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Studio sound

THE INTERNATIONAL PROFESSIONAL AUDIO MAGAZINE
FOR RECORDING, POSTPRODUCTION AND BROADCAST

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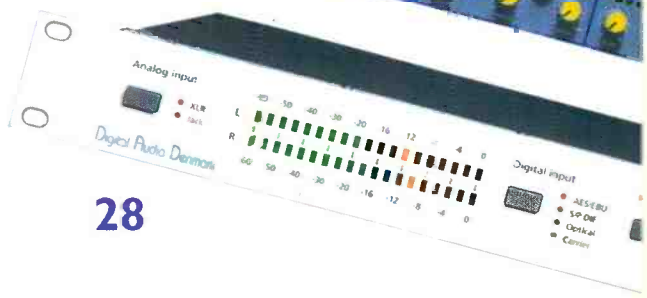

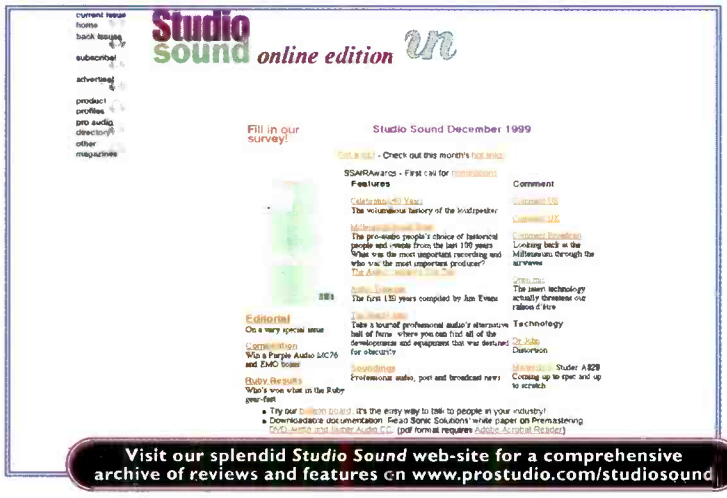

EDITORIAL

Suffering around

THIS MONTH IT IS THE TURN of the VHS machine. A long-standing fixture in the armamentarium of the family 'entertainment' system it was bought as a 'manager's special' from a reputable high street store. Of course 'manager's special' meant that the unit had been returned faulty from new, but had been fully reconditioned by the manufacturer and carried the full warranty.What attracted me was the price (naturally) and the excitement I felt at seeing the words '4-head' emblazoned on the flap (I'm in audio and that rings a bell for me). I was pressed by the fact that the machine's predecessor had just expired with a tape in it (I'd already had it repaired once for a price not dissimilar to what I had paid for it originally), and the unmistakable signs of Postman Pat and Noddy withdrawal symptoms were rife. A remote control with 'slow-mo' and the fact it was 'stereo' tipped me over the edge. The machine coped magnificently, and without adverse effects, during its brief induction period as a post-box and temporary store for crayons an jigsaw pieces. Life was good with stereo and a remote. It chewed its first tape about a year ago, embarrassingly one that was borrowed and had to be replaced, but this was attributed to operator error. I've now had to buy three replacement video-cassettes even though the tape path is cleaned regularly and the loading mechanism works perfectly again and again with the lid off, tensions are good, nothing is worn or bent. That's because for 99.5% of the time it works perfectly.

The unerring desire to work around is definitely an audio thing. I have a suspect channel on my mixer, won't use certain convertor outputs on certain boxes, dislike the attack characteristic of certain gates, can recognise by sight the dodgy cables that I horde 'just in case', and frequently have to use monitors that I'm not altogether happy with. Yet I manage. It's why I have developed a peculiar and highly stylised method of loading the VHS machine which seems to do the trick. It's the devil's own work, but I'll never buy another.

Zenon Schoepe, executive editor

School's out

CATCHING A TELEVISION news item explaining how the major record companies are now breaking new acts to younger children through 'school tours' recently brought it all back. Just when it has seemed impossible for the majors to do any more damage to the recording studio business, they developed a new marketing ploy so casually destructive it renewed my respect for their resourcefulness. You have to hand it to 'em—who'd have envisaged virginal girl-bands lip-syncing on school stages they had left just months earlier?

At the heart of the problem is the majors' abject failure to maintain the status of pop music when the CD and the Gameboy arrived. Faced with a choice between investing in tomorrow's artists or milking yesterday's catalogue, they did the first wrong thing. They did the second wrong thing when they pretended they hadn't done the first, and accepted the overtures of pop's Svengalis to cover up. The charts were flooded with pretty puppets and formulaic productions while the real appeal of musical expression was systematically destroyed. The elitism of learning to play instruments and audiences was lost to good looks, good co-ordination and mindless co-operation. The recording studios, of course, were caught between falling equipment costs and failing record company bookings.

Little wonder then that youth culture found greater pleasure in computers and nightclubs.

Little wonder because both possessed the essential element the majors had neglected: mystique.

Magical recording studios have surrendered their secrets on children's television programmes week after week. 'Star' status has become a tradable commodity—the stuff of good fortune and competition prizes. And now children see pop music laid bare on the school stage.

Entering a nightclub you still cross the threshold to the make-believe world that once fuelled proto-pop stars' dreams and filled their music. A world of fantasy where rules change moment by moment, and reason defers to expression. The atmosphere is created by common consent, with no one person in control and no guarantee of longevity. Here, by virtue of the passive consent of the record companies, the DJ continues to enjoy what the recording artist has lost to the record companies' poor judgement. No wonder that it is now easier to sell a dance anthem than a ballad...

Tim Goodyer, editor

Studio Sound

Incorporating Broadcast Engineering

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Miller Freeman Entertainment Group, A division of Miller Freeman UK Ltd, 4th Floor, 8 Montague Close, London Bridge, London SE1 9UR, UK.

Tel: **+44 171 940 8500**
Fax: **+44 171 407 7102**
Email: **studiosound@unmf.com**
Net: **www.prostudio.com/studiosound**

Editorial
Executive Editor: **Zenon Schoepe**
Email: **studiosound@unmf.com**
Direct line: **+44 171 940 8513**
Editor: **Tim Goodyer**
Email: **studiosound@unmf.com**
Direct line: **+44 171 940 8578**
Production Editor: **Peter Stanbury**
Email: **pstanbury@unmf.com**
Direct line: **+44 171 940 8523**
Secretary: **Eileen Sullivan**
Email: **esullivan@unmf.com**
Direct line: **+44 171 940 8524**
Consultants: **Francis Rumsey; John Watkinson**
Columnists: **Dan Daley; Barry Fox; Kevin Hilton**
Regular Contributors: **Jim Betteridge; Richard Buskin; Simon Croft; Ben Duncan; Dave Foister; Bill Foster; Tim Frost; Yasmin Hashmi; Neil Hillman; Keith Holland; Rob James; Caroline Moss; Philip Newell; Terry Nelson; Stella Plumbridge; Martin Polon; George Shilling; Patrick Stapley; Simon Trask**

Advertisement Sales
Group Sales Manager: **Chris Baillie**
Email: **cbaillie@unmf.com**
Direct line: **+44 171 940 8517**
Deputy Ad Manager: **Phil Bourne**
Email: **pbourne@unmf.com**
Direct line: **+44 171 940 8542**
Classified Sales: **Andrew Lynn**
Email: **alynn@unmf.com**
Direct line: **+44 171 940 8518**
Advertisement Production: **Denise Walshe**
Email: **dwalshe@unmf.com**
Direct line: **+44 171 940 8539**

Publishing Editor: **Joe Hosken**
Direct line: **+44 171 940 8602**
Circulation Manager: **Caroline Chamberlain**
Direct line: **+44 171 940 8579**
PA to the Publisher: **Lianne Davey**
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Eva Böhm, Studio Manager, MG Sound Studios.

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SL 9000 J SERIES
SL 9000

Axiom MT

Solid State Logic

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Singapore +65 (0)438 2272

■ LA's first to Euphonix System 5 has been installed by Soundproof Studios making it the third commercial music recording facility to install the digital console since its September AES debut. The other two facilities include Hit Factory New York and Miami's Criteria Studios. Meanwhile, LA's Acoustic Arts CD and DVD mixing and mastering facility has installed a Martinsound MultiMAX multichannel monitor controller in The Digital Barn, the facility's surround sound studio and graphic design office. The MultiMAX is to be used to control five Genelec 1031A close-field speakers and a dedicated subwoofer, and to switch between alternative sets of speakers and monitor sources. Mixing and mastering at The Digital Barn are performed with a 32-track SADiE 24-96 DAW and Mackie d8b digital console, a CAD class-A analogue desk, Apogee, HDCD convertors, and a comprehensive selection of outboard. Current projects include a remix of the first seven Fresh Aire albums for American Gramophone Records.

Euphonix, US. Tel: +1 650 855 0400.
Acoustic Arts, US.
Tel: +1 760 723 8851.
Martinsound, US.
Tel: +1 800 582 3555.

■ Dutch-based Markant Recording Studios has added a Pro Tools 24 system to its its recording-mixing-facilities. The installation includes Logic Audio Platinum, Auto Tune, Amp Farm , Vocaline , TC Works worksmasterX and Soundreplacer plug-ins. Located near Eindhoven, Markant has a 96-channel, automated Trident Di An console and Mitsubishi X850 machines and lists Soul II Soul's Jazzy B among its clients.

Markant Studios, The Netherlands.
Tel +31 40 2264130.
Digidesign, UK.
Tel: +44 1753 653322.

■ China's first and presently only stage art venue, Stage Play Art, has installed two ARX SX-3000; 12 ARX SX-1500; 10 ARX ZR-850; and 1 ARX ZR-350 power amplifiers; and a MIXX; 2 x EQ-15; seven EQ-60; and a MAXISPLIT signal processor. The installation is part of the Black Box Act Hall.

Email: sales@arx.com.au

■ Berlin's ARD broadcasting station has equipped all 48 of its journalists' audio workstations with Jünger VAMP4 digital voice processors, specifically developed for this project. Signal processing is based on the VAMP2 processor, the system being remotely controlled by an NT network capable of holding personal preset data for each journalist on the system.

Jünger Audio, Germany.
Tel: +49 30 6777 210.

■ Ireland's leading television company Telegael and Welsh-based postproduction firm Barcud Derwen have teamed up to build a £1m OB vehicle commissioned by Aontel Teo. The Aontel OBV is to be equipped with a Soundcraft Series FIVE console and will cater for a range of client requirements including sport, music, current affairs and light entertainment primarily in Ireland and the UK. It will support up to 12 cameras, eight VTR's, vision mixing, DVE and graphics.

Soundcraft, UK.
Tel: +44 1707 665000.

■ Japanese TV Tokyo has installed an AMS Neve VXS multiformat analogue mixing console for a new facility. The 72-input desk is in Tennohzu Studio 1 where it will handle music recording for television broadcast. Osaka's Yomiuri TV, meanwhile, has ordered a 48-fader AMS Neve Libra digital postproduction console for its 1st MA audio post suite where it replaces an SSL 4000E desk. And in Shinagawa, AV post operation Imagica has upgraded Room 5's Logic 2 to Logic DFC status complete with Encore automation where it will support surround working. The Premier Arts music engineering school has ordered five SSL 9000j analogue consoles for its various colleges in Tokyo, Osaka, Nagoya and Sapporo following the successful of a 9000j at the Kyushu school.

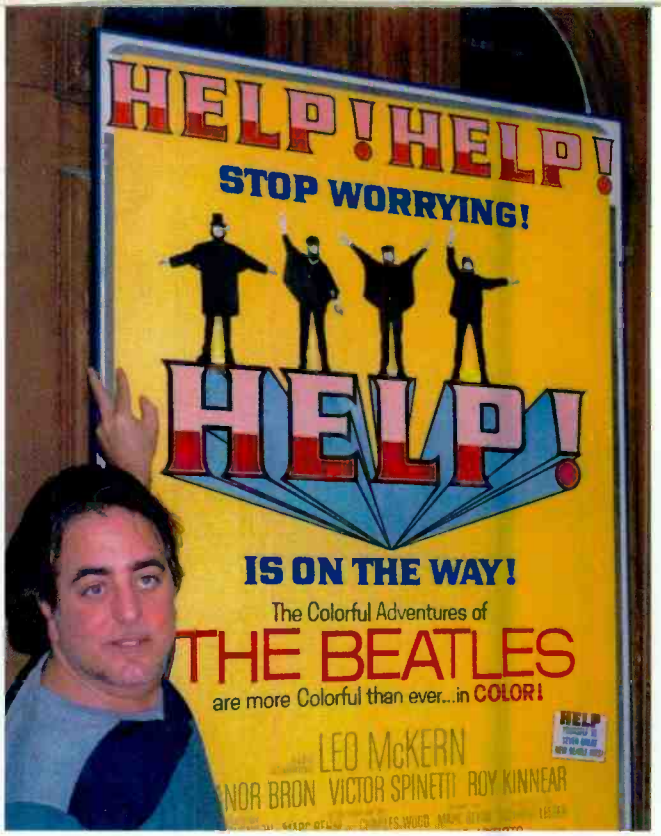
Imagica, Japan. Tel: +81 3 3458 9200.
AMS Neve, UK.
Tel: +44 1282 457011.
SSL, Japan. Tel: +81 3 5474 1144.

■ Canada's film production house Deluxe Toronto has installed a dual-operator Euphonix System 5 digital console, the world's first multi-operator installation. The desk is located in Theatre 6, one of four film dubbing stages at the facility that includes Foley and ADR theatres, three episodic television mixing studios, eight digital editing suites, 30 film editing rooms, three telecine transfer suites and a screening theatre. Theatre 6 is a 5.1 film dubbing room, designed for 24-bit digital audio operation and using a Pro Tools 24-bit systems, Tascam MMR-8 recorders and MMP-16 players. Plans are currently underway to combine picture playback from a nonlinear Doremi Labs V1 video deck. Deluxe produces film release prints for Universal, Miramax, New Line Cinema, Sony and other film entertainment companies.

Net: www.euphonix.com

■ UK-based artist and producer Ian Broudie has taken one of the first Audient ASP8024 consoles in the territory for his floating studio on the River Thames. The Lightning Seeds' mentor's desk will be partnered with an Otari RADAR hard-disk recording and editing system having been craned in to replace a Neve console. Dorset's new Conversion Studios joins Brodie's barge in pairing an ASP8024 and RADAR while Stroud's dB Studios has incorporated an 8024 in the refurbished of one of its studios where it will run with a Tascam DA-88 and two DA-38s. Abbey Road Studios, meanwhile, has taken five KRK E8-RoK Bottom sub speaker systems for 5.1 applications while AIR Lyndhurst and the Sound Store have installed CD-Base sound effects library software.

Abbey Road, UK.
Tel: +44 171 266 7000.
AIR Lyndhurst, UK.
Tel: +44 171 794 0660.
Expotus. Tel: +44 1923 252998.
KRK, US. Tel: +1 714 841 1600.
Nagra, UK. Tel: +44 1727 810002.
Net: www.euphonix.com



▲ US: New York's new independent post facility Penny Lane Studios has purchased two Fairlight FAME2 systems and a Fairlight MediaLink server for its West 19th Street location. The brain-child of an old hand in the NYC postproduction scene Penny Lane will serve Bobby Sorrentino's clients in the city's booming advertising and television markets. The studios feature two audio rooms and an Avid video editing suite and is designed to address a changing landscape. 'My clients are getting increasingly tech-savvy,' commented Sorrentino. 'If I had a non-proprietary system, they would certainly question a premium rate for time on the same system that project recordists are charging $30.00 an hour for. They're looking for more and more performance and more features, that's why all the best respected facilities in New York are now using Fairlight.' Sorrentino's roster of clients includes Nickelodeon, J Walter Thompson, McCann Erikson Partners & Shevack, Newcastle Partners, Kidvertisers, VH1 and MTV.

Software pirates

Internet: Pirates in Nashville, Tampa, Florida, Lawrence, Kansas, and Portland, Texas have all admitted to posting software in newsgroups on the Internet and soliciting others to access and copy the software without the authority or permission of the copyright owners'. But as the warez were all under the watchful eye and litigious umbrella of Copyright Control Services, they have been forced to make settlements with CCS in order to support it and its clients' antipiracy campaign and to settle the copyright and other legal claims of the copyright owners against the infringers. Each infringer also agreed to destroy all copies of the pirated software and not use any means to infringe the copyrighted software in the future. CCS has also reached a settlement with a company now helping CCS to investigate the possibility of Internet piracy being hosted on the company's in-house systems.

Dave Powell, managing director of CCS, stated, 'While we are keen to send clear message to would-be pirates that copyright infringement is not tolerable, we are pleased that these individuals—who have not done this for gain (some of whom are young adults) recognise and admit to their mistakes. However, we and our clients take a much more serious view when a pirate is actually profiting from the many man-years' of work that software companies invest in their products. In such cases, we will seek the full damages available under the law.

Another company in Georgetown, Texas, although stating that it was 'unaware of the infringements' CCS claimed were distributed on the Internet via the company's equipment agreed, nevertheless, to pay a settlement to CCS 'in order to assist CCS in defraying expenses associated with their investigations'. In addition, the company agreed to inspect their servers, disks and files to determine if there was infringing software and to take all reasonable precautions to ensure that their facilities would not be used in the future to provide access to CCS' clients' software.

CCS, Tel: +44-20-8977-1001.
www.CopyrightControl.com

▲ UK: Abbey Road hosted a celebration of the Beatles Abbey Road album held by American broadcaster MJI late last year. The party lasted three days and saw 14 US radio station jocks host their shows and included a live remote broadcast to America. In attendance was a string of notable guests including Steve Hackett, Asia, Bill Wyman, Yoko Ono, Chrissy Hind, Ken Townsend, Mike Vernon and Mick Glossop.

▲ US: Purveyors of theatrical venom and violence, the American World Wrestling Federation is to take AMS Neve Capricorn and Euphonix Series 5 digital consoles for its new studio complex. The 72-fader Capricorn is equipped with 24 mic inputs, 80 channels of 24-bit AES-EBU digital inputs and outputs, 160 EQs and dynamics, 28 analogue aux sends and 48 tracks of MADI inputs and outputs making it the largest Capricorn yet produced. The 48-input Series 5 will help meet the nine weekly hours of programming plus promos, trailers, videos and pay-per-view specials presented to some 500 million viewers. The new facility in Stanford, Connecticut was designed by the Russ Berger Group in conjunction with the New York Design Collaborative. Titan, WWF owners, last musical output was *WWF: The Music Volume 3* which reached a double platinum Billboard No. 10 spot recently.

SIEL 2000

France: The Paris Expo at Porte-de-Versailles will host SIEL Night & Show on 6th-9th February as a trade show dedicated to the Nightlife industry. It aims to attract professionals involved in the decoration, lighting, sound system, DJ equipment and items for parties and special events and is described as 'the new place for meetings and exchanges reserved exclusively for all those working in the nightlife industry'.

A concept area will showcase 'the entertainment venue of the year 2000' while other attractions will include a Net forum and a technique centre for DJs. Conference headings are given as 'Auditorium Sound Level Restrictions, a Constraint or a Necessity?', 'Show Lighting Techniques Take to the Streets', 'Issues based on the Merger and Integration of firms Working in the Domain of Live Events', and 'Conventions and Live Events. Large Format Image and Sound Experiences'.

SIEL, France.
Tel: +33 1 4766 9553.
Email: comisili@wanadoo.fr

HHB surrounded

UK: After a lay-off of a good many years, HHB recently returned to the venue at London Zoo once occupied by its annual Digital Audio Information Exchange to host a one-day conference on multichannel sound.

There was, unsurprisingly a heavy presence from Dolby, who explained Dolby Digital encoding, distribution with reference to Dolby E and a valuable insight into the world of its associated Metadata that was supplemented by input from tc electronic on multichannel ambience simulation and creation and acoustician Neil Grant who looked at the role of diffusion in the context of multichannel monitoring.

The conference was well organised and attended, and rewarding for the attendee. The section on Metadata, in particular, was fascinating and ultimately will be extremely relevant to anyone involved in the production of multichannel material as it holds the key to the translation and interpretation of programme.

HHB, UK. Tel: +44 20 8962 5000.

3i takes SSL

UK: Industry console stalwart SSL has announced its change of ownership from Carlton to 3i plc, Investors in Industry. The news was presented with enthusiasm by SSL Marketing Director John Andrews in the company's 30th year and came with the assurance that SSL 'will continue to concentrate on its core business of designing, manufacturing and supporting the world's finest audio consoles for the music, broadcast, post and film industries'.

SSL, UK. Tel: +44 1865 842300.

Broadcast census

UK: In an attempt to address training requirements in the UK media industries, a cross-industry working party will conduct Britain's first broadcasting census early this year. Developed by the Audio-Visual Industries Training Group under the chair of Roger Laughton (Bournemouth University School of Media Arts & Communications), the programme involves the government department for Culture, Media and Sport alongside Skillset. Laughton commented: 'We're starting by finding out what's good and what's missing, then we'll try to identify the strategy that will enable us to make the most of the drive and talents of our people will be crucial in making sure that the current views and aspirations of our industry are collected, analysed and focused so that future policy reflects industry need.'

Skillset, UK.
Tel: +44 171 534 5300.

▲ Finland: The highly rated Finnish television channel MTV3 has completed re-equipping its TV Production Studio, replacing a 40-inout Amek Classic desk with an 80-fader, 160-channel Soundtracs DPC-II. Studio duties include on-air transmission, and recording and postproduction of entertainment programmes. Recent productions include the Syksyn Savel Song Contest and Bumpsti Bum.

January 2000

23–27
MIDEM 2000
Palais des Festivals,
Cannes, France.
Contact: Jane Garton,
Reed Midem.
Tel: +33 1 41 90 44 39.
Email: jane_garton@midem-paris.ccmail.compuserve.com.
Net: www.midem.com.

24–27
Broadcast, Film and Audio, BFA 2000
Bombay Exhibition Centre,
Mumbai, India.
Contact: Jasubhai Media.
Tel: +91 22 6542363.
Net:www.exicomindia.com.

February

3–5
SMPTE Advanced Motion Imaging Conference
Fairmont Hotel, San Francisco, California, US.
Contact: Bryan Nella, SMPTE.
Tel: +1 914 761 1100 ext110.
Net: www.smpte.org

6–9
SIEL 2000
Paris-Expo, Hall 3, Porte de Versailles, Paris, France.
Contact: Reed-OIP.
Tel: +33 1 41 90 48 45.
Fax: +33 1 41 90 48 29..
Email: siel@reed-oip.fr
Net: http://siel.reed-oip.fr

8
AES Lecture: Rights, Management and Technology for Delivering Audio on the Internet
Gilwell & Brownsea suite,
Baden Powell House, South Kensington, London SW7, UK
Refreshments 6.30pm.
Lecture 7pm.
Contact: AES.
Tel: +44 1628 663 725
Fax: +44 1628 667 002.
Email: uk@aes.org
Net:www.aes.org/sections/uk

17–20
ITS Technology Retreat
Hyatt Regency Suites,
Palm Springs, California, US.
Contact: Nancy Zern, ITS.
Tel: +1 703 319 0800.
Fax: +1 703 319 1120.
Email: nancyzern@erols.com

19–22
108th AES
Palais des Congres,
Paris, France.
Contact: Hermann A O Wilms.
Tel: +32 2 345 7971.
Email: 108th_exhibits@aes.org
Net:www.aes.org

March

5–7
Entech 2000
The Dome, Sydney Showground & Exhibition Centre, Homebush, Sydney, Australia.
Contact: Caroline Fitzmaurice, Connections Publishing.
Tel: +61 2 9876 3530.
Fax: +61 2 9876 5715.
Email: caroline@conpub.com.au
Net:www.conpub.com.au

14
AES Lecture: Understanding A–D and D–A Convertor Measurements
Gilwell & Brownsea suite,
Baden Powell House, South Kensington, London SW7, UK
Refreshments 6.30pm.
Lecture 7pm.
Contact: AES.
Tel: +44 1628 663 725
Fax: +44 1628 667 002.
Email: uk@aes.org
Net:www.aes.org/sections/uk

15–19
ProLight & Sound 2000
Frankfurt, Germany.
Tel: +61 81 750 11.
Fax: +61 81 757 00.
Email: info@werbebauges-mbh-octanorm.de
Net: www.werbebauges-mbh-octanorm.de

26–29
SIB International
Rimini Trade Fair Centre,
Rimini, Italy.
Contact: Ente Autonomo Fiera di Rimini.
Tel: +39 541 711 711.
Net: www.fierarimini.it

April

12–14
Optical Disc Production 2000
Tokyo Big Sight, Tokyo International Exhibition Centre, Japan.
Contact: Mesago.
Tel: +81 3 3359 0894.
Fax: +81 3 3359 9328.
Email: kunimoto@message-jp .com
Net:www.mesago-jp.com/odp

May

8–9
AES UK Conference Moving Audio: pro-audio networking and transfer
Church House, London , UK
Refreshments 6.30pm.
Lecture 7pm.
Contact: AES.
Tel: +44 1628 663 725
Fax: +44 1628 667 002.
Email: uk@aes.org
Net:www.aes.org/sections/uk

June

3–6
Nightwave
Rimini Trade Fair Centre,
Rimini, Italy.
Contact: Ente Autonomo Fiera di Rimini.
Tel: +39 541 711 711.
Net: www.fierarimini.it

6–9
Broadcast Asia 2000, Cablesat 2000 and Professional Audio Technology 2000
Suntec Centre, Singapore.
Contact: Singapore Exhibition Services.
Tel: +65 233 8625.
Fax: +65 835 3040.
Email: jk@sesmontnet.com
Net:www.broadcast-asia.com

TC ICON

Icon - /'aɪkɒn/ n 1 [An object acting as mediator between man and the ideal] 2 [A symbol having cultural significance and the capacity to excite or objectify a response]

SYSTEM 6000

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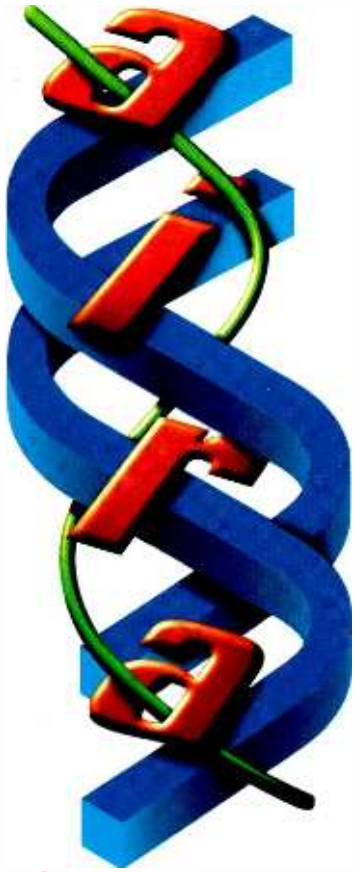
TCUK@TCELECTRONIC.COM ▸ WWW.TCELECTRONIC.COM



2000 SSAIRA VOTING

THE THIRD YEAR of the *Studio Sound* Audio Industry Recognition Awards finds us departing from previous years' events in one significant respect only: due to the early timing of the European AES Convention, we will not be holding our Awards ceremony in Paris, but in London at a slightly later date. In all other respects you are invited to vote for your favoured pieces of new equipment through the established channels of post, fax and email (details below). Based on the growing success of the previous two Awards, we are anticipating an even bigger response this year. Please support the manufacturers of your choice with your votes.

Ways to vote

Readers can vote for one product in each category in four ways.

