

Connections

SOUND LIGHTING STUDIO AV MUSIC TECHNOLOGY THEATRE TOURING SHOWBUSINESS

WIRELESS

Wireless microphone systems:
all you need to know



Financial turmoil
at Studio School

Lighting Scrollers:
Buyers Guide

HOW TO: Light
Theatre, Fly Gear

Studio Monitors:
Buyers Guide

ROCK STEADY FOR 25 YEARS.

Year after year, the Shure SM58 tops the charts as the world's best-selling microphone.
People who sell it call it the steadiest performer in the business.
So do the people who use it.

SHURE SM58

JANDS

Jands Electronics Pty Ltd. A.C.N. 001 187 837

578 Princes Highway, St. Peters, N.S.W. 2044, Australia Phone: (02) 516 3622 Fax: (02) 517 1045

Fostex

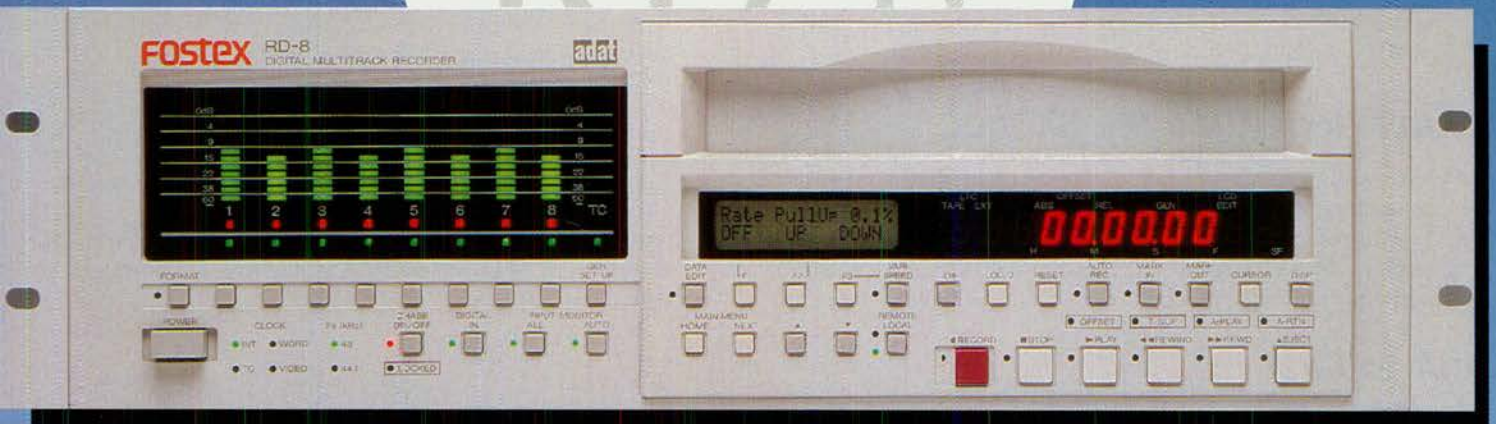
RD-8

RD-8

RD-8

RD-8

RD-8



- 8 track recorder compatible with Alesis ADAT
- Up to 100 locate memory points are possible
- RS-422 port is provided as standard equipment
- Complies digital I/O: 8 channel serial (optical) ADAT format
- Allows you to set the Pre/Post Roll time 1 to 30 seconds at one second increments
- TC Generator (Int/Ext reference switchable) is installed and can be set to any start time

adat

SYNTEC INTERNATIONAL For the name of your nearest dealer, call:

NSW: (02) 417-4700 VIC: (03) 481-6000 QLD: (07) 371-3999 WA: (09) 275-5066 SA: (08) 211-7044

Real World

Introducing a complete new range of amplifiers from ARX - The SX Series.

A distillation of the experience gained through years of making the award winning SS series of amplifiers. A range of amplifiers designed smart, and ready for the

intensive duty cycle that today's standards of production demand.

More power, more protection, less heat, less weight.

Real World Power

The SX3000 delivers a true 3000 watts RMS bridged into 8 ohms. That's real continuous RMS power, not music power, peak power, instantaneous power, or any other unquantifiable esoteric standard that can make an amplifier appear to deliver something it doesn't. 3000 Real Watts from an amplifier that only weighs 5 kilos more than our current

SS1200VC. This massive output comes from an equally massive toroidal transformer power supply. No marginally designed multi rail voltage wobblers here - when it comes to horsepower, there's no substitute for cubic inches! Power to drive the biggest system; power to deliver low frequency crunch that lesser powered amps can only dream of.

Are you wearing any Protection?

We've done intensive research into amplifier protection, in order to design something that really does work, not something that should work! Both the SX1500 and SX3000 have all new relay switched DC protection circuits, one per channel, that instantly disconnect the speakers when DC is detected.

You'll appreciate the fact that it's a re-settable circuit, too, not a

simple 'one time only' crowbar system that has to be stripped down to be replaced.

As well, the new SoftClip™ circuit intelligently protects the amp from clipping. Unlike simple limiting which can cause harsh distortion of low frequency signals, the SoftClip circuit keeps the amplifier from hard clipping without destroying the sound quality, and retaining the music's dynamics.

Keep Your Cool

It's generally accepted that at the current state of the art in amplifier design, Power equals Heat. The more power the amplifier puts out, the more heat it produces. And let's face it, 3000 watts is the equivalent of a good sized electric radiator! To cope with all this, ARX has further refined its innovative UltraFin™ technology, which uses the same techniques as airconditioning heat exchangers to deliver an amplifier that runs cool even under the most arduous conditions.

Four rows of fins per heatsink gives a surface area of 450,000 sq mm per channel. No extrusion or casting known to man can even come close to its volumetric efficiency.

Of course, all this fin area is pointless without sufficient air movement, so we've got Four high cfm DC fans pushing cool air over the heatsinks. These fans are temperature controlled, so that when the amp is idling, so are the fans. When the internal temperature rises, so does the fan speed.

It Ain't Heavy, It's My SX3000

Some amplifiers are just designed heavy, because it takes more time and effort and money to design them light! Well, here at ARX, we've taken the time and effort and spent the money! The SX3000 comes in at just under 19 kilos by the use of intelligent design. Nobody wants a wrecked back when

touring, and installation technicians need to pull an amp out of a rack without getting a hernia!

Advanced computer modelling techniques enables us to put the strength where it's needed, and to reduce the weight where possible.

Built to Last

Over 8 years ago, ARX was one of the first companies in the world (and the first in Australia) to bring out a high powered amplifier (the legendary SS700) in only 2 rack spaces! A concept that has been embraced by virtually every amp manufacturer since then. Today, over 5,000 amplifiers later, we're more experienced in getting more out of less than just about anyone else!

Look inside any of these new amps and you'll see that it looks different from ordinary amps - all the circuitry is on one motherboard. And a mother of a board it is, too! But time is

money, and your service people will appreciate the fact that by just undoing 5 bolts the complete amplifier assembly can be lifted out for routine maintenance.

So where do we go from here? Well, how about starting by contacting the person listed below who's nearest to you. They'll be happy to tell you more about the SX series of amplifiers from ARX, and even happier to sell you one! Around the world, thousands of people every day use ARX equipment to earn their living, and it all started right here in Australia, with people like you.

Victoria and Tasmania: Tony Hosking 03-888 6555; New South Wales: 02-879 6788 Dave Croxton; Queensland: 074-424 233 Rod Watts; South Australia: 018-085 666 Peter Asztalos; Western Australia: 09-354 3185 Ian Ross; New Zealand: + 64 (0)9 789 863 John Carter

1 d P O W E R

Extra heavy duty rear mounting ears.

Soft Clip and Bridged Mono Switches.

Balanced XLR Inputs and loop outs.

One piece motherboard.

High joint capacitors for maximum Low Frequency power.

High current Mosfet output devices.

Super efficient UltraFin heatsink.

Massive toroidal transformer.

ARX Systems
PO Box 18, Cheltenham
Victoria 3192
Australia

4 variable speed high cfm DC fans.

LED metering of all Amp functions;
detented level controls.

New EasyGrip handles.



inside

FEBRUARY 1994. (Number 11)

•**STUDIO:** We cover the scene
Our complete studio guide *STARTS PAGE 29*

•**AUDIO:** ALL about WIRELESS SYSTEMS Greg Simmons details what they are, what they do, and what the LAW says. *STARTS PAGE 35*

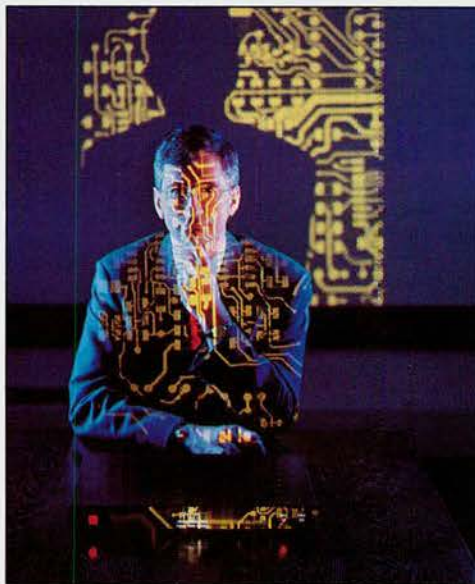
•**LIGHTING:** SCROLL ON REGARDLESS Cathy Grey visits the place where Australia's only Scroller manufacturer lives. *STARTS PAGE 48*

•**MULTI-MEDIA:** NIMBUS is almost here ... Revolution or hype? Can your domestic CD player REALLY replay video? *STARTS PAGE 75*

•**TESTED:** Soundtracs Solo LOGIC, Yamaha QY20, XTA Analyser, Alesis Monitors *INSIDE*

•**LIVE:** Tommy Emmanuel, Grace Knight, Lasers at Seaworld, How to Fly Speakers ... *ALL INSIDE*

and *LOTS* more!



Mr Nimbus (Dr. Jonathan Halliday) ponders his radical technology. See story, Page 75.

HUGE BUYERS GUIDE

Wireless Microphone Systems	Page 40
Studio Monitors	Page 44
LIGHTING:	Page 56
PC Spots:	Page 46
Colour Changers:	Page 46
Scrollers:	Page 47

THE REST:

Showbiz News	Page 7	Nightclub/DJ section:	P. 78
Interview: John Pope	Page 14	Great Mistakes	P. 82
Aux 2: Gossip	Page 20		
Hire Biz Buz	Page 21		
Letters & big abuse!	Page 16		
The Idiot's LX guide:	Page 68		
Bryant on Mastering:	Page 31		
Howard Jones: Workbench:	P. 29		
Studio News with Simmo:	P. 31		
Music Technology:	P. 55		
Acoustician: Glenn L	P. 74		
Social Page:	P. 77		

HEY - if it isn't on the exact page number above, look nearby. We make this contents page early on, about 4 days before finals. In fact the ONLY certainty is that this is an 84 page issue! Pages are STILL moving about, stories getting canned, as this is set. Ce la vie!

Editors Notes

TECHNICAL CREW need to think carefully and act NOW to secure a working future. The union that aspires to cover our live performance sector - namely the Media, Entertainment and Arts Alliance (MEAA) will shortly draft a policy on imported road crew, which will then be forced on to promoters. This could put Australia into the 'too hard' basket for international tours, or it could create some extra work for local crew currently displaced by imports. But who gets allowed in?

Our report in this issue details the process, crew and production organisations really MUST respond to the MEAA now while there is a chance. It's really very important.

Once a policy is in place the MEAA will doubtless come up against the Entertainment Industry Employers Association, (EIEA) who may well have brought this on themselves by forcing the end of compulsory temporary MEAA membership of visiting crew. Until recently promoters have paid dues to the MEAA on behalf of imported crew, the EIEA have consulted with the government and discovered non-payment of dues is NOT a barrier to the issuance of a visa - so promoters have ended this long standing practice.

NEWSAGENTS nationally now carry Connections, we have crept up numbers and outlets through

NDD since last April - but refuse to throw vast tonnages of (potentially unsold) magazines at the market like traditional publishers. Newsagent distribution accounts for about half our total, if your newsagent hasn't got a copy, order one. They can sell out, too!

The poor newsagent also has a dilemma with Connections, not knowing where to display it! We've seen this magazine in the photographic section, and even one joyful day in the wildlife section! We think the Music section is the best place, so we've put a little note on the cover for the newsagent. If you find the mag hard to locate, look there.

Thank you!

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SHOWBIZ

NEWS & UPDATE



Newcastle's Civic Theatre has a new look after a \$12 million renovation that adopts the buildings original style - but introduces new equipment and technology. Theatre consultant was Tony Youlden, and Peter Knowland was the acoustic consultant. The fitout includes a Strand Gemini 2 lighting console, Startech dimmers, Selecon and Tectro luminaires and audio from Jands including JBL and Bose speakers, Soundcraft Spirit console, and Jands amps.

Studio School trades on

SYDNEY: The Audio Education Centre, part of the Rich Music Studio complex, has started advertising for students - after a complex and sometimes bizarre sales process saw the facility sold and then repossessed by armed guards last year.

The trials and tribulations of the centre culminated in the appointment of a liquidator, who appears to have sold the business. Whatever the case, Paul Rich is firmly in charge and it is business as usual - except many creditors didn't know the business had been sold at presstime!

Located in the Sydney CBD, work was continuing at a feverish pace to ready a second digital studio floor for the expected on-rush of new students, who would remain unaware that many like them faced uncertainty and turmoil just a few short months ago as the previous course collapsed under the weight of debt.

Our Studio pages this month detail the sorry saga of the Audio Education Centre in Sydney and Melbourne, and attempts to unravel the Byzantine machinations of a company collapse that has put the reigns of power firmly once again back into the hands of Paul Rich.

• OUR FULL STORY STARTS ON PAGE 20.

Opera House Crew Strike

A unique venue but bedevilled with conflict. The technical crew at the Sydney Opera House staged a 24 hour shutdown early in January after management failed to respond to a log of claims. The Media and Arts Alliance union claim management is attempting to fill: off groups of its membership to negotiate with individually. Technical crew say they are earning a base wage of less than \$25,000, while management say most actually earn in the region of \$45,000.

Claim and counter claim raged while the crew picketed the gate, with signs critical of management. Many crew we spoke with were totally fed up, claiming management had stalled negotiations, and that some management union members had attended a union meeting prior to the industrial action.

Don Gunn from the union promised to send Connections further information supporting the crews action in striking - but we're still waiting.

WHO WHERE WHEN

Moves and Changes, from the publishers of the Australasian Music

Bob Aird has been elected as Chairman of the Australian Music Publishers Association Limited (AMPAL). Aird succeeds MCA Music's Peter Hebbes who has stepped down after three successive terms. Aird also becomes Chairman of AMCOS, the licensing arm of AMPAL.

The following people have all left Warners. Financial Director Steve Wagner. Label Manager for rooArt and East West (and former assistant to Paul Turner) Linda Tallo and Jennifer Holley, personal assistant to Warners Managing Director Robert Rigby. Mathew Medcal has been appointed as rooArt and East West Label Manager.

Amanda Urquhart, EMI Promotions Manager for New South Wales has resigned from her position at the company. Pixie McQueen, former OTS advert salesperson has taken the job.

Lynlea Macintyre has been appointed co Director of Hot Records.

Personality and Agro manipulator, Jamie Dunn has left 2DAY FM, moving to Brisbane where he'll be doing Breakfast on Austereo's sister station B105. Paul Holmes and Wendy Harmer will continue as the Morning Crew at 2DAY next year.

Union To Restrict International Crews?

Ever wondered why international tours like Madonna and U2 need to import its own video crew? That's the question currently being debated in the entertainment industry, according to the Media Entertainment and Arts Alliance.

Organiser Diane Kanaan says that in the last few years, Australia has seen many overseas and Australian acts come into the country with largely imported crews including Prince, Guns N' Roses and INXS. Every single member of a massive touring party can currently work on a tour through Australia, while stiff barriers exist for Australian technicians trying to work overseas.

The M.E.A.A. is now putting together a policy on imported technical crew that represents the views of the Australian Technicians. "The Alliance wants wide consultation with Australian technicians to ensure that we develop a workable policy that is in the interests of all parties in the industry."

The issue of imported technical crew has been a contentious one for several years given the limited work opportunities for Australian technicians here. As far back as 1991, INXS imported a predominantly American crew for the X Tour, unemployed locals were aghast to see carpenters and stage hands with basic skills jetting into the country.

The Alliance say they want to ensure a balanced policy is developed. "We are concerned that we don't produce a policy that puts Australian technicians on the 'too hard' list for international tours", Ms. Kanaan said. On the other hand through a consensus approach we hope to create more work for locals and bring down costs to promoters by restricting crew to essentials and forcing internationals to pick up some locals.

What do you think? Submit your opinions now! Contact Diane Kanaan at the Alliance, phone (02) 333-0947, 018 114-086, or fax (02) 333-0933.

Lid Re-Opens on Bonza's Ian Stewart



Remember Bonza Boxes and Cobra Speaker Systems? The lid came down on Bonza back in early 1991, but founder and roadcase veteran Ian Stewart (left) has just announced his new venture after several quiet years at Cadillac Cases. The new business is called RAMTEK Pty Ltd, and of course is dedicated to the art of building things like roadcases, racks and speaker cabinets.

Located at 34 Bartlett Street Summer Hill NSW, the new place is just around the corner from the old Bonza premises. Call Ian on (02) 798-6539, and hum the theme to the Twilight Zone... or fax (02) 798-6571

Peavey surprise Contracting PA market

At press time we had word that Peavey have brained the Sound Reinforcement contracting market with a new computer control technology called 'MediaMation'. This system uses a Motorola 56000 series DSP to re-make virtually any audio control device used between microphone and amplifier. Using a PC computer, the system entails software, a DSP rack/interface for up to 10 system cards, with D/A and A/D converters.

The idea is that a sound system is designed off site, then installed. Racks of equalisers, crossovers, time alignment delays and system processors are done away with. This system clearly flags Peavey's intentions in the audio contracting field, where they have already released a staggering array of products.

In Australia and New Zealand the challenge is on for Peavey distributors Australis to penetrate a new market away from their traditional MI base. More as we hear it.

BOSE buy US Sound from Carver

Bose Corporation have recently announced the purchase of U.S. Sound, a manufacturer and marketer of specialty professional loudspeaker systems, from Carver Corporation of Lynnwood, Washington.

Founded in 1983, U.S. Sound was acquired by Carver in 1992. U.S. Sound's proprietary 'Coherent Zone' technology is used in their loudspeaker systems for very large arenas, including those seating more than 10,000.

Sound systems using Coherent Zone technology are installed in New York's Madison Square Garden, the OMNI Theatre in Atlanta, and the Garden State Arts Centre in New Jersey. Bose choose Coherent Zone systems to work with Bose loudspeakers at the last Olympic Winter Games.

"It's an unusual step for Bose to acquire another loudspeaker company", said president Sherwin Greenblatt, but we believe Coherent Zone technology is outstanding for large venues, and will complement our ability to provide quality sound in all areas."

"We learned at the Olympics that Coherent Zone technology provides quality sound reinforcement in long throw, high SPL applications" said ex-pat Aussie David Bell, manager of the Bose Professional Sound Systems group. "We chose to use their technology, above anything else available".

For details call Brian Chilcott, Project Manager at Bose Australia on (02) 684-1022.

Mario La Marca for Coemar DeSisti

Lighting co Coemar DeSisti Australia are expanding- the recession is a long distant memory in most parts of our industry. Mario La Marca joins C.D.A. to help out in sales, he is no stranger to lighting, and has a good computer background, suited to CDA's aim to become the lighting software supremo's. Call Mario on (03) 467-8666 and say Bion Journo - or spell it?

WHO?(cont)

Robert Scard who specialises in media and computer law and who has recently concluded negotiations on behalf of Queensland band Powderfinger can now be found at: Suite 1, 7 Duke Place, Balmain, NSW, 2041. Phone: (02) 555 8077. Fax: (02) 818 4846.

After three years at Polygram in Adelaide, part of which was as State Manager, Steve Wherrett has returned to the Sydney office of the company to look after major retail accounts.

Castle Communications has sold a majority stake in its Australian subsidiary to BMG's local subsidiary, BMG Arista/Ariola.

Maynard and Terri Robert have both left Triple J.

Music Sales have renewed their association with Chris Gilbey, through the signing of a long term agreement to represent the print rights of Chris Gilbey Pty Ltd.

Libby Wilson has left her position working with promoter Michael Coppel.

Tina Arena has signed a world-wide recording agreement with Sony Music Australia.

The Divinyls are no longer signed to Virgin Records, the label to which they were signed world-wide.

BUYERS GUIDE

Connections Buyers Guides bring you the latest, up to date products with prices EVERY issue! Now a **whole year** of BUYERS GUIDES ensures you get more value from every issue!

Distributors: DEADLINE is the 15th of the month before publication. Enquiries: call **Caroline Grafton, (02) 876-3530.**

Feb: Wireless Mics, Studio Monitors, Scrollers, Colour changers, PC Spots.

March: Sequencers, Sound Modules, Test Gear, Flood Lights, Colour Medium.

April: EQ's, Crossovers, Limiters, Signal Processors, Rigging, Trussing, Flying Gear.

May: Effectors, Reverbs, Synths, Effects Lighting

June/July: Live Mixing Consoles, Instrument Preamps and processors, Profile Spotlights

August: Studio Mixing Consoles, MIDI devices, Moving Lights.

September: Microphones, DAW, Lighting Control

October: Amplifiers, Dimmers

November: Speakers, Fresnel spots

December/January: Recorders, Powered Mixers,

Follow Spots, Fog Machines, Studio Luminaires.

<More categories may be added>

PRODUCTS

Studio Supplies & Soundcorp: B&K

Soundcorp and Studio Supplies are now exclusive distributors for Bruel & Kjaer series 4000 professional studio microphones. Within the fields of acoustics and vibration B & K has long held a reputation for high product quality says Leon Hart from Studio Supplies - and who are we to argue with that?

Condenser mic's for precision measurement purposes have been produced by B & K for more than 25 years, which led to the introduction of the studio series mics, designed with digital recording in mind. The range comprises 2 omni-directional and a cardioid mic, which will withstand 143dB before clipping. Three new models join the range later this month. Demo and info: Studio Supplies (02) 957-5389 or Soundcorp (03) 416-1066.

ARX expanding, exporting, releasing...

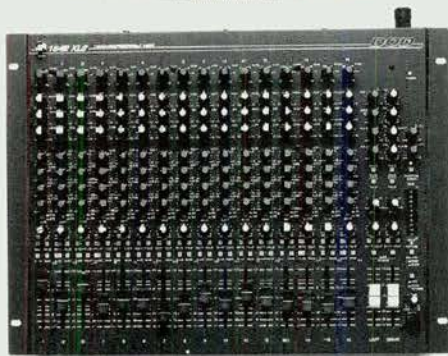
Melbourne audio manufacturer ARX are to release a record number of new products at Frankfurt Music Messe next month - headed by the SX Series amplifier range, all 2 r/u tall and ranging in power output from 150w/ch to 600w/ch - all 8Ω ratings.

ARX Managing Director Colin Park says the firm is excited about this years show, as Germany is now their strongest market. Also new are MAXX Series installation mixers with a new 'open bus' system allowing interconnection of modules. ECX Crossovers, and MSX-4 active mic splitters will also be released.

Meanwhile ARX have made important appointments around the world, with a new sales manager in the USA, and new Netherlands and Italian distributors.

Corrections

- Last issue (Dec/Jan) we goofed in the Buyers Guide: Yamaha's Digital Recording products, **DMR8** and **DRU 8** were listed at \$2700 and \$2200. We dropped a zero - they actually list at \$27,000 and \$22,000 respectively. Sorry Yamaha.
- **CAD Equitek mic:** (reviewed in Dec/Jan): New importer *Australian Audio Supplies* say the Ni-Cad battery system is recharged from phantom power alone. Without phantom they run about 6 hours.



• The **MX1542** and **MX 1642XLR** from **DOD** (above) are versatile units designed for virtually any application, say impedance CMI. They are configurable in either 15 x 4 or 16 x 2 x 2 modes, both have external power supplies, 'adaptive' EQ, 6 aux. sends, 4 stereo aux returns, solo and routing for all inputs and submasters. RRP is \$2999 and \$3249, call Pete Shilleto at CM: (03) 315-2244.



• **AKG** say the new **C3000** microphone (left) is a large diaphragm studio cardioid and super cardioid (switchable) condenser with a bass roll off, 10dB pad, internal capsule suspension, and C414 capsule. It sells for \$750 retail, according to AWA's Alistair Dewar, whose name we always misspell for obscure reasons. Alistair also informs us that the C451 is out of production, and after the fact oh hand go, they're gone! The new Blue Line from AKG have taken off to the extent supply is short, and the C5600 has proved an excellent 'On Air' mic, despite being mainly a condenser cardioid instrument mic for on-road use. AWA (02) 838-3000.

Chief Accountant for the records division of BMG. Michael Golden will now also be taking on the job of Financial Controller for BMG Music Publishing. Golden will work closely with Managing Director Jim Shipstone. The link up of Castle Communications and BMG Australia, has meant a relocation of premises for the company from Brookvale to Crows Nest. Castle Communications are now located at: Level 2, 54 Alexander Street, Crows Nest. Phone: (02) 437 4844, Fax: (02) 437 4833.

The Maybe Dolls and Andrew McManus management have parted ways.

Heather Kitson has left OTS as Editor, that position being assumed by Publisher Noel Crabbe.

Melbourne-based publication *Mike* has ceased to exist after nearly 20 years. (See MEDIA)

State Opera of South Australia has announced two management changes - Director of Production Stephen Phillips has been promoted to Dep. General Manager, and Marketing Director Atul Joshi has left. A new Marketing & Promotion director is sought.

Design engineer Stuart McLean has left Australian Monitor.



Power is serious business...
...now Crest quality at a price you can afford.



LA What do Crest Audio's LA Series amplifiers have in common with the more expensive Professional Series? Just about everything. Crest has taken the proven technology that brought the world the Professional Series, and applied it to the LA Series. That technology brings with it road-tested reliability and sonic excellence. And it's available to you in the LA Series. The LA Series has the features you need (input balanced 1/4" & screw terminal input connectors, binding post & screw terminal output connectors), plus you can enhance your amplifiers' performance with a new series of budget priced Octal plug-in accessories. Now you can add crossovers, limiters, input isolation transformers and much, much more. Crest's LA Series offers more features and reliability than any of the competition.

LA SERIES Power Specifications	LA601	LA901	LA1201
8 ohms/channel	150 watts	280 watts	300 watts
4 ohms/channel	275	350	475

PRODUCTION AUDIO SERVICES PTY. LTD. ACN 006 149 499

MELBOURNE: 5 Feathertop Ave., Lower Templestowe, Vic. 3107 Ph: (03) 852 0900 Fax: (03) 852 0422
SYDNEY: Suite 407, 220 Pacific Hwy., Crows Nest, NSW 2065 Ph: (02) 954 5100 Fax: (02) 954 4927

Write in Reader Service number: 122

Events

MIDEM, Cannes France Jan 30 - Feb 3
TUYAP Musicavision, Turkey Feb 5 - 9th
SCIF, Sandown England, 8 - 9th Feb
BROADCAST THAILAND, 13-15 Feb
SIEL, Paris 13 - 16 Feb
AES Amsterdam, Feb 26 - Mar 1st
SATIS, Paris March 6 - 10
MUSIK MESSE Frankfurt March 16 - 20
SIB-RIMINI, Italy, March 27 - 30
NAB, Las Vegas, March 21 - 24
ELENEX, Thailand, March 24 - 27
NSCA, Las Vegas, 6 - 8th April
USITT, Nashville USA, 13 - 17 April
ISBM Italy 22- 25 April
EXPOMUSICA Spain 10 - 13 May
Pro Audio, Light & Music, Beijing May 7-11
BROADCAST MADRID '94 11-15th May
BROADCAST ASIA, Singapore 1st - 4th June
INFOCOMM Anaheim 9th - 11th June
RADIO MONTREUX Switzerland 9th - 11th June
World Lighting Fair, Tokyo, 16 - 18 June
APRS London 22nd - 24th June
SMPTE '94, (Sydney) July 5 - 8
Pro Audio & Light Asia, Singapore July 6 - 8
I.A.A.M. Minneapolis July 30 - August 1
PLASA, London, Sept 11-14
ENTECH '94, SYDNEY 6 - 8 October
AES 97th, San Francisco Nov 10 - 13
LDI Reno USA Nov 18 - 20

RUMOURS

- It's looking like the **Australian Music Association** will stage a regional music show in Brisbane later this year, if a venue can be found.

- **Peter Blackmore** is probably staging a tradeshow around his 'room with a view' seminar scheduled for Sydney sometime later this year - but no word on this yet.

NETAA SEMINARS

Pyrotechnics. Jonathan 'Le Maitre; Ciddor will overview pyro effects and safe use.
On: Tue 15 Feb, '94.

Voice Reinforcement. Intro to voice reinforcement techniques, by Michael Summons.
On: Tue 15th March, 1994.

Venue for above: Rafferty's Room at the Riverside Theatres, cnr Church & Market streets, Parramatta. To book call (02) 697-4860. Price: \$25 (NETAA members/ students), \$50 others.

Your EVENT here: FAX the details to us by the 15th of the month for inclusion. Plan ahead!

MEDIA

*Music Press Review -
with The Weazel*

Bad news. JUKE Magazine has closed after many years, signalling a win for regional 'street' media. The free weekly music trade papers made life hard for the old weekly Juke, resulting in a revamp a few short months ago, which saw the title appear as a glossy monthly. The great error appeared to be distribution, whereas Juke was available weekly from newsagencies, the revamped monthly was sold only through Brashes stores. This was doomed to fail, your dear Weazel was in the habit of buying Juke at a newsagent and certainly wouldn't travel 15k to the nearest Brashes store to buy a music magazine. Whoever thought THAT one up blew it. RIP Juke, a great music magazine in the tradition of GoSet, Daily Planet and RAM - all gone, but not forgotten.

Entech '94

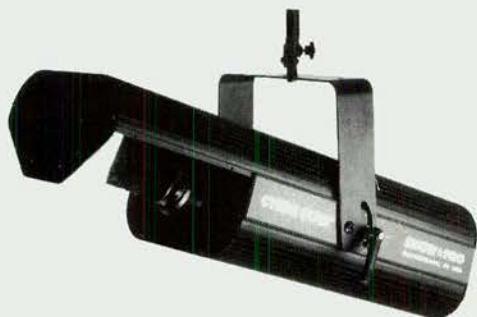
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QANTAS

PRODUCTS



• A major new moving light product was released at LDI '93, with a blue regarding tradenames overshadowing the event. While High End Systems released the **Cyber Light**, Show Pro of New Jersey released the **Cyber Scan** - (above), HMI-575 unit. With 12 colours, 8 gobos, an iris, dimmer and remote focus, the Cyber Scan is set to upset the local market when it appears down under. Made in the USA, the fixture is offered with a controller called 'Mentor'. *Details from ShowPro, call 1-201-646-9522.*

• Also LDI saw the new SHADOW followspot from **Clay Paky**, a by-product of moving light technology. Dubbed 'the first generation of Intelligent Followspots', the Shadow is based on a 1200HMI Golden Scan (we think) because it has neat remote control capability. This opens up new dimensions for L.D.'s, who can now change colour, zoom iris, and dim - even programming these functions on a memory board. The operator then simply points the thing on cue! If need be, all functions can be performed at the follow spot, of course, but instead of a mechanical iris, blackout dowsler, colour changer and dimmer, the whole lot appears at a control panel on the rear of the followspot. A clever idea. Prices: from \$6,350 inc. tax. *Call LAVA (02) 816-4444. PS: A name change for LAVA is mooted, there will be a story about this soon.*

• **White Light** offer the VSFx Optical Effects system (right) through Selecon dealers. A rework of the old Strand 252 system, the VSFx offers all kinds of effects for theatre and theme parks, etc.



• Two of the recently re-launched range from CCT lighting caught our eye as fairly unique. The **Minuette Condenser** variable beam profile utilises a bi-convex condenser lens behind the gate for better gobo and shutter definition (left).

• Also neat is the ultra wide 58° beam angle possible from the **Turbo Silhouette** 28°-58° zoom profile. (left) In use this lantern's triple-lens system allows an ultra-wide, short throw gobo projection without the 'pin cushion' effect you'd expect. It works! *Rosco Aust: (02) 906-6262.*



• A new 6" fresnel by Selecon (right) is called the 'Compact 6' - and is a re-engineered 7" fresnel designed for a lower cost 6" lens. A PC spot version is also available, the lens supplier has got it together, say Selecon, so the output is almost as good as the 7" models. The Compact 6 range take 650w, 1000w and 1200w lamps, weigh about 5kg, and have a simplified gland arrangement (!) to reduce costs. *Call your Dealer.*



• **Coemar DeSisti** say they have sold product to the J.C. Superstar tour in N.Z., a new Mini-Ultra Scan 200MSD system to Australian Disco Services, and 20 TAS smoke machines to TCP for the Seaworld Laser Show (see feature this issue).

• Meanwhile **Selecon** offer an upgrade kit for **Zoomspot** 1200's, an 'enhanced' reflector package is available for retrofit to older model Selecon 1200 profiles. For just \$45.80 plus tax you get heaps more light output.

• At press time **Clay Paky** announced a new version of the MiniScan, with a larger lamp: the MiniScan 300. Selling here at \$2999 inc tax, this is still the smallest professional moving light around, and with heaps more light output - now a contender again. This sector started with the MiniScan and went on to include the Trackspot, Microscan & Roboscan Pro 218. *Call LAVA (02) 816-4444.*

MEDIA(cont)

ON THE STREET in Sydney is an unhappy ship. publisher Noel Crabbe just can't keep staff. After Editor Heather Kitson left, assistant Steve Cadbury also walked. Meanwhile this weekly continues to decline in size, ad's, and content against fatter arch rival. The Drum Media. Crabbe's troubles don't stop there. all last year On The Street promoted a new publication, 'Aust. Music Business Index' (AMBI) which was promised for April, then July, then November, then by Christmas, and now: by January 30. Rule # 1 in publishing: don't promise, just DELIVER! (and on time).

Possibly AMBI hasn't been warmly received because Phil Tripp's Australasian Music Industry Directory already services the market - why do we need another directory anyway?

STAGE WHISPERS, the Melbourne Theatre Monthly, has changed to a new paper stock.

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PRODUCTS



• The new **Aphex Model 622 Expander/Gate** (top) is a dual channel dynamics processor incorporating new proprietary detection circuitry that provides extremely accurate and stable operation of any gate, they say. With flexible 'Q' filters, key headphone outputs, and remote bypass, it suits recording, broadcast or PA. Call *East Coast Audio* for details, (03) 428-9797.

• **INKEL** have a new dual 15 band graphic equaliser, the EQ 815 sells for a humble \$500 or so, and offers active balanced inputs and outputs via both 6.5mm jacks AND XLR's. The cut and boost is stated at +/-10dB, with bypass switch and high pass filter standard. Inkel is available here from *Magna Systems*, call *Peter Hotson* for your nearest dealer. (02) 417-1111.



• With the **FBX900 Feedback Controller** already successfully installed in a variety of venues round Australia. The new **Sabine ADF1200** (mono) and **ADF2400** (stereo dual channel) offer even more, with an LCD display, 12 independent adaptive notch filters, 12 band parametric filtering, programmable shelving filters, narrow band noise removal, programmable noise gate, digital output delay, and real time analysis. They tune themselves automatically and can be reset immediately to adjust for changes in sound environment which may have caused a change in feedback frequencies. Call *Audio Telex* for more: (02) 647-1411.

• **HBB** make a popular range of portable DAT machines, which are now available from *Audio Services Corporation*. The *Portadat PDR 1000* has a 4 head, 4 motor transport allowing off tape monitoring, while the *TC* variant will record, generate and reference to time code in all existing standards.

ASC also flog **HBB DAT tape**, which comes in 15, 30, 48, 62, 92 and 122 minute lengths. Call them: (02) 901-4455.

• **AT series** public address amplifiers, are made in Australia by *Audio Telex*, who've changed the colour- to black. Features of the AT series amplifiers include limiter and compression to prevent damage to the amplifier even under extreme overload conditions. They also feature universal microphone/aux inputs which provide maximum flexibility in system installation. Call *Audio Telex*: (02) 647-1411.

• **AKG headphones** are sold by *AWA*, who say the new *K70* and *K 80* are really very good value for money. Who are we to argue? *K70* is a lightweight open backed unit at \$89 retail, while *K80* is the only neodymium unit at its price - \$112 retail. Call *AWA* in your state.

MEDIA(cont)

• **STAGES**, published by the Victorian Arts Centre, is the BEST theatre/arts magazine in Oz, say I. Call (03) 818-5371 to advertise.

• **X Press** in Perth wins The Weazel's award for street paper coverage ratio vs. population - it is strong. But unlike every other city, doesn't have competition.

• **DRUM MEDIA** in Sydney still takes the cake for advertising content, running at 70% plus.

• Either **RIP IT UP** in Adelaide and **TIME OFF** in Brisbane are now the ONLY street papers in those towns, or their competition have stopped sending The Weazel a copy each week! Come on - are these people AFRAID? Connections welcomes scrutiny from the street press too, you know! Time Off run 50% ad's. Rip It Up the same but with more pages - does this mean ADELAIDE is a busier entertainment mecca than BRISBANE - surely not!

• The Australasian Music Industry Directory (AMID) January issue is out, the 12th edition is a 328 page, quality production from the Phil Tripp empire. Tripp boasts advertising revenue is over \$275,000 and it is possible, given the plethora of diverse types plying their wares, services and corporate profiles in the thing. AMID really is the 'here and now' definitive guide to the music trade, with a loose 'strategic alliance' with Connections. To get a copy of AMID, send \$15 to Immedia, 3 Rose Street, Chippendale, or pay \$10 at the door or at the VRF in Melbourne. MIA in Qld, or ring them: (02) 212-6677.

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PRODUCTS

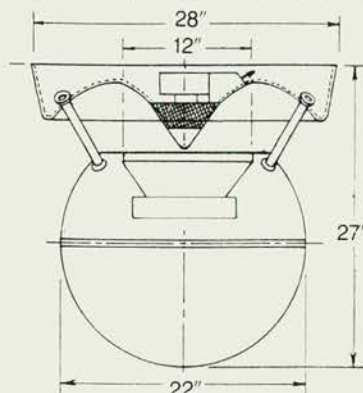


• **CREST AUDIO** have announced new amplifiers including the Crest 9001 (above) - a 3 rack unit tal monster that delivers an amazing 3,000 watts per channel at 2Ω. Crest say the concept is that they have 'over-designed' the product, and it is interesting because your editor remembers touting the AM-1600 to a cynical AES audience in New York in 1987, who all said in unison: 'who needs an over-engineered amp that delivers 2 ohms?'. Anyway, aside from the \$8,280 amplifier above, Crest have been busy releasing a whole range of amps, and Production Audio Services in Sydney and Melbourne have them. There are some quite affordable cooking models like the FA 901 (\$2,450) and really, there is a model for every occasion! Call (02) 954-5100 or Mel (03) 852-0906.



• **Spirit FOLIO Si** from Soundcraft is a stereo input mixer designed specifically for today's complex keyboard rigs. That means plenty of inputs. Available in 18:2 rackount and tabletop versions, the Si has three band EQ, two aux. sends and latching PFL soloing. It has six unbalanced stereo inputs, two balanced stereo inputs with 2 band EQ, and two balanced mic inputs with sweep m d EQ. Suits many uses, say Jands. From \$1795. Call (02) 516-3622.

• **Soundspheres** provide the advantage of providing even distribution of sound over the entire area of coverage with comfortable levels. The Soundsphere Q12 300 watt unit combines geometric elements of a sphere with opposing loudspeaker drivers which mix sound in a radically expanding space. This area is made up of two important shapes-the sphere and a precisely shaped reflector. The combination



transforms the conical coverage pattern of the cone driver and bullet tweeter into a clear hemispherical pattern. Tests over the years have proved the advantages of a spherical enclosure to provide the smoothest possible frequency response due to the fact there are no sharp edges in the path of the expanding sound waves, say Audio Telex. Low freq. from the cone driver are reflected from the perforated cone. High frequencies are reflected from the nose cone of the reflector and pass through the perforations. Precise spacial addition occurs, resulting in a smooth frequency response over the 180° vertical and 360° horizontal coverage of the sphere. For details: Audio Telex, (02) 647-1411.

• **Alen & Heath** will continue to renew their range with two new consoles about to be released. The GL 1 will be a low cost rack mount mixer with 6 inputs. It has: priority switching, mic, phone and line inputs on all six channels,

presel level adjust, 3 band EQ, and master level with input limiter.

Then the GL 4 will be available as a 16/8 or 24/8 version, with expander to make a 32/3 10 busses, 6 groups, 4 band sweep EQ, mute automation and on the 32 ch version, 72 inputs on mixdown - all with EQ, aux sends and mute automation. Call Studio Connections, (03) 723-4300.

• **DigiTech** has acquired Hafler MI Amplifier Technology which has long been recognised as the standard in high quality amplifiers. This allows them to move forward in the market with their plans to be a leader in guitar amplifier technology without a huge investment of time and resources from their Engineering Department! DigiTech are also proud to announce 3 new products:

• **T3 Pre-amp** - a three-channel, MIDI switchable, tube Pre-amp in a single rack space. Complete with a Stereo Returned FX Loop, the T3 can be used with other DigiTech Signal Processors. RRP \$1249

• **DigiTech G-150 Stereo Guitar Amplifier** The G-150 is two space, two channel, 150 watt, Mosfat Stereo Guitar Power Amplifier. The G-150 delivers a punchy, dynamic sound usually found only in tube amplification. RRP \$1399

• **G-300 Stereo Guitar Amplifier** - Although considered a standard or the most serious pro Guitar players, the G-300 also packs enough punch to drive a Bass Guitar set-up. Call CMI: (03) 315-2244

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JOHN POPE

Tour Manager & Party Animal interviewed by Catriona Forcer

John Pope is a well known face on the Australian tour circuit having been in the business since the late seventies. I met him in a bar in the city to discuss his life history but when I went to replay the tape a couple of days later, it totally screwed up. When I called John, and woke him after what was obviously a heavy night, he was rather pleased with this stating 'I'm gifted with never being committed'!

