once. Ambient sounds and impact noises all remind the listener of the shipyard past. Lumps of steel, ship chains and landscape features reinforce.

Shane hired Howard Jones from Studio Solutions to do the audio installation. A steel box was made to house the two racks, one loaded with three

Sony CD PC325M players - chosen because they start their program when powered up. Three Brook NS10 amps. and a Mackie 1202 mixer complete the system.

The metal box is outside in the weather, so a second box was built inside, with layers of insulation between each. Several small fans draw up air from under.

After the theft, Howard and Shane consulted with the builders and decided to weld the box shut. Howard is convinced the system will switch on and perform 12 hours a day - and that the ambient temperature in the box will not overcome the equipment. Changes and repairs will now require an angle grinder.

If it all isn't stolen first.....

EAW's new KF700

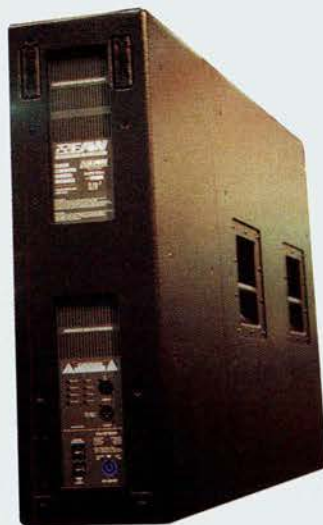
(continued from previous page)

modules are available with an internal Close Coupled Power Module, developed with high-end multiamp specialists CyberLogic.

Only 31 inches tall, KF700 Series modules can stack three high, cutting the amount of truck space needed for any given array by one third. Specially designed truck pack tools keep the load stable.

The enclosure weight is around 190 pounds, or just under 100kg in our terms.

• **Production Audio Services,**
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~ AMP OF THE MONTH ~



Inter M introduce MSR amps

Inter M introduce a high powered professional stereo amplifier pair at a very affordable price point. The PSR 2000 (and 3200) are heavy duty bi-polar amplifiers with a dual power supply and a traditional toroidal power transformer.

They are fully featured, with a variety of protection circuits - including peak limiting and clip limiting. Inter-M prefer front-to-rear cooling, reasoning that a clogged air intake is more obvious, and fixable, at amp front. The back panel (pictured) has all the proper connections - balanced XLR line inputs; 6.5mm jack inputs; and speakon speaker outputs as well as binding posts.

Both amps are three rack spaced tall, the PSR 2000 weighs in at 24kg, and the PSR 3000 is a kilo more. Power: 2 x 750w (2000) or 2 x 1200w (3000) at 1kHz with 1% THD.

Prices: A\$2,000 and A\$2,500 retail.

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Write in Reader Service Number: 141



NEW PRO DJ GEAR THIS MONTH



MiniDisc editing for DJ systems

Sony MDS-DRE1 recorder/player is the company's most advanced MiniDisc-based editing system designed specifically for the dance club DJ. The unit offers BackTracking, which allows DJs to record, synchronize and play tracks "on the fly," enabling live cueing of external audio from a myriad of sources.

The MDS-DRE1 recorder/player provides near CD-quality recording and playback while remaining a flexible audio tool in the dynamic club environment. Sony also sees opportunities in the radio industry with this machine.

Features of the tabletop unit include seamless looping; turntable-style scrubbing and trick play; digital archiving; digital disc and random access capability; hot start buttons, allowing up to eight tracks to be assigned simultaneously for continuous instantaneous play; slider faders to control pitch and tempo; and full song-based editing function (1/86 sec accurate), including the capability to divide, combine, move, erase or copy a track.

• Coming soon, call Sony.

NuMark anti shock dual CD

The CDN-34 is the world's first dual-transport CD player to incorporate 12 seconds of anti-shock memory, says NuMark. It allows true instant start, seamless looping, a unique stuttering effect, a pitch/cue wheel, an enormous back lighted display, and a beatcounter. The seamless looping has no restrictions on loop length and is preprogrammable or adjustable in play. Stuttering allows you to select any point in the music, on the fly, for retriggering play instantly.

This unit also features auto-dead space elimination, full CD infinite play, 3 Speed Forward/Reverse Scanning Wheel, +/-12% pitch adjust, +10 track advance, and NuMark's track sequence program mode.

• Coming soon, call Show Technology on +61 2 9898-1111.



Connections Reader's Story

A very jinxed audio production

by Gus Macdonald

I was never superstitious, didn't worry about walking under ladders or whistling in the theatre. In fact I enjoyed sticking my tongue out at the things that are mysterious and unknown.

That is until the 3 witches came up with some inspiring curses worthy of any theatre workers.

Thanks to some play writer of 300 years and more, my view of things supernatural has now changed. I had the unenviable job of editing sound cues for this production which included some 70 odd sound cues of music, horses and screams - along with several sequences of radio play style sound tracking.

The digital editor handled all the live recording with consummate ease, the multitracking was done without delay, the CD Rom burner burnt the glossy gold discs as it should have done. Transfer to the Mini Disk was successful. Everything was labelled and ready to go.

Now comes that moment when half an hour before the show, you check everything is ready. But no, the minidisk player is suggesting that the disk contained within is empty and ready for recording, followed directly by a magnificent 'chick pulling' lighting display on the front panel!

Initially I thought it may have been a 'DFO' problem (dumb —operator) but subsequent turning on and offs did not reset the minidisk. The house was sold out, this was the only copy of the show tape with the radio plays on, my face was as white as the witches. Back to the studio to find the radio plays.

The computer had it in its mind to hide all the links to the voice overs that comprised the complicated multitracking- by my estimate, it would take upwards of a day to find all the links and recompile the show tape. The deleted minidisk was the only sure version of the sound tape.

That evenings performance was cancelled, we had decided to sleep on the problem and start afresh in the morning for a long day of PC editing. At about 6:30am the following morning, after a very restless night, I had an idea that might just work, and recover the erased minidisk.

Here is my solution.

Firstly, I recorded a black minidisk with 74 minutes of silence with only 1 track. I now had a full disk of silence music. I then took off the lid of the MiniDisk player (a Denon 1050j), and identified the drive mechanism. Some players will not have the drive mechanism easily accessible, let alone work the top cover off.

Next I played with the little cog at the back of the drive which makes the disk cartridge go in and out. I then discovered that you could put in a disk, load up the table of contents which tells the microprocessor in the player how many tracks and how long each track is and where on the disk each track is, and then put it to sleep by pressing 'stop'. Then I unloaded the disk by spinning the wheel, reloaded the disk using the same method and waking up the

"Initially I thought it may have been a 'DFO' problem: dumb operator"

Please turn the page.

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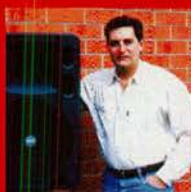
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NEXT GENERATION MDM

YAMAHA introduce 8 channel hard disk recorder with MIO drive

SAN FRANCISCO: Yamaha will soon enter the MDM (modular digital multitrack) recorder market, with the launch of an affordable, 24-bit, 96 kHz digital multitrack recorder. Based on readily available 3.5-in. magneto-optical disks, the D24 Digital Multitrack Recorder offers 16, 20, and 24-bit, 8-track simultaneous record and play capability at 44.1 and 48 kHz sampling rates, and 4-track record/play at 96 kHz. Additionally, the D24 offers modularity, all the benefits of non-linear editing, and the convenience of removable media.

Intended as an alternative to tape-based modular digital multitrack recorders, up to eight units can be synchronized to create large recording systems. Other benefits include digital I/O in a variety of formats, editing capabilities and a range of special features.

The D24 is intended to serve as a multitrack recorder for music recording and mixdown, post audio applications for television and film, and live playback for theater and other live sound applications. The D24 is also well-suited for surround sound applications. Delivery of the D24 is expected to begin in March. The D24 has been designed to be a drop-in alternative for tape-based digital multitrack recorders. It is likely to sell well against ADAT or Tascam DA-XX.

Key benefits of the D24 are its editing capabilities which are possible due to its non-linear format. A variety of editing options are offered including the ability to copy, move, erase, delete and merge audio data. The D24 allows the recording of 8 tracks plus virtual tracks for unlimited editing possibilities. The D24 also has a +/- 6% vari-speed adjustment.

Expect a keen price when the unit arrives around March. **-BF**

Jinxed! (continued)

player to find that the microprocessor is none the wiser.

I wonder, I thought, "if I put the blank disk in, put it to sleep, then remove the disk and put the corrupted disk into the player if the microprocessor recognised the difference between a disc full of one track or many cues"?

You guessed it, yes.

I managed to hoodwink a microprocessor, something that should be impossible, and recover the entire disk of audio-albeit in a slightly different order of the original cues.

I have not detailed many other facts which occurred during this production to do

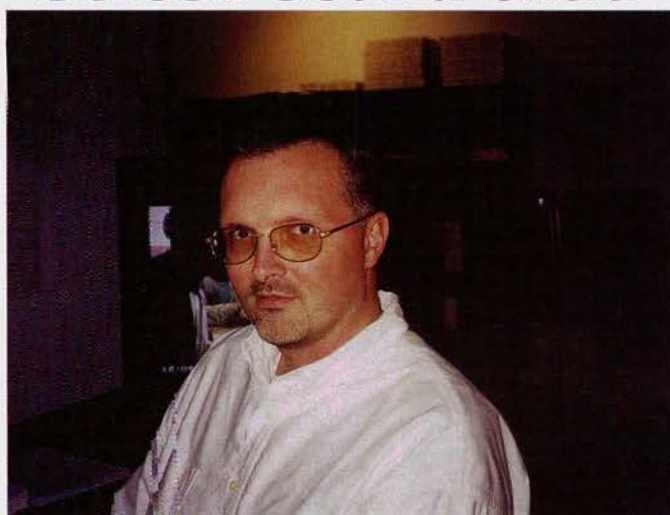
with the sound, such as that we went through 3 minidisk players, 2 dat players, various corruption's of CD's and several chewed Dat tapes. Let alone all the staging problems and hair pulling, all which lead me to say without doubt that: *the production is cursed.*

For those that tread this path, and there is one notable coming up, you have been warned.

Heed the witches curse and never mention the production's name again!

• **We LIKE to get Reader's Stories here at Connections! You can call the editor to discuss, or just blast away. Fax +61 2 9876-5715, mail PO Box 439 EPPING NSW 2121, or email mail@conpub.com.au**

Screen Sound extra



Lee Smith on: The Tricks of the trade

by Madeleine Murray

Lee Smith was the film editor and sound designer for *The Truman Show*, and is about to start sound on *Holy Smoke* for Jane Campion. Lee is now a techno-junkie, but didn't used to be. He loves new equipment and new programs. "In the old analogue days, we had no ability to change levels. We used to physically wipe the emulsion off the film with acetone, for a film wipe. And it was all destructive".

"The beauty of non-linear is that it's non-destructive, so it encourages you to take a punt. Now you can just basically play, whereas you couldn't before, and that is really exciting."

Smith worked on Peter Weir's current hit film *The Truman Show*.

Instead of basking in the (relative) limelight, Smith is sitting in a dimly lit room, editing *Two Hands*, the first feature by Gregor Jordan. It will be mixed in 6 track digital at Atlab, with Phil Heywood. The film is strange, dark, and narrated by a dead man. Smith explained that, "the soundscapes are going to be complex, because we're cutting from surreal to real. The director wants a David Lynch type track."

Fresh faced, tall and personable, Smith is a sound designer, as well as being a sound and picture editor. He and another sound editor, Peter Towrend, own the largest library of sounds in Australia, all fully computerised and listed. "We built up a huge library over the years, and we also pulled in other libraries from around the world. You could build anything with the effects we have at our disposal, but I still like recording a lot of sound effects as well. Often, it is far better to go out and record something."

Sound design

On *The Piano*, Smith and his team did a lot of recording. "We must have cooked pretty strange, down at Church Point, dragging logs through the mud, and holding mics up to them. We slowed those sounds down when the Maoris were pulling the longboats across the sand. We needed the weight, and didn't think that Foley could handle it."

They also bought an old piano, rigged it up, and dropped it in the Foley studio. "We then did all the other things that happen to the piano—

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a string breaking, a key removed, an axe through it. We hit the piano in certain ways to get the soundboard to vibrate, and make all the interesting sounds, with a bit of pain, to try and get some angst into that piano."

They recorded all the water noises, including the underwater end sequence. The assistants had to leap into a pond, in winter. "That was for depth. It's very hard to get depth on a Foley stage. I'm not criticising Foley, but if the character jumps into a lake, and swims and does intricate movements, you have to actually do it for sound. It's extraordinarily complicated. It's the luck of the draw what the backgrounds are doing at the time. If someone starts a buzzsaw up half a mile away, you're stuffed."

When a little girl falls into an icy lake in *Little Women*, Smith attached two neck mics to the blades of some skaters. "It was tricky, because we don't have outdoor ice here. We had to find a way of extremely close micing indoor ice. With a wide mic, we would have gotten nothing but reverb. We came up with the idea of putting a DAT in a backpack, and running the neck mics down. It really worked well, in conjunction with Foley."

In *Dead Calm*, Phil Noyce wanted the evil ship, Orpheus, to sound like an old man dying of cancer. They found an old tug with a 1908 diesel motor, and hired a mechanic to gradually destroy it. "Most motors just stop when you switch them off. We were recording this derelict leaking boat, out in the water. We fired up the motor, and the mechanic progressively took it apart, while it was running. Flames were shooting out, and it went through phenomenal death throes."

"For *Rapa Nui*, we did a huge replacement job on the dialogue. At one point we had 28 Maoris in the room, doing war chants. It's kind of spooky when you're in the room with them. They can get excited! I wouldn't want to be facing them!"

"Because of various factors, there is a lot of replacement sound in features. If it's done well, you don't notice it. You don't realise that 80% of the dialogue has been re-recorded, sometimes for performance, sometimes for technical. Or the character has been completely revoiced! It's never ending, what you can do."

"On *Fearless* we did a lot of slowing sounds down, and playing them backwards to get all the surreal sounds, to weird the whole thing up. It's good to be weird and subtle, so that you don't notice that you're being heavily manipulated."

The Truman Show

The film was shot in the States, and edited in Sydney, despite pressure from the studio to finish it in LA.

Technically, it was a bit of a nightmare, because they ended up working in PAL, and NTSC. "We had to keep it in NTSC, because Paramount wouldn't commit to us finishing the project here, totally.

Later, we still had to maintain a certain NTSC element in the track, because all the dialogue and all the EDLs coming out of the Lightworks were NTSC. So we cut the dialogue on Pro Tools in NTSC. We brought in special programs for automated cueing the ADR [replacement dialogue]. We cued everything in NTSC, and then we cut the atmos, Foley and effects in PAL. Then we combined all of that, and Rick Lisle did a lot to figure out how the hell to do it. We had to end up back on the Sony stage in America."

They predubbed at Atlab in PAL for the effects and atmos. At Soundfirm, they premixed dialogues in NTSC. They were using PAL pictures. At this point, Smith and Lisle try to figure out exactly how they did do it. "As you can hear, it was a little bit mind boggling," Smith explains.

The final product was mastered at the US Sony lot, in NTSC. "We were always a little scared of the PAL/NTSC combination, but it translated beautifully from what we had heard at Atlab, and Soundfirm. You always get nervous about playback discrepancies, when you move stage to stage. The film was digitally mastered for DTS, SRD, and SDDS, and we all flew home happy campers."

"The sound was well recorded. Peter had a few ideas about making it sound super clean and clear, as if it were on a sound stage. We never added ambient sounds or birds, unless they were for a reason, as if the master of the whole studio was doing it. Every morning of Truman's life, in the film we played exactly the same birds, as if they were on a loop and cued by someone in the control tower." (Note to sound buffs: listen out when you see the film.)

The US

Smith and Weir have enough clout to post a film in Australia, but it was a battle to convince the studio. "Technically and artistically, we can do it here. The big difference is facilities. In America, there are endless facilities. They have very highly sophisticated dub stages with everything you can think of on every one of them. So it's exciting to work there."

"Sound is a big industry over there. They get all the toys, it's annoying they get them cheaper. But we use the new things far faster. We are much more ready to accept technical change here. They have a lot invested in equipment, and they have a very powerful union. Like, the sound recordists didn't want to give up their Nagras."

"The *Truman Show* was recorded on 1/4", with no noise reduction. I couldn't talk the sound recordist into doing it on DAT! He's been doing it for 35 years, he's won Academy Awards, and the good old Nagra is where he wants to stay. That's ingrained over there, they are very slow to move."

"We have a much more limited arena to work in. But ultimately, we can produce a sound track here as good as America, for 50% of the cost." •

When a little girl falls into an icy lake in *Little Women*, Smith attached two neck mics to the blades of some skaters. "It was tricky, because we don't have outdoor ice here. We had to find a way of extremely close micing indoor ice".

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EAW's Fillmore Night

EAW staged a very cheeky gig during the San Francisco AES. They rented the Fillmore Auditorium to show off the new KF700 system, and put on some bands.

Fillmore is one of the last remaining time tunnel flashback rock venues, with Fillmore poster art neatly framed and decorating the walls. The upstairs bar has a Gerry Garcia shrine, an almost lifesize picture of the Greatful Dead guitarist, framed in taffeta frills. Dead were, of course, The Most Severly Major Meyer Sound using group of the century - they owned a huge Meyer rig, and are totally synonymous with the brand.

The Fillmore was opened by Billy Graham as a dance hall in 1966. It is the home of rock and roll, the concert variety. Catering to less than 800, it was crippled in recent years by the Californian state anti smoking laws. Somehow it isn't the same being in the Fillmore without taking in several months worth of passive smoking in one night!

But the lobby photos tell it all. Hole in 1994, Bad Seeds in 1989, Butterfield blues Band in 1969. Hell, I got that album, once.

EAW~ good idea, and thanks for inviting me back to Fillmore. -JG

Shure move onto Studio turf

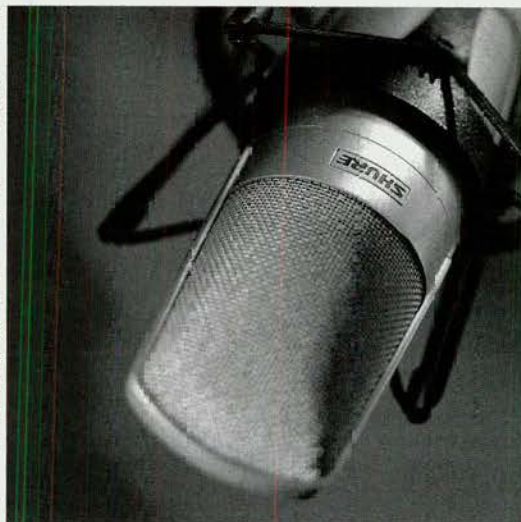
After years of research and development, the Shure KSM32 studio mic is here. It's a side-address, cardioid condenser mic outfitted with Class A, transformerless preamp circuitry.

This virtually eliminates crossover distortion and brings improved linearity across its entire operating range.

Its embossed, highcompliance, gold-layered, Mylar diaphragm provides extended low frequency response while improving environmental stability. The very low mass of this ultra-thin (2.5 micrometer) diaphragm enables it to accurately reproduce the transient response of any sound source.

The KSM32 incorporates a 15 dB attenuation switch for managing extremely high SPLs. Performance is further enhanced by its extremely low self noise (less than 13 dB typical, A-weighted), resulting in the increased dynamic range required for demanding recording applications.

Given the KSM32's high output capability, noise potentials are reduced even further by eliminating the need for large amounts of



microphone preamp gain.

Two KSM32 models are offered a full studio version comes in a champagne-colored finish with a ShureLock elastic-suspension shock mount. A live version finished in non-reflective charcoal grey is also available.

Expect to pay around A\$1,500.

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PRO AUDIO NEWS SHOOTOUT!

02R vs WR DA-7

The low cost digital mixer market heats up as Yamaha's market leading 02R II is joined by Japanese rival Ramsa with the WR DA-7.

Julius Grafton sits them side by side to see: WHICH MIXER DOES WHAT?



Then there are eight line level analogue line inputs or returns. You can run 32 digital inputs and outputs on the Yamaha, using three optional 8ch. I/O cards to do this. But Yamaha have four card slots, whereas Ramsa offer three.

Like in a boxing match, you need to know HOW to count. We count 24 digital inputs and outputs for both desks.

Both desks have very similar feature sets. In keeping with the fact that the Ramsa is several years newer than the Yamaha, it offers 24 bit analogue to digital (A/D) audio converters on the inputs and outputs (D/A on the outputs). Yamaha make do with 20 bit.

But Yamaha can handle 24 bit rate recording via the optional input cards. The drawback is that currently ADAT and Tascam DA-XX modular digital multitrack recorders are limited to 20 bits. If you ask 02R to operate at 24 bit resolution with a vanilla ADAT (working at 16 bits), then 02R will need to allocate two channels for each channel of the ADAT. But why would you wish to do this?

Claims and counter claims

Last year we told you Ramsa had made various claims about their desk vs. Yamaha - one of which is that Ramsa (part of the giant Panasonic conglomerate) sell motorised faders to Yamaha for the 02R. They went on to claim that the motorised faders used in the DA-7 would be of a superior quality.

Well, side by side, the DA-7 faders sure feel slightly smoother. The test: flick the fader with your finger and see how far it glides. Neither will glide the whole 100mm, but the Ramsa goes to about 70mm (of the 100mm possible travel), while Yamaha's fader falls short.



Unless you've been in a cave - or on the moon, you'll know the Yamaha 02R digital mixer. It won an ENTECH award this year, and it is probably the most common digital mixing console in post production and studio use anywhere.

Last October in New York Connections spotted a pre production version of a new contender from Ramsa, the DA-7 digital mixer. It is pitched directly against the 02R, whereas other new digital mixers from Mackie and Spirit are somewhat different.

The DA-7 has landed, and we arranged with Sydney pro audio dealer Leon Hart (from Studio Supplies) to compare one with a Yamaha 02R II. The Yamaha came from a third party, as Leon doesn't sell Yamaha. For a fair and objective comparison, we enlisted the services of John Bee, a well known freelance recording engineer who has been mixing on Yamaha 02R's for two years.

Then we locked Leon out. After all - he must be biased, right?

Side by side

Same mission statement. The DA-7 looks like the next generation of 02R - it is similar, but different. The Ramsa is slightly wider than the Yamaha, but a good 130mm less deep from front to back. The front and rear heights are similar to Yamaha's. The Ramsa is finished darker than Yamaha's 'Yamaha grey', and Ramsa uses the front panel more space efficiently. It has six status indicator LED's above the input faders, with input gain controls at the console top, same as Yamaha's. The Yamaha has some blank real estate on the front lower right hand side of the panel to deal with.

The RAMSA allows 32 inputs, the first 16 of which are analogue - and the first eight of these are balanced XLR's. You can then operate channels 9 through 32 in the digital realm, using three optional 8 ch. I/O cards. So you can get 24 I/O's in the digital realm on the Ramsa.

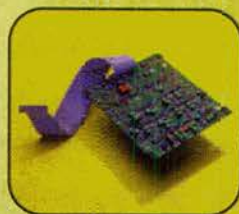
Yamaha have 40 inputs available on the 02R, if you take optional input cards. Channels 1-24 (analogue) come standard and all via jack sockets (6.5mm). The first eight are also available as balanced XLR's.

Typical

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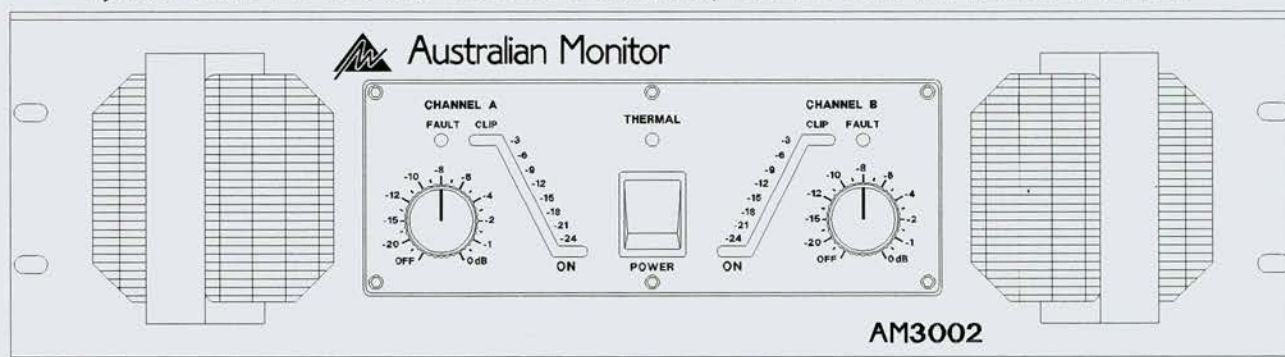


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02R vs WR DA-7

A big difference? No. But Yamaha say that Ramsa in fact do NOT make their faders - they are from ALPS.

Mix outputs are scarce on both mixers, unless you have an optional output card you are restricted to the control room monitor outputs, studio monitor out's, and left/right main outputs, plus auxiliaries. Great for mixing in stereo, obviously these desks almost always get sold with optional output cards. More on these soon.

These desks both have extensive dynamics control on each channel - compressor, limiter, expander and noisegate. These make life easy, especially as you can recall all settings - which is what a digital desk is all about anyway.

The Yamaha has two reverbs, whereas Ramsa offer none. Ramsa say people are very fussy about effects and will end up using other effectors anyway. Yamaha say their internal effects are equal to the new PRO R3 effectors. Yamaha take it further still, with third party cards from the likes of TC Electronics offering bigger and better effects.

Sound & Routing

Our comparison involved two Tascam DA-88 (16 bit) modular digital multitrack machines, the audio output from each run digitally into optional TDIF cards on both mixers. Relying mostly on John Bee because my ears are not used for professional return, we tried and tried to hear a difference. Non apparent, at least using this test configuration. "I haven't been able to compare the front end A-D (analogue input) converters" cautions John.

Ramsa and Yamaha both let you assign 24 input channels direct to 24 outputs, so you can record more than 8 tracks at once. The Ramsa has insert jacks on all 16 analogue inputs, whereas Yamaha only has them on the first 8 inputs. Conversely, Yamaha wins in the auxiliary output department because they have eight. The last two (channels 7 & 8) address the internal effects busses (Ramsa has no internal effectors), while the first six appear on the back panel as neat, normal, mono analogue jacks. You can assign them to a digital I/O card if you seek digital output from the auxiliaries.

Ramsa's auxiliary trade off is to offer the first two of six as digital outputs via S/PDIF (and also two S/PDIF digital auxiliary inputs too) - and the remaining four auxiliary inputs (and four auxiliary returns too) are made available as unbalanced stereo jacks.

So Yamaha have eight aux, and Ramsa six. But Yamaha have no returns, while Ramsa do - and two of the six Ramsa auxiliaries are digital.

The optional digital input/output cards are another point of difference. Yamaha have four card slots while Ramsa offer three. There are cards available for ADAT (lightpipe) or Tascam TDIF and also a card for AES/EBU and SP/DIF. For more analogue inputs or outputs, a card carrying eight of each is available. Yamaha have several flavours and varieties of input cards.

Surface

John Bee is impressed at how easy it is to get around the Ramsa. "The ten alpha/numeric keys (*pic, right*) are better, instead of having to curser things up and down" he says. The Ramsa has machine control under these alpha keys, with MIDI machine control (MMC) and standard. Yamaha don't offer machine control.

The channel flip switch on every Ramsa channel is great too, according to John. Yamaha let you flip the 16 faders from inputs 1-16 to inputs tape 1-16, otherwise thought of as inputs 17 - 32.

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Thus if your Yamaha is set up for 16 recording inputs, and 16 tape machine inputs, you can flip the main 16 faders to control either.

Ramsa let you flip individual channels, so if you were mixing down from tape, you could still have one fader switched to -say- one analogue input. Useful if someone is playing along to a mix where you need control over both mix and input at the same time.

Likewise getting into the dynamics is easier on the Ramsa, the dynamics and delay functions are accessible on the top right of the console, just under the display. On the Yamaha you need to cursor into each of the controllers.

Both mixers have dedicated EQ controls, Yamaha have a numerical screen next to each to denote actual settings, and an EQ display on the screen - Ramsa do the settings display on the EQ display screen alone.

Speaking of screens, these 320 x 240 backlit LCD screens are identical, They probably come from the same manufacturer.

Memory and automix

Ramsa seem to have adopted a slightly different approach with memory, they let you record up to 50 snapshots of the console, while Yamaha has 99.

This appears to be a tradeoff by Ramsa, which is more than compensated for by optional software which will enable a Mac or PC to act as an on screen controller for the desk. A serial port and Mac Geoport are on the back to interface with your computer.

More seriously, the automix abilities of both mixers are such that a complete song 'session' can be totally automated - you select automix, start the track and mix away as fast as you can.

We tested the automix action on the faders by running automix and giving the faders some extreme action. On reply, both mixers did a pretty convincing flying fader action, more or less as we had done originally.

Automix is the full enchilada, and is wonderful. The only hassle is that Yamaha have memory capability (in 02R II software version) for 16 mixes, while Ramsa allows just four.