1. By filling in the form and posting it to: SSAIRAs, *Studio Sound* Magazine, Miller Freeman Entertainment, 8 Montague Close, London Bridge, London SE1 9UR, UK.
2. By faxing the form to: +44 171 407 7102.
3. By emailing their unique reader identification number, the category numbers and their votes to: SSAIRAs@unmf.com
4. By filling in the interactive voting form on the *Studio Sound* web-site: www.prostudio.com/studiosound

NOMINATIONS

1. Large scale console
AMS Neve Libra Post; Calrec Alpha 100; Euphonix System 5; Midas Heritage 2000; Toa ix5000B; Soundtracs DS-M

2. Medium to small scale console
Allen & Heath ML5000; Audient ASP8024; D&R Airlab; Klotz Digital Spherion; Mackie D8b; MTA 924; Soundcraft Series Two; Soundcraft Series 15; Studer On-Air 5000; TL Audio VTC; Tritech TS-24; Roland VM3100 Pro

3. Outboard dynamics
Avalon 747SP; dbx Quantum; Drawmer DC2476; Joemeek C2; TL Audio Valve Classic C-1; Tube-Tech SMC2A

4. Outboard preamp
Aphex 1100; Presonus MP20; Summit MP4X; TL Audio Valve Classic PA-1

5. Outboard equaliser
Focusrite ISA430; KT DN422M; Summit MPE200; Summit EQ200; TL Audio Valve Classic EQ-2

6. Outboard Reverb
Eventide Orville; Roland SRV3030; Quantex Yardstick; Sony DRE-S777

7. Combined outboard device
Eventide Orville; Focusrite ISA430; Joemeek VC6Q; Jünger Audio Accent1; TC Intonator

8. Monitors
ATC SCM70SL; Genelec 1036A; HHB Circle 3; Munro MA1; PMC TB1S; Tannoy Reveal Active; Westlake LC5.75

9. Microphone
Audio Technica AT895; Audio Technica AT4047SV; DPA 3541; Earthworks SR77; GT Electronics AM40; Joemeek JM47; Neumann Series 180; Sennheiser Evolution wireless

10. Convertors
Apogee PSX100; Euphonix multi-channel convertors; Prism ADA8; Weiss SFC2 SRC

11. Audio editor
DAR Storm; Digidesign Pro Tools V5.0; Soundscape R.Ed

12. Audio recorder
Digidesign Pro Tools MIX plus; Euphonix R1; Fairlight Merlin; Marantz PMD650; Sony MDS-E11; Sony MDJE530; Soundscape R.Ed; Studer A827 Gold; Tascam D40

13. Desktop duplication
No nominations

14. Location portable equipment
Copper CS208; Marantz PMD650; You/Com ReporterMate

15. Plug-ins
Aphex Big Bottom; Digidesign Bruno/Reso; Digidesign Sound Replacer; CEDAR Declick 96 (SADiE); CEDAR Declick (Soundscape); Line6 Amp Farm; Steinberg TL Audio EQ-1; Wave Mechanics Pure Pitch/ Pitch Doctor;

16. Special category
CEDAR BRX+ debuzzer; CEDAR AZX+ azimuth corrector; Neutrik Minirator MR1; mSoft ServerSound; Symbolic Sound Kyma 5

VOTES CAN BE CAST by photocopying or cutting out the page opposite, filling it in and returning it to: SSAIRAs Nominations, *Studio Sound*, 8 Montague Close, London Bridge, London SE1 9UR UK. Fax: +44 171 407 7102. Alternatively, you can email the category numbers and your nominations to SSAIRAs@unmf.com

Readers will only be allowed to vote once. Readers may only vote for one product in each category.

Your reader identification number is the nine-digit number starting with a zero that is located in the middle of the top row of your *Studio Sound* address label. In all instances the inclusion of the reader identification number is essential.

The objective is to identify equipment that genuinely warrants recognition for being special in some way.

Readers are not obliged to vote in all categories and their attention is drawn to Special Category 16 which serves as a 'catch all' for any products not covered in the other categories.

Any questions can be directed to Zenon Schoepe and Tim Goodyer at *Studio Sound*. Tel: +44 171 940 8500.

SSAIRA FAX VOTING

1 Large sc…	7 Combined outboard device	13 Desktop duplication
	8 Monitors	14 Location portable equipment
namics	9. Microphone	15 Plug-ins
4 Outboard preamp	10 Convertors	16 Special category
5 Outboard equaliser	11 Audio editor	DON'T DELAY FAX TODAY!
6 Outboard reverb	12 Audio recorder	

VOTING

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Calrec Alpha 100

A bold step for a small but historically significant British desk manufacturer, Calrec's Alpha bodes well for its future. **Zenon Schoepe** witnesses true evolution

With its earliest assignable desk attempts still earning there keep some 14 years down the line with the likes of the BBC, NRK and Turner Broadcast among others, Calrec has considerable experience in the discipline. It is therefore with considerable interest that the arrival of its Alpha 100 all digital broadcast desk has been greeted.

Following on from the digital test-bed of its radio orientated X Series the Alpha is clearly a significant step towards the company's digital future. Yet it already has something of a history as it is derived from the successful T Series digitally controlled analogue board. When the T Series was conceived it was designed to run a digital engine but Calrec claims that at the time it could not build one that was as reliable enough, redundant enough or affordable enough and opted instead for the DCA route. However, it did employ a control system that could be ported in the future and this was proved by the appearance of the Digital T Series at NAB two years ago which sported a traditional T Series worksurface controlling a new digital rack. A rethink was in order though as the T Series had been designed four years earlier and control devices were now cheaper and the opportunity to improve the worksurface in the light of such things as multichannel sound and improved router control possibilities was taken.

Like many other digital desks around, the Alpha is SHARC-based, but unlike many manages to get 12 stereo channels or 18 mono channels off one board of six SHARCs. Price-wise its largely equivalent to a similarly sized T Series with savings or premiums incurred by the number and type of I-Os specified.

The Alpha is multichannel-able, has flexible I-O routeing and all processing available to all the signal paths all the time. An NT PC runs a snapshot recall system for reset of all the desk parameters in under 60ms from Flash ROM and is involved in the desk set up and naming routines. This computer also tracks all desk activity but is not essential for the fundamental operation of the console. Alpha uses a ported version of the same control system found in the T Series which has proved to be eminently reliable after working in the field for five years.

The production version of the desk is a 2-rack system with a control rack and a separate DSP system rack plus analogue and digital I-O racks. I-O options include a mic-line card, line-only card and AES-EBU inputs. Analogue racks talk to digital I-O racks via a proprietary bulk I-O card which handles 128 channels. You can run to two analogue input tracks and these connect to the digital input rack which has has a bulk I-O receiver card to take the analogue inputs, and some DSP cards that take the AES-EBU format bulk I-O format signals and put them on TDM buses. Signals then go from that I-O rack to a DSP rack via what Calrec calls a V-bus high speed bus which connects the racks together. The DSP rack has a control card that can have a redundant spare and spares can also be carried for DSP cards. There is only one type of DSP card in the system and this acts for the signal processing and the DSP that takes the AES-EBU signals and puts them on the TDM.

The control processor rack controls the worksurface and consists of hub controllers for up to ten panels and these do not have a hot redundant spare although Calrec's experience with the original T Series suggests that reliability is exemplary. However, if you should lose a panel you can transfer control to the screen.

Panels are connected via SCSI type cables to the racks and can be unplugged hot and the system boots from cold in 9s and the control surface can be reset in under 4s with continued passing of audio.

Worksurface panels can be arranged according to taste, and the worksurface is scalable and incorporates layers but these are not obligatory. If you really want a straight 96-fader worksurface then you can have one.

System limit is 144 channels as 96 stereo channels and 48 mono channels which is bigger than any desk Calrec has ever been asked to build for live broadcast. Additionally more inputs can be connected to the system than there are channels via routers and accessed on the snapshots. The desk can be split f operators and loaded with addi duplicate panels and there are a hos copy, global and default functions p the T Series speciality of being able t swap and move channels around the desk at will.

In line with Calrec's approach to assignability there's a Central Assignable Section something that the company invented, lest we forget, which accesses all a channel's parameters at the touch of an ACCESS button. Channels can be accessed locally from a fader panel or centrally from the CAS.

Core to everything, which will be reassuring to most, is minimum use of the computer screen which helps to manage the memory system, permits titling, and provides screen displays if you want them. However, it must be used for setting the desk up and naming inputs physical inputs. It also performs the diagnostics of the system.

The fader panel has a moving fader with PFL and indicators for MS, dynamics, filters and EQ selection. A meter looks at input gain post input stage, channel direct output level or dynamics gain reduction. A channel On indicator follows with peak indicator, touch sensor, and nulling lights should the motor fader fail.

The desk's two layers are referred to as A, which corresponds to the colour green, and B, which is amber. Any fader can be a channel, a group or stereo or mono and LEDs tell the user what a fader is. More indicators tell if the channel in question is a VCA-type master or slave and allocation is performed by holding and pressing the master and then pressing switches in channels that are to be slaved to it. The system also works in reverse for interrogation purposes.

A channel CUT-ON button is accompanied by AFL and a twin line alphanumeric display that indicates what is on each layer and changes colour according to which layer is being accessed.

Above the fader panel you will find what Calrec calls Wild controls, but others

refer to as freely assignable rotary controls. You get four with associated displays and these can be split into twos to serve the two layers of associated channels.

Assignment of Wild rotaries is simply a matter of choosing the channel, and then identifying the Wild control and its controlled parameter in the CAS by clicking the switch on the relevant pot by depressing it. A further batch of indicators show channel statuses and routeings.

There also are four buttons activating Rear AFL, direct talkback, which talks to the direct output of every channel, an AUTO MODE button, which is likely to be incorporated into any future dynamic automation process, and a button which can be assigned for the user to perform any existing switch function on the desk.

The input panel offers two inputs per channel for snapshotting across them. There's fine gain on a pot, coarse gain in 6dB steps on nudge buttons, SRC, and phantom power. A balance control is joined by Left to both and Right to both switches and when both of these are pressed simultaneously then the pot serves as a balance between all left and all right for mixing perhaps VT tracks. There's also the expected phase reverse, tone and MS switches along with multichannel panning switches including front-back panning with an overall rear level control, rear panner, LFE and bypass and divergence with bypass plus Centre only routeing.

Each channel can have an inserts and these have in-out, preEQ and pre-post fader switching. The Direct out can receive tone, and talkback and can be AFLed along with the mix minus bus. Again it can be preEQ and pre-post fader and dropped on to the Mix Minus bus.

The I-O matrix panel takes care connection making and the business of snapshot saving, recalling and previewing. Main outputs are allocated on-screen only and the alteration of these is password protected for obvious reasons.

There's a 4-band equaliser on every channel which mimics that on the T Series with two variable Q centre bands with overlapping frequencies plus an HF and LF in shelving or bell. It can be flatted, bypassed, placed in the channel or dynamics and has a useful alternative setting as a type of EQ undo. High and low-pass filters are fully variable and overlapping and can be inserted in the channel or dynamics together with a notch function.

There are 20 mono or ten stereo auxes on the desk accessed by ten sets of rotary controls each with an associated display, on/off, pre/post switching, pan and gain. Aux masters follow the same principle on a separate panel with meters, gain, cut, AFL, and an INTERROGATE button. A direct input is also available on auxes.

A full dynamics set is available on each channel and the main outputs and groups, and is presented on a panel in the CAS. You get a compressor-limiter with bypass and an expander-gate also with bypass plus gain makeup and gain reduction meter. Pre-post switching is included along with a keyed side chain (EQ and filters can be part of the side chain) with listen and four link buses.

Routeing is available to eight mono or stereo groups, the four main outputs, which can be specified as multichannel in the menu set-up routine, and 48 multitrack outputs. The last of these, because they have individual channel to track output levels with tone and talk to them, can serve as a matrix output for what I am told the Americans refer to as IFB (Interrupted Feed Backs). Track outputs levels can be pre-post EQ or fader and can also send the mix minus signal to the multitrack with monoing of stereo sources. There's much more and you can interrogate the routeing from here as well in what amounts to a section that is beyond the normal understanding of the word 'flexible'. The same can be said of the talkback features.

The Monitor section is based on a master selector and two preselectors. There's a separate ON button for small loudspeakers complete with a volume control, plus dim, cut, and monitor balance. The master selector permits listening to the main output in mono, stereo or surround and the same applies to the remaining three mains. You can also listen to off-air with decoding. Preselector 1 gives mono and stereo outputs for all four outputs and surrounds for all outputs while preselector 2 gives access to all the auxes, groups, PFL, tone and another 32 external sources which can be mono, stereo or surround. Decoder remotes are included and you can solo the 5.1 channels and defeat the LFE. I cannot even begin to touch on the full facilities of the Alpha in the available space here because there is depth to the features and the thought that has gone in to it that is quite frankly best appreciated first hand and hands on. I was conscious that I was in the presence of greatness.

Anyone who has run a T Series will be more than comfortable with the Alpha and anyone who is familiar with a analogue Calrec will be see immediate operational clues and principles. everyone else will have to soldier on with what I consider to be a triumph of ergonomics.

You can tell that the Alpha is a very serious and very flexible desk yet it manages to understate the fact. The Alpha worksurface amounts, by my calculation, to the fourth generation of assignable surface for Calrec and it really does show because there is a maturity in the presentation that is lacking in digital desk early attempts. There's really not that much wrong with the T Series worksurface but taking the opportunity to redesign it has distilled the concept still further.

Most particularly it is the manner in which functions have been selected for grouping in to individual panels and how they are arranged in the panels that shows off unmistakable traces of experience. This panel approach is not exclusive to Calrec, but no one does it quite like them. You won't need to look to any other panel for an associated function, everything is where it should be and where you'd expect it to be. Then there are the operational points like the simplicity of Wild control assignment and metering control—things that were performed on screen on the T Series. The colour coding of the layers makes a huge difference to clarity. I love the small parameter value displays despite the fact that at first encounter I thought they were too small to be useful. Viewing angle is actually very good, as is all illuminated indication, and once your sitting behind the desk the quirky little displays feed back a lot of information which can be grasped with a glance once you get the hang of the way that they work.

Like all refined systems the Alpha allows a choice of ways of achieving the same ends. Some are more direct while others are more appropriate when you are doing something else and this is the sort of area in which the truly distinctive and innovative digital desks are putting space between themselves and the competition. But then it should be so and it's what differentiates a digital board at this level. Speed is one thing but is often confused with the matter of operator convenience. When the balance is right it adds to the feeling of being in control and that the desk is on your side when working in a high pressure environment day after day.

Yes, of course I'm impressed with the Alpha and part of this has to do with the fact that I can understand where it has come from and I can appreciate the work that has gone in to it to get it where it is. There seems to be none of the unavoidable trade-off that often occurs with the leap from analogue to digital. Alpha is true evolution which offers target end users familiarity, a leap in functionality and swathes of added value. It's a brilliant concept, it's a brilliant desk, it deserves to do well, it will do well.

The future of professional audio is safe in the hands of companies like Calrec. ■

Contact
Calrec Audio, UK
Nutclough Mill, Hebden Bridge,
West Yorkshire HX7 8EZ
Tel: +44 1422 842159
Fax: +44 1422 845244

REVIEW

Marantz PMD650

Carefully conceived and long awaited, Marantz' PMD650 portable MiniDisc recorder promises professional performance. **Neil Hillman** put it to the test

BY ALL ACCOUNTS, it has been a difficult gestation. Firstly the processor would not perform nearly as efficiently as was expected, so back to conception went the PMD650. And back too went the expected date of delivery—several times.

During the process, some rather soul-searching questions have been asked of this machine by Marantz. And it shows. It shows in the enviable quality of build, the ease of operation, the audio integrity and barring the inevitable few, but very few, minor blemishes that any new product might subjectively present, it arrives in our mixer pouches or on our sound trolleys as a robust and hearty newcomer—albeit without time code.

'TC or not TC, that is the question; whether 'tis nobler in the mind to suffer the slings and arrows of outrageous camera-folk—who balk every time the sound department approacheth the camera to check synch'. The time-code debate is interesting as it tends to expose two camps—obviously those for and those against the necessity of inclusion but more specifically, I would suggest, between recordists operating to film and to video. Productions working on film are very much more likely to depend on the time-honoured clapper-board for synchronising sound to picture, allowing the labs who develop the film overnight to also offer a synching service of rushes the next day. This has certainly been my experience of film-location recording on dramas, commercials, even a travel-documentary series. Mind you, on that particular example of classic British cinematography where the technical ignorance of the director and the producer was exceeded only by their arrogance, the 'sync' was something you washed your hands in.

In short, if you perceive the need to use MiniDisc on location as your recording medium, this is the *de facto* machine. No doubt—and it costs less than £1,000 (UK). Its key features include phantom power, SP and LP recording giving up to 74 minutes stereo or 148 minutes of mono recording, one-touch instant recording, prerecord memory cache allowing 2s of pre-hear before the RECORD button is pushed and a 20s stereo or 40s mono audio buffer to eliminate the corruption of material due to knocks and shocks during record, playback or during that delicate time when the machine is writing to the TOC.

The top face of the slim, black machine—conveniently sized to slip into a Portabrace mixer front pocket—is the engine room housing 23 individual switches, yet maintaining an uncluttered and logical layout. The bottom quarter of the machine is taken full width by the in-built 200mW speaker grille which in the bottom right-hand corner reveals the inbuilt microphone. The remaining left half of the top face houses the spring activated disc door, disappointingly a rather flimsy metal pressing, undamped, and in contrast to the feel of the rest of the machine; how secure this door is against the ingress of water or dust gave me some cause for concern.

Below the door are the two slider switches for power on-off and disc eject, the powering switch noticeable by its red slider. The right-hand half of this face is given over to a slightly raised bank of switches, the dynamics of the machine controlled through three rows of three slider switches dedicated to Record mode (switching between SP and LP); Source (switching between the stereo XLR inputs, mono on the left channel or internal mic) and the headphone-speaker source selector (allowing access to the left, right or stereo channels). The middle bank of three switches allows for mic attenuation of the inputs between 0dB, -15dB or -30dB; Input Level to be switched between mic or line level; and the limiter to be operating in either ALC mode, fixed limiter mode—which was happy to hold steady signals to the machines reference level of -12dB with respect to digital 0dB, while transient peaks crept up to -2dB—or Manual, in effect switching the limiter out of the chain. The bottom row of three dynamics switches are a 3-position ANC—Ambient Noise Control in Marantz speak, but high-pass and low-pass filters to the rest of us—with roll over frequencies of 125Hz for high pass, flat, or a band pass of 125Hz to 3kHz; an INPUT SELECT to switch between analogue or digital signals and an ON-OFF switch for the 'LSR' Level Sync Recording option, which enables a trigger from a user-set threshold level of an analogue input signal of either -60dB, -40dB, -20dB or -10dB to automatically commence recording if the machine is sitting in the Record-Pause mode.

A row of five smaller buttons below these switches address the disc directly. REPEAT enables the whole disc to either repeat play the contents of the whole disc or a single selected track; or in conjunction with the >

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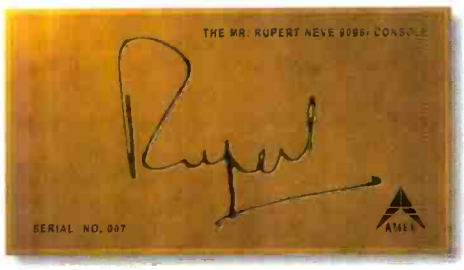

OLYMPIC STUDIOS

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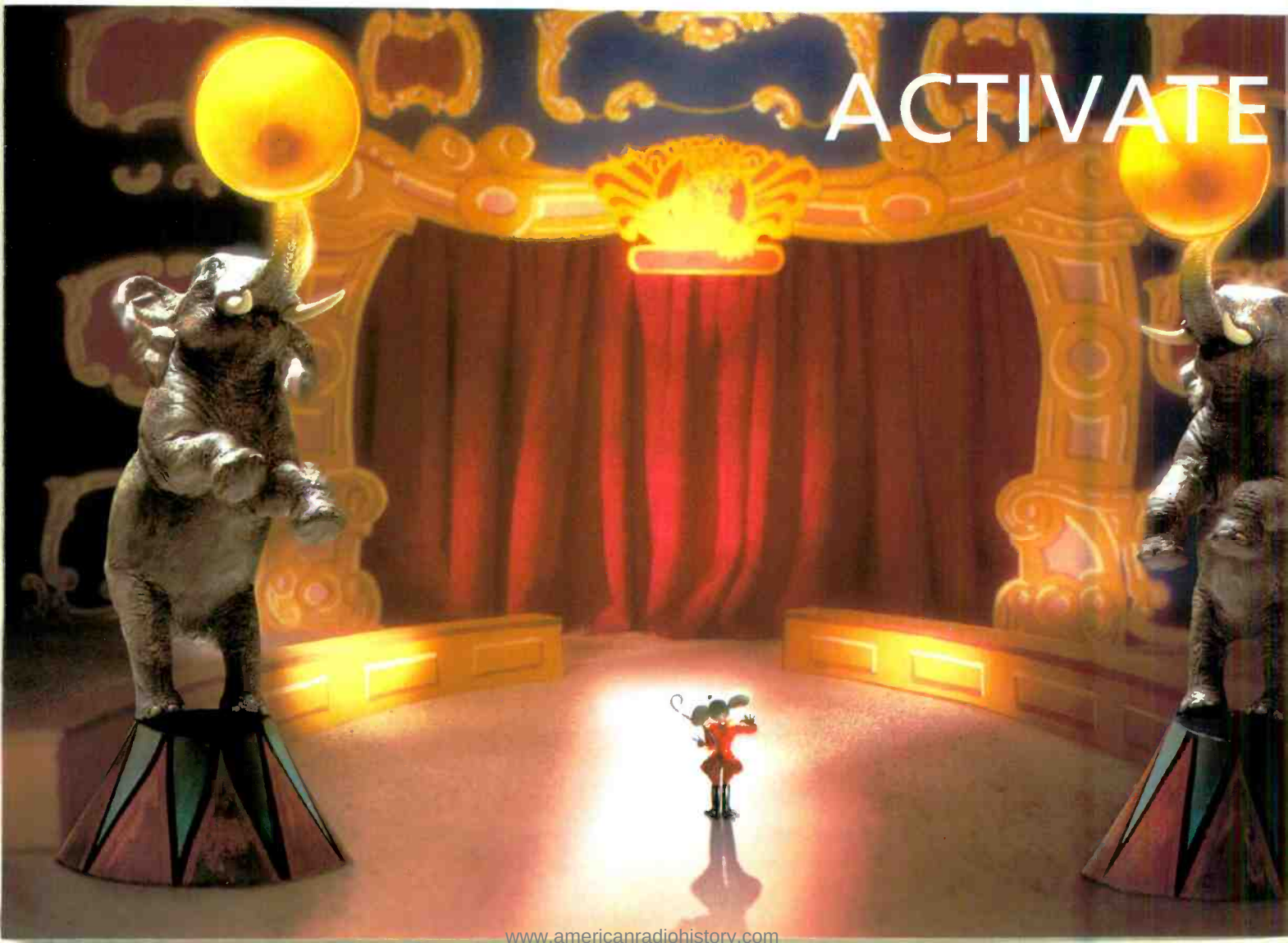
< A-B/DEL switch next to it, a selected part of a single track—ideal for the playback of musical numbers being filmed in discontinuous parts. The TITLE button opens the disc for the titling of the disc or just a single track; CHARACTER toggles between upper-case letters, lower-case letters, numbers or symbols—the 'Forward' or 'Reverse' transport keys scroll up and down the desired figure-set—and ENTER fixes the selection and moves the cursor along the script.

The EDIT up-down twin push-buttons present access to the menu display on the front face and scroll either up or down the options to Divide, Combine, Move, Erase or All Erase tracks, adjust the machine's clock and calendar, or adjust the system presets. These presets are: Power Management which beeps when the machine has been inactive for 5 minutes or 5 minutes before the battery is exhausted; the signal level for the 'Level Sync Recording' function, variable as previously described between -60dB to -10dB ; New Track Time—the time after the analogue input signal has dropped below the 'LSR' threshold before a new track number is written to disc, variable between 2s, 3s, 5s or 10s; Track Increment to enable the automatic allocation of a new track number while in LSR mode; prerecording Time—variable between 0.5s and 2s before RECORD is pressed; and Battery type in use—selectable between either alkaline or NiCd, and designed to give the battery display a fighting chance to gauge the state of discharge.

The system presets also provide for a sampling-rate convertor SRC to be switched in or out. When selected On, digital signals routed through the Digital In jack are also output on the Digital Out jack at 44.1kHz. With the SRC set to Off, signals appearing on the Digital In jack at either 32kHz or 48kHz are converted to 44.1kHz for recording purposes, but still appear at the original sampling rate on the Digital Out jack. The last of the system presets allows for the Serial Copy Management System (SCMS) to be switched on or off.

The transport controls are divided between this top face and the front face. The STOP and PLAY-PAUSE buttons sit on the top face and next to the recessed and semishrouded BACKSPACE button, that when pressed while in Record cancels the recording and returns the machine to the Record-Pause mode and the point on the disc that recording began.

The front face of the PMD650 carries a large display window that shows track number, track title, whether SP or LP recording is selected, battery level as an icon either full, half-full or empty and twin bar graph level metering calibrated between infinity and 0dB, with steps marked at -40dB, -20dB, -12dB, -6dB and -2dB. An Over level is set to the right of 0dB. The metering should be bigger scale than it is, with the lion's share of available space being given over to track titling during Stop or Playback mode or date information during Record. This is secondary information, and the ability to quickly scan a display and get an instantly recognisable confirmation of the temperature of the recording must be given primary importance and hence impact on the eye. To the left of the display glass is the 32Ω, ¼-inch headphone socket which disables the speaker, and above it is the volume pot for both the headphones and the speaker; the speaker is also defeated when the machine is in Record. To the right of the display window are the RECORD-PAUSE button and the dual function RECORD-MARK sprung slider switch, conspicuous by its red cap. This switch takes the machine directly into recording and



while in Record, another dab on the switch will mark the current point on the track, and increment the track number upwards for each subsequent key press, providing at least 1s has elapsed between marks. A red LED illuminates when in Record and flashes when in Record-Pause; a more frenetic flashing indicates that the battery voltage is low. Below these two switches are buttons to illuminate the display —either momentarily, or sustained if held for over 1s and a DISPLAY button that toggles the disc information. In Stop mode it changes the read-out in the display window between disc information, time available for recording, and current date and time; in Record mode between time elapsed during recording, time available for recording and current date and time and in Playback mode between time elapsed on current track, time remaining on current track, time remaining on the disc and the date and time of the recording. The last switch on the front face sits under the RECORD slider and acts as a Key Lock, defeating all functions on this panel except for the display LIGHT switch. At the right-hand end of the front panel are the dual-concentric RECORD LEVEL pots., graduated 0-10 and in my opinion in need of either a heavy friction pad or a locking device to prevent movement inside a mixer bag taking the record level either up or down at random.

> The Marantz PMD650 is delightfully straightforward to use and clearly much thought has been given to the end user. Its been a long time coming, and it looked good in trade-press ads

The right-hand side panel houses the Digital Input on an RCA socket, a remote control for transport keys also on an RCA socket and the twin female, balanced, Mic-Line XLR inputs. The 48V phantom power is switched on and off by a small slider switch that controls both inputs, and is situated next to the right channel XLR socket.

The left-hand side of the PMD650 houses the male XLR Digital Out socket, and next to it a small slider switch to switch the output on or off—a power conservation consideration. The analogue 'Line Out' is on twin RCA jacks and the last component on this face is a 3V DC in-charger socket with a small LED charger indicator.

The battery compartment is accessed through the back panel and the given operating times for 8 AA 1.5V alkaline batteries is 3½ hours for recording and 4 hours for playback or 2½ hours for recording and 3 hours for playback when using the 9.6V rechargeable NiCd battery pack.

The Marantz PMD650 is delightfully straightforward to use and clearly much thought has been given to the end-user. There are welcome safety measures such as a backup of the Table Of Contents being written whenever a recording commences (Pre-UTOC) in case of a power loss, enabling previously recorded material to be retrieved; or when in dual-mono mode the left channel carries signals up to 0dB, but in case of an unforeseen overload, the right channel is recorded 15dB lower allowing a high quality backup to be available.