Like many people John started as a loader and then progressed onto mixing sound for friends' bands. After a while he caught the eye of the incredibly astute Julius Grafton and he found himself running a P.A. system through Graftons. "Julius was smart because I was popular as everyone was wanting to hire my system so he took me off mine and put me on his," said John. "He used to run about fifteen systems then. He exploited my talent!"

Eventually John was offered enough work of his own from bands and he branched out on a solo career. For years John worked front of house for many bands and then he went to production/crew boss status.

"I got sick of turning up at hotels too find there were no keys," he said. "So I decided if you want a job well done, it's best do it yourself so I went into tour managing. From then on the bands used to turn up at the hotels to find it was always the crew keys ready and waiting."

The first band John tour managed was The Allnighters and from then on it seems just about every Australian band of the mid-eighties employed John at some point. At that time not many people knew John was diabetic and there was many an occasion when he would be caught 'shooting up' in some back room. It became a bit of a joke with many a support band being led to think they had a heroin crazed junkie on tour. When John worked for Graftons, Julius Grafton got very used to people phoning to complain about him hiring out a drug addict.

Since 1988 John has been working for Frontier with acts such as Bob Dylan, Billy Joel, Faith No More, Guns'n'Roses, De La Soul, Concrete Blonde in fact the list goes on and on.

"Put it this way, the longer I stay in Australia the longer my resume gets but I don't get any more money at the end of the road!" John complained. I asked him how he originally managed to secure work with Frontier.

"I was doing The GoBetweens when they opened for REM in Australia and the PA broke down in Perth," John replied. "I suggested they use somebody else. I became rather loud about what should be done in front of Chugg and Gudinski who up until then only knew of me to nod to. In the end they did what I suggested and, after a four month tour of Europe with The GoBetweens, I didn't have any work so I kept phoning Chugg. Eventually he asked me to come in and I got a gig."

John tends not to care to remember 'bad tours' as he sees them as just a job that has to be done. Occasionally he really looks forward to a tour because he's a fan of the artist only to find the artist to be a real pain. John wasn't prepared to name these people on tape! However he has fond memories of the tours he has enjoyed which he believes are made good by the people themselves. John highly rates Billy Joel who he describes as a really friendly guy and he now calls him a friend.

Despite their media hyped reputation, he also found Guns'n'Roses a great band to work for and they were no problem. In fact, along with Chugg and Gudinski, John

received a personal invite to Guns'n'Roses' Christmas party held at Universal Studios last December. John was touched to be remembered and two days after receiving the invite, he was there in California. John also recently finished working as assistant tour manager on Madonna but, try as hard as I could, he would not be drawn into any juicy gossip.

One tour John recalled was the last Aerosmith tour which coincided with the pilots strike in Australia. The band had to get to Adelaide and so a private plane was chartered which took them as far as Albury. The band were hungry and so the entire entourage descended on the local Travel Lodge much to the amazement of Albury folk. Somehow it's difficult to imagine Aerosmith in an Australian country town fast food restaurant!

The main problem with being a tour manager is that there can be extended periods when there is no work and then suddenly everybody wants you. With the current overseas invasion of acts escaping the northern hemisphere winter, John is suddenly in demand and can't accept all the work available to him. He has the irritating knowledge that come July/August, it's highly possible he may be unemployed. As a result John has to take work when it's offered - so long as the price is right - and so when Michael Coppell asked him to tour manage the recent Alice in Chains/Suicidal Tendencies Australian tour he did not think twice although he doesn't understand the music!

"With the Frontier organisation you're working with a group of people but obviously there's only the one with Michael Coppell," John said. "Michael tends to work the American way by settling at the end of every night whereas with Frontier they'll settle at the end of, say, a two week tour."

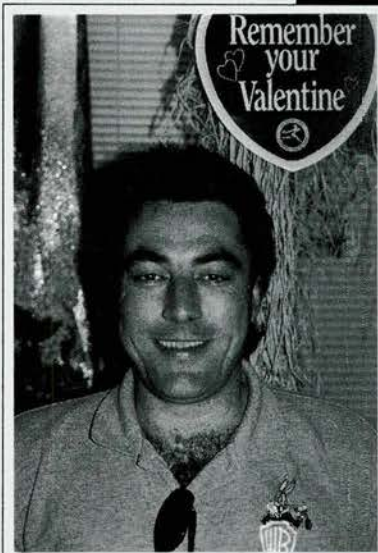
John strikes me as being a bit of a party animal and I asked him if he thought that crews today were quieter and more restrained, due mainly to the fact they have more responsibility with the amount of high tech equipment they have to look after. After a moments thought he said no, there were still plenty of wild parties out there and he didn't mind what his crew got up to as long as they could do their job the next day.

Being a hardened 'man of the road', John seems to have little patience with the younger crews he encounters these days. He gets fed up of them whinging about petty things like, for instance, the sandwiches & catering supply.

"In my day there was no catering....." he began (reminding me of that Monty Python sketch about living in a shoebox). "The only thing that has got better is the hotel rooms. The hours have certainly got longer, something I wouldn't have believed possible a few years ago. I just have a good time because I wouldn't do it if I didn't"

In 1992 John returned to doing FOH sound when he toured with Indecent Obsession, also acting as their tour manager. The tour took in Europe, South Africa and Japan

John's future ambition is to land a couple of big 18 month tours and travel to South America, Russia and Alaska.



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PRODUCTS

• **JL Cooper** introduces **CuePoint** - an autolocator/transport control unit that fully supports MIDI Machine Control and can control up to 8 MMC-compatible tape recorders, software programs and serial or parallel tape machines. CuePoint is also compatible with the Alesis Adat, Tascam DA-88, Fostex RD-8 and many hard-disk recorders, offering conventional transport controls, a shuttle wheel and track enable/track grouping functions. Also provided are auto-punch in/out, 99 locate points and a SMPTE reader/generator with LED display. Retail around \$2099.00. Contact *Electric Factory* (03) 480-5988.

• The **Phantom Cab** speaker simulator from **Rocktron** is designed to take the hassle and experimentation out of microphone placement and eliminate the need for extra mic placements in live or studio situations. Another plus is the Phantom Cab's patent pending Reactance circuit, they say. When connected to a speaker cabinet this develops the same frequency curve as a quality tube amplifier. Players simply adjust the unit's mic placement control for automatic mic angle adjustment. Rocktron's Phantom Cab can tap right off a speaker cabinet for live work, or a preamp for direct inject recording. Other features are XLR balanced and 1/4" jack unbalanced outputs, headphone output, level control, clip indicator and filter/bypass switch. Contact *Peter Shillito at Central Musical Instruments* (03) 315 2244.

• **Rocktron's MIDI Mate** foot controller has new software that offers users the chance to send up to six MIDI program changes on six separate MIDI channels, simultaneously. In controller mode, the new V2.0 software will split the MIDI Mate into two units. While one row of switches transmit preset data as normal, a second set gives instant on/off switching via MIDI, for individual effects. Featuring a robust all steel chassis, (they all say that! -Ed) Rocktron's new MIDI Mate has individual indicators displaying 'preset number', 'preset title' and 'preset switch setting'. A 7 pin MIDI in connector saves on additional power cables while providing a real time continuous controller pedal input. Call *CMI: (03) 315 2244*.

• **Turtle Beach Systems**, multimedia sound products people, announce **MultiSound Monterey**, the new standard for quality in PC sound cards.

MultiSound Monterey is everything that the original is, plus some more, they say. "The original MultiSound was an incredibly successful product for us" says Jeff Klinedinst, VP of Marketing. "It had a two year ride at the top of every comparison chart and is still the standard by which sound cards are judged. Monterey just adds to MultiSound's impressive resume."

MultiSound Monterey features SampleStore, a technological capability of the hardware (upgradable to 4 megs using standard SPPs), which can take any standard WAV file and use it as a MIDI instru-

ment. This means that the end user is no longer stuck with only the factory sounds provided by most manufacturers.

Turtle Beach has added a new synthesizer to MultiSound Monterey. The Wavefront sample playback synthesizer is a 32 voice, General MIDI compatible synth. "The rich, lifelike instrument sounds will add incredible realism to any MIDI file". Poetic, huh?

Price around \$1400.00. From *Mainly Multitrac* Phone (03) 558 1155

• **Turtle Beach Rio Professional MIDI Synthesizer Module:** Rio is the next step in the evolution of Turtle Beach synthesizer technology. The Wavefront synthesis chipset provides 32 voices of 16 bit CD quality General MIDI compatible instruments stored in 4 megabytes of ROM on the card. Rio's synthesis section also includes a real-time effects processor which allows the user to add various echo and reverb effects to produce even more lifelike instruments in MIDI files. These effects are all software-based for future upgradability.

The Turtle Beach Rio will have a list price around \$595.00 and will be shipping in January. Call *Mainly Multitrac* (03) 558 1155

• Then there is **Tahiti**. To be precise, the **MultiSound Tahiti Digital Audio Card**. "Tahiti is everything that made the MultiSound famous, minus Synthesizer." said Roy Smith, President of Turtle Beach Systems.

Tahiti provides two tracks of 16 bit CD-quality hard disk recording, the legendary Hurricane Architecture, and the same audiophile specifications that made the MultiSound the most talked about sound card in the industry today. They say. (Of COURSE they would say that. -Ed) Tahiti also provides a Creative Labs WaveBlaster compatible header so that a synthesizer can be added at a later date.

This will give individuals on a budget, a way to produce audio presentations available to a Windows PC. Tahiti is also perfect for OEM sound applications not requiring a synthesizer.

MultiSound Tahiti will be shipping late January and will sell for around \$800.00. Call *Mainly Multitrac* (03) 558 1155.

• **Alesis Corporation** is introducing the **A1-2 Multipurpose Audio/Video Synchronization Interface**, to be released this month. The A1-2, a single-rack space time code synchronizer for the Alesis ADAT Digital Multitrack Recorder, was developed jointly with TimeLine Vista, an industry leader in synchronization products.

The A1-2 effectively interfaces the ADAT system with the entire world of professional audio and video. "The A1-2 is a lower cost alternative for professionals who need to synchronise and control the ADAT, but don't need the extra functions of the BRC", said Gary Lyn from Alesis.

For more info, call the *Electric Factory* on (03) (03) 480-5988.

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LETTERS

#/@/%XX -?!

Re: the live sound mix for Tina Turner.

I did the FOH sound mix for Tina worldwide all of 1984/85. On the final U.S. tour in '85, Dave Natale was chief system engineer for the Claire Bros. PA we were using. He replaced me when Tina toured again in 1987.

Mixing for Tina Turner is not difficult - most of the job is simply "keeping her voice head and shoulders above the band" and this was how Tina described the sound she was after when I started with her. Achieving this is not difficult for a sound mixer as the PA's used today have plenty of power and clarity - relative levels between the band and the vocals are a matter of choice and good sound mixing requires being sensitive to the artist and mixing accordingly. A heavy rock band with loud vocals can be mixed with everything loud, an individual artist with a backing band is different. Fans have paid to see and hear Tina and it is her voice that should be 'in your face' with the band at a suitable level behind her. Solos and other sections do need to be turned up and down through the songs but the audience should not 'hear' these level changes.

Tour fatigue can affect personal relationships on the crew bus and lead to strange behaviour in bars on days off but there is no excuse for forgetting the basics of mixing at showtime.

-Mark Woods, Melbourne.

I would like to take this opportunity to correct a few points from your HIRE BIZ BUZ column, December edition. The article was entitled "The DMX Commander Story".

Osmond Electronics has never hired any equipment from TCP. Furthermore Osmond Electronics lighting crew had absolutely no involvement with the rigging or the operation of the show referred to. Unfortunately however, it is true that a lighting desk did go down. This could not possibly have been foreseen, as apparently the desk worked fine the previous day. As for acting like kids in a lolly shop when shown a DMX Commander, this type of device may be of a novelty to some people, but at Osmonds we have been using a LIL DMXter for about 2 years.

The article would have been embarrassing enough if we had been involved, but to have had no involvement, I find degrading. So please next time let's get the names right.

-Darren Boughton, OSMOND ELECTRONICS, SA
**The story in contention came off the fax, (so in writing), from Lee Conlon at Showcraft. -Ed*

I am a computer consultant interested in developing a user-friendly (and hopefully relatively cheap) computer based intelligent lighting controller.

Whilst there appear to be a number of proprietary control standards, the DMX-512 standard seems to be the only "Open Systems Technology" protocol in common use.

I am, however, having difficulty in tracking down a comprehensive definition of the standard. The physical layer would seem to be built on the RS485 standard, but so far I have drawn a blank in terms of the communications protocols in use.

Clive Austin, Armadillo Applied Computer Technologies, NSW.

**Contact the ISITT, I'm sending you details. Another controller??*

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Write in Reader Service number: 162

After reading your comments about the sound at the U2 extravaganza at the S.F.S., I find that I must write in support of your analogy.

For many years I spend long hours working on the "Internationals" and on many occasions I was grateful that I did not have to pay for the experience of woeful sound. I felt sorry for the audience at a lot of shows who were subjected to aural crap from the "big name" operator from overseas. Many Australian support-band operators blew the main act clear off the map.

I went to the S.F.S. as a paying customer to see AND hear an act that was guaranteed to be BIG. The S.F.S. is an absolutely woeful venue for sound. The "back-slap" from the notorious roof was absolutely horrendous and the sound was unintelligible for most of the concert. Full marks must go to Chuggie and Gudinski for staging Madonna at the S.C.G. where the acoustics are far more tolerant.

I can't help but get the feeling that the venue was used in order to generate the highest turnover possible. Full marks to U2 and Paul McGuinness for wanting us to see the full spectacular. Too bad we couldn't hear it. Next time I'll spend my \$70 somewhere else.

-Harry Graham, Sydney.

*Clearly no-one else cares. Frontier have just announced a monster concert for the SFS in Feb. -ed

I write in reference to your Media Review column which until your last edition was compiled by Jennifer Temm. In that column Jennifer makes comparisons of the page quantity and advertising content of street magazines.

Jennifer states IN*PRESS is averaging about 60 pages and 65-70 per cent which places it behind its competitor Beat. This comment is based on incomplete information. Four months ago IN*PRESS introduced a companion publication ZEBRA which is a full sized stapled and trimmed insert that is in each copy of IN*PRESS every week.

ZEBRA focuses entirely on nightclubs, dance music, dance parties, fashion and restaurants leaving IN*PRESS to concentrate on live music and venues, band interviews, gig guide, live and record reviews and specialist music genre columns.

Since its inception, ZEBRA has been averaging 24 pages at 70 per cent. Its advertising rates are the same as IN*PRESS. Combined with ZEBRA, IN*PRESS is thus averaging around 84 pages which in fact places it ahead of its competitor.

I hope this explanation will be verified when you return in the New Year and continue what is a worthwhile column.

- Andrew Watt, IN*PRESS MAGAZINE, Melbourne.

-Correct you are, sorry. Our new columnist 'The Weazel' considers Zebra is part of In*Press. -Ed

Congratulations on a superb publication - at last a rag that reflects our industry downunder and written in its unique vernacular. I especially like the product reviews which come across as accounts of real life experiences rather than pages of dull B&K test plots and coy comments when the odd specification is not met. The behind the scenes articles are well researched (you can almost smell the beer) and there always seems to be a good national balance. I have but one gripe in that the Contracting section always seems to be light in content. I guess companies like ourselves are to blame in not reporting our successes in the field.

-Mike Dodds, NMX, Sydney.

-Ta. Yes, we NEED Contracting News. Our Product Reviews get us into trouble with some short sighted advertisers because we print what our reviewers find - because we trust them. It's servicing our readers with truth. -Ed

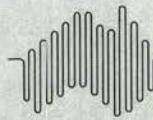


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Write in Reader Service number: 133

LETTERS

*#/@%XX -?!

Back in May, through no-one's fault, I missed out on the GUVT, ATS, High End Systems seminar and workshops. When Noel Bourne (GUVT Brisbane), found out about this, he very kindly arranged for me to have "one-on-one" training on Intellabeams, at Clearlight Shows in Melbourne.

I would like to publicly acknowledge Noel's very kind efforts on behalf, and also to sincerely thank John McKissock, manager of Clearlight, and LD Alex Saad, who gave me an excellent opportunity for "hands-on" training. Everyone at Clearlight, especially John and Alex, deserve every success in the industry.

While in the big V, I was also treated very kindly at Coemar DeSisti, and CLS. Thanks to Peter and Richie at Coemar for showing such a great tool as the NAT-TM 2500, truly an awesome light - pity it's so damn heavy; and thanks to Trevor, and all at CLS, for making me feel very welcome, and showing the Pan Command's and Col-our Fader's.

You have a great mag, and I've just renewed my subscription. Only one small complaint - please don't make snide remarks about Christian gigs such as Youth Alive, etc. You may not believe in what happens there, but I guess when it comes down to it, you don't join in much at gay gigs either; however, I don't hear you say anything much negative about them. My point is, we all - Christians, gays, greenies, whoever - spend money. If you don't like the gig, you don't have to do it, but I'd like to see the hire company that wouldn't like the \$40k to \$70k we spend in S.A. alone per year.

Other than that, keep up the good work, and remember - MORE LIGHTS - always.
-Peter Robins, PR Lighting, Meadows SA.

-Editor responds to Peter Robins letter (left): I hope I've got this right, Peter. First you say 'no snide Christian comments' (which I cannot find in any back issue, please advise when and what we said), then you say 'I don't hear anything negative about them' - meaning Gays. We should now make snide Gay comments for balance, right? A very Christian attitude, or am I totally misreading this? PLEASE let me be wrong.
-Julius Grafton.

Just a quick note in relation to your December 1993 edition of Connections; I read the A-DAT article by Dave Mackin in your studio section with great interest.

Of course, I am sure that Connections Magazine has a vested interest in providing a balanced point of view regarding the VHS versus High Eight scenario and, to this end, I wish to provide you with details of what is happening on the High Eight front.

It may interest you to know that the most esteemed film and video post-production studio in Australia, if not the Southern Hemisphere (namely, Roger Savage's "Sound Firm" organisation with facilities in both Sydney and Melbourne) purchased eight pieces of TASCAM DA-88 with Sync. Card and Remote Control Units for use in both Sydney and Melbourne, all of which were delivered in December.

Also in December, the ABC at Gore Hill have confirmed their requirement for an additional twelve DA-88's which will be used to replace their 2" 24-Track

Studers. Some five months ago, the ABC purchased an initial DA-88 with a view to trialing the unit in a Video Post-Production Environment and the additional order confirms their delight with the product.

Most significantly also in December, Mr. Keith Walker (an engineer of considerable prowess, and a DA-88 owner) reported that he engineered the Jimmy Barnes Concert in December having recorded the Concert on three DA-88's and later on utilised the same three to do the final mix for the subsequent Television programme. Mr. Walker reported his delight with the DSA-88 stating the Audio Performance was audibly superior to most other technology he had used and he also expressed delight in the speed of lock-up time, and the ease with which the whole production process came together.

- Travers Falkiner, Director Sales & Marketing (TASCAM).

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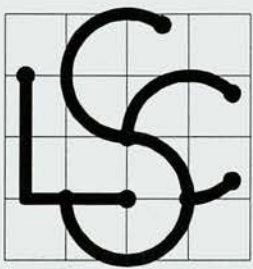
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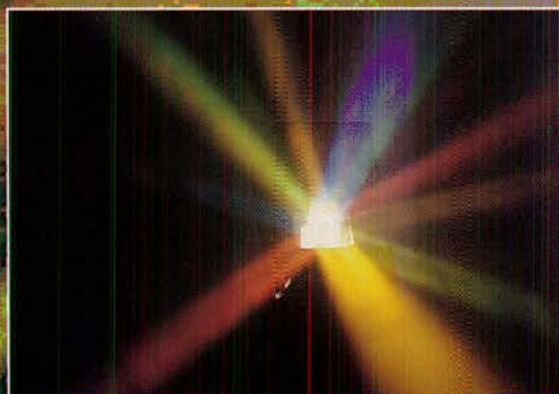
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Phil Tripp Writes....

I have seen the future of the music industry and it's not in a record store or a music venue. A lot of people in the music business—both record companies and live entertainment professionals—had better start thinking about new career directions. The future of music and entertainment in general is going to be directed more by cable television channels, telephone and computer networks, satellite companies, fiber optic networks and even the musicians- with their own music delivery corporations putting their goods directly in the hands of the consumer without the middleman record company, retailer, concert promoter or series of venues.

Over the past few months in Hawaii, I was plugged into three separate cable television networks on different islands ranging from 16-40 choices which included TV specialty programming ranging from children to news to science and music channels, movies on instant order as well as 24 hour movie channels, two home shopping channels and several local access or court/political coverage/headline news and sports channels. Anything we wanted delivered into our holiday home- with either a simple punch of the remote or a toll free call for pay by view concerts/sports, special events or to order next day air delivery of a bomber jacket for our dog.

But what was most impressive was not being able to order any CD or computer game from a catalogue-driven, mail order retailer we could call any time toll free for next day air delivered software. It was the Digital Music Express option offered on the fiber optic delivered cable channel we had which offered at least 2000 albums that we could select from for immediate delivery into our home through the cable. We could either direct the signal containing the album through to our cassette recorder, hard disk on the computer, video recorder, or, if we had one handy, either a DAT, DCC or Mini-Disc, magneto optical recorder or other storage device. And we could have received the cover art, graphics and other information as data for printout or mailed to us. Either way, we'd have instant music for instant pleasure saved for later replay without having to shop.

The same is true of concert appearances from Streisand in Vegas to the event of Howard Stern's New Year's Eve special delivered by Pay Per View right into the home and recorded for personal posterity. Who needs to go out to a concert in a club or stadium-or a record store?

This is not conjecture anymore nor is it crystal ball stuff. Most of us have the technology to receive and record programs—whether low end audio, high end video and audio combined—all most of are lacking is the connection to the "information superhighway" that we've been hearing is being built in many countries overseas but not yet here where we don't even have hopes of a decent cable TV system within the next few years.

But for those of us in the music or entertainment industry in a technical production, professional audio/video/lighting job description or even a staffer working within a record company, concert promoter, venue operator or allied business, unless we make ourselves ready to enter into an interactive media, home delivered technological society, we might as well consider food service or office work as our next career option.

Do these terms seem like a foreign language? Inboard/outboard service delivery; Full Service Networks vs Interactive Channels; interactive handheld remote vs touch screen response devices; CD-ROM, CD-I, 3DO, HDTV, SmartCard; Letterboxed LaserDisc...and for those whose work habits dictate, do you understand telecommuting or can you log onto the Internet and do you have a 14.4 faxmodem which is V32 bis compatible? Your e-mail address please?

Some of the tech-head road-kill littering the off ramps of the information superhighway will be as follows. **Audio engineers** whose abilities do not extend to hard disk recording, digital editing, ADAT, Mac-based audio and who have no job prospects with major studios because most of them are not being used by people who have their own home studios to record their own product distributed not through record companies but by home shopping channels and Digital Music Express systems. **Producers** who are not savvy with fiber optic remote recording which is most exquisitely evidenced in how the new Frank Sinatra "Duets" album was recorded—Frank and an orchestra in one studio for one set of sessions with all the other vocalists delivered by a fiber optic network, overdubbed and lasered back. **Video production companies** which can not produce on high definition TV format. Anyone who does not have access to a satellite dish. Anyone who does not reside on Internet. Anyone who does not have a computer, printer and faxmodem combo.

There is no joking about the future of entertainment as an industry nor of music as entertainment. Video game creators are becoming pop stars in their own right. While hardware companies have been buying up record companies, they are being gobbled up by media conglomerates like Time Warner and Murdoch who need the audio and video software to feed their cable networks and home delivery systems. If you are watching movies, 200 channels of TV on tap and playing games in the meantime, what time do you have to listen to music? And certainly who'd want to bother buying a nosebleed altitude ticket to an Entertainment Centre concert when you can have front row seats for the same artist in your Home Theatre system?

Better think about this and bone up on the research into the new age of entertainment or you'll get boned out of your next job. •

AUX 2

KUPO Australia are a distributor of Taiwan built lighting. Seems the Mother Ship. KUPO (Taiwan) are unhappy, they are faxing new prospective distributors looking for a new deal in Australia.

The CELCO GOLD crashed before the first Perth Bryan Adams gig. Having brought it with them, the crew had no immediate support - who do you call? Catriona Forcer, at 3.40am. Turns out Celco boss Keith Dale is Cat's Brother-in-law!

Melbourne local Bill Surtees will tour with Peter Gabriel as moving light operator - great show, we hear.

Howard Page, Aussie Legend now resident in Texas, will resume his 'love job' mixing gig when the Bee Gees tour Europe next month. Howard is a senior VP of everything at Showco. Phil Collins is in pre-production he also tells us.

One time Dirty Pool agency stalwart and Chisel tour manager Chris Bastic, is revelling in his new gig as Mayor of troubled Randwick council in Sydney. Blazened across a two page spread in a recent issue of the Bulletin, Bastic is profiled as proud of his rock heritage. "Yeah it was tough", he is quoted, "the first thing I would do was get the promoter to meet me at the venue and and I would go through the contract, and if there were any problems I would say 'Either we do it my way or we don't play' ... But I don't recall ever leaving a venue without the money, because that was the Dirty Pool motto - We Get The Cash".

Connections EXPANDS!

FACT: Now SONICS has ceased publishing a regular periodical, ADVERTISERS and industry people are being hassled with PROMISES and PROPOSALS for NEW magazine concepts of all kinds. We suggest caution: **Wait and See** regular issues first! Most importantly, we urge: DO NOT PREPAY advertising!

FACT: Now that regular SONICS issues are no more, Connections can expand coverage **without stretching the market!**

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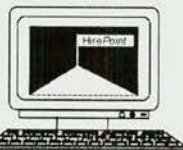
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TOMMY & TRUCKS

"The itinerary wasn't too bad towards the end, but in N. Queensland we were doing 400k or 500k's every day and doing a show every night," Tommy Emmanuel L.D. Philbie Lewis said. There had been a lot of truck problems on the tour, and four different truck drivers. The first truck driver had never worked in the industry before, the second's truck blew up, the third had a limited time he could stay with the tour and his truck was really too small. "You really need a 12-15 tonner and there are not many around," said Phil. "That is the most economical truck to take. We were really jammed into his truck. Then we got Revolver's semi and the driver is a lighting rigger so I didn't have to teach him anything. He knew what to expect and it took twenty minutes off the bump out time having the semi which is about three quarters full."

House sound engineer Glenn Inglis is keen on the PA, hired from McLeans in Melbourne. "The main benefit of the P.A. system are the Clair Bros. "R4" cabinets powered by Carver PM 1200 Amps.

"They've got to be the best sounding boxes available," said Glenn. "The racks are light weight, very clean with all the power we need. In a lot of theatres the sightlines can be your greatest problem but not so with the R4 - just stack them up and turn them up, they sound fantastic."

Glenn has had several people comment on the EQ and tuning. "They see my graphics + desk EQ and wonder how I get the end result," he said. "Unlike your average rock band where you turn on all the channels and look forward to the end of the show, this show has a lot of dynamics and ever changing instrumentation to deal with. Tuning the P.A. for a band and then having to get the 'best sounding acoustic guitar you've ever heard' can be a bit of a task.

HIRE BIZBUZ



Glenn Inglis with assistant, Allison McEwan

CREW LIST: Tour Manager: **Erendan Fyran**, Lighting Director **Phil Lewis**, Lighting Concept **Rohan Thornton**, Lighting Production: **Lotts Of Watts**, Sound Engineer: **Glenn Inglis**, Foldback Engineer: **Brent Matthews**, Sound Production: **McLean Audio**, Guitar Tech: **Andy Lamont**, PA Rigger **Paul Mossop**, Truck driver/lighting rigger: **Mark Girard**, Stage Tech: **Paul Collings**, Merchandising: **Rachael Farley**

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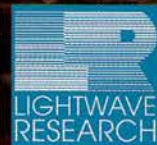
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WRITE IN READER SERVICE NUMBER 111

BYRON BAY FESTIVAL USES LOCALS

Graham Kennedy and Danny Herringe of the Total Touring Company, from Sydney, were production co-ordinators for the large event which included six stages.

Stages and tents were supplied by John Knights of OzHire in Noosa, who also lit the site. Most production came from Ivan Simon of IJS in Brisbane, both sound & lx. In the big top was a JBL system comprising eight subs and top boxes, with a 32ch Soundcraft desk. Monitors were EV1502 monitors driven by a Yamaha 2408 desk, lights came from a Theatrelight 36 desk.

The outdoor stage had a rig from Pink Noise, who hail from Grafton - the town, not the editor. FOH desk was a Soundtracs M32-8, with monitors from an AHB 18-6. PA was Martin speaker cabs and JBL horns, with lighting driven by

a Jands Aurora (goodness me, a relic! -Ed) One of the smaller tents had PA and lighting from George PA of Byron Bay. "We tried to use as many local people as

possible - the promoter didn't want strangers from Sydney doing the gig" said Graham Kennedy. **-Catriona Forcer**

• Below: Clouds perform at Byron.



Photo by Suzi Precarica

SHOWCORP TOUR FOR TELECOM

The Telecom Chief Executive Conference is produced by Penta Productions with the staging, audio, lighting and special effects by Showcorp Production Services, of Sydney. A conference 'tour' that will take in Sydney, Melbourne, Adelaide, Perth and Brisbane by March, Telecom have invited senior executives from the top 500 companies in Australia to present their latest technology and plans for the future. *(We use Optus! -Ed)*

Showcorp's brief was to come up with a visual feast for the opening and closing of the show whilst working in synergy by way of integrating the lighting, special effects and stage set with the audio visual elements. Colin Baldwin of Showcorp and Paul Vermeesch of Penta designed the opening sequences of the show.

The show was designed to be identical at every venue and so a Betacam VCR was used to trigger the Mac computer graphics, effects and the lighting via SMPTE code.

"The show went perfectly, we spent about 48 hours programming the opening sequence," said Colin Baldwin. "You can imagine programming the show to a signal was very time consuming and a delicate situation. You do three or four seconds of lighting change and movement and that would take about six hours. The end result is that you just press play on the night and the show runs itself. Some of the comments going around were that you didn't need a lighting

director and so why was I there?"

The Multiscan computer software system was used to run the Trackspects, Emulators and lighting fixtures.

"The Multiscan system was very good, the way you can do your preset focuses has been refined" explained Colin.

An oil cracker smoke machine was used to ensure a constant atmosphere without the usual clouds of smoke from other machines. In the opening sequence of the show there

were sound effects of an electric field and the Emulators were used to represent the electricity effect with quite an effective result.

"Emulators are virtually a laser simulator so you can get a lot of good effects out of them with the use of cracker oil smoke," Colin said.

The sound system comprised: 4 Meyer UPA-1 speakers; 2 Meyer USW sub woofers; Yamaha PM1800 console; White graphics and Perreux arps.

• Catriona Forcer



GRACE KNIGHT: NICHE WORKER

"I love men, truly I do. I just don't like the ones I know". Grace Knight is in her element, queen of a niche market she created alone, fronting a ten piece swing band before large club audiences across the land. Her second album, 'Gracious' is a collection of re-worked classics like 'Cry Me A River' and 'Pappa Was A Rolling Stone', produced by Larry Muhoberac and recorded at Studio 301 in Sydney.

Making a new solo career from the ashes of a rock band is notoriously hard for any singer, Knight is several years into this one with manager Diana Baily at the helm. Roadwork involves a pickup band of session musicians who read the score from charts, infusing a two part concert with vibe lacking from musicians of this genre who a few short years ago would read and play through the motions in unwashed tuxedos.

Co-ordinating production, tour managing and mixing FOH is the versatile Peter Wait who knows most owner-operator PA and Production firms around the country. Working



until last year with Yothu Yindi he picked up a lot of production for them, until they got too successful whereupon: "I'd just roll out a rig from Jands. The manager would whinge about costs and I'd tell him his band was shipping Platinum - what'd he expect?"

Diana Baily is shrewd to the game thanks to a previous stint as a publicist, which is possibly a more difficult way to earn a living than artist management - although perhaps JUST as difficult. "I'm concentrating on breaking Grace overseas" she told me, truly a task without precedence.

We caught a recent Sunday night show at Castle Hill RSL club in Sydney's north west, where seated fans were quietly appreciative and fairly subdued, perhaps due to the day of the week. At \$18 a head the four hundred mixed ager's seemed satisfied with the two one hour sets. Production came from The Public Address Co, in the form of PA and Lighting, in a truck with six wheels. "I remember building these phase plugs (into the M32 mid/high cabinets) with Gerry Georgettis" remi-

nises Wait, referring to the originally Revolver designed speaker system. The PA Co travel a sizeable Revolver speaker pair configuration, the M32 houses 2 ATC 12" midrange speakers and a JBL 2441 high frequency driver/horn, sitting atop a dual 15" JBL 2225 woofer loaded W bin, all driven by Jands SR 3000 and ARX SS1200 amplifiers.

Monitors originate at a Yamaha 2408 console, usually where you'll find elegantly ageing system engineer Jim Peisley. Eight White third octave equalisers feed active crossovers before entering two matching amp racks which feed JBL Active wedges. It's all very neat.

The front of house part of this rig comprises a Soundtracs M series 32-8 console, with Klark Teknik 360 dual third octave equalisers, BSS crossovers and DBX 160X limiters & a rack full of effects. Lighting comprises a Jands Instinct 48 desk, Roadpak racks and is all multipinned to 60 cans with fog, strobes and followspots, according to LD John Pascoe.

The last word goes to Grace Knight, whose Scottish accented humour fits very neatly into her show. "I'm sure there's some good men out there - and this song's for both of them!"

-By Julius Grafton.

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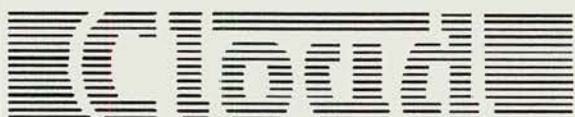
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National Roundup

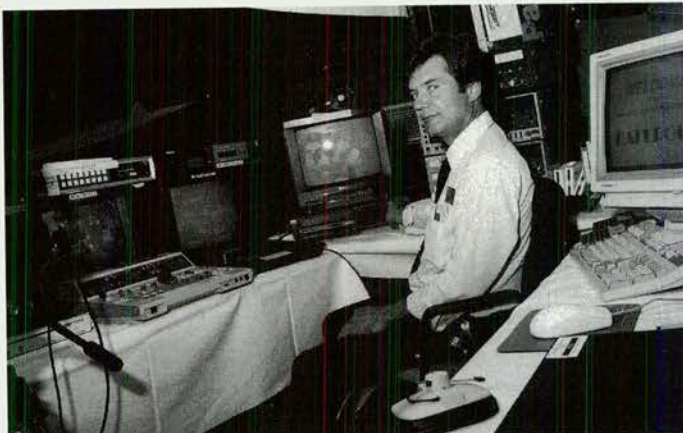
With Caroline Grafton

Well if you didn't have a busy Festive and New Year trading season, and haven't pulled some gigs out of the various National Summer Festivals, then you are not diversifying enough. The work front nationally was and is very healthy according to most people I've talked to. From elite New Years Eve parties to Rave and Dance Parties, Australia, with it's most recent happy shot in the arm (The Olympic Bid Win), partied hard. Just a few happenings follow.....

New Years Eve in Perth W.A. we found Stan White of **ASHTON ADMOR** and Rob Watson of **AUSTRALIAN PARTNERS ENTERPRISES** at the Charteuse Ball in the Sheraton Ballroom. A black tie event with French cuisine and flowing liquid refreshments the gig featured live entertainment in the form of *Get on Down*, a hot reggae band, comedy act *The Zuccini Bros.* and even a Fashion Parade. 1994 exploded on the evening with Stan Stan the-pyro-man detonating an in-door pyro show at midnight, including Streamer Cartridges, Aerial Bursts and a Pyro Spray across the front of The cat-walk. I am told that no-one was injured though there was a bit of singed calico in anticipated areas. Stan is one careful dude. The French theme was highlighted by using Eiffel Tower, Arch de Triumph templates on lights focused on surrounding walls and indi-

vidually spotlit dining tables.

Every year the **ADELAIDE COVENTION CENTRE** has a theme New Years Eve dinner - this year 'Ballroom' was the theme. The 'guys' (a term applied to girls in Production too) all look forward to this night, 'cause they get a license to play - in a technical sense! 'It's like taking your dog for a walk, going outside your normal boundaries, yet still on a lead, happy and pulling to go further" says Bronte Rhodes. Hmmm. Anyway, the crew were headed by Richard Quigley (producer), and included Colin Pyke, Deb Collyer, Michael Quigley, Kevin Soper, Dave Kinney, Gary Willis, Joel



Bronte Rhodes at the Vision OP Point, Adelaide Convention Centre.

Beclu, Peter Brockbank, and Bronte. Interestingly, these guys have a 60ch Jands Aurora lighting console, a rare bird indeed. Jands offered deep discounts on Aurora trade-ins a few years ago, and only a few are thought to survive. The Aurora is loved by those who have been through the tribulations of learning how to use, but detested by those who need to service them.

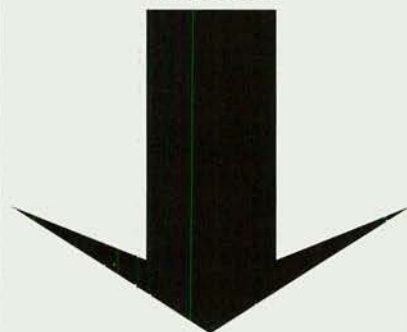


Deb Collyer & Colin Pyke, audio ops, Adelaide Convention Centre.

Although normally regarded as working with only the cream of local and touring rock bands, **REVOLVER** successfully turned its hand to the production requirements of Fred Flintstone, Barney Rubble and the whole Bedrock gang during December. The Rcyal Christmas show saw over 15,000 children and their parents watch the Flintstone gang in pantomime at

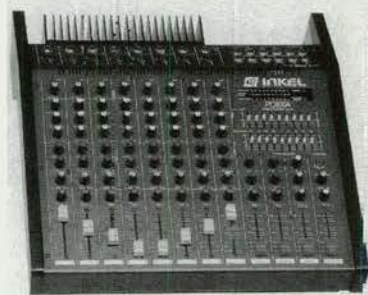


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the Hordern Pavilion. Revolver was there, providing the production for the show, which was the first of its kind at the showground. "It was a simple case of 'less is more'" said Sound Engineer for the show, Simon 'Davros' Blanch. "The audience was to be limited to 3000 people per show, but with the dance floor fully seated this still left a lot of area to be covered. The main concern was intelligibility of the vocals over the DAT backing tracks, without deafening the kids at the front of the venue. The answer was to fly a Revolver/Martin F32 cabinets and a single sub, and use a ground stack consisting of a Revolver sub, another F32 cabinet, and a custom Revolver mid high cabinet." Colourset scrollers were in use again, specified by lighting designer and operator Craig Martin. "As this was the first year of the show, the budget was conservative, but I was able to create the bright happy Christmas looks I needed by using the scrollers and cutting down on the actual number of lamps."

AUDIO & RECORDING have purchased the two former A1 Audio Soundcraft Series 4, 40ch concert consoles, one FOH, one Monitors.

AUSTRALIAN CONCERT PRODUCTIONS, Fortitude Valley Qld, had a continually busy season with numerous dry hires to large production happenings. Yothu Yindi at Southbank and a ten day tour, Wendy Matthews at Seagulls and the Riverstage, Blazing Salads at Southbank, Youth Alive Concerts at Brisbane Entertainment Centre, Lucky Dube SEQ Tour, Peter Andre in Brisbane, numerous Dance Parties, and lots of corporate functions and presentations at the Brisbane Entertainment Centre, Sheraton and the Hilton. ACP covered Southbank Parklands including the Piazza with all major production for the Summer Festival. Acts ranged from many local artists to acts such as the Black Sorrows and Gangajang. Full production for Blazing Salads and the Allan Brown Big Band at Jupiter Casino over New Year's along with the Australian Doors Show at Fisherman's Wharf. ACP also supplied full production for the 'Big Day Out' Gold Coast for stages two, three and four, as well as full production for Wreck X N Effect and E.Y.C. in Brisbane. ACP have also increased their hire stock with the addition of another Yamaha MC2410M monitor con-

sole, 14 x Jands SR3000's and 2 x Jands SR1500's and TMS-3 Cabinets.


