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THE INTERNATIONAL PROFESSIONAL AUDIO MAGAZINE
FOR RECORDING, POSTPRODUCTION AND BROADCAST

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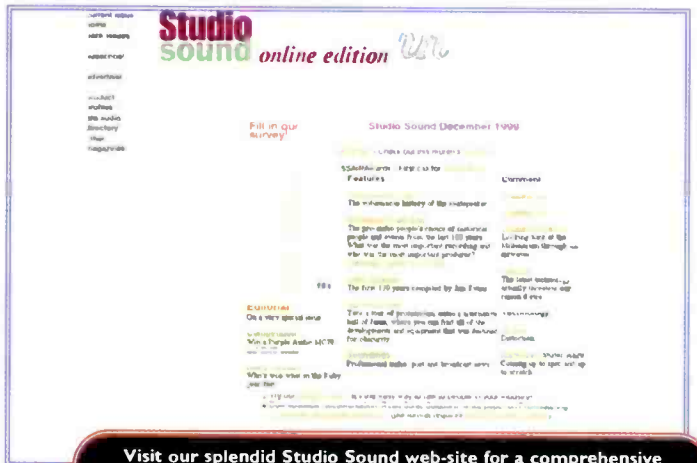

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A handful of salt

LIKE ALL INCREDIBLY RASH ACTIONS, it seemed like a good idea at the time. The early hours of the morning were upon me and my webbing exploits had arrived at the point where an online download of Quick Time was in order together with a strongly suggested upgrade to my version of Explorer. The first passed off painlessly and relatively quickly given the line speed at my disposal, but the second, for reasons that remain unclear to me, saw me power down successfully and eventually just as the first calls of the dawn chorus were breaking out across the rapidly lightening morning sky. What started off as a constructive end to a session turned in to a small personal nightmare with my suspicion of partly loaded software precluding me from aborting the process once it had started.

I had much time to contemplate as I watched the bar graph snail down on 7.2Mb at a rate that was completely at odds with my supposed modem speed. First, and naturally, I blamed Uncle Bill for the dependence he had hooked me on, followed by self-loathing in my own weakness. But as the time passed I became aware.

In centuries passed when ancient man decided it was time to trade his wife's best chitling recipe for a handful of salt or some one-careful-owner sackcloth he would walk directly across country towards the smoke plumes that marked the next settlement hunting and gathering, if the opportunity presented itself, as he went.

Old at 35 and most likely dead at 40, one of the things we traded for longevity with our forefathers was the freedom to roam. Roads came not just to aid the reliable passage of carts but to remind us that someone now owned the land to either side. When it came to a river or a town we were reminded that they also owned the bridge and the road and you paid to use it.

Uncle Bill gained little from my download, he's had my money and is now topping up my addiction, but I paid for my online time. Talk of picture and audio online potential pales into insignificance in comparison to the power of those who control the cable that interconnects it all, those who own and control the bridges and roads of modern technology. Thing is they're still building the roads for the lowest common denominator of the ox and cart, not for Formula 1. Those who have prepared a business plan around the promise of online will no doubt be acutely aware that they continue to propose optimistic traffic-calming measures where a 4-lane motorway is needed.

Zenon Schoepe, executive editor

Natural born lovers

SEX KICKED OFF on earth around 16 billion years ago. Love, on the other hand, didn't show up until some 100 million years ago. A late yet welcome arrival to the evolutionary programme, it came as part of the 'mammal package' that enabled parents to establish the necessary emotional links with their offspring in order to take care of them. As a result, while very young children are rarely big thinkers, they are innate masters of communication.

Proof exists, if it is needed, in the form of an experiment that links mother and child through a video camera-monitor setup. Running live feeds in both directions, the child accepts the protection and care of its mother. Substitute a recording of the mother, however, and the child becomes progressively more distressed as its cues go unacknowledged and its security fades away. In extreme cases, you arrive at The Despair State where the child is starved of love to the point of despair—it happens to puppies and lovers too...

The secret of love, it seems is the synchronisation of feeling and thought. In the first moments of life the communication channel is almost purely visual with audio playing a supporting role. As the child learns to recognise and understand its mother's voice, audio becomes more important and eventually evolves into language. Throughout, it is the feedback loop that enables both love and learning. Distance is a killer.

Music has played its part in social anthropology for the best part of love's 100 million years and shares the feedback model between performers and audience alike. Unlike the mother-child relationship, however, the appreciation of music is robust enough to have survived the invention of recording. But what benefits would an acutely interactive replay system offer? Would they make our present forays into additional bandwidth and audio channels seem naive or misguided? What form would the supporting technology take? Will we be here long enough to find out?