Its been a long time coming, and it certainly showed promise and looked good in trade-press ads a full 18 months ago. But now at last it is here, a little later than expected, and frankly I think you are going to want to buy one. Hundreds of us will. ■

Contact

Marantz Professional, PO Box 80002, Building SFF-2, 5600 JB Eindhoven, The Netherlands.
Tel: +31 40 2736634. Fax: +31 40 2735578.
UK: Marantz Professional.
Tel/fax: +44 1753 686080.

Audio Service DAIS

Choosing the right audio matrix for a broadcast centre is a critical task. **Rob James** connects with the Audio Service Digital Audio Interconnection System

MATRIX is in evocative word in large-scale broadcast television. It conjures up images of the very heart of a production centre where all roads lead not to Rome but to the matrix. In Audio Service's Digital Audio Interconnection System, (DAIS) an on-screen X-Y matrix replaces the manual patching of audio sources to destinations. This is accomplished by using a PC to control a crosspoint router or routers. The idea is hardly new but the Audio Service solution is significantly different to other router and matrix systems using off-the-shelf Yamaha YGDAI I-O cards of the CD8 series (and compatibles—cards that fit the 02R and 03D mixers) to form the basis of a comprehensive router and format convertor.

A single DAIS rack-frame can accept up to 14 single-height or 5 dual-height interface cards inserted vertically (dual height cards actually take up more physical space than the name implies). Each rack can handle up to 72 stereo crosspoints (144 channels) depending on the cards fitted. It can also function as the master wordclock generator in an installation at either 44.1kHz or 48kHz sampling rates.

All the 'synchronous' cards must be locked to a single clock. This can be internal or external wordclock or derived from input one of any digital card. However, it is also possible to fit four of Audio-Service's own 'asynchronous' cards in the horizontal slots. This effectively gives you two routers in one box—a 16 x 16 AES-EBU (stereo) that relies on all its sources and destinations being synchronous to an external reference, and a maximum 56 x 56 (stereo) with combinations of YGDAI cards. All routeing is done in stereo.

It is technically feasible to unpack stereo AES-EBU streams and route them as independent mono sources but this would greatly increase the system's cost and complexity. The YGDAI cards output synchronous digital silence in the absence of an input signal. When an assignment is made there is no delay and no clicks or splats. A source may be routed to up to seven destinations but, as might be expected, multiple sources to a single destination are not permitted.

Using the supplied Windows application, the sync source and other parameters are set and connections made and broken. The main window displays a matrix of squares that represents crosspoints with a hierarchical tree display on the left that may be hidden if the user requires a larger view of the matrix. The hierarchical structure allows a number of patch assignments to be stored for instant recall (by double-clicking) associated with a particular view of the matrix. Changing between patch assignments within a view leaves the rest of the matrix untouched. This can very useful where a large and complex system requires frequent changes to only a few sections. Complete global setups can be mapped to function keys 1-12. Patch assignments can be saved for particular jobs and the connections made instantly. This is a vast improvement on the time-consuming chore of manual patching. Audio Service will also supply the control protocols to users wishing to create a custom application, perhaps controlled via a touch-screen. There is nothing to prevent any half-way competent programmer 'rolling their own'.

If an application requires an 8 x 8 or 16 x 16 single-format router, there are alternatives which are more cost-effective. If, however the application demands anything much larger, perhaps with a complex mix of formats, DAIS starts to make financial sense. Add to this buffering and improvement of jitter, analogue and sample-rate conversion options, and the versatility of the concept becomes apparent. If 56 x 56 isn't big enough Audio Service has a couple of answers. Version 1 gives an 80 x 80 matrix with 56 digital inputs and outputs and 24 stereo analogue inputs and outputs controlled from a single DAIS matrix display. Version 2 effectively links two units—2 x (56 x 56) matrices with 24 stereo buses (48 channels) between the two this is currently controlled from two DAIS Matrix displays.

I suggest costing a 'conventional' patchbay solution (including all the wiring and format convertors) and comparing with the cost of a matrix. (Leaving aside costing in the potential time savings.) The result may well provide a pleasant surprise. ■

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Audio Service
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Sennheiser Series 3053/54

Turning radio mic technology around, Sennheiser has developed a new in-ear monitoring-foldback system **Neil Hillman** puts his ear to the ground

WHILE RADIO microphones remain the fastest growing sector of the pro-audio market, the small move sideways for manufacturers to the parallel technology of in-ear monitoring cannot be far behind. It makes good sense for them to package what is essentially the same technology, but for two different applications, and increase their market profile and recoup development costs at a greater rate than they otherwise might. Lectro for instance has achieved this brilliantly with the T5/R5 Interruptable Fold Back, based on the sophisticated tracking front-end of the UCR 300 UHF diversity radio microphone, and are quietly making huge in-roads into broadcast studios on this side of the Atlantic. But that system is more focused as a presenter/on-air talent talkback feed, premixed in the control room, and geared to the precise requirements of broadcasters. This Sennheiser option is of a more general nature, offering FM stereo dual-channel capability, but without as much processing sophistication as the Lectro. But it should nonetheless enjoy popularity as both in-ear monitoring for stage performers and as a useful television studio tool for presenters, as an interruptable foldback with production talkback on one channel and programme sound on the other.

The stereo transmitter for the system is the SR 3054-U, a 19-inch 1U-high rackmounted device with 16 UHF transmission frequencies preprogrammed in four groups between 450MHz–960MHz, and all inputs on the rear panel leaving a clean and clear front panel. A twin-transmitter version—the SR 3056-U—duplicates the features described for the SR 3054-U. The AF inputs to the transmitter are on electronically balanced female XLR sockets, fed at a nominal -10dBu and internally adjustable. The frequency response is given as 40Hz–15kHz, with the signal-to-noise ratio of the overall link being greater than 90dBA. The signal is stereo FM with a pilot tone, with Sennheiser's own HiDyn stage wideband compander system designed to increase the signal-to-noise ratio by compressing the AF level on the transmitter at 2:1, and then expanding by a similar amount the signal at the receiver. Interestingly, I pressed the receiver system into use in an emergency on location by transmitting to it for production monitoring purposes from a Sony WRT 820 pocket transmitter. Surprisingly, the receiver worked very well despite —I assume—a difference in pilot tones between the Sony and the Sennheiser, with precious little discernible loss in range or audio quality, merely a reduction in output level at the earpiece due in part to the compressed signal remaining unexpanded; a long shot that paid off. Other components on the back face are an IEC mains socket with cable grip, accepting an input of 115V to 230V at either 50Hz or 60Hz; a BNC antenna connector for either a 'stubby' placed directly on the unit or a feeder for a remotely sited antenna. Suitable products offered are the Sennheiser 2003 passive directional UHF antenna or the GZA 1036-9 ground plane antenna. The final connector is a 15-pin sub-D socket programming interface for the Sennheiser SMCD software, which facilitates frequency programming of the units and programmable control of the Series 3000 rackmounted receivers through a comprehensive Windows-RS485 platform.

The front face of the transmitter carries four small display windows, with the ON-OFF switch on the right-hand side nearest to the rackmount handles. This switches just the low voltage of the secondary of the magnetic core integrated mains transformer, its high efficiency reducing the residual consumption of power. The handles at each end of the front face are solid cast, sculpted, and predrilled and tapped to accept a front mounting of the BNC antenna connector if required. To the left of the power switch are three small push-buttons mounted in line above each other, the top two marked with UP and DOWN arrows respectively, which when pressed together toggle the unit's transmission output between mono or stereo. The largest display window carries a LCD segment that aligns with the legends of either MONO (M) or STEREO (S) depending on the selection made. When in Mono mode, only the right AF signal is transmitted. The bottom button is marked SET and is used to change the transmission frequency. When this button is pressed, the 1-inch by ¾-inch display window that shows the frequency in use as a 6-digit LCD read-out, flashes the headline 'Frequency >

It should nonetheless enjoy popularity as both in-ear monitoring for stage performers and as a useful television studio tool for presenters, as an interruptable foldback with production talkback on one channel and programme sound on the other

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< MHZ'. The UP and DOWN arrows now allow selection of the next fixed frequency set in the programme and is executed by holding down the SET button for 2s. Transmission remains unaffected on the old frequency until the SET execution command is given followed by a 'STO' confirmation message, and the 'Frequency MHZ' headline ceases flashing. If an error in selection is made before this point, a brief dab on the SET button will escape the procedure with a momentary display of ESC as confirmation that the operation has been aborted. The power of the RF signal is shown by a small vertical LCD bar graph to the left of the main display window, calibrated bottom to top between 20% and 100%. Under normal conditions this is at 100%. The final two displays are again vertical LCD bar graphs, paired to show deviation of the AF signal and calibrated bottom to top in steps of 3%, 10%, 25%, 50% and 100%. A 1/4-inch, 16Ω headphone socket is available for monitoring the output, with an associated volume knob next to it.

If the Sennheiser company is firmly lodged into the collective psyche of audio users, it is due in part to being spread strongly across consumer, semipro and professional markets, the latest entry to the in-ear monitoring arena will further this progress

The EK 3053-U receiver is robustly built—a die-cast grey, cigarette-packet sized unit, with a curious curved contour along the right-hand side of its otherwise square sides. The bottom of this curved side houses the battery flap, a strongly sprung affair in similar metal, that reminded me in operation very much of the opening doors on boyhood model cars—a 1937 MG TC to be precise. The 9V MN1604 battery occupies the full width of the bottom third of the receiver, and offers an operating life of around 5 hours with a medium volume setting; this time can be reduced by a couple of hours if the unit is driven hard however. The square, left-hand side of the unit houses all adjustments and settings bar output volume—in a recess—with the rotary channel selector of 16 channels marked Hexadecimal fashion 0-F. Above it is a tiny RF squelch rotary control knob, adjusted to prevent hiss on the system with the transmitter switched off; a slider switch for headphone limiter either 'on' or 'off' and a similar slider switch for selection of either Stereo or Focus output—all shielded behind a sliding transparent plastic cover for the recessed controls. The Focus option mixes both left and right input signals and routes them as a mono signal to both left and right outputs. The rotary BALANCE control at the top of this left-hand side during Focus selection adjusts the relative levels of the two separate channels in the mono mix, or in the stereo position adjusts the balance between the left and right stereo signal. The top face has a pleasingly large combined ON-OFF switch and volume pot, calibrated Off-10. In the centre of this panel is the 3.5mm stereo headphone-earpiece socket and next to it the beautifully machined Lemo antenna connector.

The front face carries two LEDs at the top right-hand corner; for the one marked RF a green display indicates that an RF signal is being received and for the other, marked ON-LOW BATT, a red constant display shows that the receiver is switched on and that the battery carries sufficient voltage. A flashing red LED shows that about 15 minutes of operating life is left in the battery and it should be replaced. The back panel of the receiver carries the familiar Sennheiser spring belt-clip and also a table of the operating frequencies corresponding to the 16 channels available for selection. The stereo channel separation of the 2 x 32Ω outputs is given as greater than 45dB, and in use it was possible to isolate left information from right easily enough; the 2 x 100mW output leaving plenty in hand on the volume knob for tired performance ears.

If the Sennheiser company is firmly lodged into the collective psyche of audio users, it is due in part to being spread strongly across consumer, semi-pro and professional markets; and now as part of the mid-priced 3000 series of radio products, the latest entry to the in-ear monitoring arena will further this progress. With the SR 3054-U transmitter priced at £1,100 (UK) and the EK 3053-U receiver priced at £700 (UK), both semi-pro and professional stage users—as well as some applications in a television studio—may well benefit from a good product at a reasonable price. ■

Contact

Sennheiser Electronic, Postfach 10 02 24, 3002 Wedemark 2, Germany.
Tel: +49 51 30 600 366.
Fax: +49 51 30 6312.
UK: Sennheiser UK,
3 Century Point, Halifax Road,
High Wycombe, Hampshire
HP12 3SL, UK.
Tel: +44 1494 551551.
Fax: +44 1494 551550.
US: Sennheiser, 6 Vista Drive,
PO Box 987, Old Lyme, CT 06371.
Tel: +1 203 434 9190.
Fax: +1 203 434 1759.

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Focusrite ISA 430

Combining the best of the best into a single outboard unit, Focusrite's Producer Pack is certain to win plenty of accolades. **Dave Foister** offers the first

IF YOU WERE ABLE to carry your own rack of signal processing around with you, what would be in it? For many people, it would include something from Focusrite, particularly the classic Neve-designed ISA range. The 110 equaliser was what started it all for Focusrite, becoming the standard outboard EQ to deal with the perceived shortcomings of the onboard facilities of otherwise excellent consoles, and the 110's circuit found its way into the mammoth Focusrite consoles as the standard EQ. Further outboards followed, all based on the same central design philosophy, including dynamic control and mic preamps. Those who wish they could carry a set of these around in a single box need wish no longer: the ISA430 is the fulfilment of that wish.

With this use in mind the 430 is dubbed the Producer Pack, containing as it does a complete Rupert Neve-designed signal path that can apply a whole chain of sought-after Focusrite treatments to a single mono signal. It offers, folded neatly into a 2U-high package, a particularly well-equipped mixer strip, with comprehensive EQ and a full set of dynamic processors, coupled with a Neve transformer-based mic preamp. The preamp also has a line input and a front-panel instrument input (duplicated on the back), with controls for coarse and fine gain, phantom and phase reverse. One of the functions of the big vu meter is to show the input level post the preamp.

In the normal scheme of things the signal then passes to the EQ, which is the original 110 circuit as Rupert designed it. Many will therefore be familiar with the layout; it starts with a pair of swept filters, then has a pair of overlapping parametric bands, and finally has shelving bands at each end with switched turnover frequencies just like the classic old Neve console EQ. Each of these three sections can be individually switched in or out, and the whole equaliser can be bypassed. In addition, any of the sections can be diverted for use in the dynamics side chain, offering huge potential for frequency-conscious processing, while leaving the others in the main path.

There is minimal calibration on the EQ controls, but none is needed. This is the kind of EQ that seems to draw the controls into the right place with almost no messing about, giving it an intuitive ease of use that few can match. Why it should be so much easier to get the required result out of some equalisers than others is a mystery, but this design is one of the best in this respect. Whatever the settings, the treatment is smooth and musical, powerful when it needs to be yet capable of the subtlest nuance; the fact that many more recent esoteric high-end EQs still can't sound this good is a remarkable tribute to the designer.

Next comes the dynamics section, with no less than four treatments separately and simultaneously available and making extensive use of opto-coupled gain control. It starts with the compressor, based closely on the original ISA130 and featuring a deceptively simple layout with little more than the bare minimum of controls. Besides variable ratio, threshold, attack, release and gain make-up, there's an Auto release setting—and that's it. Switches for bypass and external key enable are provided, and the gain reduction can be shown on the main meter; curiously, the calibration of the meter seems to drift as the unit warms up. You can monitor the side-chain path, which is useful for setting up some EQ to tailor the compressor response, remembering that the filters, or the parametrics, or the shelving EQ can be placed in the side chain if required. Once again, the compressor's performance belies the apparently basic nature of the setup, as it is so easy to get to it to do what you want. In fact the meter is almost a distraction, as it can suddenly start flicking around to make you think you're overdoing it, when the sound tells you otherwise.

By comparison the gate is unusually sophisticated, although it still 'shares the ISA130's vintage heritage' according to Focusrite. It can be switched to operate as an expander, and has a range control as well as most of the usual set. It is slightly unusual in having only a switch to alter the attack time yet having a variable control for the hold time. A little more numeric calibration is provided than on the compressor, and a row of five calibrated green LEDs shows how much gain reduction is occurring. There is an extra switch to introduce hysteresis into the threshold operation, so that its closing threshold is lower than its opening threshold, in order to avoid chatter on long tails. In conjunction with the rest of the control complement this makes for extremely fast and tolerant setup; you'd be hard pressed to find a friendlier gate than this in or out of a dedicated box. For frequency-conscious gating the availability of the various EQ sections to modify the side chain is even more useful than it is in the compressor. The entire dynamics section has a Link socket to allow two 430s to operate in tandem.

Many will be familiar with the layout of the ISA 430; it starts with a pair of swept filters, then has a pair of overlapping parametric bands, and finally has shelving bands at each end with switched turnover frequencies just like the classic old Neve console EQ

One possible use of EQ in the compressor control is de-essing, yet the 430 makes complex setups unnecessary by having a dedicated de-esser following the gate. This uses an optocoupler and operates extremely simply, with a swept frequency control and a threshold for the chosen frequency. Finding the band that requires attention is made easier by yet another side-chain LISTEN switch, this time giving only the contents of the narrow filter pass band, making it very simple to identify the problem area. An LED shows when it is doing its stuff.

The last process is a limiter whose operation is enabled by a single switch and shown by a single red LED. Although it looks like the simplest limiter you could find, almost an afterthought, it is in fact a 3-band device using a separate optocoupler stage for each band. The lack of user-control is more than compensated for by its separate treatment and different attack time ranges for the three bands—the kind of specialist approach that might be expected from a mastering limiter. This is alongside a final output level control, joined by a knob for mixing in a second input source that we shall come to later. The 430's final signal output level is shown on a horizontal >

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< LED meter above the main vu meter.

If this selection of treatments seems powerful enough, more flexibility still is provided by a simple switched patching system that can change the order of processes around in various ways. For one thing, like any mixer channel the 430 has an insert point, which is available on the back panel on balanced XLRs and whose return level can be shown on the vu meter as its final option. The insert can be placed in the chain before the EQ, between the EQ and the dynamics, or after the dynamics as the final process, simply by cycling round the three options with a push-button switch. Similarly the dynamics can be shifted *en bloc* to come before the equaliser in the signal path, again with the option to place the insert wherever you like. Besides all this, if all you want for a particular job is the use of the microphone preamp, and you want to shorten the signal path as far as possible, a separate output is provided at the output of the preamp.

As a final twist, the dynamics section can be split off from the main path to operate entirely independently, while the main signal passes through the preamp and the EQ. In this mode the whole dynamics chain is accessed by means of the insert point connectors and becomes effectively a separate unit. This apparently simple feature adds hugely to the bangs-per-buck appeal of the unit; where others give you a very nice signal path that can only deal with one signal at a time, the 430 gives you two top-notch Focusrite outboards in the one box.

Any more than a cursory glance over the front panel reveals that there is yet more to come. So far what we have is perhaps one of the most desirable analogue signal paths in the business; bolted on to the end of it is Focusrite's more recent digital expertise in the form of a high-performance analogue to digital convertor. This is an optional card that can be user-fitted in a slot on the back panel (it took me15 minutes), although the necessary controls are already in place on the front. The controls select the various sampling rates and word lengths—up to 96kHz and 24 bits. The card carries outputs in AES-EBU and SPDIF (BNC and optical) formats, and a BNC for word clock or Pro Tools Superclock synchronisation. There are two small switches, one for 75Ω termination of the sync input and one to select between two analogue output reference levels.

The 430's internal signal path appears on the left leg of the stereo output, and there is a further line input direct into the convertor's other channel. The two output signals appear on the LED meters above the vu, and the external input has its own gain control. This is useful in the Sum mode, where the two signals are mixed in mono to both digital channels. Besides this, there is a 3-pole jack that breaks the internal link to the left channel, allowing a stereo analogue signal to be connected straight to the convertors while the analogue sections remain available via the analogue ins and outs and inserts. This means that the 430 can function, simultaneously and without breaking sweat, as a parametric EQ, a dynamics processor, and a 24-96 stereo convertor, all fully independent from each other.

At its most extreme, this would seem to allow two channels of an analogue desk to use the 430's EQ and dynamics independently, while the desk's stereo bus feeds the 430's convertors directly in place of its own internal path. Surprisingly (and usefully), the limiter operates in stereo on the convertor inputs as a safety net separate from the rest of the dynamics.

It will be obvious by now that the ISA430 Producer Pack offers even more than its front panel would suggest. The prospect of a chain of Focusrite processors inheriting the fundamental characteristics that established Focusrite in the first place would be enough to sell the 430; the extraordinary flexibility that comes with it, controlled so simply from a well thought out front panel, makes it outstanding. ■

As a final twist, the dynamics section can be split off from the main path to operate entirely independently, while the main signal passes through the preamp and the EQ. In this mode the whole dynamics chain is accessed by means of the insert point connectors and becomes effectively a separate unit. This apparently simple feature adds hugely to the bangs-per-buck appeal of the unit

Contact
Focusrite Audio Engineering
Tel: +44 1494 462246.
Fax: +44 1494 459920.
Japan: Access All Areas.
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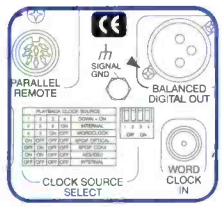

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FIRST WE LISTEN

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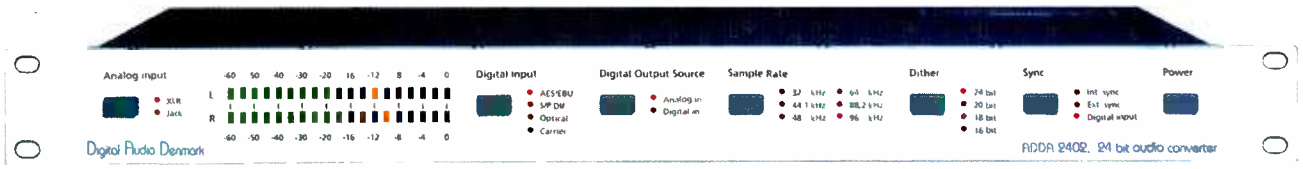
Digital Audio Denmark ADDA 2402

One of today's essentials is the convertor, through which an audio system can be made or broken. **Rob James** preaches conversion

ONE VIRTUE of digitally encoding audio, video or any other analogue signal for that matter is that at least one source of distortion should be completely eliminated. In a properly designed and functioning digital system an output signal will be precisely, mathematically the same as the input unless it is deliberately altered. Many of the perceived 'virtues' of analogue equipment result from its inability to achieve this.



In the early days of commercially available digital-audio equipment, its advantages over many existing analogue devices outweighed and obscured its disadvantages. In recent years, the disadvantages have become more obvious, even to those not blessed with 'golden ears'. The vexed questions of bit depth and sampling rate are eclipsed by a more fundamental problem. There is an old saying in computing circles, GIGO (Garbage In, Garbage Out). One of the greatest contributions to whether a digital device sounds good is the quality of the analogue to digital conversion and vice versa.

The ADDA 2402 is a full-duplex 2-channel A–D and D–A convertor. It also functions as a 2-channel D–D convertor able to convert between any of the six sample rates provided by the internal clock—32kHz, 44.1kHz,48kHz, 64kHz, 88.2kHz and 96kHz. It will also convert between consumer and professional flavours of AES-EBU. Rear-panel connections start with a combined IEC mains socket, switch and fuse. Seven XLRs deal with balanced analogue in and out, AES-EBU digital in and out and external AES-EBU sync. Four 2-pole jacks cater for unbalanced analogue I-O. Balanced analogue is at +18dBu maximum and unbalanced at +4dBu maximum. Optical TosLink and co-axial phono connections are provided for SPDIF.

The chalk-white front panel is dominated by a pair of 19-segment LED bar graph, analogue input, peak meters. These are calibrated to light the rightmost red LED at 0dBFS. Down to -20dBFS the scaling resolution is in increments of 2dBFS allowing the common operating levels to be set. All the keys are small, grey, oblong buttons with adjacent LED indicators. ANALOGUE INPUT switches between XLR and jack, while DIGITAL INPUT switches between AES-EBU, SPDIF or optical. The fourth, CARRIER, LED indicates valid signal on the selected source. DIGITAL OUTPUT SOURCE selects between digital and analogue inputs, SAMPLE RATE selects between six internal sampling rates. DITHER selects the output bit depth between 24, 20, 18 or 16 bits. SYNC switches the sync source between Internal, External or the currently selected digital input. If there is no valid external input the unit defaults to internal and no other source may be selected. The front panel POWER key puts the unit into Standby mode.

By dint of the number of connection possibilities the ADDA 2402 can form the nucleus of a small system, eliminating the need for a patchfield. The analogue and digital inputs are selected using the ANALOGUE and DIGITAL input keys. The DIGITAL OUTPUT SOURCE key switches between analogue and digital inputs—that is, it switches between digital-to-digital, sample rate, and ADDA conversion. The analogue outputs always carry the converted output of the selected digital input source. The Dither function employs a psychoacoustic noise-shaping filter.

Early A–D convertor designs required a brick wall analogue low-pass filter at the Nyquist frequency (half the sampling rate) to avoid highly undesirable aliasing artefacts. The design and construction of such a filter is problematic being both difficult and expensive to do well. These filters also introduce delay. To quote John Watkinson, 'As the slope tends to vertical, the delay caused by the filter goes to infinity; the quality is marvellous but you don't live to hear it'.

Techniques such as oversampling are claimed to remove the requirement for an analogue filter allowing much gentler (and cheaper to manufacture) filter designs to be employed in the digital domain. Many convertor designs allow a small amount of aliasing distortion at high frequencies on the grounds that it is unlikely to be heard. At the 1999 AES conference in Munich, Richard Black presented a paper identifying a type of distortion, Aliasing Intermodulation Distortion or AID that arises when there is aliasing distortion present, accompanied by intermodulation distortion above a certain level. The IM distortion is introduced by analogue devices and or transducers such as loudspeakers. The AID and IMD can mix and generate new audible frequencies.

In order to avoid AID Digital Audio Denmark has implemented Nyquist frequency stop-band filtering using a Crystal Semiconductors device. The trade-off in this case is the -3dB bandwidth is reduced to 19.3kHz at 44.1kHz sampling rate. Using higher sampling rates such as 96kHz the aliasing distortion moves up in frequency to an area where IM distortion has little effect rendering such strategies unnecessary.

With proper design there is no proven justification for the use of high sampling rates. However, their use avoids the necessity for expensive precision filters and, along with increased bit depth, allows more margin for error.

The unit takes a few seconds to calibrate when first switched on and recalibrates when a different rate is selected. It is a good idea to recalibrate once it has had a chance to warm up. Any convertor ultimately stands or falls on subjective audio quality. The ADDA 2402 acquits itself honourably by being inaudible in all the listening tests I devised. It is highly convenient to operate and the meters are bright and easy to read with just the right peak-hold duration.

At the asking price, the ADDA2402 is competitive as a simple upgrade to existing integrated convertors. However, it has the considerable bonus of multiformat inputs and outputs and sample-rate conversion. Add to this the degree of future proofing conferred by its 24-bit, 96kHz sampling capabilities and Digital Audio Denmark may well have found themselves an ideal niche in the market. This unit should appeal to small studios looking for high quality conversion and connectivity and especially for DAW and transfer setups. ■

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Digital Audio Denmark.
Tel: +45 435 04941.
Fax: +45 435 04989.
Email: ps@digital.dk

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Tascam CD-R/RW

Tascam's 2U-high rackmountable CD-RW700 accepts CD-R and CD-RW discs, has a built-in sample convertor, a digital input level control, phono I-O and coaxial and optical SPDIF I-O. It also features fade in/out, auto track increment (-24, -30, -36, -42, -54, -60, -66 or 72dB selectable), sync start, CD-RW erase, repeat, random and program Play. The CD-RW700 also has a clock function, headphone output and wireless remote control.

Tascam, US. Tel: +1 323 726 0303.

Marantz CD players

Designed to fulfil the requirements of DJ, sound installation, recording studio, post, broadcast and on-air applications the Marantz 300 Series of professional CD players comprises three units. The entry level PMD330 offers all the standard features of

a professional machine while the PMD331 and PMD340 include a 10s antishock buffer, instant start and advanced pitch control and bend features. The top of the range PMD340 additionally incorporates an industrial grade transport mechanism and optical pickup unit with integrated preamp. Features include CD-RW playback, CD text, frame search, index search, programmable cue point memory, digital pitch control ±12%, end monitor, 10-key pad, fader start, backlit transport controls, backlit LCD and adjustment-free mechanism with digital servo.

Marantz, UK. Tel: +44 1753 686 080.