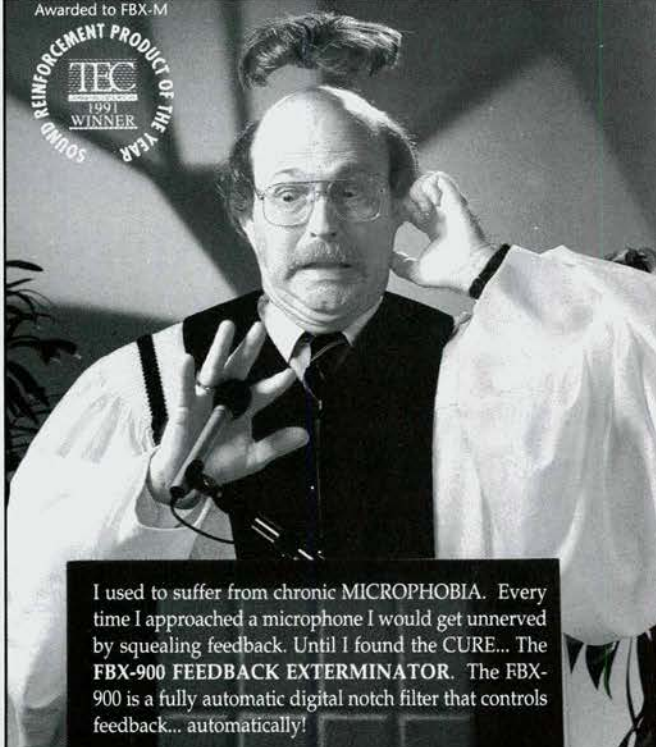
JOE'S PA HIRE & PRODUCTION, Lewisham NSW, spent January at the Powerhouse Museum on a series of gigs entitled "Hot Summer Nights". Acts included, Swoop, Anne Kirkpatrick & Band, Dog Trumpet, Bellydance, Marcia Hines, Juice, Dig, King Clam just to name a few.

FERNANDEZ MUSICENTRE, Cairns Qld, have had a busy holiday season. The crew are looking forward to actually cabling up an entire show after doing the production for Carols By Candlelight, Rick Price (Unplugged), Boom Crash Opera (Unplugged) and Wendy Matthew's (Unplugged)- although Wendy did manage to chew up 16 channels. Also, Doug Johnstone (LD & FOH Engineer) has returned to the Fernandez hire dept. after a leave of absence doing an in-house gig. He's even managed to grow a bit more hair. I wish he'd tell our editor how! (*Ha Ha Ed*). The boys tell us it's BLOODY HOT up there so if your going north BYO Air-Conditioning! •


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Audio Education Centre: turmoil unresolved

By Julius Grafton

"I don't want to rake over the past" says Paul Rich, manager of Rich Music Studios and the A.E.C. recording school in Sydney, and it's easy to see why. The facility in Kent Street was being rebuilt in January, a project worth up to half a million dollars, Rich said. Just a few short months earlier, Rich Music Studios Pty Ltd had a liquidator appointed, and as the renovations continued the fate of several hundred thousand dollars outstanding to creditors was un-certain.

It is often perplexing to people not versed in the machinations of company law to see an entity re-arise from the ashes immediately after all seems to be lost, yet the Paul Rich empire has done just that - thanks to the efforts of an accountant, Giles G. Woodgate. Woodgate was appointed as Administrator of a Company under Administration at the invitation of Paul Rich on August 16th last year. It is always preferable to put someone you know into this position, rather than have a receiver nominated by a creditor or court forced upon you.

The list of creditors of Rich Music Studios includes with Paul Rich himself owed \$150,000, then reads as follows: G. Ferguson (\$5000), L.A. Huntley (\$18,000), E. Huntley (\$2,000), Audio Visual Designs (\$7,000), A.G.C. (\$58,000), H. & N. Antonopoulos (\$28,000), Bridge Wholesale Acceptance (\$49,000), P. Lees (\$1,300), K. Delandro (\$4,000), IOOF Australia Trustees (\$55,000), D. Dupuche (\$2,400), Sonics (\$3,054), P.D. Robinson (\$120,000), Financial Focus Pty Ltd (3,350), Esanda Finance (\$11,164) Tomerong Pty Ltd (\$16,883), Drum Media (\$1,185) and so it goes.

Further grief emerged at the creditors meetings late last year, with an estimate of \$40,000 being owed to the Tax office, thus the total of the creditors above exceeds half a million dollars - entirely coincidentally the same amount Paul Rich claims his new extensions are worth. Another drama unfolded at the first creditors meeting when it was revealed the students of the Victorian A.E.C. could be preparing a claim for \$100,000. This was later settled. (See other story this section)

A creditors meeting is often ugly, with people asking awkward questions. The Rich Music Studio meetings were no exception, with all kinds of rude accusations levelled by all kinds of people. Most insistent were those questions from a Solicitor, Ms. J. Sarah, who amongst other things asked if there was any possibility of cash being received and not accounted for, in the day to day running of the facility, which was still trading. This was angrily refuted by the administrator, Giles Woodgate.

It transpires Ms. Sarah was appearing as legal representative of Nonda and Lenny Antonopoulos, private individuals owed \$28,000 by the studio. The story of Nonda and Lenny is not yet clear, they are in Greece as we go to press. Several parties close to the matter say that they advanced their savings to Rich Music Studios, and that they have now left Australia in distress.

What is known is that the business was sold to a new company called Dealfilm Pty Ltd, who now trade as Rich Music Studios and also as Audio Education Centre. The people behind Dealfilm are the
(continues over)

Victorian SAE: a safe rebirth

By Julius Grafton

It's every student's secret horror when the audio course they are working hard at goes broke and they've paid in advance. This happened in Melbourne late last year when the Audio Education Centre collapsed with the appointment of an administrator to the Paul Rich studio empire. Operating in Sydney from the premises of Rich Music Studio, and in Melbourne from premises opposite Metropolis Studios, the Audio Education Centre fell into a liquidity crisis that saw Rich Music Studios ownership pass hands at least once - and then retaken under controversial circumstances - before Paul Rich appointed Giles Woodgate of Woodgate and Co as administrator.

The manager of the Audio Education Centre in Melbourne was Vyt Karazija, who established the syllabus and much of the course material when he started running the school for Paul Rich several years ago. "I got a bit toey when he (Rich) started asking me to send money to Sydney - naturally you expect some repatriation of funds, but these were pre-paid fees we were talking about. It was about \$35,000 in all" said Vyt, putting a total to the funds transfers. "After this I started putting the students money into trust and drawing it out as the courses progressed. When the school crashed there was about \$10,000 in trust I could then refund (to the students) when I got permission from the administrator".

According to Vyt, the Students were devastated when the course closed. "I got my solicitor to advise them about a possible class legal action, got them to write letter of demand to Paul Rich, - after all, he was just expecting them to go away! It infuriates me!" said Vyt. Meetings were held at Vyt's house where the students were updated on events. The students became creditors, and under Vyt's direction a combined force who applied a lot of pressure.

Vyt says he was owed over \$16,000 in back pay, but despite this he negotiated a deal with the administrator of Rich Music Studios Pty Ltd and Rich North Pty Ltd to transfer ownership of the Melbourne school to him, which was completed in September. "I then completed all outstanding courses. Kids had their dreams and their money resting on this". Vyt also has the name 'Audio Education Centre' registered, but will not use it. "It's a blocking manoeuvre to prevent Rich reappearing down here".

Now trading as Recording Industry Training Centre, Vyt is big on students checking the credentials of any private college or training organisation. Vyt says his new school has support from Ausmusic and is a registered private provider with TAFE (so students can claim Austudy), having satisfied the State Training Board that all is kosher. In Victoria you can call the State Training Board on (03) 628-3789 to check if a course is accredited.

The course offered at the Recording Industry Training Centre runs 40 weeks full time, and
(continues over)



THE ONES THAT ALMOST GOT AWAY.....

Several very tricky repairs have come through the workshop during the last few months, the first involving a Sony PCM-501. The Sony 501/601/701/F1 series were used to encode and decode audio signals in such a way that they could be recorded and played back on a VCR. A 501 and a VCR together basically formed a DAT-type recorder in a less convenient package, and although many users had unhappy experiences with the unreliability of the tracking of these devices, they still have a certain underground popularity.

The machine brought to us would periodically mute the audio, and leaving it on soak test showed that it had an intermittent decoding problem. Apart from the difficulty of dealing with intermittent faults, the 501 makes wide use of servo loop circuits where the failure of any one section will basi-

cally cause the whole circuit to stop running. The challenge is that, since virtually the whole circuit stops all at once, how do you ascertain which component is actually the one causing the shutdown?

The fault in this particular machine seemed to be somewhere in the timing circuits: when it failed, the clock driving the sampling FETs was absent and a number of the signals around the playback sync separator IC were missing. Heating and freezing the area around X502 and its associated components would cause the fault to disappear and reappear. It seemed apparent that the problem was in this area. The transistors metered okay and the CRO showed that a healthy clock waveform was being produced at pin 4 of IC511.

(continues over)

Rich Music Studio Woes (continued)

Saminaden brothers, Guy John and Gerry, along with Christian Bru. Paul Rich told me that he owns 60% of the business, in any case is an employee of Dealfilm. A creditor of Rich Music Studios (Mark 1, under Liquidation) told me on February 12th that he had heard nothing whatsoever from the liquidator regarding a sale of the business, and that he had not received a report of the sale. A search of the company extract at the Australian Securities Commission revealed no material of this nature had been lodged.

Up on level two at Rich Music Studios it's full steam ahead to get Studio B built and on line before the next Sound Engineering course kicks off in the middle of February. Studio B will feature three ADAT's with a BRC, a new DDA DMR-12 fully automated console, and an adjoining Midi suite, being established by programmer Steve Svitek.

The Audio Education Centre in Sydney (or A.E.C. as it styles itself) is now advertising its courses for 1994 in the Sydney street press. The courses offered are a part time diploma course (\$3,200 by instalments or discounted to \$2,880 if paid up front) and a full time certificate course at \$2,160 payable up front. The courses are not accredited with anyone, but feature a well prepared 350 page set of course notes and a special guest appearance by ARIA winning engineer Al Wright.

Connections has been concerned for some time about the activities of the A.E.C. (earlier known as the AAEC) whilst under the control of Paul Rich. In fact, in June 1992 *Sonics* (the recently defunct music magazine) ran a glowing review of the course which rang the alarm bells. A stiff letter to *Sonics*



Paul Rich pictured in January

last editor, Gavin Hammond, advising the editor to check certain facts drew an almost immediate legal letter - from Docker & Partners acting for *Sonics*! The letter stated that if we published OUR letter to THEIR editor, (about the AEC story) then THEY (*Sonics*) would sue us.

The story in *Sonics* ran for four pages and solely dealt with the virtues of the Audio Education Centre. Headed: "Are Sound Engineering Schools SOUND?" it was further tagged: "Worried that they may be a rip-off? Look no further. We go behind the scenes at one of Sydney's top sound engineering schools to let you know what really goes on at these increasingly popular hang-outs for would-be sound

engineers". A breathtaking endorsement.

Indeed there were some great people associated with running courses for Paul Rich. These include current course co-ordinator Glenn Ferguson, the presenters, and several current Connections contributors, to name a few. At press time the Audio Education Centre confirmed to Connections that the managing director there is still Paul Rich. •

Editors Note. *I'm sorely pissed off that kids put faith in private colleges which don't deliver. I really agonised over this story, which doesn't help genuine people involved in studio education. I'm still angry at Gavin Hammond for publishing THAT story in Sonics, doubtless attracting students to AEC. And before the cynics cry, I'm quite aware my current Studio Editor Greg Simmons was a presenter at AEC. Good luck to future students!*

Victoria (continued)

includes some hands on work at Metropolis, across the road. The total cost is \$6,490, which is payable by term and placed in a trust account, says Vyt, administered by a third party until each part of the course is completed.

Naturally it's a rebuilding exercise for Vyt, "I'm quite happy with the way it's going, so far. I also write jingles and do production work so I don't need the courses to stay alive, I've got the luxury to be able to take a smaller group. I want this place to be the premier trainer".

*Contact the Recording Industry Training College, on (03) 696 4117.

Workbench (continued)

After quite a period of time left on soak test, during which it would briefly fail, the fault went hard. Re-examining the circuit around X502 showed that there was no output at pin 4 of IC511 despite a clock waveform being applied to pin 5. Closer examination of this clock signal however, showed that its peak-to-peak voltage was rather small, and that the whole waveform was effectively being pulled high. This meant that the bottom of the clock signal was not reaching a true TTL low. As far as the inverter was concerned, pin 5 was always high, regardless of the clock signal oscillating away merrily. As a result, the output was permanently low.

A quick check then showed that the signals around Q529 were as they should be, but that the DC conditions around Q528 were incorrect. The circuit diagram indicates that both the base and the emitter should sit at 2.8v: in fact the base was nearly 10v. Q528 was whipped out and measured with the trusty Fluke meter, and tested okay. This was one of those occasions when one kind of test conflicts with the results of another kind of test, but experience tips the balance one way. Clearly, this transistor was faulty whatever the meter might say: sometimes, a simple diode-drop meter test can't adequately reveal a fault condition that affects the behaviour of a transistor under active conditions. Q528 was replaced and the unit ran perfectly.

So, this turned out to be a classic case of a tiny component stopping a whole machine and consuming repair time out of all proportion to the replacement cost of the transistor.

Another very difficult repair occurred recently after a Tascam DA-50 DAT recorder had been through the workshop. When the customer received the machine back, it ran for about a day then failed - the reels were turning and the tape was running, but no audio was being output. Despite the fact

that the machine had run for a while without problems, the fault was now hard on and gave every appearance of being related to the PLL circuits. To explain this fault fully, a brief discussion of DAT theory will be helpful.

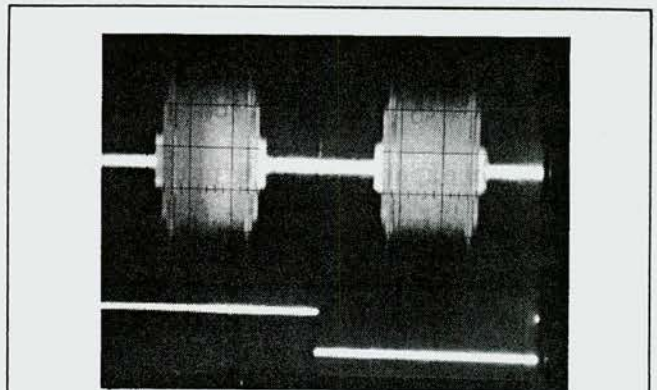
A DAT recorder has to place data on a tape in widths measured in microns, and it has to do this to an agreed standard, so that a recording made on one machine can be reliably reproduced on another machine. To achieve the required degree of control, a DAT mechanism uses a number of servo controlled circuits to direct the motion of the reel motors, capstan motor and drum motor. Furthermore, to move the tape through the tape path and around the head drum such that the data is correctly recorded requires all the motors to move in sync with each other, and at the correct speed.

When playing back a previously recorded tape, this speed must be set so that the heads are positioned properly over the data tracks as the tape passes over the drum. To enable this to occur, bursts of data are read from the tape and used to lock the control circuits such that the speed is varied until the heads are perfectly placed over the data tracks. So, the electronics are controlling the motors, but the data being read from the tape being driven by the motors is used to control the electronics. Sound complicated?

As with the PCM-501 de-

scribed above, a fault in one section of a servo system like this immediately ripples through to all the other sections, and it becomes quite difficult to determine where the underlying problem is occurring. After a period of observing the DA-50, we noticed that the capstan speed was running away, and this became an important clue in tracking down the eventual cause of the muted output.

Referring to the diagram below, the upper waveform shows the blocks of RF as recorded on any DAT tape. The two distinct bursts visible are from the two separate heads on the drum (known as A and B), and each burst contains PCM audio data plus synchronising information for the servo circuits. The lower signal in the figure below, shows the so-called switching pulse. Only one head is ever



The head reads data off the tape over a cylinder angle of 90 deg.

The bursts in this photo are the signals read off the tape.

INTERIOR DESIGN: AN OBJECT LESSON

Connections recently dropped into Damien Gerards and learnt a valuable lesson in rock'n'roll recording. Looking like a World War II bunker, there's none of the glitz, glamour or classy interior design you find in the typical large studio complex. Talk about breaking every rule!

The ceilings are low, there's virtually no natural light, airconditioning is assisted by a doorway that opens out onto a busy road, the control rooms are not symmetrically balanced, and acoustic treatments are done with pieces of carpet, sheets of corrugated iron or whatever else seems to be hanging around. Attitude and history seep from the walls, along with that strange smell you only ever find in venues such as Springfields (Sydney) or The Prince of Wales (Melbourne).

Yep, it's a fantastic place to record rock'n'roll! The fact is that DGs are currently one of Sydney's busiest and most productive recording studios, and that says something about interior design. Thumbs up to Marshall and Elia! •Greg Simmons

Workbench (continued)

active at a time and this switching pulse controls which head is currently feeding data from the tape to the decoding circuits. Naturally, this pulse has a very precise timing relationship to the RF waveform - if the switching pulse tells the decoding circuits to switch on or off prematurely, then large chunks of data are simply lost.

And so, back to the DA-50: the next step was to determine why the capstan speed was running away. After examining all the servo circuits, we found that the switching pulse signal was suffering a periodic drift out of sync with the RF. In Fig 2, the trailing edge of this pulse, where it goes from a high to a low, occurs roughly in the middle of the two RF bursts. In the Tascam, the trailing edge was slipping slowly backwards; eventually, it was switching after the second RF burst had begun. This meant that the servo circuits were not receiving the synchronising data buried at the start of the RF. Without this sync data, these circuits were sending signals to the capstan motor saying: hurry up! We're waiting for our data. However, with the switching pulse locked into the wrong position in relationship to the RF, these circuits could never receive the data they required. Effectively, they were sending a permanent hurry-up to the capstan motor servo. The result is that things look like they're working - the tape is moving and the reels are rotating - but the audio remains muted until the fault is fixed.

*Howard Jones runs Studio Solutions in Sydney, who sell, repair, hire and install. Call him on (02) 906-4363 or fax: (02) 439-6444.

MASTERING With Paul Bryant

My Place - or Yours?

Brendan Palmer of Clan Analogue writes:

As a member of Clan Analogue and a younger member of the sound community, I'm fascinated by the changes that have gone on since the beginning of audio. I can understand the need for the Analogue resurgence. What better way to learn about real sound than with a dodgy analogue monosynth and a cathode-ray oscilloscope? (Turn up the resonance slider and witness the result with your ears and eyes!)

Those born into the Digital world haven't had the chance to create sound the analogue way. The new era in Home Recording has enabled many a low budget composer/producer to bypass the Commercial recording companies and in a lot of cases even the most budget professional studios.

From personal experience I can see that Home Studio recording has opened up many an innovative door, such as the greater fusion of composing and sound engineering, as well as allowing the individual to use as much time as he/she wants. This applies especially in Electronic Musik.

However, those who choose to record in some of the more balanced pro-studios, (if the individuals get their shit together) will 9 times out of 10 develop a deeper and cleaner end result.

How do you compare the compositional and production qualities of these two options that the low budget composer/producer has to choose from?

Has the quality of digital audio systems allowed for an improvement in compositional and engineering arenas or has it only allowed for user-friendly, uneducated slackness and/or ignorance?

PAUL COMMENTS: The actual location of the recording equipment is not important. The real issue here is the quality and quantity of the equipment. It's possible to obtain brilliant results in a home studio, and a few very rich artists do so. Compromises inevitably arise when you are faced with the cost of purchasing/renting equipment, although even at today's devalued studio rates, a month in a studio buys a lot of equipment. The real problem is that most home studios are inadequately equipped.

I don't believe the instruments themselves are to blame. There is however, too much reliance on presets and common samples. For example the choice of sounds used in dance recordings is so narrow it borders on fascism. Then again, what do you expect from the bubblegum of the 90's?

The second major problem area is monitoring. Soundwise, home recordings' most common problems are "big fat bottoms" and a lack of presence. These characteristics usually represent the INVERSE of the frequency response of the monitors used, i.e. presence is reduced in the mix because it is too pronounced in the speakers, and a bass added because it can't be heard properly. The spare bedrooms and converted garages commonly used also cause problems, generally they are too small to allow accurate bass reproduction. Typical home studio monitoring consists of a pair of "shoebox speak-

ers" stuck on a convenient shelf. If you must use this type of speaker, then at least add a sub-woofer. If possible, try to buy a pair of small to medium size studio monitors, but expect to pay between \$1000 and \$3000.

For referencing, a CD player is essential. Use CDs of a similar genre as a reference point, comparing your own mix to the CD. It would be pointless comparing a techno mix to a solo flute CD.

Digital recording systems have a clearer, cleaner sound which sometimes allows people to "get away" with things that analogue recording would not allow. For example, digital instruments/samples can be transferred digitally to DAT and then digitally to CD. Peak levels that would have been squashed by analogue tape are transferred unaltered. Theoretically this improves clarity but if left unprocessed then the apparent loudness of the finished product can actually be reduced. I recently had a problem with a sampled kick-drum which sounded reasonable but was affecting the overall level of the mix. The sample turned out to be an almost pure 90Hz pulse, with hardly any harmonic overtones. This would be much less likely with analogue recording.

Perhaps the best compromise would be to record at home and then mix in a fully equipped professional studio. Unfortunately, you have to find a studio with a compatible recording system and this is getting more and more difficult as the number of new, incompatible recording systems increases almost daily.

As the Home Studio gets closer to that "high quality, clean sound", it begins to draw a more direct path to the mastering suite. Do you find that you have to compensate for these home recordings by involving more re-mastering techniques and if so how can you suggest that Home Studio engineers improve the monitoring or referencing of their work during the mixing stage, making the mastering a little less corrective?

How have digital audio systems affected the quality of the recordings you have mastered?

Most home studios are assembled by people who are more musician than technician. They are not helped by some of the semi-pro equipment available, which have incompatible connectors, operating levels, and earthing philosophies. There is also a tendency to buy more keyboards and sound modules instead of problem solving signal processors. The end result is that Home recordings generally exhibit a lack of dynamic control, sibilance problems where there are vocals, and sometimes mono compatibility problems. There is also a tendency for unacceptable levels of hiss, hum, and distortion, which are very hard to fix at the mastering stage, if not impossible.

WRITE TO PAUL: Fax (02) 876-5715.

PAUL BRYANT is a Mastering Engineer at All music Manufacturing, call (02) 557-1169.

EX-TRACK

With Studio Editor, Greg Simmons

Here goes... Studio Hat Trick? **Enrec Studios** are pleased to announce they have been named by the **Country Music Association of Australia** as finalists for this year's awards. Enrec's **Steve Newton** recorded **John Williamson's** 'Good Woman' at Trafalgar Studios, nominated as a finalist for Song Of The Year. **Norma Murphy's** Heritage finalist 'Barbwire and Bamboo' and **Pixie Jenkin's** Instrumental Of The Year finalist 'Kindee' were both recorded by Steve at the Enrec Studio in Kurri Kurri, near Newcastle. New CDs by **Ron Wells** and **Errol Gray** are to be released at this year's Tamworth Festival. Call Enrec on (049) 361 376.

• Onward and upward: **Damien Gerard's** have added to their complement of microphones with some new **Audio Technica 4033** and **CAD Equitek 200** condensers, which are being used by **David Price** for the **Nitocris** EP being recorded in Studio B. Meanwhile, **Tim Powells** has been hard at work producing and engineering new band **Notorious** and working on rare tracks for the forthcoming **Ana Christenson** album. **DGs** was open throughout the Christmas break, and young **Dave Trump** had his hands full running sessions while the other engineers took well-deserved breaks. Call DGs on (02) 692 9915.

• **Studio 52** are now running their new **Tracmix** automation system. They've also added a **Roland DM80** digital hard disk recorder and a **TC Electronics M5000** reverb to their list of equipment. To check out the new goodies, call them on (03) 417 7707.

• Relax... **Fran Esther** from **JMF Sound Studio** tells us that the staff of JMF work hard to provide

personalised service in a non-threatening atmosphere, and to nurture creativity. Call them on (02) 790 4097 and chill out...

• Copyright and fruitloops... **Graeme Storer** of **The Enterprise** is still looking out for reputable and serious musos, programmers and songwriters to add to his strong pool of talent. So send a demo of your copyrighted work in a stamped self-addressed envelope to Graeme Storer, 51 Windsor Rd, Dulwich Hill NSW 2203. And please, make sure your work is copyrighted, Graeme gets enough fruitloops as is...

• Just for the Christmas record: **Ex-track** received a great Christmas present from **All Music Manufacturing** — a card with a coloured vinyl disk mounted inside. With a little bit of folding and unfolding according to the printed directions, the card turns into a record player with a dress pin for a needle, sticky-taped to what is literally a folded horn! Drop the needle onto the outside groove of the vinyl (remember how to do that?), spin the disc and a scratchy 'We Wish You A Merry Christmas' comes bellowing out from the folded horn. Believe it!

• Blessed Curse: **Craig Beck** from **Powerhouse Studio** tells us that after blowing three tweeters and three drivers — and totally trashing the place — **The Blessed** are heading to **Studios 301** to mix down! The big question is, who's better off? Call Craig on (02) 318 1220 to find out. • **Sony Music Studios** are reporting new drum sounds thanks to recent acoustic refurbishments. Call **Simon Tonx** on (02) 332 0320.

• From the belly of the horse... Latest additions to **Troy Horse Studios** include **JBL monitors** in the live room, an **all-valve stereo guitar rig** with two



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(02) 357 1599

HOW TO LIST YOUR STUDIO:

1. Deadline is ALWAYS the 15th of the month before publication.
2. Mail or Fax the information to us, you do not need a specific form, but you do need to follow the format of the guide, which is obvious - have a look.
3. From March we must limit listings to eight or less separate artists.
4. Please note your studio NAME, phone number, state and your contact details so we may check anything odd.
5. If we have any doubts we will contact you around the 20th of the month.
6. Questions? Verification? Call Elaine on (02) 876-3530 (BH).

Send to: **Connections, BASF Guide, PO Box 439, Epping 2121, or Fax: (02) 876-5715.**

ARTIST	PRODUCER	ENGINEER/S	NOTES
New South Wales			
Airmotion Studio	Contact Kristen Wolek	(02) 550-3863	24 Track Album
Flicker		Tim Whitten	Album
Big Byte Prod.		Adrian Bolland	Advert
Blair Greenburg		Shane Fahey	Short Film
All Music Manufacturing	Geoff Sturre	(02) 557 1169	Mastering
Odessa Mama	David Fairman	Paul Bryant	CD Master
Errol H. Renaud	E. Renaud	Paul Bryant	CD Master
Clan Analogue 3	Brendan Palmer	Paul Bryant	Digital Mastering
Heroes from Heaven	Jeff Cripps	Paul Bryant	CD Master
Shot to Pieces	Rob Specogna	Paul Bryant	CD Master
A Sharp Studio	Jeff Cripps	(02) 538 8136	16 Track
Astral Taxi	Jeff Cripps	Jeff Cripps	6 Track C.D.
Thieves	Jeff Cripps	Jeff Cripps	Demo
Piston Broke	Paul Tagg	Paul Tagg	8 Track CD
Damien Gerard Studios	Contact Elia Bell	(02) 660-8776	16/32 Track
Nitocris	Dave Price	Mike Wood	Single (Roo Art)
Chocolate Shop	B. Price	Dave Trump	Album (Foghorn)
Madhouse	R. Vanderby	Russ Pilling	E.P.
The End	G. Warsmley	Tim Powells	E.P.
New Christs	R. Younger Colin Wright	Album (Citadel)	
Festival Studio	Vicki Eldridge	(02) 660 4022	32 Track
King Clam	Aya Larkin & Band	Mark Thomas	
Jeff Vincent	Keith Cohen	Mark Thomas, Greg Henderson	Album Tracks
Pippa Grandison	Tim Whitten	Tim Whitten	Album Tracks
Swirl	Ben Aylward	Mark Thomas	Album Tracks
JMF Sound Studio	Contact Fran Esther	(02) 790 4097	24 Track
Albanians	Albanians	Keith Tombs	Demo
Outcry	Outcry	Ralph Esther	Album
L. Imber	Imber & Bronson	Paul Gray	Single
Thieves	Libby Murray	Ralph Esther	Demo
Main Street Studios	Rob Specogna & Tim	042 83 4515	
Robinson Bros.	The Band	M. Nicholas	Demos
Thousand Plane Raid	Band/R.Specogna	R. Specogna	C.D. Single
Shot to Pieces	Band	R. Specogna	Demos
Wongawilli	R. Specogna	R. Specogna	C.D. Album
Megaphon Sound Recording Studio	Contact Guy Dickerson	(02) 516 3917	24 Track
Died Pretty		Allan Thorne	Singles
Elektra String Quartet		Guy Dickerson	Album
Load Star		Jason Blackwell	Demos



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quad boxes and a **Behringer Stereo Enhancer** (whoa), and a **Behringer mic preamp**. They've also installed air-conditioning in the **Loopy Green** digital mastering studio, and re-decorated the control room with lovely pictures of all the recent releases they've recorded. For more information, or to join the **Colin Wright Is A Big Spunk** fan club, ring **Michael Levis** on (02) 557 3129.

• **Freelance Phil: 001 Recording Studios** tell us that engineer/producer **Phil Pomeroy** is leaving to go freelance, and wish him luck. Call **George** or **Owen** on (03) 348 1300 if you want to make some bookings.

• **Big Sky, QLD, ADAT: Grevillea Recordings** say that **Simon Gardner** has become the first artist to use their 8-track **ADAT** synchronised with their two inch 24-track analogue recorder, running a full 32 tracks for his debut album 'The Big Sky'. Call **Grevillea** on (07) 262 8422.

• Well I say, I say, I say: **Foghorn Records** are looking forward to a big 1994. Releases planned before May '94 include the debut album for **Once Upon A Time** (following up from their debut EP released last year), and the first album from a new act called **Chocolate Shop**, featuring **Drue Tyson Hoille**, **Barton Price** and others, which promises to be very interesting. **Chocolate Shop** are touring with **Tim Finn** and have been hailed as a 'grungy World Party'.

• Other worlds: the incredibly well-appointed **Planet Sound Studios** have got themselves some extra mikes, an **AKG 535** and a **Beyer 201**. Call **John Villani** at **Planet** on (09) 382 2211.

• Finally, word just in from **Under New Management** tells us that **Angelique Cooper** has finished a remix of 'World Turning' for **Yothu Yindi**, completed at **EMI** and engineered by **Jim Taig**. The album was programmed by **Mark Ovenden**. Jet-setting **Brendan 'Bam Bam' Morley** (who does a damn good **Tom Jones** impersonation, by the way) has returned from LA, and promptly mixed **Wendy Matthews** video 'Live At The Opera House', soon to be released. Also back from the land of hot dogs, baseball and questionable gun laws, **Brent Clark** has returned from New York and is mixing **Tall Tales and True** single and album tracks in **Studio M** at **301**, with **Daniel Denholm** engineering and programming, and **Nick Launay** producing. **Colin Simpkins** is at **301** recording and co-producing **Juice's** new album. Not content with his work on the new **Tall Tales and True** album, **Daniel Denholm** has produced an EP for **Relic of Marylou**, and demoed **Max Sharam** and **Tan Morris** (Jenny Morris's brother). The big news for Daniel was continued work with **frente!** and working with **Ween**, while they were touring here. **Garth Porter** headed off to

(continued)

ARTIST	PRODUCER	ENGINEER/S	NOTES
Paradise Studios	Bill Field (02) 357 1841	24 Track	
Tahere	Edwin Alamshah	Michael Stavro	Album & Mix
You Am I	Wayne Connolly	Michael Stavro	Mix
Cactus Child	Mark Moffat	Tom Colley	Tracks
Toney Hatch	Glen Phimister	Tom Colley	Tracks
Alan Dean	John Frolic Tom Colley	Score	
Clyde Bramley	Alan Thorn	Tom Colley	Tracks
Ron Barry	Ron Barry Mark Roberts	Album	
Powerhouse Studio	Contact Craig Beck	(02) 318 1220	24 Track
The Blessed	Band & Jack	Jack/Craig Beck	E.P.
Vox	Craig Beck	Craig Beck	Demos
Bananahead	Daren Atkinson	Craig Beck	Single
Wize Move	Craig Beck & Band	Craig Beck	Single
R&R Recordings	Contact Robert Zimola	(02) 624 4484	16 Track
CJJM	C.J. Turner R. Zimola	Album	
Nu-Skin	R. Zimola	R. Zimola	Corporate Training
Bankstown Council	R. Zimola	R. Zimola	Road Safety Campaign
Ledlin Partners	G. DeFries	R. Zimola	Corporate Training
Reilly Creative	N. Reilly	R. Zimola	Road Safety
Rich Music Studios P/L	Contact Jason Nairnsay	(02) 264 7734	
Scott Walker	Scott Walker	Randall Walker/Phil Munro	Tracking & Mixing
Tiny Tim	Tom Kazas/Martin Sharpe	Tom Kazo/Phil Munro	Tracking & Mixing
Slipstream	Band	Al Wright/Phil Munro	Mixing
Sisters Confess	Lyndsay Johan	Randall Walker/Fraser Stuart/Matt Lovell	Demos
Deth Con One	Al Wright	Al Wright, Phil Munro	Album
Paris Dumper	Band	Fraser Stuart, Jason Nairnsay	Tracking & Mixing
Puppet Sphere	Band Martin White	Fraser Stuart	Mix
The Choice	Daniel Louison	Randall Walker/Fraser Stuart	Mix
Freakshop	Mark Tinson	Fraser Stuart	Mix
Swirl	John Hresc Fraser Stuart	Mix	
Renegade Fund Train	Band	Fraser Stuart, Michael Ward	Tracking & Mix
Swamii Tom	Al Wright	Al Wright, Michael Ward	Tracking & Mixing
Caligula	Band	Brett Stanton	Dub
Mal Eastick	Mal Eastick Al Wright, Michael Ward		Tracking & Mixing
S.A.E. Studios	Tom Misner	(02) 211 3711	
Clover	Jason de Wilde	Brett Wagland	Demo
Pelican Jed	Jason de Wilde	Dave Cowling	Live to DAT demo
Paula Terry	Jason de Wilde	Jason de Wilde	Demo
Mind Candy	Ben Frost Oscar Gaona	Video Demo	
Robert Krusk	Thomas Misner	Thomas Misner	Album
Winterhouse	Winterhouse	Thomas Misner	Album
Sony Music Studios	Contact Ross Ahern	(02) 332-0320	24 Track
Glen Morris	Simon Tonx	Simon Tonx	Album
D.I.G.	D.I.G.	Ross Ahern	E.P. (Live)
Boxcar	Boxcar	Adrian Bolland	Album
Brent Eccles	Brent Eccles	Greg Henderson	Radio Show
Slava	Autin Pritchard	Ross Ahern	Album Mix
The Giant Production House	Penny Seta (02) 555 8999		
Ian Miller	Ian Miller	Paul Grant	E.P.
Joe Guido	Joe Guido	Paul Gray	Demos
Mastif	Peter Dawkin	Gavin Outfield	New Material
Anthony Bellari	A. Bellari	Gavin Outfield	Community Project
Foreskins	Dave Outfield	Dave Outfield	Heavy Album
The Vault Studio	Contact Michael Tame	(02) 953 0332	24 Track
Ian Moss	Mark Moffat	Mark Moffat	Writing, forthcoming album
Cactus Child	Mark Moffat	Tom Colley	Prod. for forthcoming album
Trackdown P/L	Contact Jeff Watson	(02) 550 6890	
Happy House	Daniel Danholme	Tim Ryan	E.P.
Gondwanaland	Charlie McMahon	Cathy Naunton	Album
Priscilla-Queen of the Road	Latent Image Productions	Guy Gross	Feature Film Underscore
Tracking Station Studios	Contact Martin Cass	(02) 212 4801	24 Track
Lily Meyer		Anthony McKenzie	Album
Roly Poly Man	Dave Skinner	Martin Cass	Film Soundtrack
Allan Crowell	Martin Cass	Cartin Cass	Album
Wayne Law	Martin Cass	Martin Cass	Album
Troy Horse Studios	Contact Kitty Blackman	(02) 557 3129	
Trout Fishing in Quebec	John Encarnaceo	John Rafferty	Album
Upsidarium	Michael Wheatley	Michael Levis	E.P.
Raw Sugar		John Rafferty	Demo
Kyle Burtland		Colin Wright	Film Score
Jak		John Rafferty	Demo - E.P.
Wirra Willa Studios	Contact Will Rout (02)605 1203	24 Track & Optical 8 Track Digital	
"Raining Steel"	Band	Will Rout	Demo
"7 Up"	Band	Ian Cooper	Album
"Times Variable"	Bob Luxford	Dion Wilton	Film (Post)
"Gizmo"	Dion Wilton	Will Rout	Film (Post)
Home Corp.	Anton Strauss	Dion Wilton	Video (Indust.)
"Wirra Willa"	Dion Wilton/Will Rout	Video (Promo)	
Queensland			
Grevillea Recording Studios	Contact Malcolm Jacobson (07) 262-8422		24 Track
Simon Gardner		Malcolm Jacobson	Album
Rough Diamonds	Peter Martin	Bruce Jacobson	Film Soundtrack
The Mercurys		Malcolm Jacobson	Album
South Australia			
Mixmaster Productions	Contact Mick Wordley	(08) 278-8506	24 Track
Violets	S. MacQueen	M Wordley	Album Mix
Storytime	L. Karski	M. Wordley	Album
Auntie Raylene		M. Wordley	Album
Jeff Lang	L. Karski	M. Wordley	Album
Miltions	Miltions	M. Wordley	E.P.
Victoria			
Audio House Pty.Ltd.	Contact Nikki Mackenzie (03) 532 0633		24 Track
White Elephants	G. MacKenzie	S. Flannery	Mixdown
Hyperion	Gary Mackenzie	Sean Flannery	Album
Bengal Tigers	Gary Mackenzie	Gary Mackenzie	Album
Call of the Wild	Gary Mackenzie	Gary Mackenzie	Album

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land of the long white cloud last December after finishing the **Rough Diamonds** soundtrack, featuring **Jason Donovan**, at **Glebe Studios**. **Greg Henderson** has just finished producing **Brenda Webb's** debut 'Little Black Girl' with **Mark Ovenden** doing the dance remix. Greg also did the Live To Air for **The Angels**, **The Poor Boys** and **Judge Mercy** concert, Adelaide and Brisbane. The high profile job for Greg is the **Rick Price** and **Margaret Urlich** single 'Where Is The Love?'. **Mark Moffatt** has completed the **Debbie Byrne** album and continues with **This Life Fantastic** at **The Vault** and writing with **Ian Moss**. **Mark Ovenden** is presently in **301** remixing a single for **Margot Smith**, and working on a remix for **Icehouse's** next single. **Rick Will**, with credits including **Ziggy Marley**, **John Mellencamp**, **Amy Grant**, **Pat Benatar** and **Bobby Brown** has mixed **Defryme's** debut album, **GANGgajang's** new album and has produced **Scary Mother's** debut album. Other Australian credits for Rick include **Diesel's** 'Hepfidelity', **Jimmy Barnes's** 'Soul Deep', **Boom Crash Opera's** 'Fabulous Beast', and mixing tracks for **The Poor Boys** 'Underfed' EP. **Ted Howard** has been engineering **Barefoot's** new material at **Rondor**, and engineering the **Rough Diamonds** project. **Tom Colley** has finished **Happy House's** 7-track EP and has produced tracks for **Andrew Williams** of **E-Street** fame. He now turns his energies towards **Jane Saunderson's** new material, to be recorded and mixed at **Glebe Studios**. **Kevin Shirley** makes a welcome return to Sydney after working in the US with **Rush**, recording their latest album 'Counterparts', and **Paul Mercury's** 'Material Issue'. Kevin is probably best remembered in this country for **Baby Animals** multi platinum debut album. After declining **Indigo Girls** new album to spend time in Australia, anyone wanting a hard rock album of international standard should call **Under New Management** immediately. **Mike Fraser** spends a couple of months with **Under New Management** after producing **Dio's** new album. With a 'Who's Who' list containing the likes of **Metallica**, **Poison** and **Aerosmith's** 'Pump', **AC/DC**, **Whitesnake**, **Bryan Adams**, **Robert Palmer** and **Bad English**, he's definitely hard to ignore.

Whew, that's it for February...