You can do a MIDI sys-ex dump of the automix track data from either mixer, and get to your archived mixes that way. Virtually any small midi recorder would allow this.

Yamaha also allow external PC control via third party software by CMEXX, hooked up to the RS422 port on the

02R.

Ramsa's approach is that using the optional external PC or Mac software allows you infinite automix tracks, and the added benefit is on screen control and monitoring of the desk. But of course, it is another screen in the studio.

Software

It is impossible to do more than scratch the surface of the software. John went into the surround pan features of both consoles and liked the Ramsa approach. It enabled you to do a quad joystick mix with the parameter wheel operating left and right, while the master fader operated up and down. It was possible to locate the mix anywhere in the circle really quickly. Yamaha have a clunky approach to this, which requires you choose left and right, or up and down, or diagonal, or circular operations for the parameter wheel.

Both desks allow 5.1 (3+2+1) or 2+2, or 3+1 modes, with separate output options for mix and monitoring.

Wrapup

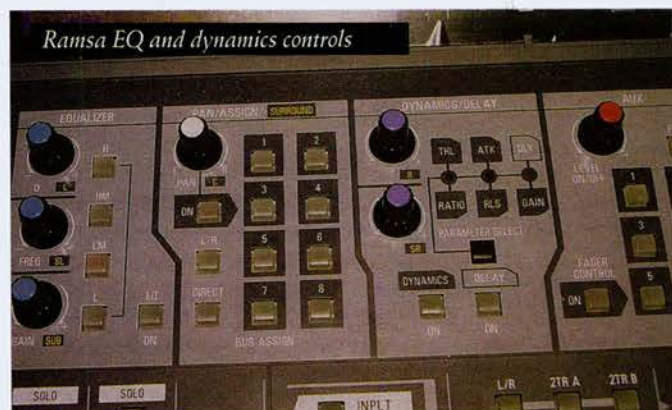
Ramsa is maybe like a more modern version of a Yamaha 02R. It has a little less of some things (auxiliaries, one less card slot, automix memory) and more of other things.

Point in question: the optional meter bridge. Yamaha's has less resolution and the LED ramp extends only halfway up the bridge. The Ramsa one goes three quarters of the height, so there are more LED's. It looks better too.

The Ramsa is smaller, has internal 24 bit converters on the analogue inputs and outputs, vs. Yamaha's 20 bit. Is 24 bit better than 20 bit? Betcha. But will people really notice the difference?

Ergonomics? Style? In the eye of the beholder.

Price? Look for yourself, but remember that 'street price' is always somewhat lower than the retail prices shown here.



John Bee



Info

Yamaha's pro audio manager in Australia is Mark Amory, call +61 3 9699 2388.

Ramsa info: RamsAudio Aust. call +61 2 9299-6731.

Leon Hart at Studio Supplies, call +61 2 9957-5389

Both manufacturers have reprints of other magazine reviews, trust these: MIX magazine in the USA and Studio Sound in the UK. They DON'T do payola or cut advertising deals for reviews. We don't either.

Price List

(retail, AU\$ including sales tax)

Yamaha 02R II \$14,995
Ramsa WR DA7 \$12,498

Options:

Yamaha cards	ADAT	\$595
	TDIF	\$595
	Analogue	\$595
Yamaha meter bridge		\$2,995
Ramsa cards	ADAT	\$598
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Write in Reader Service Number: 103

DYNAUDIO ACOUSTICS DA-BM6A NEAR FIELD STUDIO MONITORS

Sid Kidman took a pair of DynAudio monitors into the studio last month.

First Impressions

If you are in the market, or curious about a good set of near field monitors, and can afford the RRP of \$4,295.00 or qualify for Pro Sell at just under \$3,500.00, then definitely try these — after any alternative product — because — if they make it into your studio, it's a safe bet that they will remain there. They are delightful equipment to work with.

Appearance

Weighing in at a little over ten kilos, they occupy just 338 x 216 x 330 (h x w x d) millimetres of studio space. Appearance is quite conservative, and the finish is a black semi-mat hard plastic. The front panel is the speaker baffle, and is secured to the top and sides by ten sturdy counter sunk bolts. The drive units are securely mounted to the baffle, and are a 170mm bass/mid unit, and a 26mm soft domed high frequency driver. The drivers are exposed, but a sturdy steel three legged wire barrier protects the high frequency dome.

A simple "dynaudio acoustics" badge sits in the left centre of the baffle, and two leds occupy the lower right hand corner. The rear panel is recessed enough to accommodate the bi-amp, which sits on the inside of a black anodised aluminium plate, with the convection cooled heat sink occupying most of the



outside of this plate. On the right hand side, from top to bottom, are the HF trim, the LF trim, the -10 or +4 dBm toggle, the XLR input, the power switch, and the male power plug.

Construction

The box panels are 20mm compressed fibre board or similar material. The joints are simple glued 45 degree cuts, and the fit is less than perfect, with some gaps into which a razor blade could be inserted.

However no air leaks were apparent. The amplifier plate is secured to the box with four bolts, and removal of these is necessary for replacement of the fuses, should they ever need replacing. Inspection of the amp construction reveals quality work in the electronics department.

The reflex vent is at the top of the rear panel. It is a slot with a height of 12mm, bounded by the top and side panels, and a shelf of 12mm board which extends the full internal width, and to a depth of 205mm, leaving a gap into the box volume of 60mm. This is the result of extensive design work, to match the Thiele-Small parameters of the low/mid driver to the cabinet and port, in order to achieve extended low frequency performance.

>more

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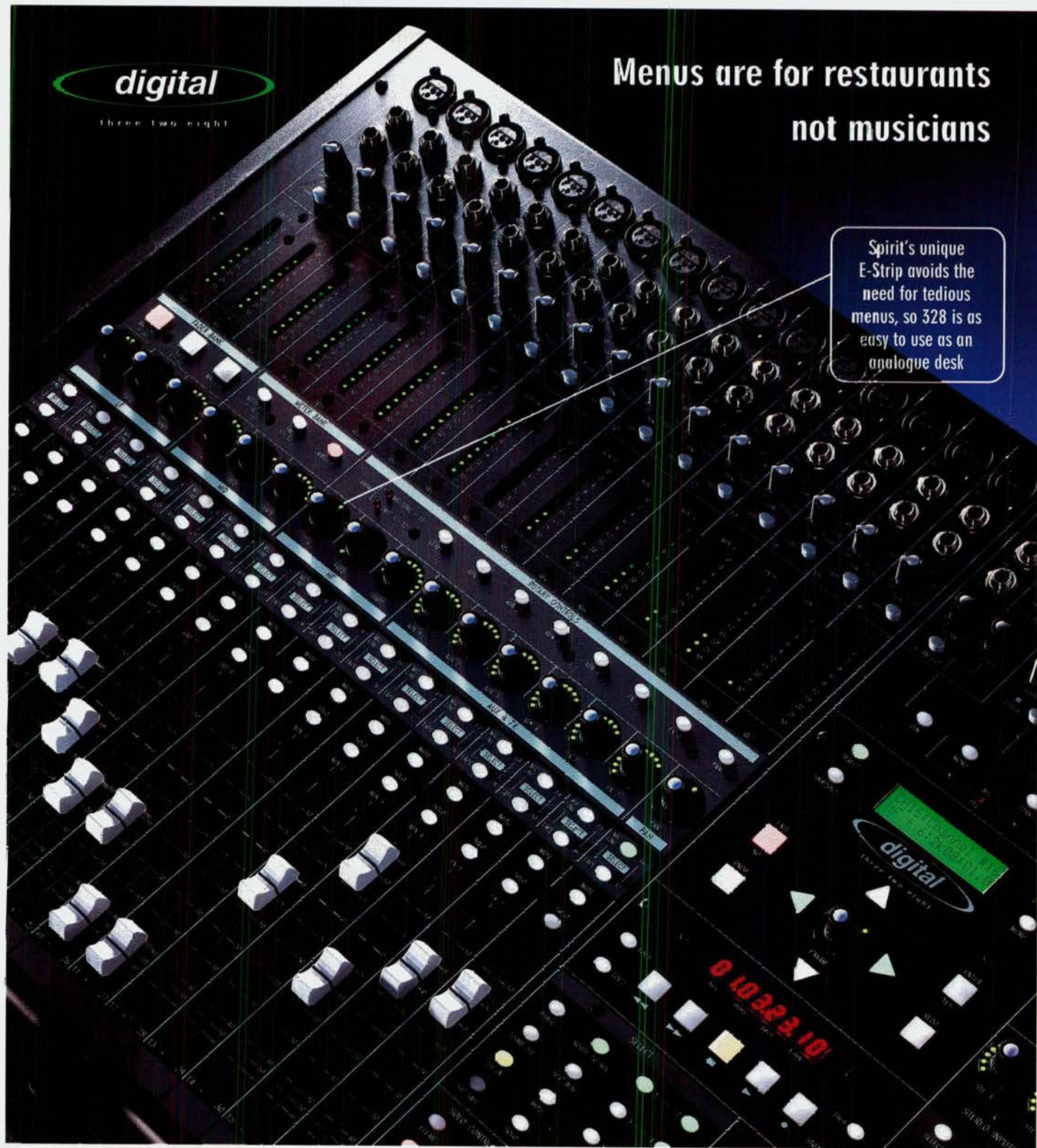
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Write in Reader Service Number: 120

DYNAUDIO ACOUSTICS DA-BM6A NEAR FIELD STUDIO MONITORS

Specs and Facilities

As stated in the owner's manual, there are dual 100W discrete mosfet power amps; one for each driver unit, with a fourth order phase aligned crossover at 2.2kHz. The frequency response is flat from 42Hz to 21kHz (+/- 2.5dB).

There is DC and thermal protection on both channels, and a photo-active limiter on the high frequency component. The HF trim produces a maximum of 5dB attenuation at 20kHz. The LF trim is unusual in that it produces a 5dB per octave high pass filter from just above 100Hz, but allows the frequency response to extend down to below 30Hz. The -10/+4 dBm toggle matches the input sensitivity to professional or semi-pro/home use.

On the front panel, the right hand led is green under normal operating conditions, and red if a protection circuitry is activated. It briefly shines red on switch on. The left led when lit is red and indicates clipping in the low frequency driver's amp.

Technical observations

Switching on and off, there is only a very quiet click from a relay unit, and no speaker reaction. There is no audible noise in quiescent running, so look to the rest of the patching if any noise is present. The convection cooled heat sink does not get any more than mildly warm when the DA-BM6As are working quite hard. The clip indicator is conservative for music, as no severe distortion was detected during tests with music, when the indicators flashed. However, with sine wave tests, harmonic distortion can be quite obvious long before clipping is indicated.

The low/mid frequency driver can produce peak to peak excursions in excess of 15mm with out any apparent distress, which is a lot of travel for its size. Between 30Hz and 40Hz, the port is working quite hard, and generating copious air flow - equating to good levels of bass performance. The LF trim set at maximum of -4, does produce more energy at the mouth of the port under 30Hz, however this does not directly translate to an observed extension of low frequency in the music, more of a reduction in wasted power at the bottom end.

The HF trim produces just enough attenuation to be useful if perhaps the listening environment is overly bright. The HF unit itself does its job with apparent ease, and there is no reason to doubt the manufacturers claims about it being flat to 21kHz.

Listening tests

Here, it is appropriate to summarise initially by saying that the DA-BM6As are beyond criticism (not meant in any unique sense), but worth much discussion. "dynaudio" have a product, at that level, at which choices are made, not on the basis of faults or lack of, but on personal preference.

The BM6As coped well with the wide range of music tested, and with other sounds such as speech. The listening position was mostly at one apex of an equilateral triangle with sides of approximately 1.2m. At this distance, attained SPLs can be very high, and the speakers compete favourably with quality headphones, but have the advantage of spatial and low frequency presence. They are definitely for near field use, as their power and efficiency is not sufficient for a tactile performance in larger spaces.

Spatial imaging is quite definite and not confined to the sweet spot. Two people could sit in a useful portions of the listening field at the same time. Indeed the image is broader than the width of the speaker placement by up to one third of the distance of separation. The small dimensions of the speakers enable the sound to have some of the useful properties of an ideal point source.

The sound shows no normal coloration from the box, and no roughness in any part of the frequency range. Accurate low frequency production is always a trade off between level, phase response, and damping. The BM6As gain level at 40Hz, for some trade off in tightness. This has further ramifications, I believe, in the development of a sound with some feeling of "lushness" - an 'attribute' which could be a little addictive.

The "dynaudios" could be considered to be high quality technical equipment, in as much as they are accurate enough to readily show up the effects of distortion associated with the digital world: unpleasantness associated with aliasing, imaging, and the psycho-acoustic masking to compensate, or lack of.

In like manner, they accurately reproduce the most exquisite bells and tinkles that good digital recording is capable of.

In the studio situation, they should prove very useful on several different levels while recording/mixing material. One level would be in discovering and eliminating sources on unwanted noise. Another would be to make the most of the timbre of a particular instrument or sound source to be recorded with respect to the choice of mic and/or EQ/

processor. On becoming familiar through use, it should be possible to obtain product which will accurately transfer to other systems.

In Conclusion

Little has been said about the enjoyment of using these speakers so far, but enjoyment is a strong positive aspect of the "dynaudio acoustics" DA-BM6As; hence the opening statement. Professional visitors who have dropped in for a listen are, to a person, impressed with the detail of the top end. Categories of music used included choral, symphonic, solo operatic, piano, experimental rock, disco, heavy rock, and speech.

Only in the category of heavy rock was the listening experience left a little wanting. Once again, this is not due to any lack of performance, but more an aspect of "flavour".

An ideal speaker system would transport the listener to the original scene of the music or sound event that is to be reproduced. So far, no system is capable of achieving this, even for people with partially impaired hearing. The reasons for this are complex, and research aspires to closing the gap, but in the meantime, close monitoring of sound with the DA-BM6As goes a long way down this road, and is certainly worth a trial.

• Distributed by Amber Technology,
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(No commercial negotiation or advertising deal was undertaken or consumated in exchange for this review).



DUNCAN FRY

PFC. And it doesn't stand for Power Factor Correction

I'm sure that sometimes all of us like to remember how we got into this business. My first venture into the audio business was a rehearsal studio.

Back in the days of Dunk's Disks, the Smoothest Sounds in the South, the shop had way too much space for just selling records and cassettes to its small (and getting smaller) regular clientele.

In a moment of inspiration, I decided to halve the size of it and create a rehearsal area at the rear of the shop.

I enlisted the help of the complete staff of Utopia Sound and Lighting (you can check them out in the Archives section of the ARX website) to help me build a partition between the shop and the back area.

Driving home that evening past some offices that were being remodelled, I saw piles and piles of old carpet and underfelt thrown out and waiting to go to the tip.

'You little Beauty,' I thought, 'just what I need.'

I made about twenty trips back and forth to the shop with great rolls of the stuff piled high on the roof of the 1310 Mini Clubman GT. Not the ideal vehicle for transporting large amounts of anything, but it was all that I had.

The next day, in between being bothered by customers wanting to buy things, we set to work with a vengeance, covering everything in multiple layers of underfelt and burnt orange shag pile carpet - the floor, the walls, the doors, the ceiling.

When we were finished it looked like a carpet fetishist's private hideaway or, as one unkind soul commented, 'more like a padded cell!'

And boy did it smell! A heady combination of water damaged underfelt, cheap carpet, glue, dust and cat's piss! Actually - just like every other rehearsal room I've been in! It didn't seem to bother the customers, though.

I put together a rudimentary system comprising various bits and pieces I'd collected - a pair

of 4560's, an amp, a six channel mixer, and three Shure 585 microphones, probably left over from Sunbury!

In this original configuration I ran the 4560's full range - this was before the great piezo experiment of '86 - they were a bit middy but loud enough, despite being left in the garage for a couple of years. The first 'Check 1 - 2' after they were plugged up sent a family of mice scuttling out of one of them, who ran across the carpet and disappeared out the back door!

Everything worked, though, and I was eager to start recouping some of the massive expenditure (about \$50 all up!) I had outlaid, so I put an ad in Juke magazine for the place -

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....and the phone number.

I had no name for this state of the art pre-production facility, but that problem was soon solved for me by my clients.

The phone rang hot as soon as the ad came out, and the first question all the customers asked was 'how much, mate?'

When I told them it was \$10 for three hours, 7 till 10pm (I figured that was all the neighbours would stand before storming the walls) their only comment was 'Shit, that's Pretty F***ing Cheap!'

So PFC it became!

Soon it was a whole lot more profitable than the shop, being booked solid every night even after I jacked it up 50% to \$15. I registered the business name (initials only, for some reason the complete name was knocked back!) and opened up a bank account.

As he worked his way through the paperwork, the bank manager asked me what the initials stood for.

When I told him, I thought he was going to have a heart attack there on the spot! Luckily he didn't, and lived long enough to sign the papers; PFC Music Services was born. •



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TOM MISNER'S PRACTICAL STUDIO TECHNIQUES

- BASIC SOUND THEORY (Part 9)

COMPLEX WAVEFORMS

Simple sine waves are very common in the world of electrical engineering but they are very rare in the world of music. The sounds from musical instruments are complex blends of many different related frequencies that often form a harmonic series. Many musical sounds consist of a fundamental frequency, which determines the instrument's pitch, and numerous whole number multiples of the fundamental frequency which are called harmonics.

The following shows a harmonically related set of waves based on a fundamental frequency of 200 Hz:

- 200 Hz = Fundamental
- 400 Hz = Second Harmonic (one octave above fundamental)
- 600 Hz = Third Harmonic
- 800 Hz = Fourth Harmonic (two octaves above fundamental)
- 1000 Hz = Fifth Harmonic

RECORDING INFO:

Phase relationships

When mixing a song in the studio, check the phase relationship of all the recorded sounds. If one sound tends to cancel another try using the phase reverse button. If you want to have an instrument sitting left and right only - without a centre image - split the signal into two channels on your mixer, pan them left and right, and reverse the phase on one of the channels.

Most musicians will recognize musical relationships between the individual harmonics. The second harmonic is twice the frequency of the fundamental frequency, which is a musical interval known as an 'octave'. The interval between the second and third harmonics has a ratio of 3:2, which is a 'perfect fifth'. The interval between the third and fourth harmonics has a ratio of 4:3, which is a 'perfect fourth'.

The sound from a musical instrument may also contain frequencies that are not harmonically related, which are often called partials. Every sound has its own unique combination of harmonics and partials, at their own individual amplitudes. This is what gives each instrument its own particular sound or texture, and is referred to as its timbre. By specifying the harmonics, along with their amplitudes and phase relationships, we can generate or copy any musical waveform. Analyzing harmonics from a subjective listener's point of view, we find:

- Fundamental note: Feeling of pitch.
- Second harmonic: Adds fullness and body.
- Third harmonic: Decreases the amplitude.
- Fourth harmonic: Similar to second harmonic.
- Upper harmonics: Feeling of 'edge' and 'attack'.

Valve circuits exhibit a boost of the second and fourth harmonics, resulting in a 'warmer' sound. This explains the lasting popularity of valve microphones and valve guitar amplifiers. Solid state (transistor) electronics exhibit a boost of first and third harmonics, producing a 'harder' sound.

The human hearing mechanism has the ability to create additional harmonics which were not present in the original signal. This is called harmonic distortion, and also occurs in electronic circuits. Our ears are quite tolerant of harmonic distortion because it is harmonically related to the musical content. In most cases it must reach significant

TOM MISNER'S PRACTICAL STUDIO TECHNIQUES

- BASIC SOUND THEORY (Part 9)

levels before it is judged to be objectionable.

WEIGHTING NETWORKS

Weighting networks are used to compensate for the ear's varying frequency sensitivity at different loudness levels. The two types of weighting networks - known as 'A' and 'C' - corresponding to 40 and 70 phons respectively. Measurements made using the 'A-weighted' scale are indicated by the term 'dBA', while measurements made using the 'C-weighted' scale are indicated by the term 'dBC'.

These weighting scales allow us to compare different signals without having to account for the ear's varying frequency sensitivity. In acoustic measurements, sound level meters are usually equipped with the more common 'A' weighting network.

SUMMARY:

The following are interesting points that influence the formation modification of sound:

- 1) Sound is created through the even vibration of a sound source, and noise is created through uneven vibration.
- 2) Sound must have a medium through which it is conducted. Solid objects transmit sound faster than gases or soft materials.
- 3) Sound, if not obstructed, spreads evenly outward from the source.
- 4) Sound in air has a constant velocity (measured at 20°C) of 343.4 metres per second.
- 5) Sound creates a change of air pressure (rarefaction or compression).
- 6) Frequency is measured in Hertz (Hz).
- 7) Pressure is constantly changing in a sound wave.
- 8) Wavelength is measured between adjacent points of maximum pressures. The lower the frequency the longer the wavelength.
- 9) Phase is the time relationship of two sound waves, measured in degrees. A full wavelength equals 360 degrees.
- 10) Harmonics are whole number multiples of the fundamental frequency.
- 11) Every object has a resonant frequency.
- 12) The ear reacts to average level and not to transients.

This is extracted from the top selling book: **PRACTICAL STUDIO TECHNIQUES**, by Tom Misner. ©Tom Misner 1988. ISBN 0 646 16704 9. Retail: \$40.00. Available from book stores and music shops everywhere, also through the Connections Shop, call 1800 635 514. Tom Misner is the owner of SAE International.

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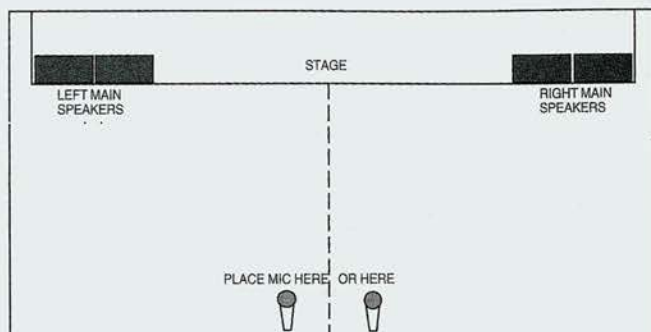


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How to do it

DUNCAN FRY'S LIVE SOUND MIXING

- EQUALIZERS (Part 9)



Basic Room EQ methods

1. Plug a microphone into the console of the same type as the lead vocals, flatten out the EQ on that channel, put the microphone on a stand somewhere around the middle of the room, facing the stacks, pull down all the other channel levels, set the master L/R outputs at about -10db, and bring up the channel level slowly. As the howls and squeals start to appear, bring down the appropriate sliders on the main equaliser. Keep going until you have the level you need.

This 'ringing out' method is very popular, because it works, but is prone to over EQing, leaving you with a PA that won't feed back—sure, but it won't sound any good either.

Remember that your microphones won't be out in front of the speaker stacks, they'll be behind them, and thus not quite so susceptible to setting up feedback squeals. Only pull the EQ sliders down *just enough* to stop the squeals, or you'll take all the life out of the sound. Keep this one handy for monitor tuning, too.

2. Play a CD or tape or DAT that you are very familiar with, and adjust the house EQ until the music sounds the way you think it should. Be very critical, and use the same CD/tape/DAT and songs every night, until you know its sound inside out.

3. Grab our microphone off the stand from method #1, and go "CHECK ONE - TWO" into it. Repeat this as you adjust the EQ sliders until you have a good crisp voice sound from the system, with plenty of 'punch' to it. I know these descriptions might be undefinable, but I'm confident that you'll know it when you hear it! Be alert for any honks or rings that hang on during or after your words, as these are the frequencies that are going to cause trouble.

4. For this method you'll need a pink noise generator. This is a gadget that gives you equal amounts of each frequency from 20 Hz to 20 KHz. They either come together with a spectrum analyser or you can make or buy one.

Put the microphone back into the same position as method #1, and bring up its level to just under feedback. Plug the

pink noise generator into a channel, check that it's running OK, then switch the channel Off. Bring up its fader, switch the channel On for a split second and then Off again. You will clearly hear the room overtones hanging on for quite a while after the original signal stops. Locate the appropriate sliders on the EQ and adjust them until the 'hang on' is reduced as much as possible. Keep going until you have the microphone level you need.

The advantage of this method is that it simulates the way the room will sound when it's full of loud music, and isn't that what you really want to know?

5. A spectrum analyser with a pink noise generator is the basis of this next method. With our microphone still in position #1, run some pink noise into the system as in #4, and read the response on your analyser. If it is full of peaks and dips, adjust the corresponding sliders on your EQ until you get close to a straight line of dots along the 0 or centre line. The straighter the line, the flatter the response. And the flatter the response, the less chance of feedback squeals.

If you can't get close to a straight line, try adjusting the levels on the crossover first, then adjust the EQ. For example, if all of the low frequencies are way above the centre line, reduce the level of the low frequency crossover output until the line of LEDs hovers around the centre line - some above, some below. Then you can adjust the EQ to get a flatter response.

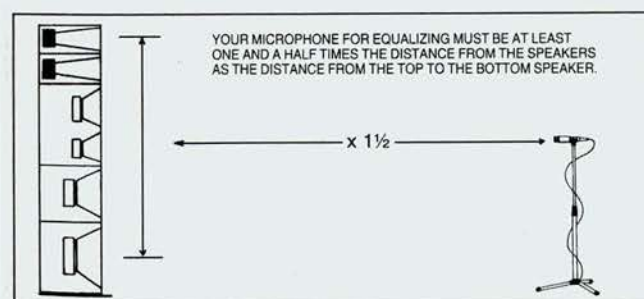
Although analysers usually come with their own microphone, I like to use a microphone similar to one used on stage to run this sort of test, since this gives you the most accurate picture of how the room and the PA system will interact.

Two things here: One, if you've used the singer's microphone, don't forget to put it back!

And two, don't forget to unplug the microphone cable you've been using from the console and **plug the multicore snake channel back in.**

Whenever you are using a spectrum analyser, keep this in mind; what is acoustically flat to a microphone may not sound particularly musical to the human ear. In fact, it will probably sound a bit light in the LOW end and heavy in the HIGH end.

It is a starting point only.



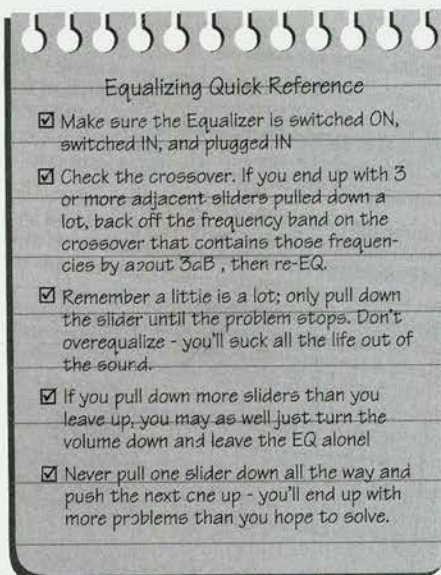
DUNCAN FRY'S LIVE SOUND MIXING

Always let your ears be the final judge of the best sound - that's what they are there for. A spectrum analyser is only a useful tool to give you a visual indication of what's happening acoustically. There are literally thousands of very successful people mixing out there who've trusted their ears and never felt the need to use an analyser.

It is a good slave but a poor master, and not many of them buy tickets to see concerts! Remember at show time there will be lots of ears out there, not analysers.

So where do you start?

I'd suggest using a combination of methods 1, 2 and 3, coupled with a LOT of practice in listening to sounds and picking the right frequency on the equaliser. There is no shortcut for this; it's just



one of those things you have to learn.

EQ'ing the Monitors

See also Chapter 11 - Monitors

All of these methods work for monitors, but as a general rule I'd again suggest using methods 1, 2 and 3 for tuning monitors quickly. They will instantly show you where the problem areas are, so you can pull them down on the graphics.

You'll find that tuning monitors frequently requires a heavier hand on the sliders, so can remove as much chance of feedback as possible. With lead vocal, the microphone position rarely stays constant, so your EQ has to cope with the microphone often getting closer to the speakers than you'd prefer!

EQ'ing the monitors is the one area of mixing that people often have the most trouble with, so see also the troubleshooting section in Chapter 14 - Problems.

This is extracted from the top selling book: **LIVE SOUND MIXING**, by Duncan Fry. © D.R. Fry 1998. ISBN0 646 11235 X. Retail: \$39.00. Available from book stores and music shops everywhere, also through the Connections Shop, call 1-800-635-514.

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Connections

AV PRESENTATION *NEWS*

BIG SCREEN COMES OF AGE

After more than fifteen years dominance by cathode ray tube (CRT) technology for video screens around the world, new developments from the producers of light emitting diodes (LED) have led to considerable competition in the video screen market.

CRT video screen systems from SONY with their Jumbotron range and Mitsubishi with their Diamondvision range have been the main choices of Stadiums and rental operators since 1982 when giant video screens emerged.

Panasonic have an alternative system utilising fluorescent discharge lamps similar to the lamps used commonly in traffic signals. The Panasonic system has been less popular with rental operators because of inherent problems of temperature management with this technology, but Panasonic has been very successful in getting their screen systems into some major venues as a consequence of their major international sponsorship of the Olympics.

The release of pure blue and green LED's from Japanese manufacturer Nichia in recent years has enabled the production of full colour LED video screen systems. The

major benefits from LED are their relatively lighter weight and the longer life expectancy of diodes over CRT.