Clever talkback

Audionics' COM2000 talkback system is based around a 16 or 8-way 1U-high rackmount base station. Talkback controllers are connected to the base station via standard CAT5 data cabling, simplifying installation in new and existing systems. Controllers can be operated as simple point to talkback units or several destinations can be preselected and a single talkback key is used to talk to all the selected areas. Talkback keys can be operated in momentary or latched modes. Optional software provides the user with setup facilities and each controller can have an open listen of any number of other controllers providing a permanent listen of the selected talkback mic or a keyed open listen which provides a listen of the controller when it is talking to any other controller. Controller switches can be programmed to talk to any combination of destinations. Preset configurations can also be saved or loaded from PC.

Audionics, UK. Tel: +44 114 242 2333.

Audio-Technica AT4047/SV

Bringing nostalgia up to date, Audio-Technica has released a FET condenser mic. **Dave Foister** catches up with the past

EVEN NOSTALGIA has to move with the times. Perhaps it runs on a parallel track, so that we always yearn for things from a certain set distance in the past. Whatever the reason, this year's classic and vintage stuff is newer than last year's. We've done the valve microphone thing now, and it's time to move on to the classic sound of early FET microphones, with the help of Audio Technica. Try not to worry about the fact that the whole reason valve microphones were rediscovered was a feeling in some quarters that FETs were a retrograde step.

The AT4047/SV is the latest addition to Audio-Technica's acclaimed 4000 series of studio condenser microphones, the range that began with the surprise of its year, the 4033. In many respects the new model is very closely linked to the 4033; it shares its shape, its essential functionality and its accessory range, but adds a vibe that harks back to the sixties and seventies.

Like the 4033, the new microphone is a simple cardioid side-fire type, with the familiar shape that makes the basket surrounding the capsule substantially bigger than the remaining body length. The standard means of support is the supplied suspension mount, a simple but well-designed affair that grips the microphone purely by means of its rubber bands; these drop neatly into grooves around the housing. It has a big locking lever and holds the microphone well.

Audio-Technica's slick manufacturing quality is now well-known, and the 4047 once again is immaculately built and finished. It has two switches for obvious functions, and while these are out of the way of fiddling fingers they are still accessible, even when the microphone is in the suspension mount. The polar pattern is fixed at cardioid, and so the only switches are for the high-pass filter and the pad. The filter is a sensible one, rolling off at 12dB per octave below 80Hz, high enough to be useful, but low enough not to eat into the sound unnecessarily. The pad attenuates by 10dB, and with this in place Audio-Technica claims a maximum SPL handling of no less than 159dB for 1% THD. With a specified equivalent noise level of 9dB SPL this makes for an impressive wide dynamic range and a performance that is certainly in line with current media—unlike some of the original models it is attempting to emulate.

The finish of the microphone is part of the chosen retro image. Once all microphones were this satin nickel colour, but now black has taken over, a trend A-T normally follows with its own models. The silver-matte finish remains attractive, however, and when applied to the 4047 undoubtedly reinforces the image it is trying to present.

But the cosmetics are, of course, really beside the point: if you're trying to produce something that recreates a microphone style from the past, the sound is all that matters. There are one or two manufacturers around who might benefit from being reminded of that, but Audio-Technica is certainly not one of them. The 4047's literature refers to it as 'a contemporary replication of vintage condenser technology' and whatever has been done is primarily in the interests of producing a sonic character.

The character in question is, perhaps, even harder to define than the elements that constitute the sound of a valve microphone, but the important thing is that when you push the fader up on the 4047 you know they've got it right. There's a kind of silvery sheen to the sound of an early big FET microphone; you know it doesn't go all the way up into the ultrasonic stratosphere, but as far as it does go it is clean, bright and smooth. That's what the 4047 has too, coupled with the expected big warm bass end, giving the subtle contour that makes this kind of microphone so good for vocals. This is one of its obvious applications, and it does it very well, producing an instantly familiar type of sound that immediately reduces the amount of further processing that will be required.

That's not to say that the 4047 is obviously coloured to the extent that its usefulness is restricted. On the other obvious candidates for a big condenser it performs as you would want it to, with a big flattering sound on saxophone, detail and warmth on trumpet, and so on; an accomplished all-rounder without having to be clinically flat to achieve it.

What ever recording technology is around in thirty years' time, you can bet someone will be recreating the classic sound of the Sony DTC1000, or the vintage character of an early ADAT—but better, of course. The trend starts here, with a deliberate replication of something that originally replaced the valve sound that we've been trying so hard to replicate up to now because we didn't like what replaced it. Make of it philosophically what you will; the 4047 does what it sets out to do, with the bonus of modern technical specs and presumably improved reliability and consistency, and will surely have a place in many armouries. ■

Contact

UK: Audio-Technica.
Tel: +44 1132 771441.
Fax: +44 1132 704 836.
US: Audio-Technica.
Tel: +1 216 686 2600.
Fax: +1 216 686 3752.

Tube Tech SMC2A

Another valve based compressor in a rackmount? Correct but Tube Tech has put some daylight between itself and the competition by making this one multiband. **Zenon Schoepe** indulges

Continuing the dynasty of well thought out and interesting outboard processors with valves in them, Tube Tech has come out with the SMC2A which qualifies as the first valve based multiband compressor. A stereo device with transformer balanced XLR connectors and optical elements, gain reduction is performed in three bands which are fed from two variable 6dB/octave crossover point pots which dictate how the spectrum is split in to low, mid and high bands.

The high/mid split sweeps from 1.2kHz to 6kHz while the low/mid crossover spans 60Hz to 1.2kHz with the use of a x1 and x4 multiplier switch. The 'optimum summing' design is such that the three bands are flat within ±0.25dB when each band's gain controls are set at the same level.

Each band has an identical compressor with fully variable threshold (-20 to off), ratio (1.5:1 to 10:1), attack (3-60mS), release (60mS to 2S) and a band gain reduction meter. Band gain sweeps from off to +10dB while a master output gain pot offers the same at the end of the chain together with a bypass switch.

I initially felt that the lack of individual band bypasses was something of an oversight but extended use taught me to appreciate the fact that results are achieved by effectively mixing the component band contributions and winding off bands' gain controls allows the remainder to be heard in isolation as an altogether more satisfactory arrangement than simply being able to 'flat' the bands individually. The beauty is that you can apply the compression where you want it or where it is needed only. Alternatively you can simplify matters for yourself by winding the crossovers to their extremes to give yourself the broadest midrange as an easy starting point and then dial in top and bottom.

Selection of the crossover points is crucial for optimum operation of the SMC2A and needs to be set on a per programme basis. The reason for this is that you have to be careful of large disparities in amounts of compression on signals around the crossover points. If an important or obvious portion of the programme is centred at or around the crossover and you apply a liberal dollop of compression in the low band and a more restrained amount in the mid, under certain circumstances you will be able to hear the two chunks of the signal being worked on separately.

This is true of other multiband devices that offer tuneable ranges and it's pretty obvious that you don't plonk the crossover astride a strident kick drum in a mix unless of course you're after the effect.

However, this effect can be particularly good when applied to solo instruments by using just one channel; it's a shame that the unit isn't dual channel but I'd shudder to think how bulky and expensive it would become. But you can get phenomenally sophisticated and unique compression on solo drums, for example. Decadent? Perhaps but if you're after something different that reminds you constantly that there are glass bulbs involved then this is the box to buy in bulk.

The ability to apply ultra deep frequency compression in isolation selectively will appeal to those targeting dance floors, narrow mid band treatment can do wonders to vocals in a mix and I was surprised at just how much high band valve compression you get spread on and get away with.

This is an exquisite piece of machinery. I have tried a number of variations on the multiband dynamics theme in analogue and digital incarnations and while I am yet to find one that I positively dislike all have their own very definite character and I would certainly rate some above others for particular tasks. The character inherent in a particular box's processing is multiplied when it becomes multiband which is maybe to be expected. To this end I am stating the obvious when I say that the SMC2A sounds like lots of Tube Tech with its characteristic roundness and the intactness of the original signal's audio spectrum.

What you loose with the multiband approach is the immediacy and speed of broadband gain reduction adjustment—you choose the box and simply dial in more or less according to what you want. What you gain is a quantum leap in control of the precise nature of the compression which I have to admit I did not believe was possible with valve based processing. Although you become skilled in applying it, the SCM2A is not as fast to use because your options are tripled and you are invited to analyse what you are attempting and positively encouraged to experiment once you get close and you won't be able to resist. To say it suits mastering well should not denigrate the myriad of uses it has in the control room.

The results are incredibly impressive on all counts and applications. It also does a good very good job of approximating the sound of other tube type compressors because you can frequency bias the processing very finely.

If you are prepared to invest the time in becoming truly familiar with this unit then it will be the only valve stereo compressor you'll need. Try it and prepare to be amazed. ■

Contact
Tube Tech,
Ved Damhussoen 38, DK
2720 Vanlose, Denmark
Tel: +45 38 71 0021
Fax: +45 38 79 0091

NEW TECHNOLOGIES

Indigo speakers

The Indigo Home and Studio range of speakers aim to deliver studio playback monitors for the home. The range features no internal wadding, hardwired second

order crossovers, 21mm MDF cabinets, and controlled dispersion HF units. Drivers employ neodymium magnets, kapton voice-coil formers, laminated paper cones, contoured MDF baffles and real wood veneers. The Indigo One is a compact monitor with magnetic shielding for home studios, broadcast control rooms and DAW applications. Indigo Two is landscape format monitor for similar applications but well suited to surround playback. Indigo Three is described as a powerful, high performance monitor designed with phase accuracy for nearfield listening as a priority using a titanium dome HF and a 170mm laminated cone LF.
Indigo, UK. Tel: +44 1480 861175.

Radio on-air

The Airlab radio on-air console is D&R's solution for applications where features and functions must not obstruct operational simplicity. A simple control surface combined with intelligent instantly resettable digital functions enables customisation to a station's requirements through the use of a personalised chip card holding all important functional data. Additional features include a welded steel frame that accommodates a maximum of 16 triple input modules, which could include Telco modules plus the master section with script space. The main outputs are electronically balanced and the majority of connectors are on balanced XLRs.
D&R, Netherlands. Tel: +31 2940 418 014.

STM 99 modular mics

Drawing on 20 years of experience in miking brass and woodwind in studio situations, the STM modular series offers a variety in top-quality shock-mounts and exchangeable elements. Top of the line is the 'deep and warm' sounding STM-99 large diaphragm element. The patents pending mounting systems are suitable for studio situations and give the player the freedom of movement. SD Systems designs each microphone system for a specific instrument, picking up the complete sound spectrum in the right way. The mics are fixed in the optimum acoustical positions on the instrument and extensive research has been conducted to find which sound pattern each instrument produces, which sort of element matches the instrument's sound and where to position the elements.
SD Systems, The Netherlands.
Tel: +31 20 692 6413.

Crane Song Trakker

Building on the reputation of the STC-8, Crane Song's Trakker brings class-A prestige to the party. **George Shilling** makes tracks

THE TRAKKER IS a new mono compressor-limiter from Crane Song. Similar in appearance and circuitry to the STC-8 Stereo Compressor (*Studio Sound*, November 1999), the differences manifest themselves in class-A electronics, solid construction from steel and aluminium, and a bluey-green colour scheme for the front panel knobs.

Although the Trakker's workings are squeezed into a 1U-high rack space, it is a fairly deep box and feels decidedly weighty—no doubt due to the large toroidal transformer and multitudinous heatsinks. These seem generously over specified, as the unit feels fairly cool for a class-A unit. Designer David Hill has a boffin's obsessive attention to detail in all areas, an example of which is the options of four different (internal) voltage settings. Using the 230V setting instead of 240V in a 240V environment would probably not be disastrous, but perhaps the unit might run hotter. Input and Output XLRs are accompanied by a DB9 connector for attaching a fully balanced side chain, and a DB15 for linking up to a further seven Trakkers. In this mode, the Trakker claims to, erm, track within 0.1dB for accurate surround-sound program compression. Also in this mode, only the slaves' Gain controls are active. These unusual connectors make things neat and tidy, but could be a nuisance in any situation other than a permanent installation, due to their non-standard nature.

On the front panel are gently damped rotary controls for Threshold, Attack, Release, Knee and Output Gain, and a 16-position switch for mode selection. Legending could be better, but is a slight improvement over that on the STC-8: the MODE switch is here accompanied by colour-coded LEDs. The variable knobs are mostly given scales of 1-10, which is sensible as settings interact and are dependent on program and mode. They seem to vary to always provide a perfect range of adjustment. These are a joy to use. OUTPUT GAIN is simply that —no attenuation can be achieved with this knob, simply a make-up of up to 14dBs, which is perfect. The long LED meter is superb, relating accurately to what one hears when set to Gain Reduction mode. There is also an Output Level indication available. Toggle switches are provided for power, meter, link, and hard-wired bypass, in which mode compression is still metered, which can be handy or confusing depending on your point of view.

The 16-position switch offers four modes, with the same four variations of each mode. I don't know why there are not two 4-position switches, which would have made operation simpler and mode comparison easier. The four quadrants of the switch equate to modes Hard, Soft, Optical and Air Optical compressor characteristics. Hard refers to the knee, (the KNEE knob is for fine tuning), and this mode effectively turns the unit into a peak limiter. Optical aims to emulate the sound of certain vintage units, and when the other knobs are set to recommended settings, this is a fairly convincing replication of a vintage Teletronix LA3 compressor. Air Optical mode adds a small high frequency boost to replicate compensatory treble-lift circuits found in certain vintage valve compressors.

The four sub-modes found within each main four sections are related to amplifier colouration: Clean, Vintage (tube or 'old-style

NEW TECHNOLOGIES

C-Lab options

C-Lab has updated its universal clock convertor with the addition of a connector for sending and receiving control data plus super or other clocks over long distances.

The C-Net connector provides long distance lines for remote access and control between machine room and control room.Options for a USB connector, word clock distributor and plug-in video sync pulse generator have also been added with multiple machine control.

C-Lab, Germany. Tel: +49 40 69 44 000.

PMC compact active

PMC's AML1 boasts claimed sub-35Hz performance from an 8 x 12 x 16-inch cabinet and employs transmission line design. It uses a custom-built 6½-inch flat piston woofer constructed from a carbon fibre/Nomex honeycomb and a high power handling 1¼-inch silk dome tweeter. The two drivers are integrated by discrete low-noise active crossovers and the dual 120W amp and crossover designs are licensed from Bryston. User-controls provide for input level adjustment with LF roll-off, LF tilt and HF tilt that can be defeated on a push-button. The XB1-A MKII is described by PMC as an excellent dedicated speaker for the .1 effects channel and partner to the TB1 and LB1 nearfield monitors. It includes its own internal crossovers which remove the LF below 90Hz from the satellite speakers and routes it via its own dual coil bass driver. Features include a new look cabinet in style with the IB1S and SB100 products, rotatable back panel for horizontal or vertical placement, radiused front port opening for improved air flow, easy reading wiring legend for input and output, an optional full face grille and usable bass extension to 25Hz.

PMC, UK. Tel: +44 1707 393002.

Interpreter booth

Brahler ICS' M83H interpreter booth com-

plies with ISO4043 and exceeds the industry standard for sound-proofing criteria. It can accommodate two interpreters but through its modular construction can easily be expanded to accommodate three and special clips facilitate simple assembly by one individual. The booth consists of lighter laminated panels and the inside surface is covered with a hard-wearing felt while a rubber seal for the door furthers sound attenuation. Brahler claim it is the most efficient and cost-effective of its type available.
Brahler ICS, UK. Tel:+44 1223 411601.

Windspoiler

Rycote's Windspoiler wind-reduction device can be used with any mic fitted with a Rycote Softie and Softie mount. It works

by reducing wind noise on the rear of the mic and is said to have no discernable influence on audio quality. Total wind-noise reduction is claimed to be more than 30dB.
Rycote, UK. Tel: +44 1453 759338.

90 Series from Wharfedale

Developed from the successful 2180 series which continues in production, the 90 Series offers increased power handling and high sound pressure levels from a range of compact boxes. With three models available, each speaker uses 8-inch reinforced pulp cone woofers (featuring a 50mm high temperature voice coil) with Ferrofluid cooled 25mm titanium domed HF units; all designed in house by Wharfedale. The 2190 and 3190 speakers also feature the 'Baker Effect Array', by mounting two HF drive units perpendicular to each other, and carefully contouring the crossover network, the speakers are able to reproduce a dramatic stereo effect in almost any listening position. The 90 Series consists of three models. The 2090 and 2190 are rated at 200W (programme) with a nominal impedance of 8Ω. The principal model of the range, the 3190, delivers 350W (programme) with a nominal impedance of 4Ω. The 3190 is loaded with two 25mm tweeters as well as two 8-inch woofers.
Wharfedale, UK. Tel: +44 1480 431 737.

Vegas Pro

Vegas Pro features a multithreaded architecture designed to 'squeeze over the top' real-time performance from a Windows PC. It is able to perform nondestructive edits during playback, run multiple plug-in effects and mix file properties, bit depths and sampling rates. The system has 24/96 capability, accommodates 'unlimited' tracks and includes DirectX support. It can support creation of streaming media for Windows Media Technologies 4.0 and RealNetworks Real System G2 file formats plus mp3. It can also incorporate timeline metadata for

class-A'), Clean with VCA artefacts and Vintage with VCA artefacts. Vintage paths add colouration set to replicate that found when using triode tube circuits and single-ended class-A transistor circuits, which translates as second harmonic colouration, with third harmonic as clipping is approached. I compared a Urei LA3A and found that to replicate the ratio characteristics a higher knee setting than suggested was necessary. Air Optical mode was very similar-sounding. I also compared a Teletronix LA2A to Optical Vintage, and this again required a steeper knee setting than recommended to match those characteristics, but once dialled in, sounded convincing. The differences between these modes can be fairly subtle, dependant on program and other settings, but it should be noted that all controls interact, and the Optical settings especially have an element of program-dependency. VCA artefacts are only apparent when the gain is changing; only on faster settings are the colourations apparent. Vintage VCA adds the most extreme colouration, with an apparent emphasis and added dynamism in the high-mid frequencies and an obvious presence boost in the region associated with guitar string finger noise or vocal detail. On drums, extremely fast settings sound terrific, especially with a steep knee. The differences between the modes are more obvious in these extreme circumstances. With slower settings, instruments are especially clean and detailed, and vocals really cook.

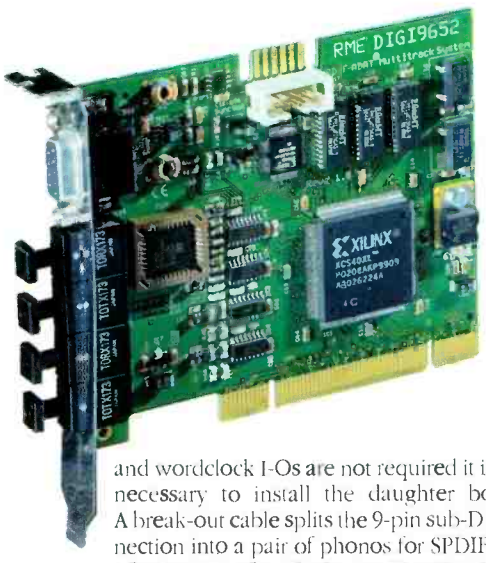
This unit is excellent in sound quality and operation. It is difficult to make it sound bad or distort in a nasty way. All deliberate colourations are subtle, and the overall impression is always of cleanliness and supreme signal integrity. Sometimes it is impossible to decide on the suitability of one particular subtly different setting over the other 15. But it would take a long time to really get to know this machine, and perhaps that is the beauty of it. I would love to spend some more time with it. ■

RME Project Hammerfall

If grand title equals impressive specification, RME's Intelligent Audio Solutions Digi9652 PC Interface Card should be a gem. **Rob James** put it to the test

THE GERMAN DESIGN house, RME Intelligent Audio Solutions has offered a range of soundcards for some time now. The latest example is the implausibly named Project Hammerfall. This provides 24 channels of optical ADAT I-O, ADAT sync and stereo SPDIF I-O together with wordclock I-O on a single, tiny PCI card.

The connectors for all this will not physically fit into the space available in a single PC back-plane slot so a daughter board is employed that carries optical connectors for channels 17-24, the BNC connectors for wordclock I-O and a LED to indicate a valid wordclock input. The daughter board connects to the card via a ribbon cable and does not require a second PCI slot. If the third ADAT



and wordclock I-Os are not required it is not necessary to install the daughter board. A break-out cable splits the 9-pin sub-D connection into a pair of phonos for SPDIF and a further 9-pin for ADAT sync. The SPDIF outputs are actually transformer balanced with no ground connection. This, together with a 'professional' setting that increases the voltage to 2.3V, makes direct AES-EBU connections possible. There is also an internal digital input on the card for connection to a CD-ROM drive.

Two cards can co-exist for a total of 104 input and output channels. 96kHz operation is enabled by sample splitting—each 96kHz channel occupies two ADAT interface channels and indeed, two ADAT tracks on a standard ADAT recorder if you want to record or replay on this medium.

ASIO drivers are supplied for Windows 98 and NT-Windows 2000. The latest release also has Windows 98 MME drivers. Mac drivers are under development.

Once installed, the visible evidence of Project Hammerfall's presence is a hammer icon in the tray and a shortcut on the desktop. Clicking the hammer opens the DIGI9652 Settings dialogue box. Project Hammerfall is unusual in that any changes made to settings take immediate effect. There is no need to click OK or exit the dialogue. This can be very useful when trying out different buffer sizes or sync modes in order to minimise latency and glitches, although the buffer settings are only applicable using ASIO.

RME has concentrated on optimising performance under ASIO by allowing the bus-mastering Hammerfall to handle audio drive access with little or no CPU involvement. They have also employed a 96kb PCI burst FIFO to reduce the possibility of glitching. The claimed processor hit using ASIO is ZERO. Since few PC applications are currently capable of using ASIO drivers I was interested in the performance under MME with applications such as the Sek'D Samplitude. Purely subjectively there is a gain over other cards. Not massive but tangible. I found I could reduce buffer sizes for a given project with obvious consequential benefits to latency.

RME has also implemented enhanced ZLM (Zero Latency Monitoring) When used with a suitable ASIO application, or suitable MME applications such as Samplitude, allowing multitrack-style monitor switching.

The intelligent Autosync mode constantly scans all inputs for a valid clock signal. If a signal is found that corresponds to the current sample playback-rate sync is switched from the internal crystal. It is also possible to set a preferred sync reference. If a valid reference is present here it will be used as the master. This can be useful in systems which include nonsyncronisable sources—like most CD players. The SyncCheck function continuously monitors the sync status of all inputs. Three states are indicated; No Lock indicates that there is no valid signal present, Lock means valid signal present and Sync equals valid synchronous signal present. The board will rapidly lock to any rate between 25kHz and 105kHz. The claimed jitter performance is remarkably good at less than 2ns on the ADAT inputs. Another useful detail allows the audio bit in the SPDIF header to be set to 'nonaudio' This is essential when sending Dolby AC-3 streams to external decoders. A suite of applets is also included entitled DIGIcheck. This provides high precision meters and diagnostic functions.

Project Hammerfall makes a good case for the use of ASIO drivers. With any luck it should provoke more software developers into supporting ASIO. With well thought out software, reduced latency and versatile connectivity Project Hammerfall advances the state of play in PC audio interface cards. Now all we need is better disk controllers and drivers optimised for audio. Meanwhile RME has raised expectations and reduced the cost of getting into something closer to genuinely viable, professional multichannel PC audio. ■

Contact
JoeMeek, UK.
Tel: +44 1626 333949.
Fax: +44 1626 333157.
Net: www.joemeek-uk.com
RME Intelligent Audio Solutions, 21, D-31303 Burgdorf, Germany

advanced Internet content authoring.
Sonic Foundry, US. Tel: +1 608 256 3133.

MP3 Audio Machine

Alcorn McBride has introduced a stand-alone audio source for background, triggered or interactive audio applications. The MP3 Audio Machine uses a real-time clock to play

tracks at predetermined times or to select different random playlists depending upon the time of day. It can receive new audio across the Internet via its onboard modem or Ethernet interface and stores the audio on removable memory card with a optional internal hard disk accommodating hundred of hours of audio. Audio can be created and edited using a PC with software provided and then copy the MP3 or WAV files to the storage media. Clips can be triggered using push-buttons or controlled via RS232. The book-sized device can work in high vibration environments such as roller coasters, and runs on mains or battery.
Alcorn McBride, US. Tel: +1 407 296 5800.

Multichannel meters

Designed for multichannel working, Logitek's Ultra-VU 5.1 and 7.1 meters are based on the company's Ultra-VU meter. Six or eight LED bar graphs are packed into a single enclosure with analogue or digital inputs. Analogue inputs are bridging and accept balanced or unbalanced signals and a level trim control allows calibration of any reference within the -10dBu to +24dBu range for full scale indication. The digital model can accept professional or consumer digital signals and automatically locks to the sample rate. Each bar graph is composed of 62 LEDs with true 300ms VU ballistics with peak indication and hold. Operating modes selectable from the front panel include loudness filter and fine resolution. The packages are the same size for both versions, only differing in the number of vertical meters, and the power supply is in a separate enclosure and can be located away from the console. A Super-VU 5.1 surround meter is also available that differs from the Ultra version predominantly in the use of 40-LED bar graphs. The latest addition to the Logitek stereo meter line is the Tru-VU model that is based on the curved LED meter face found on the company's ROC digital consoles. It represents the true 300ms VU ballistic standard along with a peak display. The two meters come in a rackmount that is similar to the company's analogue 2VUB and contains the power supply, connectors and controls.
PR&E, UK. Tel: +44 1223 415 459.

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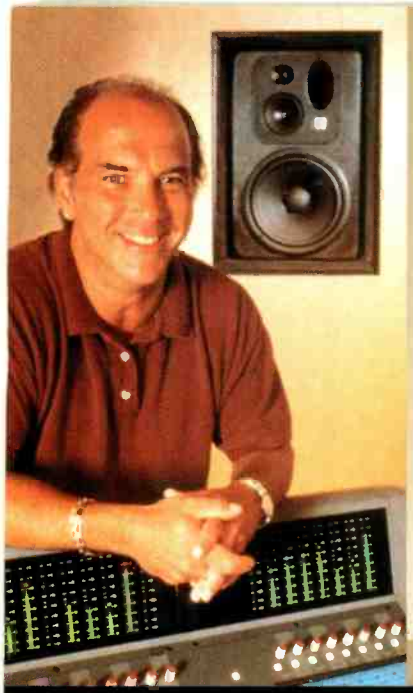

Neil Karsh is the Vice President of Audio Services for New York Media Group. Recently, Karsh selected LSR monitoring systems for two of his Manhattan facilities, *Lower East Side* and *East Side Audio*.

"We've installed the first of our LSR 5.1 surround systems at East Side Audio and it's a great addition. The sound is extremely clear and is enjoyed by our mixers and our clients. Everyone is very pleased with the result."

New York

LSR. Profiles

The world's most noted recording professionals discuss the world's most advanced monitoring systems.

NO.1: New York / Los Angeles

David Kershenbaum is a Grammy Award winner who has been on the cutting-edge of music production for decades. His discography is a remarkable *'who's who'* of popular recording.

"Speakers have always been important to me and I've had many systems that I have really loved. When Kevin Smith told me about LSRs, I tried them and was amazed at the accurate flat response and how the mixes translated so well compared to other monitoring systems. Now we're using them to track our new records and we'll use them to mix, as well."

Los Angeles

The World's Best Performing THX® Monitoring Systems Are Also The World's Most Applauded.

Since its introduction in 1997, the system-engineered JBL LSR Series has become a favorite choice of engineers, producers and performers, many of whom have also become its most loyal advocates. More important, this acceptance is found in every major geographic area of the recording industry; from Los Angeles and New York to Nashville and London.

LSR 32 LSR 28P LSR 12P

Monitors Whose Performance Profile Was Determined By Science, Not Opinion.