ARTIST	PRODUCER	ENGINEER/S	NOTES
Bel Air Sound	Contact Danny Olesh	(03) 563 7887	24 Track
Jabulani	Jabulani	D. Olesh	Album Pre Production
Effogy	J. Hall	D. Olesh	Demo
Kaliope	D. Olesh	Sam Pulley	Demo
Gotham Audio	Contact Tom Kehoe	(03) 879 9400	48 Track
The Truth		Doug Roberts/Spiro	Album Mix
John Farnham	Ross Fraser/John Farnham	Paul Kosky/Aaron	B-sides Record & Mix
Diana Kiss		Laurence Maddy/Aaron	Album Mix
001 Recording Studios	Phil Pomeroy	(03) 348 1300	24 Track/Midi Suite
Tan		G. Ooi/S. Melamed	EMI Xmas Album
Barb Waters	P. Pomeroy	P. Pomeroy	Album
"The Family"	Band	Marty Robinson	Album Mix
Tlot Tlot	Band	P. Pomeroy	Album
Platinum Aust. P/L	Contact Gary Moorhead	(03) 827 7483	
Hunters & Collectors	Band	Kalju Tonuma	Mix Album
Toshihiko Furumura	Yasho Iya	Stewart Day, Moira Lawson	Mix Album
Skytrackers	Cezary	Chris Corr	Record TV soundtrack
Andy Richardson	C. Corr	Chris Corr	Record & Mix Album
Phil Judd	Phil Judd	Chris Corr	Rec. & Mix Film Soundtrack
Sing Sing Studio	Contact Kaj Dahlstrom (03) 428 4622	24/48 Track & Programming Room (Sony Digital)	
Peter Andre	James Ingram	Tony Espie	Re Mix
Hunters & Collectors	Band/Nick Mainsbridge	Nick Mainsbridge	Album
Sunday Kind	Dan Friedman	Chris Thompson	Mixing Album
Colin Hay	Colin Hay	Phil Butson	Album
Joe Camilleri	Joe Camilleri	Phil Butson	Tracking
Albare	Albare	Tony Espie	Mixing Album
The Outlaws	The Band	Michael Letho	Mixing Album
Studio RB-X	Contact Ross Burton	(03) 429 6199	24 Track
Yothu Yindi	James Kilpatrick	Mark McDougall	Album Mix
Strange Neighbours	Self	Mark McDougall	Demos
The Woodshedders	Self	Matt Voigt	Demos
The Gas Cooker	Self	Matt Voigt	Demos
Frank Strangio	Self	Doug Brady	Theatre Logos
Paul Gibbs	Self	Mark McDougall	Album
Audio Network	Stewart Cyc	Matt Voigt	Industry Info Tape
Greg Mills	Self	Mark McDougall	Stage Tracks
Rogue	Self	Matt Voigt	Demos
Georgietta	Robert Severini	Mark McDougall	Album
Linda Cable	Daren Farrugia	Mark McDougall	Album
Brady/Severini/Fitzgerald	Themselves	Various	Jingles
Studio 52	Contact Paul Higgins	(03) 417 7707	16, 24 Track
Peter Cupples	Peter Cupples	Trevor Carter	New Album
Things of Stone & Wood	James Black	Colin	(Studio 2) Pre-Prod. & Demos
Notorious	Band	Trevor Carter	Track for Nu-Music 8
Jack	Band	Trevor Carter	Track for Nu-Music 8
Bannista	Band	Trevor Carter	Track for Nu-Music 8
Indian	Band	Trevor Carter	Album Tracks
Stephen Davies	Band	Paul Higgins	Demos
Chris Davies	Chris Davies	Paul Higgins	E.P.
Warchild	Band	Paul Higgins	Track on Nu-Music 8
The Jam Tin Sound Studio	Contact Mark McCormack	(03) 583 2341	16 Track
Outlaws	Band	Mark McCormack	Comp. C.D.
Damien Dickson	Band	Mark McCormack	Demos
Nororius	Band	Mark McCormack	Demos
Head Rush Honey	Paul Sherritt	Mark McCormack	Demos
Alice Dee	Band	Mark McCormack	Demos
Biff & The Fire Trucks	Band	Paul Sticca	Demos
Wild Frontier	Band/Mark McCormack	Mark McCormack	CD/Album Mix
Little Big Man	Band/Mark McCormack	Mark McCormack	Album Tracks
Zambellis	Band/Mark McCormack	Mark McCormack	CD/Album
Entasis	Band/Mark McCormack	Mark McCormack	Demos
Western Australia			
Bonsai Recording Studio	Tom Thorpe	(09) 349 60	
Aurora	Tom Thorpe	Tom Thorpe	Album Tracks
Andrew Breen	Tom Thorpe	Tom Thorpe	Demo
Peter Herring	Tom Thorpe	Tom Thorpe	Demo
Matt Williams & Rick Lovett	Tom Thorpe	Tom Thorpe	Album Pre-Production
Planet Sound Studios	Contact John Villani & Kim	(09) 382 2211	48/32/24 Track
Empire		Les Williams	Album
Music Station -	Mr. Selzaki	Les Williams	Album Mix
Justy Nasty -	Tsuchia	John Villani	Album Mix
Moonlight Cafe -	Mr. Okamura	John Villani	Album Track & Mix
The Faces - IV.		Les Williams	Single
Troppo Sound	Contact Mick Connolly	(091) 92 2394	24 Track
Frank Baguley	Self	Self	Solo Album
B.M.A.C.	Ben Raja	Frank Baguley	Compilation Album
Broome Regional Prison		James Edwards	Mini Cassette
Jane Rutter		James Edwards	Demo

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Wireless Microphone Systems

Greg Simmons details the INs and OUTs of this boom technology

INTRODUCTION

Wireless microphones are one of the most liberating technologies available to the professional sound industry, offering complete freedom of movement to musicians, actors, television presenters and entertainment technicians.

Unfortunately, wireless microphones are also one of the least understood technologies available to the professional sound industry. In theory, they are just like any other microphone but with a radio link instead of a cable. In practice, the radio link introduces a whole new set of parameters that must be considered for effective and successful operation.

It doesn't matter how experienced you are as an audio engineer, if you don't know about radio you probably won't get the best performance from a wireless system — not without a little help from an expert.

TYPES OF WIRELESS SYSTEMS

What type of wireless system do you need? There are four types available, each suited to a different application:

- hand-held,
- body pack with lavalier,
- instrument transmitters & :-
- wireless intercoms.

Hand-held wireless mikes look similar to any other hand-held microphone, although they're typically larger and don't have a mike cable connected to the end of them. Everything is contained in the microphone's body: the microphone capsule, the transmitter and the batteries.

Body packs with lavaliers are used where the microphone should not be seen or when the user needs their hands free to do other things, such as acting. The body pack transmitter is a small box — about the size of a packet of cigarettes — that can be concealed in the user's clothing. A lavalier microphone is attached via a thin lead and may be connected to the user's tie, shirt collar, or somewhere else close to the mouth. In theatre, body packs are often used along with miniature microphones which are stuck on the actor's cheek or forehead with a small flesh-coloured elastoplast. Unlike a hand-held wireless mike, a body pack/lavalier combination cannot be quickly handed from one person to another.

Body pack/lavalier systems are also ideal for miking up instruments such as saxophones and trumpets, where the musician prefers to move around rather than stand upright facing a wired microphone. A miniature microphone is mounted on the instrument, typically using a soft rubber-coated clip. Once correctly set-up, the instrument will always be on mike and the musician has complete freedom of movement.

Tip: When using body pack/lavalier systems, always remember to turn the mike channel off when the performer leaves the stage. There is nothing more embarrassing than hearing a back-stage conversation pumping through the PA system!

Instrument transmitters are body packs with special high impedance inputs suitable for connection to the output of an electric guitar or bass. The body pack is often connected to the guitar strap, allowing the guitarist free movement around the stage.

Wireless intercoms are useful for back-stage use in theatre, television and other situations where two-way communication is required. Each operator has their own transmit and receive frequencies, and the person running the show (e.g. stage manager) is able to talk with any number of operators at the same time. In comparison to wired intercoms, a wireless intercom offers far greater ease in setting up and operation, and plenty of freedom of movement for the crew.

BUYING A WIRELESS MICROPHONE

'You get what you pay for' — that's the bottom line when you're buying a wireless system, and there's no way around it. The more expensive wireless microphones use better quality electronic components with much tighter tolerances, and offer improved performance and reliability.

However, buying the most expensive wireless mike you can find is not going to guarantee good performance. Important considerations include frequency selection, transmitting and receiving systems, audio circuitry and processing, physical construction, your application and long-term needs, and the availability of local support and back-up. Let's take a look at each of these considerations...

FREQUENCY SELECTION

Frequency selection is the process of choosing the right radio frequency for your wireless system to transmit and receive the audio signal on. It is the most crucial, yet least understood, part of buying a wireless system. Think

of it as the wireless system's equivalent to a microphone lead — if you've got a bad lead it won't make an ounce of difference whether the microphone is a \$3000 Neumann or a \$30 Tandy. Right?

Like all other RF (radio frequency) transmissions, the frequencies available for wireless microphones are controlled by regulations set by the Australian Broadcasting Authority. These determine the frequency bands, maximum transmission power, licensing and other details for wireless microphone usage. (To ensure accuracy, we've chosen to fully reprint the information supplied to us by the Australian Broadcasting Authority. See 'Wireless Microphone Regulations'.)

According to the regulations there are three frequency bands allowed, known as Band III, Band IV and Band V. Band III covers the spectrum from 174 MHz to 204 MHz, and from 208 MHz to 222 MHz. It's commonly referred to as VHF (Very High Frequency). Bands IV and V cover the spectrum from 520 MHz to 820 MHz, and are referred to as UHF (Ultra High Frequency). Wireless microphones have to share these bands with the television broadcasting services, each of which transmits on four different frequencies.

The receiver in a wireless system is tuned to receive on the same frequency that the microphone transmits on. However, the receiver will also pick up any other signals that are transmitted on that frequency. You may hear a television station or even another wireless microphone 'breaking through' the audio signal coming out of your receiver. This type of interference is the major problem experienced with wireless systems.

Careful frequency selection is the solution to interference. If you're buying just one wireless microphone, you might not experience any interference problems. However, interference can become a problem when two or more wireless systems are used together. It is essential to ensure each microphone is transmitting on its own unique frequency and does not coincide with local television stations and other wireless systems in the area.

Unfortunately, selecting a group of unused and different frequencies will not guarantee interference-free performance. The signal from each transmitter will also interact with other radio signals, creating potential problems due to harmonic, intermodulation and/or triple beat frequencies. If one of these 'side effect' frequencies matches one of the receiver frequencies, there will be interference.

The same interference problem is possible when adding more wireless microphones into an existing system. For example, the guitarists

in a rock band may all be using wireless transmitters, and the system is working well. One day the singer buys a very expensive wireless mike, only to find that it interferes with the guitarists' signals. The common assumption is that "the system was working perfectly well until the new microphone was introduced, therefore the new one is no good...". This is a very obvious assumption that is also very incorrect. The problem is caused by poor frequency selection — it doesn't matter how good the equipment is. However, the lack of understanding of this basic principle of wireless microphone operation leads to frustration and, ultimately, a bad reputation for wireless systems.

The problem above might have been avoided if the singer had told the sales person about the other wireless systems in use on the stage. If the sales person was properly educated and experienced in the field of wireless systems, they would ask for a list of the frequencies being used by the band and choose an appropriate frequency for the singer's microphone.

Detecting and preventing these sort of interference problems in advance is virtually impossible without the use of a sophisticated computer program into which each transmitting frequency in the region is entered. Your microphone distributor should be quizzed about their knowledge of frequencies.

CHANGING FREQUENCIES

There are two methods available for changing the frequency of a wireless system. The first and most common method involves changing the 'crystal' inside the wireless system. The crystal is a small electronic component, often made from carefully milled quartz, designed to resonate at a particular frequency. Wireless microphone dealers should have a wide choice of crystals available ex-stock.

The second method is through 'frequency synthesis', where the frequency is controlled electronically and does not require crystals. Frequency synthesis is very useful for touring shows, where different television frequencies and other local transmissions will be encountered as the show moves about.

However, frequency synthesis can easily get out of control because every user is able to change their frequency at will. When a user changes their frequency, it may solve their problem but generate a whole new set of problems for someone else!

VHF OR UHF?

As stated earlier, wireless systems transmit over three frequency bands, which are divided into two categories: VHF and UHF. In all cases, FM transmission is used for added immunity.

VHF stands for 'Very High Frequency'. The spectrum used for wireless microphone sys-

tems is actually known as 'VHF high band', and has very low noise and interference with good transmitting range at low power levels. (The 'VHF low band' spectrum includes CB radio and FM radio stations, and is too noisy for wireless microphone usage.)

Signals transmitted on the VHF high band spectrum are able to penetrate through buildings and other solid surfaces, which is good for communication between rooms and around obstacles such as stage props. Of course, this also means that unwanted signals on the VHF high band can enter a building and be picked up, causing interference.

UHF stands for 'Ultra High Frequency' and has a typical wavelength of around one metre, so a quarter-wavelength antenna is typically between 20 to 25 cm long. Its range is not as good as VHF high band, and it will usually be reflected off a surface rather than penetrate through it. In comparison to VHF high band, UHF requires smaller antennas and is less prone to interference from outside signals.

The UHF spectrum allocated by the Australian Broadcasting Authority extends from 520 MHz to 820 MHz. Note that a second band, above 900 MHz, was officially available up until two years ago. It is now being phased out to allow room for mobile phones, computer LANs and things such as the Apple 'Newton' PDA.

(continues over)



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Wireless

Although many people assume that UHF is the best, you can get excellent performance from VHF systems at considerably lower prices. For the advantages and disadvantages of each system, see 'VHF vs UHF'.

ANTENNAS

Wireless systems transmit and receive radio frequencies, therefore they must use antennas. To get the best performance from a wireless system, you must pay close attention to how the antennas are set up.

There are two types of antenna necessary: one for the transmitter and one for the receiver. Using a handheld, the antenna is often contained within the microphone itself. The body of the microphone may actually form part of the antenna, so keep it clean and dry at all times.

Other hand-helds use a short length of wire that extends from the bottom of the microphone. Always leave it fully extended and don't try to hide it by running it alongside the microphone's body.

Body pack transmitters use a short length of wire as the antenna. For a body pack with lavalier microphone combination, it is recommended that the body pack be mounted near the small of the user's back, with the antenna running vertically upwards towards the lower neck. An elastic band can be connected to the end of the antenna and attached to the user's clothing with a safety pin, giving the antenna considerable flexibility when the user needs to bend or stretch.

Believe it or not, the microphone lead itself is an integral part of the antenna, so its positioning is also an important consideration. With the body pack situated at the small of the user's back, run the microphone lead down to the hip, horizontally across the hip, around to the front of the body, and up to the microphone position.

It is of utmost importance to keep the antenna and microphone lead separated. Bundling them together will effectively 'short out' the antenna, causing a significant loss of transmission range (e.g. a loss of up to 90% could be expected). For the same reasons, do not run the antenna along the side of the body pack — make sure the antenna always extends directly away from it.

The performance of a body pack transmitter is also affected by the antenna's proximity to the skin, especially if the user is sweating heavily (a sweaty body will have a tendency to short circuit the antenna). Don't let the antenna get wet if it's in direct contact with the user's body. Spacing the antenna just a few millimetres away from the body will improve the range significantly. If possible, wear the antenna outside one or two layers of clothing, or enclose it in surgical rubber tubing. Some theatre companies use readily available con-

doms for this purpose.

Antennas for wireless receivers come in two basic types — whip and dipole — and the receivers use a number of different methods to maintain a healthy signal.

It is important at this point to understand that an antenna actually has two halves: a radiating element and a balancing element. The balancing element can take many forms, e.g. as mentioned earlier, body pack transmitters use the microphone cable.

Whip antennas are simple lengths of wire cut to 1/4 wavelengths of the RF frequencies they are required to receive (approximately 40 cm for VHF, and 23 cm for UHF). The whip antenna uses the body of the receiver as its balancing element. Operating a whip antenna via a length of RF cable will result in a serious decrease in operating range (typically as high as 75%) because there is no balancing element. If a whip antenna is to be connected via a cable, a 'ground plane' (i.e. a large metal surface) must be connected to the outer shield of the RF cable, as a balancing element.

Dipole antennas contain two identical 1/4 wavelength wires, each acting as a balancing element for the other wire. This configuration allows the dipole to be connected to the receiver via a length of RF cable.

Note that the performance of an antenna connected via a length of RF cable is often determined by the brand and type of cable, its impedance, the frequencies in use, and the length of the cable. You can't simply hook up a length of RF cable and expect it to work.

Positioning the receiving antenna is also very important. As any educated sound engineer knows, every room has certain 'dead spots' caused by out-of-phase reflections combining with in-phase reflections and the direct sound. Put a microphone in one of these spots and you're likely to miss a whole part of the sound you're recording.

The same problem exists with wireless systems, where RF signals reflected off surfaces in the room are picked up by the antenna and combined with the direct RF from the transmitter. RF signals can be reflected surfaces such as armoured concrete walls, metal grids, cars and machinery, buildings, trees and people. Some of these reflected waves will be 180 degrees out-of-phase with the direct sound, causing cancellations and resulting in RF signal dropouts. This problem is referred to as 'multipath', since the RF signal has multiple paths between the transmitter and receiver.

Obviously, positioning the antenna is an important consideration.

DIVERSITY AND NON-DIVERSITY

'Diversity' and 'non-diversity' refer to the way the receiver and antenna work together to produce the best resulting signal. A non-diversity receiver has a single antenna, which is usually oriented in the same direction as the transmitter's antenna.

Diversity systems use two antennas spaced a certain distance apart, with a circuit in the receiver that chooses the strongest signal. Diversity reception is a good way to minimise

AUDIO CONSIDERATIONS

We've looked in detail at the RF side of wireless microphones, but what about the audio side? There are a number of areas to consider and a few misconceptions to correct. These include the topics of companding, squelch, capsule selection and phasing.

Companding. When considering the sound quality of a wireless microphone, a wired microphone is used as a reference. The manufacturers of wireless systems are constantly striving to produce a wireless microphone that sounds as good as a wired microphone, within the limitations of the RF medium.

The major limitation of the RF medium, when compared against a wired microphone, is restricted dynamic range. To overcome this, wireless microphone manufacturers use companding (compressing/expanding) circuitry. This is very similar in principle to dbx noise reduction, while others have developed their own systems.

The concept of companding is to compress the audio signal from the microphone capsule, allowing a higher overall signal level to be transmitted. The receiver expands the audio signal, returning it to its original dynamic range. Any noise picked up during the transmission also gets expanded, but because it was not compressed, it becomes considerably softer. As an example of good companding, Vega's patented Dynex III process delivers over 100 dB of dynamic range.

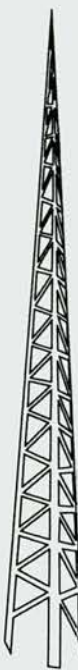
Squelch: is a term used in wireless terminology to describe a threshold level below which the audio output from the receiver is muted. It's a bit like having a noise gate built into the receiver. When correctly set-up, squelch can mute the output of the receiver whenever the transmitter is not sending any signal, preventing the receiver from 'grabbing' low level RF interference signals and outputting them.

Capsule Selection. The selection of the microphone capsule for use in a hand-held transmitter is another poorly understood aspect of wireless microphones. Many audio engineers and musicians demand the classic Shure SM58 dynamic microphone capsule, and many manufacturers supply these as an option. However, as anyone who knows about dynamic microphones will attest, a Shure SM58 will not sound nor perform the same if it is not mounted in the proper Shure SM58 housing. In other words, putting a Shure SM58 capsule in a wireless microphone will not necessarily sound like a wireless version of the classic SM58 microphone, nor will it have the same feedback rejection or other characteristics.

In response to the demand for the SM58 'sound', some manufacturers are using condenser capsules and electronic circuitry to produce a wireless microphone that sounds like a wired Shure SM58. The bottom line is to use your ears and choose the one that sounds right. Shure have their own wireless systems too, with SM-58's.

Phasing: Microphone phasing is the final audio consideration. The output from the receiver is typically a balanced signal, and the owner's manual should tell you which pin is 'hot' or 'in phase'. However, it is still possible for the microphone capsule to be out of phase.

Phase becomes a bit trickier when using body packs with lavalier microphones. Most of the capsules for lavaliers are electrets and cannot be reverse wired, because of the need to supply a biasing voltage. In these cases, it is wise to use a phase checker or other method to establish the phase relationship at the output of the receiver.



Wireless

the effects of multipath cancellations, because it is highly unlikely that both antennas will be affected by the same multipath problem.

For maximum diversity from a VHF system, the antennas should be spaced at least two to three metres apart. Due to their smaller wavelengths, UHF systems require considerably less antenna spacing. It is recommended that the two antenna are positioned at right angles to each other, with each one at a 45 degree angle from vertical. When using two whips on a diversity receiver, they should form a 'V', like TV 'rabbit ear' antennas.

Although non-diversity systems can deliver excellent performance in many installations at lower cost, most wireless buyers tend to choose the more expensive diversity systems, which simply work better.

BATTERY LIFE

As with most portable technologies, battery life is a big issue for wireless microphones. A cause of grief is the 'memory effect' of nicad batteries, which occurs when they are recharged before being completely drained (it's a good idea to regularly discharge nicad batteries until they're completely flat before recharging, to compensate for the memory effect). When choosing rechargeable batteries,

avoid models that are 7.2 volt designs.

A fresh Duracell MN1604 battery should give over six hours of operating life. It's worthwhile putting a new battery into each microphone before the start of each show.

YOUR LONG TERM NEEDS

What's your application? If you're travelling around the country, you must be aware of the television stations in each state. Every TV station has a number of transmitters on a number of different frequencies. There may also be other local transmissions.

LOCAL SUPPORT AND BACK-UP

The field of wireless microphone technology involves a lot of specific knowledge that the average audio engineer does not have. When buying a wireless system, make sure the supplier has a proven track record for service and back-up. Apart from the general knowledge of wireless microphone technology, a good supplier will also be informed of the latest government regulations specific to your region and be able to help you sort out any problems. In many cases, they will be able to prevent problems before they occur.

Back-up is extremely important. You cannot do AB tests very easily or accurately with wireless systems since, to be fair, each one should be transmitting on the same frequency — causing interference problems. This immediately prevents you from testing two systems at exactly the same time. Your only

chance is to make the best decisions you can with the help of an experienced wireless microphone sales person, and test them out in the field. If there are any problems, the sales person should be able to help you rectify them.

Special thanks is due to Ian Johnstone from Mark IV Audio (Aust) Pty Ltd, distributors of EV and Vega wireless systems, for his invaluable assistance in assembling this article.

VHF vs UHF

VHF Advantages: Less expensive; wider product range; many price and performance levels; easier to use; more forgiving of errors and poor conditions; easier to maintain; simpler antenna systems.

VHF Disadvantages: Many systems in use, therefore fewer frequencies available; greater possibility of interference; larger systems may run out of useable frequencies.

UHF Advantages: Fewer systems, wider range of frequencies available; less possibility of interference; smaller antennas; easier to conceal and set-up; a lot of current development in UHF means very recent designs are available with the latest features.

UHF Disadvantages: More expensive for equivalent performance and features; audio quality does not match best VHF systems; generally more difficult to use; antenna distribution networks frequently needed and are more expensive than similar VHF equipment.

What the WIRELESS regulations actually SAY

The following is a reprint of the advice supplied by the Australian Broadcasting Authority regarding the use of low power wireless microphones.

Attachment A: Unlicensed Operation of Very Low Power Wireless Microphones (Cat. A)

Definition: A very low power wireless microphone is one which meets all of the requirements of Schedule 3 of the Radiocommunications Regulations, for 'wireless audio transmitters'. Very low power wireless microphones are considered as Category 'A' wireless microphones.

Unlicensed operation of very low power wireless microphones in television broadcasting service bands through extension of the provision of Radiocommunications Regulations, Schedule 3, is proposed under the following conditions:

- frequencies which may be used are in television broadcasting service bands:

Band III (174-204 MHz and 208-222 MHz). (Note that channel 5A (137-144 MHz) is not permitted, and parts of Band III spectrum needed to create the proposed television channels 9A and 12, 204-208 MHz and 222-230 MHz, is embargoed until 1996, or until otherwise advised by the Australian Broadcasting Authority).

Bands IV and V (520-820 MHz).
- cochannel operation with a television service within the planned coverage area of the transmitter providing that service is not permitted in the same area;
- in an unused television channel, the wireless microphone frequency must be at least

200 kHz above the upper channel edge or 400 kHz below the lower channel edge of an operating adjacent channel television service;

- for wireless microphone operation in television broadcasting service bands, the maximum field strength of 100 dBuV/m @ 3 metres and a maximum bandwidth of 330 kHz shall apply;
- wireless microphones operating in television broadcasting service bands are subject to the regulatory arrangements set out in Part 3 of the DOC 60 'Low Powered Devices' brochure, published by the Department of Transport and Communications in April 1990; that is, operation on a non interference basis and exemption from licensing under Schedule 3 of the Radiocommunications (Licensing and General) Regulations;

- for applications where wireless microphones will be used in large numbers at a known location and on a periodic basis, e.g. theatres, studios, outdoor stadiums and sporting venues, and noting that wireless microphones are operating in the broadcasting service bands on a secondary status, the onus is on the user to determine suitable frequencies to avoid causing interference to television services, and to rectify any interference caused to television services. Any assessment should consider planned or proposed television services, of which the Australian Broadcasting Authority can advise, to ensure the future availability of the frequencies chosen.

These conditions are consistent with those which apply for wireless microphones operating in the 915 to 928 MHz band and those

already permitted under Schedule 3 of the Radiocommunications Regulations.

Attachment B: Licensed Operation of Low Power Wireless Microphones (Category B)

Definition: A low power wireless microphone is one for which the RF power delivered to its antenna does not exceed 50 milliwatts. Low power wireless microphones are considered as Category 'B' wireless microphones.

The licensed operation of low power wireless microphones with RF power up to 50 milliwatts on a case-by-case and site-by-site basis is proposed. It is recognised that this precludes mobile operation of these wireless microphones, that is, for use at unspecified locations as required by users from time to time. The 900 MHz band remains suitable for such mobile wireless microphone operations.

Licensed operation provides some flexibility for use of wireless microphones for large productions in theatres and at studios, also for special events, such as at outdoor entertainment venues, provided enough advance advice is sought from the Authority for licensing to be completed before the specific event.

Wireless microphones which may be licensed shall comply with the following conditions:

- Frequencies - television broadcasting service bands
Band III (174-204 MHz and 208-222 MHz). (Note that channel 5A (137-144 MHz) is not

permitted, and parts of Band III spectrum needed to create the proposed television channels 9A and 12, 204-208 MHz and 222-230 MHz, is embargoed until 1996, or otherwise advised by the ABA).

Bands IV and V (520-820 MHz);
- Emission bandwidth-not to exc.180 kHz; and
- RF power into the Antenna - not to exceed 50 milliwatts.

As with very low power wireless microphones permitted to operate without a licence under Schedule 3, for applications where licensed low power wireless microphones will be used in large numbers at a known location and on a periodic basis, e.g. theatres, studios, outdoor stadiums and sporting venues, wireless microphones are permitted to operate in the television broadcasting service bands on a secondary status. The onus is on the user to avoid causing interference to television services, and to rectify any interference caused to television services.

Written submissions for licences, which should include the necessary transmitter licence applications on ABA Form 12, are to be submitted to:

*The Director
Planning Division
Australian Broadcasting Authority
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WTH-70 VHF Diversity 160-250Mhz Concert system handheld OM7 hypercard capsule, feedback rejection, high output 2 + 2 diversity receiver. \$1499.00

WTH-80 VHF Diversity 160-250Mhz Concert system handheld OM8 hypercard capsule, feedback rejection, high handling noise, 2 + 2 diversity receiver. \$1699.00.

AUDIO SERVICES CORP.
(02) 901 4455 Geoff Grist

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RMS2000 RX + TX VHF 140-240Mhz Popular film production kit with robust build and great performance. Switchable frequencies built in. \$5740.00

RMS2000/MX2000 UHF 300-1000Mhz Small size, big performance. Palm size. Ideal Becacam work, accessories available. \$6170.00.

H X 2 0 0 0 Both 140-1000Mhz Unique handheld accepts famous Schoeps mic capsules for ultimate versatility. \$3415.00

D X 2 0 0 0 Both 140-1000Mhz True dual diversity receiver in case just a little larger than a pack of playing cards. Total mobility. \$5700.

Lectrosonics (U.S.A.)

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D R 1 9 5 U H F 4 8 0 - 620Mhz Diversity rack mountable receiver with choice of pocket, plug on or hand held transmitter. \$6000.00

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AMBER TECHNOLOGY
(02)975 1211 John Fitzpatrick

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S250H VHF Hand-held diversity system comprising the SM250 microphone/transmitter and the NE250 true diversity receiver, c/w antennas and power supply. \$1550.00

S250G VHF Guitar diversity system comprising the slimline TSG belt-pack transmitter with adjustable gain and NE 250 true diversity receiver, c/w antennas and power supply. \$1450.00

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S250H VHF (4) 174.5, 175.0, 177.0, 192.6 Cost-effective true diversity hand-held system, "antenna-less" transmitter, free standing receiver with rear mounted antennae & A/B channel indicators, 12 channel system capability. \$1550.00

S250G VHF As per S250H Cost-effective true diversity guitar/instrument system, slimline transmitter with gain control, free standing receiver with rear mounted antennae, 12 channel system capability. \$1450.00

S250P VHF As per S250H True diversity belt-pack system supplied complete with MCE5 miniature lapel mic., integral phantom power allows connection of various optional headset systems. \$1550.00

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Audio-Technica Japan

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ATW -1253 VHF available in one of 6 fixed frequencies: 175.800, 176.200, 189.800, 193.000, 194.400, 202.200 MHz. Body-pack system suitable for instrument or lapel mic. True diversity VHF FM high stability receiver, THD<1%, low noise, external antenna, 12V external DC or mains powering, RF and AF level meters, adjustable squelch and AF level, compact IU half-rack size. Body-pack transmitter features adjustable gain and bias for condenser mics, 9V battery powered (10 hour av.life). C/w receiver rack ears (mic optional). \$1299.00.

ATW-1236 VHF, available in one of 6 fixed frequencies: 175.800, 176.200, 189.800, 193.000, 194.400, 202.200 MHz. Hand-held system. True diversity VHF FM high stability receiver, THD <1%, low noise, ext. antenna, 12V external DC or mains powering, RF and AF level meters, adj. squelch and AF level, compact IU half-rack size. Hand-held transmitter features integral T36HE microphone with neodymium magnet, 9V batt. powered (10 hour av. life). C/w receiver rack ears. Conforms to Australia spec. DOC60. \$1299.00

ATW-2241 VHF, 16 selectable frequencies within 175.8 to 213.8MHz Professional body-pack system suitable for instrument or lapel mic. True diversity VHF FM PLL high stability receiver, THD <1%, low noise, external antenna, 12V external DC or mains powering, RF and AF level

meters, adjustable squelch and AF level, headphone output, compact IU half rack size. Body-pack transmitter features adj. gain, bias for condenser mics, 2 x AA battery powered (8 hour av. life). C/w receiver rack ears (mic optional). Conforms to Australian spec DOC60. \$1895.00

ATW-2244 VHF, 16 selectable frequencies within 175.8 to 213.8 MHz Pro hand-held system. True diversity VHF FM PLL high stability receiver, THD <1%, low noise, ext. antenna, 12V ext.DC or mains powering, RF and AF level meters, adj. squelch and AF level, headphone o/p, compact IU half-rack size. Hand-held transmitter with T44HE microphone, neodymium magnet, 2 x AA battery powered (8 hours average life). C/w receiver rack ears. Conforms to Australian spec DOC60. \$1995.00

ATW -T35 VHF, available in one of 6 fixed frequencies: 175.800, 176.200, 189.800, 193.000, 194.400, 202.200 MHz Body-pack transmitter only (ATW1235 System) \$775.00

SC-T35 Soft cover for T35 Body-pac transmitter \$18.99

ATW-T41 VHF, 16 Selectable frequencies within 175.8 to 213.8MHz Body-pack transmitter only (ATW2241 System) \$969.00

ATW-T44E VHF, 16 selectable frequencies within 175.8 to 213.8MHz Hand-held transmitter/microphone only (ATW2244 System) \$969.00

AT-831aW Lapel mic, unidirectional condenser, for ATW1235/2241 systems \$199.00

AT-803aW Lapel mic, omnidirectional condenser, for ATW1235/2241 systems \$189.00

ATM-73cW Headset mic, unidirectional condenser, for ATW1235/2241 systems \$259.00

MT-830 Sub-miniature lapel

mic, ideal for theatre or AV, omnidirectional condenser, for ATW1235/2241 systems \$289.00

ATW-D10 Diversity RF antenna amplifier/splitter, 1 in/4out, connects a pair of antennas with up to 4 receivers \$1495.00

ATW-A10 VHF ground plane high gain antennas (pair) \$499.00

ATW-8319 Guitar cable for body-pack transmitters, 6.5mm jack to HR101A-7P-4P connector \$79.00

ATW-8317 Mic cable for body-pack transmitters, female XLR-3 to HR10A-7P-4P connector \$89.00

ATW-8432 Mic clip for T36HE and T44HF \$18.99

ATW-8628 Hardware for joining 2 x half-rack receivers \$49.00

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TOA (Japan)

WM270 VHF 9 Avail. Budget hand held system. Non-Diversity \$880.00

WM370 VHF 9 Avail. Budget Lavalier System. Non-Diversity \$790.00

A.K.G. (U.S.A./Austria)

W M S 1 9 0 V H F 0 n Application Hand held non-diversity system. \$4460.00

W M S 1 9 0 V H F 0 n Application Lavalier Non-Diversity system \$4550.00

W M S 1 9 0 V H F 0 n Application Hand held diversity system \$6000.00

W M S 1 9 0 V H F 0 n Application Lavalier Diversity system \$6090.00

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WMS900 UHF On Application 6 Channel Multi-purpose

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EQ Section

A warm, pristine, musical, British sounding EQ because it is British.

The four band EQ (with in-out switch!), features fixed point shelving high and low frequencies with centre points of 12 kHz and 70 Hz respectively. The peak/dip upper mid band sweep is continuously variable from 500 Hz to 15 kHz, lower mid band from 35 Hz to 1.5 kHz. All bands feature 14 db boost and cut at 18db per Octave.

Input Section

All inputs feature professional standard connectors. TRS balanced line inputs and individual 48 v phantom power switch (avoid embarrassing pops and fully power your hottest power hungry microphones). Our mic/line switch works as a 20 db pad on the XLR connector allowing you to plug into balanced XLR line level inputs when you need to.

Output Section

All four discrete subgroup outputs, Left Right and Main outputs feature balanced XLR connectors and TRS insert points for simple interfacing of your finest signal processors.

Stereo Inputs

Stereo inputs featuring more EQ than most consoles have on their *mono* inputs. With two sets of inputs per channel and an A/B switch, you have the flexibility to select between 4 stereo sources (keyboards, CD etc.). For multitrack recording, used in conjunction with the 4 AUX/tape returns, you can bring in 8 tracks of tape while still tracking all of the other 10 inputs and getting a full function studio monitor feeds as well!



Auxiliary Section

6 discrete auxiliary sends selectable pre-fader/EQ (for monitor or studio headphone sends) or post fader (for effects sends). Routing and flexibility not found on mixers costing hundreds, even thousands more!

AUX Reverse Routing

Full function stage monitor console, **it's that simple!** Routing switches via our unique source reverse switch allows the console to be converted from a recording/Front-of-House sound reinforcement board to an expandable 18:6 stage monitor console with a fully selectable engineer's cue mix.

Faders

As is the standard on all professional mixers of its class, the GL2 boasts full throw 103 mm Alps™ faders for thousands of hours of smooth, seamless operation.

Master Section

Four discrete subgroups, left and right outputs, and the AUX reverse section allow the GL2 to adapt in ways impossible on other compact mixers.

Tools, not toys.

Under the Hood

Careful attention to detail, as in individual circuit boards for each channel, fastidious component selection, and the best of British engineering all combine to establish the highest standard of performance... performance that is daily tested and confirmed anew.

The GL2 is the world's first multi-function mixer perfectly suited for Front-of-House Monitor, and Multitrack recording. ■ The ultimate in flexibility, this compact rackmount unit reveals a world of new opportunity - the ability to adapt. ■ In basic format, the GL2 is a 16 by 4 by 2 by 1 system for quality Front-of-House mixing, but at the touch of a button it's instantly configured as a 16 by 6 plus 1 Stage Monitor mixer. Another button and you're set up for a digital Multitrack recording. No fuss - no compromise - no limitations for the future. Our unique SYS-Link™ system gives the GL2 the means to grow as you do. Designed and built by engineers that have been bringing you audio tools with the superb specifications and quality you expect from Allen & Heath. ■ Audition the latest tool for the working professional at your nearest Allen & Heath dealer or call us for more information.



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hall system \$177,000.00

WMS900 UHF On Application 12 Channel theatrical stage system \$299,000.00

WMS900 UHF On Application 24 Channel open air system \$585,000.00

WM270 System VHF 9 Available 200 MHz hand held non-diversity WT770 system \$1340.00

WM370 System VHF 9 Available 200MHz Lavalier non-diversity WT770 system \$1250.00

WM270 System VHF 9 Available 200MHz hand held diversity WT870 system \$1490.00

WM370 System VHF 9 Available 200MHz Lavalier diversity WT870 system \$1400.00

WM370 System VHF 9 Available 200MHz Lavalier diversity WT870 system \$1400.00

SYNTEC INTERNATIONAL
(02) 417 4700 Mark Setchfield

Sennheiser (Germany)

SKM4031-90 VHF 200 MHz 202.9, 203.4, 203.8 Hand held transmitter with condenser capsule. Hi-dyn. noise reduction \$2457.00

EM2003-90 VHF 202.9, 203.4, 203.8 Mains powered full diversity receiver to suit SKM4031-90 \$3313.00

SETBF1051 VHF 174.5-175.0 Hand held transmitter with dynamic capsule. Mains powered diversity receiver (2 Channel switchable) \$1899.00

SK2012TV UHF 900MHz Pocket transmitter with Hi-dyn. noise reduction. \$5100.00

SKM4031TV 900MHz Hand held transmitter with Hi-dyn. noise reduction. \$4157.00

EK2014TV UHF 900MHz Pocket receiver to suit SK2012TV \$4806.00

EM2003TV UHF 900MHz Mains powered true diversity receiver to suit SK2012TV & SKM4031TV \$6663.00

SK50-UHF 900MHz 16 Channels switchable UHF pocket transmitter with Hi-dyn. plus noise reduction. Requires separate battery pack. \$4557.00

EM1046 UHF 900MHz Multi channel receiver system to suit SK50-UHF. \$P.O.A.

EK4015 UHF 900MHz Miniature diversity receiver to suit SK50-UHF.

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Vega (U.S.A.)

AX-20H/H VHF 8 Professional system featuring Dynex III Processing and N/D 757 Element; Condenser option available; Dual-Mode Squelch; Multipole RF Preselectors; XLR Mic-Level output; 0.5% Maximum harmonic distortion; 8 stock frequencies (1700 custom) \$3625.00

AX20BP VHF 8 Features Dynex III Processing; Impact-resistant ABS Body-pack; 50 milliwatts of R.F. power; optional mics at extra cost; 300 metre range; low-battery indicator; 0.5% maximum harmonic distortion; 8 stock frequencies (1700 custom) \$3495.00

VX-20 VHF Broadcast Leader in U.S.A.; For all Eng. EFP & Video; Features miniature camera-mount receiver and h/ held or body pack versions; Ten poles or IF filters; XLR Output; Choice of hand-held elements; Rugged and Dependable. \$3605.00

600 Series UHF Custom + 1700 Most advanced on the market; Interfaces to Medialink Lone Wolf system; XLR output; True diversity; Features Dynex III; Less than 0.2% Harmonic distortion @ 1kHz; for Live Theatre, broadcast or film; Monitor interface; choice of transmitters From \$7000.00

Electro-Voice (U.S.A.)

MS2000AH VHF 12 Features tru-diversity receiver - Hand transmitter features N/D757B Insert. Has DNX™ companding circuitry, separate power and stand-by controls. Designed by Vega for Electro-Voice. \$1799.00

MS2000AB VHF Exceptional body-pack system with true-diversity receiver. Choice of microphones including C0100EX Omni Mic (Extra Cost). Features SMT circuit boards and DNX™

companding circuitry. \$1509.00

RMT-141FB VHF 4-Channel transmitter with miniature PL-2 receivers for talent-cues and audio monitor applications. Features companding circuits to reduce interference. Dipole antenna system. High audio output for noisy environments; 1700 freq. From \$3825.00

IFB-121FB VHF Private-line IFB system with multiple PL-2 receivers; Single-channel transmitter, compatible with Q & System & Clearcom; 1700 frequencies available for talent-cues and audio monitor applications. From \$2750.00

Q+/Q600 VHF Wireless belt-pack intercom systems; Hands-free continuous; Full-Duplex; Up to 6 belt-packs per system; VHF high-band and UHF/VHF; Inexpensive receivers; 2-way or listen-only; Exceptional range. From \$7900.00

AUDIO TELEX COMMUNICATIONS
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DR505/Q309 VHF 202.4, 202.9, 203.3, 203.8, 204.25, 210.25, 216.25, 220.6. Many other frequencies available on request. Half rack unit diversity receiver complete with Hand Held Mic with Audio Technica Insert. Tone Squelch circuitry to eliminate interference. \$991.00

DR505/Q309S VHF As Above, except Shure SM58 in lieu of Audio Technica Insert. \$1223.00.

DR505/M309 VHF As Above As above except with Belt Pack and Audio Technica Lapel Mic in lieu of Hand-Held Mic. \$1075.00

DR505/M309C VHF As Above As above except Countryman Lapel Mic in lieu of Audio Technica Lapel. \$1397.00

DR505/GT309 VHF As Above As above except with Guitar Lead in lieu of Lapel Mic. \$926.00

DR318/Q303 VHF As Above Full rack unit metal chassis diversity receiver complete with Hand-Held Mic

with Audio Technica Insert. The preferred system for Hire companies and Stage Shows. \$1025.00

DR318/Q303S VHF As Above, except Shure SM58 in lieu of Audio Technica Insert. \$1257.00

DR318/M303 VHF As Above, except Belt Pack and Audio Technica Lapel Mic in lieu of Hand-Held Mic. \$1110.00

DR318/GT303 VHF As Above, except Guitar Lead in lieu of Lapel Mic. \$961.00

R318/Q309 VHF As Above Full rack unit non-diversity receiver complete with Hand-Held Mic with Audio Technica Insert. Tone Squelch circuitry to eliminate interference. \$770.00

R318/Q309S VHF As above, except with Shure SM58 in lieu of Audio Technica Insert \$1002.00

R318/M309 VHF As Above, except with Belt Pack and Audio Technica Lapel Mic in lieu of Hand-Held Mic. \$855.00

R318/GT309 VHF As Above, except with Guitar Lead in lieu of Lapel Mic. \$706.00

SR303/168U UHF 16 Channel System 803.25, 803.5, 804, 804.875, 805.5, 805.875, 806.125, 806.375, 807.125, 807.75, 809.5, 810.625, 810, 875, 811.375, 812.25, **QR** 915.75, 916.75, 917.25, 918.50, 919, 919.75, 920, 921, 921.5, 921.75, 922, 922.75, 923.5, 925, 926, 927.25 Diversity 16 Channel Synthesised UHF receiver, full rack complete with Hand-Held Mic with Audio Technica Insert \$3229.00

SR303/168SU UHF As Above As above except with Shure SM58 in lieu of Audio Technica Insert \$3500.00

SR303/168EU UHF As Above As above except with EV 757 N-Dyme Insert. \$3647.00

SR303/168CU As Above except Condenser Insert \$3280.00

SR303/M30U UHF As Above except with Belt Pack and Audio Technica Lapel Mic in lieu of Hand-Held Mic. \$3188.00

SR303/M30CU UHF As Above except with Country-

man Lapel Mic. \$3540.00

SR303/G303U UHF As Above As above except with Guitar Lead in lieu of Lapel Mic. \$3015.00

Telex (U.S.A.)