The major rental company, Screenco, reports that a typical 40 square metre screen can weigh as much as 30% less than a CRT system. The managing Director of Screenco Australia, Clive Potter, says that the lower weight allows them to compete more effectively in Asia— and indeed other parts of the world, because of the lower freight costs.

Mr. Potter tells us that the longer life of LED is not a matter of considerable interest for the normal rental business. It is, he says, an important issue for screens that might be used as advertising mediums and therefore used as much as 24 hours a day.

Screenco is the oldest and largest video screen rental company in the world. The perception for many years has been that they were informally a Sony house because most of their video screen equipment was Jumbotron.

This has been debunked to some extent by Screenco's recent release of their LED systems. They have presented two different models and interestingly have
(Continued on page 48)

Blacksheep acquires Computer Slide Centre

SYDNEY: Blacksheep Productions has taken a huge step towards providing a complete and all-encompassing audio and video production service for the new millennium, with the acquisition of the design and multi-media department of Staging Connections (formerly Computer Slide Centre) this month.

The energetic Ultimo based company specialises in event management, audio-visual staging, video production and multi-media. The new design and multi-media department is a synergistic addition which will broaden Blacksheep's existing corporate services and is a strategic move for the future development of the company.

According to Ben Alcott, Managing Director of Blacksheep Productions, "Their expertise in the area of computer design and animation has a perfect synergy with our video department, enabling us to offer clients a complete package, which extends into the fields of professional Powerpoint Presentations, Web Site and CD-ROM design and production."

The new department will be lead by talented designer and multi-media manager, Debbie Helliard whose extensive experience in print media, packaging and fashion as well as the highly technological area of computerised design will provide clients with exceptional creative resources for their projects.

Blacksheep productions was started by Ben Alcott in 1987 whilst he was a student at Sydney Grammar School. The company is the realisation of a young vision and with this latest acquisition is now set to develop further as a 21st century industry leader, they say.

They are conveniently located on the fringe of the Sydney CBD at Ultimo. Call them on +61 2 9212 7222 or Fax+ 61 2 9212 7018. •





WAY OF THE SCAN CONVERTER

A new range of scan conversion products is now available in Australia from computer to video specialists Analog Way. The product range consists of scan converters, down converters, line doublers and quadruplers, video scalers and interfacing products.

The comprehensive line up of scan converters start from A\$900 and cater to corporate presentations right through to full broadcast studio environments.

The scan vision VHX 470 allows images up to 1024 x 768 to be displayed onto video, with continuous and linear zooming, three level anti-flicker and 16 input format memory functions.

Down Converters are one of their more unique products, which takes very high work station images and converts them down with no vis-

ible artifacts to the native resolution of LCD projectors.

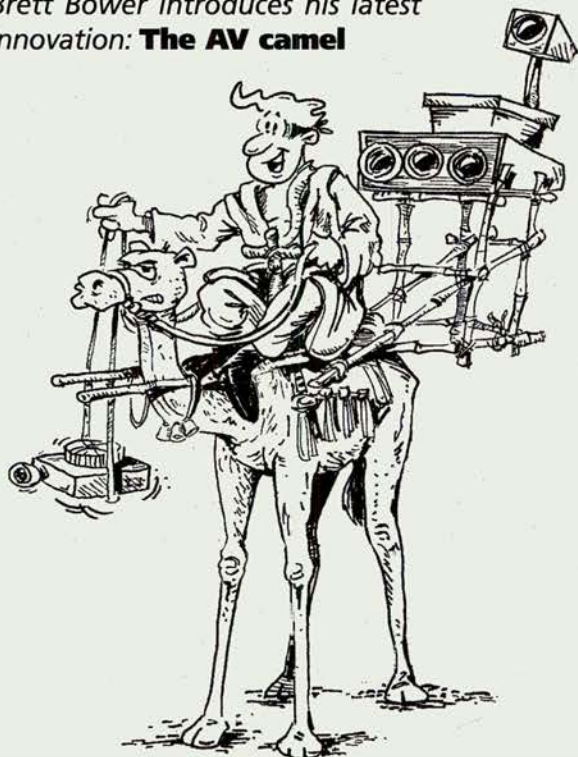
For those who have ever seen the conversion done by most LCD projectors this product would come as a welcome relief.

The recent release of their Transcaler line multiplier (video scaler) is another product designed specifically for the LCD market, converting video into three resolutions, 1024x768, 800x600 and 640x480. Rivalling image quality of line doublers and even quadruplers, video scaling is an increasing popular method of increasing image quality for large screen projection.

Analog way have been producing scan conversion products for over 13 years, supplying to major international companies on an OEM basis.

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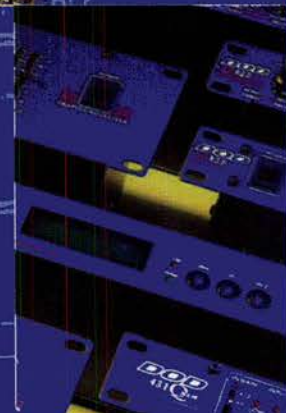


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Brett Bower's ICIA column

The last few years have been tough for the A/V industry in Asia.

On a recent visit to Singapore and Hong Kong I discovered just how competitive this shrinking market really is, with forecasts well down on previous years.

This harsh macro-environment seemed have an up side to it. It has forced companies to re-think the way they approach their sales and marketing and

look at ways to keep clients loyal. Some were diversifying while others were looking to Australia, New Zealand, India and Europe for new business.

In some ways it was exciting to see how competitive the industry had become in order to survive.

There is a strong commitment in South East Asia to not just survive this tough economic period, but to grow businesses and in-

crease market share.

It seems to be the sales staff in these companies are leading the way, not just by making sales but by providing the necessary feedback to management about the local market.

As the local market size has reduced, there is a need to provide an even higher level of service.

One such company is XIN Technology in Singapore. Managing Director Peter Lim says,



"Our sales team have a great deal of contact with prospects and clients, from initial contact through to long after the sale. We build a relationship with our clients. We are partners, and their success means we are successful."

A sales person needs to provide feedback on changes in the market place now more than ever. He or she has the most contact with the client. So they will recognise market trends first providing vital feedback on products and services.

It is also important to make accurate and realistic forecasts when setting targets.

Setting unrealistic targets for your sales team will only demotivate them and they will question their ability when they fail to reach them. It is vital for management to be to reflect on historical trends and the current macro environment when setting company forecasts.

High profile events, such as the Commonwealth Games and public festivals are great opportunities that have publicity value. Send out press releases and tell the local trade press about your latest installation or event.

I am always surprised at companies that don't brag about their latest success.

Always send a picture with your article or press release, you'll have far more chance of having your story published.

Identify new markets and opportunities. Most companies could always penetrate existing markets better by providing existing clients a higher level of service. Remember the old 80% - 20% rule about where your revenue comes from, why keep adding to your client pool when you

please turn the page

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BRETT BOWER (continued)

could build on existing relationships. Everyone knows it costs less to keep a happy client than to find a new one.

The last word comes from Russell Bennet, National Sales & Marketing Manager for Gearhouse Group Australia. Russell says, "Clients aren't silly, your sales staff should sell in a professional manner rather than trying to win on price or gimmicks. Only then will clients respect and trust your organisation. Clients will stay loyal to you even when the other guy is discounting everything."

- Brett Bower

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Kramer: new for A.V. Technology

A.V. Technology have recently been appointed the exclusive distributors of the KRAMER range of video and audio products in Australia.

Headquartered in Israel, KRAMER manufactures a large range of video and audio products.

These include distribution amplifiers, video and audio switchers, interfaces and sync processors including fibre optic video interfaces.

They also have a useful range of "black boxes" such as RS232 extenders, picture-in-picture generators, black burst generators, Y/c to composite and composite to Y/c converters and twisted pair interfaces allowing high quality video and audio signals over simple wiring.

The full KRAMER range is now available through a large range of dealers throughout Australia.

• For further information call A.V. Technology +61 7 5531 3103

SONY AV direct

Sony have introduced a direct sales arm to sell to companies, registered partnerships, and government. A 40 page Audio Visual Direct catalogue has been produced. Corporate sales and marketing manager Ian Lowe says

the catalogue is a valuable guide to Sony's AV products, and is freely available to all.

Call 1800 01 SONY (7669).

Gearhouse reap local market

Australia has become the most successful outpost for the world's leading presentation equipment hire company, Gearhouse Group PLC, with a local sales increase of almost 60 percent over the last financial year.

Gearhouse's 1997/98 financial report reveals the company's Australian division enjoyed record turnover of \$A18.8 million with sales up by \$A7.8 million on last year. The next most successful overseas division was North America, followed by the Middle East and South Africa.

International operating profit jumped to \$A23.7 million with turnover up 40% to \$A191.7m.

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RYLANCE INTRO BULK WHOLESALE AV HIRE

If you hire audiovisual equipment, you would know there is no profit and some risk, in sub or cross hiring equipment from your competition to cover shortages.

If it is not a profitable exercise, you are unlikely to be given the best unit nor can you be guaranteed availability. In addition, there is the politics of hiring from your competition and the issue of their name on the equipment.

There is also the risk when you rent your own equipment to competitors. Will they care for it as you do? Will they scrape your identification stickers off leaving you with a labour intensive cleaning job? Can you be sure that what is returned has all your original components?

(All this adds up to an immature attitude in the AV industry -Ed)

However, Rylance Wholesale Rentals believe that they have come up with a solution with what they say is the most exciting innovation in AV hire since data projection. Quality, specialist AV equipment is now available for sub hires at greatly reduced prices and it is available exclusively to the AV hire industry; it is not accessible to the end user.



"Every AV hire operation can now access the latest release projectors monitors, plasma screens and accessories at 50% off for the first day and 75% off for subsequent days" said Jennifer Rylance. "These are huge savings that we predict will turn around the industry's attitude to sub hiring as being the option of last resort."

"As you can see from the price schedule, there are real incentives to look ahead at your bookings and take the equipment over 1, 2 or 4 weeks. For example an LCD projector for 2 weeks would normally sub hire for \$1575, (6 day rate less 25%), Rylance price

is \$840 saving you \$735."

The service has been introduced by Tim and Jennifer Rylance. Jennifer's family has a long history in hire with her grandfather Leo Sheehan opening one of Australia's first television hire companies in 1960. Her father, Robin White bought the business from his father-in-law in 1970. Then Tim and Jennifer purchased the retail hiring operation Robin White Corporate Presentation Hire this May.

Jennifer explains how Rylance Wholesale Rentals came about. "In the past three years we have been very successful securing large contracts to hire multiple

data projectors and VHS cameras in particular. This built our stock levels way beyond what is required for our retail hire market."

Tim and Jennifer went to the USA and discovered the concept of wholesale hire. "We returned to trial the new service in Queensland," said Jennifer. "As you would expect, the interest was tremendous, but our implementation had some problems. We ceased the trial, but pressure from Staging Connections in particular, ensured the project remained on our agenda."

"We returned to the USA and contacted American Hi Tech Rentals again for some advice. They could not have been more helpful. Once we got used to the idea that their firm owned over 200 projectors including 70 plus Barcos, (\$100,000 plus each), we learned a great deal more about wholesale hire."

Upon returning Tim and Jennifer employed Lynn Bain to oversee the operations of Rylance Wholesale Rentals.

• **Contact Lynn Bain** on 1800 AV HIRE (1800 23 4478) or Mobile: 0414 767 096, or fax 07 3252 0222. Email: info@robinwhite.com.au

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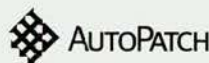


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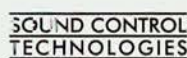
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BIG SCREEN COMES OF AGE

(Continued from page 42)

sourced light elements from two different producers. Their 15mm pitch system was produced by SACO of Canada, and their 20mm pitch uses the product of Lighthouse in Hong Kong.

Screenco's Potter told us that the Screenco group worldwide have spent the last two years investigating LED technology. He said that they had visited numerous manufacturers in all corners of the world and concluded that the majority of producers have almost no idea of the real issues or the level of optical performance required of a commercial video screen.

Potter said that the perceptions by the less well informed that LED systems offered improved performance over CRT and substantial savings in cost over CRT were both fallacies. There are numerous parameters and variables to consider in selecting an LED system. He said that the most obvious was pixel pitch, but just as important are the type of LEDs being used, the number of LEDs per pixel and the viewing

angle being offered. An apparently high resolution screen with a small pixel pitch of say 12mm, but with only three LEDs per pixel, will look far worse than a screen of lower resolution with a higher LED density. In other words, the number of diodes per square metre is a critical factor in defining the optical performance of a screen.

In Australia there have already been a number of LED screens placed into the market. Some, like Screenco's systems and Clipsalvisions wide-angle system have been well received but many other LED screens demonstrated have not lived up to claims of suppliers and certainly have not compared favourably with the CRT Jumbotron and Diamondvision systems that have been available for some time.

Many of the less acceptable screens have offered "high resolution" or "high brightness" and "dynamic pixels", but Potter says that the two most important factors are pixel density and video processing. In

many of the less expensive LED screen systems being offered, the video processing is being managed by a simple PC-based video card processor. Screenco and the major screen producers such as Sony, Mitsubishi, Saco and Lighthouse have opted for high performance video processing and the difference is evident.

Screenco have developed their own processing system using their fifteen years experience in the giant video screen business, and can offer systems now customised to optimise the performance of their screen systems depending upon requirements, be it low-light concert applications or high light outdoor and stadium use.

Screenco advises that is essential to work with a company that has the resources and experience to meet the needs, and will be around long enough to continue to support the product. "At last count we had some 80 companies on our database making, or claiming to make, LED screens" revealed Potter. "Whilst their will be

enormous demand for these screens for all sorts of applications, we don't believe that more than a dozen or so of these companies will survive in the long term".

Screenco's investment this year in new screen systems is nearly \$20 million. Nearly 75% of that amount has been for LED systems in both modular and mobile form. In Australia Screenco can offer six 50 square metre mobile systems, 60 square metres of Jumbotron modular and nearly 100 square metres of modular LED. All Screenco's LED stock is high brightness and wide-viewing angle. In the next couple of months Screenco is adding additional LED mobile screens and some new indoor high resolution LED screen systems as well.

• By Marguerite Hunter.

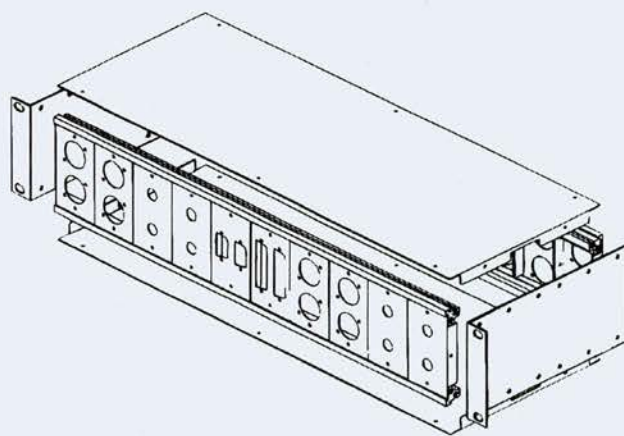
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Letters

Cassette Kid

'The Cassette Kid's' tape cueing disasters (*Connections* Sept '98) brought back painful memories of a cassette catastrophe I was involved in a good few years back.

The event was a boxing match at The Sydney Entertainment Centre that was going live to an American cable network. Audio and lighting was supplied in house and the pre event production meeting with the client occurred at about 3 minutes before the first bout and went along the lines of:

Me: "Is there a running sheet yet?"

Client: "No need, I'll let you know when somethings going to happen."

Me: "Well are there any national anthems or audio inserts we should know about?"

Client: "Nah I think the T.V. guys are taking care of that."

The audio engineer (let's call him Garry 'cause that's his name) dives for the coms to talk to the truck.

"No we thought you guys were doing it".

The client returns to the desk just as the bikini clad flag carriers enter the arena.

"Here play these when I tell you" he said offering 2 audio cassettes. "They're both cued and (pointing to one) thats the American, play that first".

With no time to check, in goes the tape and the play button was pressed. It could have been Uganda or maybe the United Arab Emirates. however, we knew pretty quickly that this was not the anthem of the United States Of America.

Garry hits the pause button, grabs the headphones and in an amazing exhibition of his craft manages to find the Star Spangled Banner in about 20 (long) seconds.

The audience thought it was terrific because they could whistle at the girls for a whole lot longer. God knows what the folks back in the States thought.

The lesson: always have at the ready, national anthems on disc.

For those interested, the CDs I bought (the next day) were: Collections Of National Anthems Vol 1 & 2 by The Regimental Band Of The Coldstream Guards. On Denon catalogue numbers CO - 74500 and CO - 74501. Hard to find but worth the effort.

The national anthem of Gabon is a corker.

**-Arthur Carruthers,
Sydney Entertainment
Centre.**

Letters to:

mail@conpub.com.au or- fax
+61 2 9876-5715 or- PO Box
439, Epping NSW 2121. We
must have a name & number.

Drug testing

This is about an issue which strikes terror into the hearts of many people I work with.

Mandatory drug and alcohol testing.

It is already practiced in some North American venues, and is imposed upon all employees and contractors on site. The venue itself may impose a black ban on anyone testing positive.

Myself I only worry about the drink. After a show I will have a few, then stagger into bed for sometimes just a few hours before an early call.

I'd hazzard a guess and say that at one of those calls I'd register *some* alcohol in my system— but not enough to cop a DUI charge.

Many of my colleagues smoke hash, drop speed, and generally push the envelope. But never at work. Testing worries me.

- Name withheld by request

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SHOWS WE'VE SEEN LATELY A PUNTER'S PERSPECTIVE

The BOY from OZ



Peter Allen wrote a few truly vomitus songs, but many more which touch the soul. Fortunately *The Boy from Oz* has enough storyline to paper over any musical misgivings you may have. It is a very good musical.

Peter Davidson's set design at the Theatre Royal was simple yet effective, a giant revolve brought a spiral staircase forward when required, mirrored flats hinged open at stage rear while a white grand piano was wheeled on and off to suit the scene.

Lighting by Mark McCullough is entirely suitable for what is most times an upbeat and exuberant production, mapping the life and times of Allen. Dramatic moments are suitably so. The Vari-Lites are virtually invisible, and obviously used as automated luminaires instead of effects. Allen's former lover Greg Connell was also his LD, so the storyline referred more than once to The Lights.

Sound designer John Scandrett (System Sound) deserves credit, he managed to get every word of dialogue intelligible while keeping level down and getting the mix design right. The sound was excellent in the seventh row where I sat - Julius saw the show sitting in Siberia Lp in 'The Gods', (Seat 54L) and reports no compromise in audio quality. He was highly impressed by this!

There is obviously a good yarn and a lot more behind how this show took to the stage, assisted by Garry McQuinn's production management firm Stage Business.

Australian Producer Ben Gannon teamed with UK impresario Robert Fox to create the show, the strength of which rests greatly in the hands of Director Gale Edwards.

The character roles are brilliant, Chrissie Amphlett uniquely qualified to play Judy Garland - and Todd McKenney is a great Peter Allen. Angela Toohey plays a vapid and fluffy Liza Minnelli and her physical likeness is uncanny.

Julius commented that he didn't wildly enjoy all of the musical arrangements, which he said occasionally missed the feel of the era - guess at his age he's more qualified to say that! "The Bandstand song in particular had too much chunky guitar, before guitar got chunky, brrr tish, tosh - it's a fab show, playing to full houses," said Julius, who still uses the word 'fab'.

As a story, Peter Allen's life was huge. It is kind of sad that his big Broadway show, *Legs Malone*, stiffed it so thoroughly. The musical glosses over this and simply features Allen sacking his long time manager, Dee Anthony, in a dispute over the ordinariness of that show.

Despite his career highlights, Peter Allen had to die to become a success on the theatrical stage.

• *Cat Forcer*

Theatre Backstage **NEWS**

Compiled by Mandy Jones

Venues

Theatre North Inc. of Launceston are the new managers of the Princess Theatre and Earls Art Centre. Changes at the Princess include refurbished kitchen and dressing rooms, and a safety guard from the Fly Floor to the stage; and technical improvements at the Earls Art Centre feature a 48 channels Jands Event Plus and the installation of two additional LSC dimmer racks. Technical and FOH staff are undergoing OH&S training including fire awareness.

• A \$25 million Federation Fund grant will give **NIDA** a range of new facilities including a 750 seat theatre. Other facilities funded by the grant are the construction of a studio sound stage with post production facilities, rehearsal space and a multi-media performance library.

• Hobart's historic **Theatre Royal** has been labelled a fire trap by outgoing general manager Anne Warwick. Warwick says \$1 million is needed to bring the oldest theatre in Australia within OH&S guidelines. Overdue works include extensive rewiring, replacement of stage lights, replacement of circuit breakers, testing of all electrical equipment, and replacement of hardware and droppers on fly wires.

• Construction on the **Docklands Stadium** continues on target with its 2000 completion date. System Sound, Bytecraft and Key Largo have been appointed by Nationwide Venue Management as specialist consultants.

Shows

• **Shirley Bassey** will join the Australian cast of *Grease* the Concert Spectacular on the New Zealand leg of their tour. The legendary Welsh singer will replace Anthony Warlow in the role of the Teen Angel.

• **The Really Useful Company** have announced a new co-production with Ross Mollison Group of *Cats*. The Andrew Lloyd-Webber musical will be staged in a 6000 sq m custom

built, multi million dollar circus tent with a seating capacity of 2000 people. It'll tour to 60 locations across Australia and New Zealand over a two year period. While the show will be the same as the theatre version, additions such as added acrobatic sequences are expected.

People & Companies

• Congratulations to **Mrs Edna Edgely, AM** and **Mr Kenn Brodziak, OBE**, the recipients of the inaugural James Cassius Award 1998 for outstanding contributions to the industry. The awards were presented at a dinner organised by the EIEA and featuring performances from the musicals currently playing in Melbourne.

• **Audio and Recording** recently provided audio production services for the *Carnivale* and *SOCOG Five Rings Concert* on the Aquashell at Darling Harbour. They also supplied a 52 Channel RAMSA SX-1 to Better Music in Canberra for their recent production of *Carousel* at the Canberra Theatre.

• **Theatrical Supplies of Australia** have advised that prices for theatre fabrics have been affected by the fall in the value of the dollar. Ninety percent of the fabrics used for the production of on-stage drapery are produced off-shore. Contact TSA.

• **The Australian Bureau of Statistics** have released a report on the Performing Arts Industries in the period 1996 - 1997. Employing businesses in the performing arts industries accrued total income of \$1,281 million and incurred total expenses of \$1,245 million in that period. The industries employed 13,359 persons at the end of June 1997. Contact the ABS for a copy.

• The **EIEA** have developed a Producers Kit which is a valuable reference for newcomers to the entertainment industry. Covering areas such as Setting up a production, How to make money in Showbusiness, Insurance and Raising finance, the kit also includes sample contracts for performers and crew.

Studio directory

These are the Studios & Replication Houses who responded to our call. There are many others! If you'd like to be included next time, please get in touch with Nicole Morris at Connections.

NSW

A# Sharp Studio

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Fax: (02) 9541 1518
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Web site address: www.airwavesound.com.au
Contact Name: Carlie Gosson
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Albert's Studios

48 Track Recording & Mixing Studios
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Fax: (02) 9953 9263
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Aphek Recording Studio

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Fax: (02) 9868 5435
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Email: mail@audiorecording.com.au
Web site address: www.audiorecording.com.au

Contact Name: Ian Richardson
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Web site address: www.ausnet.net.au/~crow
Contact Name: Marshall Cullen
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Contact Name: Ike
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Studio directory

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ShowSafe

Australian Entertainment Industry Health & Safety Association

Critics answered: safety CANNOT be a political tool

The objectives of ShowSafe are to promote and facilitate a safer work environment in the entertainment industry.

You'd think anything but, if the reaction of a few people in the past month is any indication. ShowSafe reorganised itself in September, and as a result Julius Grafton (Connections publisher) was elected as secretary. This produced some narky adverse comment in the trade, that he would 'use' ShowSafe for his own objectives. He replies thus:

"Sniping about me is sometimes understandable because Connections can be controversial. ShowSafe is important. I was elected to do a job, and I will. I haven't owned any interest in a production company for some time. I don't understand how I can 'use' ShowSafe. I am interested in seeing ShowSafe prosper, and hope that the organisation can, once again, present Seminar, Workshop and Conference topics at and around the next ENTECH - in March 2000. ShowSafe benefited to the tune of some thousands of dollars from doing that this year, so I think any sane person would agree that such an alliance is constructive".

"The workload at ShowSafe is heavy and no-one is paid. ShowSafe is full of good people, and is always looking for more volunteers."

WEBSITE: Just key in showsafe in your browser

ShowSafe has a new website, courtesy of Netline and Personal Internet Services. The site, at www.showsafe.com has a webboard, (discussion centre) which has already generated over a hundred discussion points on ten conference topics. It's all about safety, so log on and have a look. •No .au in the address, just key showsafe alone into your location field.

CONFIDENTIAL REPORTING SYSTEM (CRS)

This was launched last month and has proven VERY effective. It is a means for people to report safety issues, where management are either unprepared to listen and fix, or where some discomfort exists that perhaps career prospects may suffer as a result of a complaint.

ShowSafe has already fielded a series of complaints, covering a variety of typical and less obvious safety issues. In each case, the identity of the complainant is kept strictly confidential, and the management are contacted. In every case so far, the risk has been removed.

Managements have been appreciative that the opportunity to rectify a problem has arisen, as opposed to facing the tragedy of suffering an accident, or getting a court summons from a workplace organisation like WorkCover. ShowSafe IS prepared to refer and name recalcitrants.

ShowSafe feel that beyond the immediate issues raised with venues, perhaps in some cases some HRM study should be done to identify the cultural problem which prevents staff communicating with management.

INDUSTRY ISSUES

• **ShowSafe is circulating a proposal for 45 amp cable and plugs on portable dimmers.** See our website for details, or members can call us for a copy. Membership can be purchased online or over the phone.

• **Noise :** Once again, see our website. Venues Unlimited Pty Ltd was fined \$3,000 in Brisbane last month for exceeding the workplace limit. This is a national issue and EVERY audio person and venue manager needs to be aware of current limits and laws. You'll be surprised.

• **Uniform workplace safety policy, framework.** This is the basis on which ShowSafe seeks a uniform approach to a national workplace safety policy. We need your input, so please see the website for more.