During a half century of building the most technically advanced studio monitors, JBL has developed a long list of working relationships with key recording professionals around the globe. As a direct result of this unique collaboration, these industry leaders have chosen JBL monitors more often than any other brand. Not once or twice, but consistently for decades. In fact, JBL monitors are a part of the history of recording itself. Consider as examples, the now fabled JBL 4200 and 4400 Series that, at their launch, actually defined an entirely new standard and new category of monitor. Such is the case now with the entire LSR line.

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Eternal Youth

From punk beginnings to Brits 'Producer of the Year', Youth has a flair for marrying innovation with success. **Richard Buskin** talks originality, performance and lesbianism with the producer, remixer and musician

TOYING WITH ANOTHER artist's compositions is never easy, but for a recognised producer-songwriter it can be a particularly tricky issue given the sensibilities and fragile egos in play. Such is the predicament that occasionally confronts Youth, the 1998 Brits 'Producer of the Year' who has carved out a solidly contemporary niche courtesy of his recent production work with acts such as The Verve, Embrace, Vanessa Mae and Crowded House. A new album by The Audience features compositional contributions in addition to production work, continuing the pattern set with the likes of Blue Pearl, The Orb and Killing Joke (of which he himself was a founder member). Yet Youth is quick to point out that credit should only be taken when the service has been requested well in advance.

'This issue can really screw up a session,' he says. 'You might feel that you really want to hear a song use a different chord or you might get an idea for a line, but the artists are trying to establish their own identity and their own writing credentials and you can ruin their confidence by adding your opinion. Within the studio everybody's role has to be clearly defined, because once you're in there you're all in there together, and even the tape op contributes. How I approach it, therefore, is to define our roles beforehand, and if I'm asked to cowrite with an artist then that's what I'll do. Sometimes I might put a line in and sometimes I might come up with the melody, and at the end of the day it'll be credited as a cowrite. If, however, I'm just commissioned as a producer and I don't think the song is there, then I'll tell them what I think is wrong and I'll ask them to change it.

'Once we're into the album I'll actually give them lines. I've done that on a number of occasions otherwise I'll only ask for what I've been asked to do, but I will give 200 per cent. This issue can come up when I'm working with keyboard players, programmers, even tape ops, because the tape op can be playing around with a guitar during a tea break and the guitarist will say, "I love that. I'll have that," and what do you do? So, when this kind of thing happens I tell people to give whatever you've got to give, but be careful when you give it because it's not always been asked for. If the composer says, "I want to give you a bit more for that, I want to give you some publishing," then great, but don't expect it.'

Born Martin Glover, Youth—who took his name from reggae artist Big Youth—was still only 15 years old when he quit full-time education in 1977, abandoning plans to go to art school in favour of answering an ad to play bass in punk outfit The Rage.

'I had never actually played bass before,' he now recalls. 'I'd learned how to play guitar after doing a deal with my chemistry teacher at school; if he'd teach me a few chords on the guitar I'd play some songs at his Christian folk meeting. Then I persuaded the music teacher at school to show me how to take the chords that the chemistry teacher had taught me and play them on the piano without having to go through all of the grades. He agreed to do that, and straight afterwards I started writing songs. You see, listening to music always left me feeling dissatisfied. At first I'd get turned on by it, but then I'd be left hanging when they changed key or went to a different chord. So, I was more into sort of learning a few chords and then just getting them to loop, almost like we do now.'

Two weeks after auditioning for The Rage, Youth was on a tour supporting The Adverts and The Saints. 'I told the manager I was 18 although I was only 15,' he now recalls. 'Years later I bumped into him, he was driving a London cab, and when I told him how I'd lied about my age he said, "Well, you know I told you I was 21? I was only 17.

'At the first rehearsal I didn't know where to plug the guitar lead in, and I plugged it into the back of the speaker instead of the amp. The drummer was watching me and he said, "Have you done this before?" I said, "I'm not really familiar with this equipment." He said, "I'll show you once, and that's it," and he did and I learned really fast.'

Talk about flying by the seat of his pants. What's more, six months later the Youthful one had dispensed with Rage, and, in an intriguing sideways move, became the lone male member in a lesbian punk band named The Stilletos.

'That was just a laugh,' he asserts. >

< However, another six months on, he came to the realisation that he was fed up with just having a laugh. Thus, in more serious pursuit of his musical ambitions, he hooked up with Jazz Coleman, Paul Ferguson and Geordie Walker to form Killing Joke. Still only 17, but with two John Lydon records already under his belt, Youth had far more studio and touring experience than his older colleagues, and before long he was also a partner in the band's own label and management, as well as a deal with EG Records that enabled Killing Joke to produce themselves and license the ensuing recordings. This was the blueprint for the first three albums.

'I left the band when I was 23, and the last album that we did together [*Revelations*] was my first experience working with another producer,' says Youth. 'That was with Conny Plank, and it was an amazing experience. He was the only producer who we could all agree on, and that was because he had produced Kraftwerk. Conny died about 15 years ago, but he was a central figure in that whole "Kraut Rock" scene. He had produced Stockhausen and Brian Eno—both of whom we were really into—and so, working with him in Germany, we really felt that we were doing something different. We were doing music that we wanted to do, but which was still relatively obscure and unknown, and I just think that I was so lucky to be there at that time. That music has become such a big part of the alternative music influence, and we managed to get touched by it just as that era was winding down.'

Blue Pearl showcased Youth's dance sensibilities and provided the 'Naked in the Rain' hit single

> If you go too far left-field it becomes avant-garde and only certain people in certain cliques will understand it, and even then they'll only understand it if it's presented to them in a way that they're familiar with

Now more attuned to working in the studio than going back out on the road, Youth quit Killing Joke in 1983 and immersed himself in work as a producer of electronic music while also launching a funk rock outfit called Brilliant.

'We ended up being signed to Warners,' he recalls. 'We had two drummers and two bass players on stage, and my production instincts told me that I couldn't really translate that sound in the studio, so I thought that we'd go the other way and go really electronic and really pop. We therefore got in Stock, Aitken & Waterman to cowrite and produce an album with us, and it was a disaster. We didn't get any hits and we almost drove them mad, because we were a band and they were just starting to work with the likes of Kylie. There again, being that at the same time that we were doing this dance music I was producing all of this industrial material for the American market, working with Waterman was very good experience for me. I mean, what those guys were doing was quite anarchic; bringing in import dance records, Pete saying, "We'll use that bass line," borrowing another record's chords, another record's beat. They were like samplers, and we thought that was really refreshing after being in bands where everyone was concerned with being completely unique and original.

'That left me re-evaluating what the criteria were to be an artist. After all, what is it to be original? You know, sometimes you try to be original and it's just bollocks. No one understands it or relates to it, and when I investigated the whole concept of originality it became clear that, whatever the culture, it still has to have a point of reference and come from a certain school of thought and a certain scene. Whether you're dealing with hip-hop or whatever, to some extent you have to go with what is already known in order for people to be able to relate to it. If you go too far left-field it becomes avant-garde and only certain people in certain cliques will understand it, and even then they'll only understand it if it's presented to them in a way that they're familiar with, so it's still coming from a certain school.

'I had to understand all of this stuff if I was going to produce and be good at it, because part of being a producer is bridging those two worlds. It's working with the raw material and saying, "Okay, I can help you produce this so that people will understand it in a commercial medium." I mean, working with Stock, Aitken & Waterman was a paradox; I thought they'd be really banal and superficial—and I think a lot of their work was—but their actual approach was quite radical for us. Up until then there was this whole thing of "I'm not going to do a chorus, because everyone does choruses and I'm going to be an original artist. I'm going to be unique and I'm not going to play those notes." Actually, with Killing Joke, by the time of the third album it was like that and we were having massive arguments about whether or not we should have a chorus.

'These experiences really come in handy for what I do now, because I work with a lot of young bands who go through that process. I counsel them and encourage them to embrace those [pop structure] limitations, because by embracing them you can get a higher quality of result. Of course, it makes it harder, because you have to embrace the cliché and then transcend it, and a great songwriter and a great artist will do that and they'll have a No.1 record.'

Sample The Verve's Youth-produced singles, 'The Drugs Don't Work' and 'Bitter Sweet Symphony', which went to No.1 and No.2 in the UK charts respectively and which both adhere to a very simple pop format arrangement, managing to transcend the clichés by way of their sincerity and emotional depth.

'What's most important is what you're saying as a writer or as an artist; what emotion you're projecting and the depth that you're going to. The sonics aren't the hard part—that's just positioning the mics—but the buck stops with the song and the performance. You've got to have great songs, and you can encourage the artists to go deeper in terms of their songwriting by showing them where the gauge is; playing them great songs and recounting experiences that you've had where songs have moved people profoundly. If the songs are there it's a joy, because you can produce them in a number of ways, and the hard part then amounts to deciding on what is the definitive way.

'I actually record songs in a number of different ways sometimes; faster, slower, different keys, and I don't >

<think that's unusual. I spend a lot of time in pre-production working out what the arrangements are, not only for the song but for each of the musicians in a rehearsal setup, so the pressure isn't on. They're not worried about spending loads of money or loads of strange people who are walking around, prodding them and positioning them with mics. They're in their home territory and they're comfortable and they're relaxed, so we can get a lot of work done and I can settle on the arrangements. My background as a writer and an artist enables me to go directly to those areas, and see what I need before we ever get into the studio. As a result, when we do get into the studio all I have to focus on is the emotional depth of the performance, and I'm not being distracted by whether or not that middle eight is right or whether or not the bass line is helping the melody. I've already done all that.

'Concentrating on performance is, I think, an art in itself. It requires making sure that the engineers, the management and the roadies have all got everything there on time, and that they're confident and competent. Everything has to be set up quickly so that there's not much waiting around, and then you have to get the band playing early. I mean, if you've spent all day setting up and then have dinner before they start playing at 7 or 8 o'clock in the evening, it's going to be really hard to get a good performance out of them. The problem is, a lot of people really want it to be great, because they've worked all day, they have all spent months and months coming to this point, and they want to leave the studio on the first day with a good vibe. So, they end up staying around all night trying to get it, and it just throws the whole thing off kilter.

'You've therefore got to start early every day, and you've also got to be very flexible. You've got to understand what the needs of the band are; what they are like personality-wise, what their temperaments are, and what they have been doing. You know, if they've just been on tour for 18 months, if they've just done another album, if they've never done an album before—all of these things will determine what studio and what working conditions you should employ to get the maximum performance out of them, and of course for different bands that means different things.'

You've got to understand what the needs of the band are; what they are like personality-wise, what their temperaments are, and what they have been doing.

In the case of The Verve, they had already attempted to record their ultimately-chart-topping *Urban Hymns* album with two different producers before recruiting the services of Youth.

'Their way of working was to stay up for three nights and wait for the moment,' he says. 'It just wasn't happening for them, and so my approach was to start in the studio at 10 o'clock in the morning, have takes by 3 o'clock and be overdubbing by dinnertime. No drugs or booze, maybe a bit of smoking, but no more than that while we focused on the project. At that point they were really washed out with the other approach, and so they thought this was a relief and said, "Okay, yeah, let's try it". As a result, we got it really fast. On the other hand, with bands like Crowded House who had worked with Mitchell Froome—who is a very conservative producer—and who had brought in session musicians for the rhythm section, I'd say, "Let's go out to the country and let our hair down". I'd encourage them to experiment.

'You have to make the work exciting, because otherwise it's a very clerical task. Most engineers, I think, don't appreciate that. They're just thinking about the technical hurdles and how they can get around them technically. >

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email: info@sadie.com

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2218 MetroCenter Blvd.
Nashville TN
37228

tel: +1 615 327 1140
fax: +1 615 327 1699
email: info@sadieus.com

SADiE GmbH
Villa Leinen
Kollwitz Straße 16
73728 Esslingen
Germany

tel: +49 711 3969 380
fax: +49 711 3969 385
email: info@sadie.de

Home Comforts

YOUTH'S HOME setup, located in an upstairs bedroom, includes a 24-channel Mackie console with a 24-channel extension, 16-bit and 24-bit Pro Tools, Urei and DBX compressors, Focusrite and Moog EQ, an H3000, a pair of Roland reverbs and a DAT machine, not to mention a K250C, several old analogue keyboards, an assortment of guitars and plenty of old pedals.

All of his writing and preproduction takes place here, such as making film music ready to score for orchestra, and the facility can also used in a postproduction sense to edit and compile the CDs that he puts together for the record labels.

'I've also been mastering some Killing Joke material here with Jazz,' says Youth, 'and I'm managing to get to grips more with the engineering as I'm working alone as a one-man show. At times I get a programmer in to help me, and so again I'm always learning while still trying to keep an objective distance from it, because a big part of being a producer is being objective when you get a little near to the rock face.'

The Verve went to the top of the British charts with Youth's productions of 'Bittersweet Symphony' and 'The Drugs Don't Work'

< They move the band around like they're actors on a set, and that can make for a very uninspired atmosphere and stale performances. I think a lot of producer-engineers fall into that trap and make competent but very predictable records. What I try to do is find out what will create a magical atmosphere that enables something special to happen...'

Nevertheless, the man who once remixed a host of records by artists ranging from Marc Almond, Tom Jones, Lisa Stansfield, Erasure, Kool & the Gang, Fine Young Cannibals, Wet Wet Wet and Pop Will Eat Itself to Malcolm McLaren, The Shamen, The Cult, INXS, Siouxsie & the Banshees, Psychedelic Furs, Art of Noise, U2 and Jimi Hendrix, asserts that around 10 to 15 years of production experience is required in order to have the goods to achieve that something special.

'It's a mystery, and to really understand the elephant traps that are there you have to go through them,' he says. 'No amount of preparation will compensate for a day's experience of failure. I made a lot of records in the eighties and early nineties, experimenting and confronting flat atmospheres and wondering why, and then working it out. Sometimes it was because I'd expect them to be where my head was at, whereas I think a lot of it is down to you working out what they need, and what you all need to get you buzzing and turned on. That will hopefully compensate for the mundane drudgery of waiting for the technology to work or whatever. You can make the process a lot more fun and a lot more exciting, and also you get that creative momentum going. So you get a lot more ideas and you get inspired to do different things, because you've got a lot more choices.' ■

PRO TOOLS

views of creation

Koblo Studio9000

A complete synthesis, sampling and drum machine package, Koblo's Studio9000 uses Digidesign's DirectConnect™ Plug-In engine to stream stunning, mind-bending tones into Pro Tools.

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SampleCell II Plus™ is a scalable PCI card-based sampler and waveform editor. It features optional TDM integration, a super-fast trigger time, 32 voices and 32 MB of RAM per card.

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Virus

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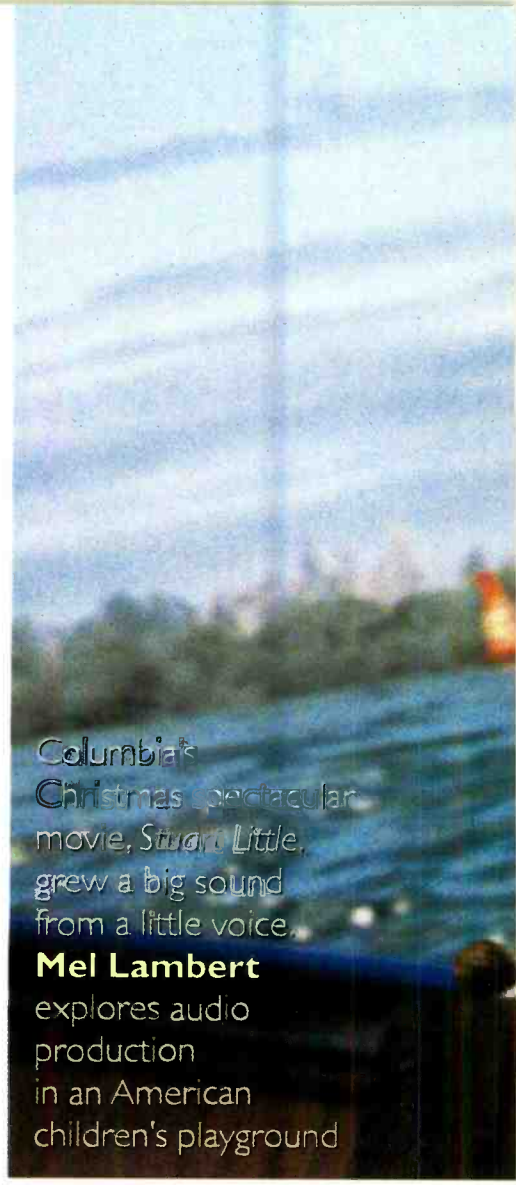


Columbia's Christmas spectacular movie, *Stuart Little*, grew a big sound from a little voice. **Mel Lambert** explores audio production in an American children's playground

EB WHITE'S POPULAR 1945 novel, *Stuart Little*, is Columbia Pictures' 1999 Christmas major-cinema release. It combines live action, digital character animation and effects presenting director Rob Minkoff with the challenge of merging Sony Pictures Imageworks visual effects (*Godzilla*, *City of Angels*, *Contact*) with live action. The story chronicles the experiences of a mouse adopted by a human family, and who embarks on adventures with a variety of characters, including his nemesis, Snowbell the cat (voiced by *The Lion King*'s Nathan Lane). Geena Davis and Hugh Laurie play Little's adopted parents, while Michael J Fox supplies the voice for a coming-of-age tale that focuses on a small, yet intimate portrait of contemporary middle-class New York.

In essence, this big-screen adaptation of America's beloved children's story can be compared to such films as *Babe*, *Toy Story* and *A Bug's Life* in that the world is seen from a decidedly different point of view. The chief difference between these films and *Stuart Little* is in the dimension of performance-based, photo-realistic digital character creation. Where *Toy Story* and *A Bug's Life* created digital characters, they were synthetic characters populating a synthetic world. In Babe, a combination of techniques including photographing real animals, animatronic animals and digital facial replacement were employed to create the talking animals. In contrast, the character of *Stuart Little* was created by entirely synthetic means and integrated into a real world. From both the visual effects and sound points of view, both sets of artists began with the same basic elements—the sound of the voice actor and nothing else. What the finished movies contain reflects the collective effort of a team charged with creating something big from very little.

Supervising Sound Editor on the project was Larry Mann, an LA-based freelance editor who assembled his editorial crew at Sony Picture Entertainment's multiroomed postproduction lot in Culver City, to work on the intricate sound design required to create the intimate world of Stuart Little. The supervisor has worked in the past on such films as *The Quick and the Dead* with director Sam Raimi, *Soul Food*, with George Tillman, Jr, and *Extreme Measures*, with Michael Apted; sound editing chores have included *Meet Joe Black*, *Anaconda*, *Con Air*, *The Rock*, *Waterworld*, *The Shadow* and *Patriot Games*. (He has also worked on a number of TV shows, including *Chicago Hope*, and several Movies of the Week for TNT, and Disney.)

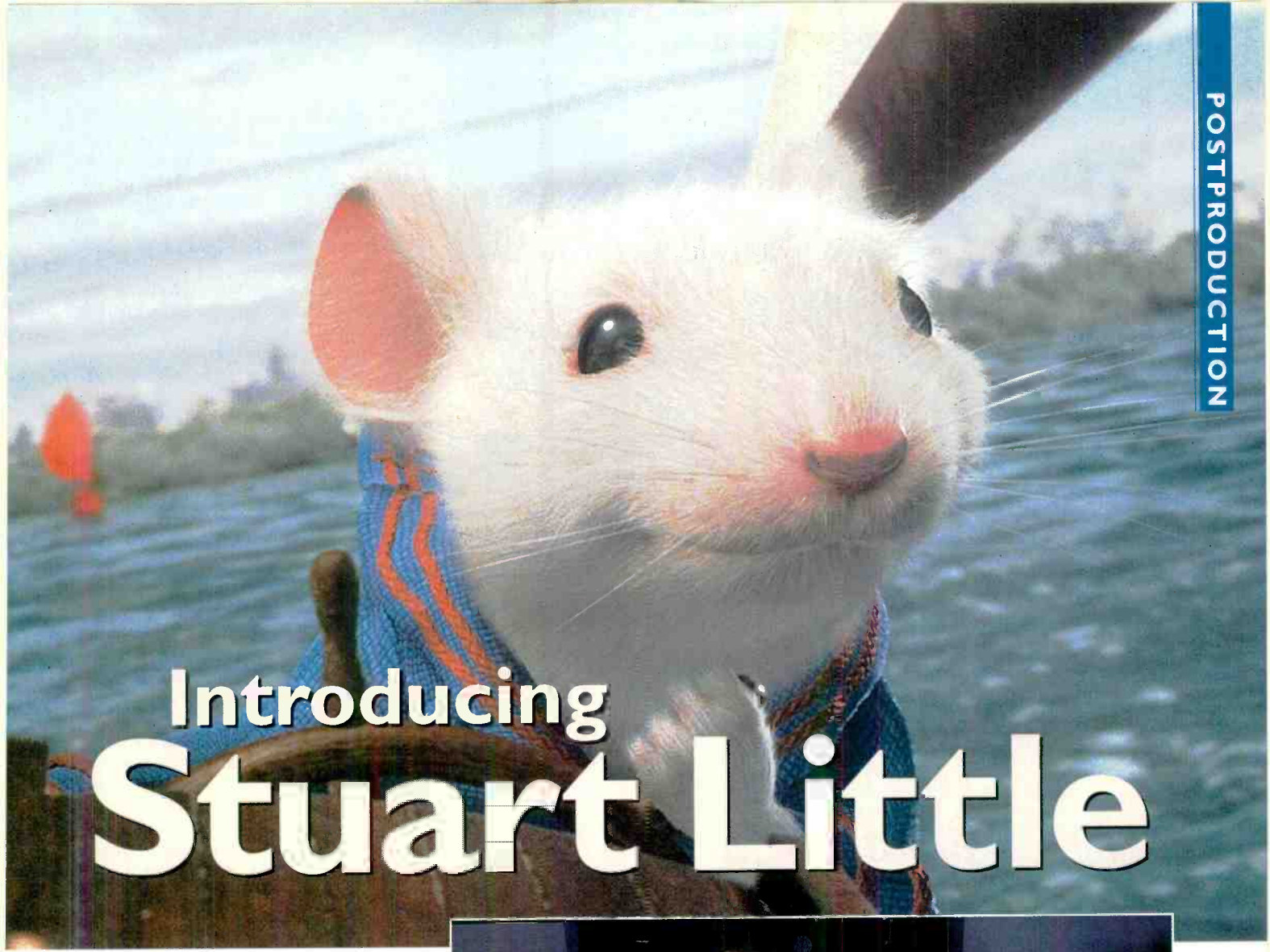
Mann says that he worked closely with picture editor Tom Finan, to determine the basic pacing of the film, but was left pretty much on his own to develop the individual 'sound signatures' and overall 'sonic theme' for the picture. (Mann had worked previously with Finan on *Pet Sematary*, and *Problem Child*.) 'Our biggest challenge,' he considers, 'was to create such a convincing sound environment for the CGI character of *Stuart Little*, that audiences would forget that he was, in fact, computer generated, and treat him just as if he was a... mouse that was confused about being human.

'We also focused on creating a larger-that-life sonic signature that we could transition into when the action entered Stuart's World, as we referred to it. Being small we wanted to capture that essential feeling of experiencing the world from Stuart's perspective.

'So whenever we were seeing or experiencing the action through Stuart's eyes—and there are several high-energy chases sequences where this approach became particularly appropriate, including a journey in a boat through the lake in [New York's] Central Park—the large objects around Stuart needed to be 'amplified' and enlarged to make it obvious that not only were we now in Stuart's inner world but that we were kind of overawed by it, just as children are when they first experience the big city, for example.

'In contrast, the family world that Stuart enjoys—the kitchen and the other rooms within the Little household—were to be treated as 'normal' environments, with all of the sonic details that audiences expect from a big-time movie soundtrack. We styled the Little home—a small house situated between high-rise skyscrapers close to Central Park—like a mid-west location, to emphasise the tranquillity and safety aspect for Stuart. But there were exceptions within the house; the washing machine, for example, in which Stuart becomes trapped, needed to be made more threatening and bigger than life.'

Assisting Mann in handling the complex task of editing the various dialogue, effects, Foley, ADR, backgrounds and related elements, and providing sound design input, were a seasoned crew, several of whom he had worked as the Supervising Sound Editor on past movies. The majority were hired by Mann as freelancers, working within Sony Picture's well-equipped editing rooms; predubs, rerecording and print mastering of the final multichannel soundtrack took place in Sony's William Holden Theatre, with rerecording mixer Paul Massey as gaffer, handling dialogue and music, with Doug Hemphill handling effects and Foley. (Mann had



Introducing Stuart Little

worked previously with the mixing team on *Extreme Measures*. In early January 2000, Massey and Hemphill moved across town to the John Ford Theatre at Fox Studios' new dubbing complex.)

Mann's first assistant editor was Ann Ducommun, who also functioned as 'Information Central' as the supervising sound editor put it; Suhail Kafity handled FX editing, with Steve Ticknor (who also handled several Temp Dubs); Cindy Marty supervised ADR editing, plus prerecords; Fred Stafford was an ADR editor; Linda Folk handled ADR editing; Dave Arnold and Duke Brown handled dialogue and ADR editing, plus prerecords; Mark Pappas was Foley supervisor, working with Foley editor Gary Wright while Chris Winter oversaw the inloading of production dialogue and related files into the Pro Tools workstations from OMF files created by the picture editors. Wright was also responsible for managing hard drives, co-ordination the inload of sound effects, predubs, laybacks, assisting the editors and Pro Tools management, troubleshooting, and so on.

All sound editing was handled on individual Digidesign Pro Tools systems, working from production dialogue recorded onto time-code DAT machines plus effects pulled from >

The editorial sound-crew for *Stuart Little*. At the back (left to right): Suhail Kafity, FX editor; Mark Pappas, Foley supervisor; Duke Brown, dialogue and ADR editor; Larry Mann supervising sound editor; Paul Wood, director of engineering and R&D, Sony Pictures Studios; and Steve Ticknor, FX editiing and temp dub mixer. In front (left to right): Dave Arnold, dialogue, ADR, effects and Foley editor; Linda Folk, ADR editor; Ann Ducommun, first assistant; Cindy Marty, supervising ADR editor; Larry Goodman, director of sound, video and projection, Sony Pictures Studios; Chris Winter, digital assistant editor

Steve Ticknor, FX editor and temp dub mixer in one of Sony Pictures' mix-to-picture suites. The room features a 32-channel /4-layer Digidesign Pro Control mixing system, linked to a fully loaded Pro Tools digital audio workstation with three 8:8:8 convertors for 24-channel I-O. An Otari picmix handles multichannel monitoring and loudspeaker assignment, with PEC-DIR control switching for two Sony DADR-5000 digital dubbers

< Mann's extensive library of analogue and digital elements. 'We were also able to playback our edited Pro Tools session projects on the [rerecording] stage via removable hard drives loaded into the new Sony DADR-5000 [16-channel] digital dubbers,' which are now fully file-compatible. 'That way we could playback elements directly from the Sony drives featured on the William Holden stage used to remix *Stuart Little*. Extensive Foley elements and ADR were also recorded directly to DADR-5000 hard drives that were loaded into Pro Tools for editing.

Because of the CGI nature of the film's main character, all that the editorial team had in the way of production sound was the prerecorded voice of Michael J. Fox. As Supervising Foley Artist Gary Hecker explains, 'We had to create everything else in Stuart's world, including all of his footsteps, clothing rustles, movements, slides and the myriad other 'sonic seasonings' that a mouse makes as it moves around. I placed myself —quite literally—in Stuart's shoes, and created his whole environment on the Foley stage, [to make] the CGI character appear real and totally believable on the screen. Our intention was to bring life to this charming, computer-generated character.'