FMR70/HT58 VHF 202.4, 202.9, 203.3, 203.8 Many frequencies available on request Half Rack diversity receiver complete with Hand-Held Mic with Shure SM58 Insert \$1835.00

FMR70/HT757 VHF As above As above except with EV757 N-Dyme insert in lieu of SM58 \$1993.

FMR70/WT55 VHF As Above As above except with Belt Pack and WLM60 in lieu of Hand-Held Mic. \$1532.00

FMR100/HT58 VHF As Above Half rack broadcast quality diversity receiver complete with Hand-Held Mic with SM58 Insert. \$2411.00

FMR100/HT757 VHF As Above As above except with EV757 N-Dyme insert in lieu of SM58 \$2570.00

FMR100/WT60 VHF As Above As above except with Belt Pack and WLM60 Lapel Mic in lieu of Hand-Held Mic. \$2207.00

FMR200/HT58 VHF As Above Top of the range full rack diversity receiver complete with Hand-Held Mic with SM58 Insert \$3280.00

FMR200/7757 VHF As Above As above except with EV757 N-Dyme Insert in lieu of SM58 \$3438.00

FMR200/WT80 VHF As Above As above except with Belt Pack and WLM60 Lapel Mic in lieu of Hand-Held Mic. \$3443.00

ENG4/HT58 VHF As Above Camera Mountable Battery powered 4 channel receiver complete with Hand-Held Mic with Shure SM58 Insert \$4736.00

ENG4/WT60 VHF As Above As above except with Belt Pack and WLM60 Lapel Mic in lieu of Hand-Held Mic. \$4533.00.

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NADY (China)

301 HT UHF 920- 928MHz True diversity four selectable channel UHF wireless system. Nady standard handheld microphone. \$1820.

301 HT/58 UHF 920-928MHz True diversity four selectable channel UHF wireless system. Nady handheld microphone with SM58 insert. \$2220.00

301 Aerobic UHF 920-928MHz True diversity four selectable channel UHF wireless system. Beltpack transmitter with Countryman aerobic headset microphone. \$2440.00

RW-3 HT UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Balanced out. Nady standard handheld mic. \$1995.00

9000D LT VHF 174-220MHz True diversity wireless microphone system with beltpack transmitter. Built-in Nady lavalier microphone. \$815.00.

9000D LTSX VHF 174-220MHz True diversity wireless microphone system with belt pack transmitter. Mini XLR microphone socket (no mic.) \$815.00

9000D LT/EMW VHF 174-220MHz True diversity wireless microphone system with belt pack transmitter. Countryman EMW lavalier microphone. \$1155.00

9000D AEROBIC VHF 174-220MHz True diversity wireless microphone system with belt pack transmitter. Countryman Aerobic headset microphone. \$1445.00

RW-1 HT VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Standard Nady handheld microphone. \$1095.00

RW-1 HT/58 VHF 174 - 220MHz True diversity rack mount radio microphone system with balanced output. Nady handheld microphone with SM58 insert. \$1385.00

RW-1 HT/257 VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Nady handheld with NDYM 257 insert. \$1430.00

RW-1 HT40/58 VHF 174-

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with SM58 insert. \$1385.00
RW-1 HT/257 VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Nady handheld with NDYM 257 insert. \$1430.00
RW-1 HT40/58 VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Nady HT40 handheld with SM58 insert. \$1950.00
RW-1 LT VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Belt pack transmitter with built-in Nady lavalier mic. \$995.00
RW-1 LTSX VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Belt pack with mini XLR mic. socket (no mic.) \$995.00
RW-1 LT30 VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Metal body belt pack with mini XLR socket (no mic.) \$1750.00
RW-1 GT VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Belt pack guitar transmitter. \$995.00
RW-1 LT/EMW VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Belt pack with Countryman EMW lavalier microphone. \$1335.00
RW-1 LT/HS VHF 174-220MHz True diversity rack mount radio microphone system with balanced output. Belt pack with Countryman headset microphone. \$1580.00
750HT/58 VHF 174-220MHz Dual discrete channel rack mount wireless system with balanced out. 2 x Nady handheld microphones with SM58 inserts. \$2995.00
750 LTSX VHF 174-220MHz Dual discrete channel rack mount wireless system with balanced out. 2 x Nady belt pack transmitters with mini XLR jack (no mics) \$2215.00
750 HT58/LTSX VHF 174-220MHz Dual discrete channel rack mount wireless sys-

tem with balanced out. 1 x Nady H/held (SM58 insert) 1 x Belt pack with mini XLR \$2595.00
2000 HT/58 VHF 174-220MHz Top of the line VHF wireless system. Hiss mute circuitry and superb RF filtering. Nady handheld, SM58 insert. Balanced out. \$3095.00
2000 HT/757 VHF 174-220MHz Top of the line VHF wireless system. Nady handheld microphone with NDYM 757 insert. \$3195.00
2000 GT VHF 174-220MHz Top of the line VHF wireless system. Nady belt pack transmitter with mini XLR socket. (no mic.) \$2995.00
2000 LT/EMW VHF 174-220MHz Top of the line VHF wireless system. Nady belt pack transmitter with mini XLR socket. (no mic.) \$2995.00
2000 LT/HS VHF 174-220MHz Top of the line VHF wireless system. Nady belt pack transmitter with Countryman EMW lavalier microphone. \$3335.00
2000 LT/HS VHF 174-220MHz Top of the line VHF wireless system. Nady belt pack transmitter with Countryman headset microphone. \$3580.00
301 LT UHF 920-928MHz True diversity four selectable channel UHF wireless system. Belt pack transmitter with built-in Nady lavalier mic. \$1775.00
301 LTSX UHF 920-928MHz True diversity four selectable channel UHF wireless system. Belt pack transmitter with mini XLR mic. socket (no mic.) \$1775.00
301 GT UHF 920-928MHz True diversity four selectable channel UHF wireless system. Belt pack transmitter. \$1715.00
301 LT/EMW UHF 920-928MHz True diversity four selectable channel UHF wireless system. Belt pack transmitter with Countryman EMW lavalier mic. \$2115.00
301 LT/HS UHF 920-928MHz True diversity four selectable channel UHF wireless system. Belt pack transmitter with Countryman headset microphone. \$2360.00

RWS-3 GT UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Nady belt pack guitar transmitter. \$1950.00
RW-3 LT/EMW UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Nady belt pack transmitter with Countryman EMW lavalier microphone. \$2270.00
RW-3 LT/HS UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Nady belt pack transmitter with Countryman headset microphone. \$2540.00
Wireless One HT VHF 174-220MHz Non-diversity radio microphone system with standard Nady handheld microphone. \$615.00
Wireless One HT/58 VHF 174-220MHz Non-diversity radio microphone system with handheld microphone (SM58 insert). \$975.00
Wireless One LT VHF 174-220MHz Non-diversity radio microphone system with belt pack transmitter. Built-in Nady lavalier microphone. \$595.00
Wireless One LTSX VHF 174-220MHz Non-diversity radio microphone system with belt pack transmitter. Mini XLR microphone socket (no mic.) \$595.00
RW-3 HT/58 UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Nady handheld transmitter with SM58 insert. \$2395.00
RW-3 HT/NDYM UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Nady handheld transmitter with NDYM insert. \$2450.00
RW-3 LT UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Nady belt pack transmitter with built-in Nady lavalier microphone. \$1950.00
RW-3 LTSX UHF 920-928MHz True diversity rack mount four selectable channel UHF wireless system. Nady belt pack transmitter with mini XLR socket (no

mic.) \$1950.00
151 VR/HT VHF 174-220MHz Camcorcer Microphone system with standard Nady handheld microphone. 120dB dynamic range. \$450.00
151 VR/LT VHF 174-220MHz Camcorcer microphone system with built-in Nady lavalier microphone. 120dB dynamic range. \$375.00
351 VR/HT VHF 174-220MHz Compact video microphone system with standard Nady handheld microphone. Rubber antenna available. \$575.00
351 VR/LT VHF 174-220MHz Compact video microphone system. Belt pack transmitter with built-in Nady lavalier microphone. \$545.00
551 VR/HT 174-220MHz 2 Channel professional video microphone system. Balanced output and rugged metal case. Standard Nady handheld microphone. \$1395.00
551 VR/HT58 VHF 174-220MHz 2 channel professional video microphone system. Handheld microphone with SM58 insert. \$1775.00
551 VR/LTSX VHF 174-220MHz 2 Channel professional microphone system. Belt pack system with selectable channels. Mini XLR socket (no mic.) \$1325.00
551 VR/LTEMW VHF 174-220MHz 2 Channel professional microphone system. Belt pack system with Countryman EMW lavalier mic. \$1665.00
Wireless One Aerobic VHF 174-220MHz Non-diversity radio microphone system with belt pack transmitter. Countryman Aerobic headset microphone. \$1250.00
9000D HT VHF 174-220MHz True diversity wireless microphone system with standard Nady handheld microphone. \$850.00
9000D HT/58 VHF 174-220MHz True diversity wireless microphone system with handheld microphone (SM58 insert) \$1150.00
9000D GT VHF 174-220MHz True diversity wire-

less microphone system with belt pack guitar transmitter. \$815.00
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DWM Handheld VHF 170.825, 174.800, 186.250, 204.250MHz. Features Dual diversity holds strongest signal to eliminate signal drop out; Frequency response 50-15kHz; Dynamic range >=100dB, Signal - Noise >= 100dB, THD < .5%, unit includes receiver with > 80dB rejection of unwanted signals and 10dB/uV sensitivity, external power supply, rack mount kit available. \$1077.00
DWM Series Lavalier VHF 204.250MHz. Same features as above but utilises a belt pack with miniature lavalier microphone. \$1340.00
AS1000 Antenna Divider accessory (4 Diversity Channels), 0dB Gain, 50R output impedance, eliminates the need for 8 diversity antennas, ensures balanced coupling

between receivers in the correct frequency band. \$560.00
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Nady (China)
**RW-1 HT VHF True Diversity 191.30MHz New, 202.10MHz, 202.90MHz, 203.40MHz, 204.00MHz 1u RACK MOUNT True Diversity Receiver - Hand held microphone transmitter with Nady YD-04 element similar to SM-58, balanced/unbalanced outputs, front mount antennas Nady patented COMPANDING NOISE REDUCTION Adj. audio and mute, 120dB dynamic range. \$1199.00 RRP
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Guitar/Instrument Transmitters Only 191.30MHz New, 202.10, 202.90, 203.40, 204.00MHz. Transmitter body pack for second guitar, save change-over time on stage or replacement for lost or damaged units. \$359.00 RRP
Lapelle Microphone Transmitters 191.30MHz New, 202.10, 202.90, 203.40, 204.00MHz. Complete transmitter body pack use as addition or repl. \$425.00 RRP
HT-10 Hand Held Microphone Transmitters 191.30MHz New, 202.10, 202.90, 203.40, 204.00MHz. Additional transmitter or replacement for lost or damaged units - Nady YD-04 insert. \$425.00
101HT VHF Single Channel System 191.30MHz New, 202.10, 202.90, 203.40, 204.00MHz. 101 Receiver - Hand held microphone transmitter with Nady YD-04 element similar to SM-58, Nady patented COMPANDING NOISE REDUCTION Adj. audio and mute, 120dB dynamic range. \$659.00 RRP
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 47 Brodie Street Rydalmere NSW 2116 Call (02) 638-0302, Fax (02) 638-0331

202.10, 202.90, 203.40, 204.00Mhz. 101 Receiver - Lapelle Mic Transmitter ideal for Churches, Conventions, Clubs etc. Nady patented COMPANDING NOISE REDUCTION Adjustable audio and mute, 120dB dynamic range. \$649.00 RRP

Wireless One VHF Single Channel System 202.10, 202.90, 203.40, 204.00Mhz Wireless One Receiver - Guitar/Instrument body pack transmitter, Nady patented COMPANDING NOISE REDUCTION Adj. audio and mute, 120dB dynamic range. \$529.00 RRP

201HT VHF True Diversity System 191.30Mhz New, 202.10, 202.90, 203.40, 204.00Mhz. True Diversity 201 Receiver - Hand held microphone transmitter with Nady YD-04 element similar to SM-58, Nady patented COMPANDING NOISE REDUCTION. Adjustable audio and mute, 120dB dynamic range. \$879.00

201GT VHF True Diversity System 191.30Mhz New, 202.10, 202.90, 203.40, 204.00Mhz. True Diversity 201 Receiver - Guitar/Instrument body pack Transmitter, Nady patented COMPANDING NOISE REDUCTION Adjustable audio and mute, 120dB dynamic range. \$869.00 RRP

201LT VHF True Diversity System Available in 191.30Mhz New, 202.10, 202.90, 203.40, 204.00Mhz. True Diversity 201 Receiver - Lapelle Mic Transmitter body pack ideal for Churches, Conventions, Clubs etc. Nady patented COMPANDING NOISE REDUCTION Adjustable audio and mute, 120dB dynamic range. \$869.00 RRP

201HT VHF Shure SM58 Insert True Diversity Available in 202.10, 202.90, 203.40, 204.00Mhz True Diversity 201 Receiver - Hand held microphone transmitter with SHURE SM-59 insert, Nady patented COMPANDING NOISE REDUCTION Adj. audio and mute, 120dB dynamic range. \$1235.00 RRP

JANDS (02) 516 3622 Jeff Bolt
Shure (U.S.A.)

TG VHF 176.2, 177.6, 186.2, 202.2* Guitar or instrument system with L11 belt pack transmitter, WA300 instrument cable & T6 receiver. \$695.00 RRP

TP VHF 176.2, 177.6, 186.2, 202.2* Presenter system with small 839W lavalier mic, suits church & commercial sound applications. Mic plugs into L11 belt pack, includes T6 receiver. \$895.00

TV VHF 176.2, 177.6, 186.2, 202.2* Vocalist system with genuine Shure SM-58 mic & transmitter all in one (L2/58), with T6 receiver. \$1095.00

ELS24/58 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Handheld SM58 vocal mic system with L4 Marcad Diversity receiver, rack mountable case & XLR or jack output. \$1745.00

ELS24/87 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Handheld SM87 vocal mic system with L4 Marcad Diversity receiver, rack mountable case & XLR or jack output. \$1945.00

ELS24/Beta58 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Handheld Beta 58 vocal mic system with L4 Marcad Diversity receiver, rack mountable case & XLR or jack output. \$1995.00

ELS24/Beta87 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Handheld Beta 87 vocal mic system with L4 Marcad Diversity receiver, rack mountable case & XLR or jack output. \$2095.00

ELS114 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Guitar or instrument system with L4 Marcad Diversity receiver, L11 Bodypack, rack mountable case & XLR or jack output. \$1395.00

ELS114/16 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00

* Headworn condenser system with L4 Marcad Diversity receiver, L11 Bodypack, rack mountable case & XLR or jack output. \$1995.00

ELS114/98 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Instrument condenser system with L4 Marcad Diversity receiver, L11 Bodypack, rack mountable case & XLR or jack output. \$1895.00

ELS114/839 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Lavalier system with 839W mic, L4 Marcad Diversity receiver, L11 Bodypack, rack mountable case & XLR or jack output. \$1545.00

ELS114/83 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Lavalier system with wl 83 mic, L4 Marcad Diversity receiver, L11 Bodypack, rack mountable case & XLR or jack output. \$1595.00

ELS114/84 VHF 174.500, 176.200, 177.600, 186.200, 190.600, 202.200, 203.00 * Lavalier system with WL84 cardioid mic with L4 Marcad Diversity receiver, L11 Bodypack, rack mountable case & XLR or jack output. \$1645.00

ECS2458 VHF On Application Vocalist system with SM58 performance, PowerGain antenna & EC4 Marcad Diversity receiver. \$2595.00.

ECS2487 VHF On application Vocalist system with SM87 performance, PowerGain antenna & EC4 Marcad Diversity receiver. \$2795.00

ECS24 Beta 58 VHF On application Vocalist system with Beta58 performance, PowerGain antenna & EC4 Marcad Diversity receiver. \$2795.00

ECS24 Beta 87 VHF On application Vocalist system with Beta 87 performance, PowerGain antenna & EC4 Marcad Diversity receiver. \$2995.00

Buyers Guide

STUDIO MONITORS

Retail Prices include sales tax. Current at 15/1/94. The reference after model type shows size of woofer, eg: 15" (b), then midrange, ie: 8" (m) then size of high frequency tweeter, ie: 1" (h)

AUDIO SERVICES CORP. (02) 901 4455 Geoff Grist

E.A.A. (France)
DCM3 Miniature control monitor, 2 way built in 70 wrms amplifier and signal processor, symmetrical input, magnetic shielding. \$1150

DCM3DC as above but with dual powering 9-18 VDC/220 VAC Mains \$1650 (prices include sales tax)

SONOSAX (Switzerland)

JUM-3A 3 Way active monitor speaker with built in 3 way crossover, limiter and amplifier \$11,845 per pair (price includes sales tax).

ELECTRIC FACTORY (03) 480 5988 Ray Kimber

Alesis (U.S.A.)
Monitor 1. 6.5" 1.5" The design of the cabinet gives the Monitor One more low-end punch than other speakers in its class. \$1095.00

A.R. AUDIO ENGINEERING (02) 299 3666 Steve Bray

ATC (U.K.)
ATC SCM10 5" Mid/Bass 1" Soft Dome tweeter, Console Top Application. All ATC's feature Billy Woodman designed drivers & cabinets \$4000.00

ATC SCM20 7" Mid/Bass 1" Soft Dome Near Field Application \$6900.00

ATC SCM50 9" 3" Soft Dome 1" Mid Field/Main Monitor Application \$14,500.00

ATC SCM50A 9"(b) 3"(t) Soft Dome 1" Active tri-Amp version \$16,500

ATC SCM100 12"(b) 3"(m) Soft Dome 1" Mid Field/Main Monitor Application \$16,900

ATC SCM 100A 12"(b) 3"(m) Soft Dome 1" Active Tri-Amp Version \$20,900

ATC SCM200A 2 x 12" 3" Soft Dome 1.25" Main Monitor Application incl. EC23 Electronic Crossover but ad. Amplifiers \$29,500

ATC SCM300A 2 x 15" (b) 3" (m) Soft Dome 1.25" Main Monitor Applications incl. EC23 Electronic Crossover but excl. Amplifiers. \$35,600

ATC SCM500A 2 x 15" (b) 1 x 4" (m) & 1 x 1.75" Soft Domes 1.25 Monster Monitor Application \$60,000

SYNTEC INTERNATIONAL (02) 417 4700 Mark Setchfield

Tannoy (Great Britain)

PM86.5 6.5 inch bass/mid transducer. 3/4inch fluid cooled, polyamide dome tweeter. Peak power 100 watts. Impedance 8 ohms. Freq. response 57 Hz - 20kHz. \$799.00

8NFM 8" Dual concentric near field monitor. 20 to 120 watts. Peak power 200 watts. Impedance 8 ohms. Freq. response 48Hz - 25 kHz. Sensitivity 93dB \$1859.00

10DMT 10" Dual concentric. 30-150 watts. Peak power 350 watts - Impedance 8 ohms. Freq. response 45Hz-25kHz. Sensitivity 94dB. \$3199.00

12DMT 12" Dual concentric. 50-300 Watts. Peak power 450 watts. Impedance 8 ohms. Freq. response 44Hz-25kHz. Sensitivity 96dB. \$4449.00

15DMT 15" Dual concentric. 50-400 Watts. Peak power 600 watts. Impedance 8 ohms. Freq. response 38Hz - 25kHz. Sensitivity 98dB. \$5999

215DMT 2 x 15" Dual concentric. 150-500 watts. Peak power 750 watts. Impedance 4-8 ohms. Freq. response 35Hz-25kHz. Sensitivity 101dB. \$9999.00

PBM8 8" bass/mid transducer. 1 inch fluid cooled, polyamide dome tweeter. Peak power 125 watts. Impedance 8 ohms. Freq. response 47Hz - 20kHz. \$1099.00

STUDIO CONNECTIONS (03) 723 4300 David Sloss

Genelec (Finland)

1031A 1 x 8" (b) 1 x 1" Dome, Bi-amplified near field

Monitors - full output is 160 watts \$4970.00 per pair

1032A 1 x 10" (b) 1" Metal Dome, 2 Way Bi-amplified near field monitors. Output is 200 watts. \$6510.00 per pair

S30C 200mm (b) 80mm (m) 65mm ribbon 3 way active monitoring systems featuring a proprietary ribbon tweeter. Full output is 200 watts. \$7655.00 per pair.

1035B 15" (b) 5" (m) 1"(h) These studio monitors incorporate Direct Control Wave Technology which provides excellent stereo imaging. Full output 3500 watts. \$P.O.A.

1038A 15" (b) 5" (m) 1" (h) 3 Way active monitoring system. The bass, midrange & treble amplifiers produce 400 watts, 120 watts & 120 watts respectively. \$17,650 per pair

1033A 2 x 10" (b) 5" (m) 1" (h) dome. The bass, Mid-range & treble amplifiers produce 2 x 500, 2 x 270 and 2 x 270 watts. \$29,600.00 per pair.

1030A 8" (b) 1" (h) The 1030A's are self powered studio monitors and can be used for midfield or studio monitors. \$2890.00 per pair

ARTECYH SYSTEMS (03) 752 4088 DES SYLVESTER

KRK Monitoring (U.S.A.)

6000 6" Polyglass (b) 1" Kevlar Dome Tweeter Closefield Monitor 2 way passive 75 Watts \$1550.00

7000B Time Aligned 7" Kevlar (b) 1" Kevlar Dome Tweeter Closefield Monitor 2 way passive 150 watts. \$2550.00

9000B Time Aligned 9" Composite (b) 1" Kevlar Dome Tweeter Closefield Monitor 2 way pass. or riamp 150 watts \$4450.00

13000B Time Aligned 12" Polyglass (b) 5" Kevlar (m) 1" Kevlar Dome Tweeter Closefield Monitor 3 way passive or Biamp 200 watts \$6850.00

15A3 Time Aligned 1 x 15"



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Distributor: ASHTON ADMOR

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STUDIO MONITORS. Buyers Guide (continued)

Polyglass (b) 1 x 7" Kevlar (m) 1 x 1" Kevlar Dome Tweeter Main control room monitors 250 watts \$16,570.00
 15A5 Time Aligned 2 x 15" Polyglass (b) 1 x 7" Kevlar (m) 1 x 1" Kevlar Dome Tweeter Main Control Room monitors 500 watts \$26,510.00

AMBER TECHNOLOGY
 (02) 975 1211 John
 Fitzpatrick

Celestion (England)

Model 3 Mk11 13cm Celestion Low/Mid driver 2.5cm two-piece titanium dome tweeter 2-Way system, 8 litre internal volume cabinet, vented box design, 62Hz-20kHz ± 3dB \$639.00 per pair

Model 5 150mm(b) 25mm (h) Compact near-field monitor - 90 watts, 2-way with 1" titanium dome tweeter, freq. resp. 62Hz-20kHz, 89dB sens., 350H x 260W x 250D, 8 ohms. \$759.00

Model 7 20cm Celestion Low/Mid driver 2.5cm two-piece titanium dome tweeter 2-Way system, 27 litre internal volume cabinet, vented box design, 57Hz-20kHz ± 3dB. \$1059.00 per pair

C 3 2 1 0 5 m m (b) 25mm (h) Video shielded near-field monitor - 60 watts, 2-way with 1" titanium dome tweeter, freq. resp. 39Hz-20kHz, 86dB sens., 292H x 161W x 225D, 8 ohms. \$599.00

C S 4 1 3 0 m m (b) 25mm(m) Video shielded near-field monitor - 75 watts, 2-way with 1" titanium dome tweeter, freq. resp. 72Hz-20kHz, 87 dB sens., 331H x 180W x 229D, 8 ohms. \$699.00

MARK IV AUDIO
 (02) 648 3455 Grahame
 Harrison

Electro-Voice (U.S.A.)

S40 Handles 160 watts at 4 ohms. Has protection on both tweeter and woofer; dispersion is 100° x 100°; Low flux leakage design. \$669.00 pair

MS802 Power Handling: 80 watts at 6 ohms; 8 inch woofer with Superdome Tweeter; Hi Freq. Attenuator; Dispersion: 160° x 140° \$1736.00 pair.

Sentry 100A Handles 30 watts at 6 ohms; 8 inch woofer with

Superdome Tweeter; Dispersion: 158° x 140°. Available with in-built power amp. \$1952.00 pair

Sentry 500 Handles 100 watts at 8 ohms; 12 inch woofer with Superdome Tweeter. Available in slanted version (for corners). \$3914.00 pair.

STUDIO SUPPLIES

(02) 957 5389 Leon Hart

Dynaudio Acoustics Denmark

BM10 1 x 7" (b) 1" Dome 2 Way passive low cost nearfield studio/broadcast monitor. 114dB SPL @ 1kw peak handling \$1945.00

PPM1 2 x 5" (b) 1" Dome 2 Way passive miniature nearfield studio/broadcast monitor. 117dB SPL @ 1.25m 1kw peak handling \$3345.00

PPM2 1 x 6" (b) 1" Dome 2 Way passive general purpose nearfield studio/broadcast monitor. 117dB SPL @ 1.25m 1kw peak handling \$4495.00

PPM3 2 x 7" (b) 1" Dome 2 Way passive high power nearfield studio/broadcast monitor. 123dB SPL @ 1.25m 1kw peak handling \$6795.00

M1 2 X 5" (b) 1" Dome 2 Way passive console top nearfield studio/broadcast monitor. 122dB SPL @ 1.25m 1kw peak handling. \$4895.00

M2 2 x 8" (b) Dome Mid 1" Dome 3 Way passive midfield studio/broadcast monitor. 125dB SPL @ 1.25m 1kw peak handling \$10,995.00

M3 (P) 2 x 12" (b) 2 x 5" Cone Esotar 1" Dome 3 Way passive main monitor. Mastering/Rush mounted 123dB SPL @ 1.25m 1 kw peak handling \$18,995.00

C2 1 x 6" (b) Esotar 1" Dome 2 Way nearfield high quality reference monitor 120dB SPL @ 1.25m 1kw peak handling \$5495.00.

C3 1 x 12" (b) 1 x 5" Cone Esotar 1" Dome 3 Way Ultra high quality reference monitor 120dB SPL @ 1.25m 1kw peak handling \$10,595.00

ABES 2 x 12" (b) Active Bass Extension System. For extended bass response to be used in conjunction with BM10, PPM series and M1/M2 \$8745.00.

M3 Active 2 x 12" (b) 2 x 5" Cone Esotar 1" Dome 3 Way

Active main monitor. Mastering Flush mounted 123dB SPL @ 1.25m 1kw peak handling. Includes amp/electronic c/over. \$35,845.00.

M4 (2) Active 2 x 12" (B) 2 x 5" Cone 1 x Dome Mid Esotar 1" Dome 4 Way Active main monitor. Mastering Flush mounted 130dB SPL @ 2.25m 1kw peak handling. Includes amp/electronic c/over. \$57,348.00.

M4 (4) Active 4 x 12" (B) 2 x 5" Cone 1 x Dome Mid Esotar 1" Dome 4 Way Active main monitor. Mastering Flush mounted 130dB SPL @ 2.25m 1kw peak handling. Includes amp/electronic c/over. \$80,380.00

YAMAHA MUSIC AUSTRALIA
 (03) 699 2388
 Stephen Leonard

Yamaha (Japan)

NS10MST 18cm cone bass/mid driver 3.5cm soft dome tweeter 2-Way system, near-field monitor for reference applications, 60Hz to 20kHz, exc. image posn due to factory matching of components for left and right speakers, differs from NS10MC in power handling and high end response 50W \$949.00 per pair

NS10MC 18cm cone bass/mid driver 3.5cm soft dome tweeter 2-Way, commercial version of NS10MST, incl. rated mounting points for wall or ceiling mount (via BWS50-190 brackets), 60Hz-20kHz, 60W \$1095.00 per pair

NS40M 2 x 18cm cone bass drivers 6cm soft dome mid driver 3.5cm soft dome tweeter 3-Way pro. studio monitor, suitable as main monitors in small studio, 50Hz to 20kHz, left and right speakers, 100W \$899.00 each

RCF AUSTRALIA
 (08)234-2789
 (08)234 2790
 Roger Kelly/Colin Campbell

RCF (Italy)

Monitor 5S Full range inc 130mm high powered carbon fibre cone woofer with magnetic shielding and 19mm dome tweeter coupled to a 110 x 110 degree constant directivity horn, crossed over with a LOW IMPEDANCE COMPENSATED CROSSOVER™ ensures correct phase alignment and repro. to

20,000Hz, enclosed in high density foamed polystyrene, 175w. \$806.00 pr.

EQ5 Stereo active equaliser provides correct low frequency equalisation enabling a flat response down to 65Hz, cuts bass frequencies below 50Hz by 12dB eliminating subsonic frequencies. \$163.00

MA5-1 Double bracket for wall mounting

MA5-2 Bell joint bracket

MA5-3 Threaded adaptor for coupling of Monitors 5S

MA5-4 Ceiling mount adaptor for flush mounting

MA5-5 180 degree adaptor allows 2 Monitor 5S for 180 degree coverage

MA5-6 Central cluster allows up to 4 Monitor 5S for 360 degree coverage

MA5-7 Used with MA5-6 to give 45 degree angle for speakers.

MONITOR 8: 8" carbon fibre driver w/phase plug developed to provide frequency response up to 23,000Hz mounted on a constant directivity flare 110d x 80d, 275w. \$850.00 ea.

JANDS
 (02) 516 3622 Rod McKinnon

JBL (Japan)

Control Micro 125mm (full range) Full range ultra-compact speaker complete with mounting hardware, 100Hz-20kHz, 40W RMS/4 ohms, sensitivity 85dB. \$445 pair

Control 1 135mm (b) 19mm (h) Compact magnetically shielded two-way for home studios, location recording, foreground music. 70Hz-20kHz, 150W RMS/4 ohms, sensitivity 87dB. \$595.00 pair

Control 1 Plus 135mm 19mm High performance compact two-way with pure titanium dome tweeter, magnetically shielded. 60Hz-20kHz, 160W RMS/4 ohms, sensitivity 88dB \$795.00 pair.

Control 1AT 135mm 19mm Control 1 with built-in 60W transformer for indoor 100V line distributed background & foreground music. Two-way, magnetically shielded, 70Hz-20kHz, 150W RMS/4 ohms, sensitivity 87dB. \$735.00 pair
 Control 1AW 135mm (b)

19mm (h) Control 1 with all-weather drivers & rust-free stainless steel grille, built-in 60W transformer. Two-way, magnetically shielded, 70Hz-20kHz, 150W RMS/4 ohms, sensitivity 87dB. \$815.00 pair

Control 1CM 135mm (b) 19mm (h) Control 1 in ceiling mount format with built-in 60W transformer, mounting hardware, grille & flanges. Mag. shielded, 70Hz-20kHz, 150W RMS/4 ohms, sensitivity 87dB. \$915.00 pair

Control 1E 135mm (b) 19mm (h) Control 1 with built-in bi-amplification: 20W dedicated to LF & 10W to HF. Volume & tone controls, magnetically shielded, 120Hz to 20kHz. \$1345.00

Control 5 165mm (b) 25mm (h) Mid-sized two-way with pure titanium dome tweeter, magnetically shielded. 50Hz-20kHz, 175W RMS/4 ohms, sensitivity 89dB. \$895.00 pair

Control 5 Plus 200mm (b) 25mm (h) Control 5 with larger bass driver for critical listening, magnetically shielded. 45Hz-20kHz, 180W RMS/4 ohms, sensitivity 89dB. \$1095.00 pair

Control 10 300mm (b) 130mm (m) 25mm (h) High performance three-way in high impact ABS enclosure with handle, pure titanium dome tweeter, aquaplas cone woofer, magnetically shielded. 35Hz-27kHz, 150W RMS/8 ohms, sensitivity 94dB. \$3495.00 pair

4206 165mm (b) 25mm (h) Two-way near-field monitor with sculptured baffle, pure titanium tweeter, magnetic shielding. 65Hz-20kHz, 75W, RMS/8 ohms, sensitivity 87dB. \$995.00 pair

4208 200mm (b) 25mm (h) Larger two-way near-field

monitor with sculptured baffle, pure titanium tweeter, magnetic shielding. 60Hz-20kHz, 75W RMS/8 ohms, sensitivity 89dB. \$1295.00

4408A 200mm (b) 25mm (h) Compact two-way, ideal for smaller recording studios & broadcast control rooms, pure titanium dome tweeter. 50Hz-20kHz, 100W RMS/8 ohms, sensitivity 89dB. \$1895.00 pair

4410A 250mm (b) 125mm (m) 25mm (h) Three-way designed as a vertical line array with pure titanium dome tweeter, delivering fine transient response characteristics & detail. 45Hz-20kHz, 125W RMS/8 ohms, sensitivity 90dB. \$2795.00

4412A 300mm (b) 125mm (m) 25mm (h) Three-way all-purpose bookshelf system providing maximum LF output & accurate near-field monitoring with pure titanium dome tweeter. 45Hz-20kHz, 150W RMS/8 ohms, sensitivity 89dB. \$3095.00

4425 300mm (b) with Bi-Radial horn Designed for smaller studios & demanding audio applications. 40Hz-16kHz, 200W RMS/8 ohms, sensitivity 91dB, 2416H pure titanium diaphragm compression driver with 2342 horn, 100 (H) x 100 (V) degree dispersion. \$4895.00 pair.

4430 380mm (b) with Bi-Radial horn High performance monitor. 35Hz-16kHz, 300W RMS/8 ohms, sensitivity 93dB, 2425H pure titanium diaphragm compression driver with 2344 horn, 100 (H) x 100 (V) degree dispersion. \$12,395.00 pair

4435 2 x 380mm (b) and Bi-Radial horn Top performance monitor. 30Hz-16kHz, 375W RMS/8 ohms, sensitivity 96dB, 2425H pure titanium diaphragm compression driver with 2344 horn, 100 (H) x 100 (V) degree dispersion. \$14,495.00 pair

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LIGHTING Buyers Guide

PC SPOTS

Lighting Prices exclude sales tax, which is a Lighting Industry practice. Prices are current at 15/1/94

? P.C. spots have a Prism Convex lens, otherwise work like a Fresnel spot with less spill. The soft edged beam can be adjusted from tight to wide.

	LAMP	WATTS	OUTPUT	BEAM SPREAD	LANTERN SIZE	PRICE
STRAND, from BYTECRAFT P/L (03 587 2555) Made in U.K. *Price includes lamp.						
Minim P.C.	CP81	300	700 lux	@5m 7.5° to 52°	175mm x 165mm x 2C0mm	\$228
Quartet P.C.	T26	6500	1700 lux	@6m 7.5° to 55.5°	286mm x 243mm x 2E8	\$233
Prelude P.C.	T26	650	1200 lux	@8m 7.5° to 55°	235mm x 230mm x 270mm	\$334
Cantata P.C.	T29	1200	520 lux	@20m 4° to 49°	410mm x 300mm x 3E5mm	\$505
Alto P.C.	CP91	2500	1550 lux	@20m 4° to 58°	460mm x 360mm x 4E0mm	\$966
CCT, from ROSCO AUSTRALIA FTY LTD (02) 906 6262 Made in U.K.						
Minuette 10/59°	T27	650		0°-59°	142mm x 305mm, 2.5kg	\$265
Starlette 1k/1.2k	T29	1200		7°-38°	210mm x 250mm x 4C0mm, 8.3kg	\$680
Starlette 2k	CP79	2000		5° - 50°	270mm x 330mm x 4C0mm, 14kg	\$1170
SELECON, from DEALERS AUSTRALIA WIDE Made in New Zealand *Price incl. lamp						
10MPC	T/27	650	1000 lux	@11m 4.5°-54°	100mm Lens, 320 Lx 210w x 245H	\$270.00
10CPC10	T/19	1000	1000 lux	@15m 5°-58°	150mm Lens, 400Lx 280w x 320H	\$345.00
10SPC1200	T/29	1200	1000 lux	@19m 4.5-62°	175mm Lens, 400Lx 280w x 320H	\$550.00
10SPC2000	CP72	2000	1000	@23m 4.5-60°	200m Lens, 476Lx 365Wx 450H	\$840.00
10SPC2500	CP91	2500	1000	@24m 4.5-60°	200mm Lens, 476Lx 365Wx 450H	\$960.00
PROLITE, from PFOLITE MANUFACTURING PTY LTD (076) 327312. Made in AUSTRALIA						
PR5-PC	525/27	500/650		10/56	295 x 228 282mm	\$216.00
PR6-PC	525/27	500/650		10/56	295 x 228 x 282mm	\$227.00
PR10-PC	T19	1000		10/56	315 x 2E3 x 330	\$342.00
PR12-PC	T11/19	1000/1200		10/56	315 x 2E3 x 330	\$380.00
PR22-PC	CP72/91	2000/2500		10/56	375 x 3C3 x 453	\$468.00
TEATRO, from LIGHTMOVES TECHNOLOGIES (02) 560 0000 Italy * Prices include lamp						
Comma	T/27	350	15C lux	@7m 9.5-38°	3.5kg 295 x 223 x 294	\$260.00
Punto	T/25	500	10C lux	@7m 8-50°	3 kgs 255 x 204 x 156	\$250.00
Spazio 1200	T/29	1200	135 lux	@10m 5.5-58°	6.2kgs 435 x 290 x 400	\$420.00
Spazio 2000	CP72	2000	17C lux	@10m 5-60°	6.2kgs 435 x 290 x 400	\$490.00
Tratto 1200	T/29	1200	115 lux	@10m 6-48°	8.5kgs 488 x 285 x 420	\$630.00
Acuto 2000	CP72	2000	22C lux	@10m 4-57°	11.1kgs 578 x 365 x 550	\$1110.
COEMAR, from COEMAR DE SISTI AUSTRALIA (02) 467 8666. Made in Italy.						
Corto E 300/500	GY9.5	300	4220 lux	@2.5m 8°-50°	LWH(mm) 225 x 204 x 156	\$165.00
Corto E 300/500	GY 9.5	500	9220 lux	@2.5m 8°-50°	LWH(mm) 225 x 204 x 156	\$165.00
Solar 300/500/650	GY 9.5	300	1860 lux	@2.5m 9.5°-38°	LWH(mm) 295 x 223 x 175	\$188.00
Solar 300/500/650	GY 9.5	500	2520 lux	@2.5m 9.5°-38°	LWH(mm) 295 x 223 x 175	\$188.00
Solar 300/500/650	GY 9.5	650	5970 lux	@2.5m 9.5°-38°	LWH(mm) 295 x 223 x 175	\$188.00
Solar 650/1000	GY 9.5	650	7020 lux	@2.5m 10°-41°	LWH(mm) 305 x 223 x 175	\$203.00
Solar 650/1800	GY 9.5	000	9840 lux	@2.5m 10°-41°	LWH(mm) 305 x 223 x 175	\$203.00
Passo 650/1000	Gx 9.5	650	3910 lux	@5m 5.5°-58°	LWH(mm) 435 x 290 x 240	\$271.00
Passo 650/1000	Gx 9.5	000	5020 lux	@5m 5.5°-58°	LWH(mm) 435 x 290 x 240	\$271.00
Passo 2000	GY16	2000	8520 lux	@5m 5°-60°	LWH(mm) 435 x 290 x 240	\$310.00
TAS, from COEMAR DE SISTI AUSTRALIA (02) 467 8666. Made in Italy.						
Spot 650/1000	Gx 9.5	650	3870 lux	@5m 7°-60°	LWH(mm) 409 x 254 x 300	\$195.00
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Polycolour HM11200W (Discharge). Colours: Infinite. Control: Analogue (0-10V) or Digital (RS232/423 or DMX 512). Features Colour mixing (complete range of colours), Stopper Strobe, dimmer (0-100%), and frost dimmer (0-100%). Avail. with HM1575 & HMI 1200 \$6550.50

Tiger MultiColour Lamp HM1575W(Discharge) Colours: Colour Wheel. Control: Analogue (0-100%) or Digital (RS232/423 or DMX 512). features: Fully Controllable & Programmable, eight colours, dichroic filters, stopper strobe, frost dimmer. \$3179.40

Tiger Multi Colour HMI1200W (Discharge) Colours: Colour Wheel. Control: Analogue (0-10V) or Digital (RS232/423 or DMX512) Features: Fully controllable & programmable, eight colours, dichroic filters, stopper strobe, frost dimmer. \$3622.30

Piper Colour Changer HT1500W (Halogen) Colours: Colour Wheel. Control: Analogue (0-10V) or Digital (RS232/423 or DMX512) Eight colours, dichroic filters, colour change via continuous rotation, bi-colour beams. \$971.00

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Robocolour 2 250W Halogen ENH Colour Mixing Stand Alone, Martin Controller, DMX512 via Interface. Colours: Ten Colours, dichroic filters, stopper strobe \$T.B.A. Robocolour MSC 200 MSD200W Discharge Colour Mixing Stand Alone, Martin Controllers, DMX512 Via Interface 16 Colours plus white, variable high speed shutter, adjustable focus, sound activated, remote control of built in sequences, slave/master avail. \$1358.70

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CYC. Suits Iris 1. Colours: 2-16 Trimmable. Weight: 5kg. Control: DMX/Analogue. Features: Vertical moves, Fitted with pluscard - 12 bit resolution/frame by frame/remote speed. fan. \$3350.00

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SELECON

WRITE IN READER SERVICE NUMBER 146

SCROLL ON REGARDLESS

Cathy Grey - remember her? We do! Anyway, Cathy has ventured into the cave to discover an Australian Manufacturer hard at work - making Scrollers!