Membership: Individual A\$50, Institutions A\$200

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ARTIST	PRODUCER	ENGINEER	PROJECT	ARTIST	PRODUCER	ENGINEER	PROJECT
New South Wales							
Damien Gerard Studios Marshall Cullen (02) 9660 8776. 2" 24 Track/ 1/2" 16 Track				Rockinghorse Zubin Henner (02) 6688 4005. Music Recording with Neve desk, 24 track Studer & PT 24			
Alex Lloyd	Daniel Denholm	Dave Trump	Album Transfers	Spin	Christian Pyle	Anthony Lycenko	Album
Geraldine Turner	Brian	Russell Pilling	Album Mixing	Liz Nankervis	Zubin Henner/Artist	Zubin Henner	Music for Documentary
Pete Wells	Pete Wells	Russell Pilling	Album Tracking	Terry Nelson	Artist	Anthony Lycenko	Album
Flywheel	Band	Russell Pilling	Album Mixes	Alan DeVendra	Jo-Soledad	Zubin Henner	Single
Elia Bel	Marshall Cullen	Dave Sweet	Remixing	Geoff Andrew	Artist	Anthony Lycenko	Demo
War Button	William Bowden	Dave Trump	EP Recording/Mixing	Load	Band	Anthony Lycenko	Tracking
Darling Harbour Studios Ike (02) 9211 1474. 24 Track 3 Channel SWS				Saturation Level Wayne (02) 4730 4742. 16 Track ADAT & Logic Audio			
Disfigured	Band/Ike	Ike	EP	Saturation	Wayne	Wayne	Demos
ZRose	Mr Riff	Ike	Demos	Drunken Drummers	Wayne Grech/Mark Lucas	Wayne	EP
Lice	Band	Ike	EP	Sony Studio Sarah (02) 9383 6461. Recording Studio			
Kelp	Ike	Ike	Single	Wanderlust	Band	Ross A'Hern	Record CD
Sugar Fix	Band	Marah	Demos	Atmosphere	Band	Ross A'Hern	Record CD
The Incident	Ike	Ike	EP	Voice Of Love	Simon Tonx	Simon Tonx	Record/Mix CD
Feral Studio Jon Robertson (02) 6299 3224. 16 Track Analogue				Robin Hood	Roger Boreham	Tod Deeley	Record/Mix Single
Monypeni	Jon Robertson	Jon Robertson	Demos	Cherry	Michael Szumowski	Tod Deeley	Record CD
Exhibit A	Jon Robertson	Jon Robertson	Album	Mothers Little Helpers	Band	Tod Deeley	Record CD
The Rug	Jon Robertson	Jon Robertson	Album Tracks	Soundwarp Meredith Brooks (02) 9905 7144. Mastering			
The Lads	Band	Jon Robertson	Demos	Marilane	Marilane/Mark	Meredith Brooks	Album
Gayle M	Jon Robertson	Jon Robertson	EP	Salt	Mick Newton		Album
Festival Mastering Bianca Vukelic (02) 9395 8000. Mastering				Carlo	Carlo	Meredith Brooks	Album
Fendahlene	Band	William Bowden	Album	Duncan Wheeler	Artist	Meredith Brooks	EP
Drop City		William Bowden	Album	Lata	Kiran	Meredith Brooks	EP
Hardcore Solutions	Scott Harper	William Bowden	Compilation Album	Bernie Lynch	Artist	Meredith Brooks	Album & Paris 98
Adam Brand		William Bowden	Single	Studios 301 Mastering Jacqui Espie (02) 9211 7301. CD Mastering Facility			
Dogbuoy	Kalju	William Bowden	Album	Tim Rogers	Paul McKercher	Don Bartley	Solo Acoustic Album
The Cooks	Chris Campbell	William Bowden	Album	Hunters & Collectors	Band	Don Bartley	Live Album
Festival Studio Bianca Vukelic (02) 9395 8000. Recording				Regurgitator	Band	Steve Smart	Single
Lavish	Clint Mansell	Mark Thomas/Matt Lovell	Album	Antennae	Antennae	Steve Smart	Album
Paul McDermott/GNW	Paul McDermott	Keith Walker		Hoodoo Gurus	Band	Don Bartley	Live Album
Frank Bennett Project	Michael Stavrou	Michael Stavrou/Matt Lovell	Album	Suze Di Marchi		Con Bartley	Single
JMF Recording Studio Fran Esther (02) 9790 4097. X850, 24 ADAT, 24 Track Analogue				Top Cat Recording Studio Brad Wann (02) 6628 0843. Automated 24 Tk Analog. 1"-16 Tk Digital			
Sodium	Band	Mike Ward	Demo	Side Project	Band	Brad Wann	EP/CD
Fearless Management	Phil Morello	Mike Ward	Demo	Krazelna	Brad Wann	Brad Wann	Album Mix & Mastering
Steve Lee	Steve Lee	Ralph Esther	Demo	Paul's Fish Cafe	Brad Wann/Graham Ward	Brad Wann	Album Mix
Guinn Regal	Dave McMillan	Ralph Esther	CD Album	David Gordon	Artist	Brad Wann	Album Demo
Remy Australia P/L	Ralph Esther	Mike Ward	Voice Over	Souljire	Brad Wann	Brad Wann	Album Tracking
Cold Turkey	Band	Guy Saminaden	CD Album	Chillblane	Band	Brad Wann	EP/CD
Lucinda Street Recordings Rick Mostyn (02) 4229 1169. Digital 8 Track & Post				Trackdown Digital Simon Leadley (02) 9550 6890. Music/Post/Recording			
Awkward Partners	Rick Mostyn	Rick Mostyn	Live CD	Various	Matt Carroll	Simon Leadley	Passion - Feature
Conservatorium Of Music	Professor C. Pompilli	Rick Mostyn	Annual Scholarships Awards		Brilliant Interactive	Tim Ryan/Torei Lista	Ace Ventura CD Rom
Enemy Me	F. Marcias	Rick Mostyn	Live CD		Brilliant Interactive	Tim Ryan/Torei Lista	Popeye CD Rom
Megaphon Guy Dickerson (02) 9550 6576. 24 Track Analog & DA88 Digital Recording					Binaburra Films	Simon Leadley	Feeling Sexy Music
Nitocris	Band/Lachlan Mitchell	Lachlan Mitchell	Album Tracks			Tim Ryan	Thunderstone ADR Record
White Trash Orchestra	Paul Mac	Trent Williamson	Album Tracks	Velvet Sound Recording Studios Dave McCunn (02) 9283 5968. 32 Ch. Automated 24 Track 2" Analogue			
Azeruz	S. Riley/C. Abrahams/S. Wishart	Shane Fahey	Album Mixes	Sandy Klose	Tony Wall/Artist	Tony Wall	Album Tracking
Tim Gaze	Mike Gupp & Jim Conway	Guy Dickerson	Album Mixes/Overdubs	James Blundell	Artist	Greg Harris	Tracking TV Ad
Tumbleweed	Phil McKellar/Band	Phil McKellar	Overdubs	Skinbus	Tony Wall	Tony Wall	EP Track/Mix
Kiva	Paul Mac	Trent Williamson	Album Tracks	Frank Bennett	Michael Paul Stavrou	Michael Paul Stavrou	Album Tracking
Morrison Music John Morrison (02) 9901 4414. 32 Track				Yeska	Charles Fisher	Tony Wall	Album Tracking
James Morison	John Morrison	Morrison Bros	Special Edition 3 CD Set	Welter	Elliott Weston/Tony Wall	Tony Wall	Album Tracking
Kathrine Hunter	John Morrison	John Morrison	CD				
Joel Davis	Artist	John Morrison	Demo				
Nu-Town Studio Greg Hopping (02) 9516 3306. 16 Track Anna/32 Track Digital							
Mary Kiani	Hopping/Nevin	Greg Hopping	Single	Queensland			
Power Play	Leon Berger	Sofie Loizou	Demos	Domenic Sound Shane Hughes (07) 3216 5187. 32 Track ADAT/Release Duality			
Paul Nee	Sofie Loizou	Greg Hopping	Single	The Age	Shane Hughes	Shane Hughes	Album Final Mixing
Jim Shipstone	Greg Hopping/Artist	Sofie Loizou	Demos	Old. Health Department	Lee Ingram	Shane Hughes	Infomercials
John Loughnan	Artist	Greg Hopping	Demos	Stewart Paxton	Shane Hughes	Shane Hughes	Demo
Skunk	Sofie Loizou/Greg Hopping	Greg Hopping		One Humanity	Jane Shrapnel	Shane Hughes	Promotional Song
Paul Bryant Mastering Paul Bryant (02) 9748 0222. Mastering Suite				Rhonda Tant	Shane Hughes	Shane Hughes	EP Debut
Ray Beadle	Jeff Cripps	Paul Bryant	CD Album	Hot FM Network	Shane Hughes	Shane Hughes	Jingle Production
Kinderjazz	David Llewellyn	Paul Bryant	CD Album	CPM Studios Daniel (07) 3374 0066. 24 Tk. ADAT, Mackie Console			
Swing Team	Rod McCormack	Paul Bryant	CD Single	Gambles Goat	Daniel/Band	Daniel	EP
Eartheater	Jeff Cripps	Paul Bryant	CD Single	Mick Sheedy	Daniel/Artist	Daniel	EP
Grant Petersen	Phil Scorgie	Paul Bryant	CD Album	The Big Easy	Dave Drummond	Daniel	Single
Blues Doctors	Tim Gaze	Paul Bryant	CD Album	Chord On Blue	Daniel/Band	Daniel	EP
Powerhouse Studios Doug Henderson (02) 9318 1220. 32 Input Neve Console, 24 Channel Studer				Group Hug	Daniel/Band	Daniel	Album
Brenda Starr	Band	Peter Blyton	CD Album	Awesome Bros	Daniel/Band	Daniel	EP
Victor Talema	Artist	Greg Stace	CD EP	Stanier Studios Rob Stanier (07) 4778 4058.			
The Bone Heads	Band	Peter Blyton	CD Album	Jeyson Watkin	Rob Stanier	Rob Stanier	Album
The Cleavelands	Band	Mark Worrall	CD Album	Sunshine Leon (07) 3252 2872. Classic Neve Desk			
Angela Forti	Berger/Henderson	Doug Henderson	CD Album	Chill Buds	Leon Prescott		EP
Yannis	Berger/Henderson	Doug Henderson	CD Album	Lucy Beagle	Mark McElligott		EP
Q Recording Richard Muecke (02) 9212 4851. 2" Analogue Recording & Mixing				Palladium	Mark McElligott		EP
Spiderbait	Phil McKellar	Phil McKellar	Tracking	Aquanaught	Mark McElligott		Demo
R & R Recordings Studio Robert Zimola (02) 9672 4494. 16 Track 1" Analog				Vandersound Studios Eric Vandersande (07) 5546 8100. ADAT/XT, HDR, O2R, Mastering			
Kristy Lee	K.L. Entertainment	Rob Zimola	Album	Ian Francis	Eric Vandersande	Eric Vandersande/Andrew Hines	Album Edit &
Ged Zarb	Artist	Rob Zimola	Single	Rough Mix			
Raw Studios K. Ballard (02) 6557 0667. 16 Track Digital Studio/CD Burning				Nadir	Andrew Hines	Andrew Hines	Album Edit & Mix
Weeve	Band	Kevin Ballard	Single	David Damel	Eric Vandersande	Eric Vandersande	Mastering
Pete Burton	Kevin Ballard/Artist	Kevin Ballard	Album (Mixing)	Geoff Healey	Eric Vandersande	Eric Vandersande	Mastering
Emma Quinell	Kevin Ballard	Kevin Ballard	Demos	Lyn Dickson	Eric Vandersande	Eric Vandersande	Special Project
Mr Steenky	Kevin Ballard/Band	Kevin Ballard	Album	Green Room	Eric Vandersande	Eric Vandersande	Edit Mix & Master
Roam Around Sound Angus Kingston (02) 9810 8121.							
Colourblind	Mark Gephart	David Trump	Album				
The Whitlams	Tim Freedman	Angus Kingston	Demos				
Professor Groove	Band	Angus Kingston	Live Album				



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ARTIST	PRODUCER	ENGINEER	PROJECT	ARTIST	PRODUCER	ENGINEER	PROJECT
South Australia							
Adelaide Tape Duplicators	Al Sankauskas (09) 8212 7111. Mastering/Duplication			Wombat Road Studio	Barrie Clissold (03) 5145 4204. 32 Tk. Digital, 16 Tk. Analogue		
Ricochet			CD Release	The Camel Beads	Band/Barrie Clissold	Barrie Clissold	Demo CD
Radio Station 5AA			Mastering/CD Release	The Cutters	R. Cross	Barrie Clissold	Demo Tracking
Quro			CD Release	Tinkers Cuss	J. Corby	Barrie Clissold	Album Tracking
Pure Bristle			CD Release	C.R.C. Traralgon	P. Cavenagh	Barrie Clissold	Album Tracking (On Location)
Assembly of God Churches			CD Release	Various	R. Machin/D. Roberts	Barrie Clissold	CD Mastering
Adelaide Football Club			Tape Release	Project 4	T. Austria	Barrie Clissold	Demo Tape
Disk-Edits	Belinda Kent (08) 8340 1377. Master/CD Manufacturing			Yo! Studio	Francois Blovin (03) 9386 5303. 32 Tk Digital on Cubase VST Mixing, Editing, Composition		
This Is Australia	Rising Star Music	Neville Clark	Mastering/Album	Elle Walker	Francois Blovin/Artist	Francois Blovin	Album
Hippocrene	Mick Wordley/Steve Fieldhouse	Neville Clark	Mastering/EP	Duncan Rae	Francois Blovin/Artist	Francois Blovin	Album
The Seen	Band/Travis Young	Neville Clark	Mastering/Album	Sequoia	Francois Blovin	Francois Blovin	Single
Terlingie	Band/Cran Wilton	Neville Clark	Mastering/Album	Lovecraft	Francois Blovin	Francois Blovin	Album
Angela Priess	Artist/Martin Kubitzky	Neville Clark	Mastering/Album	Sonia Bergeron	Francois Blovin	Francois Blovin	Demo
Snapperhead	Brett Sody/B. Sweeney	Neville Clark	Mastering/EP	Dean	Francois Blovin	Francois Blovin	Demo
Fat Trax	David Grice 0412 495 578. 32 Track Digital Studio			Western Australia			
Bay Royals Marching Club	Artists	David Grice	Marching Tape	Bonsai Recording Studio	Tom Thorpe (08) 9246 4406. 24 Track Analogue, 32 Track Digital		
Mercy Seat	Band	David Grice	Demo	Sue Bluck	Tom Thorpe/Artist	Tom Thorpe	Album
The Tomahawks	Band	David Grice (-hippo Audio)	Album	Kay-Redman	Tom Thorpe	Tom Thorpe	Jingles
Industry Studios	Rob Transini (08) 8232 3088. Music Record, Remix & Mastering			Brett Greenfield	Tom Thorpe	Tom Thorpe	Demo
Kate Battersby	Rob Transini/Battersby	Rob Transini	Album	Matt Williams	Tom Thorpe	Tom Thorpe	Demo
Sam Willoughby	Rob Transini/Battersby	Rob Transini	Album	The 2-Ins	Tom Thorpe	Tom Thorpe	Demo
Nick Love Productions	Nick Love (08) 8297 6519. Producer/Engineer			Pinnacle Recording Studio	Anthony B. Kitson (08) 9382 1528. 24 Track 2", Hard Disk, AMEK Angela		
Boom Box	Nick Love	Nick Love	Single	Giftbox	Band	Anthony B. Kitson	Demos
Revolvar	Nick Love	Nick Love	CD EP	Round	Anthony B. Kitson	Anthony B. Kitson	Demo/Single
Lessie Does	Nick Love	Nick Love	CD EP	Livid	Anthony B. Kitson	Anthony B. Kitson	Demo
Pariah	Nick Love	Nick Love/Walrus	CD EP	Big Boss Beaver	Anthony B. Kitson	Anthony B. Kitson	Album
A.S.D.	Nick Love/Band	Nick Love	CD Album	Cartman	Anthony B. Kitson	Anthony B. Kitson	Demo
Finelines	Nick Love	Nick Love/Walrus	CD Album	Joker	Anthony B. Kitson	Anthony B. Kitson	Demo
SA Recording	Rino Cufone (08) 8281 9900. Yamaha 02R/ADA 24 Track			Poons Head	Rob/Sam/Blush (08) 9339 4791. 60 Track		
7 Stars Battle Of The Bands				Honey	Rob Grant	Rob Grant	Mastering - Album
Childs Play	Band/R. Candido/L. Panayiotou	Louis Panayiotou	EP	Senor Lopez	Rob Grant	Rob Grant	Recording/Mixing
Captain Pyjama	Band/Mr K/Walrus	Louis Panayiotou	Album	Paradox	Alfredo Malabello	Rob Grant	Mastering
Compilation	Mr K/Walrus	Louis Panayiotou	Album	Mission Blue	Rob Grant	Rob Grant	Recording/Mixing
"the fridge" Nigel Sweeting	(08) 8231 3588. Digital Non Linear Full Automation			Zanic Art	Rob Grant	Rob Grant	Recording
St Dominics School	Danny/Nigel	Nigel	CD Mastering	Kissing Tree	Rob Grant	Rob Grant	Mixing/Mastering
Giraffe	Band/Nigel	Nigel	CD Tracking	Revolver Sound Studio	Vic Manfrin (08) 9272 7505. 32 Track Automated		
Glass Eye	Ray Smith	Nigel	Demo	Crawl Space	Band/Ben Glatzer	Ben Glatzer	Single/Album Tracks
Southgate Productions	Leslee/Nigel	Nigel	Trent Nathan "India" Release	Solid State	Band/Ben Glatzer	Ben Glatzer	EP CD
Jelelah	Band/Nigel	Nigel	CD Tracking	Viable Options	Band	Ben Glatzer	Single
House Of Harlequin	Band	Nigel	Demo	Thumb	Band/Ben Glatzer	Ben Glatzer	Single Mastering
Victoria				Turnstile	Band	Laurie Sinagra	CD
Chris Wilson Recordings	Chris Wilson (03) 9544 7026. 16 Track Digital Music Production for CDs or demos			Love Camp 7	Band	Vic Manfrin	EP CD
Rose Haden	Chris Wilson	Chris Wilson	Indie CD	The Sonic Lab	Mark Whitehouse (08) 9375 3902. Mastering Facility and Duplication		
Maria Pellicano	Chris Wilson/Artist	Chris Wilson	Indie CD	Matt Angel	Artist	Mark Whitehouse	EP Mastering
Crystal Mastering	Joe Carra (03) 9326 2318. CD Mastering/Sonic Solutions			Thunder Shuffle		Liam Collins	Album Mastering
Swervedriver		Joe Carra	Mastering Singles	Jaylee's	One Man's Journey	Mark Whitehouse	Album Restoration and
Even	Band	John Ruberto	Mastering Singles	Mastering			
Sprung Monkey		Joe Carra	Mastering Singles	Gas Quaa	Band	Mark Whitehouse	CD Mastering
Johnny Chester	Artist	John Ruberto	Mastering Album	The Jury	Craig Ballantyne	Mark Whitehouse	CD EP Mastering
Plasticine		John Ruberto	Mastering Singles	Cory Madrigali	Artist	Mark Whitehouse	CD Mastering
3RRR	Brendan Watkins	John Ruberto	Mastering Live Album	Northern Territory			
Dex Mastering	Adam Dempsey (03) 9372 2266. Pro Mastering & Restoration, 2 Suites			Caama Music	Rich Micallef (08) 8952 9205.		
Doug Owen	Bryan Conway	Adam Dempsey	Remasters - 3 Albums	Le Herstick	Allen Murphy	Stan Satour	CD Album
Busy Fingers	Band	Adam Dempsey	EP	Nanga	Allen Murphy	Stan Satour	Debut CD
Sue Ogilvie	Artist	Adam Dempsey	EP	Warren Williams	Stan Satour	Steve Tranter	Song with John Williamson
Doc Watson	Bruce Williams	Adam Dempsey	Interview (Restoration)	Masters Studio & Production	Lindsay Masters (08) 8932 1754. DA38 & MIDI		
Billy Hyde	Ken Volaris	Adam Dempsey	Commemorative Album	Territory Boys	Lindsay Masters/Band	Lindsay Masters	2 tracks
Miriam Morris	Artist	Ben Hurt	Album	Annamiek Wilson	Lindsay Masters/R. Wilson	R. Wilson/Lindsay Masters	EP
Jam Hut	Mendo (03) 9947 1023. 16/24 Track with Valve Pre Amps			J. Moberg	Lindsay Masters	Lindsay Masters	Demo
Amobea	Band/Sebatron	Sebatron	Album	YOUR BASF TRADE SALES OUTLETS:			
Who Killed Kenny	Sebatron	Sebatron	Demo	NSW:	Audio Visual Designs (02) 9281-2444,		
Metropolis Audio	Fleur Colvin (03) 9696 2111. Music Tracks & Post				Silver & Ballard (02) 9439-5355,		
Brown Hornet	Band/Chris Dickie	Chris Dickie/Hadyn Buxton	EP		Independent Tape Services (02) 9436-0666		
Human Nature	Band/Doug Brady	Doug Brady	Mixing Single	VIC:	CATS (03) 9529-3177,		
Brian Cadd	Brian Cadd/Ern Rose	Ern Rose/Simon Pavone	Album		Chapple Tape (03) 9580-6620,		
Music Lab	Elwood Dean Horler (03) 9531 6627. 32 Track Music Production				DEX Audio (03) 9372-2266,		
Richard Zartorski	Artist	Dean Horler	Album		MTA & Assoc. (03) 9819-6455		
A Cat Called Monty	David Jennings	Dean Horler	Album	SA:	Adelaide Tape Duplicators (08) 8212-7111,		
Jeff Warner	Dean Horler/Artist	Dean Horler	Album		Pro Media (08) 8276-6793		
Lucky Face	Hammond Robinson	Dean Horler	Album	WA:	Ausmag (09)314-1953,		
Toyland	Adam Calaitzis (03) 9482 2111. 24 Track				Pro Copy (09)375-3902		
Whiskey Dogs	Adam Calaitzis	Adam Calaitzis	Album	QLD:	Musiclub (07) 3862-1633,		
Earth	Band	Adam Calaitzis	Album		Tek (07) 3239-4000		
Heat Nightclub	Adam Calaitzis	Adam Calaitzis	Editing				
Jhon Collins	Jhon Collins	Adam Calaitzis	Demos				
Chris Backis	Adam Calaitzis	Adam Calaitzis	Mastering				
Kayta	Adam Calaitzis	Adam Calaitzis	Demos				
True Form Music Services	Neil Gray 0500 509 509. 24 Tk. Digital, 36 channel English Inline Console						
Snakehips	Neil Gray/Band	Neil Gray	Album				
Minotaur	Neil Gray/Band	Neil Gray	EP				
Arbitrator	Neil Gray/Band	Neil Gray	Demo				
Klinger	Neil Gray/Band	Neil Gray	Mix EP				
McSweeney	Band	Neil Gray	Live to DAT				



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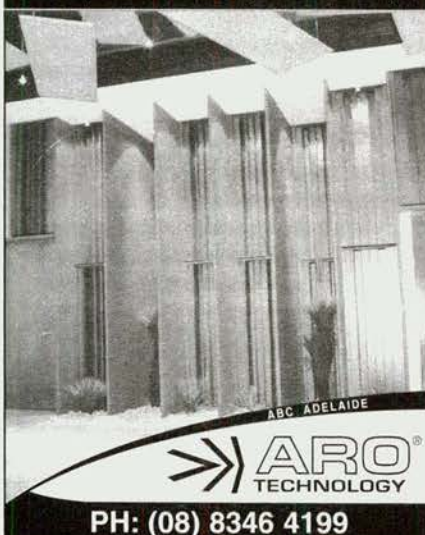
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SUBS. Cannon S218 new Double 18" triple bandpass designed by Jim V (ex Nova) and built by Ian Stewart Ramtech Industries. \$2,300.00 each, new pro user price. Have to be considered. Cannon Sound (02) 9948 4440 or sales@cannonsound.com.au

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YAMAHA RM2408 Mixer \$3,500.00. Matching roltop

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Greater Union Entertainment Technology (GUET) is a sight and sound specialist with a network of offices around Australia. Our growth and recent restructure has seen the creation of three separate divisions:

**Wholesale Distribution of lighting and audio equipment
Sound Video and Lighting (SVL) Contracting, and
Cinema equipment supply, installation and service.**

In line with this restructure and our expansion plans, several positions have become available:

SALES - DISTRIBUTION DIVISION

Two new positions - Sydney and Melbourne

To service our wholesale dealer network, two energetic, self-motivated salespeople are required for our SVL Distribution division. These positions will include sales as well as supporting and building a local dealer network. Experience with our lighting range is preferred, including High End and MAD.

SALES - SVL CONTRACTING DIVISION

Two new positions - Sydney and Brisbane

We are looking for energetic, self motivated salespeople to expand our Contracting division through promoting our quality range of products and installation services, to target markets; including clubs, hotels, entertainment venues, boardrooms, etc. Experience in the audio-visual and lighting industries is essential. Previous exposure to tenders and contracting projects would be an advantage.

SENIOR ENGINEER - GROUP SUPPORT

An engineer is required in our Group Support section in Sydney to be involved in large tenders, quotations, CAD and systems design. Extensive experience in these areas and audio-visual product knowledge is essential.

TECHNICIANS - SVL CONTRACTING DIVISION

Permanent and casual positions - all states

As the largest installation organisation in Australia, we are seeking skilled audio-visual installation technicians for on-going employment in our Contracting Division. Previous experience is essential. An electronics or communications trade qualification would be an advantage.

TECHNICIANS - CINEMA DIVISION

Experienced and trainee positions available - Sydney & Melb.

As market leaders in this industry, we are looking for experienced technicians to reinforce our Cinema technical team. Previous experience in projection equipment, 35 mm projection and digital sound is essential. We are also seeking trainee technicians who are looking to diversify their career into the cinema industry.

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BUYER'S GUIDE

PA speaker systems

Prices INCLUDE sales tax and were correct on 15th October 1998. All care taken, no responsibility for errors. Four models only are shown in each category although these manufacturers have many more. Indicative only.

POWERED LOUDSPEAKERS

ANCHOR AUDIO

ESA Audio (03) 9562 4605

MPA-5100 bi-amplified with active limiter; 130w of power; XLR bal. input switchable to mic or line level with or without phantom; 1/4" unbal. line input, bal. line output, tone control and AC accessory outlet. \$1804.

MPA-5000 bi-amplified with active limiter; 130w of power; XLR bal. input switchable to mic or line level with or without phantom; 1/4" unbal. line input, bal. line output, tone control and AC accessory outlet. \$1804.

ARX

ARX Syst.s (03) 9555 7859

SPL 12 Integ. self pow. bi-amped loudspeaker syst. with Mosfet amp.s 24dB crossover and ISC syst. protection. Rugged all ply trapezoidal cabinet with rigging provision. 305mm Pro series LF driver, 60mm diaphragm Ferro cooled HF driver. Stunning sound - just connect a signal and AC power. \$TBA.

SPL 18 Fully integ. Sub bass amp./speaker combination. 460mm bass driver in bandpass cabinet with high power Mosfet amp., 24dB crossover and ISC syst. protection. A truly flexible Sub Bass solution for all applications - just connect a signal and AC power. \$TBA.

dB TECHNOLOGIES

CMJ (03) 9315 2244

EXE 1P 100w twin cone 12" speaker with Piezo tweeter. Parallel 1/4" jack inputs. Input sensitivity from line to mic. FOH or foldback applications. Lightweight ABS design. \$699.

EXE 2P 140w 2-way active biamp syst.. 12" bass driver with 1" compression driver. Line input. FOH or foldback applications. Lightweight ABS design. \$999.

EXE 3P 180w 2-way full range syst.. 12" bass driver with 1" compression driver. Line input. FOH or foldback applications. Lightweight ABS design. \$1199.

MB 120 50w full range comp. pow. speaker with mic and line inputs on separate volume controls. Close field and small PA applications. \$499.

EASTERN ACOUSTIC WORKS

Production Audio Services (03) 9415 1585
KF400a is a full range, three way syst. utilising a 15" low EQ, 1.4" high EQ drivers. Coverage is 65° x 45°. Freq. response +/- 3dB 62Hz - 20kHz. \$18,995.

ELECTRO VOICE

EVI Audio Australia (02) 9648 3455

Sentry 100EL 100w self pow. reference monitor. Eight inch bass driver with Superdome tweeter. Line level input. \$2,499.

SB 121 300w pow. sub-woofer utilising SX casing. Can be stand mounted or flown using SX Hardware. Line level input with attenuator. \$1,799.

SX 300A 300w pow. version of popular SX 300. Twelve and Horn in comp. box with stand mount and flying fittings attached. Line level in with attenuator. \$2,199.

FENDER

Fender Australia (02) 9666 5077

Powerstage 100 100w pow. cabinet able to be used as a monitor, FOH box or instrument amp; detachable pre-amp controls; 12" coaxial Eminane speaker; sweepable feedback notch filters; 5 year warranty. \$1299.

Xpander 100 as above but without the pre-amp controls. 100w + 12" coax speaker, pow. monitor. \$1099.

JBL PROFESSIONAL

Jands Electronics (02) 9582 0909

JBL-EON15 Pow. 2-way Pow. Speaker Syst.: 380mm (15") LF with Dual Coil Drive TM, 90x60 degree Bi-Radial Horn, Bi-amped

130W+50W, XLR Bal. Mic or Line Input, Volume Control. \$2,295.

JBL-EON10 Pow. 2-way Pow. Speaker Syst.: 250mm (10") LF with Dual Coil Drive TM, 90x60 degree Bi-Radial Horn, Bi-amped 60W+25W, XLR Bal. Mic or Line Input, Volume Control. \$1,795.

JBL-EON15 PAK 2-way Mixer/Amp./Speaker Syst.: 380mm (15") LF with Dual Coil Drive TM, 90x60 degree Bi-Radial Hcm, Bi-amped 130W+50W; Mixer section with 1 XLR Bal. mic/line & two 6.5mm Jack line inputs; 4 band EQ; line output to additional pow. speakers. \$2,595.

JBL-EON-SUB Pow. Sub-Bass Syst. to suit EON Series loudspeaker syst.s: 380mm (15") with Dual Coil Drive TM; 250W Amp.. \$2,495.

MEYER

Meyer Sound Australia (07) 3252 4493

VPA-1P 2 x 320w amp.s; 12" speaker + 3" compression driver; 100° x 40° CQ horn; 133dB @ 1m; 60Hz-18kHz. \$6200.

CQ1 or 2 x 2 x 640w amp.s; 15" speaker + 4" compression driver; CQ1 (80° x 40°) CQ2 (50° x 40°) CQ horn; 136 - 139dB @ 1m; 40Hz-18kHz; 59kgs. \$10,750.

MSL-4 2 x 640w amp.s; horn loaded; 12" speaker + 4" compression driver; 40° x 35° CQ horn; 140dB @ 1m; 65Hz-18kHz. 82kgs. \$13,100.

MTS-4 4 x 640w amp.s; 1 x 18", 1 x 15", 1 x 12" speakers + 4" compression driver; 470° x 60° CQ horn; 140dB @ 1m; 32Hz-18kHz. 127kgs. \$17,000.

PEAVEY

Audio Telex (02) 9647 1411

Impulse 200P Bi-amped 12" woofer and 1" horn moulded enclosure. 200 w amp. for woofer and 125 w amp. for high freq. driver. Mic and bal line inputs. \$1873.84

YAMAHA

Yamaha Music Australia (03) 9693 5164

MS60 pow. speaker 60W 2 way using Yamaha's Active Servo Technology for increased bass response 'The ultimate spruiking box' inputs: XLR/Mic/Line 20Hz-20kHz low and high EQ. \$1295.