Creating all of the Foley elements for the boat race through New York's Central Park was particularly demanding, Hecker recalls. 'Rather than pull sound-effect elements, we created all of the dynamic sounds of the wind, water, sails here on the Foley stage. We recorded stereo sails slaps—so that the mixer could establish a very realistic-sounding perspective—plus mono water splashes, waves, winds, and a whole slew of 'detailing' elements that [Larry Mann] thought would be required to convince the audience that Stuart Little—in his inner world—was really in trouble on this "Sea in Central Park," and join him in his anxiety and excitement.' Assisting Hecker on the Foley stage at Sony Pictures was Michael Broomberg, working with engineer Richard Duarte

'Normally, an editor will pull standard effects for water, winds and one or two other elements,' Hecker says. 'We wanted to create a total environment; and the only way we concluded we could do that was to actually recreate the Central Park lake on the Foley stage.' An added bonus, Hecker offers, was that all sounds were in hard sync with picture, thus saving the sound effects editors many man-hours of resyncing effects from a library, or recorded specifically for an action sequence. On these busy reels, Foley Elements were recorded across 16 tracks of Pro Tools for editing by the editorial team ready for the temp mixes and predubs. 'Foley is used to compliment the library of sound effects,' Mann offers.

In late October, the series of predubs were going extremely well, Mann reports. 'But we are already four revisions behind the picture changes,' >

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The Foley crew for *Stuart Little*. From left to right: supervising Foley artist, Gary Hecker; Foley engineer, Richard Duarte; and Foley artist Michael Broomberg

< refining for the Finals and 3DDS Print Mastering from late November until early December of this year.

A key contributor to the various temp dubs was Steve Ticknor, who was able to use Sony Pictures custom-developed mix-to-picture suite to quickly create a more realistic sounding temporary mix than might be possible on a conventional dubbing stage. Ticknor also handled sound-effects editing.

'Because of the integration offered by the Pro Control system we have here, Larry and Rob Minkoff were able to refine the mix more quickly, because I could replace elements real fast, and move sync markers for anything that we wanted to slip on the track.'

Ticknor's room features a 32-channel /4-layer Pro Control system, linked to a full-loaded Pro Tools DAW equipped with three 8:8:8 convertors for 24-channel I-O and capable of 128-track internal playback. An Otari PicMix System built into the control surface handles multichannel monitoring and loudspeaker re-assignments. PEC-DIR control switches for the suite's pair of DADR-5000 dubbers is also featured. Other recorders include Tascam 24-bit DAT decks and a pair of DA-88 digital 8-tracks. Monitoring is via a 5.1-channel Event Electronics 20/20 bi-amplified system with Ashley 24-bit Protea room equalisation and subwoofer. Outboard includes an Eventide DSP 4500, a new Drawmer Master Flow DC2476, tc electronic Fireworks, Yamaha YDP2006, two dbx DDP Digital Dynamics Processors, tc electronic M3000, and Lexicon PCM-91 and PCM-300 units. Two flat-screen monitors provide display of system data, and flank a central large -format video monitor for the work print.

'Because of the speed and flexibility offered by this configuration,' Ticknor reasons, 'I could offer the director different ideas about the way we might realise his wish for the "inner" and "outer" worlds of Stuart Little, and how these might be achieved in a realistic and meticulous way. We needed to 'Make the familiar sound unfamiliar.' For example, I was able to sweeten the sounds of water with underwater sounds to enrich the track, and make it more enveloping for the audience. >

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Millennium Chimes

Broadcasting Big Ben's Millennium chimes was not a ground-breaking project it was one that would demand a thousand years for a second take. **Kevin Hilton** watched

EACH CITY, each country has its own way of counting down to the start of a new year. New York has Dick Clark and his dropping ball; Tokyo has its huge display screen above the streets; and London has the chimes of Big Ben.

Because it was the start of a new millennium, there could be no risk that the country (and those listening to the BBC World Service) would not get to hear those famous chimes and know for sure that it was time to join hands and sing 'Auld Lang Syne'.

The BBC has its own land-link connection to the microphones in the clock tower of the Houses of Parliament, which it has had for many years. A misconception in this matter is that the clock tower is mistakenly thought to be Big Ben itself. The name in fact refers to the 13.7-tonne bell inside, which was cast at the Whitechapel Bell Foundry in 1858. It is known as Big Ben after Benjamin Hall, the first Commissioner of Works in London at the time.

Last year, things were different. The BBC was to relay the chimes for its broadcasts as usual but was taking its feed from the Millennium Dome in Greenwich, south-east London, where those attending the building's opening night had to be able to hear them as well. Doing what everyone else in the country does—turning on the radio for that brief but all-important time—would not be enough, given the high profile dignitaries in attendance, royalty and heads of state among them.

The New Millennium Experience Company (NMEC), which built and operates the Dome, was asked to ensure that the chimes could be recorded and transmitted without fear of a last minute appearance by the Millennium Bug. Simon Daniels, deputy head of broadcast engineering for NMEC summed up the pressurised situation: 'Because there were to be so many important people at the Dome on New Year's Eve, we had to find an absolutely secure method of recording the chimes.'

As is well documented, the Dome has been fully equipped with audio-visual equipment for the live entertainment and informative displays it contains. What is less well known is that it has comprehensive broadcast facilities, as the BBC was taking a live relay of the main live show, featuring music by Peter Gabriel, in the countdown to the chimes.

The central TV facilities complex, or International Broadcasting Centre (IBC), is equipped to receive, mix and distribute TV signals to and from the world. It also features Internet broadcasting links and a full radio broadcast suite. This includes a postproduction area, two identical broadcast studios and a talks area, that can be linked to either studio.

Simon Daniels commented on these facilities, 'We envisaged that the studios would be used by a variety of broadcasters during the Operational Year. As walk-in facilities, they are very comprehensive, offering CD, MD, DAT, cassette, tuner, effects units, communications, ISDN and phone lines.'

Building redundancy is commonplace in modern broadcast installations but it was felt to be imperative to ensure that the chimes of Big Ben came through. 'For this installation we've doubled up on everything, so effectively we've two separate audio channels to allow for total redundancy,' explained Daniels. 'We routed the chimes directly through two Focusrite Red 7 mic preamps, which went into two Sonifex Redbox RB-DA6 distribution amplifiers feeding an ISDN unit and a BT microwave link. Whichever route we took the audio, whether through the ISDN unit, or the microwave link, we were covered. We even had two UPS units, one for each set of equipment.'

The microwave link went directly from Big Ben to the BT Tower in the West End of London and then on to the Millennium Dome site. The intention was to avoid sending the signal though any switching centres. It was ensured that the ISDN line numbers were ex-directory and a sub-addressing technique was used, both methods to avoid any possibility of wrong numbers being answered and engaging the line.

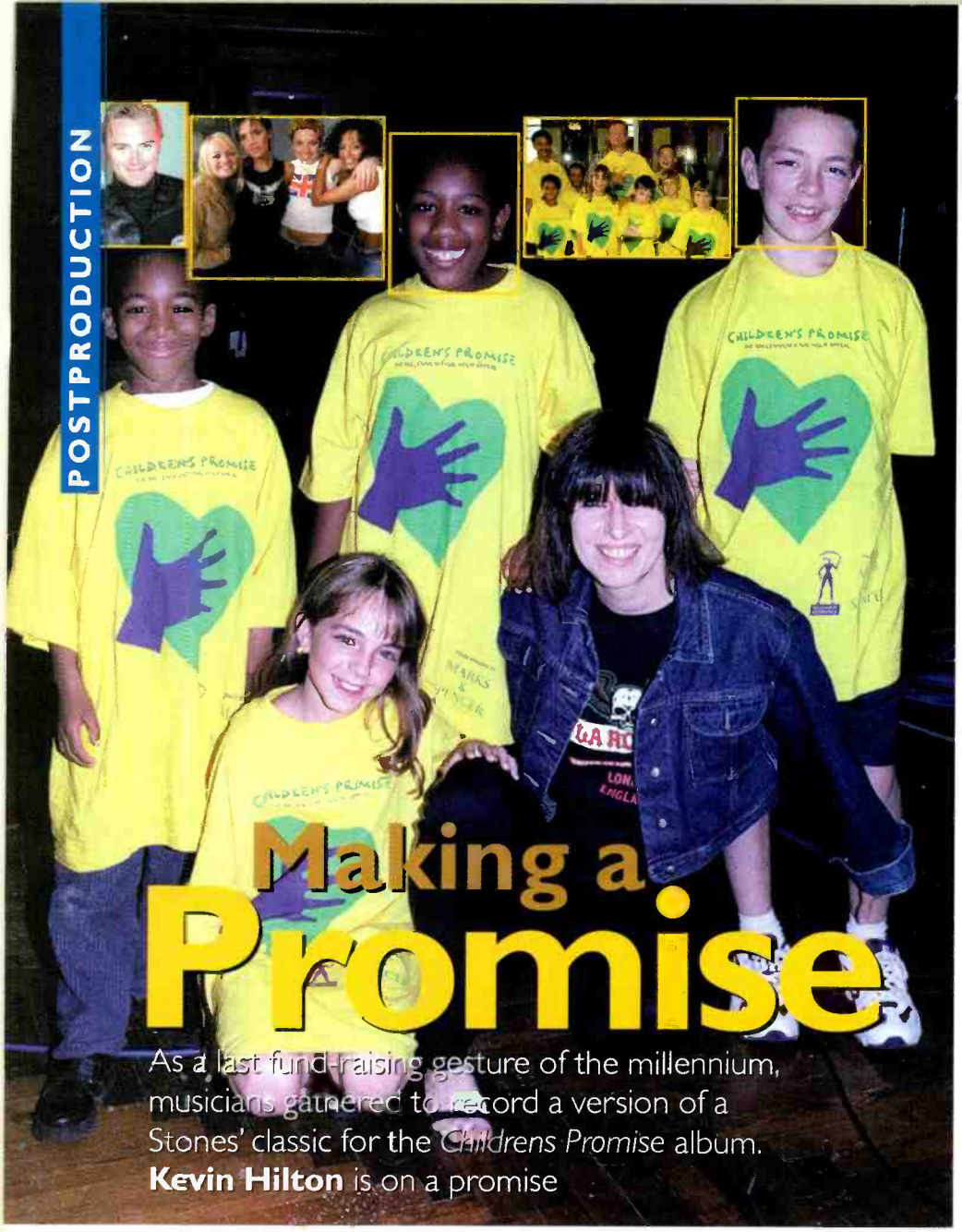
The big task facing engineers during the installation process was getting everything up to the bell, which can only be reached by a narrow spiral staircase. Simon Daniels recalls that it took 15 minutes to get to the top of the tower, without any equipment. 'Getting ISDN lines and telephone lines up to Big Ben was no joke either—it took two weeks to work out how to get the cabling up there.'

The BBC also took a feed of the signal that was generated by NMEC, with its own land-link as a backup, again to guard against any possible Y2k problems. 'This was a very big event and we just couldn't take any risks of failure,' said Daniels. To this end, three clock engineers were due to be on site to ensure both that Big Ben did not fail and that it was on time.

Initially there were plans to synchronise Big Ben to the Rugby radio clock signal, which generates a time pulse that is generally considered to be the most accurate and which is used by all broadcasters in the UK. This would have been done using electromechanical devices, but permission was denied to tamper with the clock's mechanism.

Back at the Dome, a comprehensive array of communications and distribution equipment was laid on to ensure most types of connection. The IBC featured four twin Sonifex DHY02 digital telephones, with the manufacturer's Redbox units being used as interfaces for VHS tape machines and ONdigital digital television decoders and so on Redbox RB-DA6 distribution amplifiers were additionally installed into the Media Centre, which was used for press briefings and has facilities for radio and TV news staff to take audio feeds for broadcast.

It may seem a lot of effort just to hear a clock chime the hour but given which clock it was and which hour, the precautions seem perfectly understandable, particularly as missing the chimes is, subconsciously, a heinous crime. ■



Making a Promise

As a last fund-raising gesture of the millennium, musicians gathered to record a version of a Stones' classic for the *Childrens Promise* album. **Kevin Hilton** is on a promise

A BIG EVENT like the end of a millennium calls for big gestures. Big tops, big wheels, big parties. Some thought it should also prompt big thoughts, making people consider others. At the turn of the year, turn of the century, countless people in the UK pledged their last hour's earnings of the old millennium in a bid to help create a better future for the children of the new millennium.

Such a big undertaking as the Children's Promise campaign needed the best possible publicity. The last 20 years of the 20th century saw the development of a highly successful way of raising both money and awareness—the charity record. The Children's Promise organisers chose the Jagger-Richards classic—a phrase often over-used but that applies here—'It's Only Rock 'n' Roll (But I Like It)', on which 37 artists sang or played in perhaps the biggest virtual musical gathering of its kind. The list is an odd mix of near-legendary old timers (BB King, James Brown, Joe Cocker); current and potentially long-term favourites (Robbie Williams, The Corrs, Jamiroquai); and the most likely short-lived but commercially important (S-Club Seven, Boyzone). And Robin Williams.

Nobody knows the logistics involved better than producer Arthur Baker, who, with Steve Van Zandt, pulled together the anti-apartheid anthem 'Sun City'. 'On this kind of project, you don't know for sure who you're going to get,' he says. Baker's concept was to create a tribute record, both to the old millennium in general and rock 'n' roll in particular. He knew he needed a good cross-section of artists, but started out with big older names—James Brown, BB King, Herbie Hancock and percussionist Ray Barretto—to demonstrate his pulling power. 'The first four artists gave us an average age of 64,' he continues, 'and the idea of this record was to make money, and young kids are the lowest common denominator. We were told by [BBC] Radio 1 that it wouldn't get played unless it had younger artists on it.'

Technology has changed considerably in the 15 or so years since 'Sun City' was recorded. *Children's Promise* was still not an easy proposition but digital made the prospect of recording artists wherever they were more viable. 'The idea was to record people in their own situations, wherever they happened to be,' explains location recordist Ian Duncan, 'so that they really couldn't refuse to do it.'

The mobile rig was put together by studio equipment hire company GearBox, who were also asked to recommend an operator. Engineer and musician Merv de Peyer was approached but couldn't do it—although he mixed the whole project—but recommended Ian Duncan. A former Digidesign staffer, but now freelance, Duncan had been working with GearBox to put together a Pro Tools package based around a G3 PowerBook and a US-built, 4-slot Magma expansion chassis. Lugging this onto aeroplanes and into taxis, Baker and Duncan cornered the greater majority of artists who could not make it to the handful of studio sessions. At the end of May last year, BB King was the first down, back-stage at the Royal Albert Hall in London after a gig. Later, it was Bonnie Raitt on her tour bus and notoriously difficult R&B diva Mary J Blige in a hotel room. 'Some of the recordings we did in dressing rooms sounded better than the studio tracks,' comments Baker wryly.

Conventional sessions took place largely in London. After the first four singers had been recorded and the project's momentum kicked in, a day was booked at AIR Lyndhurst, where Robin Williams, Annie Lennox, Chrissie Hynde, Womack & Womack and Status Quo all made their contributions. Skin (of Skunk Anansie) was recorded at Abbey Road, with others dropping into Mayfair and Whitfield Street studios. In these cases, the Pro Tools rig was tie-lined into the studio desk, with the artist in the booth in the traditional way.

Everybody sang or played to a basic backing track, that had been laid down at Mayfair Studios by drummer Clive Deemer, bassist Fi Johns and Merv de Peyer on piano. To this 2-track recording were added guitar parts by BB King, Steve Cradock (Ocean Colour Scene), Parfitt and Rossi (Status Quo) and Keith Richards—because it wouldn't be the same without that famously sloppy sound—plus middle-eight keyboards by Herbie Hancock and the percussion of Ray Barretto. A guide vocal was sung by Simon Carmondy, who didn't make it onto the finished track.

Arthur Baker had a good idea of who he wanted to sing what, although, in the beginning, he made sure that as much as possible was laid down by artists. 'In those early stages, everyone sang one or two lines in each verse,' he says. 'I had to make sure that we had everything covered. Some of the artists, like Kid Rock, knew the song and he sang the whole thing. Mary J Blige didn't know it and just did a line at the beginning and one at the end.'

With most artists only able to spare >

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< The Pro Tools onboard MIXPlus facility was used heavily, as each vocal part (37 of them) had its own fader on the desks. 'Every vocal had a bit of its own sound,' says de Peyer. 'The idea was that each singer should sound like themselves and be totally recognisable but not so loud that they drowned out the backing. For the singers I was less familiar with, I listened to their records and tried to emulate them.'

After the initial mix was completed and two days before it was due to be delivered, it was confirmed that the composers of the song would make an appearance. Both Mick Jagger and Keith Richards were in the US at the time and so went into Capitol Studios in Los Angeles and ISDNed their parts to London (as did Ozzy Osbourne). 'Because of who it is, their bits had to be quite prominent,' explains de Peyer, 'and Mick asked to lay down the whole track, not just fit a line in. I didn't have to recall the full track, I just broke into the instrumental mix, having an *a cappella* vocal along side. I used a similar method to take out the sample of "Whole Lotta Love" because we weren't allowed to use it.'

Nonlinear music recording is more of a reality than ever before, but, as with any thing computer-based, there are still occasional problems. Ian Duncan admits to two instances. 'There were a few bugs in the software,' he recalls. 'Because we had to run with time code for the video playback, I put it into a loop each time we set up. But if you set a pre-roll before the loop, it doesn't go into record. We discovered this when Annie Lennox laid down her part. It held things up a bit and she got bad tempered but we got things going as quickly as we could.

'The other problem was when we recorded the Corrs. We were at the Metropole Hotel during Net Aid, when a lot of artists came in. Andrea [Corr, lead singer] had done the main line and was doing some harmonies and ad libs when one of the drives just ran down for no reason. But it booted up quickly and we carried on.'

With the Children's Promise organisers and BBC producers having a say in the final mix—some vocals parts were extended if the video shots were particularly good, as in the case of Natalie Imbruglia—the final mix was saved to Pro Tools, backed up on CD-R and mastered from DAT at Metropolis. The record was released on 15th December and immediately joined the race for the Christmas No.1. But, given the intentions behind the project, that was hardly the point. ■

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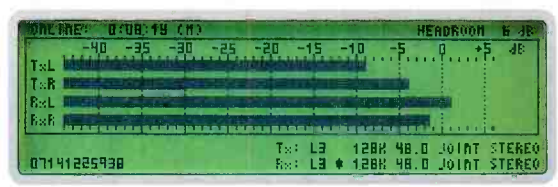
others without complicated manual programming. Operationally the buttons are large and straightforward to use, while the illuminated LCD display gives a clear indication of what is going on at all times. No noisy internal cooling fan to worry about in quiet studio conditions. The Remote Panel can control a MusicTAXI from over 500m away via the RS422 interface. The online menu indicates online time, send-level, receive-level, adjusted headroom, Rx and Tx audio configuration, SYNC flag of MusicTAXI at the other end.



Tapeless recording and transmission on the spot is the answer to the enhanced requirements of correspondents. The CTAXI is the solution and is set to become the standard for mobile recording and transmission, because it satisfies the users demand: stereo recording, editing, file-transmission to computers, realtime-transmission to all well known codces. The CTAXI is, of course, child's play to operate. You can use it as telephone, walkman, audio recorder, mobile editing station, transmission device. The size is as small as today's cutting

edge technology allows: 58 x 239 x 150 mm, the weight is 1150 g including 2 x Li-ION batteries. The charger is inbuilt and allows uninterrupted operation. PCMCIA flash cards or hard drives can be used for stereo recording. BWF format is supported.

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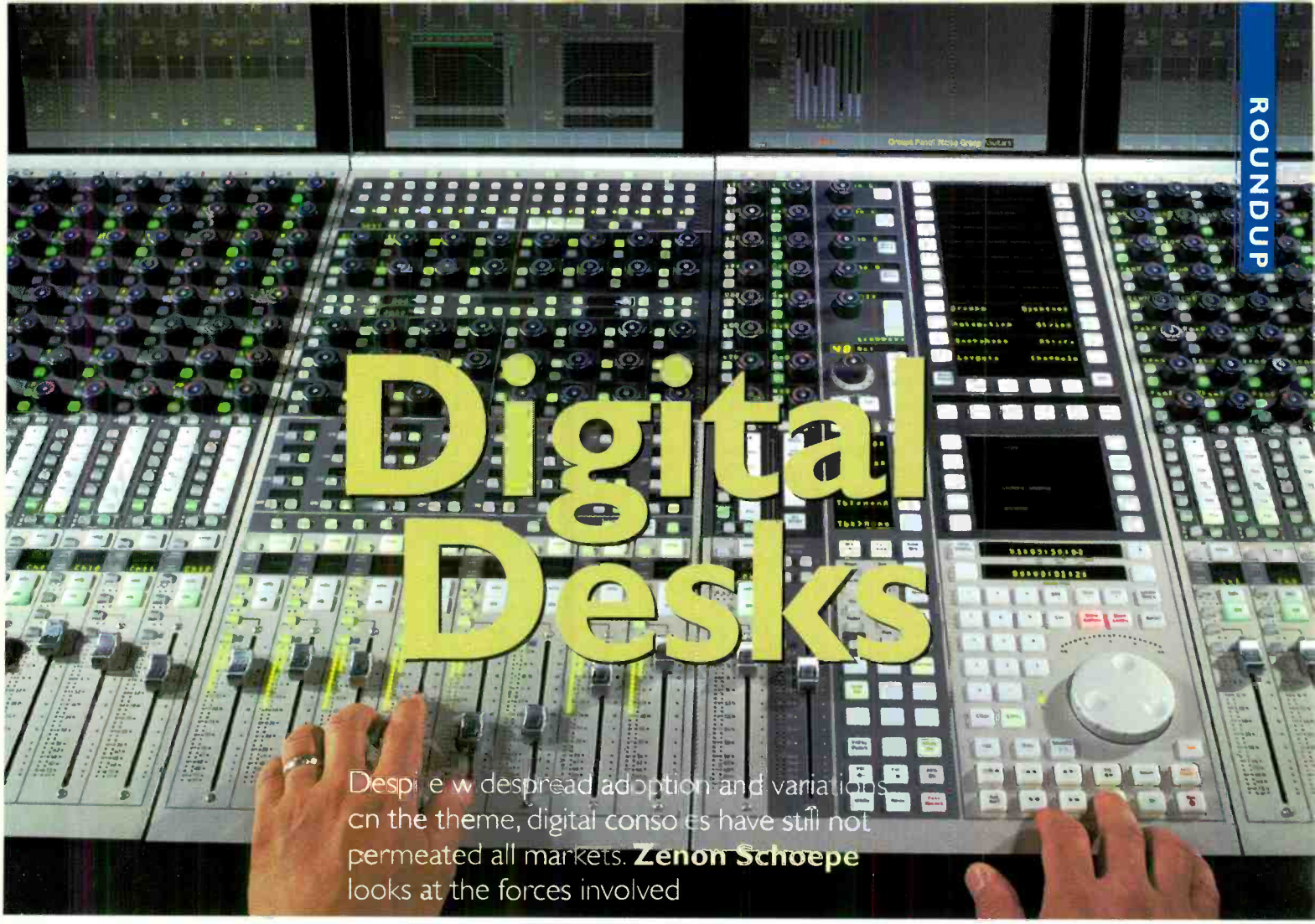

Digital Desks

Despite widespread adoption and variations on the theme, digital consoles have still not permeated all markets. **Zenon Schoepe** looks at the forces involved

IT IS INCREDIBLE that you will meet people who believe that digital desks are still a thing of the future, that the technology is still not proven and that it is yet to impact with any sort of force. If you're talking to someone in high end music recording then there will be an element of truth in it as arguably the most important large digital console, AMS Neve's Capricorn, had the market to itself for years until the arrival of Sony's Oxford, SSL's MT and most recently Euphonix' Series 5. Other disciplines are far more advanced but there are logistical and cultural reasons why the take up of digital desks in different market sectors has been staggered.

Core to this all is the requirement for the necessary technology to be available, able enough and affordable enough for manufacturers to create products with. The sheer variety of digital desks now being offered across the board means that even the most jaded and die-hard analogue power-user must concede that this is now in place even though they may wish to fault them on operational details. Beyond this take up is then governed by different combinations of user-interface and user-acceptance, matters of speed and convenience, cost savings, timing, the maturity of the technology and that irresistible lure of affordable functionality.

Live sound is the last bastion of analogue resistance and is an interesting case study in how entry requirements have to be met before the digital desk is considered. Digital desks like AMS Neve's Logic 2 and TOA's offerings have been installed in theatres for fixed FOH mixing in small numbers for some years but a transportable equivalent was not available until small French company Innova Son took the bull by the horns with its Sensory console and the derivatives that followed.

Touring live sound still concerns itself predominantly with analogue sound chains and while the reset ability afforded by a digital desk finds a natural application on the stage, apathy greeted digitally-controlled analogue equivalents. The engineers seemed happiest with the straightforward operation and bullet proof reliability of analogue but this scenario throws up another condition that is apparent in any new market being addressed by digital desks and that is that users want to have a choice of systems.

Yamaha's long-awaited live desk the PM1D looks to redress this issue and will surely spur others to enter the arena. The pieces are in place to serve the revolution and the leading edge of touring live sound in two years' time will be dramatically different from what it is today. The engineers will have conquered the operational changes, they will not be happy to work without the increased functionality and they will already be making demands on the manufacturers to push the technology envelope to the extreme.

Postproduction is by far the most sophisticated and experienced of digital desk markets and owes this position to a willingness to absorb and adapt to digital in the early stages. As a companion to hard disk editing systems digital desks were seen as facilitators, assignability was not an issue when it offered bountiful control and compact size and was operated by the same engineer every day. Post trail-blazed the refinement of digital desks with AMS Neve basing its desk range on progress made here and SSL also offering integrated desk-recorder-editor combinations. Most manufacturers can find uses for their desks in post but most recently Soundtracs has addressed the market with a range of specific products which now also includes the mixer-recorder DS-M

Recording is an example of the time being right for the adoption of digital desks despite the fact that flagship analogue desks continue to make a lot of sense. It has been a change in working practices brought about by a need to work in different formats that has drawn attention to digital desks for facilities looking to capture reMix business. The Capricorn added a film coring panel relatively early in its development as a clue to the redefinition of the digital desk in recording applications. The Oxford added multi-format capability and these sorts of features were stipulated as standard issue on the MT and Series 5 at their launch highlighting their appropriateness for>

< remixing for DVD using the high level automation and reset facilities for fast turn-around and high efficiency.

Broadcast take-up of digital consoles demonstrates that digital can be integrated into an infrastructure and yield increased convenience and speed. The complexity of manufacturing digital systems would seem to be at odds with the requirement to make products suitable to the particular working practices of individual national and subnational broadcasters. It is difficult in the context of analog yet digital manufacturers have managed it and even supplied niches within the niche, such as OB vans. Once a broadcaster becomes convinced of technology it adopts it wholesale leading to large markets for players like Lawo, Stage Tec, SSL, Calrec, Studer, Otari, AMS Neve, Klotz and Amptec with room in production duties for associated digital music recording desks. Benefits through the reset ability for live broadcasts and the integration into digital sound chains are obvious, but there are also savings to be made with, for example, one well equipped truck able to perform the functions of two on a live broadcast.

Radio is an example of how savings through digital can made while adding functionality, issues that are of paramount importance in instances where whole radio stations can be put together for substantially less than many major broadcasters spend on refitting a single studio. It also relates to a major shift in emphasis that is occurring in radio. A studio's major investment used to be its mixing console as the centre of all activity. Today the most important investment a radio station makes is in its automation system because this can call all the shots and make all the difference. In such an environment the console has been shifted in to the wings but it has to be digital to integrate.

Analogue on-air radio desks are simple but the digital ones are simpler still and while they won't tax the absolute capabilities of available DSP they are a demonstration of absolute refinement of function. A few faders and switches for the DJ are supplemented by deeper levels of programmability accessed and set up by the station technicians. Players of note who subscribe to this mantra include Calrec, Klotz Digital, Studer, Seem Audio, Logitek, Fidelipac, Audionics, Pacific Research & Engineering and Soundcraft.

At the opposite end of the spectrum the once 'totally conservative' film industry has astounded all by going digital with a vengeance. As well as serving as a reiteration of established cut-in-granite film working practices it serves to remind that digital desks can increase efficiency and free creativity and that film sound is under economic pressures, the same as any other discipline. Most importantly the creation of monster digital boards is an indication of the maturity of the technology as these consoles push the envelope of what is possible in high-pressure, high-dollar, high-volume environments day in, day out. AMS Neve, SSL, Harrison, Stage Tec and Otari have all set up stall in the film theatre.