Forged in the unforgiving fires of rock and roll, Showcraft's Australian-made Colourset colour changers are now used extensively in theatre as well as on the road. Cathy Gray talks to Lee Conlon, Colourset's designer, about the problems he faced and the solutions he developed.

Back in 1987, Lee Conlon bought some colour changers for his hire stock. Lee is the man behind Sydney's Revolver Light and Sound, and its associated manufacturing company Showcraft.

The units he chose were American - Par 64-type cans with scrollers built in. Each had its own internal power supply, so they were very heavy and the lead that connected them carried both 240V and control signal. Cumbersome, yes, but when customers say, "I want colour changers," you try and accommodate them - that's what business is all about, eh? Unfortunately, that's when the headaches began. According to Revolver staffer Sandy Moore, "every time they went out, it seemed like they'd come straight back in - fault after fault". Not good enough.

"People were keen to use scrollers - both in rock and in theatre," says Lee. "They could see the value of the idea. But they just kept being let down so less and less people were prepared to hire them. That's when scrollers as a whole developed a bad name. The demand was there, but the technology wasn't up to it."

So he set about making his own.

Getting sweaty

He'd done it before. In fact Revolver began life as a manufacturer in 1974 in Adelaide - this time on the audio side of things, building PAs for sale to bands. Eventually he moved into hire, although still using some of his own products, and came to Sydney in the late 70s, providing systems for the likes of the Angels, Chisel and Icehouse.

No-one had scrollers in those days, let alone things that moved. But people used a lot of lights. (I remember working at the Stagedoor Tavern the night someone hung a can under a sprinkler-system sensor. Never have I seen so much water so fast - which might have been nice and cool for the punters if it hadn't also drowned the racks and foldback desk.)

Anyway, Lee is what I would describe as a practical perfectionist. He's always been one to get right in amongst the action, sweaty and uncomfortable though it might be, to keep in touch with what it was like to actually use his gear. So when he set out to solve the problem of making a reliable colour changer, that's the



Is that a dry joint? Lee Conlon (left) contemplates a perfect Colourset circuit board with Gordon Simons, the man responsible for actually making most of Showcraft's products.

focus he brought to bear - the thing would have to work under 'real life' conditions. And 'real life' in this industry can be pretty extreme.

The first units he came up with were for Lekos, and as they went out in Revolver's hire stock he kept tinkering, gradually improving them until in 1990 he sold the first batch of Colourset 1K units, adaptable for both Par 64s and 6" profiles like Lekos. Now there's a whole Colourset family, including 2K and 5K versions and a large-format model for 8-way Molex-type lights. Rack-mount power supplies and a keypad controller are also part of the system.

Reliability under duress

The job of a scroller is to change the colour of the gel in front of the lamp. This it must do reliably, which is not just a matter of making a unit that won't break down; you have to be able to rely on the colour you want always coming up when you want it. Add to this the fact that lights produce a lot of heat and you've got a formidable design problem.

"It's not just the heat itself," says Lee. "There's a huge change in temperature over the time the lamp/scroller are being used - things expand, change their properties; oils

and greases don't work the same - and everything has to function properly over the entire temperature range."

How did he approach the task? "The first thing to note is that the scrollers were designed with a 'money is no object' view. I didn't set out to make them as a commercial product. I just needed something reliable for our hire stock - I was sick of standing helplessly at the back of an auditorium watching things go wrong."

More than a year went by in research and development, with the Colourset solution evolving as a combination of twin microprocessor-controlled motors and a system of sensing the position of the gels via marking tapes on each gel frame.

"Two motors working together are necessary to maintain appropriate tension through all the back and forth motion of the scroller," says Lee, "and the software is like the interface between the sensor - the infrared 'eye' which 'sees' each marker tape as it goes past - and the motors. It tells the motors what to do."

The use of the marking tapes on the scroll itself was important.

"Early on, I began to feel that a system which depended on selecting a gel according to some-

thing like the number of revolutions of the roller just wouldn't be good enough. Gels change with the heat - they get harder, more brittle, distorted and buckled - and the diameter of the scroll gets bigger as a result. Plus I've seen gel scrolls double in size as they get full of moths!

"It needed something to make sure the gels lined up properly whatever the state of the gel scroll. The marking tapes allow the unit's software to know where in the scroll it is - by counting the frames, among other things - and they also serve as a guide for lining up the selected frame precisely."

Other aspects of the design are also intended to keep the system working under less than ideal conditions. The ends of the rollers which hold the gel scroll are rubber disks, for example, instead of being rigid, which allows them to move up and down slightly, adjusting if the gels haven't been cut square, or get distorted over time.

Clever motors

Having the scroller motors under software control allows all sorts of smart stuff according to the Showcraft people. The system will actually search for a marker tape if it overshoots slightly, for instance. It can also work

out the difference (within reason) between a blob of dirt or a squashed insect and a marker tape.

The software is constantly being modified too, in response to comments and experience from the field. "It's an advantage of being a local manufacturer - you're on the spot so you see things with your own eyes, and when users speak I can listen."

For example, Lee saw situations where the scroll might jam and a slight extra nudge from the motors could free it. So he modified the program to drive the motors a bit harder if they were having trouble getting where they'd been told to go.

But the modification he's most proud of is his success in interfacing the Colourset scrollers with an LSD controller. This was prompted by Rod Stewart's 1992 Australian tour, which specified 100 LSD Colourmag scrollers - as well as 12 eight-way models. Arena Technical Services (ATS) got the gig to supply the gear, but they had only 50 Colourmags available, so Revolver was approached to provide around 60 of its Coloursets as a sub-hire. Problem was, Stewart's LD had his whole show programmed on an LSD controller and reasonably enough, wanted to avoid having to re-program to accommodate the new

scrollers. Lee put his head down, and many hours of programming later, the Showcraft Coloursets could respond to LSD commands. With each brand running off its own power supplies and the two systems linked via the power supply inputs, the shows went off without a hitch. Impressed the American lighting crew no end, I gather.

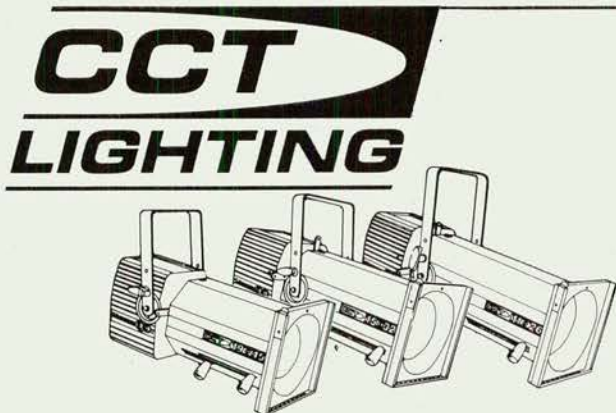
Under control

Which brings us to the issue of control. The Colourset scrollers were originally designed to work only with a dedicated Colourset controller. This is a 16-channel keypad which you use to set the speed and colour for each scroller or group of scrollers (the channel is selected using a thumbwheel on the back of each scroller, and you can assign any number of scrollers to a particular channel). It has a 64-scene memory and 99-step sequence.

According to Lee, "Scrollers are usually the last thing to go up when a show's rigged, and often they're set up under pressure. So the controller was designed for fast programming and quick access - each key is dedicated, not multifunctional, which makes it very direct to use."

But in another example of listening to the

(continues)



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users, Lee developed a DMX512 interface so that the scrollers can also be controlled from any lighting desk which has DMX facility. "The controller was great for music people because they need the ability to ad lib. But nothing's ad lib for theatre lighting operators, and they wanted to do everything from the one console."

In this mode, one fader on the desk controls the colour-change speed for all units, and you use the subsequent faders to set the colour for each scroller channel. With the fader completely down, for example, you've selected the first gel, and when it's at 100% you've selected the last gel. It's worth noting that, although the fader movement may be continuous, the scroller's movement isn't. "It moves to the next colour only when you actually reach the corresponding fader percentage," says Lee. "This is important for reliable programming."

Taking on the world

For something that wasn't designed to be a commercial product, the Colourset scrollers haven't done too badly. Lee says he's sold around 500 units since 1990 - 100 of them to Japan and some to New Zealand.

He wants Showcraft to develop further as a manufacturer, and his most recent innovation, the DMX Commander, is, he says, "Showcraft's first truly commercial product". This is a pocket-size DMX controller which, among other things, can plug straight into dimmer racks and give you full lighting control while you're actually standing on the



Colourset 1K (left, with its guts exposed) and 2K scrollers. The silver rectangle on the bottom edge of the 1K's gel scroll is a marker tape - the key to lining up each gel frame precisely even when it gets distorted. The infrared 'eye' (to the left of the tape in the picture) 'sees' each marker tape as it goes past and the unit's software tells the motors what to do.

stage. Sounds like a beautifully obvious idea to me! There's even a C-2 model which incorporates a 5-pin lead checker.

There's definite export potential, Lee believes. As we go to press in fact, Showcraft is gearing up to produce a batch of Commanders for a US company - and again, in true Conlon style, he'll be incorporating a host of suggestions from his customers.

Don't forget to sweat

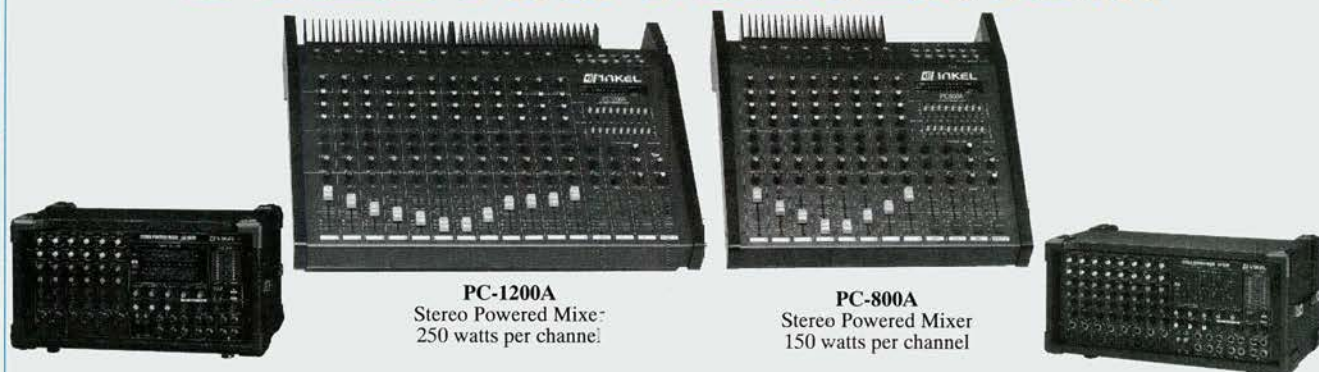
Needless to say, the early American dino-

saurus that started all this are no longer sold, and the imported scrollers available these days have obviously come a long way since then.

For Showcraft's Lee Conlon, staying closely in touch with the users of his products may now mean hanging around more civilised shows like 42nd Street or Aspects of Love.

But there's no doubt that those years of getting sweaty at rock and roll gigs were a great proving ground. •

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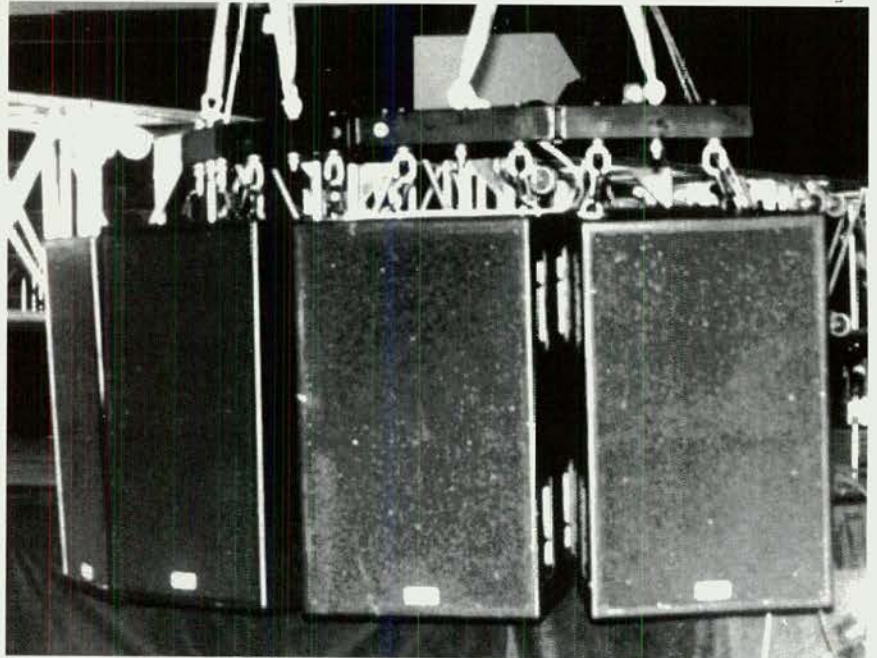
By ANDREW T. MARTIN*

The practice of rigging loudspeaker systems has become an integral part of high quality sound reinforcement production services. Flying loudspeakers is no longer confined to large scale touring companies: in fact, it is commonplace for small audio rental companies to provide flying hardware systems for a good portion of their productions.

The rental market demand for flyable loudspeaker systems has generated a need for safe and reliable loudspeaker rigging hardware systems. Many loudspeaker manufacturers offering flyable loudspeakers have done so by utilizing hardware components from the aircraft cargo control industry. These types of systems can be difficult to array and often do not lend themselves to smaller loudspeaker array configurations. Recently, some loudspeaker manufacturers have started to implement rigging hardware that is requirement specific. These types of systems work in cooperation with after market flying hardware systems to provide the user with a comprehensive loudspeaker flying hardware system for a wide variety of uses and array sizes. There is a trend toward this type of cooperative rigging system concept due to the cost savings and acoustical advantages to the end user of the loudspeaker system.

Since there are many types of rigging hardware systems in the sound reinforcement marketplace, this article will examine many of the aspects associated with various rigging systems for both portable and permanent installation applications.

The primary concern for anyone flying a loudspeaker system should be safety, a consideration which begins with the loudspeakers themselves. Most of the flyable loudspeakers available from professional loudspeaker manufacturers have been designed and rated for overhead suspension. However, there are structural limitations to any loudspeaker with rigging hardware, and it is always a good idea to ask the manufacturer for a copy of the certification on the loudspeaker prior to rigging. For touring rental companies, a copy of the certification on the loudspeaker system and the rigging hardware system should accompany the system at all times.



Modular Grid system manufactured by ATM Fly-Ware. Photo courtesy ATM Fly-Ware, Carson, CA USA.

RIGGING HARDWARE

Loudspeaker attachment points will vary from manufacturer to manufacturer. Therefore, most loudspeaker rigging hardware systems are not compatible. However, there are a few common rigging hardware designs that are worth reviewing. Perhaps the most common rigging hardware system in the marketplace today is the aircraft cargo control panel fitting. This type of hardware has been the most implemented hardware in the past, however new loudspeaker designs have moved away from the aircraft cargo control panel fittings. Another common form of attachment hardware is the aircraft cargo control track. Here again, new loudspeaker designs are moving away from this type of hardware. The newest type of loudspeaker hardware system is the threaded hole or nut plate system. This type of hardware enables the user to choose how to attach to the loudspeaker depending upon the specific use of the loudspeaker system (see Figure 1, on next page).

With most flyable loudspeaker enclosures, the external hardware component is fastened to an internal enclosure brace which helps to distribute stress through the loudspeaker enclosure. In some cases, the internal brace is the rigging hardware attachment point. Internal braces are usually small corner plates which distribute load from the top and bottom surfaces of the enclosure to the side panels of the enclosure. Internal braces can also be tied together so that loading is transferred through the enclosure via the through-enclosure bracing rather than by the enclosure side panels. With through-enclosure braces, the loudspeaker enclosure only needs to support its own weight rather than the weight of each consecutive loudspeaker below it.

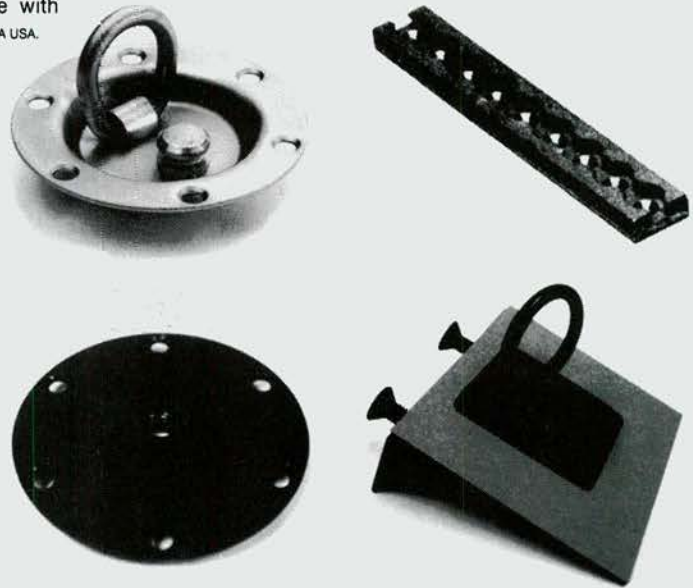
As a general rule, the loudspeaker enclosure bracing and hardware is very strong and the weak link in the loudspeaker enclosure can be found in the joinery and/or material used to construct the loudspeaker enclosure. For this

reason, it is important to know the working load limit of the loudspeaker enclosure, and what design factor the working load limit reflects. Most professional loudspeaker manufacturers calculate loudspeaker enclosure working load limits utilizing at least a 5:1 design factor. This means the point at which the loudspeaker enclosure breaks is five times greater than the working load limit. When considering working load limits, assume that the enclosure is suspended from only one point, this way if all other points fail, the enclosure will not fall. Also, if the enclosure is tilted at a severe angle, it is possible to have all of the load concentrated on only one of the enclosure suspension points.

The 5:1 design factor applies to all of the rigging hardware outside of the loudspeaker enclosure as well. It is the responsibility of the user to make sure that the design factor is adequate for every aspect of the rigging system: this includes the loudspeaker enclosure, the rigging fittings, the suspension truss, the steel cables, the fasteners, and the attachment to the structure. It is for this reason that hardware with working load limits stamped onto the part should be used whenever possible. If the hardware does not have a working load limit or ultimate load strength stamped onto the part, a copy of the certification for the part must be in the possession of the rigger when the parts are being used. This is particularly important for rental companies since certain venues concerned with liability issues are beginning to refuse rigging productions if these minimal requirements are not complied with.

Other safety factors associated with rigging loudspeaker systems include suspension of the loudspeaker array, load distribution, and suspension hardware. Much of the time the venue riggers will handle all of the rigging requirements down to the array suspension hardware. However, the house riggers will rely on the rigging hardware and equipment provided by

FIG 1: L-R; Kinedyne Ring and Stud pan fitting. Brownline Seat Track (AKA L-Track), Nut-Plate fitting, ATM Fly-Ware OSRIBI Internal Brace with OSRVI-3/8" fitting. Photo courtesy ATM Fly-Ware, carson, CA USA.



the rental company, and this hardware and equipment must be kept in excellent condition. While the venue riggers are charged with the task of safely suspending the loudspeaker arrays from the building structure, it is a very good idea for the individual in charge of the sound system to keep an eye on the riggers performance. Do not make the mistake of assuming that a rigger knows what he/she is doing just because he/she is doing it; many riggers have a lot of experience at doing the wrong things. To learn more about rigging, one can contact entertainment rigging supply vendors and inquire about rigging books and instructional courses. Also, one could partake in the ticketing program available in Australia, although this program is designed more for the construction industry. *(Still worth doing according to some I know. -Ed)* It is worth noting that only ticketed riggers are allowed to perform rigging tasks in Australia, although non-ticketed individuals can give instruction and guidance.

Some of the equipment that is of particular importance to the safe and reliable rigging of loudspeaker arrays includes; wire rope assemblies, shackles, locking steel carabiners, synthetic rigging slings, sling links, chain motors (hoists), motor distribution and control, safety harnesses, belay ropes and fittings, and pulleys. As a general rule, the lower cost items should be routinely inspected and discarded when they look worn or no longer perform their task properly. The higher cost items, such as the chain motors and motor control, should be routinely inspected and re-worked to bring them back up to specification. Some common areas of damage include; kinked, rusted, or stretched wire rope assemblies, shackles with widened jaws or pins that do not turn, carabiners without locking gates, synthetic rigging slings with holes worn in the cover or stiff sections within the sling, ropes with fibers torn or cut, and pulleys that wobble or rub.

As a result of continued market demand, rigging systems have become a necessity for the professional sound reinforcement company. The benefits of rigging loudspeaker systems is clear for the promoter of an event when one considers sight lines and seating availability. However, the practice of flying the loudspeaker system can be equally beneficial to the sound company if the rigging hardware system is thought through and performs well in many situations. Loudspeaker rigging system flexibility and ease of installation is of extreme importance. In many instances, a little extra funding to purchase the right flying hardware system up front will save a tremendous amount of aggravation and additional expense in the future.

SUSPENSION SYSTEMS

One of the more important user features of a loudspeaker flying hardware system is the ability for the system to control the loudspeaker within the array. While there are many variations of loudspeaker array suspension hardware systems, there are two basic types of suspension systems; the grid truss, and the modular truss.

The grid truss system is often found in the large scale touring product on marketplace (see Figure 2). This type of system works well for large concert work since it is quick to set up and reasonably cost effective for large loudspeaker arrays. However, it does not work well for smaller venues or productions which require sound system modification from venue to venue. The grid truss system usually incorporates some type of adjustable pull strap in order to tilt the loudspeakers column by column in the vertical plane, hence the grid truss system is termed a vertically configured system. The horizontal splay angle between columns can be varied by moving the grid truss suspension points around, or in some instances the grid truss will have a swiveling bar for each column of loudspeakers. It is important to note that grid truss systems are usually not utilized when severe tilt angles are necessary from the loudspeaker array since the grid truss becomes very large in order to accommodate the space the loudspeaker enclosures need to occupy. The modular grid truss system is a variation of the traditional grid truss. With modular grid truss systems, the user is able to add as many columns of loudspeakers as the venue may require, and the splay angle becomes fixed between each column of loudspeakers. Modular grid truss systems are usually a great deal smaller than conventional grid truss systems.

The modular truss system is the most recent advancement in loudspeaker rigging hardware systems (see Figure 3 on next page). The modular truss system is designed to hold a group of loudspeakers together rigidly in the horizontal plane, hence the modular truss sys-

tem is termed a horizontally configured system or planer system. Each loudspeaker in a modular system is treated as an individual module which can be assembled to the whole array in any position. Since each loudspeaker module is identical, the removal or addition of a module is simple and predictable. Each of the loudspeaker modules is held together in the horizontal plane with the use of connecting bars which can be a fixed splay angle or variable, depending on the design. Once a group of loudspeakers is held together in the horizontal plane, the entire group can be tilted without the use of additional adjustable pull straps. This is achieved by manipulating the center of gravity with the suspension points for the row of loudspeakers. By moving the suspension points toward the rear of the loudspeakers, the entire row of loudspeaker will tilt downward, and vice versa. Another feature of the modular truss system is the inherent wavefront coherency. Since the loudspeakers are held together in the horizontal plane at a fixed distance in space, the wavefront across the horizontal plane is coherent. Also, the modular truss system will allow adjustment of the vertical acoustic wavefronts when multiple rows of loudspeakers are arrayed.

LIABILITIES

A loudspeaker rigging hardware system that works well and looks good is a very beneficial asset to the sound reinforcement rental company and installer. However, there are many liability issues that are attached to the process of rigging loudspeaker systems. Firstly, there is a legal responsibility for the owner and user of the loudspeaker flying hardware system to ensure that the system is insured, safely designed and constructed, and that the system is used safely and appropriately. Insurance for a rigging system can be expensive, but it is a necessity for both the owner's and client's protection. The safe design and construction of the rigging hardware system is also critical.

(continues over)

Mark Collins

Australian Friends of Mackie



Winner of the 'USA Rocky Mountain Banjo Competition', Mark has been associated with Golcush, Emmanuel Brothers and Fargone Beauties. Recording credits include Rennie Wood, Dragon, Tommy Emmanuel, Slim Dusty and Walt Disney Productions. He is currently putting a band together with singer, songwriter Kevin Bennett.

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FLYING LOUDSPEAKERS (cont)

One must remember that any rigging system is only as good as the weakest link in the system. Many equipment failures can be avoided if the rigging hardware system is designed and then certified by a structural engineer, and if the builder is a professional fabricator with the proper equipment and knowledge to produce structural assemblies. Even if the system is designed well, built properly and insured, the ultimate success and/or failure will rely on the user and assembler of the system. This area is often overlooked by sound reinforcement rental companies and installers. As discussed earlier in this article, it is not the responsibility of the rigger to implement the rigging hardware system safely, ultimately that responsibility belongs to the owner and/or user.

Another liability associated with loudspeaker flying hardware systems is the cost. Assuming the process is done correctly, flying loudspeaker systems is not an inexpensive venture. On average, a loudspeaker flying hardware system will cost between 10%-25% of the loudspeaker cost. As this article has discussed, it is not worth trying to cut back on the cost of the loudspeaker flying hardware since it can inevitably cost far more in the long run: in fact, a tragic accident will most likely put a company out of business. Flying hardware systems are an investment for the future: a company should not purchase a loudspeaker flying hardware system until the finances are there to do it right. Many companies will attempt to design their own rigging hardware systems thinking that it will save money, however it usually costs a great deal more than buying a flying hardware system from a reputable manufacturer. Once one considers all of the research and development (since the systems seldom work the first time), structural analysis and engineering fees for the certification, manufacturing costs for outside vendors with certified welders and fabricators, finishing costs, and destructive loading tests it becomes apparent that the cost of constructing a proprietary system can be in excess of 150%-200% of market available flying hardware systems. Another hidden cost is found when the company needs additional loudspeakers for a large production, however the sub-rental company operates with a different flying hardware system. As discussed earlier in the article, most flying hardware systems are not compatible; therefore the company needs an additional inventory of flying hardware in order to accommodate the occasional sub-rental. Standardization of a popular rigging hardware systems between rental companies is a much more economical option.

THE FUTURE

The future of the professional loudspeaker production industry holds a great deal of advancement for loudspeaker flying hardware systems. However, the industry must be careful and act responsibly in order to protect the industry from government regulation and restrictions. Sound reinforcement company owners need to work with loudspeaker manufacturers and rigging hardware manufacturers to exchange information and partake in training seminars.

Loudspeaker manufacturers have begun to cooperate with rigging manufacturers in order to provide cost effective and safe solutions for the users of their products. The future will bring more standardized products and hardware for flying loudspeakers. The future will also bring new materials into the rigging business. The advent of modular truss rigging hardware systems has opened new doors for lightweight materials such as fiberglass and polymeric plastics.

The computer age will also touch the loudspeaker rigging industry. It is conceivable that servo motor driven loudspeaker flying hardware systems will work in conjunction with computer simulation and control software in order to steer loudspeaker arrays and optimize loudspeaker array performance from venue to venue.

As the field of loudspeaker rigging becomes increasingly more important, there is a large

potential for innovative solutions to complicated problems. Be assured that loudspeaker flying hardware manufacturers continue to look for new flying hardware systems that will add safety and efficiency to the practice of flying sound reinforcement systems.

***ANDREW T. MARTIN** is President of **ATM Fly-Ware**, from Carson, CA USA. In Australia, ATM are represented by E.S.A. Audio, call (03) 562-4602, fax (03) 547-6683.

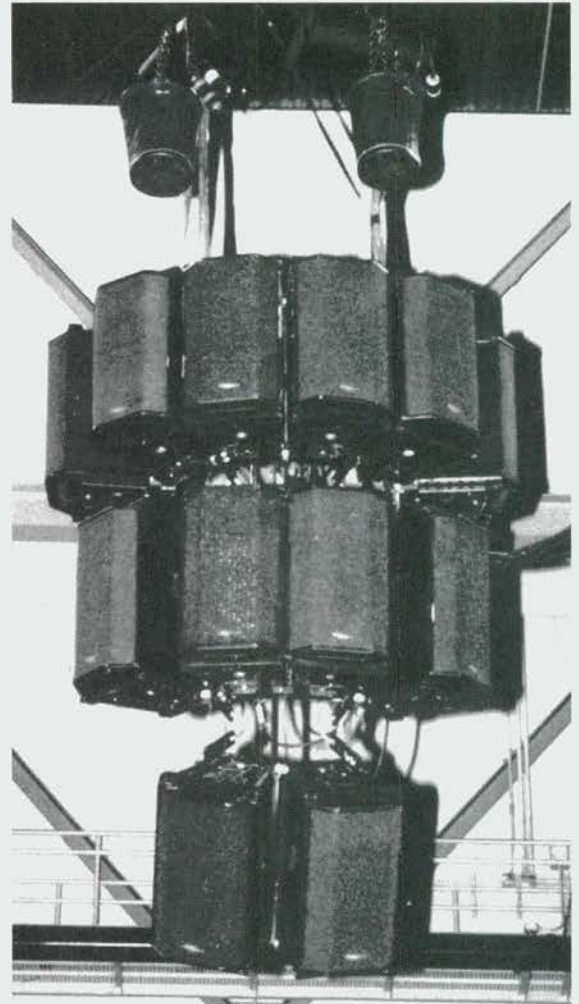


Fig 3. Modular Truss system from ATM Fly-Ware.
Photo courtesy ATM Fly-Ware, carson, CA USA.

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What is MIDI & how does it work?

part eight

MUSICAL INFORMATION TRANSMITTED VIA MIDI

Channel Messages (continued)

a. Voice Messages.

Note information is the most basic, it simply says which key was pressed, when it was pressed, and when it was released.

A **Program Change** is used to cause the slave to change its sound. Synths, electronic pianos, and sampling machines have memories full of many sounds. With these Program Changes the muso can choose which sound to use. It is also possible to switch the memories of MIDI effects devices.

A **Control Change** can add subtle nuance to a performance, things like modulation (ie: vibrato and tremolo), hold (damper) pedal, soft pedal, and portamento. These messages are not used in all MIDI instruments - an electric piano will send and receive damper pedal info, but surely won't need portamento. The MIDI implementation chart at the back of the instrument's owners manual should make things clear for you.

After Touch. Synths and samplers can control vibrato, brilliance, volume, etc, by simply

pressing the key harder after initially playing it. This effect is called 'after touch' and can be used to transmit the same effects via MIDI to the slave instrument, which must then decide how to use the after touch info it receives.

If the master instrument has a **Pitch Bender**, the info may be sent via MIDI. Once again, the slave will decide if it wants pitch bend, and even how much it wants.

b. Mode Messages.

As mentioned earlier, MIDI has four modes, and MODE messages are used to switch the MODE of a slave. Some synths or electric pianos are in MODE 1 (OMNI ON,POLY) whenever they are switched on, so you will need to switch them to sequencer. Because of this, some sequencers will automatically send a mode message to turn the slaves to MODE 3. Turning the slaves power on first, followed by the power of the master, will often achieve the same result. NOTE: Make it a habit to always turn the MASTER on last!

SYSTEM MESSAGES

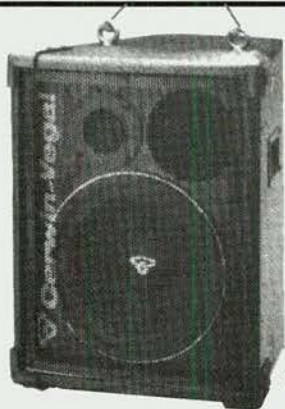
System Messages can be sent no matter how the MIDI channels of the slave or the master are set, since they are used to control the whole MIDI system, that is, every instrument connected by the MIDI cables.

For example, they can be used to synchronize a sequencer and a drum machine, so that they play exactly in time together, or to start and stop the performance, or simply to avoid MIDI system problems.

Also, there are messages called 'System Exclusive Messages' which are messages that are exclusive to a particular manufacturer, an 'ID Number' which their instruments will recognise. Any system exclusive data received with the wrong ID Number will be ignored. With Exclusive messages it is possible to transmit sounds between synths, or to change the parameters of the synth via a synth programmer, such as the PG-1000 or PG-300.

(continued next month)

Re-printed from the Roland MIDI Guidebook



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Yamaha QY-20.

"DRUM MACHINES ARE DEAD", says our reviewing duo, the Blind Lemon Pie persons

Let's face it, drum machines have enjoyed huge popularity all the way from the lowliest to the most prestigious of setups, and in many varied ways continue to do so, alas the thrill has gone. From crude beginnings the humble drum machine has almost turned full circle on itself and become a handy tool. Pass the drum machine...., Pass the pliers...., what's the difference? About the only thing that you can't do on, from, or with a drum machine nowadays is have fun with the thing.

Following on from the success of its predecessor, the QY-10, Yamaha now offer for your convenience and enjoyment the QY-20 Music Sequencer. What better way to capture a hole in the marketplace, once occupied by many models of drum boxes, than combine existing, if not ageing concepts and reinvent them. Only this time they made it small, useful and fun. The musicians Game Boy is here.

Verging on being almost the perfect size to fit in your hands, (at 188 x 37 x 104mm), the QY-20 Music Sequencer is instantly recognisable as some sort of musical device, with its 2 octave micro-keyboard along the bottom, LCD display dominating the top left and function buttons akin to both tape and drum machines on the top left.

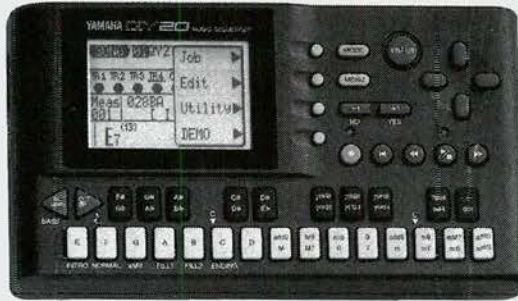
Essentially the QY-20 is a 28,000 note (approx.) sequencer with onboard tone generator enabling 100 voices and 8 drum kits. The sequencer modes, PATTERN and SONG, are an interesting cross between the familiarity of 8-track tape recording and the basic-ness of most sequencing keyboards or drum machines. The PATTERN mode consists of 100 preset patterns with a further 100 user patterns, any combination of these will later serve as a 4 track accompaniment to the other 4 tracks written in SONG mode.

In each PATTERN there is a drum track, a bass track, and two other assignable tracks labelled C1 and C2 (C for chord). These are displayed in the centre of the screen with their corresponding VOICE number and muting status underneath, surrounding this is information relevant to the pattern such as name, tempo, time signature and number of measures. By manoeuvring the cursor onto the required track the assigned VOICE may then be played on the micro-keyboard or a keyboard connected externally via MIDI.

Using an external keyboard is probably the way to go if time is precious as the micro-keys of the QY-20 are not velocity sensitive and STEP writing on any sequencer, as useful as it is, is laborious. The QY-20 does offer two PATTERN writing modes, REALtime and STEP, the realtime mode is obviously simple, press record and establish the parameters of the PATTERN (tempo, time signature etc.) then hit play and you're off. With a limitation of eight measures per PATTERN you'll sometimes find yourself rearranging the recording perspective as longer parts may be written by using available tracks in SONG mode, later on.

The need for more control over the recorded sequences will lead the user into the STEP writing mode as it is here that all the usual MIDI continuous controllers (modulation, pitch bend, sustain, volume, even LSB and MSB data entry - Least and Most Significant Byte) are made available. If you're

into the torture of STEP writing you might even like to initiate recording in this mode whereby you can set note values, velocity and style - NORMAL or



SLURred, write rests and TIEed notes.

All this appears on a reasonably easy to understand screen, though having to deal with each kind of data separately will either give you a sore finger or remind you so heavily of early Roland sequencers that you'll find alternatives to wasting so much time. To speed things up it's fastest to use the REALtime mode for recording the PATTERNS and go on to use the EDIT submode (submode!? did we just invent stupid buzz word No.44392... please no) to fine tune the information.

At some stage during the recording and editing process another submode, JOB, will crop up and it's here that the QY-20 can really save time. The ability to quickly COPY, TRANSPOSE, QUANTIZE and CLEAR a pattern or part thereof as well as modify gate times and velocities is an invaluable set of tools for such a unit. If you learn to make use of the functions PATTERN writing can become fast, fast, fast BUT... don't rush... in some of the submodes the Exit button suddenly turns nasty and becomes the Event or Delete button, .. surprise! As humorous a software design idea as this is, it's frustration or disaster potential is pretty high and due to the lack of backlighting for the LCD it is at times easy to make an error.

Where it is possible to have trouble with some parts of the display there is no mistaking the bold type showing the chord on which the currently selected PATTERN is based. If you think that sounds a little peculiar, wait there's more... the QY-20 is able to recognise certain kinds of chords. Provided the information meets the criteria needed for accuracy it can then successfully reharmonize the PATTERN into different chords. By moving the cursor to this section of the display the chord may be changed using the micro-keyboard which is marked with both root notes and type of chord.

The ABC or Auto Bass Chord system is quite a confident little feature if it's limitations are respected. When creating an original PATTERN it is best to compose in the key of C. Using the 1st,3rd,5th and 7th in the scale is another good idea as these intervals are easily understood by the QY-20. High and low recognition notes, shown when ABC is chosen from the menu, permit the user to set an operable range for the ABC system. People with an understanding of music greater than that of the QY-20 may find this feature unusable and downright irritating as this unit tells no lies about what it will and won't comprehend properly. Suffice to say, for oth-

ers the ABC system could be the answer to their prayers, making musical communication more effective and easier which in turn may, if used as a practicing aid, expand abilities.

For those who like to use factory presets of the more popular contemporary styles of music as a basis for composing will probably make the most of the QY-20's chord changing capabilities. With 100 preset PATTERNS onboard, ranging from jazz and r&b through the obligatory pop, rock and hard rock catalogue and onto some latin, reggae and world music patterns the QY-20 should satisfy you for while. You'll be even happier to find out that each preset PATTERN is actually six different PATTERNS - intro, normal, variation, fill 1, fill 2 and ending. Like an early drum machine!

A few of the 600 preset PATTERNS are quite impressive with their slick sound use and snazzy programming, and while a few of the others are pretty funny (check out No.37 it's a real rib tickler) nothing may be as amusing as the Trumpet sound of the QY-20. Despite the Trumpet problem, the onboard sounds or VOICES of the QY-20 come together as a believable enough, for all intents and purposes, standard set of instruments. This set of simulations and processed sounds include brass, strings, pianos, synths, organs, guitars etc. etc... ho hum nothing new.

The lack of esoteric VOICE selection may simplify, due to absence, a process that can often become bogged down with indecision and tinkering. After all this is a small, hopefully quick to use product that doesn't really warrant having twenty types of snare drum and ten types of electric organ. Even if the QY-20's VOICES aren't the latest and greatest they do represent a very well rounded selection for this style of device.

The VOICE 'mode' of the QY-20 is more than just choosing a sound and going for it. This mode makes it possible to set volumes, mutes and pan positions for all of the VOICES being used. It would normally be used whilst in SONG as the two modes may be toggled between as the sequence is playing. The display that appears as part of a tiny mixing console with a channel for each VOICE used in the PATTERN as well as the 4 SONG tracks is instantly familiar and a welcome change to scrolling through lists of data.

In SONG mode 4 extra tracks are ready to record parts alongside the PATTERNS that have been used to construct a composition. This is as easy as the pattern writing with both REALtime and STEP writing available in SONG mode. The methods used for programming a SONG are very similar to those used for PATTERN writing though SONG offers some extra features.

A total of fourteen JOB functions, including copy/create measure, quantize, transpose, mix track and move clock, should allow for quick programming, helped further by such EDIT features as the repeat function which is a real time saver. The track mixing capability of the QY-20 is a nice inclusion whereby two nominated tracks can be mixed onto a third track or even one of the original tracks. Likewise, the move clock function is great for slipping the time of a particular track to obtain a less rigid,

less sequencer-like feel.

Seeing a SONG through to completion on the QY-20 can be as easy or hard as the user wishes. You can quickly piece PATTERNS together in REALtime then go back and make any chord or tempo alterations and in no time flat it's almost there. Alternatively, if you need MIDI control in sequences, start programming, the QY-20 has an acceptable amount of MIDI capability though flipping between menus and parameters one at a time may become tedious. None the less an entire SONG could be programmed this way and by that stage you'd have probably used almost all of the QY-20's functions.

Yamaha's QY-20 proved to be a powerful little sequencer that isn't cluttered up with too many features. It was about as difficult to handle as a Dr. Rhythm drum machine but the additional sounds and expanded sequencing concept left almost all drum boxes for dead. The applications where something this small and easy to use would come in handy are many and varied, similar to drum machines but better. Drum machines eventually competed with each other by having the biggest, best and most functions and sounds possible until they became cumbersome, really only useful as prey for hungry samplers. By not being so complex or stubborn by design, products like the QY-20 are starting to push older designs aside.

Drum machines are dead.