MS150 pow. speaker 150W 2 way, 12" driver + HF horn, 3 inputs XLR/Mic/Line, 50Hz-18kHz, low and high EQ, units are cascable, 18kg. \$2495.

MS101II pow. speaker 10W, 4" full range driver, Mic. in, 2 x line in, line out, 2 band EQ and volume, 75Hz-18kHz, shielded, 2.2kg. \$295.

MS202II pow. speaker 20W, 2x4" full range driver, Mic. in, 3 x line in, line out, 2 channel mix, 2 band EQ and volume, 70Hz-18kHz, shielded, 3.9kg. \$495.

DEDICATED INSTALLATION SPEAKER SYSTEMS & BOXES

ARX

ARX Systems (03) 9555 7859

Ambience-1 Ultra comp. high impact resin installation speaker. Foam rolled surround 8" LF driver, and a soft dome 1" HF driver with a 2nd Order 12 dB internal crossover. Available in 8 ohm or 100v line models. \$335.00 pr.

Ambience-5 Comp. high impact resin installation speaker. Foam rolled surround 8" LF driver, and a soft dome 1" HF driver with a 2nd Order 12 dB internal crossover. Available in 8 ohm or 100v line models. Mounting hardware available for both Ambience models. \$783.25 pr.

MicroMAX High performance installation speaker in a trapezoidal MDF cabinet. Pro Series 8" LF driver, and a soft dome 1" HF driver with a 3rd Order 18 dB internal crossover. Available in 8 ohm or 100v line models. Designed to use the MicroPRO syst. controller. \$715.00 each.

MicroSUB Super efficient Sub Bass speaker for LF enhancement of the MicroMAX syst.. Dual Pro Series 8" LF drivers in a bandpass

MDF cabinet. Designed to use the MicroPRO syst. controller. \$1015.50 each.

AUSTRALIAN MONITOR

Australian Monitor (02) 98749355

HDA-1 High definition tapered array column loudspeaker, ideal for use in highly reverberant environments. 96dB 1W/1Metre, 40 by 90 degree dispersion angle, 120w peak programme. 6 ohm or 100v line tapings. 800mm by 160mm by 140mm. \$655.

HDA-2 As per HDA-1 but with sensitivity of 94dB 1W/1 Metre, 90 w peak programme and smaller size of 380mm by 160mm by 140mm. \$620.

BOSE

Bose (02) 9204 6111

Bose FreeSpace Model 3 Loudspeaker This loudspeaker is designed for flush-mount ceiling installation in commercial spaces with ceiling heights up to 16 feet. Multi tap transformer with 1w, 2w, 4w, 8w settings. Available in 70v and 100v in white with Easy install with Quick Install Bracket supplied requires Active Equalisation. \$202 Each.

Bose FreeSpace Model 32 Loudspeaker This loudspeaker is designed for flush-mount ceiling installation in commercial spaces with ceiling heights up to 30 feet. Multi tap transformer with 1w, 2w, 4w, 8w, 16w and 32w settings. Available in 70v and 100v and 4-Ohm passive Eq in white. Easy install with Quick Install Bracket supplied requires Active Equalisation. \$289 Each.

Bose FreeSpace Model 25 Loudspeaker This loudspeaker is designed for surface-mount installations in commercial spaces where flush-mount installation is not possible. Multi tap transformer with 1w, 2w, 4w, 8w, 16w and 25w settings. Available in Black and White. Easy install with Quick Install Bracket supplied requires Active Equalisation. \$629 Pair.

Bose FreeSpace Model 1B Bass Unit This Bass Unit is designed to provide Bass augmentation for installations in commercial spaces, using Model 8, Model 32 or Model 25 loudspeakers increasing their freq. range down to 50Hz. Available in Black or White requires Active Equalisation. \$1058 Each.

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Horwood Australia (02) 9585 1011

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CPL-27 dual 8" 2-way; 500w; 40Hz-20kHz; 100x100 flare; same attributes as CPL-23. \$899.

WET228 completely waterproof; dual 8" with 1" horn; 250w @ 4 ohms; 50Hz-18kHz; 90x50 flare (rotating); 117dB SPL; mounting bracket available. \$3139.

dB TECHNOLOGIES

CMJ (03) 9315 2244

EXE 150 150w 2-way syst. featuring 12" bass driver and 1" compression driver on 90° x 90° horn flare. ABS cabinet. Lightweight design. \$699.

EXE 300 300w 2-way syst. featuring 12" bass driver and 1" compression driver on 90° x 90° horn flare. ABS cabinet. Lightweight design. \$899.

EASTERN ACOUSTIC WORKS

Production Audio Services (03) 9415 1585

Mk2100 available in 60 x 45 and 90 x 45 coverage patterns, the Mk2100 series offers +/- 3dB 70Hz - 17kHz freq. response. From A 12" LF driver and 1.4" exit HF combination. \$3480.

Mk5100 available in 60 x 45 and 90 x 45 coverage patterns, the Mk5100 series offers +/- 3dB 50Hz - 18kHz freq. response. From A 15" LF driver and 1.4" exit HF combination. \$3795.

AS660 a bi-amped 3-way full range syst. includes 2 x 12" LF mounted in a tuned dipolar array, 10" horn loaded MF and a 1.4" exit HF. Available 60 x 45 and 90 x 45, +/- 3dB 70Hz - 17kHz freq. response. \$7795.

UB82 a 2-way passive full range syst. utilising 2 x 8" LF drivers and a 1" exit HF on a 90 x 70 CD horn. +/- 3dB 62Hz - 20kHz freq. response. \$3590.

ELECTRO VOICE

EVI Audio Australia (02) 9648 3455

PI 640C Mid-Bass/Hi freq. active two way horn loaded trapezoid 60 x 40. Ten inch mid with two inch hi. Fitted with aerquip flying points for installation. Also available in 60 x 60 and 90 x 40. \$5,399.

PI 6415 Three way active full range horn loaded trapezoid cabinet with 60 x 40 dispersion. Fifteen inch bass, ten inch mid and two inch horn. Also available in 90 x 40. \$8,799.

MH 640C Fibreglass Stadium Horn. Mid-Bass/Hi freq. active two way horn loaded 60 x 40. Ten inch mid with two inch hi. Also available in 60 x 60 and 90 x 40. \$3,949.

MX 9040C Fibreglass Stadium Horn. Large format flare with four DL10X mid/bass drivers mounted. Hi Freq. flare will accept DH 1, N/D 1, DH 2A, DH 2A/4MT (price of compression driver not included). Also available in 60 x 40 and 40 x 20. \$7,699.

ESP TECHNOLOGY

ELSTA (02) 9568 2100

MR8 12 Comp. and portable, the ESP 12" + horn mid/high syst. features 1 x 12" ESP dedicated mid range, with 300W thermal power rating, max program power of 600WRMS, max short term SPL 128dB and employs a 1 inch throat horn offering an efficient smooth response and wide coverage. Weighs only 22Kg. Comes with a 2-year warranty. Made in Australia. \$1884.45 pr ex tax.

SUB300 incorporates leading band pass sub bass computer technology. Provides maximum acoustic power output and are made to exacting air tight specifications. Features 127dB max short term SPL, 600W RMS program power, 300W thermal power rating. Weighs 28kg. Made in Australia. \$1556.56pr ex tax.

SUB400 incorporates leading band pass sub bass computer technology. Features 128dB max short term SPL, 800W maximum program power, 400W thermal power rating, 8 ohms impedance, ESP408 LF Driver and weighs 42kg. Made in Australia. \$1884.45pr ex tax.

FENDER

Fender Australia (02) 9666 5077

2915 MkII 400w program; 1 x 15" + 1" horn eminence loaded; 13 ply birch cabinet; multiply flypoints; bi-ampable; 40 x 90 degrees horn (with inserts to narrow to 60 degrees); 1/4" phone or speaker connectors; 12 month warranty. \$1699.

2912 MkII as above but 1 x 12" + 1" horn eminence loaded and 300w program power; 12 month warranty. \$1599.

118S 800w program; 1 x 18" eminence loaded subwoofer; front loaded; 12 month warranty; 40kg; freq. resp. 40Hz-400Hz. \$1399.

215S 1600w program; 2 x 15" eminence loaded bandpass style subwoofer; 12 month warranty; 40kg; freq. resp. 35Hz-170Hz. \$1399.

JBL PROFESSIONAL

Jands Electronics (02) 9582 0909

Control Contractor Series is a range of comp. satellite loudspeakers, subwoofers and ceiling speakers ideally suited to background/foreground applications in restaurants, bars & retail shops. Paintable, weather resistant,

BUYER'S GUIDE

PA speaker systems

90x90 degree horn. Built-in mounting hardware featuring the Invisiball mounting syst.. A wide variety of installation brackets are available for mounting to almost anything, as well as clustering multiple loudspeakers. From \$325 pr.

Marquis Series is a complete range of installation enclosures designed for low power, short throw applications. All Marquis Series loudspeakers have 12 suspension points (M10) except MS26 & MS28 only 2 M10 points; Advanced network topology (where applicable) tamper resistant bi-amp/passive selector (as appropriate); & are Weather Resistant. Designed to cosmetically integrate with JBL Sound Power and Venue Series loudspeakers. From \$1,495.

Sound Power Series is a complete range of installation enclosures designed for high power, short throw applications. All Sound Power Series loudspeakers have 12 suspension points (M10); Advanced network topology (where applicable) tamper resistant bi-amp/passive selector or parallel/discrete selector (as appropriate); & are Weather Resistant. Designed to cosmetically integrate with JBL Marquis and Venue Series loudspeakers. From \$3,495.

Venue Series is a complete range of installation enclosures designed for high power, long throw applications. All Venue Series loudspeakers have 12 suspension points (M10); Advanced network topology (where applicable) tamper resistant bi-amp/passive selector or parallel/discrete selector (as appropriate); & are Weather Resistant. Designed to cosmetically integrate with JBL Marquis and Sound Power Series loudspeakers. From \$4,495.

KLIPSCH

Horwood Australia (02) 9585 1011

KP-102 8" 2-way; 100w @ 8 ohms; 75Hz-20kHz; 90x40 flare; 115dB SPL; optional mounting bracket; white or black; excellent for distributed syst.s. \$677.

KP-262 12" 2-way; 300w @ 8 ohms; 50Hz-17.5kHz; 60x40 flare; 125dB SPL; 2" horn driver; flying points; excellent for corporate venues or AV hire. \$2196.

KP-362 15" 3-way; 2" midrange; 400w @ 8 ohms; 45Hz-20kHz; 60x40 flare (rotating); 126dB SPL; flying points; excellent for dance clubs and live productions. \$2745.

MACH

Audiology (02) 9584 0033

M42 MkII 50w; 4" dome tweeter; ABS cabinet; weatherproof design; 80Hz-20kHz; 87dB 1w/1m; 8 ohm; available in black or white. \$399 pr.

M62 MkII 80w; 6" + 1" dome tweeter; 65Hz-20kHz; 90dB 1w/1m; 8 ohm; other features as above. \$599 per pair.

M68 125w; 8" + 1" dome tweeter; 50Hz-20kHz; 92dB 1w/1m; 8 ohm; other features as above. \$999 per pair.

M108 2 x 80w stereo sub woofer with built-in crossover; 45Hz-120Hz; 93dB 1w/1m; timber construction. \$699.

MARTIN AUDIO

Technical Audio Group (02) 9810 5300

C115 surface mount speaker with 5" ICT (Inductively Coupled Transducer) driver in weather resistant enclosure. 111dB peak SPL. Unblowable HF driver. Light grey/graphite. Swivel bracket included, line transformer option. \$295.

C516 flush mount ceiling speaker with 6.5" ICT (Unblowable HF) driver including grille and back-can. 111dB peak SPL. 80Hz-20kHz. Line transformer option. \$325.

EM15 2 x 5" ICT (Unblowable HF) 2-way trapezoidal miniature PA speaker. 113dB peak SPL. White/black. Omniumount fittings. Sub woofer option. \$495.

EM26 8" 2-way trapezoidal PA speaker with 1" compression driver/CD horn. 117dB peak SPL. 70Hz-18kHz. Omniumount fittings. Sub woofer option. \$1495.

MEYER

Meyer Sound Australia (07) 3252 4493

HM-1 bi-amped; 1 x 7 cone with concentric 1" dome tweeter; 100⁰ x 100⁰ CQ horn; requires 48v power supply; 116dB @ 1m; 42Hz-20kHz; 5kgs. \$1750.

HM-1 Subwoofer pow. from HM-1; 10" speaker; HM-1 + sub SPL 118dB @ 1m; syst. flat to 40Hz. \$875.

PEAVEY

Audio Telex (02) 9647 1411

Impulse 6 50 w 8 ohm, trapezoidal, weather resistant comp. speaker. Features 5" woofer and dome tweeter. Available in 8 ohm or 100v line, black or ivory. \$370.72.

Impulse 1282 150 w, bi-ampable, 8 ohm, full range 2-way enclosure with symmetrically located flying points. Components include a high power 12" woofer and an 22XT 1" compression driver on a CD horn. \$1403.08.

HV1582 300 w, bi-ampable, 8 ohm, full range 2-way trapezoidal enclosure symmetrically located flying points. Components include a premium 1505-8DT woofer, constant directivity horn loaded with an 44T 2" compression driver. \$2573.46.

PHONIC

CMC Music (02) 9905 2511

SE-206 installation speaker; 5 1/4" woofer; 1" soft dome tweeter; 30w RMS (8 ohms); complete with mounting bracket; black. \$250 pr.

SE-207 as above but 6 1/2" woofer. 50w RMS (8 ohms). \$399 pr.

Versatop 30 installation speaker; 8 ohms (30w RMS) and 70.7v tap positions (2, 4, 8, 16 w); 4" polycarbon woofer; 1" soft dome tweeter; complete with mounting bracket; white. \$125.

Versatop 50 as above but 6 1/2" polycarbon woofer; 70.7v tap positions (2 1/2, 5, 10, 20 w); white. \$225.

SONY

Sony Australia (02) 9887 6672

PA-S102 Water-resistant ceiling mount, 10W rated, low impedance, 120Dia/76Hmm, 0.9kg. \$210.

PA-S102T Water-resistant ceiling mount, 10W rated, high impedance, 120Dia/76Hmm, 0.9kg. \$330.

SRP-S150 Low Impedance, Ceiling Speaker. \$395.

YAMAHA

Yamaha Music Australia (03) 9693 5164

S15 80w 2 way comp. speaker syst., 6 ohms, 60Hz-40kHz, 2.8kg, full magnetic shielding, can be ceiling mounted. PA, monitor or installation. \$425 sold as pair.

S55 140w 2 way comp. speaker syst., 6 ohms, 60Hz-40kHz, 6kg, full magnetic shielding. PA, monitor or installation. \$395.

STAND ALONE FULL RANGE SPEAKER CABINETS & FOLDBACK (STAGE) MONITORS

ARX

ARX Systems (03) 9555 7859

PowerMAX Powerful and musical, the PowerMAX series brings processor controlled speakers within everyone's range. All PowerMAX high performance Front of House cabinets, Subs and Monitors are all controlled by the dual channel **PowerPRO** speaker processor. From \$1834.

922 Concert Series Trapezoidal active 1 x 15", 1 x 12", 1 x 1" Ferro cooled HF 2 way cabinet with the improved response of a 3 way syst.. An ultra comp. full range concert speaker syst.. Uses **LSP-2** ISC processor. \$4355.50.

215T and M Active 2 way Concert Series cabinets for Front of House and Monitors. 15" Ultra series LF driver with 2" throat Ferro cooled HF driver. For all professional stage monitor applications. Uses the **LSP-2** dual channel ISC

processor. \$3942.

222 Active 2 way Concert Series multi angle (30, 60 and 90 degrees) very low profile monitor wedge. Dual 12" Ultra series LF drivers with 2" throat Ferro cooled HF driver. For all professional vocal monitor applications. Uses the **LSP-2** dual channel ISC speaker processor. \$4101.

AUSTRALIAN MONITOR

Australian Monitor (02) 98749355

QMX-D15 High efficiency 2-way full range enclosure. Vented, quasi-bandpass, double ended reactive loading enclosure; 2 x 15" LF drivers, 2" HF comp' driver; 4 ohms; 1200W peak programme; 136dB peak SPL, 105dB 1W/1 Metre; 90 (60 optional) x 40 dispersion. \$3,450.

NRG-500 2-way full range in vented trapezoidal enclosure. 15" LF driver + 1" comp' driver on 90 x 40 CD horn. 8ohms; 500 w programme, 126dB peak, 99dB 1W/1Metre. c/- Stand mount. Flying hardware optional. \$2,075.

F-300 Full range Wedge/Composite: 15" coaxial speaker and 1" comp' driver. Passive network with time alignment. 500W programme. Optional stand mount available. For use as stage monitor or stand alone PA cabinet. \$2,295.

BOSE

Bose (02) 9204 6111

Bose 402 Articulated Array Loudspeaker This comp. high fidelity loudspeaker engineered for high quality voice reinforcement and music reproduction in small to medium sized rooms. Light and durable, these loudspeakers can be used for either permanent or portable sound syst.s. Weight 7.7Kgs and require Active Equalisation. \$850 Each.

Bose 802 Series II Loudspeaker A professional loudspeaker engineered to deliver natural sound and high power from a comp., lightweight enclosure. High power handling and rugged durability make the 802 well suited for installed and portable applications. Weight 14Kgs and requires Active Equalisation. \$1600 Each.

Bose Panaray 502 Loudspeaker A premium high fidelity speaker syst. designed for Auditoriums, Lecture Theatres, Churches and other venues where both quality sound and aesthetics are important. Available in Grey or White with a range of installation brackets to suit most venues. Weight 6.8Kgs and require Active Equalisation. \$1263 Each.

Bose Syst. Controller 1 rack unit device that provides crossover functions, active electronic equalisation and dual channel signal processing must be used with above product. \$429 Each.

CERWIN-VEGA!

Ashton Admor (08) 9478 3800, (02) 9690 0991

PS-15 SII Proxtax 15" 3-way syst.; 600w continuous program power; 101dB sensitivity (1w/1m); 15" woofer; 2" phenolic diaphragm compression driver; 1" horn-loaded tweeter. Trapezoid vinyl covered cabinet, full steel perforated grill. \$2182 (also PS12 \$1826 and PS10 \$1095).

V-153T 15" 3-way with dual flare horn; 104dB sensitivity \$1717, also V-152 15" 2 way syst. with spherical waveguide and 103dB sensitivity \$1310 and V-122T 12" 2 way syst. with 102dB sensitivity. \$959.

SM-152T 15" 2 way professional stage foldback monitor featuring coax configuration permitting more gain before feedback; 250w continuous program power; 103dB sensitivity \$1084. Also SM-122T 12" 2 way foldback monitor \$946.

dB TECHNOLOGIES
CMi (03) 9315 2244

PM 122 200w 2-way syst. featuring eminence 12" bass driver and 1" compression driver in trapezoidal cabinet design. Heavy duty black carpet, stand mount included. \$499.

PM 152 200w 2-way syst. featuring eminence 15" bass driver and 1" compression driver in

trapezoidal cabinet design. Two parallel 1/4" jack inputs. \$599.

PM 122M 200w 2-way monitor cabinet, dual angle design with 12" bass driver and 1" compression driver. Heavy duty black carpet, two 1/4" input jacks. \$529.

PM 252 400w, 4 ohm double 15" bass driver and 1" compression driver and large horn flare. Heavy duty black carpet, two parallel input jacks. \$999.

EASTERN ACOUSTIC WORKS

Production Audio Services (03) 9415 1585

LA325 a full range passive/biamp 3-way syst. includes 2 x 15" LF, 2 x 7" MF and a 2" exit HF on a waveguide horn. +/- 3dB 50Hz - 20kHz freq. response. 1000 w power handling. \$7795.

LA460 a full range passive/biamp 3-way syst. includes 1 x 15" LF, 1 x 8" horn loaded MF and a 1.4" exit HF on a CD horn. +/- 3dB 62Hz - 20kHz freq. response. 500 w power handling. \$8195.

SM122e a 12" LF 2 way stage monitor, passive crossover with horn level adjustment. +/- 3dB 80Hz - 18kHz freq. response. 450 w power handling. \$2985.

SM200IH a low profile 12" LF with 2" exit HF on a waveguide horn. Passive/biamp operation. +/- 3dB 75Hz - 18kHz freq. response. 500 w power handling. \$5938.

ELECTRO VOICE

EVI Audio Australia (02) 9648 3455

XI 1122/85PF Active two way twelve/horn cabinet. Flying top and bottom via aeroquip track plus hat for pole mounting. Available as 80 x 50 dispersion. \$3,749.

XI 1152/64PF Active two way fifteen/horn cabinet. Flying top and bottom via aeroquip track plus hat for pole mounting. Rotatable horn to allow for horizontal mounting. Available in either 60 x 40 or 90 x 40 dispersions. \$4,699.

XI 1183/64PF Active three way eighteen/twelve/horn cabinet. Flying top and bottom via aeroquip track. Rotatable horn to allow for horizontal mounting. Available in 60 x 40 dispersion. XI 1153 version with fifteen instead of eighteen also available. \$10,199.

XI 2183/64PF Active three way with two tweeters with twelve/horn mid section mounted between. Full flying via aeroquip track. Rotatable horn to allow for horizontal mounting. Available in 60 x 40 dispersion. IX 2153 version with fifteens instead of eighteens also available. \$11,899.

ESP TECHNOLOGY

ELSTA (02) 9568 2100

12" ESP Pro Series features 99dB sensitivity, 8 ohm impedance, 40Hz-20Khz freq. range, 100W rated power, ESP108 LF driver and 200Rms of maximum power. Weighs 16kg. Stand mountable. Made in Australia. \$613.95pr ex tax.

E2112 offers high bass performance and a wide freq. range. Featuring 99dB sensitivity, 8 ohm impedance, 200W rated power. Weighs 28kg. Made in Australia. \$736.88pr ex tax.

E2115 ESP 15" speakers feature 101dB sensitivity, 8ohm impedance, 200W rated power, 400W RMS maximum power. Weigh 24kg. Stand mountable. Made in Australia. \$818.85pr ex tax.

E4215 2 x 15" speakers featuring bottom end punch, crystal clear mids and highs, 104dB sensitivity, 4ohm impedance, 400W RMS rated power, 800RMS maximum power and weighing just 36kg. Made in Australia. \$1738.26pr ex tax.

FENDER

Fender Australia (02) 9666 5077

SPL 1226 2 x 15" + 1" horn eminence loaded trapezoidal cabinet 800w program power; 3 way passive crossover or active 2 way mode; carpet covered; 57kg; 12 month warranty. \$1699.

SPL 1211 1 x 15" + 1" horn eminence loaded

BUYER'S GUIDE

PA speaker systems

cabinet 300w program power; full range or biamp operation; carpet covered; 31kg; 12 month warranty; 50Hz-20kHz. \$999.

ELC XP 1 x 15" + 2" Piezo drivers, trapezoidal, carpet covered cabinet 300w program power; 26kg; 12 month warranty; 60Hz-20kHz.

1275A 1 x 15" + 2" Piezo drivers, carpet covered monitor 200w program power; 20.5kg; 12 month warranty; 60Hz-20kHz; volume attenuation on front of wedge. \$599.

GALAXY

Horwood Australia (02) 9585 1011

HSMS-0000 microspot vocal monitor; single 5" driver; 100w power handling; with bracket; 117dB SPL; 150Hz-15kHz; excellent for studio talkback, courtrooms and all installations. \$256.
HSRG-0000 hot spot vocal monitor; single 5" driver; 200w power handling; with bracket; 123dB SPL; 150Hz-15kHz; optional volume control; 16 ohms; perfect for solo and duo acts. \$325.
PMCB-1000 permanent install version of hot spot; 200w @ 16 ohms; mounting bracket available; 100 volt line version and water-resistant treatment available. \$345.

GEMINI

Disco World (03) 9735 0588

XRS-1203 440w (music program) 3-way; 12", 34mm titanium compression diaphragm, Ferro fluid cooled tweeter; 55-20,000Hz; 97dB 1w/1m; 8 ohm; 25kg. \$825.

XRS-1503 500w (music program) 3-way; 15", 34mm titanium diaphragm compression driver (x2); ultra large high density horn; 44-20,000Hz; 99dB 1w/1m; 8 ohm; 35kg. \$995.

XRS-3004 950w (music program) 4-way; double 15", 34mm titanium diaphragm compression driver (x2); 125 degrees wide dispersion; 40-20,000Hz; 100dB 1w/1m. \$1449.

HAMMER

Melmusic.com.au (03) 9578 2426

112THD 400w, 12" and 1" HF full range speaker syst.. \$950.

112HWD 400w, 12" and 1" HF fold back speaker syst.. \$925.

1012HD "Blitz" 500w, 3-way 12", 10" and HF full range speaker syst. utilising band pass bottom end. \$1595.

JBL PROFESSIONAL

Jands Electronics (02) 9582 0909

JBL-TR125 2-way syst., 380mm (15") LF Transducer, Fluid Cooled Compression Driver, with 25mm (1") Titanium Diaphragm & 90x45 degree Optimised ApertureTM Horn. 225 w power handling. Also available in stage monitor format (TR105). From \$1,195.

JBL-MR925 2-way Syst., 380mm (15") LF Transducer, 25mm (1") Exit Compression Driver, 44mm (1.75") Titanium Diaphragm Compression Driver & 100x80 degree Flat Front Bi-RadialTD Horn. 350 w power handling. Also available in stage monitor format (MR905). \$1,995.

JBL-SR4725A 2-way Full Range PA Syst.: 2226H 380mm (15") LF Transducer; 2426H 25mm (1") exit Compression Driver and; 2370A 90x40 degree Flat-Front, Bi-Radial Horn. 600 w power handling. Available in stage monitor format and also with large format compression driver and horn. From \$3,295.

JBL-Array 4892 2-way Comp. High Performance Speaker Syst.: 255mm (14") Neodymium LF Transducer; 38mm (1.5") exit, 100mm (4") Large-Format, Titanium Diaphragm Compression Driver; 45x35 degree Horn, 35mm (1 3/8") Pole Mount. 600 w power handling. Also available in stage monitor format. \$7,295.

KLIPSCH

Horwood Australia (02) 9585 1011

KP-2002 200w; 65Hz-16kHz; 60x40 flare; 125dB SPL; excellent for school installations, small PA syst.s; fuse protection; matches with KP-1000 sub. \$1007.

KP-3002 500w; 15" 2-way: 60Hz-16kHz;

60x40 flare; 127dB SPL; fuse protection; dynamic box with 2" horn driver and tight, punchy bass. \$1684.

KSM-12 12" 2-way floor monitor; 250w; 85Hz-15kHz; 90x40 flare; 126dB SPL; passive or bi-amp; 2" horn driver. \$1427.

KSM-15 15" 2-way floor monitor; 400w; 50Hz-15kHz; 60x40 flare; passive or bi-amp; 2" horn driver. \$1739.

MACH

Audiology (02) 9584 0033

TX12 200w; 12" + 1.5" compression driver; 59Hz-19kHz; 95dB 1w/1m; 8 ohm; carpet covered timber construction; steel hardware; stand adaptor. \$999.

TX15 300w; 15" + 1.5" compression driver; 54Hz-19kHz; 97dB 1w/1m; other features as above. \$1199.

TXM12 as per TX12 but in floor monitor version. Will double as FOH cabinet as it has a stand adaptor fitted \$1099.

M1501R 500w; 15" + 2" compression driver; full touring stage monitor; 50Hz-17kHz; 99dB; active or passive mode. \$2499.

MARTIN AUDIO

Technical Audio Group (02) 9310 5300

WM0.5 8" 2-way miniature wedge monitor with 1" compression driver/CD horn. 120dB peak SPL. 70Hz-18kHz. 50° x 90°. \$1495.

LE350 12" 2-way / low profile wedge monitor with 1" HF compression driver on differential dispersion horn. 125dB peak SPL. 70Hz-18kHz. \$3595.

LE400 15" 2-way passive or active wedge monitor with 1" H-F compression driver on differential disperson horn. 127dB peak SPL. 50Hz-16kHz. \$4295.

LE700 15" 2-way active wedge monitor with 2" EV DH1A compression driver on differential dispersion horn and 4" voice coil 15" ATC driver. 130dB peak SPL. 60Hz-15kHz. MX5 controller required. \$5495.

MEYER

Meyer Sound Australia (07) 3252 4493

PSM-2 2 x 640w amp.s; 12" speaker + 4" compression driver; 50° conical dispersion; 134dB @ 1m; 60Hz-18kHz; low and high profile slant and vertical orientations possible. \$10,500.

UM-1P 2 x 320w amp.s; 12" speaker + 3" compression driver; 45° conical dispersion; 133dB @ 1m; 60Hz-18kHz monitor speaker. \$6200.

UM-100P 2 x 320w amp.s; 12" speaker + 3" compression driver; 100° x 40° CQ horn; 133dB @ 1m; 60Hz-18kHz monitor speaker. \$6200.

MTS-4 4 x 640w amp.s; 1 x 18", 1 x 15", 1 x 12" speakers + 4" compression driver; 70° x 60° horn; 140dB @ 1m; 32Hz-16kHz. \$17,000.