What cannot be overlooked with digital desks is their functionality. Challenged at the very high end only by digitally-controlled analogue boards, the features and automation capabilities of even a modestly priced digital console are streets ahead of anything that came before it in its price range. This affordable functionality has impacted on everyone who is involved in audio be it through the entry level Tascam TMD1000, Yamaha 01V or Spirit 328 or 324, Allen & Heath Icon, the Rolands, the LEM range or through to Panasonic WR-DA7, Yamaha 03D, legendary 02R, Tascam TMD4000 or Mackie D8b—all set a standard in their own right.

Most significantly, they have exposed users to the previous exclusivity of digital, familiarised them with concepts and methods, demystified it, and allowed them to experience the benefits and the downsides at first hand rather than having to rely on handed down insight.

This has made digital desks a true people's revolution that has introduced a currency of language that is applicable all the way up the scale and allows advanced concepts and implementations to be understood. It could be argued that such a democratisation of experience and knowledge never existed between the low end and the upper end in the heyday of analogue. Progress has been good.

The take up of digital desks in different market sectors tells you more about the freedom of adaptability of the engineers involved and the real-life integration issues that they face than any other measure. Home recordists are free to be taken by the affordability of the functionality they are being offered, functionality that would be beyond the depth of their pockets in the analogue domain. Recording studios look for flagship products that can serve as a magnet for business but that resemble the operational processes of existing flagship analogue consoles for a largely transitory engineer base. Postproduction still operates on the engineer's room principle and can be geared up around the specific requirements of the operator employing levels of assignability, for example, that would perhaps be unacceptable in other spheres. Broadcasters are driven by the convenience and suitability of a digital desk within the framework of how it chooses to work and trains its operators accordingly. Radio takes advantage of digital's ability to hide its complexity beneath a blatantly simple surface while saving costs and film requires a desk big enough to cover all eventualities with digital's automation serving, in the hands of experienced desk drivers, as the means by which it can all be controlled and fixed.

Progress has indeed been very good.

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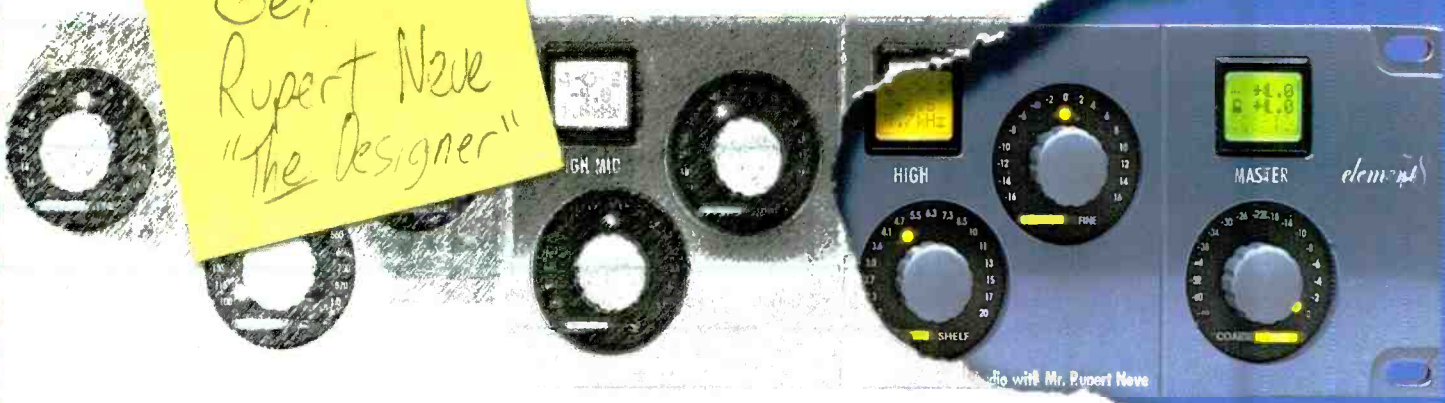

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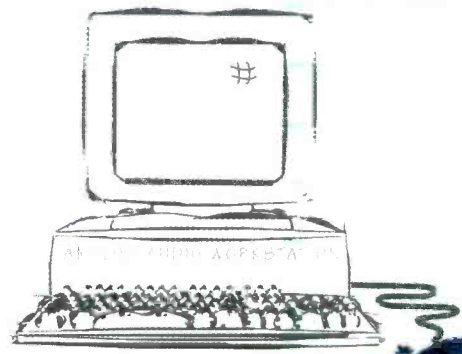

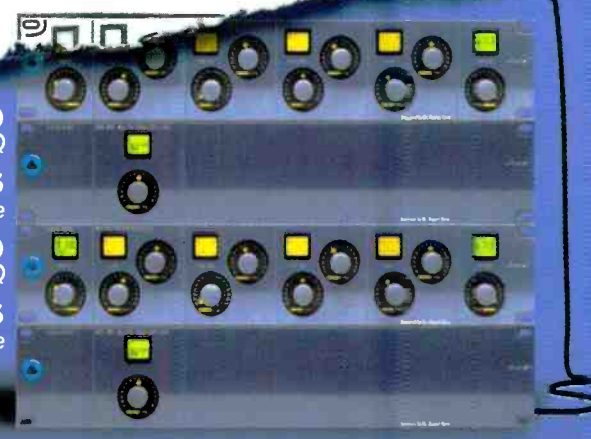

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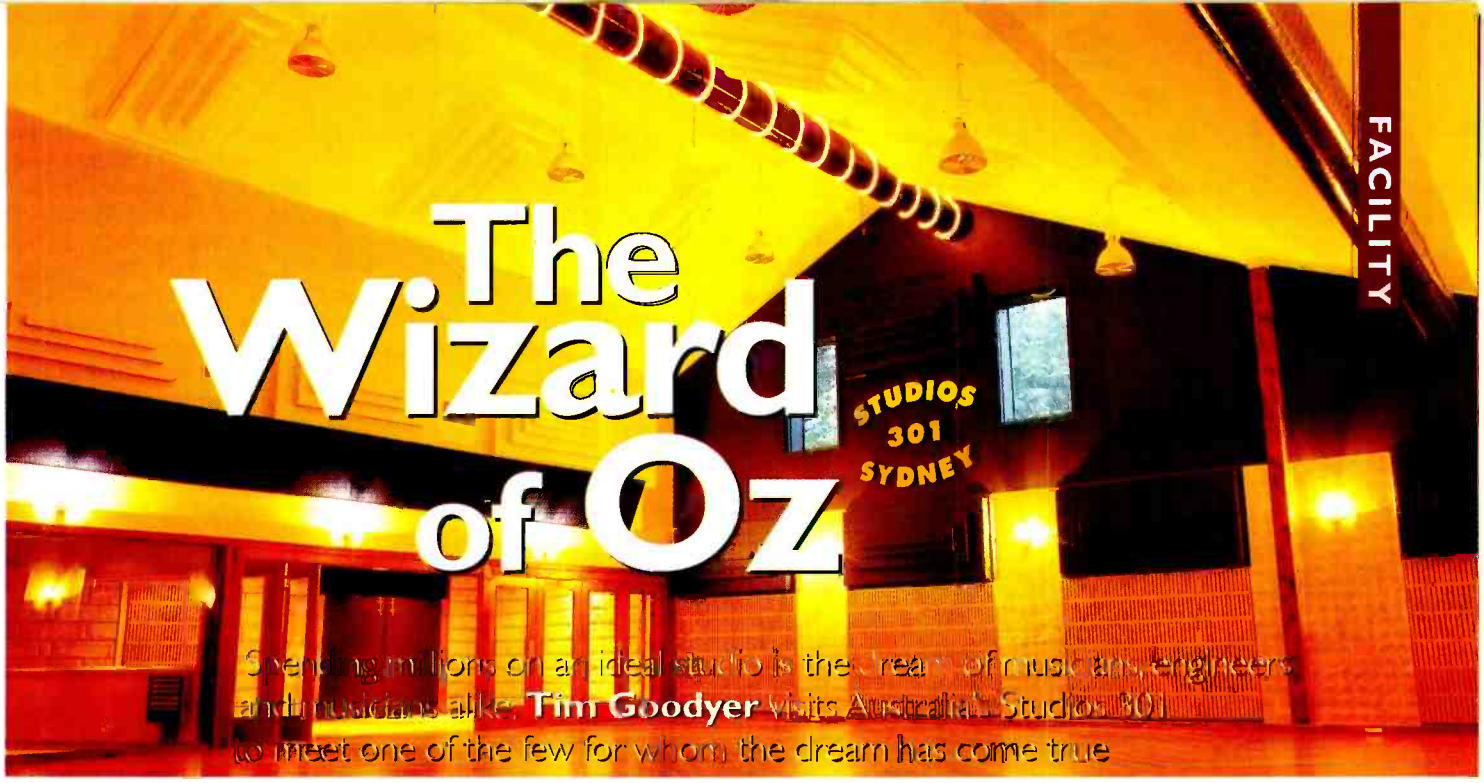


The Wizard of Oz

STUDIOS 301 SYDNEY

Spending millions on an ideal studio is the dream of many engineers and musicians alike. **Tim Goodyer** visits Australia's Studios 301 to meet one of the few for whom the dream has come true

A SELF-CONFESSED DICTATOR and madman, Tom Misner has little time for any additional accusations levelled at him by his critics. And he's taken plenty as founder and mentor of the School of Audio Engineering. If a recent article in The Australian *Financial Review Magazine* valuing Misner at roughly A$900m has fuelled their disdain, his latest venture will leave many of them speechless. His purchase of Sydney's Studios 301 and their subsequent relocation and refurbishment puts Misner into the premier league of the world's music recording studios somewhere close to Abbey Road. For the modest investment of some A$8.2m, he is now running the world's second longest-established studio and only orchestral facility south of the equator.

'It's a number of things,' he responds with gentle satisfaction from behind his new office desk. 'First, it's a statement. Second, I've put my money where my mouth is—I've been teaching acoustics at SAE and to prove to myself and everybody at SAE that I can actually do it, I've done it.'

The result is a magnificent 2-room music recording studio complete with three programming rooms, a multimedia suite and mastering facility in Alexandria, Sydney. The two main control rooms are identically designed and equipped, differing only in that where Studio 1 has a Neve VR Legend console, Studio 2 has an SSL 4060 G+. The acoustic, aesthetic, monitoring and outboard aspects of the rooms match closely enough for Misner to rate them closer than the Harris Grant rooms at Nashville's Starstruck. Add to this the fact that the mastering operation already handles 70 percent of Australian recordings and that 301 had secured the music recording duties for the forthcoming *Star Wars* Episodes in advance of its opening, and you can share Misner's satisfaction.

In fact, his relaxed manner sits in sharp contrast to the frenzied readying of the studio for this evening's opening party and, for that matter, Misner's own involvement in the 301 project. Or perhaps the bullet-proof windows and door are lending a hand.

'This was the old Commonwealth Bank,' he offers in explanation. 'This was the manager's office and the tape store was the bank vault, although the staff reckon I go in there to count my money...' The vault served yet another purpose during the soundproofing of the studio, demonstrating to the building team that thick walls and heavy doors are only part of the story. But the whole episode is a story with some interesting lessons for Misner's detractors, as its architect demonstrates.

'There is an irony to the whole story. I never wanted a studio because I was teaching people and I didn't want to put myself in a position to compete with the people I'm trying to present my students to. But strangely enough, Jim Taig the manager of Studios 301 in 1994 turned up at an accreditation meeting I was having with the government—unannounced, I didn't know who he was. He walked in with an 80-90 page document to say why the industry in Australia didn't want the SAE to be recognised. To cut a long story short, he was general manager at 301 but he was also in partnership with another school—which has since closed—and he was using 301 to push the course. The government didn't want to know because they have procedures that they follow, and I wrote to EMI who were then the owners of 301. What that resulted in was me thinking that if they were going to attack me, I would attack back. So I bought the first VR into the country and set it up at my school in a mixing room—just a mixing room, nothing lavish.

'I was then on the lookout to move my room and turn it into an orchestral recording studio because there were none in Australia. So I found a building and started work on what was initially to become Mirage Studios—because that was the name of my mixing room.'

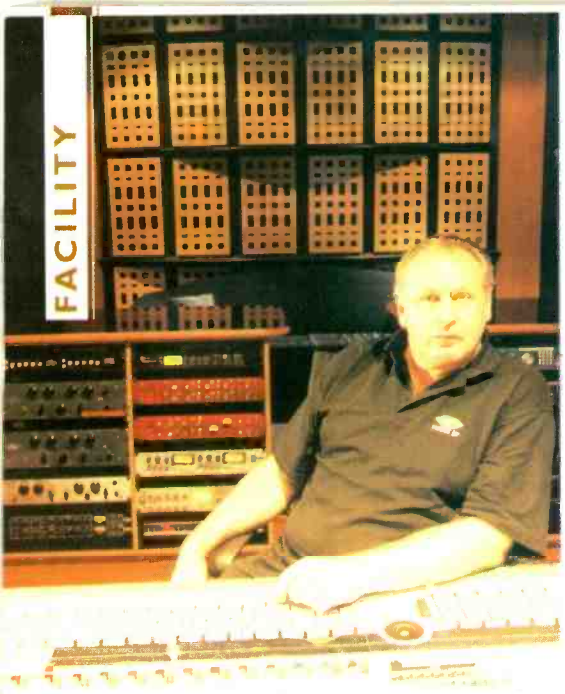
The stage was set for the entrance of Martin Benge, ex-Abbey Road manager then working as a consultant in his home territory of Australia. Then Studios 301 came up for sale... 'It was going broke not because business was bad but because it was badly managed,' Misner opens, with characteristic frankness. 'Half the equipment was leased, it was heavily overstuffed and it was getting tired. So I bought it off EMI lock, stock and barrel. I took it on with the Phoenix room—the SSL studio—which was very nice but it was tired. I wanted to get rid of Jim Taig, because I have a long memory, and I wanted to reinvest in the mastering side. The plan then was to close down half of 301 and bring the operation over here. Then I decided to really make a world-class studio of it.'

It's an odd move, given the decline of the professional recording studio in other parts of the world.

'In terms of business, the only people who are going to survive are going to be at the very top or at the very bottom,' Misner asserts, 'and what used to be the top a few years ago is now little better than a home studio and is going to die. I've observed this world wide, and Australia is in the same boat as the rest of the world.'

Leaving 301 destined never to recover its cost...

'It cannot make money,' Misner agrees. 'Doing the sums, my top rate—my orchestral rate—is $2,000 a day, normal mixing rate is $1,400 which is half or less of London rates. And that's for this facility—with every effect known to mankind in here. You can't make money on that kind of investment. My instruction to the guys here is that I don't want to pay to keep it going. If the revenue covers their wages and the expenses here, whatever extra there is >



Tom Misner: 'I've built my ideal studio'

< make my own mistake, dig my own grave and be buried in it. I don't need somebody else to do it for me. Everybody makes mistakes and I don't want to blame somebody else for mine. The buck always stops with me. Nothing happens without my involvement—every detail from the skirting boards up.'

Misner's attention to detail extends to coordinating his efforts with others in Sydney: 'The second biggest film studio outside of Hollywood opened last week and is five minutes away from here—Fox. And we've synchronised the way we do things here with Fox such that Fox deliberately did not build a big recording studio. They have sound stages and so but they do not have a huge recording studio because we have one here with all the same dubbers and same matrix so that we can easily exchange projects between us.

'We're now doing *Star Wars* 2 and 3, the last two Star Wars in Sydney. Fox is doing a lot of the filming and postproduction and we're doing the music. The reason is that labour is cheaper, even the experts, and with films like *The Matrix*, *The Thin Red Line and Mission Impossible 2*, we've proved that Australia is of world standard.'

Like Kevin Costner's character in *Field of Dreams*, Misner is confident that having built a world class recording studio, international clients will arrive on his doorstep.

'It is very practical to attract overseas people here,' he says. 'At Studios 301 now we have probably two requests a month from overseas people wanting to come over here. We've just had Alanis Morissete and Puff Daddy in the old studio—but they look around and it's nice but the old room is not an A room. But people like coming to Australia; Sydney is a nice town, we mostly understand each other, and it's a safe part of the world to be in. On the film side we're already attracting huge amounts of work partly because it's the only orchestral room here but more importantly the American's are flocking down here because they don't have to pay repeats to the musicians. They book the Sydney Symphony, record the thing, thank you very much, bye... In the States you keep paying the band forever; you do not pay repeats here because the Australian copyright laws are different.

'We have bookings already. It's fully booked through February, March and April. My first client is actually in one of the programming rooms now. It's the musical production of *Peter Pan* that's over here from Germany. It's a major musical production and a major client. The next three clients are all projects of mine. I'm producing albums, one for a very successful Australian artist called Grace Knight who had hits in England and the States with a band called Eurogliders. Another act is Tina Martin for ABC Records. She's just come back from Nashville to record here with us. And the third is for Doug Williams. So I'm going to be doing quite a lot of production work in one studio throughout February. Richard Lush will be in the other studio doing all of February with *Peter Pan*. What I'm after is 4-day or 5-day mixing session rather than longer sessions because where I see the studio placed is for people who record at home. The gear you can have at home is excellent; if you've got an ADAT or Pro Tools and a Mackie at home, it's great. It's what made the studios go broke, by the way. But you can't mix at home. You can program, play, record at home but to get a really good vocal sound and to do the really big polishing you need a big studio. You need the acoustic, the desk, the outboard and—what people forget—you need the atmosphere. That makes you work better.'

Contact
Studios 301, 2-10 Mitchell Road,
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Putting his money where his mouth is once again, Misner expects to be one of his own major clients.

'I've been working in Nashville and Europe, engineering as a hired gun,' he explains. 'Now my intention is to spend two or three months a year in Europe and then spend the rest of the time working here in the studio. I've got five albums where I'm confirmed as the producer-engineer and I want to do them here—and I will be very seriously pissed off if the studio gets too busy.'

The queue of people needing Misner's guidance over colour schemes and carpet laying is lengthening. The catering for tonight's party is calling and photographs have to be approved before they can be entrusted to the hands of visiting journalists.

'It takes a sick mind to build a studio, I can tell you that,' Misner concludes. 'You have to be crazy to start with and it makes you even more crazy. It's 12 hours a day full on. It's chaos.

'But I've built my ideal studio. I am completely happy—100 percent. You can never please everyone so there's always somebody who's going to come in and say it's crap but I am totally happy because I had in my mind my vision of how the studio ought to look and now seeing it has been my achievement. The concern now is that I could not build a better studio. So what's next? It's a life's work and it's done, so I'm looking for something else.'

Surely it's a worthy challenge for a perfectionist to seek imperfection in his own creation. Misner smiles.

'I haven't seen anything I would change about the studio yet, but I will. It may be that better lighting comes along or something. It's just a matter of time.' ■

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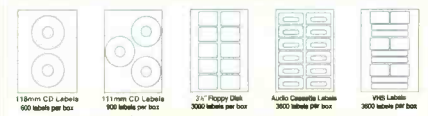

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US: The lawn-mower man

That change is inevitable is accepted, only rates of change remain to be agreed, writes **Dan Daley**

IN CHARLES DICKENS' *A Christmas Carol*, Marley's ghost visits upon his erstwhile business partner three visions of things that were, that are and yet to be. But what if Dickens were writing about pro-audio instead of the human condition?

If Marley's first spectre foreshadowing what Scrooge would become and why, a similar visit by some studio haunt would reveal a smug and complacent landscape of studios that, like the banking and phone monopolies of yesteryear, had a steady stream of clients for which those facilities were the sole resort when it came time to make a record or post a picture. The second spook would reveal a brawling and bloody East-End tableaux in which facilities teemed in numbers, and the older ones had to fight with a huge influx of young newcomers for the best parts of the Christmas goose. And Marley's final visitation would be dressed in a Prada suit, small ponytail and an MA from Wharton, scaring you not with long, bony fingers pointed towards the gates of eternal damnation but with a smirking reminder—as he picks up the check—that you didn't buy AOL when it was $20 per share.

Like it or not, The Change is upon us. All around, we can see the new models of the audio business at the speed of life—a pace we had all better become accustomed to. These new paradigms are multiplicitous and fecund, spawning mutant varieties with each generation, and with a gestation period that seems like months, if not weeks. But there are a few archetypes emerging and they point the way the industry is heading.

The Internet Man—with e-commerce nowhere near its peak, the need for Internet-based audio is growing like wildfire, and facilities are cropping up to meet those needs almost as quickly. In Nashville, Antarctica offers direct-to-hard disk recording and will pop your stuff—and promotions for it—right onto the web-site of your choosing, complete with graphics designed within the facility; Universal Digital is predicating much of its future on mastering specifically for MP3-type audio formats, filling in the widening gap left by conventional mastering facilities who are striving after ever-higher bit rates even as 16-year-olds are making hits by buying truncated 16-bit (supposedly) songs off the Internet. Studios that turn to new media as a prime focus will likely find that within a short period of time, audio has become simply one of many components, rather than the goal itself.

Look, Ma: no console! Already, the notion of studio-in-a-box has evolved from the back bedroom to the front office. Miami is the epitome of this new model, with studios opening every other week based around console-less hard-disk recording systems and small recording spaces abetted by a growing array of plug-ins and other digital ambience generators. And they're making hits.

Mega-Global Audio Enterprises, Inc / Ltd / SA/GmBh—the unsettled economic landscape left behind by the first winds of change—the home studio, is being reculti-vated with the same implements as the rest of the media industry: with consolidation, acquisitions and mergers. Facilities with capital are purchasing those without it at a rate never before seen in this business, and it shows no signs of abating. Emerald Recording in Nashville is the paradigm for the domestic model, having bought, acquired or merged with more than five properties in less than 18 months, building a cradle-to-grave sort of arrangement, from preproduction to mastering, with a 'the more you buy the less you pay' economic plan.

Out on the Interstates, New York City-based The Hit Factory's acquisition of Miami's Criteria Studios is likely the opening salvo of what could be a dozen or so similar interstate mergers. LA-based Ocean

Europe: Roamin' holiday

Keeping in touch with your business while on the road is becoming as frustrating as it is tempting writes **Barry Fox**

THE MUSIC, concert and recording industries were early into email because it cuts across the time zones that fragment an international business. Similarly, GSM cellphones can 'roam' around Europe, with charges billed to a 'home country' account avoiding hotel surcharges. And using a cellphone with a PC provides access where there are no lines or sockets, or only digital switchboard lines that can fry a modem. Herewith some hard-won tips and warnings for European users.

The cost of roaming GSM calls is usually between one and two pounds a minute, and that's for incoming as well as outgoing calls because you pay for all the international legging. I recently tried a Motorola Triband GSM phone in Nevada and California, and found it 'gave good roaming' on the PCS system. You need a triband as opposed to a dual-band phone because PCS works at 1900MHz, while GSM works at 900/1800MHz. The phone must be manually switched because the bands overlap. Expect one from Nokia soon.

The new free Internet services, like Freeserve, can only be accessed by calling back to a UK number. The GSM modem speed is limited to 9600bps, compared to a download speed of 56kbps with a fixed line modem. If your email contains any junk mail and bloated Word file attachments, the GSM access cost is horrendous. If you subscribe to a world-wide service, like Compuserve or AOL, you can access your mailbox with local calls to local nodes. These will still be expensive if you use a roaming cellphone, but hotels usually charge a sensible rate for local calls, and some (like the Motel 6 chain in the US) even offer them free. Last year AOL bought Compuserve, and launched a new service called Compuserve 2000. This uses similar software to AOL, and subscribers are encouraged to migrate from the existing Compuserve Version 2, 3 and 4 systems to new 2000.

Think very carefully before you make the move—you will almost certainly lose your original email address because the new system shares the same address list as AOL, and virtually every imaginable name has long since been taken. Although mail sent to the old address will be automatically forwarded, you will be stuck with a new dog-end. I was offered BFox7654 or some such, and finally settled for BarryPhox@cs.com. So I now get messages from people who think my real name is Phox.

In the past it has been smart to check foreign access numbers before leaving the UK, simply by dialling them long distance. This saves the hassle of setting up a laptop dial screen after crawling off a long haul flight. But some of the CS2000 numbers can only be dialled from inside the foreign country. While in Berlin I wasted around £15 on failed GSM calls. The modem repeatedly connected to a local CS2000 node, handshook and dropped the line. Other times the connection worked, proving that the setup was correct. Compuserve promised to check, but never got back to me.

Think very carefully before you make the move—you will almost certainly lose your original email address because the new system shares the same address list as AOL, and virtually every imaginable name has long since been taken

Compuserve 2000 levies access surcharges on calls made from some foreign countries. The online help is ambiguous over what these charges are, not explaining whether they are per access, hour or minute. The telephone Help Line is all at

Way's joint venture with Memphis/LA-based House of Blues in Nashville in 1997 seemed like an anomaly at the time; now it looks prescient. There's already a couple of other LA guys sniffing around Miami.

And on the global scene, Metropolis of London did the deal with Sterling Mastering in Manhattan, which just goes to show that we're still two countries separated by a common language. Mergers, acquisitions, joint ventures, strategic partnering—these are all phrases that will become as readily used in audio as 'plus or minus 3dB.'

Music of the stock market—Harman did it first, but in their own button-down fashion. But the lure of the stock market has been too much for many pro-audio manufacturers and service providers, with more and more companies taking the same route as Euphonix, Avid, Mackie, Todd-AO and a host of others in pursuing public capital and the perceptual legitimacy that comes with it. The problem is that most of their stockholders would not know a fader from a hole in the ground.

How do you adapt? However you can. Accept that change is not only coming, but is already here. Watch other industries knowing that what goes for one will likely come to others, including ours. And read more than the equipment reviews in this magazine to stay abreast of changes. I think I remember reading somewhere that Tascam is now making a lawn mower...

sea, having only the online information to work with. A colleague reckoned he had been charged £2.50 per access in Italy and Compuserve's Communications Manager Cass Meaden confirmed that accessing the service from the US was surcharged at £2.50 a time however brief. With Compuserve v3.04 there was no US surcharge. Parent company AOL levies £2.50 per hour. Over a period of a month I five times asked Cass Meaden how US company Compuserve could justify a £2.50 per access surcharge for access in the US.

When I heard nothing I asked Claire Bellamy, of CompuServe European Business Service. It's not per access, she said, it's per hour. Now, without hint of apology, Cass Meaden says there is no surcharge for the US at all. She also says that Italian access is £2.50 an hour, not access. I give up. If the people running the wretched service don't know what it costs, who does? It's especially absurd because Compuserve sells itself as a business service for serious users, not nerdy surfers or casual emailers.

Yes, it is possible to say, 'enough of this nonsense' and ask to migrate back to the old Compuserve. But the migration obstacle course takes several days and incoming mail is lost during the changeover period. I would not now trust Compuserve to redirect mail sent to my abandoned CS2000 address. So I'm stuck. But you can learn from my mistake and either stick with v3.04 or ditch Compuserve altogether.

Historycasting

Sixty years of broadcasting have shared their time with incredible technical advances, appalling military invasions and curious social comment writes **Kevin Hilton**

THE HISTORY of broadcasting stopped and started in 1939. Just as NBC began the first regular television service in America, the BBC suspended its TV transmissions with the start of World War II. Manufacturers concentrated efforts on producing equipment for the war effort—with the manufacture of radio sets stopping for the duration—but research continued that would greatly affect future broadcasting.

In 1940, CBS in New York experimented with colour TV transmissions based on the semi-mechanical field sequential system. It would be another 13 years before a full service began, introducing among the first broadcast acronyms, NTSC. Two major drawbacks were that the colour could slip, forcing viewers to manually adjust the picture, and it made the full horror of Lucille Ball's red hair a terrifying apparition.