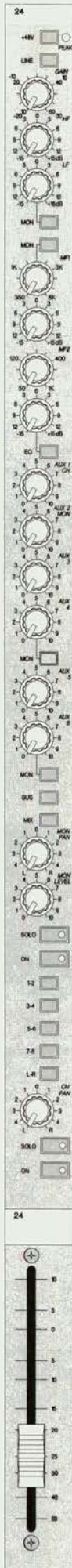
YAMAHA QY20 SPECIFICATIONS SEQUENCER SECTION

No of TRACKS:	SONG MODE= 8 TRACKS (4 x ACCOMPANIMENT TRACKS/ 4 x PATTERN MODE)
RECORD MODES:	REALTIME or STEP WRITE
PRESET PTTNS:	600 TOTAL (100 PATTERNS x 6 SECTION TYPES)
PRESET CHORDS:	25 TYPES
NOTE RESOLUTION:	96 CLOCKS per QUARTER NOTE
POLYPHONY:	32 NOTES

TONE GENERATOR SECTION

Max POLYPHONY:	28 NOTES
TYPE:	AWM (Advanced Wave Memory)
Multi-timbre Parts:	16 (with dynamic voice allocation)
PRESET VOICES:	100 PITCHED VOICES/ 100 DRUM VOICES (8 Drum kits)
DISPLAY:	128 x 64 DOT LCD SCREEN
CONNECTORS:	OUTPUTS= MINI STEREO JACK/DC in/ MIDI IN & OUT
POWER SUPPLY:	6 x AA BATTERIES (Alkaline) / OPTIONAL AC ADAPTORS
RETAILPRICE:	\$1,095

Thanks to Turrumurra Music for the loan of this demo unit !!



SOLO LOGIC MIDI AUTOMATED PRODUCTION CONSOLE.

Reviewed by Dave Macken & Bruce Waite,
from Blind Lemon Pie studio.

When purchasing a console for the purpose of recording studio operation it was, until a few years ago, a big freak out if someone actually had some sort of automation. This is unless their studio was of the corporate nature with a couple of finance companies in tow. Now as we leave 1993 and enter 1994 the situation is fast turning around to the point where prospective clients and/or engineers are coming out with comments which sound more like "Oh! You don't have an automated console. Hmm!" The raw fact is that automation is reaching further and further down the price line everyday. Helping to prove the point is the Soundtracs 32 channel "Solo Logic", this months offering supplied by distributor, Amber Technology, of Sydney.

The first noticeable feature of this desk is the physical layout. Colour is very basic and makes the console sub-sections very easy to distinguish, the spacing between the controls is somewhat smaller than previous Soundtracs' yet the manufacturer has clearly managed to avoid making one of those products that's so cleverly minituarised that you need to be sober and non-myopic to use it. All switches available to the MIDI patch parameters are coloured red so as to avoid confusing them with any manually operated selectors. At first the other controls seem to be a little whacky with their alternating colours but, as usual with Soundtracs, aesthetics have been blended well with practicality.

Metering is constantly available for the input rails and is presented in the form of LARGE 10 segment LED ramps with loud and clear silk screening for level reference. These 32 peak meters are housed, along with the L,R/SOLO meters in what the manufacturer refers to as the "meter pod"! Channel meters are pre-fade whilst the master meters are post-fader, post solo selection. Each channel also has its own single peak input LED right up the top of the channel next to the input gain control.

EQ: Aside from the automation, this console has many handy analog on-board features. Supplied with the now seemingly mandatory 4 band EQ with sweepable mids the SOLO LOGIC also allows fully split EQ configurations to be employed within it's "in-line" channels. To explain further, it is possible to assign either the Hi and Low controls and/or the Para-Mids to your choice of the main channel-to-tape path or the monitor path. This is good !! What is not so good with the EQ is this...the Hi control is a shelving type set for 12kHz upwards and yet the Hi-mid frequency selection (the next band down) is only capable of reaching 8kHz with a fixed 'Q' of 1.5 (filter width) so it is perceivable that you may find it necessary to insert an extra EQ unit in the channel path from time to time.

In Line: Solo Logic consoles are configured with what is commonly known as "in-line" channel paths. This is where each recorder track can be sent to directly from the corresponding channel and then be simultaneously monitored through a "tape in" socket on the same channel via a separate rotary level control. If you were to use these tape in sockets as extra line inputs it would then be possible to achieve a mixdown capability of 64 channels each with at least two bands of EQ and also insert points on 32 of these channels. Another handy routing

Solo Logic Console

(continued)

feature is the ability to "bus" channels (in sets of eight) directly to the bus out sockets for easy on board track access although, depending on your patch, consoles used in this fashion can limit you to recording eight tracks at one time!!

AUX: Auxiliary sends number a total of six and here again Soundtracs have come up with a great multi-solution arrangement. All six auxiliary sends may be internally set to pre or post fader on a channel by channel basis. Derivation of signal varies from Aux 1 to Aux 6 whereby the first Aux is permanently derived from the channel path, the second comes from the monitor path and the last four, in sets of two, are switchable between channel and monitor. Further to this a link switch on the master section enables Aux 1 and 2 to combine thus making cue-ing mixes much easier to construct between recorded tracks and incoming lines which have yet to be recorded. On top of these features there is a MIDI mute switch available for each auxiliary master so you can turn on and off effects at their input as well as muting them upon their return.

RETURNS: Speaking of effects returning to the console: the Solo Logic is fitted with four stereo effects returns each with a two band shelving equaliser, a send to auxiliary one, solo, pan and again a MIDI mute button. Usually with consoles of this nature the FX returns are permanently assigned to the stereo mix faders yet here the manufacturer has used four switches to quite capably increase the FX routing. For example the first stereo return can, by pushing a button, be routed via groups 1 and 2 instead of straight to the mix. As follows the second return can be to group 3 and 4 and so on. Each of the eight sub-groups also has its own insert point, pan, solo and MIDI mute control as well as a switch which allows the group to be used as a bus output with or without letting it's signal be heard at the master faders.

This pretty much covers the layout of the console apart from the post-mix features. (no not a cheap hotel soft drink appliance!) There is an independant set of control room outputs for the engineer and these are of course interrupted by the PFL (pre fade listen) or IPS (in place solo, which allows you to preview the fader level and the panning of a source.) Calibration of gain paths can be achieved using the on board test oscillator which doubles up with the on-board talkback mic to enable routing to various places including the sub groups and the studio monitor outputs. Studio outputs are basically a copy of the control room outputs however they are not interrupted when



'solo-ing" any particular channels etc.

Of final interest in the master section is the inclusion of two pairs of two track return inputs for monitoring outboard stereo tape machines. Selecting these can, for instance, let the engineer listen to the outputs of a stereo mixdown recorder as it is recording the mix.

AUTOMATE: Combining external MTC (MIDI timecode) with the on-board mix memory seems to be the most efficient way we could find to automate this console. We tried a number of the manufacturers suggested hook-up's yet none served our purpose, so using the many syncing options we created our own "hook up". The automation is very simple to operate and if you have used any main stream automation system you would probably immediately recognise the functions and menu options because it's all very British.

Onboard song files are created and can contain all of the mix data for a song as well as the desk settings for the song such as the engineers choice of "soft-grouping", where one fader can control up to eight faders. The current time point is displayed in the LCD window and runs from zero in intera mode using the Logic's own FF,REW,PLAY, REC buttons. Otherwise you can run from the current time point of a sequencer when set to track external time. Mix data can be recorded in real time to a sequencer for miniscule editing but if you're not familiar with this method then it is best left alone as it complicates basic tasks, rather, song files created with the desk are better saved to your sequencer as bulk dumps. The Solo Logic has a further external mode which allows the automation to be operated entirely from an editor page within a suitable sequencing software package and this works

well although the quality of your editor could affect the accuracy of the VCA's and again the desk runs best using it's own internal memory and CPU (central processing unit)

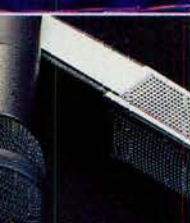
SOFTWARE: As far as the actual events you can create using the options from the menus the Solo Logic operates on much the same principle as recording and updating data to a software sequencer. The user can simply



record a mix on the first part and then go back to any point and overdub or "Trim" the existing manoeuvres. These procedures can be performed on any or all of the automated controls which include individual mutes for both channel and monitor paths. Global settings are available to allow quick engagement of modes across the board and yet to the other extreme individual faders can be isolated so they are non-automated within an automatic mix scenario thus letting the engineer practice moves and mutes without interrupting recorded mix data. New data can be inserted over old data and large red and green LEDs beside each fader allow easy recognition of channel status.

Many sub menus are available for addressing the two independant sets of MIDI ports, a great feature allowing syncing on one port and data transfer on the other, as well as a full

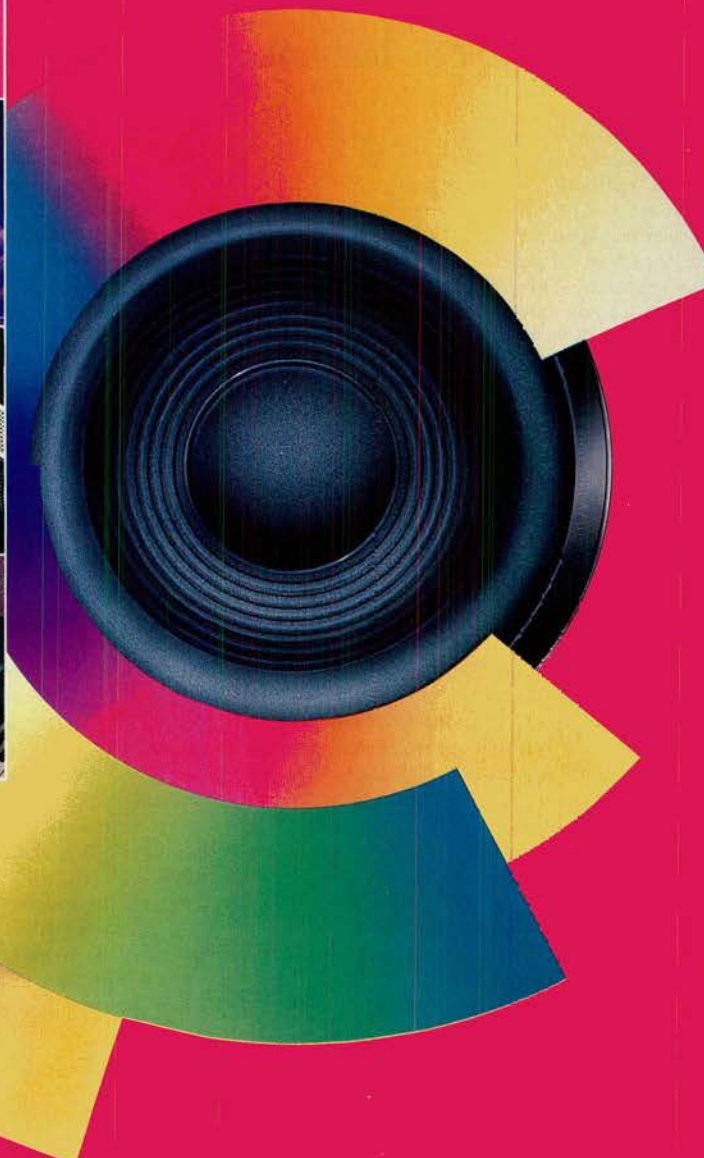
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Solo Logic Console

(continued)

range of system menus which even go as far as to allow the engineer to set his/her * own preferences for the speed at which the data wheel enters increments. (*worded hoping not to offend the persistent feminist who keeps writing in all the time). (Editors Note: I/we enjoy reading letters from our readers, including one Sheila Yates who is our conscience)

Ultimately the supplied updatable software features are all one could ask for in this price range and the most important thing about this system is that it really works to what can be deemed a professional standard and surely the manufacturers timely choice to include a port that talks to ADAT transport controls in sympathy with the consoles own set of pseudo-transport controls will attract a great number of buyers. This function does not, however, synchronise the ADAT and this must be done using a further MTC converter of some kind.

Oh. It's only a shame we couldn't do a whole mix on the desk as the whole desk wasn't operating to full capacity. Unfortunately the particular console we were given to appraise had only three channels which would send signal successfully to the master and group busses. It must be pointed out that these three channels indicated that the automation does perform smoothly and accurately without the annoying "stepping" found on some lower resolution VCA fader circuits. The EQ also yields smooth results and sounds quite unchanged from the EQ on our own previous model Soundtracs desk.

In all fairness it should be pointed out that the importer despatched a technician to our address as soon as their representative heard of the consoles' malfunctioning status. This aside, it does make us wonder when a product submitted for appraisal by a wholesaler hasn't been sufficiently fault checked by the very people who hope it will receive a glowing review! This is surely just an isolated case of some nature of component failure as we at Blind Lemon Pie just know that there isn't a wholesaler in the whole wide world who ships unchecked products..... true!!

SYNTH CONCEPTS



New Synth Technology ... wake up!

By Karl Seglin

Yamaha Music Australia has unveiled an entirely new sound technology employing **Virtual Acoustic Synthesis**. The organisation will shortly be launching the first synthesiser to employ **Virtual Acoustics (VA)**, a physical modelling system which generates waveforms by way of a computer model of the physical characteristics of actual instruments.

Virtual Acoustic Synthesis applies the science of computer simulation of reality to sound, much in the same way computer models are used to simulate weather systems or the flight characteristics of aircraft. VA simulates in software the very complex vibrations, resonances, reflections and other natural acoustic phenomena that occur in a real acoustic instrument. While this method of sound generation had previously been impossible in a real-time situation, Yamaha research and development in a computer based physical modelling since 1987, combined with recent advances in computer processing power and speed, have made real-time Virtual Acoustic Synthesis a reality.

Every nuance of an acoustic instrument, from its shape and size, or the pressure applied to a reed or mouthpiece, is contained in the model. These parameters cause the virtual instrument to vibrate air when played, with the resulting complex waveforms all generated via the software model. The VA model simulates the complex acoustic activity that occurs when an instrument is blown, plucked or bowed or hit, responding to subtle changes in lip shape, air pressure and playing technique.

The first Virtual Acoustic Synthesiser, the

Yamaha VL1 (standing for Virtual Lead), is scheduled for release in Australia in March 1994, and will feature a VA subset called S/VA (self-oscillating VA). S/VA is ideal for simulating instruments that vibrate through the continuous application of a constant pressure - namely wind and bowed string instruments. It has no oscillators, no pre-set waveforms and no samples - in fact, none of the sound generation concepts employed in conventional synthesisers.

Physically, the VL1 is a performer's instrument, best suited to solo performances, and is equipped with a 49-note keyboard with two-note polyphony and an integral breath controller. The VL1 is said to be truly responsive and 'alive', offering an unprecedented level of music expressiveness and realism. The VL1 provides the performer with control over the subtle nuances which affect the instrument's timbre, such as the effects of note-to-note transitions and breath or reed pressure.

Since VA stores mathematical models of real instruments, this data can also be used to create virtual instruments that couldn't exist in the real world - a bowed saxophone or blown violin, for example. Creating new instruments is simply a matter of defining the appropriate characteristics, its size and shape, the type of reed or bow, the length of the sound column, and so on. Using a combination of the keyboard, breath controller, foot pedals or other controllers, a musician can then play the instrument as expressively as if it physically existed.

For further information, please contact Peter Logan at Yamaha Music Australia by telephone on (03) 699-2388, or facsimile on (03) 699-2332.

SOME SOLO LOGIC SPECIFICATIONS

MIC NOISE: -127 dBu
LINE NOISE: -93dBu
MIX BUS NOISE: 24 channels = -80dB
 /32 ch = -77dB
GROUP BUS NOISE: As for above spec.**
AUX BUS NOISE: 24 channels = -80dB
 /32 ch = -78dB

**The above 3 specifications were measured (by the manufacturer) using all input faders and AUX sends set to infinity with the respective masters set at unity. "dB" is a rating

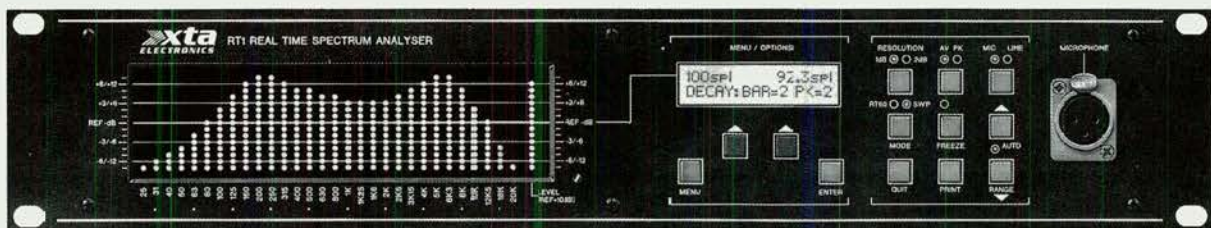
based on a reference to the particular voltage at that point within the circuitry. The above 5 specifications were measured using a 22Hz to 22kHz filter with an average responding meter. The manufacturer also supplies more info on the above spec's.

FREQUENCY RESP: Mic or Line to any output = 20Hz- 20kHz: =0dB/-1dB
MUTE CROSSTALK: >90dB

FADER CROSSTALK: >90dB
ROUTING CROSSTALK: >90dB
AUXILIARY CROSSTALK: >80dB
ADJACENT CHANNEL CROSSTALK: >90dB
HARMONIC DISTORTION 0.02%
RETAIL PRICE: 24 ch: \$25,995
 32 ch: \$29,900

Distributor: Amber Technology,
 call (02) 975-1211.

THINGS WE'VE LOOKED AT RATHER THAN REALLY TESTED



XTA RT1 Real Time Spectrum Analyser

Quick Non-Test by Julius Grafton

A real time spectrum analyser is what you use when you need a second opinion because you secretly don't *REALLY* believe what your two dear ears are telling you. They also come in handy for impressing non practitioners and customers, if you run an installation business. With that disclaimer written, we decided to have a quick look at the RT-1 analyser from XTA electronics.

This 2 rack-unit tall device is made in the UK and finished neatly. The packaging is OK, it comes with its own reference microphone that boasts an almost flat response curve if the test slip packed with it is dinky-die. You also get a shortish mic cable and a reasonable 15 page manual. We decided to measure the long suffering Grafton family hiFi, made up of a vintage Rotel bipolar

speakers with Peizo high end help. Non glam, but The Standard we use here!

The internal Pink Noise generator feeds an XLR output, with a gain control. Firing this into the Rotel and looking at the results indicated - Flat Response. NOT! 80hz (ahem) at -4db was a whopping 10db down on the peak frequency, which is 630hz (reading +6db), and the rest fared just as you'd expect on a visual representation of a rollercoaster ride! 1k6 was an embarrassing -2db, and another ugly peak hitting +5dB was 4kHz.

With the standard Grafton EQ applied to the stereo, things just got much, much worse. Now we are boosted nicely at the low end of the range, but the dip to 1k6 became 14dB less than the peak, or -7dB. The overall consequence of the test is a bad news deficiency of the important mid range vocal enhancing fre-

quencies in the Grafton hiFi. Such is life.

The RT-1 has a sweep function that produces a sine wave oscillator output that sweeps at 1/12th octave increments. Yes, the RTA display is a ramp of LED's in 1/3 octave increments, so you wouldn't see the results of such a tight sweep, but a menu/option LCD window gives you more finite readings and control. You can print the plot too, but only four printer configurations are included, which tend to suit dot matrix or bubblejet printers like the BJ-10. Our laser printer wasn't too happy, but you'd probably not choose to travel around with a laser printer anyway.

Your plots can be stored to one of 32 memories and recalled for future analysis, and you can read SPL and do reverb time measurement too. Retail: \$5626 inc tax, from Studio Connections, (03) 723-4300.

Alesis Monitor One

Quick 'Non Test' by Julius Grafton



Near field monitoring in your typical larger studio is often also the main kind of monitoring in smaller project studios. Alesis figure the hoards of happy ADAT-ers out there will readily gobble up their new Monitor One product, and on a quick listen we think they may well be right.

While these 6.5" woofer/1" soft dome tweeter loaded devices have a dip in the 125 - 200hz and 2k5 areas, (in my listening room) nearfield monitoring is designed not to provide flat re-

sponse, but a fair representation of a listeners stereo. The Monitor One does this very well, and actually sound very nice too. The SuperPort™ venting device at the rear lays on plenty of bottom end for a smallish speaker cabinet, and the claimed power handling capacity of 120w (program) is probably realistic.

The Monitor One measures 15" wide and 8.5" high, and is covered in a non slip 'grippy' kind of rubber so it will sit where it is sat.

Unusually it is a 4Ω cabinet, which will load your amp a little harder thus delivering a little more output. The high frequency rolls out at 14khz, (down about 3cB) which is about where my ears stop these days, so this is quite acceptable. Truly it is. Listen for yourself!

Mirror imaging is achieved by the simple device of putting the sticker on the other side of the second speaker, so you do have a matched pair straight out of the box.

The retail price is \$1099 they should sell well we think. Call the Electric Factory for more details. (03) 480-5988.



JBL Sound System Design Reference Manual

We have discontinued this designer series at Part 14 in the last issue. Jands (JBL importers) have the whole manual available for a very reasonable fee. Had we continued at the pace we were, the series would have concluded in 1997! Thank you JBL for allowing us to publish it to date.

For a complete manual, send \$20 to:

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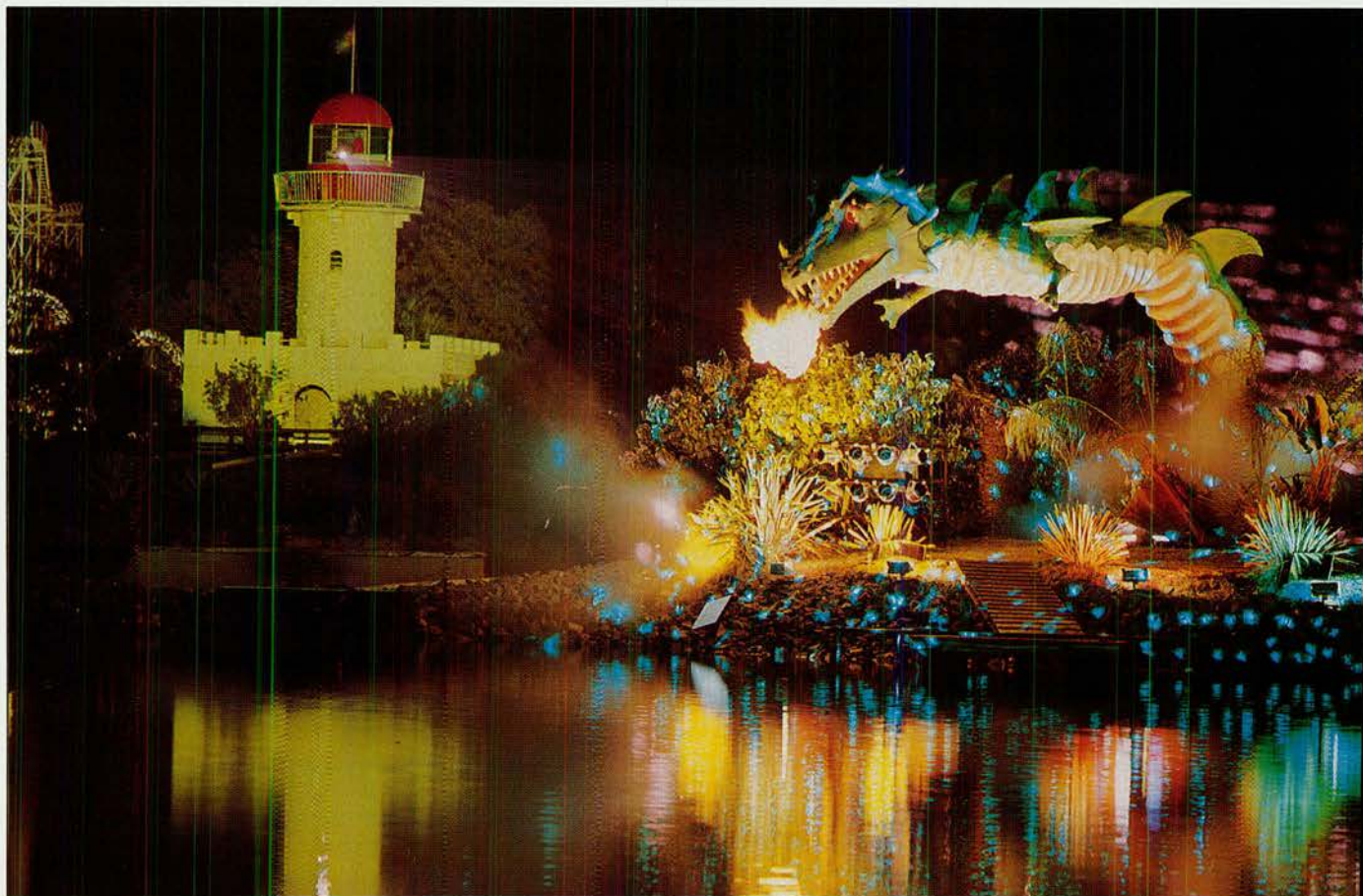
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WRITE IN READER SERVICE NUMBER 123



TCP Lasers Slay Serpent At Seaworld

Catriona Forcer meets Flippa and has fun in the sun as TCP crew slave day and night.

Well they work 15 minutes each night - but they are still very busy!? Read on

In April 1993 Sea World realised that the ride they had been planning for the peak summer season was not going to open in time (due now to open in April 94) and so they wanted something spectacular to attract the crowds of holiday makers. Their Chief Executive Officer came up with the idea of a light and laser show and Sea World set about finding if such a show was available in Australia. Originally they thought they would have to go to America to find such a show but the presentation put forward by Total Concept Productions was, to quote, 'unbelievable' and the job was theirs.

TCP returned in October with further ideas and Sea World were apparently thrilled with the progression.

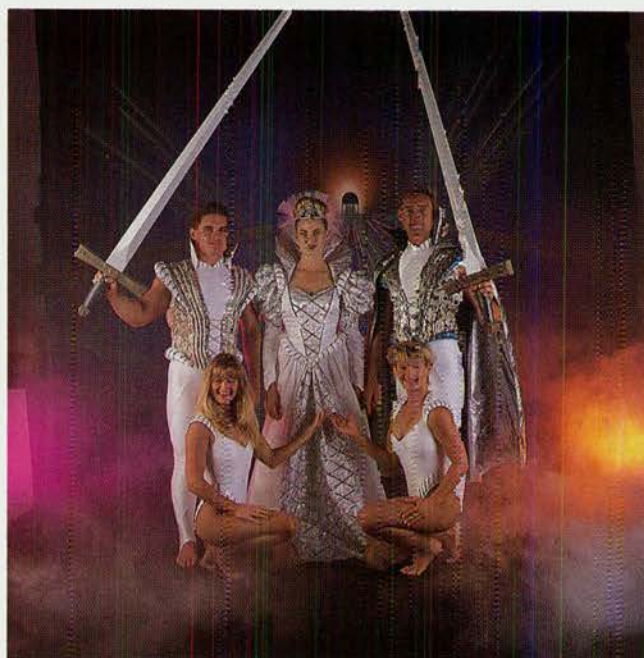
The show is basically a way of using Sea World's amazing water skiers for another type of ski show but with a twist. It is set on the ski lake and the island that is centrally located within it. The script is a story set on an island where a group of people, who have sur-

vived after a future nuclear holocaust, live. A huge sea serpent appears and snatches their princess who then has to be rescued. The show takes place every night at

7.30pm and lasts a stunning fifteen minutes. Audiences are dazzled by an astounding array of lights, lasers, pyrotechnics and a rather loud sound system. There

are skiers with fireworks coming off them, a helicopter 'shooting red lasers', a fire breathing serpent and an island that 'blows up' at the end.

"They gave us the script and said 'what can you do with it?', said Phil Greaves of TCP. "I came up with the effects and when we were here for the rehearsal period beginning Dec 18th, we went through them. They chose what they liked, we modified the effects to their requirements and eventually we got the effects that we think makes the show look spectacular. Originally I wanted to put some laser animation into the show but I can't do any projections as there is no flat surface here to fire onto. I tried just putting up 'Sea World' on the far side of the island during the pre-show trials. I was standing right behind the laser looking right down the beams and I thought it looked good but the Chief Executive Officer was where the edge of the audience would be and he couldn't read a word of it! So basically the show revolves around



Fun in the sun

beams, cones, blades and the more simple stuff you can do with lasers."

Rehearsals were a bit of a disaster with Phil (lasers) and his partner in crime Raphael Buono (lighting & audio) arriving from Sydney on December 6th fired up and ready to go. As they began to unload the 100 roadcases from the semitrailer it began to rain - something that is not supposed to happen at Surfers Paradise. The guys were supposed to have three days to set the show up and then start rehearsals on the 11th but four days of continuous rain washed away those plans. The loaders that were assigned to help them turned out to be the skiers as well as a couple of guys from a local company Professional Audio & Visual Services. Between the four of them that were technical and the skiers, they eventually put the show up. Rehearsals had been put back further and further although the date of the first show remained ominously the same. The first show was due on December 23rd which was a special 'Carols by Candlelight' night.

"We worked really hard and did only one dress rehearsal with everything," Phil told me. "That rehearsal didn't exactly go smoothly and then we had a two day break whilst they did the rehearsals for the carol show with people like Julie Anthony and other local stars. The whole crew and cast had to sweat it out but on the 23rd the show went great. There were a few little things out of time but no one would have noticed because every cue has so much lee way on it."

The set up for the show is over a fairly large area around the lake shore and on the island itself. The main control tower for the lighting and sound is above the grandstand situated directly opposite the lake and island. Two towers either side of the grandstand house lighting and sound equipment. More control and equipment is on the island itself whilst the three lasers are spread around half a kilometre of shoreline. The Spectra Physics Colourshot Laser, 3.5w mixed gas Argon/Krypton with single scan Aquarius II control system, is situated behind the island at the top of the lighthouse. It has four primary colours and has to



shoot across 190 metres towards the grandstand. The Spectra Physics 2011, 7 watt Argon with single scan Aquarius control system, shoots blue and green and is situated to one side of the lake where Phil also controls all three lasers. It's main job is to provide effects on the mirrors by the lighthouse and on the western side of the island. The main laser situated FOH is the Coherent Skylight 400, 26 watt Argon with twin scan Aries II control system, which provides most of the effects onto the front of the island and down near the stage area. Operation for Phil is quite tricky as he has three keyboards to run. He had considered doing a midlink system but he would have had problems because not all of the lasers are being used at the same time.

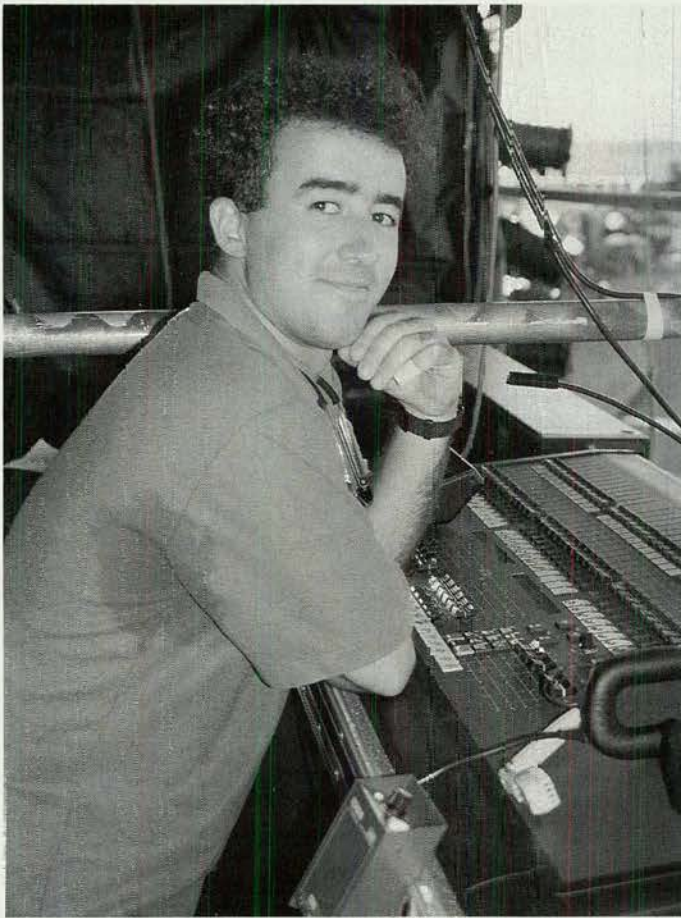
"Sometimes they are all running at the same time, then just two followed by a different two," he explained. "I could have done it but it would have been a nightmare of redesigning the control systems that we are using. So I opted for a fully manual control although another arm and hand would be useful! I can do it now without even looking at the script which is good as I don't need a hand to turn the script. The two Aquarius controllers are basically the same as an IBM computer whilst the Aries is a system all of it's own. It doesn't recognise any standard computer formats. Each controller has about three microproces-

sors in it and the keyboards control all the functions that you need. I've created patterns and stored them to presets, each Aquarius has 120 presets in four banks and the Aries has 80 presets in three banks. On the Colourshot system, I can actually visualise what the laser is doing on screen without actually having the laser on."

Power supply caused a few headaches with all of the lasers requiring 80Kw consisting of one 100A per leg 3 phase and 2 x 32A per leg. The water requirements were approximately 10,000 litres per hour of operation.

"Sea World were supposed to supply power and water," said Phil. "We were supposed to have, at various parts, so much 3 phase and so much single phase. When we arrived the power for the big laser was in because I had organised it before, there was power in the lighthouse and power where the Spectra Physics 2011 laser is situated. There was no power for the two audio towers so we had to wait for that. For the show we're using about 500,000 watts and there have been no problems since we started. With the water, we had three weeks of continual hot weather and the Gold Coast exceeded their water demand every day for the last week of that period. As a result on the second to last day of that week, we had shut down problems with the Skylight 400 laser but it didn't effect the show. We haven't had

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Raphael Buono, sound & lighting operator

anything shut down during the show, everything gets water in it but we still manage to run the show! As yet we haven't had a wash-out yet although we've come pretty close with some big thunderstorms rolling in."

Power on the island is supplied by two generators - one 35KVA to power the serpent and a 75KVA for the lighting. On the island there are sixteen TAS smoke machines and the show was designed around the expected Dec/Jan prevailing winds which were supposed to be southerlies. So far they have had only three nights where there have been southerlies! The rest of the time it has been northerlies which has caused some problems but that's to be expected with an outdoor show. Besides, Phil said the pyros supply a lot of smoke for him. The lighthouse on the far shore also has two smoke machines in it and, to stop the smoke going straight up into the air, Raph got two plastic sewer pipes into which he put two fans at one end and the smoke machines at the other end. The smoke is then at least six metres further out and rises up into the laser beams.

Although Phil and Raph worked very long hours setting up the show and whilst it was settling in, they are now having time to enjoy themselves. It's a seven day week (including Christmas day) with work starting at around 4pm checking the equipment and sorting out any problems from the night before. This leaves the guys plenty of time to explore the nightlife at Surfers!

A heady mixture of pyros, lasers, animated creatures and a cast on skis must surely result in a recipe for disaster and, although the ski-

and Movie World are owned by Warner Bros.

The sound system is 25,000 watts with six JBL Array 4892 speaker cabinets with 90° horns and eight Revolver subs with two 2225 JBL drivers for the bottom end. Added to that are two JBL System 700s on one of the towers to fill the side penguin area when a large crowd is present.

"It's a very simple being only a playback system," Raph told me. "There's one Shure microphone, a Tascam DAT, one Yamaha tape deck and CD player for background music. We're only using an 8 channel mixer. Ten Jands SR3000 amplifiers drive the whole rig and there's a JBL Control 1 monitor system. The show runs from a tape and I just add an effects CD for the serpent noise."

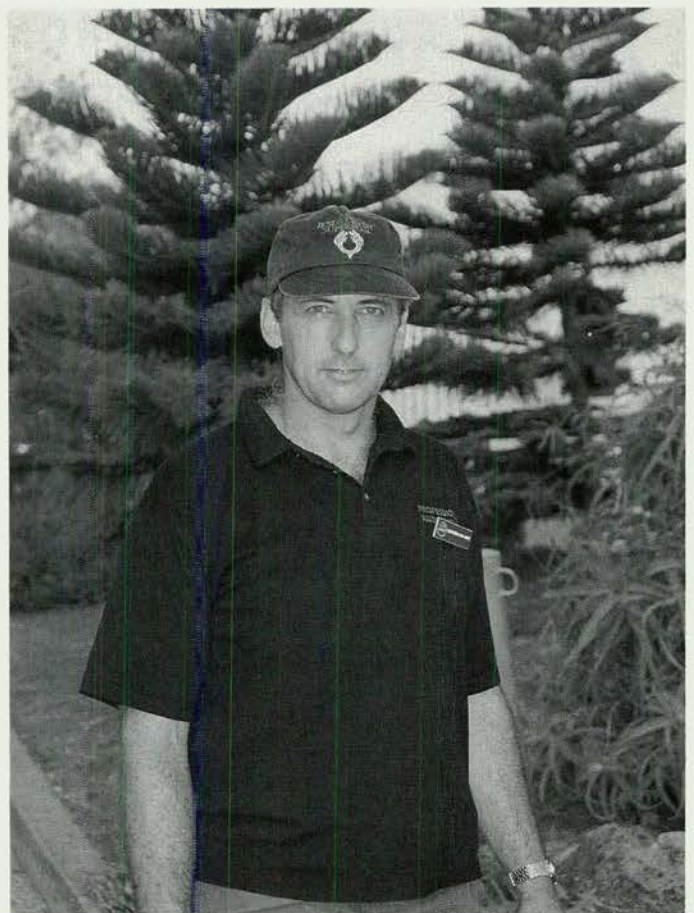
Lighting wise, there are eighteen Par64s on each of the two towers, as well as some on the roof, to wash the island area

ers occasionally take a tumble, one of the most memorable nights was when the park was set on fire during the show. The pyros on the island have to be aimed in the right direction depending on the prevailing wind and, on that night, one of the 5" mortar Starshells didn't ignite in the air. Instead it came back down onto the northern side of the island where it set the bushes on fire. It was right at the end of the show and the audience was applauding wildly at this effect whilst the crew were scrambling to get over the lake to put it out. The pyrotechnics in the show are taken care of by Movie World's own department - both Sea World

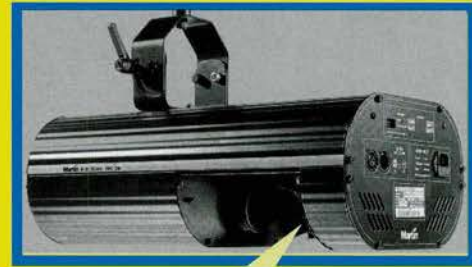
and the lake. Four 1200 MSR Coemar followspots are placed also in these positions - two on the roof and one on each tower. Staff from Movie World were trained to operate them. The system on the island is totally separate and is made up of basically outdoor, waterproof fittings. On the short side of the island there are twelve 500 watt waterproof floods to illuminate the trees whilst in the main section there are eight 1500 watt waterproof floods. Elsewhere there are another four 300 watt floods. Added to that are three white lightning strobes for the earthquake scene that shakes the island in the finale. There are also six bars of chrome ray cans which, at the beginning when the island is 'created', are set off at the same time water explosions occur. The effect is of the island rising up out of the water. Other equipment includes five Jands 12ch dimmer racks and one Showcraft DMX splitter.

"The concept they wanted on the island is that it was to be lit up but still fairly dim," Raph said. "The main point is the serpent and when he has 2 metre long flames blowing out of his mouth that really lights the island up. The followspots are running as well and there's a bit of side light from the towers. You also have to keep it quite dark to get the full effect of the lasers. If you throw a lot of light from the front you also light up the back area behind the island as well. A lot of the cues are very fast and the only constant cue is a green wash on the lake side stage area."

Originally it was hoped to run the show



Phil Greaves, TCP Laser Guru, enjoying his working holiday ...



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Fun in the sun

from one section on the lake shore by running DMX leads out to the island but that couldn't be done because the lake was so shallow the boat propellers would have sliced up the cables. As a result an operator (a lady called Kath from Movie World) was placed on the island, as well as front of house deploying radio talkback to the island whilst everyone on land uses wired talkback. Lighting control is a Jands Event 48 channel desk FOH and a ESP 24 channel desk on the island. The communications equipment is seven Esicom subs and headsets, one Esicom master, four Bendix King wireless headsets and fast charger and one transmitter base station.

"I think the biggest problem we're going to have is when we bring it all back," said Raph. "A lot of the Par cans will be destroyed from the corrosion. When we were in Sydney making up a lot of the looms and leads for the show, we were told the cables would have to be ultraviolet protected or they would fall apart in the first couple of weeks. We used standard cabling and it's been fine. Everything on the island is earth leakage protected so if there is any water in any of the equipment it'll shut down straight away. Sea World is pretty keen on safety overall and checked everything once it was installed. The only thing that really stuffs us up is the weather. If we get a northerly wind we can't turn on our water curtain

as it blows right back into the control tent where all the equipment is. All the speaker stacks have weather hoods to protect them and we have speaker leads running in the water along the edge of the lake but they've been fine. We did have to ask the speedboat drivers to calm down a bit as they were spraying the towers with water when they did sharp, fast turns! Everyday Kath has to clean all the mirrors as the days ski shows would have put salt water all over them. Between the island, lighthouse and shore there are twenty mirrors.

We actually got some water in the control equipment whilst setting up and when we turned everything on, it just went crazy with noises everywhere and things turning on and off. We thought it was water damage but in fact there was a problem with the three phase supply as it had a neutral missing."

When the princess is rescued she sails across the lake to the shore in a laser cone and as much smoke as possible was required in the tunnel to carry off the effect. The water curtain lit up the blades of laser from the shore end but if there was a southerly wind, the smoke would be blown back onto the island. To combat this, two Yes Y1 portable fog machines were placed on the barge itself. The serpent itself is constructed from a Hiab portable crane like you would find on the back of a truck and was the brainchild of a company called Australian Film Sets. The pier at the

back of the island is bolted to a concrete slab and the serpents body frame is slid over it. In that they have the cabling that supplies the power to the lights in the eyes and the propane feeds to the mouth for the flames. There's also a pipe which blows smoke out of it's nose.