PEAVEY

Audio Telex (02) 9647 1411

Impulse 200 300 w, 8 ohm moulded, weather resistant speaker syst.. Features 22XT high freq. driver & 12" 'black widow' woofer. 78Hz-18kHz. 101 dB 1W/1M. SoundGuard protection. Multiple handles and mounting points (via optional VM70). Includes stand mount adaptor. \$1210.28.

SP2G 300 w, 8 ohms tarp enclosure with 22XT high freq. driver and one 15" 'black widow' speaker. 50Hz-17kHz. 101 dB 1W/1M. Great for live music or nightclub. \$1404.02.

DT4215 600 w, 4 ohms enclosure with dual 15" black widcw woofers and a 44T 2" compression driver. Externally switchable, full range or biamp operation. 50Hz-18kHz 98dB 1W/1M. Huge sound. \$3402.36.

SP115M 250 w, 2 way fold back wedge/monitor, bi-amp ready, 8 ohms. 22XT high freq. driver and 15" 'black widow' speaker. 102 dB 1W/1M. \$1400.

PHILIPS

Philips Australia (02) 9805 4143

LHM0235/00 100w stage speaker syst. with 12" woofer and 1 3/8" voice coil titanium high

freq. driver. 100dB @ 1kHz/w/m. 75Hz-18,000Hz. 8 ohms. \$954.

LHM0236/00 200w stage speaker syst. with 2 x 12" woofer and 1 3/8" voice coil titanium high freq. driver. 65Hz-20,000Hz. 8 ohms. \$1198.

LHM0237/00 100w stage monitor with 12" woofer and 1 3/8" voice coil titanium high freq. driver. Same characteristics as LHM0235/00. \$912.

LHM0238/00 200w stage sub woofer with 2 x 12" woofer. 90dB @ 1kHz/w/m. 40Hz-1800Hz. 8 ohms. \$1119.

PHONIC

CMC Music (02) 9905 2511

SE-112H trapezoidal 12" speaker; 1" compression driver; 200w RMS (continuous); 8 ohms; speaker mount; black carpet finish; 28kg. \$699.

SE-115H trapezoidal 15" speaker; 2" titanium compression driver; 250w RMS (continuous); 8 ohms; speaker mount; black carpet finish; 35kg. \$899.

SE-201M monitor 12" speaker; 1" compression driver; as SE-112H. \$699.

SE-202M monitor 15" speaker; 2" compression driver; as SE-115H. \$899.

SONY

Sony Australia (02) 9867 6672

SRP-S730 Fold back / corner mount units. \$650.

SRP-S720 300W max, 2-way, bass-reflex, Horn Tw, 280W/450H/255Dmm, 8kg, 92dB/W/m. \$750.

SRP-S520 (pair) 240W max, 2-way, bass-reflex, 170W/450H/215Dmm, 6.6kg, 90dB/W/m. \$1,090.

SRP-S420 (pair) Vocal, 180W max, 2-way, bass-reflex, 195W/320H/230Dmm, 4.5kg, 91dB/W/m. \$790.

YAMAHA

Yamaha Music Australia (03) 9693 5164

S112 IV 300w 2 way FOH bass reflex speaker, 8 ohms, 60Hz-16kHz, 19.3kg, 12" woofer, 2" titanium compression driver; 97dB. \$945.

S115 IV 500w 2 way FOH bass reflex speaker, 8 ohms, 55Hz-16kHz, 27.5kg, 15" cast frame woofer, 2" titanium compression driver; 99dB. \$1095.

SV12 200w 2 way FOH speaker, 8 ohms, 60Hz-20kHz, 14.8kg, 12" woofer, HF horn, 97dB. Also comes as Monitor Wedge. \$695.

SV15 200w 2 way FOH bass reflex speaker, 8 ohms, 50Hz-20kHz, 22kg, 15" woofer, HF horn, 98dB. Also comes as Monitor Wedge. \$845.

H/MID OR 'TOP' SPEAKER SYSTEM BOXES

ALTEC LANSING

EVI Audio Australia (02) 9648 3455

DTS 640 Horn loaded three way cabinet, fifteen ten/horn with full flying on aeroquip track. Can be run either active two way or three way. \$5050.

DTS 941 Horn Loaded three way cabinet, twelve eight/horn with full flying on aeroquip track. Can be run either active 2 way or 3 way. \$3,725.

ARX

ARX Systems (03) 9555 7859

212 Concert Series Powerful, lightweight 2 x 12", 1 x 2" Ferro cooled Mid/High pack with unique one piece fibreglass flare moulding for maximum strength and accuracy. Common frontal area with the other ARX Concert Series cabinets. Uses LSP-2 ISC processor. \$3975.

122 SK One piece fibreglass flare moulding Mid/High pack with steel flying frame, containing 1 x 12", 1 x 2" Ferro cooled drivers. Ideal stripped down installation cabinet for dance clubs and other high spl areas. Uses LSP-2 ISC processor. \$3074.50.

922 MH Mid/High section of the 922 cabinet, with one piece fibreglass flare moulding containing 1 x 12", 1 x 1" Ferro cooled drivers, in a trapezoidal all plywood cabinet with flying

points. Uses LSP-2 ISC processor. \$3169.50.

AUSTRALIAN MONITOR

Australian Monitor (02) 98749355

QMX-D12 High efficiency MID/Hi enclosure modelled on our QMX-D15. Vented, quasi-bandpass, double ended reactive loading enclosure; 2 x 12" LF drivers, 2" HF comp' driver; 4 ohms; 1000W peak programme; 133dB peak SPL, 105dB 1W/1 Metre; 60 (90 optional) x 40 dispersion. \$3,100.

CERWIN-VEGA!

Ashton Admor (08) 9478 3800, (02) 9690 0991

MT-102T 10" horn loaded high performance model 107dB sensitivity for use with the Portable Earthquake SL-36 bass cabinet. \$1534.

T-250 Intense fully horn loaded 3 way cabinet; 10" midbass; 2" mid rare horn loaded compression driver; 1" horn loaded compression driver; 450w continuous program power; 108dB sensitivity professional concert series. \$2276.

EASTERN ACOUSTIC WORKS

Production Audio Services (03) 9415 1585

JF260e offers concert level output combined with natural undistorted reproduction. +/- 3dB 66Hz - 18kHz freq. response. 500 w power handling. Passive/biamp operation. \$6295.

KF650e a full range 3 way biamp/triamp syst. incorporating 1 x 15" LF, 10" horn loaded MF and 2" exit HF on CD horn. 60 x 45 coverage pattern. +/- 3dB 65Hz - 17kHz freq. response. \$10,660.

KF850EF touring loudspeaker, triamplified, horn loaded 15" 3 way syst.. +/- 3dB 86Hz - 17kHz freq. response, 141dB peak output, 55 x 45 coverage. \$16,600.

KF860 a 3 way vertical array syst. incorporating 2 x 15" LF drivers tuned for dipolar directivity, 2 x 10" horn loaded MF drivers and 2 x 2" exit HF drivers on CD horn. +/- 3dB 50Hz - 17kHz freq. response, 147dB peak output. \$24,850.

ELECTRO VOICE

EVI Audio Australia (02) 9648 3455

MTH 1 Horn loaded Ten inch mid/bass with two inch horn. Carpet covered cabinet with 60 x 40 dispersion. Mounting hardware optional. \$3,890.

MT 2.5H Horn loaded 2 x ten mid/bass with large format horn. Carpet covered cabinet with full flying top and bottom via aeroquip track. Available in either 90 x 40 or 60 x 40 dispersions. \$10,950.

FENDER

Fender Australia (02) 9666 5077

2915 1 x 15" + 1" horn eminence loaded 400w program power; 13 ply birch cabinet; multiply flypoints; bi-ampable; 40 x 90 degrees horn (with inserts to narrow to 60 degrees); 1/4" phone or speaker connectors; 12 month warranty. \$1699.

2912 as above but 1 x 12" + 1" horn eminence loaded and 300w program power; 12 month warranty. \$1599.

1225 1 x 15" + 1" horn eminence loaded trapezoidal cabinet bi-ampable; 400w program power; 12 month warranty; carpet covered; 50Hz-20kHz. \$1299.

1211 1 x 15" + 1" horn eminence loaded cabinet; 300w program power; fullrange or biamp operation; carpet covered; 31kg; 12 month warranty; 50Hz-20kHz. \$999.

HAMMER

Melmusic.com.au (03) 9578 2426

112THD 400w, 12" and 1" HF full range/mid high speaker syst.. Matching sub - Hammer 115SRP or 212SBP. \$950.

JBL PROFESSIONAL

Jands Electronics (02) 9582 0909

JBL-VS2110 2-way Mid High Syst.: 200mm (8") Horn Loaded MF Transducer; 2426H 25mm (1") exit Medium-Format Compression Driver; 60x40 degree rotatable waveguide al

BUYER'S GUIDE

PA speaker systems

lows pattern control to 240Hz via Optimized Aperture Horn; bi-amp/passive operation. 250 w power handling. \$4,495.

JBL-VS3215 3-way Full Range Syst.: 2227H SVGTM 380mm (15") LF Transducer; 2012H 250mm (10") Horn Loaded MF Transducer; 2447J 38mm (1.5") exit Large-Format Compression Driver; 90x50 or 60 x 50 degree pattern control to 500Hz; Low distortion via Optimized Aperture Horns. \$9315.

JBL-SP212-9 2-way Vented Syst.: 2206H 300mm (12") LF Transducer; 2447J 38mm (1.5") exit Large-Format Compression Driver; 95x70 degree Optimized Aperture Horn; Compound Shape accommodates use as a Floor Monitor. 600 w power handling. \$4,495.

JBL-HLA-4895 3-way High Directivity Horn Loaded Positionable Array Element: High Technology DCD Transducers; Spaceframe Ideal Array Element Design; Multiband Waveguide; Simple Rigging Syst.. P.O.A.

KLIPSCH

Horwood Australia (02) 9585 1011

KP-2002 200w; 65Hz-16kHz; 60x40 flare; 125dB SPL; excellent for speech and music playback; easy to install; light and portable; 12" 2-way. \$1007.

KP-262 12" 2-way; 300w @ 8 ohms; 50Hz-17.5kHz; 60x40 flare; 125dB SPL; 2" horn driver; flying points; excellent for all applications. \$2196.

KP-362 15" 3-way; 2" midrange; 400w @ 8 ohms; 45Hz-20kHz; 60x40 flare (rotating); 126dB SPL; flying points; excellent for hire or install. \$2745.

MACH

Audiology (02) 9584 0033

M128R/1281 350w; 12" + 2" compression driver; 70Hz-17kHz; 97dB 1w/1m; both cabinets are flying "R" series features all steel hardware. "I" series for permanent installation. \$1699.

M154R/1541 500w; 15" + 2" compression driver; 70Hz-17kHz; 99dB 1w/1m; "R" series for production application, "I" series for permanent installations. \$2699.

M126R/1261 600w; 2 x 12" + 2" compression driver; 70Hz-17kHz; 100dB 1w/1m; 4 ohm; other details as above. \$3899.

M156R/1561 1000w; 2 x 15" + 3" compression driver; 70Hz-17kHz; 103dB 1w/1m; other details as above. \$4699.

MARTIN AUDIO

Technical Audio Group (02) 9810 5300

EM 76 12" 2-way trapezoidal PA speaker with 1" compression driver/CD horn. 124dB peak SPL. 60Hz-18kHz. 10 x M8 flying points. \$3195.

W3 15" 3-way trapezoidal PA speaker with 1" compression driver/CD horn and 6.5" horn loaded midrange. Active 2-way. 131dB peak SPL. 55Hz-18kHz. Equipped for flying. \$5995.

W8C 3-way trapezoidal PA speaker with 1" compression driver/CD horn, 6.5" high mid and 12" low mid both horn loaded with 55° horizontal dispersion. Active 2 or 3-way. 135dB peak SPL. 120Hz-18kHz. Equipped for flying. \$8995.

W8F 3-way trapezoidal concert syst. with 1" compression driver/CD horn, 6.5" high mid and 12" low mid both horn loaded with 55° horizontal dispersion. Active 2 or 3-way. 135dB peak SPL. 120Hz-18kHz. Equipped for flying. \$10,995.

MEYER

Meyer Sound Australia (07) 3252 4493

MSL-4 2 x 640w amp.s; 12" speaker + 4" compression driver; 40° x 35° dispersion; 140dB @ 1m; 65Hz-18kHz; medium to long throw concert speakers. \$13,100.

MSL-6 2 x 640w amp.s; 2 x 12" speakers + 3 x 4" compression driver; 30° x 25° dispersion; 145dB @ 1m; 65Hz-16kHz; long throw concert speakers. \$32,500.

SB-1 2 x 640w amp.s; 12" speakers + 4" compression driver; 10° conical beam; 110dB @ 100m; 500Hz-16kHz; very long throw parabolic speaker. \$23,700.

CQ1 or **2** 2 x 640w amp.s; 15" speaker + 4" compression driver; CQ1 (80° x 40°) CQ2 (50° x 40°) CQ horn; 136 - 139dB @ 1m; 40Hz-18kHz; fill and short throw speaker. \$10,750.

PEAVEY

Audio Telex (02) 9647 1411

DTH4115F 400 w, 8 ohm concert enclosure with a single 15" black widow woofer and 2" 44T compression driver. Externally switchable, full range or biamp operation. Fitted with ATM flyware mounting points. \$3189.20.

DTH4215 600 w, 4 ohms enclosure with dual 15" black widow woofers and a 44T 2" compression driver Externally switchable, full range or biamp operation. 50Hz-18kHz 98dB 1W/1M. Optional ATM flyware version. \$3402.36.

SONY

Sony Australia (02) 9887 6672

SRP-S3000 Tw225W/W1, 500W max, Finnish Birch Plywood, 395W/510H/388D, 37kg, Tw 111dB/W/m, W1 98dB/W/m. \$6,990.

SRP-S1000 900W max, CD Horn & 30cm woofer, 400W/575H/325D, 19kg, Moulded Resin, 101dB/W/m. \$1,900.

SUB BASS BOXES (FOR C & D ABOVE)

ARX

ARX Systems (03) 9555 7859

925 Concert Series Trapezoidal 2 x 15" bandpass bass package for LF enhancement of the 922 or for use as a syst. with the 212 Mid/High pack. Has matching footprint and frontal area for easy clustering. Complete with flying points, optional wheel kit. Uses LSP-1 ISC processor. \$3643.50.

218 Concert Series Reflex loaded 2 x 18" Sub bass package for LF enhancement of the 922 or for use as a syst. with the 212 Mid/High pack. Uses LSP-1 ISC processor. The 218 is designed for those times when only 18" will do! \$4180.

UltraSUB Dual chamber bandpass 1 x 18" (460mm) sub bass cabinet for general purpose LF enhancement of any syst.. All plywood construction, uses LSP-1 ISC processor. \$2260.

AUSTRALIAN MONITOR

Australian Monitor (02) 98749355

SLAM Double 15" double-ended band pass, low freq. enclosure. 40Hz-250Hz; 106.5dB 1W/1M; 1000W programme; 4 ohms. A very comp. bass syst., comes standard with 4 x 4" castors and large steel bar carry handles. \$2,400.

D518 Larger version of the SLAM, Features Dual 18" drivers in a band pass enclosure, 1600W programme 35Hz-100Hz range. Maximum 140dB SPL. \$3,275.

BOSE

Bose (02) 9204 6111

Bose Panaray 502 Acoustimass Bass Enclosure uses patented Acoustimass technology that delivers bass with no audible distortion, this makes it hard to locate the sound source, allowing you to place the bass enclosure almost anywhere in the listening area. Is engineered to be used with the Bose 402, Panaray 502 and 802 loudspeakers syst.s. This enclosure is available in both a portable and environmental version. \$2206 Each.

Bose Syst. Controller The syst. controller is a 1 rack unit device that provides crossover functions, active electronic equalisation and dual channel signal processing must be used with above product. \$429 Each.

CERWIN-VEGA!

Ashton Admor (08) 9478 3800, (02) 9690 0991

SL-36 portable earthquake 18" JE driver with 3" voice coil in folded hyperbolic horn; 600w continuous program power; 106dB sensitivity. \$2815.

PS-18B Prostar 18" folded horn subwoofer cabinet; 800w continuous program power; 103dB sensitivity complements Prostar full range cabinets. \$2530.

PS-215B Prostar dual 15" subwoofer cabinet; 800w continuous program power; 98dB sensitivity. \$1793.

T-36 Intense 18" subwoofer in folded horn with aluminium woofer chamber door; 1000w continuous program power; 108dB sensitivity; professional concert series. \$3250.

EASTERN ACOUSTIC WORKS

Production Audio Services (03) 9415 1585

SB250R a comp. sub bass syst. with 2 x 15" driver LF mounted on a vented enclosure. +/- 3dB 38Hz - 200Hz freq. response. 2000w power handling. \$4800.

SB850R 2 x 18" sub bass syst. designed to compliment the KF850. +/- 3dB 32Hz - 150Hz freq. response. 2000 w power handling. \$9245.

SB1000e a comp. dual 18" high output sub bass syst.. Flyable with locking rails for easy stacking. +/- 3dB 30Hz - 100Hz freq. response. 2000w power handling, 138dB peak output. \$9165.

KF940 a horn loaded dual 12" sub bass syst. designed for use in arrays of four or more. +/- 3dB 24Hz - 300Hz freq. response. 154dB @ 100Hz peak output (4 cabinets). \$16,595.

ELECTRO VOICE

EVI Audio Australia (02) 9648 3455

MTL 1 Double 18 subscoop bass cabinet loaded with MT 18 drivers. Also available in "X" form with EVX 180B drivers. Carpet finish. \$3,890.

MTL 2 Double 18 manifold loaded cabinet with EVX 180B drivers. Also available as full flying with aerogrip track. Also available in textured finish as DMS 2181. \$4,999.

XI 1191 Single 18 manifold loaded cabinet in textured finish. Also available as full flying with aerogrip track. \$5,399.

SB 180 Single 18 subscoop loaded with EVX 180B. Carpet finish with pole mount to support mid/hi cabinet. \$2,499.

FENDER

Fender Australia (02) 9666 5077

118S 1 x 18" eminence loaded subwoofer, front loaded; 800w program power; 12 month warranty; 40kg; 40Hz-400Hz. \$1399.

215S 2 x 15" eminence loaded bandpass style subwoofer; 1600w program power; 12 month warranty; 40kg; 35Hz-170Hz. \$799.

115 SA carpet covered, bandpass box loaded with a 15" 700w program eminence speaker; 29.5kg; top mounted pole socket for hi-mid boxes; 42Hz-110Hz. \$799.

118 SA carpet covered, bandpass box loaded with a 18" 900w program eminence speaker; 39.5kg; top mounted pole socket for hi-mid boxes; 42Hz-110Hz. \$899.

HAMMER

Melmusic.com.au (03) 9578 2426

115SB 800w, 15" sub woofer, ideal for high level sound reinforcement, very comp.. \$1350.

212SRP 800w, 2 x 12" sub woofer, ideal for high level sound reinforcement, very comp.. \$1195.

JBL PROFESSIONAL

Jands Electronics (02) 9582 0909

JBL-VS125HS Horn Loaded Low Freq. Syst.: Dual Horn Loaded 2226H 380mm (15") VGC Transducers; 36Hz to 470Hz; Rectangular Enclosure. 1200 w power handling. \$6,095.

JBL-SP128S Low Freq. Syst.: Dual 2242H 460mm (18") Super Vented Gap Transducers; 32Hz to 2.3kHz; Rectangular Enclosure. 1600 w power handling. \$6,095.

JBL-Array-4893 Comp. Subwoofer Syst.: Dual 2217H 355mm (14") Transducers. 1200 w power handling. \$4,895.

JBL-HLA-4897 Low Freq. Array Element: Very high output; Dual 800W SVG Transducers; Integral Composite/Spaceframe Linear Dynamics Aperture Vent Design; Simple Rigging Syst.. 1600 w power handling. P.O.A.

KLIPSCH

Horwood Australia (02) 9585 1011

KP-1002C 15" subwoofer; 300w; 40Hz-400Hz; 127dB SPL; with or without internal 150Hz passive crossover; tough and reliable. \$1464.

KP-4002C 18" subwoofer with passive 15" radiator for maximum bass; 44Hz-200Hz; 130dB SPL; passive 150Hz crossover available; great for hire or install. \$2013.

KP-682 dual 18" speakers; 800w; 40Hz-200Hz; 134dB SPL; as heard in Sub.Lime dance club; reliable, powerful sub bass. \$4026.

MACH

Audiology (02) 9584 0033

M182R/1821 1500w; 2 x 18" short horn loaded sub; 35Hz-800Hz; 103dB 1w/1m; "R" series for production, "I" series for perm. installation. \$4299.

M152R/1521 800w; 2 x 15" short horn loaded sub; 38Hz-800Hz; 102dB 1w/1m; "R" series for production, "I" series for perm. installation. \$4299.

TXS15 300w; 15" sub with built-in crossover; 49Hz-160Hz; 97dB 1w/1m; carpet finish, steel hardware. \$1099.

TXS18 350w; 18" sub with built-in crossover; 49Hz-160Hz; 98dB 1w/1m; carpet finish, steel hardware. \$1299.

MARTIN AUDIO

Technical Audio Group (02) 9810 5300

WS2 double 15" direct radiating floor standing sub for use with EM76 or W3. 132dB peak SPL. 38Hz-120Hz. Wheel mounted. \$4495.

WSX single 18" long excursion driver on 7" folded horn, very high impact. 105dB/w/m, 105kg wheel mounted/floor standing. \$6895.

W8C single 15" port assisted folded horn, long excursion 800w driver, 40-200Hz. 138dB peak SPL, MAN flying fittings, matched dimensions with W8C, 66kg wheel mounted. \$6995.

W8S 15" folded horn with 18" direct radiating, 40-150Hz. 137dB peak SPL, MAN flying fittings, matched dimensions with W8F, 82kg wheel mounted. \$9495.

MEYER

Meyer Sound Australia (07) 3252 4493

PSW-6 4 x 640w amp.s; 2 x 18" and 4 x 15" speakers; 140dB @ 1m; 30Hz-125Hz; cardioid polar plot (ie. 20dB quieter at rear). \$23,700.

PSW-4 2 x 640w amp.s; 1 x 18" speaker + 1 x 15" speaker; 136dB @ 1m; 32Hz-160Hz; 93kg. \$8100.

PSW-2 2 x 640w amp.s; 2 x 15" speakers; 136dB @ 1m; 35Hz-120Hz; same size and rigging as MSL-4. \$7400.

650-P 2 x 640w amp.s; 2 x 18" speakers; 136dB @ 1m; 28Hz-100Hz; 93kg. \$7900.

PEAVEY

Audio Telex (02) 9647 1411

SP118 Single 18" front loaded subwoofer, 4 ohms. Built in pole adaptor for top mounting of a mid/high box. Very tight, inexpensive bottom end. \$1374.

DTH215b Dual 15" concert subwoofer, 700 w continuous, 2800w peak. 4 ohms, Speakon connectors, durable black polyurethane covering. Anti-axial driver arrangement. \$2364.

DTH218b Dual 18" concert subwoofer, 1000 w continuous, 4000w peak. 4 ohms, Speakon connectors, durable black polyurethane covering. Anti-axial driver arrangement. \$2922.

SONY

Sony Australia (02) 9887 6672

SRP-B3000 Sub Woofer, 1,050W max, 838W/598H/626Dmm, 70kg, Finnish Birch Plywood, 102dB/W/m. \$5,990.

SRP-B900 Sub Woofer, 1,050W max, 545W/758H/453D, 45kg, Rigid Plywood, 96dB/W/m. \$2,990.

YAMAHA

Yamaha Music Australia (03) 9693 5164

SW118 118 IV 500w bass reflex sub woofer with 18" driver, 8 ohms, 30Hz-2kHz, 32.4kg, 96dB. \$1295.

SW118 118 IV 1000w bass reflex sub woofer with two cast frame 15" drivers with 3" voice coils, 4 ohms, 33Hz-2kHz, 63.5kg, 98dB. \$1895.

CONNECTIONS SHOP

MOBILE DJ HANDBOOK \$45

By Stacy Zemor. For both the newcomer and the experienced DJ, the book contains helpful tips, advice and ideas on how to develop and expand your business, covering marketing, bookings, buying equipment and music, and running parties and dances. 170 pgs, 1997

STUDIO BASICS \$34

By Richard Mansfield. This book covers what happens on the studio side of the glass, from the artist's point of view. Subjects covered include logistics, preparation, repertoire, instruments, and how to listen to tapes. 164 pgs, 1993.

MIDI SYSTEMS & CONTROL \$55

By Francis Rumsey. 2nd Edition. Covers MIDI control principles and how they can be implemented in practical systems. Deals with MIDI in studio, musical and lighting equipment, mixer automation plus information on the latest additions to the MIDI spec. 202 pgs, 1994.

PRACTICAL STUDIO TECHNIQUES \$40

By Tom Misner. Includes a bonus CD, a practical demonstration of a complete mixdown session including setting up effects, uses of the compressor, gating of sound, various types of equalisation, selecting reverb settings & more. 102 pgs, 1994.

SOUND & MUSIC FOR THEATRE \$44

By Kaye & LeBrecht. Covers the complete process of sound design from original concept through to finished plan. Looks at development, research, cues, recording and various techniques. 196 pgs, 1992.

IT'S BACK! EFFECTS FOR THE THEATRE \$49



Edited by Graham Walne. This practical handbook divides effects into four sections: scenic, sound, lighting and special. Written by internationally experienced experts in each field. An exciting range of techniques are explained with consideration given to budget. 150 pgs, 1995.

SOUND ENGINEER'S POCKET BOOK \$50

Edited by Michael Talbot-Smith. Compact source of essential data for every sound technician. Covers noise measurement, acoustics, microphones, loudspeakers, mixing equipment, CDs, DAT and MIDI, telephony, ISDN, digital interfacing, ultrasonics. 157 pgs, 1995.

PROFESSIONAL LX HANDBOOK \$105

By Verne & Sylvia E. Carlson. Details technical foundations, equipment and methods of lighting for film and video productions. Packed with practical insights, tips and troubleshooting techniques useful on the set. 224 pgs, 1991.

CONCERT LIGHTING \$70

By James Moody. 2nd Edition covers every aspect of rock & roll concert lighting equipment and techniques, including CAD, moving lights, hi-bred consoles, rigging safety and special effects. 279 pgs, 1996. WAS \$94

STAGE LX CONTROLS \$89

By Ulf Sandstrom. Explains the general principles of modern computerised lighting consoles and the relevant control standards such as DMX512, MIDI and Ethernet. Covers the basic aspects of controlling moving lights and scrollers. 215 pgs, 1997.

PROJECTION FOR THE PERFORMING ARTS \$80

By Graham Walne. Gives a brief historical overview of early projection attempts, then looks at equipment and the planning and design of every kind of indoor and outdoor live performance. 139 pgs, 1975.

CONCERT TOUR PRODUCTION MANAGEMENT \$39

By John Vasey. Provides basic information needed to manage the production of a touring concert from start to finish. Discusses different types of venues, who's who on the road, crew management, riders, contracts, and even electrical formulae! 165 pgs, 1998.

MODERN RECORDING TECHNIQUES \$65

By Huber & Runstein. Addresses the area of project studio recording, the new base of home music production, using multitrack, Hard Disk and MIDI technologies. Descriptions of the toys, tools and practices of music recording and production. 4th ed. 500 pgs, 1995.

LIVE SOUND MIXING \$39

By Duncan Fry. 3rd Edition addresses the basics on how a PA system works, and details on troubleshooting when it doesn't. Covers EQ, processing, mixing, sound-checks, effects, monitors. 176 pgs, 1997.

OTHER BOOK TITLES:

AUDIO WORKSTATION HANDBOOK Francis Rumsey	\$75.00
BASICS OF VIDEO LIGHTING Des Lyver/Graham Swainson	\$35.00
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The Current State of Touring

An interview with Garry Van Egmond, Tour Promoter

Connections spoke to Tour Promoter Garry Van Egmond to get his opinion on the current state of touring in Australia.

Garry Van Egmond is well established as a promoter and producer of quality international acts. Managing Director of The Concert Corporation, Garry has successfully toured an array of Australian and international performers and productions.

Currently representing several major international and local tours, Garry described the industry as healthy.

"At the moment the touring industry is very healthy - for the right shows of course. The shows which seem to be doing well are the 'spectaculars'. We were one of the first ones to do that with *Jesus Christ Superstar* with John Farnham, which had great success - over 900,000 people saw it. And in conjunction with Paul Dainty we brought over *Riverdance* which played to some 800,000 people around Australia. And then there's shows that other companies have put on, like *Grease*, which have had enormous success. 'Spectaculars' are definitely doing well."

At the recent Entertainment Industry Employers Association conference, shows like these were described by Producer Wayne Harrison as "the suck-up factor" because they are big budget, short run or one-of performances that come to a city with a star cast and drain the market of bums on seats. It is usually the live theatre sector that it most affected by these shows.

Economic factors are the single biggest issue currently facing the touring industry. And while Garry said the industry is basically healthy, he went on to say that the industry is certainly not at its best.