I Love Lucy first appeared in 1951 and is still an important show because it was an early independent production, it was the first to be filmed in front of an audience using a 3-camera system rather than transmitted live and without it, today's cable and satellite channels would have a gaping hole in their schedules. It was also the first American comedy to be exported to Britain and was shown on commercial TV in the UK when it started in 1955, paving the way for a generation of children who grew up during the eighties and early nineties believing that all comedy was American. Perhaps Winston Churchill was right when he called commercial TV 'the tuppenny ha'penny Punch & Judy Show'.

The fifties are referred to as the Golden Age of Television, but it did give us the soap opera

In Japan, NHK had broadcast the first Japanese drama production in 1940. The war again caused a hiatus and it was not until 1953 that both public service and commercial services resumed full-time working. The development of national TV services started to roll out from the late forties, different countries with different priorities not establishing services until relatively late. Mainland European services appeared during the fifties, while the Republic of Ireland did not get its own TV until 1961, although BBC transmissions could be received by some in the country long before that.

The fifties are generally referred to as the Golden Age of Television, although it did give us the soap opera. UHF started to be widely adopted and set ownership increased. The cinema suffered as TV showed its ability to keep people at home. In Britain, Nigel Kneale's *The Quatermass Experiment* serial—broadcast live—cleared the streets in 1953, a feat repeated in America by the last episodes of *The Fugitive* during the early to mid sixties. TV still keeps people in their homes today, but only because they think something might be worth watching, not because it is.

In 1956, Ampex produced the first professional video tape machine (RCA had demonstrated pictures on magnetic tape two years earlier), a 2-inch machine that was widely used (the BBC bought its first units in 1958) as broadcasters looked for an alternative to film and telerecordings.

Radio continued, increasingly in the background. FM stereo was authorised in the US in 1961, adding that flickering LED to the hi-fi display as it struggled to latch onto a signal. Despite the advent of rock 'n' roll, public service radio rarely acknowledged the existence of young people. Nowadays it rarely acknowledges the existence of old people.

Radio Luxembourg filled the gap to a certain extent, but it was left to opportunistic entrepreneurs to do the rest. Radio Syd (so my sources tell me) broadcast to Sweden in 1958 and there were at least 11 'pirate' radio stations before Radio Caroline went on air in 1964. It was not until 1967 that the British government outlawed the pirates and the BBC started a 'pop' service, Radio 1. It was another ten years before commercial radio, as enshrined in the policies of the late Screaming Lord Sutch in the sixties, came on air in the UK.

The BBC launched its second TV service on 20th April 1964, although, due to a power failure, BBC2 actually went on air the following night. Colour transmissions began in 1967, with full services on both BBCs 1 and 2 two years later. This was meaningless to the Hilton household as we did not 'go colour' until the late seventies, which meant that my friends eventually started to come to my house.

One of Arthur C Clarke's visions became reality when, in 1962, Telstar beamed the first satellite pictures across the Atlantic. This established the technology that, when CNN went on air 1980, enabled reporters to tell us that nothing was happening —live. Sony introduced its professional U-matic VTR in 1969, then went on, in 1975, to launch domestic Betamax. JVC countered with VHS, thereby creating the format war that kept technology journalists busy for years.

But you remember the rest. Composite, component, competing pro-digital VTRs, nonlinear editing, satellite television, digital radio, digital television and all the stuff I've been writing about for the past six or so years. You want a comprehensive history, buy a book. Just as soon as I get round to writing it...

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Studer A827

The Studer A827 was the final analogue 2-inch machine manufactured by Studer and replaced the legendary A820. But it was not perfect, and its refinement is described here

STUDER'S A827 WAS developed in 1989 as a more moderately priced alternative to the ultra successful A820. Much of its technology, the tape transport, is derived from the A820 although the audio section was completely redesigned for the new model. Consequently, instead of four different PCBs for each channel (reproduce amp, record amp, sync amp, HF driver) resulting in a total of 96 PCBs per 24-track machine, the A827 uses a single PCB. It also combines two channels per PCB requiring just 12 PCBs to handle the whole audio section. The onboard audio control keys available to the A820 were replaced, leaving audio control to be performed using either a Studer remote control or a parallel audio interface (part no 21.328.540.00), which allows track arming from a SSL console.

Since it's introduction, the A827 has become one of the most sought after analogue multitracks. George Martin's famous Air Studios in the UK have recently begun introducing the A827 as an integral part of its extensive repertoire of equipment.

As mentioned previously, the tape transport on the A827 is completely compatible with the Studer A820 and so all transport features of the A820 are incorporated into the A827 but revised software gives an increased total of around 100 programmable functions and key commands. One of the A827's strengths is its ability to store two different tape sorts for all speeds—listed as Tape A and Tape B. Equalisation is stored internally on the Audio MPU and can be easily accessed via two switches on the deck plate. Drop-in and drop-out speeds were also improved on the A827. Fig.1 shows the audio block diagram, you will notice that the A827 runs on four separate MPUs (unlike the A820 which runs on five) because the A827's meterbridge only carries the vu meters and audio signals. The A820 needed a fifth MPU to control the auto alignment which is not available on the A827. Looking at the audio block diagram (Fig.1) in further detail it contains the following PCBs:

The Master to Audio IF converts the 8-bit parallel data bus into a serial bus and enables the time elapse counter. It reads in data from the head block identifier to open the corresponding audio data memory automatically when the corresponding headblock is inserted. This means that the A827 will detect if you have on either an 8-track,16-track or 24-track headblock. The head identifier PCB (1.820.795.00) is attached to a D-type connector on each individual headblock.

The Communication Controller converts the serial bus back into an 8-bit parallel data bus. It also provides the interface for audio remote control or SSL IF (track arming from mixing desk, part number 1.328.540.00) and the interface for data protection on PC or on tape (either via external cable or direct, without cable).

The Audio MPU enables the required audio signal path and the corresponding head(s) as well as control of drop-in and drop-out commands and the corresponding timing. It also adjusts the audio signal to the correct level (via D-A convertors) and memorises audio data (buffered RAM) or the three different head blocks and for two different brand of tapes.

The Generator unit provides internal tone generation for simplified audio alignment (60Hz, 125Hz, 1kHz, 10kHz, 16kHz) with connection for external input and allows connection (via BNC) of an external tone generator and supply signal to all audio channels. It was standard only on the A827 Gold edition, available separately as part number 1.827.725.00.

The External NRS Controller allows control of an external noise reduction system (Dolby or Telcom) to switch the unit to NRS coding or decoding in the correct timing.

The Multichannel bus driver splits the audio data and control bus into three identical buses to operate a group of eight channels (a group of eight channels consists of one audio basis board and four audio electronics PCB. One such group

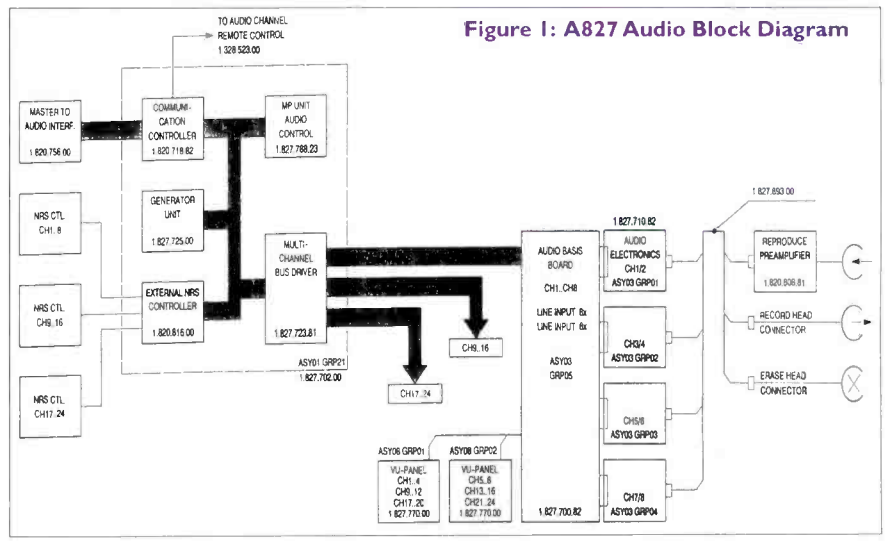

Figure 1: A827 Audio Block Diagram

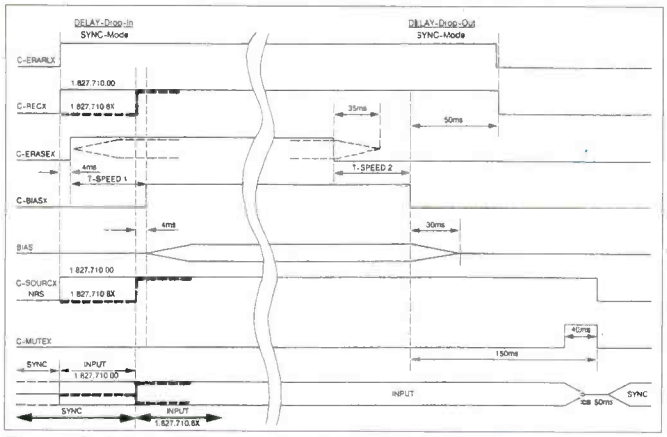

Figure 2: Jumper positions for drop-in/drop-out

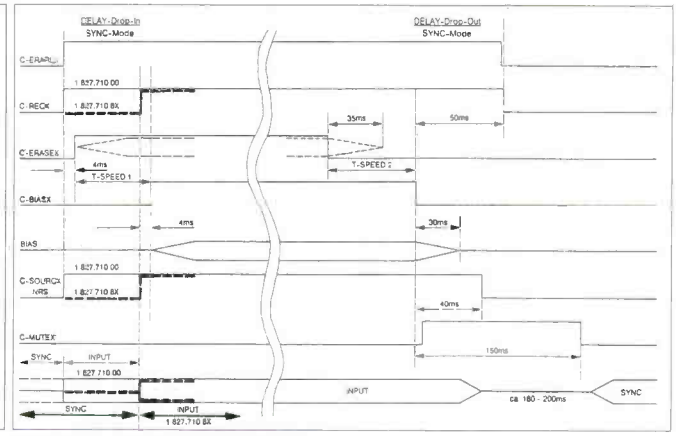

Figure 3: A827 Gold Edition

is required for 8-channel recorder, two for 16-track and three for 24-track).

The Audio Basis Board contains a chip that selects D-As and switches on the audio electronics boards. It generates the 153.6kHz bias and erase frequency outputs of the 307.2kHz clock signal from the TD MPU (square wave). Lit commands for the Ready/Safe LEDs on vu panel, supplies fusing the four supply voltages (defective Fuses indicated by red LED).

The Reproduce preamp adds gain to the small audio signal from the reproduce head to a safe level to prevent internal interference.

It is worth noting that the A827 headblock is 100% compatible with an A820 headblock. Part numbers for individual heads for both machines (2-inch 24-track) are: Record head, 1.317.780.00; Reproduce head, 1.317.785.00; Erase head, 1.216.826.00.

Earlier models of the Studer A827 were equipped with 715 PCB, there is now a modification to improve the drop-in/drop-out timing which will upgrade the PCB to 1.827.717.00. Some software needs to be changed as well as hardware modifications (for further info contact http://www.studer.ch/company2.htm)

Audio Electronics Board 1.827.710.81 for improved monitor timing at record drop in when in Sync mode (Jumper JS 17 on the Audio MPU must be removed to enable new monitor timing (Fig.2). An additional relay has been added to enable separately the erase—and record head. New Jumpers (JP 2/JP 301/JP 302/JP 502) allow ability to have the repro signal on the sync outputs. All the PCBs must be replaced for upgrade, to enable new timing all PCBs must be index .81, or .82. (Note: The PCB 1.827.710.00 can not be upgraded for these features.)

It was discovered under certain air conditions, that some machines experienced discharges of static loads off the tape. To remedy this Studer developed a non-anodised guide roller, it is advisable that you exchange guide rollers; part number 1.820.450.01.

In 1999 to celebrate Studer's history with the 2-inch format, an A827 Gold Edition was designed. Limited to just 95 units the Gold Edition is easily recognisable with its black wooded side panels, gold headstack and gold plate with a commemorative signature of Dr Willi Studer. From a technical point of view the gold edition comes with a built in test generator and RS232 interface. From an audio point of view by refining head manufacturing techniques Studer has improved head gap scatter. Without a doubt the Studer A827 Gold Edition is likely to become a real collectors item in the future. ■

DR JOHN

RMS

RMS is one of those terms that crops up every day in audio. But what does it mean. **John Watkinson** explains and suggests that it gets used too often

DIRECT CURRENT CIRCUITS are easy to deal with. The voltage and current are constant and calculating the power delivered is simple because that is also constant. Fig.1a shows the necessary expressions. However, when the voltage is alternating as it does in power distribution systems and in audio, things are harder because nothing is constant.

Sine waves are used in AC power and any periodic audio waveform can be synthesised from sine waves, so it makes sense to start with the sine wave. The sine wave is the only waveform which contains a single frequency, so it can be called a pure tone. Fig.2 shows a constant-speed rotation viewed along the axis so that the motion is circular. Imagine, however, the view from one side in the plane of the rotation. From a distance only a vertical oscillation will be observed and if the position is plotted against time the resultant waveform will be a sine wave. Geometrically it is possible to calculate the height or displacement because it is the radius multiplied by the sine of the phase angle. Thus a sine wave describes one dimension of a rotation with respect to time.

The phase angle is obtained by multiplying the angular velocity w (Ω) by the time t. Note that the angular velocity is measured in radians per second whereas frequency f is measured in rotations per second or hertz (Hz). As a radian is unit distance at unit radius (about 57°) then there are 2 Pi radians in one rotation. Thus the phase angle at a time t is given by $\sin(\omega t)$ or $\sin(2\ Pi\ ft)$.

Imagine a second viewer who is at right angles to the first viewer. He will observe the same waveform, but at a different time. The displacement will be given by the radius multiplied by the cosine of the phase angle. When plotted on the same graph, the two waveforms are phase-shifted with respect to one another. In this case the phase shift is 90° and the two waveforms are said to be in quadrature. Incidentally the motions on each side of a steam locomotive are in quadrature so that it can always get started (the term used is quartering). Note that the phase angle of a signal is constantly changing with time whereas the phase-shift between two signals can be constant. It is important that these two are not confused.

Fig.1a shows that the power dissipated in a resistance is proportional to the square of the applied voltage. Put another way, the voltage goes as the square root of the power. Fig.1b shows what happens with a sinusoidal voltage. The power waveform is a sine squared function. The squaring process makes the power positive on both positive and negative cycles of the voltage so the power waveform is unipolar. Trigonometrically, squaring a sine wave results in a raised cosine waveform.

Fig.1c shows that there are three power levels of interest here. Twice per cycle the instantaneous power is zero, and equally twice per cycle there is an instantaneous power peak. Logically there must be some mean power level in between which would deliver the same energy long-term as a DC source at that power level.

As energy is given by the product of power and time, the energy must be the area under the raised cosine power curve. The mean power would be a constant waveform with the same area below it. Fig.1d shows that as the half cycles of a cosine wave are symmetrical we can do some cut-and-paste with the energy. If we cut off the tops of the raised cosine, they will fit exactly into the troughs, producing a constant power with the same mean. Clearly the mean power is exactly half the peak power as in Fig.1c, where both are measured in watts.

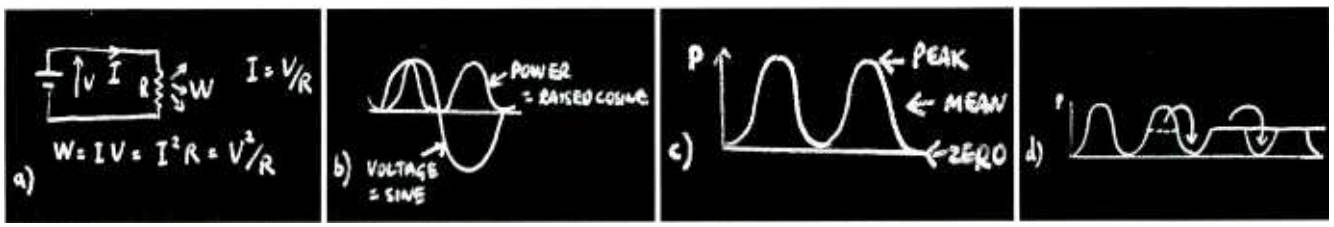

Fig.1: Power calculations

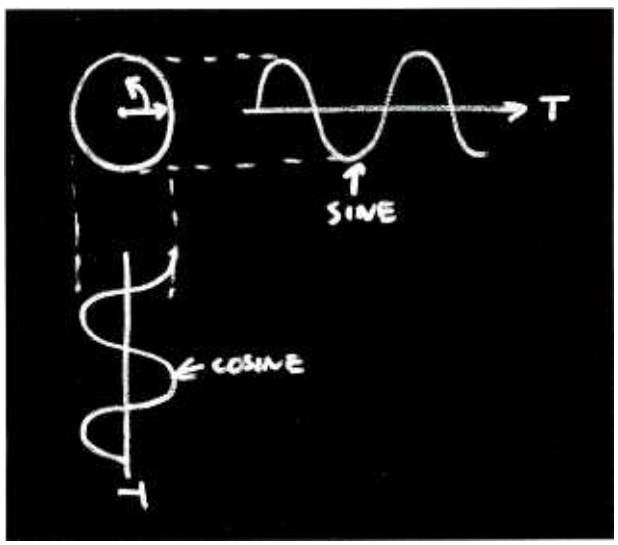

Fig.2: Constant-speed rotation sine and cosine waves

Fig.3a shows that if we take two voltage sources, one DC and one alternating, in which the peak voltage of the alternating source equals the DC voltage, the DC source will deliver twice the power into a resistive load. To those who understand the process this is obvious, but those who prefer what to why don't want to get a different answer just because the voltage is alternating. The solution is to redefine the way that voltage is expressed in alternating signals so that redefined volts AC and volts DC give the same mean power with a resistive load.

The redefined voltage would be whatever fraction of the peak voltage would deliver half as much mean power as the peak voltage would deliver instantaneously. As power goes as the square of the voltage, the redefined AC voltage is obtained by dividing the peak voltage by the square root of two. Clearly when the voltage is squared, the two roots multiply together to give a factor of two which halves the power.

Fig.3b shows the calculations. The next step is to decide what to call the redefined voltage. This becomes clear by following the process. The instantaneous power goes as the square of the voltage. We then take the mean of that power, then find what continuous voltage would deliver the same power,

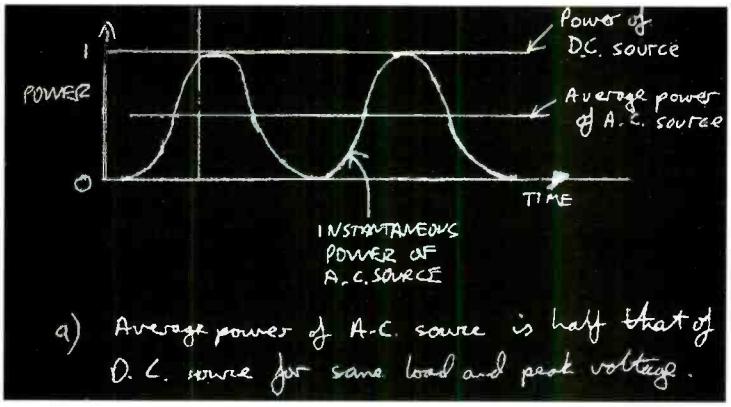

Fig.3a

which involves taking the root.

As the same power would be dissipated by a DC voltage whose value was equal to the square root of the mean of the square of the AC voltage, he volt rms (root mean square) is used. An AC signal of a given number of volts rms will dissipate exactly the same amount

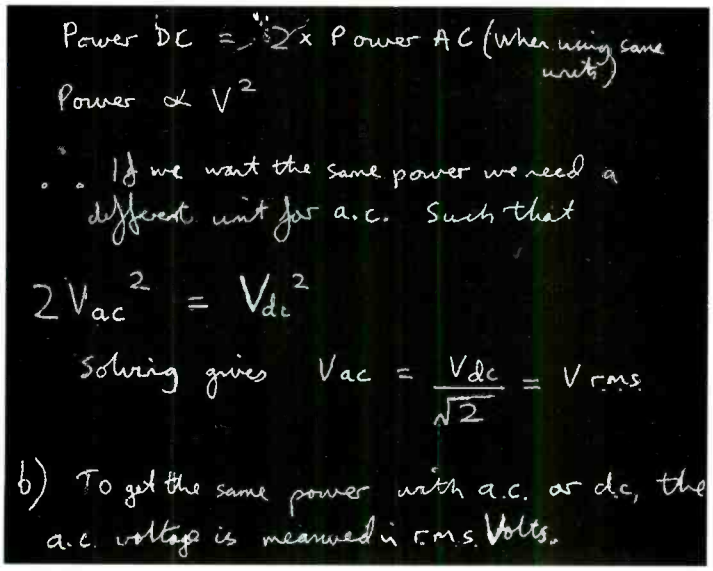

Fig.3b

of power in a given resistor as the same number of volts DC.

For a sine wave the rms voltage is obtained by dividing the peak voltage Vpk by the square root of two. However, for a square wave the rms voltage and the peak voltage are the same. Most moving coil AC voltmeters only read correctly on sine waves, whereas many electronic meters incorporate a true rms calculation which will give a correct reading on an arbitrary waveform.

On an oscilloscope it is often easier to measure the peak to peak voltage which is twice the peak voltage. The rms voltage cannot be measured directly on an oscilloscope since it depends on the waveform; although the calculation is simple in the case of a sine wave.

It should be clear that when a sinusoidal voltage is applied to a resistor there will be sinusoidal current. The power is also proportional to the square of the current, and following the above logic, when a voltage measured in volts rms is applied to a resistor measured in ohms the current will be measured in amps rms.

Power is also obtained by the product of current and voltage, thus in an AC system, multiplying volts rms by amps rms gives the power in watts. Not watts rms, but just watts, period.

This is one of the commonest mistakes found in electronics. However it is a simple fact that a Watt is not an rms measurement. The whole idea of the rms measurements of current and voltage is that the power in an AC system is the same as in a DC system. If it's the same power, we don't need a different unit.

In the power domain there is no squared term, thus from Fig.1d it is clear that the mean power is just that. For some purposes we want to state the peak power and the correct unit is Watts peak or watts (pk). On other occasions in order to be certain that we are not using peak power, the correct term is Watts mean. When the load is not a pure resistance the situation changes. If the load is an inductor, such as the primary of a transformer, the current isn't in phase with the voltage. In a perfect inductor the current is in quadrature with the voltage and the mean product of these two is zero. The instantaneous product isn't zero. In some parts of the cycle power is flowing into the magnetic circuit whereas in other parts it flows out again.

A transformer feeding a pure inductor will be handling significant current and voltage, but not delivering any mean power, so measuring its capacity in Watts isn't useful. The stress on the transformer doesn't change with phase angle, so the correct term to use here is the voltamp or VA.

For marketing purposes we can define any unit of power we like to get large numbers to put in the brochure. The result is just this side of dishonesty, but it allows the sale of 50W peak music power active loudspeakers for personal computers which come with a 4W mains power supply. Or was that a 4,000mW supply? ■

Advertisers Index

Beaujolais Challenge

COINCIDING with the 40th anniversary of the Mini, the 40th anniversary of *Studio Sound* and the 40th anniversary of the executive editor, *Studio Sound* entered the traditional annual rush to retrieve the first of the Beaujolais Nouveau as part of the Great Ormond Street Hospital for Sick Children organised charity challenge. Sponsorship of the Mini of driver Zenon Schoepe and navigator wife Susan was generously donated by the pro-audio industry's leading manufacturers and suppliers with over £3,000 raised for the charity.

Starting on the Tuesday before the third Thursday in November on which the Beaujolais is released, cars left from sub-zero Calais at midnight to wend their way down to the Loren et Fils vineyards near Macon, alarmingly near the Swiss border. Thankfully not a race, the aim was to get to the destination in the least number of miles.

Studio Sound 40' gave a surprisingly good account of itself despite being by far the smallest and least powerful car in company that included Jags, Big Healeys, Lotuses and a variety of far more modern and more comfortable cruisers. Mind you, Issigonis' finest creation came in to its sure-footed own when the snow started to fall and settle as it did for the last 200km. Weather conditions were said to be the worst for the event this decade.

The car won the 'Media' category and arrived at the vineyard after 461 miles which included a 20-mile penalty for taking up the option of giving the mid-way check point in Paris a miss. Kind experienced challengers described this as 'respectably' close to the overall winner who completed in 421 miles.

Those who wish to learn how long it took should apply privately in writing as there is a chance that small children may get to read this. Suffice to say that the figures can't possibly tell the whole story. Memory is already fading, fingers can now be unfolded from their wheel grip position, hearing has returned to normal and the decision to lower and stiffen the suspension is being reconsidered.

With the wine collected for the sponsors, the return journey started early on Thursday morning and was greeted with snow for another 250km which metamorphosed into tyre-deep sludge. We arrived home with little change out of 1,100 miles after 45 hours.

A great event and a deserving cause supported wonderfully by the pro audio industry sponsors to whom I have been asked to extend the grateful thanks of Great Ormond Street Hospital.

Next year? Yes.

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Our M•1400 and M•2600 have gained a well-deserved reputation for clean sound, bullet-proof reliability and wealth of system enhancing features. Now they're joined by in a new slightly "smaller" size to provide you with a complete family of FR Series High Current Power Amplifiers. Log onto our web site or visit your nearest Mackie Dealer and check out the best value amp line in the galaxy.

M•800
800 watts @4 ohms bridged
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400 + 400 watts @2 ohms stereo
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Keeps on cranking when "wall socket" voltage is as low as 90 volts (due to brownouts or very long, thin extension cords).

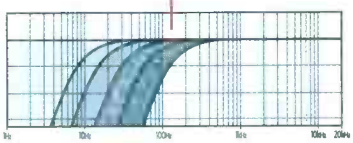
Outputs: 1/4" jacks plus **5-way binding posts** spaced for standard banana plugs.

Switchable "soft knee" limiter helps maximize SPL's without over-driving your PA cabinets (or the M•800).

Quick switch configuration for **stereo, mono** or **bridged** output.

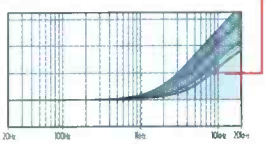
Inputs: Balanced/unbalanced 1/4" **TRS jacks** and **XLRs** plus **XLR THRU** for easy "daisy-chaining" to M•1400s, M•2600s and other M•800s.

LED display with output level ladder, signal present, overload & channel status.



Variable low-cut filters can dramatically improve your PA system's low-end response by cutting frequencies below the bass cabinets' minimum tuned frequency. 12dB/oct., variable from "Off" (OHz) to 170Hz.

Detented gain controls calibrated in both dB and volts.



Built-in variable CD horn EQ. Constant directivity horns achieve wide dispersion at the price of reduced high frequency response. The M•800 lets you restore lost treble or just add some sizzle to your PA system's top end.

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Other cool stuff (pun intended) that our overworked art department can't figure out how to draw a red callout line to...

- Short T-Design cooling air paths for smoother thermal gradient and thus increased reliability.
- Mirror-polished heat exchanger maximizes heat transfer from output devices, further increasing reliability.
- Fast-Recovery circuit design lets you drive the M•800 into clipping without audible distortion.
- 5-Year Transferrable Warranty.

NEW **M•800**
M•1400
M•1400i
M•2600

All FR Series Power Amps have: • Variable frequency low-cut filters • Limiter with On/Off switch • Detented gain controls calibrated in dB and volts • Selectable stereo, mono & bridged amp modes • LED level display with Signal Present & Overload indicators • Balanced XLR & TRS inputs • XLR thru outputs • Superior T-Design cooling • 5-year transferrable Limited Warranty

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- **Drift Stabilized™ A/D Circuitry eliminates the need for high pass filtering in the digital domain**
- **Third Stage Reflected Plate Amplifier Tube Circuit Discrete Class A Impedance Balanced Output Stage**

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