The show finishes on the 23rd of January and hopefully it will be put on again as public feedback has been very enthusiastic. The American people from Warner Bros commented that the show was bigger than anything they had ever seen before. The costs incurred by TCP alone were \$120,000. On top of that the park had to be kept open for an extra three hours a night until dark although the food outlets have benefited greatly from this. Next June it is planned to produce a similar extravaganza at Movie World called 'Illuminanz' which will be based on the Batman theme. If the 'Serpent & the Slayer' is anything to go by, it should be well worth a visit to the Gold Coast. •

Many thanks to Phil and Raph of TCP for their courtesy, Thai dinner, taxi service, trip to a nightclub, several gin and tonics, meeting with Flipper and general friendliness. Catriona Forcer is available for further travel, bribes etc. But no one way tickets please! (In case you missed the hint, TCP paid for Cat to enjoy herself on the Gold Coast. Perhaps some kind propieter out there would consider a nice trip to Birdsville or Devils IslandEd.

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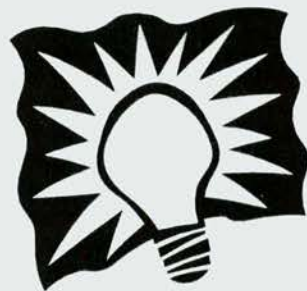
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Basic LIGHTING Course

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The Idiot's guide to basic stage lighting gets into Theatre Mode this month, where the Idiot reveals exclusively that he once lit a professional theatre show without any experience whatsoever ... and no one knew any better!

Part Five!

WHAT we already KNOW, from Idiot # 1:

Electricity: 240v, 120v and the Par 64, Series Splitting, two Par 64 = 1 x 240v circuit. Complicated isn't it??!

Idiot # 2: Rigging, hanging and staying alive, with tales about Near Death Experiences...and Near Life ones too!

Idiot # 3:.....(might become a book!) Working to a budget, sucking up to your employer, ancient effects lighting apparatus and outmoded work practices!

Idiot # 4:.... talked about Loading, being a girl, truck packing, and why these are things you can't ignore.

I lit a play once, and the cast loved me. Professionals all, they had me come to all their parties, gatherings and love ins. Being 1974, these were of the loose and uninhibited type, and I came to enjoy the esprit de corps of a performance group.

Of course I lied my way in, having not lit a real stage before. I relied on an old book, and discovered it's all quite simple if you are organised, have enough gear, cables and gels - and look like you're in control. Even when you aren't!

INVISIBLE IS BEST.

The first rule is that in straight theatre the audience mustn't notice the lighting. You are a passenger of the production, the idea is to light for mood, highlight the main active area, and operate cues in perfect time to the script. You'll need to know how to write!

My first show was almost in the round, the audience were on three sides so it was a thrust stage and the challenge was to keep the light out of their eyes. I used Fresnel's with barndoors, and hoped the front row wouldn't have kids sitting in it, or if it did, that they would be too small to realise the light was hitting them. A Fresnel has a variable soft edged beam spread from tight to almost flood-light wide, and a barndoor is used to contain unwanted spill or shape the beam.

I divided the stage into a grid, and assigned three lights per grid, per colour. The book said nothing about lighting the set, with thankfully was minimalistic. I assigned two lights for each area of the backdrop. My colour choice was good old surprise pink for daytime, (colour one) and 118 blue for night (colour two).

Sometimes you might get to use three different colours on every grid across the stage - other times the budget is stretched with one. I had a couple of specials - key lights, for slight overtones on key characters at key positions. Maybe I didn't need these?

Eight Zones = 48 lights.

With eight separate grid zones, three lights per colour per zone, so my fresnel count for this was 48 (2 lots of 24) The backdrop took another 6, and I had the two keylights. My control was a thing called a 10/20, which was a Strand monster that Did The Job. It had 10 x 2k SCR dimmers, but with a switching deal that cunningly assigned any channel direct to On (100%) through a separate fuse. This way you could double the number of 10a loads in use, to 20. You'd dim UP a channel to 100%, then switch it to direct mains. You could then use the dimmer for the second load, dealing with it before reassuming the first channel. Rough but effective!

I used it due to budget constraints, otherwise a Miniset 20 would have been needed. I had 8 grid zones for daytime, 8 for night, 3 pairs of backdrop Fresnel's and two key lights - 21 channels in all. I didn't ever use day and night together, so I could just switch these. The backdrop pairs ended up on two channels as a compromise, so my two key lights were each assigned a channel.

The 10/20 was all-in-one, a big metal console that occupied half the back of a Holden HQ panel van. The bio box was a disused goods lift in this warehouse theatre, and the 10/20 was shoe-horned in.

Fire - how to make it, the dangerous way!

The greatest thing about this production were the simulated campfires. The director didn't know how to achieve these, but I did. A 40w fluorescent starter wired across the active source to a 40w coloured bulb will make it flicker in an annoying random manner. I got a bunch of these and built a cellophane mock fire around them. The only hassle was the power cord. This I solved by running figure eight (twin flex) under the stage floor. I poked it up through a hole where the fire would go, and in a blackout got down there with my torch, hard wiring the thing in. Of course the power was off!

Don't try this at home! The other hassle with the fluoro starter is the belching and farting that afflicts the audio system while the

thing is flick-flick-flicking away. Lucky we have audio crew to sort out their own problems, isn't it? The dimmer buzz they used to make back then also proves that today's audio is way advanced compared to yesteryear! Not my problem, bucko!

Two things you need to be sure of before you race out to light a professional production. Have enough cable, and a pre-determined cue sheet. Have fun!

PS: Did I make it clear that the desired minimum lighting state for each area of a stage is 2 lights, hung about 45° elevation and 45° apart? This gives some depth.

See you next month if I make it!

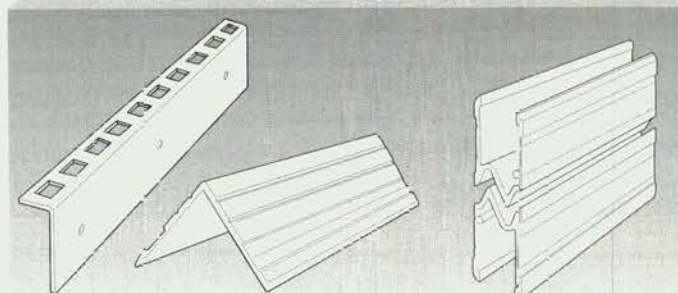
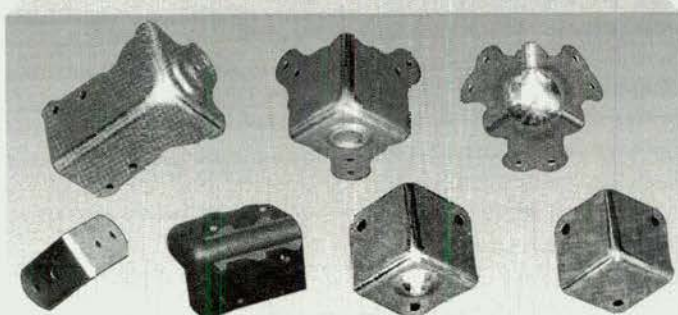
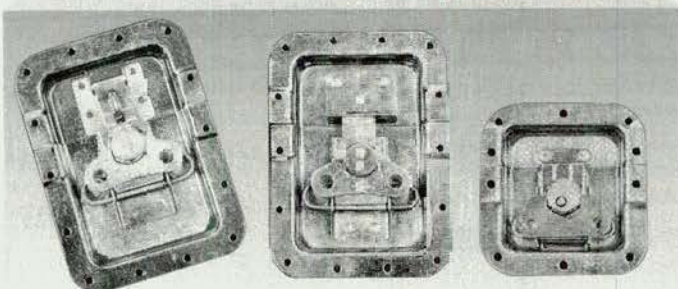
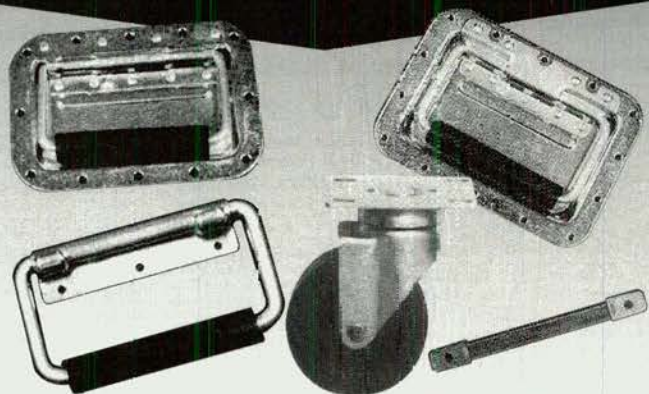
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Write in Reader Service number: 114

Peter Kemp

Well, the start to the new year has been excellent with many people talking positively of business for '94. The fact that we will have our first real trade show later this year, due to the diligence of Connections magazine, is also something to look forward to.

THE NEXT MOVE IN MOVING LIGHTS

I have always tried to provide the magazine with a column that is not biased towards CDA, or its products, however at this present time on this subject Coemar certainly have made a step in offering something new to current moving light technology.

The development in this type of fixture through the years has seen a number of changes. In the recent past the development has seen variations including the fixture in a dedicated yoke, allowing a limited range of movement, nominally 180 degree tilt and up to 350 degree pan; the fixtures with the "waggly" mirror, again with limited movement, nominally 170 degree tilt and 110 degree pan. This has been further extended by the ability to reposition the mirror head on the fixture, thus providing the mirror's movement range in another position, but not really extending the mirror's movement. Further, there are a number of companies now offering motorised yoke that you can adapt various fixtures to.

Another slight variation is the moving mirror, whereby a mirror is fixed into the motorised yoke allowing you to re-direct beams from either a fixed light source or from a moving light. This type of thing has been utilised on the recent European tour of Eros Ramazzotti where 77 large (3ft x 3ft) computer-controlled mirrors (made by Coemar) with a 120 degree pan plus 80 degree tilt facility was matched with the ability to move the entire structure that the mirror were positioned on, allowing the LD to have beams moving at varying speeds to any point on the stage. Vari-lite have come out with the VLM Moving Mirror, first shown at PLASA and then at LDI. This Vari-lite unit is a double-sided, front-surfaced polycarbonate mirror mounted in a standard VL yoke.

Now this technology has taken a quantum leap forward with the release of Coemar's NAT TM2500 articulated moving light, which took out the 'Best New Lighting Product' award at LDI. This fixture offers every conceivable feature: 2500W discharge lamp, large beam 150mm lens, and 22 control parameters. The TM in the name stands for TOTAL MOVEMENT and this is the most unusual feature. A large rotating head with a periscopic action, allows you to position the beam anywhere within a spherical envelope (360 DEGREES x 360 DEGREES) even parallel to the sides of the fixture itself. In addition to this it incorporates a 16-bit positional option which gives you pinpoint accuracy.

What will be next? Will any of the manufacturers think of something else to offer in a moving light?

Peter is head of Coemar DeSisti Australia, call (03) 467-8666.

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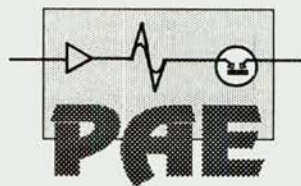
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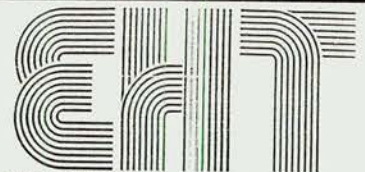
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It's Time - part 3

A LETTER: Being in the installation business, we run across situations where "consultants" have left a client with an expensive white elephant. Our organisation services schools and church buildings in our area.

The famous one is where, on advice of a "consultant", a church has installed in their nice carpeted brand new worship barn, a pair of centre-flown boxes above the stage. I have only once seen an installation like this that worked properly. All the rest are useless.

What generally happens is that we are bought in to do PA for a special event, and we use our standard array of Bose 802's each side or perhaps AM F500s or even with EHT subs if needed. The show starts and the faces start gleaming - they can actually understand the words!

Afterwards there is a barrage of enquiries from all sorts of folk about that marvellous sound, and questions as to why their system doesn't work when they spent perhaps more on it than we did on our touring system.

Very soon afterwards, the flown array comes down....

The truth is that many of these "consultants" are merely installers who have seen the application somewhere else and then utilise the "looks about right" philosophy to help themselves - with disastrous results. Taking your comments in Jan. 1994 into account, I can see why there are most likely a number of cancellations occurring at voice frequencies.

Perhaps the industry doesn't respect "consultants" because most are not consultants! Perhaps those that do profess some expertise are living in the past with their Seeburg 8" columns and ridiculous prices. The general feeling in the industry (as I read it) is that most consultants in the audio industry in Australia are as far removed from reality as are Electrical Engineering graduates from electronics servicing.

As for advice - I say listen first, buy later! This means trying out the equipment at the venue where it will be installed - not just at the shop!

And for those who can't afford a real consultant? Take my advice and stick to the good ole' classic arrangement of one high powered composite speaker box each side of the stage, about 1 metre out from and two metres aside from the edges of the performance area.

-Paul Matthews, St. Marys NSW.

The writer makes two points about consultants. The first is that "many of these "consultants" are merely installers" and secondly that "the general feeling in the industry is that most consultants in the audio industry in Australia are as far removed from reality". I agree wholeheartedly with both points.

There are those who give advice in order to sell product and installation services, and those who give advice only. It is the second type, the advice-only-givers that I think the writer believes are mostly removed from reality. Both types of consultants often fail to deliver the goods, with the result that we have many venues and sound systems which sound disgusting because of bad design.

We should then consider what is "bad design" in a sound system. While there are lots of definitions of "bad design", a starting point might be "the failure on the part of the designer to consider a sufficiently wide scope of acoustic and electro-acoustic theory to come to terms with the problems or requirements, and/or the failure to implement a logistically appropriate solution."

A large number of the advice-only consultants are really consultants who specialise in other areas and who have sound system design as an adjunct to their work. Currently much of the sound system design being carried out in Australia is by consultants who are specialists in acoustics or electrical theory. Acoustics is the study of the behaviour of sound in an environment or its transmission through a medium. Sound system design is the science of electro-acoustics and while absolutely connected to acoustics, it is a separate field of expertise. There is a fuzzy connection called the "watt" which relates sound systems to electrical theory which might explain why electrical consultants get involved in sound systems.

Electro-acoustics is part of audio which explains why the discoveries about sound systems and loudspeakers are reported by the Audio Engineering Society, not by the Acoustical Society.

The connection point between acoustics and electro-acoustics is the room or environment and to design a good sound system the designer must tailor the system to suit the room; ie have knowledge of this area of acoustics. It does not follow that an acoustics engineer who specialises in making factories quiet can design good sound systems.

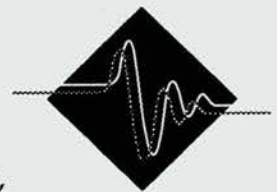
I ask the question "When it comes to sound system design, why has this country tolerated poor performing inappropriate advice-only consultants for so long?" The sound re-inforcement industry has suffered as a whole because of it, and the industry can help redress the situation. Consultants seem to avoid taking the rap for poor design. **When was the last time that a consultant was sued because the system sounded like shit?**

I have seen an equipment supplier carrying out design work for an electrical consultant who appeared to be also in bed with an acoustics consultant, and this design ultimately appeared in a major public tender. I suspect that neither the acoustics consultant nor the electrical consultant knew much about this area of design. The real consultant was the equipment supplier who neither took responsibility for the design, nor was paid accordingly. I ultimately heard the system and it didn't sound very good. (This kind of crap is itching for an expose in these pages - affected persons please call me. Ed)

Back to the letter. The "good ole' classic arrangement of one high powered composite box on either side...." is a good starting point, but it is not the only solution nor will it work all the time. It is a fine idea to first listen at the venue before purchasing equipment, but this is not always possible.

If our consultants (both types) got their respective technical acts together and produced designs with excellence, everyone would make more money in the long term. The client would have no choice but to pay for excellence. As a community and an industry we'd all win!

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VIDEO CD!

Nimbus Video CD format full motion video with high quality audio to be played from a standard CD player. That's a dull and boring introduction to some damn exciting technology, huh? Make no mistake, Nimbus' Video CD associated technologies are indeed very exciting.

Officially launched in Australia in early February, Nimbus' Video CD has received heavy coverage in international press and was featured on 'Beyond 2000' in late January. Visitors to last year's AES Convention in Melbourne were lucky enough to see a prototype of the system in action.

So why is Connections covering this consumer technology? Because the ramifications of Nimbus' technology extend well beyond simple consumer electronics and may determine the way audio and video professionals work in the future. Read on...

What is Nimbus Video CD?

A standard Nimbus Video CD can hold up to 79 minutes of full motion video and wide bandwidth stereo audio. The picture quality is equivalent to S-VHS, and the audio quality equivalent to DCC or Mini Disc. All of this is stored on a compact disc that can be played by an *ordinary* compact disc player.

What do you need to play one?

You need three things to play a Nimbus Video CD. Firstly, you need a standard consumer CD player with either an optical or electrical SPDIF digital output (approximately 40 million have been sold world-wide to date). Suitable CD players with SPDIF outputs can be purchased from \$299. Secondly, you need the Nimbus Video CDE decoder box, which will (hopefully) retail for under \$300. Thirdly, you'll need a television. Figure 1 shows how the system fits together.

How does it work?

The Nimbus Video CD uses the MPEG1 data compression process to reduce the enormous amount of digital video data to a size that can fit onto a standard compact disc. MPEG stands for 'Motion Picture Expert Group' and was officially adopted by the International Standards Organisation in November 1992. It has



been widely adopted by the consumer electronics, cable television and direct satellite broadcast industries. It is also a standard for storing and displaying graphic images in the computer industry.

The compressed video and audio data is encoded onto the disc in the same way that standard digital audio is encoded, in accordance with Philips' Red Book format. This guarantees that any CD player can read the disc, unlike other proposed CD video formats.

The CD player thinks it's playing an ordi-

nary compact disc, and offers all the usual random access features such as skip, repeat, fast forward and reverse, and even track selection (assuming track numbers are encoded into the video data). The SPDIF digital output from the CD player enters the decoder box, where the video and audio signals are decoded and sent to the appropriate output sockets - video to the TV and audio to the home stereo.

It's worth noting that the decoder box contains a high quality DAC for its own use and



Electroboard's new LCD Projector

The LitePro 550LS features inbuilt LiteShop II presentation management system. You capture images from your Mac or PC, which are stored on memory right inside the projector. A quartz 400w lamp provides the imagery, which can be forward or rear projected. Resolution is 640 x 480. It weighs in at under 1kg.

The 550LS has stereo speakers and an inbuilt amp, with a microphone input. It is small enough to be hand luggage on your next flight, and also handles video imagery. A hand held "Smart Remote" control allows switching between graphics or video sources, audio mute, video standby, freeze frame and more.

While the 550LS isn't cheap at \$18,900 (retail), it's a neat solution to image projection. Call Warren Bolton at ELECTROBOARD, (02) 957-5842.

also to replace the DAC in the CD player. The audio output of the CD player is no longer connected to the home stereo - when an audio disc is being played, the decoder will detect it and channel the SPDIF signal from the CD player directly to the DACs.

Why do this? Monitoring the audio outputs of your CD player while playing a CD encoded with video information will produce a huge burst of seemingly random digital data which may damage your speakers and your nerves! To prevent this, Nimbus have given the decoder enough intelligence to detect whether the disc is audio or video, and process it accordingly. They also provide 'dummy plugs' that fit into the CD player's audio output sockets, preventing them being connected. Once the decoder is inserted into the system, you won't need to switch between CD and decoder - the decoder will take care of that for you.

One of the most brilliant aspects of Nimbus' Video CD is the way it deals with the numerous television standards around the world, such as PAL, NTSC and SECAM. The information on the disc is universal - the decoder box provides the appropriate video output signal for its country of destination. This means you can buy a disc from anywhere in the world and know it will work on your system.

Decoder features

The decoder's front panel contains an on/off switch and a pair of LEDs to indicate whether a video or audio CD is being played. The rear panel contains a power input (240V AC direct connection), optical and electrical SPDIF input sockets, left and right channel audio outputs (RCAs) and numerous video options in-

cluding SCART and BNC video outputs and an RF output.

Inside the decoder there's a power supply, an MPEG1 decoder chip (manufactured by C-Cube for Nimbus), circuitry to detect video or audio CDs, a high quality DAC, and an RF modulator. That's it. **-Greg Simmons**

SCOOP!

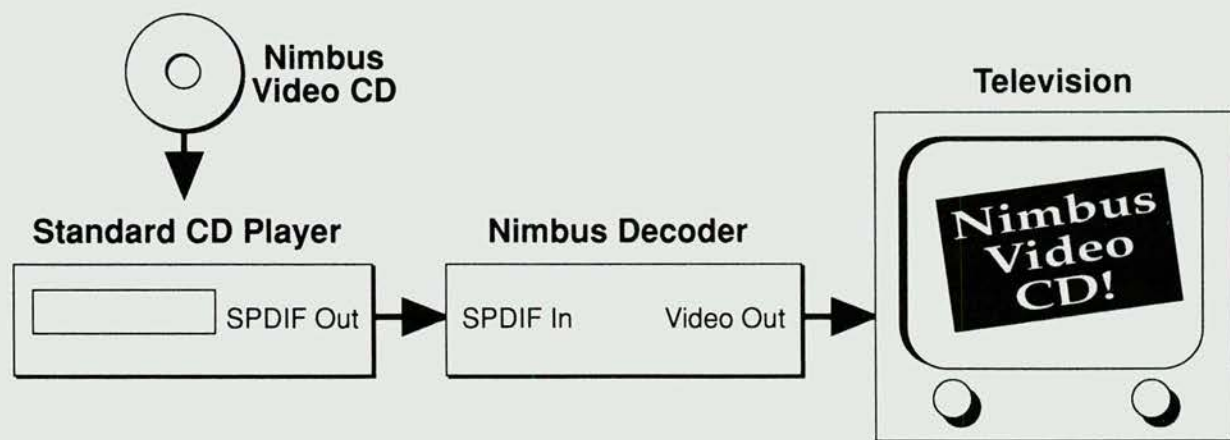
Nimbus' Australian distributor, DW Productions, will be launching the Nimbus Video CD in early February 1994, using a collection of Australian films developed and produced in conjunction with Roadshow Entertainment. They'll also be demonstrating, for the first time in the world, a double data rate disc which uses a CD player running at twice speed and offering picture quality as good as laser disc.

Nimbus have actually pushed the physical limitations of the CD format to the point where they can fit up to *50 times more* information on the surface of the disc - without data compression or reduction. These higher density discs will require new machines to play them, but there are indications from many film, music and software companies that higher density CDs are a foregone con-

clusion, and that the next generation of CD players will be capable of playing these new discs along with the standard discs.

As Adrian Farmer, deputy chairman of the Nimbus group of companies, says: "Nimbus has always broken new ground in the arts and technology, having demonstrated the world's first double density video CD cut by our own laser mastering systems. We have continued to concentrate our research and development resources on higher density CD technology with improved visual quality and longer playing times. We feel that high density and higher data rate development is the only way of providing the film studios with a 'one disc per film' format of outstanding sound and picture quality, which they will have no hesitation in backing".

-Greg Simmons.

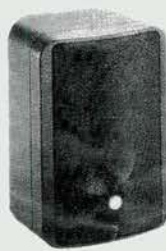


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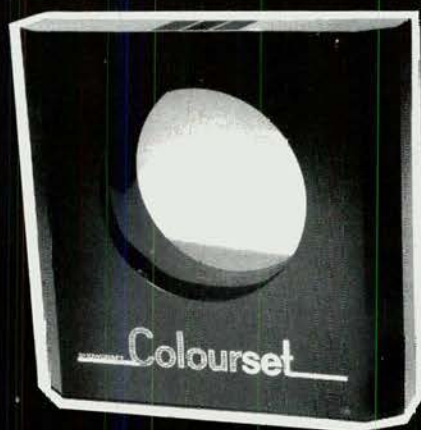
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Address: Oxford Street, Sydney, NSW.
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Venue Manager: David Erace
Venue Booker (if live entertainment): David Brace
Lighting Design: Rob Easton/Black Express Light and Sound
Sound Design: Black Express Light and Sound
Decor/Interior Design: Global Perspective/David Brace/Sue Cameron
Typical Door Charge: \$8
Theme Nights: Tue-Lunacy, Wed-Brave, Fri-Rude, Sat- S.H.A.G.
Entertainment: DJ's/ Live Acts/Guest DJ's
Notes: Restaurant/ Bar/ Pool Tables on first floor
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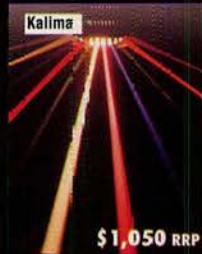
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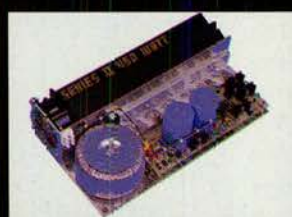
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KATE MUNROE

When DJ Kate Munroe took over the turntable at the recent Pride dance party, the crowd went wild as she is fast becoming a popular choice. Kate came to Australia from Colorado, USA about five years ago and whilst working as a chef, she fell in love and consequently decided to make Sydney her home. One night she was at a club with an ex-girlfriend when she told the management that their music was shockingly bad. They asked if she could do better and Kate said yes even though she knew nothing about being a DJ.

"I bought a few singles and started teaching myself from there!" she told me. "I've often worked with Gigi Legenhausen for all that time at places like The Freezer, The Kakadu (which is now Zoom), The Site and now Kinselas. I started playing jazz, blues and sometimes even country in a cocktail kind of atmosphere but over a period of time I realised I had to play some more dance orientated music. I also do dance parties like Sleaze, Mardi Gras and Pride."

Currently Kate is working at Gilligans, the cocktail bar at The Oxford as well as downstairs at the Boys Bar. She also still does The Site and a variety of other jobs. Kate has also recently begun running her own bar called The Eco every Friday night.

"I run it with my lover and I'm really enjoying it," said Kate. "It's a real comfortable atmosphere and, although I like doing the dance parties, I really like the slower, sexier music I



get to play there. Although I'm gay I won't limit myself solely to that market and I'd love to work in a straight market because they pay

a lot better! There's a certain amount of respect given in the straight community to DJs, what they have to do and the amount of costs they have. I've worked with those English boys that do that rave night down at the Bondi Leagues and that was really good. Some of the guys there were really surprised to see a female DJ and one actually grabbed the stylus off me. Basically my sexuality is my own business and it's not an issue with me. I've never been in the situation where some guy has wanted to kill me because he's found out I'm a dyke. After working five years in clubs you've had to deal with a whole range of people!"

Kate is very keen to get into sound engineering although she doesn't know of any women sound engineers in Australia (are there any out there?). Her current favourite tracks include Bjorks 'Sexuality', Two Fat Guitars 'Fuck DAT', Uncanny Alliance 'I'm Beautiful Damn It', U2s 'Lemon' and the new K Class record. All time favourite tracks include 'Where Love Lives', 'Somebody Else's Guy' Jocelyn Brown, anything by Salt'n'Pepa, 'I've Got a Love for You' Jomanda and 'Rythmn is a Mystery' K Class. Kate admits to gaining inspiration from other DJs such as Vicki Bradfield, Steve Aukins and her dream is to get 'DJ Kinky' over here from London!

Kate can be contacted through the Eco Bar on (02) 699 9102.

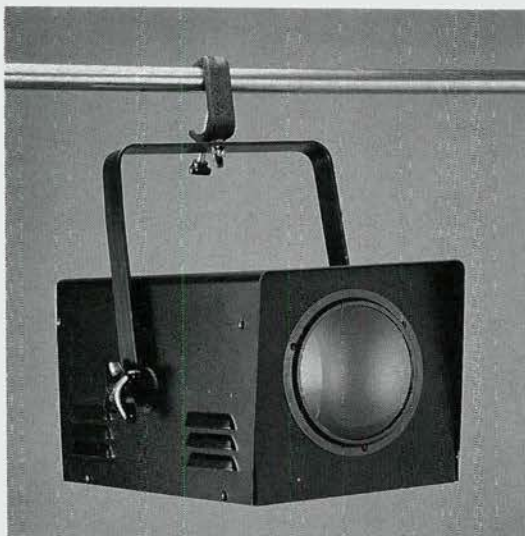
CLUB PRODUCTS

Disco & Club Lighting effects continue to pour into the country, with a pile of new releases from AE Australia and Abstract (ULA Australia).

- **STROBES.** Light Emotion strobes are inexpensive, they can be linked together (slaved) and cost just \$189 or \$220 for a remote model.

- **SAGA 250** is one of a new range, the 'GLADIATOR SERIES' from Abstract. This device has a 150w/15v or 250w/24v dichroic lamp, accepts DMX control, 7 colours & white, internal strobe wheel and 3 gobos. Comes with internal sound. \$899 approx.

- **SCENE SETTER** is a colour changer from Abstract, ENH 250w/120v lamp, 7 colours & white, 3 gobo's & strobe, with DMX control. Retail about \$999.



- **FOG MACHINES:** AE announce 3 Light Emotion brand machines, the B-17 (\$460) and B-31 (\$600) have optional remotes, while the S150 is a 1000w monster with 15,000 cu. ft/min output.

- **MORE FOG MACHINES:** ULI say the 'YES Y1' Fogger has a 2 year warranty and is 'fully servicable' with a cleanable block, at just \$699 with remote!

- **FULL MOON** (right) from AE projects cones of white light that rotate, a solar prismatic effect according to the poetic Rick Chisolm.

- **SCATTERSPOTS** project a static Moonflower type effect, top value at \$120. Call AE on (02) 896-4033, and call Abstract/ULA on (075) 290-688 for more info.

LX Corrections!

RE: A DJ's COURSE IN LIGHTING TERMINOLOGY column. DEC93/JAN edition.

I spotted a couple of inaccuracies:

1) LASER stands for Light Amplification by the Stimulated Emission of Radiation not Simulated. A LASER is a device in which there are more induced or stimulated emissions of photons than spontaneous emissions hence the importance of the distinction. This results in a very intense, highly directional, monochromatic and coherent light beam..

2) The power law should be written either $P = VI$ or $P = I^2 R$. The second form is obtained from Ohm's Law ($V=IR$) using the substitution I/R for V in the first form. R is resistance V is voltage in Volts. I is current in Amps. P is power in Watts

3) The PINSPOUT circuit due to the presence of the transformer is highly inductive and an inductive circuit will oppose any change in current through it, therefore the self-induced or back emf is very high. The back emf opposes the increase in current as the lamp turns on and opposes the decrease in current as the lamp turns off. A discharge resistor (e.g. a small light bulb) connected across the load limits the value of the back emf by causing a current to flow through the resistor and permitting the field to collapse gradually.

- GREG CAMERON, Studio 301, Sydney.

*Thank you Greg!

RAVES: Ripoffs, & Exploitation

By Caroline Grafton.

Please explain to me why Raves exist. Its not like every legitimate dance venue in Australia is sold out solidly nor would any Artist, DJs or production companies lose any work if these events were held in already existing clubs and registered pavilions instead of cheap illegal venues.

Finally after years of trial and error in NSW, Consumer Affairs has established a code of ethics entitled the 'Entertainment Industry Code of Fair Practise'. This apparently doesn't stop a shonk advertising a Rave without a venue, taking money in advance, and offering a 0055 phone number as the method of finding out where the Rave will be held! Why not legislate to prevent tickets being sold without a venue location shown on them?

The code covers advertising and promotion, qualifies ticket sales both box office and telephone bookings and to quote a particular note: *Care should be taken not to misrepresent the nature, scale or quality of a performance by including, omitting or failing to qualify information in video clips or other promotional material. Such misrepresentation could be in breach of the Media Council Advertising Code and the Law.*

Misrepresentation, now there's a word worth remembering. So many of these events are not what they are cracked up to be. New Years Eve, just gone, was no exception. At least one major function didn't even make it off the ground, sev-

eral others were shifted at the last minute and Cyberland in Sydney (according to a letter published in 3D January 10 issue) was a total farce. The only losers are the, mostly, young people who get shunted from venue to venue and totally ripped-off by (often) inadequate and previously overstated facilities.

Consider this: in the case of a Rave in a paddock or deserted warehouse, who carries the Public Liability Policies on these events, who is responsible for the safety of both the punters, performers and crews and who are these scuzz-bag promoters going to call when one of these events finally goes up in smoke, literally? I've crewed in many fire traps over the years and I'm glad to say not many exist any more so how come these filth feel entitled to put in jeopardy the lives of so many of our youth?

While I'm on the point of safety where do these low life promoters get off, by allowing the (apparent) easy distribution of chemical drugs at these gigs. I know they don't actually sell them but when, in one case, 'How To Hit Up' pamphlets are freely handed out and bleach is left in the toilets to clean needles, I would definitely call that condoning the activity.

If Raves stopped the whole legitimate entertainment industry would benefit.

I invite anyone to argue the point.



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ADVERTISERS INDEX

A.E. Australia	79
AIBA/MGA Bates	12
Amber Technology	17,21
Anything Audio	27
Artech <no artwork supplied>	
ARX	4,5
Ashton Admor	44,55
Audio & Recording	13
Audio Telex	28
Aust. Audio Supp.	53
AWA	36
Beijing Trade Show	59
CLS	18
Coemar DeSisti Australia	83
DMC	66
Entech	10
Graftons	42
GUVT/Highend Systems	22
Hectik Electric	24
Jands	2,53,62,67,69
Lightmoves	25
Lots Of Watts	43
Magna	50
Mark IV Audio	39
Multicontact	15
Music Capital	24
Noise Box	81
Paradise Studio	32
Penn Fabrication	64
Production Audio	20
RCF/Musitronics	76
Rock & Roll Music	40
Rosco/CCT	49
School of Audio Education	11
Selecon	47
Showcraft	13,45,46
Show Technology Aust.	84
Sound UnLimited	81
Southbank Trading	14
Studio Connections	41
Studio Supplies	16
Syntec	3
TCP	26
Universal/Abstract	19
Yamaha Music Aust.	61

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GREAT! mistakes

This day was to be the swan song, the big impasso, the moment to cherish, the picture montage. It was the Big Concert, and something I'd been both looking forward to, and planning for, for some time. My business comprised two average sized 'double 4 way' type touring productions, each in its own truck, and for this outdoor show I would combine everything I had, plus hire more.

One of the great things about Australia is you can start a business and train yourself happily, often without any certification or qualifications whatsoever. The gig was for a radio station on a Sunday, with two happening Melbourne bands at a beach park in Sydney's North.

The stage vendor had a mobile stage that folded out off the back of a semi, and took about two hours to setup. I heard that he tended to cut things a bit fine and arrive late, so I booked him two hours earlier than I really wanted him. Of course this tactic worked, but meant I was on site at 5am for a 7am start. My two trucks here there too, along with a Hertz 8 tonner that had the hired gear on board, and a generator on a flat bed truck I'd hired, and a fete stall type erection to act as a mixing shelter.

Mr. Stage must've twigged to my tactic, because 7am came and went, and his old semi came belching down the hill at 7.50am. Now we were 50 minutes late. Hustling the stage setup proved futile, Johnno and Lurch: 'Stage Engineers to the Stars' tended to stop and have a chat if you tried to talk at/to them. We retreat to the safety of the truck cabs, and ponder the meaning of the wind swinging hard around into a Southerly. We'd setup facing South, of course, because summer beach winds usually come from the North/East. Backward sound, now!

With nothing to do except eat bacon & egg sandwiches and sip tea, we watch Johnno and Lurch attack the stage frame with sledge hammers - the thing is slightly rusty from neglect, a little like Johnno's face. It's well after 9am

before we can put anything on the stage, we've setup the hired 32ch front of house console, effects rack and patched in the multicore by now. The power supply for the Yamaha PM2000 mixer is sitting on a roadcase lid, the PM2000 is on two up-ended packers, and we don't have a cable to connect them and it's Sunday.

With a frantic spouse leafing through the Sydney White Pages and cold calling two dozen names that might be similar to someone who might work for the hire company I start to get that gnawing feeling in my guts. I get the 24ch Peavey out of the truck just in case.....

The stacking of the PA is OK, the six extra W bins we've hired go at the bottom, three each side. Then our three atop make them all look pretty mean, while the extra Roy (midrange) boxes and horns make a mean looking stack. Wiring all this up is kind of fun, but I can't let anyone else do it 'cause it's a bit complicated. Lessee now, my Perreux 8000 runs my W's, this hired rack of Phase 700's runs the hired W's speaker lead goes here, goes there ... goes everywhere.

The moment of truth is always when you first apply the power, having powered up every amp and turned up every amp volume control. The whole PA sits quietly buzzing and hissing, the generator humming out 30 amps a leg, and the tape goes into the cassette to test each part of the system. Horns first, the crossover gain control is slowly tweaked up, the desk meters are registering a reasonable output, and here comes the highs. OK, now for the mids, and they're all there. My guys are clinging to the front of the stacks putting an ear into each box to check it's actually reproducing what it's supposed to. Now for the bottom end where is it?

Of course the hire firm deny reality and wire their JBL speakers Red (hot) to amplifier hot whereas the polarity of a JBL woofer is reversed. I knew this, my W's are correctly wired, black to amplifier 'hot' or positive out-

put, red to negative... so the bottom end is out of phase. So is the midrange, I realise! The sound output is minimal, as box cancels box what to do?

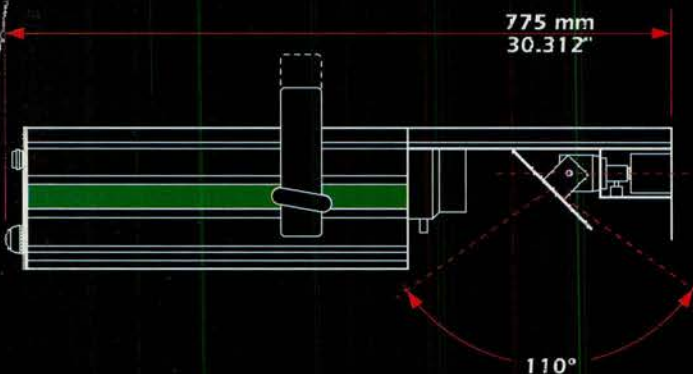
Ripping the back off the hired amp racks is time consuming 'cause they're engineered and fashioned like agricultural machinery and they've used allen headed bolts! I don't have the right size, so I use the multigrips to slowly twist each one out. The bands have arrived, the punters are milling, I've got 30 minutes before start time and the foldback guy has just tripped in great haste over the edge of the stage INTO his desk and racks which have all gone over the side onto the grass, cables stretched tight and some with connectors ripped clear off.

The crew fall all over the foldback mess and attempt to set it up again and assess damage, three Sound Developments third octave equalisers have whole rows of faders bashed in behind the front panels, one JX-4 crossover will not mains up, but the desk seems OK. So far.

I rewire the amp racks on each side of the stage, and the first bands crew have miked up and setup their gear. Their sound engineer is looking wistfully at the now packed up PM2000 case, and contemplating the Peavey. I scramble back to the mix position just in time to tell him I'll do a rough EQ of the system during the first song. Then it rains a little. The audience start to leave

Needless to say the rain became a mini tornado and the gig was abandoned. We packed up and took stock of the mud and mess. The hire company insisted the connecting cable was packed with the power supply, and tried to charge me \$700 for a replacement. They steadfastly refused to debate the speaker wiring polarity and gave me the brush off.

Lesson? Never contemplate hiring ANYTHING unless you have confidence in the people at the hire firm. At least the generator went OK, but I'd been careful - it only had a quarter tank of diesel when I picked it up. I checked. •



micro scan 2

575 MSR

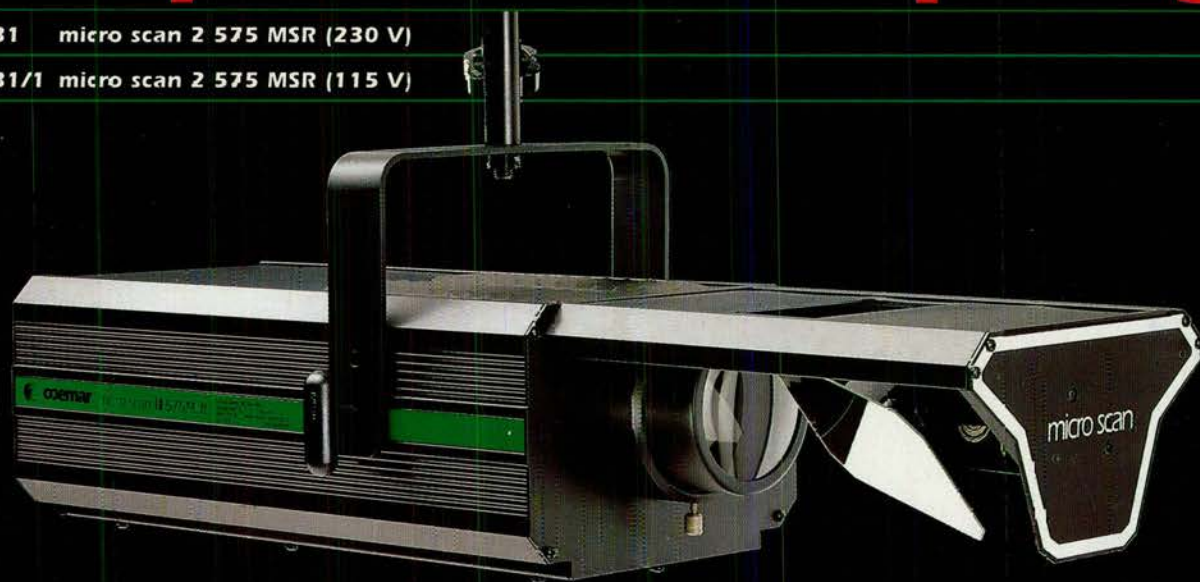


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