"Things aren't that easy with concerts at the moment because of the fluctuation of the Australian dollar against the US dollar. The low exchange rate has really been doing us a lot of damage.

"All tours are always negotiated in American dollars. When we negotiate a contract we then forward buy, but it's the agents who never understand that if the dollar has dropped by 25 percent then they have to reduce their fee by 25 percent. They can't comprehend that."

The full impact of the introduction of

a GST is still not known. Early speculation suggests an across the board 10% increase in concert ticket prices to cover the GST payable on all areas of concert production.

Given that there is already debate over ticket prices in Australia, any further price hikes will not be received well by the general public.

"Ticket prices here are higher than they are in America, but you've got to remember that there is an enormous distance between America and Australia. You've got to cover the air freight and the air travel, and a ticket for the artist to fly from LA to Australia is \$10,000 and that's an expense they don't have in America. Unfortunately it's through the ticket price that those expenses are paid."

Garry pointed out that negotiations for rental of venues in the United States are much more favourable than Australia.

"Venue rentals in Australia are much too high. The venues don't take any risk and they're driving touring costs up. In America because there is competition for venues in every city that you play, they take a risk, or you have a deal where there is a ceiling on the rental."

At the same time though, Garry says that Australian audiences are very lucky with the quality of concert venues in the major cities.

"Just recently I was in America to see the Spice Girls concerts and they played in 'sheds' which are Myer Music Bowl type venues which hold up to 35,000 people. And when you compare that to a typical Australian concert venue like Melbourne Park you realise that Australian audiences are a lot better off. And then there are transport factors - the venue I went to, it took an hour and three quarters to drive there, and four hours to drive back, whereas here we're very lucky to have good public transport systems backing up most of our venues.

"In my experience the best run venue in Australia would have to be the Brisbane Entertainment Centre, the best venue would have to be Melbourne Park, and then there are places like the Burswood Dome, Sydney Entertainment Centre, and the new Olympic games stadium in Sydney. And of course we're all looking forward to the Docklands Stadium opening because it will be a

much more intimate venue than the MCG and with the roof on it, it will be so versatile."

Garry believes that concerts have probably become as big as they can get, although the form will continue to evolve.

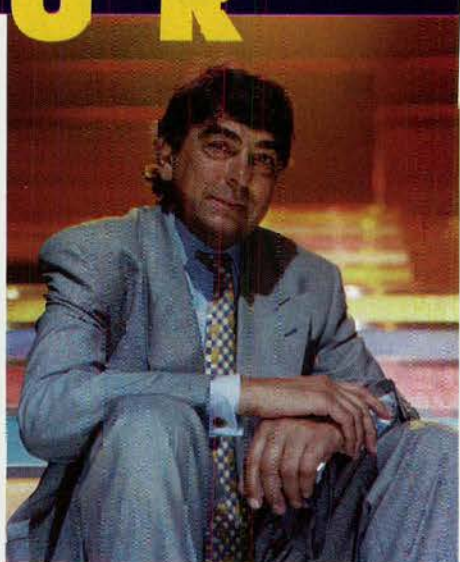
"A rock concert can't get much bigger than they are presently. Obviously they can become more sophisticated through technology developments in sound, lighting and staging. AC/DC used a roll on stage for their concerts and it cut the set up time by five hours, so there are developments like that which save on labour and costs because it means you can move the show much quicker. Sound and lights really depend on the designer - but Vari*Lite's will always be Vari*Lite's, and everyone virtually uses them these days."

In terms of the future of the touring market, Garry is optimistic. His company continues to bring high profile events to Australia such as the famous Irish Fleadh Festival which is coming to Sydney and Melbourne early next year, as well as breaking into the international market with an American and Canadian Tour of the Dein Perry dance show *Steel City*.

"*Steel City* will be the first show that we've presented in America. We've had investments in other shows that have gone to the states but this is the first one that we've done ourselves. We brought out a range of people from America, representatives from Pace Theatrical, Radio City Music Hall and others, and we took them to see *Steel City* in Melbourne and they loved it. We open at Radio City Music Hall on January 26th 1999.

"We have an office in LA and we're setting up a New York office to promote *Steel City*. We also have an interest in the Broadway and touring productions of *Jekyll & Hyde* so we're looking at expanding into those markets as well."

• Mandy Jones



ON TOUR DATE WITH DISASTER

my introduction to moving lights

It all started on the afternoon of our big school performance night; the one that had been in planning all year and was finally here. We had our lighting hire all ready from Company X; a couple of foggers, some truss for the stage, around 12 par cans and an ESPII and for the first time in the history of the school, moving lights; two Miniscan 300s. What was better, we were getting a 10% discount because we were a school.

I had everything ready and planned - right down to the last cue for the dance display. Then the phone rang. It was Company X's manager, just letting me know that another guy had come along that morning needing to hire all their truss, conventionals and moving lights and that he had taken it because he was going to pay full price.

After abusing everybody around me, we settled into a state of sheer panic. Three hours till showtime, and we didn't have one light. Desperate to get my hands on anything that lit up, I rang the company I did work experience at the year before, Company L. They sympathised with us and in the end gave us 3 Golden Scans for the same price that we would pay for the other gear, but without a console. Not having used anything moving before, we first had to hire a truck to fit the GS3's in when we found they wouldn't fit in our van, then I had to work out how to set the options without a manual or fixture library.

Disaster struck again when, as I was checking the address settings underneath the light, the guys who were holding it dropped it. Out went the bulb. I went insane after

deciding we couldn't afford the near \$400 bulb, programmed the entire show with only one GS3 on our trusty geriatric desk. Naturally, 20 minutes before the show began the one with the 'blown' bulb fired up again, and, because you couldn't update presets on our 24 channel p-o-s desk, I had to re program the entire night's entertainment.

It was then that I found out that the GS3's were full of Christmas gobos, and we weren't doing a Christmas show, and that the hazer vibrated so much it 'walked' around the floor. Then the actors complained because that the 1200w bulbs were too bright. It went badly, very badly. The motto of the story? It doesn't matter how big your moving lights are, its whether or not you can control them. We couldn't!

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THE

ELECTRIC CANVAS



LIGHTING

November 1998

MONTHLY

Edited by Catriona Forcer

TECHSCAPE bought under GUET banner

BRISBANE: TechScape was established last year as the wholesale lighting and audio distribution arm of Greater Union Village Technology (GUVT). Now it is no more.

In July the Greater Union Organisation bought out Village, and GUVT changed name to Greater Union Entertainment Technology (GUET). This change of ownership has lead to a refocus in the organisation's direction.

In line with the new strategy, TechScape has been brought under the GUET banner and its product range will be distributed through the new Sound, Video, Lighting (SVL) Distribution division. GUET now has the opportunity to utilise its national infrastructure of offices and industry professionals outside of Brisbane more effectively. The move will better support dealers, no matter where they are in Australia, say GUET.

The SVL Distribution division will continue to supply and support the latest product from the world's leading manufacturers including High End Systems, Mad Lighting, Anytronics, Light Processor, Lighting Technology ... as well as new audio and video agencies.

The other new GUET divisions include the national SVL Contracting division, headed up by Les Jones, and the Cinema division with Kevin Warry looking after southern and western Australia (VIC, TAS, SA, WA) and Ben Wilson looking after the eastern and northern regions (NSW, QLD, NT).

GUET retains all current state offices, and head office can be contacted at 61 (0)2 9420 4888.



KEDRON WAVELL RSL

Brisbane RSL installs state-of-the-art lighting system

Kedron Wavell RSL in Brisbane has recently completed the construction of a new foyer to the building with the audio and lighting contracted to Visual Innovations, also based in Brisbane.

"We had a lot to do with the design process and we were able to have a lot of input which really helped," said Cameron Gunning of Visual Innovations. "For once in a project we were involved from day one and were able to say things like 'can we wire it this way' or 'is this possible'. It made for far less headaches at the end of the project because DMX was wired correctly, the points were there and we had total control in terms of what we needed in power."

"There has been constant referencing during the past 15 months," added Peter McKenzie of Show Lighting who supplied the Clay Paky equipment used for the project. "Nothing has been too much trouble. One thing that impressed me was

the installation of a computer telephone point in the control room so we can go straight to the internet and now they are looking at installing cameras so we can perform 'remote diagnosis' with technicians in Sydney."

"We're trying to give the club, the most state-of-the-art club foyer lighting system in the country," said Cameron.

"The system is designed to run completely by remote, the only people who have a key to the control room are Cameron's company," said Peter. "If there was a fault, he can dial in from his computer at home to fix it and probably won't even have to visit the club. Other changes such as altering daylight saving times or adjusting air conditioning can be done from home saving call-out fees."

Early in the design process, Cameron and his business partner knew they were going to use moving-yoke luminaires and, as they

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television

discotheques

church

military installations

architectural

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events

home theatre

shopping centers

live venues

display merchandising

tradeshows

theatre

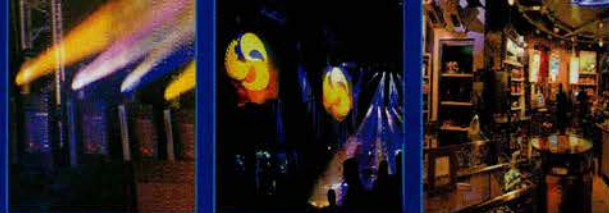
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KEDRON WAVELL RSL

continued from previous page

are also Clay Paky fans, they opted for the relatively new Stage Color range.

"Reliability was a major factor," said Cameron. "One of the most critical aspects for the job was lamp life and reliability of equipment. We knew a new long life Osram lamp was coming, so that was critical to the commissioning of the job. We also knew the Clay Paky moving yokes were coming. Time frame wise, it was very fortuitous that the two products came on the market as we were doing the project."

"Complimenting with the Clay Paky Mini Scan HPE's, it made for a very cohesive, one brand in the moving head. In a job this size and because the club operates seven days and nights a week the reliability is critical."

The foyer has eight Clay Paky Stage Color 300's, ten Mini Scan HPE's and eight Combi Color 300's in two defined sections. The eight Stage Colors and eight of the HPE's are for the ceiling shows whilst the remaining HPE's and the Combi Colors are for a wall display in another area.

Martin Proscenium software controls and time clocks the entire installation, shuts off air conditioning, controls haze machines and club audio.

"It's basically triggering out to a number of relays powering up and powering down," explained Cameron. "The job can operate as a completely autonomous installation on a time clock. We've programmed three shows plus the wall display and The Ode at 7pm. It was critical that The Ode was correct."

The club already had a dimming system installed by Dyalite to which a DMX feed was run. When The Ode comes on, a pre-set percentage level is triggered by the Martin Proscenium which blacks out the entire club.

"We also trigger during the shows to a percentage level with Dyalite and again their system takes over and dims for us," said Cameron. "The Proscenium software has basically enabled us to achieve everything in one package. It's saved going through a lot of different networks and it's been a pleasure to use as well as reliable. In terms of a control package for gen-

eral use, it's fantastic value.

"The clients wanted the best they could get for what they wanted to spend but they've certainly been unafraid to try new ideas. The Project Engineers came to Entech to make sure there wasn't any new technology they'd missed and to meet the Clay Paky representatives. They had a good look at the fittings."

It was very important to the client that the lighting fixtures were exposed in the well designed entry foyer. They wanted people to be able to see the lights moving around, part of the appeal was not only the light show but the lights themselves.

"The job specification has nailed what

it set out to do - use the technology you'd use for concerts or nightclubs in a real world architectural application," said Cameron. "Even the stainless steel 48OD lighting bars have been made part of the feature, you really wouldn't know they were lighting bars. The DMX points, speaker points and power points are concealed in a trough behind the bars. Upgrading or changing the fitting would be very easy."

Part of Visual Innovation's successful tender is a twelve month maintenance contract and installation of new shows - probably three new shows every quarter.

The first three shows, projected on



Cameron Gunning and Peter McKenzie

the ceiling are very different and run every half hour. The first show is a daybreak to night-time show set to Greigs *Morning Mood* which runs for about one minute and twenty seconds. The second show is set to the *Pink Panther* theme tune and uses paws and magnifying glasses. The final show is set to the sound of a rainforest with a projected collage of foliage and birds.

Eight minutes before a show the air conditioning is turned off and haze is delivered by a JEM Hydrosonic 2000.

The lift wall is a continuous display and proved to be very emotive. Instead of taking the opportunity to use the wall for projected advertising, the Club decided to stage a tribute. It consists of a continual colour wash over which poppies and a white cross are projected. Every minute the poppies centre and prism while another photo from a Mini Scan HPE will slowly fade in - original photos from the war are used.

All the gobos were designed by the artist Jill Kinnear with the full colour glass gobos made by Lighting By Design on the Gold Coast.

AUDIO

Audio is triggered by a CD prompt from the CD ROM drive of the computer.

"We take an audio feed out of that into a Mackie VLZ1202 desk, going into a Samson E62 graphic and from there to a Presonus ACP22 stereo compressor and then into two Mackie M1400 amplifiers," said Cameron. "We're driving eight Turbosound Impact 80's which have exceeded our expectations. Because the foyer is an unusual shape, it was a bit difficult to place the audio and so we've gone for coverage. We're very pleased with the fidelity of the Turbosound. When The Ode comes in we send an audio signal from the Mackie to the inhouse system so when Dyalite

continued over



A tribute is projected on the lift wall



32 amp plug unsafe

ShowSafe calls for feedback

Using a 32 amp three phase plug on a 12 channel dimmer rack is unsafe, according to a recent Conference participant on the ShowSafe webboard. (Go to www.showsafe.com and log onto the discussion centre)

The so called 32 amp plug standard came into being many years ago when Strand introduced the Miniset and Minipak 2kw dimmers. Although these had 10amp fuses these were only rated at 2kw per channel and in the 12way units would only supposedly draw around 33amps/phase max loading.

With the advent of the newer light fixtures and lamp technology now providing 650watt and 2.5kw lamps, and the dimmers manufacturers producing 2.5kw dimmers the load must now be calculated on the maximum load able to be provided by the dimmer. This is approximately 42amps/phase.

ShowSafe's Conference moderator Paul van der Ent (wizprod@ozemail.com.au) suggests a close look at the 'standard'. The 45amp 3phase plug would be more suitable and an increase in cable size to suit

should also be considered.

"It should be noted that the three phase supply is being used unbalanced in a dimmer system, and the potential of currents in excess of the 45 amps is possible through the neutral which is only rated at 45amps," he says.

"During the dimming cycles, (especially between 30 and 85 percent) extremely high currents can be present in the neutral at varying frequencies or harmonics thus putting extra stress on this terminal in the three phase plug and in the supply cables. This is the reason why people have complained in the past about burnt out neutrals in 3 phase plugs."

The new SAA wiring rules are now undergoing final drafting and are due out in 2000. The areas of cable sizing, derating and maximum demand of final subcircuits are the usual things that are amended. ShowSafe calls for submissions on whether to pursue a new standard requiring 45 amp cable and plugs on dimmer racks.

- Use the webboard, or mail to PO Box 785, EPPING 2121 NSW.

KEDRON WAVELL RSL

continued from previous page

drop the lighting down, we trigger a relay which drops the inhouse audio out and our system puts The Ode out through the entire club.

"Again it was important that the box was aesthetically pleasing as it was planned to be visible."

• Cat Forcer

Builder and Project Management
Paynter Dixon Qld Architect Wayne
Blow & Partners Consulting Engineers
Rodger Craig & Associates Lighting and
Audio Contractor Visual Innovations

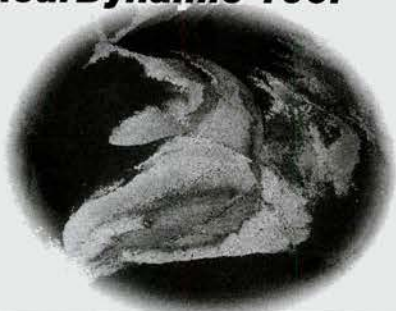


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LXbizzBITS

NEWS

HIGH END SALES

Lighting Lab of Melbourne have taken delivery of yet more Technobeams with LAD taking their total rental inventory of Technobeams to Fifty (50). **Gearhouse Lighting Australia** also have added 24 x Technobeam with LAD to their production rental inventory taking their total to Forty Eight (48). **Bytecraft** have taken delivery of 28 x Studio Color S fixtures, 24 x Cyberlight fixtures and 2 x AF1000 LCD controllers. **Entertainment Lighting Supplies**, Gold Coast, have taken delivery of 8 x Technobeam with LAD, 2 x Technobeam without LAD, 2 x Technobeam LCD controllers, Studio Color LCD controller, 4 x Ecodomes for Studio Color and 4 x Ecodomes for Cyberlight. **IJS** of Brisbane have taken delivery of 4 x Technobeam without LAD for their rental inventory. **Chameleon** of Sydney have taken delivery of 3 x Cyberlight and a Cyberlight LCD controller. **Clearlight Shows** of Melbourne have taken delivery of 4 x Technobeam with LAD, 4 x Technoray and 2 x Technopro for an installation.

• GUET +61 7 3358 5118.

LIGHTING BY DESIGN

Lighting By Design, the Gold Coast based manufacturer of colour gobo's, has a new office number. You can now reach them on P 0755 377 002 or F 0755 292 226. The resolution of their gobo's has now increased by a factor of 3 since their display at Entech earlier this year and they'll be happy to supply all your needs of colour, greyscale and stainless steel gobo's.

SELECON PRICING

While many in our industry are reeling from the continuous price increases due to the exchange rate, Selecon's prices remain either unchanged or are lower than last year. Thanks to the volume built up in Europe, Selecon have driven down some of their Acclaim range production costs which have been passed on to the industry. Full details and a promotional leaflet on Selecon's "Lighting Magic" are available from your Selecon dealer.

LIGHTING '98 43rd INTERNATIONAL LIGHTING CONVENTION

The IES (Illuminating Engineering Society of Australia and New Zealand) will be holding **Lighting '98 - Techniques and Technology** a Trade Lighting Expo and Computer Lighting Software Expo this month. The event will be at the Carlton Crest Hotel, King George Square in Brisbane from November 9-11. Check out their website:

W www.iesanzq.asn.au.

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BYTECRAFT'S SOLUTION SINE DIMMER

By Andy Ciddor

The conversion of theatres from gas to electric lighting was a major step backwards in control technology which has taken most of this century to redress. Master faders, group masters and independent channels were available on most gas tables (gas lighting control consoles) before the first feeble carbon filament lamp was ever hung over a stage.

The control of electric light levels was initially achieved by varying the throttle on the steam engine driving the DC generator, a technique which was soon after supplanted by the notion of a resistance in series with the lamps to limit the current flowing through them. One drawback to this method was the explosive Hydrogen and toxic Chlorine gasses produced by current flowing through the salt water which was part of the dimmer mechanism. Another drawback was the need to be close to the dimmer in order to operate the rope which raised and lowered a metal electrode in the salt water to vary the resistance of the circuit. At least these dimmers produced no electrical interference, which would have been a great relief to the audio people, if there had been any audio in those days. Resistance dimmers were later made using high resistance wire rather than salt water and whilst these were much safer, they still filled rooms, wasted a lot of energy as heat, weighed tonnes, cost a bundle and required direct mechanical operation.

THYRISTOR DIMMERS

The holy grail of electrical dimmer design has been a compact, high-efficiency, light-weight device which is remote operated and which produces no electrical or acoustic noise. Thyristor (SCR and Triac) based dimmers, almost universally adopted since the sixties, have been increasingly able to attain many of the attributes of the ideal: high efficiency, remote control and more

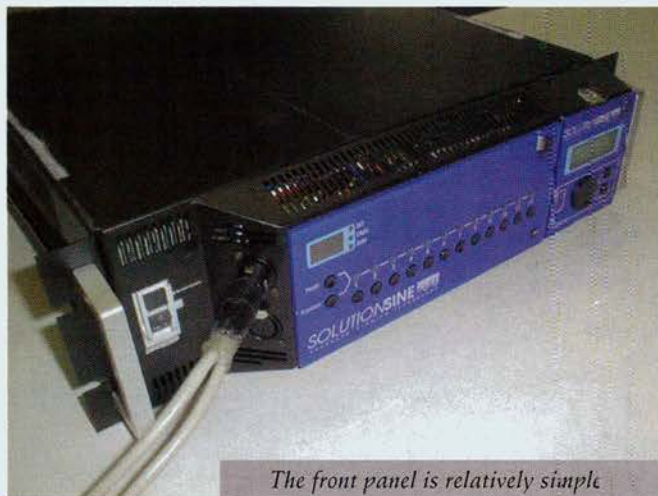
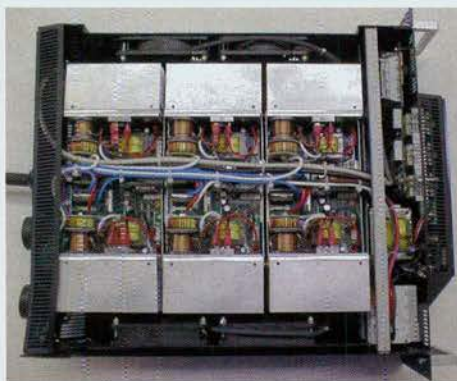
recently a good measure of acoustic silence. These dimmers operate on the principle of phase control, which basically involves cutting a variable size chunk out of each half-cycle of the AC mains supply until the lamp reaches the desired level. At full, no chunks are removed and at zero the entire half cycle is missing; anything in between involves a sudden switching on of current and then a gentle completion of the half cycle.

It's the sudden switching which causes all of the grief associated with thyristor dimmers: ElectroMagnetic Interference (the buzz in faulty audio cables), lamp filaments being rattled (singing) by the odd-shaped mains currents and mains supply problems like overheated neutral wires and mains-borne interference. The EMI problem can be reduced with a big choke (inductor) on the dimmer's output, which, in addition to making the dimmer heavier, adds a power factor (current lag) problem to the already distorted mains supply. Power supply authorities are becoming increasingly concerned about the mains distortions caused by large dimmed installations, in particular the energy management systems in large buildings. European Commission regulations require that installations completed after January 2001 must conform to reduced mains distortion levels essentially unachievable by thyristor dimmer technology.

ENTER THE SOLUTION SINE

Enter Bytecraft's latest dimmer, the PLASA award winning Solution Sine. Based on an IGBT (Insulated Gate Bipolar Transistor) switch controlled by a DSP (Digital Signal Processor) which monitors and adjusts the dimmer's output three hundred times in each mains half-cycle, these Pulse Width Modulated dimmers are getting close to our ideal. Just like the resistance dimmers of old, the output of these dimmers is a sine wave: no strange-shaped power to rattle lamp filaments or dimmer modules, negligible mains distortion and no overloaded neutrals.

Energy efficiency is around 96%, as good as any thyristor design, but unfortunately the weight didn't come down much. Although the bulky chokes are gone in these dimmers (see photo of the interior), the weight is made up for by extra heatsinks and four varispeed cooling fans in each twelve-way rack: the 1998 vintage IGBT is still very sensitive to being overheated and Bytecraft have gone to extraordinary lengths to stop them from cooking. The Solution Sine fairly bristles with temperature sensors, airflow sensors and fan rotation sensors and can be programmed to deal with over-temperature situations by either reducing dimmer output or progressively shutting down the effected dimmer modules. Of course the rack's processor keeps you up-to-date with this or any other fault which may arise. The fans are also the only source of acoustic noise from the rack and may prove a little on the noisy side for racks to be placed in a FOH slot for drama, although having said that, they're no more noisy than a single robotic luminaire.



The front panel is relatively simple

CIRCUIT BREAKERS

One of the more noticeable features of the Solution Sine is the RCD circuit-breaker on the mains input, because it's the only mains breaker on the rack: there are no load circuit-breakers or fuses! The output of each dimmer is monitored by the DSP for conditions which aren't to its liking and it just refuses to participate. If there is a short circuit caused by a wiring fault or a blown lamp the dimmer simply switches off until reset. Should you mistakenly put too high a load, say five kilowatts, on one of these 12Amp (2.5kw+) rated dimmers, then only 12 Amps of current will flow, leaving your 5kw load at half brightness. A cold tungsten filament lamp, which typically has an inrush current of 10-20 times its operational current will still only receive 12 Amps, resulting in a "soft" start over a couple of mains cycles thereby removing the sudden thud so often responsible for blowing lamps at switch on. Even if the load is highly reactive, as in the case of transformer-driven lamps such as neons or low-voltage tungsten halogens the dimmer simply controls the current without any additional mains distortion.

CONTROL

On the control side, the front panel (see photo) is very simple, in contrast with many of Bytecraft's current range of dimmers which can involve twenty button-pushes simply to test a channel. There is an optional full-function control unit which can either be at-



Optional full function control unit

tached to the front of the rack or connected via a remote cable to an entire network of racks. This unit features every function ever seen on a dimmer, from full diagnostics and dimmer characteristics configuration through network set-up to checking what time the lighting crew last took a meal break (well almost). In a move towards more inter-operability the Solution Sine breaks with Bytecraft's tradition of using its proprietary Bytebus architecture by incorporating Echelon's LONworks protocol to communicate with other racks, network controllers and soon with PC's and other devices.

CONCLUSION

In essence the Solution Sine dimmer is a bunch of sensors which measure everything about what's happening to the dimmer and its electrical and physical environment, some fast switches (the IGBT's) and a very smart piece of software running on a CPU fast enough to juggle the input from the sensors. The upshot of this is a dimmer which has the potential to do just about anything you can imagine; and if it doesn't do it right now, then in it's only a matter of modifying the control software, a process that will keep Bytecraft and their customers busy for years to come. This dimmer is a preview of several technologies that will irrevocably change the face of lighting control in the next millennium.

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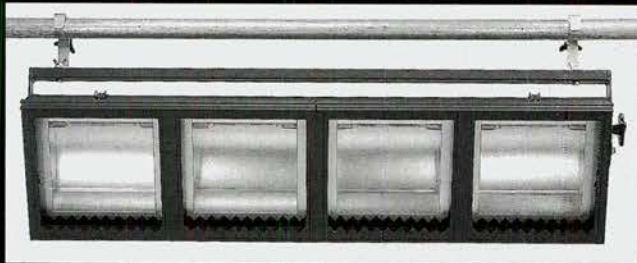
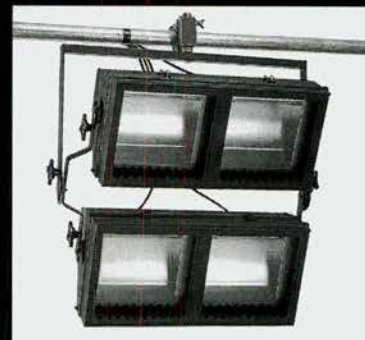
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NINE NETWORK COMMONWEALTH GAMES COVERAGE

by Rohan Thornton

Throughout the months of July through August, over 140 technicians, producers, reporters and many other support staff assembled in Kuala Lumpur to build a television station from scratch in the OB garage at the International Broadcast centre.

Headed by Executive Producer, Tony Sinclair, the crew painstakingly built a structure that contained 2 studios complete with all control room facilities, 8 edit suites, 1 Master Control to deal with all of the incoming and out going traffic, voice over booths, production departments for other programs such as News, Today Show and A Current Affair and even a small medical centre for the odd case of Gangi Fever that occurred.

In amongst all of that hustle and bustle, was the smallest department of them all. The Lighting Department. Myself, Troy

Wilson from TCN in Sydney and Trevor Lauritzen from QTO in Brisbane made up the crew. (Trevor also doubled as an OB electrician). Our responsibilities were to provide lighting for the main host studio (Studio A), the news and cameo area (Studio B), a small studio at the games village and any stand ups that required a little more help than what the sun could provide.

Although it doesn't seem a lot, it kept us surprisingly busy. Studio A was built from scratch, as we even had to construct the grid. Equipment was hard to resource, but most of our lights came from a local cable TV company, Astro. They were able to help us with some basic gear such as Desisti and Strand 1KW and 650W fresnel as well as some Videolux and Videoessence fluorescent softlights. They also hired us a Strand GSX console. Unfortunately, we were unable to locate any dimmers that worked or any profiles that were newer than the CCT Silhouette range. Heat was a major consideration within the studios so we tried to get as much use out of the softlights as possible.

Another consideration was that we were on air for up to sixteen hours a day, so we had to provide some variation on the set to keep it interesting. To do this, we flew in 6 Source 4 36" profiles with 6 Wybron Scrollers to add to the dimmers we hired from Bytcraft. I chose Bytcraft as I knew

there was technical support in KL as they were doing the installation at the Malaysian National Theatre. This proved to be a wise decision as it turned out.

The set was another issue. Senior Studio Director Rob Sherlock was having a little trouble working out the shooting patterns in the set. After some discussion, we rebuilt it in a different configuration and tossed some of it out to make it work. A few plastic palms gave it a nice finishing touch. We proceeded to light it. Our brief was there could be anything from one to forty people in the set at any one time. With twenty four dimmer channels, we proceeded to do the best we could.

The other studios were pretty easy. A few soft lights out front and a couple of fresnels at the back seemed to cover all of the evils that occurred. The only problems we encountered was when one of the dimmer racks decided to get into the vibe of the games and create its own night club. Luckily, this did not happen on my shift. It was up to Troy to cope with the disaster. I admit I would have liked to be a fly on the wall as he re-patched a 24 channel rig into a 12 channel rig.

As it turned out it was a problem with the mother board and all it required, after several frantic phone calls to Australia was to replace it with one of our extensive supply of spares. Wrong! As we later found out, the spare had a different problem. Luckily Nick Newey

continued over



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Part 3

LIGHTING ON A BUDGET

When you get a job as an LD for a play, the first thing that you should do is to talk to the director to find out the style that he intends for the play and the venue in which the play is being performed. You should also obtain a copy of the play. Secondly, read the play and ensure that you understand it, this may take many re-reads. Also, contact the venue and learn all that you can about it, specifically, number of circuits, types of fixtures and methods of controlling them that are available. From your talk with the director, you should have been able to get a rough working budget. With some plays, you shouldn't need to hire any additional fixtures and so a budget is not important but if you do need to hire any lights, then shop around. In Melbourne for instance, there are many different lighting hire companies around, some may even give you a discount depending on whether or not you are doing the play for a school or a company.

After you have decided the "look" that you and the director want for the play, it is time to decide what lights you can use. This is where the time that you spent researching about the venue and local hire companies pays off. After deciding what lights you are going to use, it is time to sketch up a plan. It is a good idea to draw this first plan in pencil so that any changes can be easily made. When you are satisfied with the plan, take it to the director. Most directors are technically competent, so they should know what you are talking about when you step them through your design and may even offer advice about improving it.

After the plan is in its final stages you should go to as many rehearsals as you can, to ensure that the actors are actually moving into the right places. If they aren't, either change your plans or tell the director to move the actors. One of these is usually easier than the other, depending on both the director and the cast, usually it results in a compromise.

Soon the time comes for the bump-in. Most directors allow at least a full day for bump-in, so progress as carefully as you can as all fixtures should be treated with care and so should the people who have to hang them. It is important that ALL hanging fixtures have a proper safety chain firmly attached both to the body of the fixture and to the bar to which it is attached.

When the time comes for the tech rehearsal, you run the show - this is your rehearsal. The tech rehearsal is there to ensure that the lighting and sound crews are using the right cues and the actors move into their correct spots. During this rehearsal it is a good idea for any cues used to be stored into the lighting board's memory, if it has such a feature. Most modern boards do so you should just check the manual for the particular board that you are using. Just remember that every board is different.

After the tech rehearsal, there will usually be two dress rehearsals before opening night. At these rehearsals it is important that the lighting cues are all confirmed and checked, as there usually isn't enough time to make major changes before the show starts.

When the big night eventually arrives, you should arrive as early as possible and check the equipment that is being used to ensure that it all works. The reason that this is done early is obvious. Also, all the light should be warmed up before they are run at full power for long periods of time, especially any high power fixtures (1KW plus) because the replacement costs for globes for these fixtures is quite high. This pre-show check and warm-up should be carried out on all performance nights.

At the end of the final show it is not yet time for celebration as the inevitable bump-out still has to be completed. The bump-out will take much less time than bump-in but the lights still have to be treated carefully. Any lights that were hired have to be returned in the same condition in which they were picked up. Any leads should be rolled properly (ie. NOT 'over-the-arm') and should be secured with a length of insulation tape to lengthen the life of the leads. After bump-out the venue should be left the same as it was when you first arrived - better even. After the final clean up, it is time to celebrate, for now is the time for the most enjoyable part of the whole ordeal - The After Party.

Just remember that every performance provides more experience for you so the more the better. When you look back on what you have done, you will find the experience worthwhile and enjoyable. Hopefully.

Bryan Nolan is currently completing Year 12 at Xavier College in Melbourne and is freelancing as a lighting designer and sound engineer. You can contact him by Fax at (03) 9854 5436 or on e-mail at bnolan@xavier.vic.edu.au

NINE NETWORK COMMONWEALTH GAMES COVERAGE

continued from previous page

(Bytecraft's Project Manager in Malaysia) was on hand to solve that little hiccup. Power was not the most reliable commodity. WE had to provide back ups for back ups. During the regular afternoon rains, lighting strikes shut us down quite often. One day, the lightning rods disappeared without a trace. One local sparky was heard to comment, "if you guys get a lightning strike today, you would be more isolated than Malaysia's economy". Everything else went fairly smoothly for the rest of the trip.

It was interesting to see that there were probably more SOCOG fact finders there than athletes. Every where we looked, a suspicious looking character with a Sydney 2000 shirt on would be looking in garbage bins then taking notes.

The other sport to take place in KL was riot-watching. As long as you sit up wind, the tear gas is not a problem and a good rain coat will keep the water cannons at bay. It did screw up the traffic to the point where it started to make Sydney traffic look good.

There were many other aspects of the games that were quite interesting. The opening ceremony had a neat little trick



called "The Human Graphic." Two thousand two hundred school children sat in seats each with sixteen colored cards. Each child had an ear-piece so the color changes could be cued to the exact second. It did look pretty impressive. The funniest moment of the games had to be when the fireworks in the closing ceremony were miss-cued twice. The expression on the Queen's was priceless. When she finally got her last words out, a couple of little fireworks accented the end of the games. I am tipping someone else would be sharing a cell with Anwar.

In short, I think all of us from the Nine Network were quite proud of the record breaking coverage of the Commonwealth Games. What we achieved under the conditions that confronted us was nothing short of amazing. It was great to work on such a cohesive team.

LXbizzBITS

NEWS

LSC SALES

Graceland Casino has installed Atom 12/24, Atom 24/48 consoles and Tour Series Dimmers. New Television Studio M-Net Supersport (Cable TV Station) has installed an Atom 12/24 Console. Finlandia House, Finland's biggest concert and congress hall has installed Multisplits, Linklights and a Softlink.

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PRODUCTS

NEW MAD PRODUCTS

Mad Lighting have announced several new products including the **IMP2** (Image Marketing Projector) with 6 x interchangeable E size gobos, 6 x interchangeable E size colours, cold beam technology, wide beam flood and built in controller or control via DMX.

The new **Slide Projector** has 3 x Slides or D size gobos manually indexable, scissor shutter/dimmer and a built in controller.

The **IMP Opticolour** fibre optic light source with same specifications as per standard Opticolour but with built in controller.

The **Axis Moving Yoke** fixture features a MSR575 lamp, auto correcting pan and tilt, 8/16 bit P.O.D or velocity mode selectable movement, scissor shutters and dimmer, 2 x 6 position interchangeable E size colour or gobo wheels, additional fixed 6 position gobo wheel, DMX selectable fresnel lens wide beam flood, auto focus and a built in controller.

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The Rocky Horror Show

Lighting designer David Murray lit the original Paul Dainty production of Rocky Horror back in 1992 and the 1998 version is basically the same production. Staged in the Showroom at Sydney's Star City Casino, the show is due to travel the country next year.

Originally it was planned to do the show on WYSIWYG but that meant that all the staging decisions had to be made early and that was not the case.

"Unfortunately with all the changes that needed to be made to sit it on the thrust we couldn't use the WYSIWYG," said David. "With the flying problems on the fore stage we couldn't lock things down. We did all the set design and movements on WYSIWYG but not much of the lighting. We didn't allocate enough plotting time in the venue."

David had also planned to use Martin Lighting Director but again time restraints put a stop to that.

"I would have loved to use it, we did have it up and running and I did actually plot it in," he said. "This is a better space to put it in. I used Wybron Auto-pilot on *Red Hot & Rhonda* at the Crown Casino and that was problematic mainly because the stage was so wide and low preventing us from getting good positions. I think it's certainly a technology worth pursuing but it does require time."

Due to budget restraints David was required to use The Showroom's diverse range of lighting equipment. This included MAC500 and 600's, Clay Paky Combicolors, Goldenscan HPE's, par cans, scrollers, profiles, fresnels and some Geni DMX strobes which David was particularly impressed by. Smoke machines - DF50's - and dry ice were a major factor in the show.

"Because we already had a number of scans, MAC 500 and 600's, it was decided just to augment them to do the rest of the moving light rig," David said. "It just made it easier from a control point of view. I did a Vari*lite and MAC rig for quotation but eventually it went to Chameleon. The

MAC500 is quite a flexible lamp so I wasn't too unhappy about that. The MAC600 seem to work quite well although we do seem to have different intensities in some of them and it didn't seem to be the lamp type.

"We're also using DHA Light Curtains and, in retrospect, I think it would have been good to link them to our system instead of running them independently with just a DMX trigger. Sometimes that got complex when you're travelling backwards and forwards from one desk to another."

Control is via a Wholehog II, a desk David favours particularly for its Effects Units although he would like to see a few more.

Most of the problems with setting up the show were time related particularly trying to work out how to track stage pieces which normally fly. The re-staging was problematic and then the lighting had to fit around it.

"There were huge amounts of leads and most of the scene elements had some set electric's built in," said David. "I tried to keep it to a minimum but there were still large amounts of looms to be tracked. There was a late decision to bring the set up on the lift at the back so those sort of staging considerations meant constant re-thinking. That's not uncommon with a musical and this one had to be re-designed especially with the fore stage."

Tim Ferguson who plays Frank'n'Furter makes a dramatic entrance flying down in a cage from the back of the room onto the stage which meant that David had to lift the lighting bars above the gantry.

"With the par cans, even though they had super-lockoff, most of them were dropping anyway so I was happy to re-focus."

David found the positions for the Lycian followspots were too shallow and they were maybe a bit too large for such a fast show.

"We could have done with a smaller followspot that is more manoeuvrable," he said. "They're also into a white set at a low angle which tends to pull focus a bit. We also found it difficult to get a soft edge - we tried lots of stuff like internal frost. I think the focus stop tends to give



David Murray



you a fried egg look."

For lighting, the show is fast and furious with about 300 called cues as well as many effects, chases and oral cues. The brief for the nineties version was not to do it in the old Rock Horror style but a more 'rock spectacular' style.

"It tends to lose on the comedy and there's a larger cast," said David. "I don't know if the concept is the most successful way of doing it."

The set incorporates a lot of neon which was very time consuming but hasn't caused any sound problems.

"I think that's due to careful planning and termination," said David. "Even the neon cage hasn't given us radio mic problems. The neon is encased in perspex and I'm amazed at how well it has travelled. Incorporating it all in a revolving, moving set was difficult, the cable runs are so complex through that piece of scenery. It has on board dimmers and a lot of 3 phase and DMX fed to it."

One of Oracle Laser's new Superscan 360 laser scan heads is used in the production for several special effects and the Superscan 360's ability to pan and tilt allows effects



that would have been impossible with a conventional fixed laser system. For example the head is pointed almost straight down to create the laser gun effect when Frank'n'Furter is executed by Riff Raff and Magenta. Shortly after, the head is tilted up to create a horizontal plane of light.

A Superscan 360 is mounted on a truss above the stage and is

lowered down during the performance. The Superscan 360 is fed by fibre optics from an 8W Argon laser mounted on the cat walk back stage. This is a distinct advantage of the Superscan since there was no room on the stage for bulky laser equipment. The effects are controlled from front of house via two networked Oracle 3D laser controllers by the lighting operator Sam Hopkins.

"Sam worked very hard with me getting the show together and doing the WYSIWYG," added David. "I'd also like to

mention the Stage Manager, Pam McDonald, who was very focussed."

The production was constantly changing up until opening night but quite often a decision would be made and relayed to David about five minutes before curtain time or not at all!

"There were production numbers that just disappeared from the show!" he laughed. "For example Brad's solo *Once In*

a While was a big production number with lots of 'Janets' running around but one preview night they were just gone! It was a lot of work to keep up with the changes most of which were due to the room and that's unavoidable. You can't whinge about it, it just has to happen.

"The rocket set piece didn't arrive until opening

night so that was interesting and then it was problematic."

● *Cat Forcer*



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BUYER'S GUIDE

fog machines

Prices EXCLUDE sales tax and were correct on 15th October 1998. All care taken, no responsibility for errors. Four models only are shown in each category although these manufacturers have many more. Indicative only.

FOG MACHINES

ADJ

Show Technology (02) 9898 1111

ADJ Fogger GT 700 uses a 700w quick warm up heater and puts out 2500cuft/min. Comes with remote control, Australian type mains pl, hanging bracket and a 1.5L fluid container. \$286.07.

ANTARI

ELSTA (02) 9568 2100

Z-Series range consists of four foggers - Z-800, Z-1000, Z-1500 and the Z-3000. This complete range comes with ECO electronic thermal control, Unicore heater core/nozzle assembly, quick warm up time with uninterrupted output and all smoke machines comes with an array of optional accessories. Available soon in a variety of colours. From \$286.10.

F-120E Micro Fogger Compact and reliable, the F-120 Micro Fogger features new electronic thermal control circuitry, 0.8 litre fluid capacity, high quality - low voltage control board and weighs just 4.5kg. Plus the F-120 only takes 4 minutes to heat up and offers you 2 minutes of continuous fog output of 2500 cubic feet/minute. Sized 315 x 116 x 130mm. \$204.10.

F-250 Nice Fogger A true workhorse, the F-250 is powered by a sturdy piston pump and cooled by an efficient heating exchange. Suitable for medium to large applications including mobile DJ and night club use. Features 5,000 cubic feet/minute output, FC-1 remote, 1000W heater, 1.3 litre fluid capacity, 4.5 minute warm up time and weighs just 6.5kg. Dimensions 380 x 205 x 145mm. \$327.05.

F-550 Aeolus Fogger Professional fog machine with 20,000 cubic feet/minute output and remote control. This superior smoke machines features, multi-function timer, output controller, 1500W heater, 5 litre tank capacity and a mechanical thermostat. It weighs just 15kg. It's the perfect fogger for night clubs and large performances. \$654.95.

DYNAMITE

Disco World (03) 9735 0588

DM600 700w; high output - 1 litre tank capacity; DC 12 volt remote control; timer remote available; big output. \$245.

DM1200 1200w; high output - 1 litre tank capacity; DC 12 volt remote control; timer remote available; big output. \$410.

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F-100 Performance Fog Generator powerful, variable output, continuous duty, 9.5 litre reservoir, optional timer (analogue) or DMX remote, 1500w element, fluid level sight gauge, low profile with dual carry handles. \$1274.25.

F-100 Timer Remote with 7.6m cable allows setting of duration and interval in seconds, output volume and allows 0-10v proportional control, LED indicators. \$398.23.

F-100 DMX Remote allows F-100 to accept DMX512 commands, LED indicators provide status information. \$521.11.

Atmospheres Lighting Enhancement Fluid three fog fluid formulations in 18.92 litre carton for use with F-100 Performance Fog Generators. HQ is slow dispersal formula, Stage is fast dispersal whilst Coldflow is for use with Coldflow LCO₂ Exchanger. \$330.36.

INFINITY

Universal Lighting & Audio 1800-648-111

Infinity IFM100 750W Smoke Machine The Infinity IFM100 is a new design mini smoke machine which is light weight and very low cost. Using reliable on board electronics and control available via 0-10V remote control. Ideal for small bands and mobile DJ's. \$164.30.

Infinity 1000W Smoke Machine The IFM200 is the big brother to the IFM100, offering a 1000W heater and powerful piston pump. The machine utilises a low voltage remote control and offers thermal protection. \$300.24.

JEM

Show Technology (02) 9898 1111

Techno Fogger has a 1 litre fluid capacity, a direct thermal protection device to prevent overheating and comes with a compact remote which offers auto-timer as well as the ability to alter smoke density level. \$630.33.

ZR12-AL enhanced output to 1kW vaporising chamber. The continuous dense smoke is controlled by JEM's new multi-functional on-board remote. A unique 8 x

mode expands the auto-timer functions beyond those normally found on smoke machine remotes. \$925.40.

ZR22 DMX is equipped with DMX512 as standard as well as multi functional analogue controller. Features include variable output timer, plus a new feature 8 x mode. First machine to feature the new 'D-TEC' vaporising system. \$1310.65.

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LE MAITRE

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G100 features LeMaitre's Genesis patented block and electronics complying with EC regulations. The G100 is robustly constructed, yet compact and modern in form. Quality machine ideal for mobile use and smaller venues. Supplied complete with variflow remote. A\$1081.35. **G150** LeMaitre's replacement for the ShowMist, the G150 is a fully digital smoke generator with microprocessor control. The G150 is capable of continuous operation and is supplied complete variflow timer remote allowing for the setting of duration and interval in addition to output flow. A DMX interface is also available as an option. A\$1596.88.

G300 not only does the G300 break all technological advancements as a fog ma-

chine, but also doubles as a water based haze machine. Extensive facilities are available from the remote handpiece, which features on LED display, and the rear of the unit. The G300 is the choice of theme parks and larger venues all over the world. A\$3845.44.

MiniMist Turbo accepts fluid aerosol canisters, allowing for the unit to be used away from mains supplies. The MiniMist Turbo is a high output machine, complete with carry handle and has a durable gun metal finish. A\$1463.63.

LIGHT EMOTION

ELSTA (02) 9568 2100

FZ-970 Magic Cloud produces a dense cool fog that remains on the floor. Featuring an R-22 German compressor and thermostat, thermo-fuse, high pressure piston pump, reliable DC 12V operation, LED control, 10 metres of extensive cable, 1000W heater and an output of 7,000 cubic feet/minute. Plus the FZ-970 comes with a twin timer control remote allowing fog interval bursts from 10 seconds to 5 minutes. Weighs 38kg. Dimensions 600 x 4151 x 345mm. \$2454.90.

MARTIN

Show Technology (02) 9898 1111

Magnum Pro 1000 features variable smoke output and pressure control, plug-in remote control, a DMX interface and electronic, mechanical overheating protection. Also comes with truss mounting bracket and carrying handles to suit all mobile and fixed installations. \$630.33.

Magnum Pro 2000 produces voluminous clouds of smoke and features built-in overheating protection, programmable output, and manual control via remote control. \$1228.69.

ROSCO

Rosco Australia (02) 9906 6262

Rosco Alpha 900 compact, economical and extremely efficient. Features a simple on/off switch on the 9 metre control and weighs 5kg. Most suited to school and mobile disco. Uses all of the Rosco fluids including the Fast Dissipating Stage, Mist and the scented range of fluids. \$495.

Rosco 1600 with the exclusive peristaltic pump system, the 1600 produces a smooth variable output ranging from small wisps to billowing fog. Features a compressed air port for cleaning or for special effects. Complete with remote control or can be used with an optional DMX interface. \$1400.

Rosco 4500 offers the highest output of the Rosco range to produce dense clouds of realistic stage fog. Three times the output of the 1600. Supplied with standard remote control or can be used with the optional DMX interface. Will fill a studio or convention centre with the Rosco waterbased fog. \$2500.

Rosco IPS the Rosco Intelligent Fog System for permanent or long running theme park installations allows a facility to have several independent fog generation sites connected to one distribution system and master show control. With automatic self cleaning purge cycles the IPS will deliver fog in the volume needed, at exactly the time its needed for up to 24 hours a day, day after day. \$12,000.

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SMOKE DESIGN

Coemar De Sisti Australia (03) 9467 8666
Viper Powerful new unit allowing for continuous operation. Enhanced safety features. Variable output and a range of control options including DMX. Stainless steel pipes, 5 litre on-board fluid container, compact dimensions. Easy maintenance and service. \$1700.

TAS

Coemar De Sisti Australia (03) 9467 8666
Mini Smoke Machine Enormous output from one of the smallest units available. Complete with mounting yoke for grid mounting, approx. 2.5 min heating time, 1.5 litre internal tank, 7.8kg weight. Simple to maintain and service and finished in attractive silver scratch-resistant finish. \$599.
Windy Fan accessory suits all brands of fog and haze machines. Compact, truss or floor mountable, with variable speed fan control. Allows for accurate directional dispersion of smoke. \$1030.

HAZE/CRACKERS/OTHERS

ANTARI

ELSTA (02) 9568 2100

HZ100 comes equipped with an oil free lubricated air compressor, sophisticated haze transfer mechanism and a specially designed tank. Eliminating all of the problems associated with traditional haze machines, the HZ100 has no aluminium heater, temperature controls, hot air and no warm-up time. Weighs just 12kg. Dimensions 482 x 250 x 235mm. \$572.95.

S-120 Foam Machine Produces a clear bubbly foam for a variety of applications. Featuring regulated output of 320mL/minute, 600W power consumption and brackets - the S-120 weighs just 12 kg. The S-120 is safe, clean, odourless and dissipates effectively so now you can throw your own foam parties! Dimensions - 600 x 260 x 300mm. \$572.95

S-100 Snow Machine Make your own snow storm with the S-100 from Antari. This robust, high pressured snow machine features high output of 140mL/minute, a cushioned motor to prevent noise and vibration, SC-1 remote control, 5 litre fluid capacity and weighs just 11kg making the S-100 ideal for stage productions and parties. Dimensions 530 x 260 x 280mm. \$490.99.

Fog Cooler The Antari Fog Cooler, when connected to any type of fogger produces a low lying smoke which stays low and is almost indistinguishable from a dry ice effect. Use it to provide a gentle flow or long bursts of low lying fog. Accepts fog from any fog machine placed within 15cm of it. Best used with the Antari F-550. Dimensions 750 x 607 x 340mm. Weighs 72kg. No need for any special fluids. \$3274.60.



Rosco Hazemaker

JEM

Show Technology (02) 9898 1111

HOT Technology 2000 Haze Generator produces large quantities of almost invisible, light enhancing haze. Must use JEM fluid to ensure safe and reliable operation. Almost silent running. \$4097.54.

Technohaze features a low fluid cut off system, eight hours of continuous operation at full output. A dispersal chamber controls the internal condensation. Also features a continuous loop fluid system. \$1146.72.

KUPO

Show Technology (02) 9898 1111

Silk Hazer uses no heat at all and features long last mist, no oil residue, low fluid consumption, instant start and built-in fan for quick dispersal of haze. \$777.87.

LE MAITRE

Universal Lighting & Audio 1800-648-111, +61-7-5532-9922(Australia), Lighting Supply Company (New Zealand) +64-9-838-9217

Neutron Star Hazer Instant start no warmup, silent operation haze machine, no oil or residue, world patent LeMaitre STAR technology, microprocessor controlled, economical fluid usage - in excess of 80hours per litre. DMX interface available as an option. A\$1421.25

LSG a revolution in Lcw Smoke Generation, which when used with a G300 smoke machine produces an unbelievable amount of simulated Dry Ice. The LSG works in conjunction with a remote dewer to create large volumes of low lying fog which does not change into choking smoke. It is possible to duct fog extensively (even vertically up), and remote control via the G300 remote control unit or DMX interface is possible. A\$12,469 05.

REEL EFX

Coemar De Sisti Australia (03)

9467 8666

DF50 Diffusion Fogger Industry standard and used by almost every major production company and many major TV studios in Australia and OS, claim CDA. Almost silent operation, 3+ hours hang time, One teaspoon of fluid per hour @ 5000 sq. m per hour. Compact, simple to operate, environmentally safe, instant haze. \$5196.

ROSCO

Rosco Australia (02) 9906 6262

Rosco Hazemaker creates an effect similar to that of a 'cracked oil' machine using a Rosco Haze fluid with no animal, mineral or vegetable oil, which eliminates concerns about residue on sensitive electronic equipment and gel strings. Is designed to be run

continuously to fill a venue and maintain a haze effect which is virtually invisible but allows focussed light beams to be seen. \$3500.

SMOKE DESIGN

Coemar De Sisti Australia (03) 9467 8666
Hazer MkI Compact Hazer for the small disco/mobile DJ. Self-priming, powerful fan, simple controls, and total reliability. On-board 1 litre fluid container and unique coiled capillary/heater design. 0.2 litre per hour fluid consumption @ 750 cu. m per hour. \$898.

Hazer MkII Professional Hazer with self-priming, powerful fan, variable control options inc. DMX option, and total reliability. On-board 5 litre fluid container and unique coiled capillary/heater design. 0.2 litre per hour fluid consumption @ 1000 cu. m per hour. \$1390.

Aroma 280 Unique 'scent' machine for use with a comprehensive and growing range of scents/perfumes. 15ml of scent lasts up to 2 weeks in continuous operation (approx 1ml per day). Simple on/off operation and also available in wall mounted permanent installation model. \$450.

Aroma 400 Professional use 'scent' machine for use with a comprehensive and growing range of scents/perfumes. 60ml of scent lasts up to 2 weeks in continuous operation (approx 2.5ml per day). Simple on/off or advanced run and delay timer operation. \$999.

TAS

Coemar De Sisti Australia (03) 9467 8666

Bubble Machine Continuous output of bubbles for use in a variety of venues. Truss mountable, with fully self-contained fluid reservoir. Suitable for production use. \$659.

next month

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THE PA PAGE

With Michael Orland

POLYSWITCHES, AND INTRODUCTION

QUITE a while back I briefly mentioned things called polyswitches, describing them as interesting devices which really deserved an article all of their own. So....

As in most businesses, I suppose, the key to success in the P.A. hire business is to systematically minimise or even eliminate your overheads. Very depressing to put in a 12 hour working day running gear it's taken you years to be able to call your very own, only to find at the end of that day, with damages, that you haven't even broken even. I am pleased to see that for many, the practice of using light globes to protect compression horn diaphragms is no longer regarded as eccentric, but standard. For those who came in late, this involves mounting globes within a speaker cabinet before that part of the passive crossover that governs them. For technical type people, the most appropriate values of these globes can be calculated via the formula: $Globe\ amp\ equals\ the\ square\ root\ of\ the\ maximum\ desired\ wattage\ to\ the\ driver\ divided\ by\ that\ driver's\ ohmage.$ $A = \sqrt{(W/R)}$. For non-technicals, refer to my previous article "Active/passive? Why not both?" available on the Connections Website.

In much the same way that the globe system may be thought of as passive compression, polyswitches may be thought of as passive limiters, only coming into play once a trip current is exceeded. The "poly" part of the name refers to their internal conductive polymers, which partially melt at overload, raising their resistance dramatically. When the current is reduced they reform almost instantly at their normal negligible resistance. If you like, they are a self resetting circuit breaker.

I first heard about them about ten years ago, but was pretty dismissive. The beauty of the globe system was that no-one need know they were even there under normal operating conditions. But of course, when a polyswitch "opens up", the sound stops. Potentially very annoying when the drivers being protected are constantly being used at their limit. A few years later I noticed they were being used in Electrovoice cabinets, but in a rather clever way. The polyswitch was wired in parallel with a hefty resistor. One recalls from high school science that a current always takes the path of least resistance. When the polyswitch is closed, the current flows through it. When it opens at the point that might otherwise be harmful to the driver, the current is forced to flow through the resistor, effectively attenuating the signal to a safer operating level.

It was around this time that we had an incident with one of our concert rig's side fills. The two letters that strike fear into the heart of any P.A. owner: D.C. When an amplifier is referred to as "going D.C." it usually means that components have shorted out, allowing all or most of the D.C. rail voltage of the amplifier to proceed straight through to the speaker terminals. Although quite

rare when I first started in this business, most professional power amplifiers these days come fitted with D.C. protection circuits. These are designed to disconnect any connection to the speakers when any significant D.C. voltage is detected, usually via a relay. Anyway, on this particular occasion, the amplifier driving the mid/high cabinets in our sidefills went D.C. on one channel, without any internal protection to block it. It happened about one hour after switch on, one of the 10" midrange speakers suddenly went BRRRAPP, while smoke appeared from the amplifier. By the time anyone could get to either amp or speaker to disconnect, the speaker's voice coil had been fried to a crisp. The amplifier was a locally produced one, so I returned it to the manufacturer the next working day for repair. When I picked the amp up a week later I was told that the fault had been a minor, fluke sort of one and was highly unlikely to recur. I told the technician that the incident had made me pretty paranoid and asked if there was any way to save the speaker if it did happen again. He suggested using a polyswitch, which at the time was a surprise to me. I had only thought of the things in terms of low wattage, compression driver protection. But as it turned out, the largest one readily available will trip at around 250 watts at 8 ohms, which made it ideal for protecting a JBL 2123 10" speaker: 250 watts at 8 ohms. And yes, you guessed it, the next time we switched on the same amplifier in the same application, it all but went up in flames. Totally different fault apparently, but this time the amp was a write off. The good news is that the manufacturer replaced the amp under warrantee with the next model up. And the polyswitch had indeed left my freshly reconed 2123 totally unscathed by the experience.

The other good news is that since all this happened, the prices of polyswitches have almost halved. The ones I paid \$13 each for five years ago can now be bought for \$7 from Dick Smith's, Jaycar, etc. Refer to the chart on page 50 of Jaycar's '98 engineering catalogue for the most appropriate value for your application.

Before I sign off for this month, I'd just like to thank those who emailed me over last month's article. To the gentleman who wrote to tell me that his adolescent fantasy preference was Judy Jetson: Thanks for sharing. A list of caring professionals' phone numbers are on the way. And to the irate woman who emailed using the words "gratuitous" and "yobo pig", I'd just like to say you've got me all wrong. I have always dug that chick's lib thing you've got going. Hell, the other day I even sat through almost a whole episode of Ally McBeal! (Nice looker, although I usually like a little more meat and potatoes with my main course, if you dig what I mean)

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