Tim Goodyer, editor

Studio Sound

Incorporating Broadcast Engineering

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■ New York's Right Track Recording and The Sound Kitchen near Nashville have chosen Martinsound's MultiMAX monitor controller for use throughout their respective facilities. The Sound Kitchen is using the system with the four Neve and two SSL consoles occupying its six recording studios and has already seen sessions for VH-1, including a Donna Summer special, and for The Nashville Network. Right Track's MultiMAX is moved from room to room and patched into the studio's SSL or AMS Neve consoles as necessary to accommodate projects such as the recent DVD-Video mix sessions for Meatloaf's 'Storytellers' and Pavarotti's 'Pavarotti & Friends' by Phil Ramone.

Right Track Recording, US.
Tel: +1 212 944 5770.
The Sound Kitchen, US.
Tel: +1 615 370 5773.
Martinsound, US.
Tel: +1 800 582 3555.

■ Flemish national broadcaster, Brussels-based VRT, recently took delivery of its third Otari Advanta console, which was installed in its TV studio 5 by Otari's Belgian representative ASC. The first live production involving the console was a national music TV programme, *Biebabeloela*, with three different stages and permanently changing groups and artists. Germany's Tonstudio Oase recently took delivery of a 96-input channel Otari Elite, and in Barcelona, broadcast commercials facility Oido Studios placed an order for two large Elite+ consoles. Oido, whose clients include Coca-Cola, Fuji, Seat, Nissan, McDonalds, Volkswagen and Ericsson, quoted sonic integrity as principle in the choice.

Otari, Duetschland.
Tel: +49 2159 50861.

■ Asia Broadcast Centre, Asia's newest and largest independent full-service, all-digital video and television production, postproduction, programme origination, distribution and satellite transmission facility has chosen Orban's OPTIMOD-6200 for processing digital audio for DTV services. Asia Broadcast Centre is using 12 OPTIMOD-6200s for the transmission of the Animal Planet Channel. The OPTIMOD-6200 is the world's first all-digital audio processor designed expressly for DAB Radio, Two-Channel Television and Webcasting.

Asia Broadcast Centre, Singapore.
Tel: +65 5480410.
Orban, US. Tel: +1 510 351 3500.

■ London's Battery Studios has purchased a Digidesign Pro Tools 24 MixPlus system along with E-Magic Logic Audio Platinum, Antares AutoTune TDM, Synchro Arts VocAlign, and Ultratools plug-ins. The system will occupy one of four recording studios, alongside a programming room, CD mastering suite and copy facility. Battery's clients include All Saints, Kylie Minogue, Joe Strummer, R Kelly, Joe Cocker and Robbie Williams. Meanwhile London's Goldcrest Studios has ordered a 40-frame Otari Elite-Film with surround sound for its dubbing and postproduction work.

Battery Studios, UK.
Tel: +44 181 459 8899.
Goldcrest Studios, UK.
Tel: +44 171 437 8696.
Digidesign, UK.
Tel: +44 1753 653322.

■ Italian broadcaster RAI has bought 70 AEQ digital telephone hybrid units to ensure high quality telephone connections. RAI has also bought portable mixers and digital commentary systems from AEQ and has ordered a 15th Stage Tec Cantus console, for installation in its central control room in Milan. Meanwhile Italy's Master Studio di Leopoldo Rossano in Sarnano has installed an Otari RADAR II recorder alongside its original RADAR. The studio works predominantly on lyric and opera projects.

RAI, Italy. Tel: +39 6 36 86 62 91.

■ UK radio station Classic FM recently installed six apt BCF 256 codecs. Classic FM, part of the GWR Group, is using the audio codecs to serve its own needs as well as London News Radio and other GWR Group services. Classic FM, which broadcasts primarily a mix of popular classical music, uses the units for incoming and outgoing contributions, the transfer of commercial audio and outside broadcasts.

apt, UK. Tel: +44 1232 371110.

■ Paris-based Plus XXX Studios is to be the first to install the newly launched AMS Neve Encore automation system on its 72-channel V-series console.

Plus XXX, France.
Tel: +33 1 42 02 21 02.
AMS Neve, UK.
Tel: +44 1282 457011.

■ London's Air-Edel's studios in London's West End has been extensively refurbished including improving the acoustics and installing a complete 5.1 monitoring system. Munro Associates provided special high efficiency low frequency and broadband absorbers around the walls and into the new ceiling structure and installed surround monitoring consisting of Dynaudio M2s, powered by Chord SPA 1032 power amplifiers (LCR) and Dynaudio BM15s(S). Munro's engineers incorporated the three front M2s and two TV monitors into a custom structure fitted over the control room window.

Air-Edel, UK. Tel: +44 171 486 6466.
Munro Associates, UK.
Tel: +44 171 403 3808.

■ California's Music Annex has installed a Euphonix CS2000 digitally-controlled analogue console. The 96-input CS2000 has been sited in Studio C and joins four other rooms in Music Annex' San Francisco facility serving the post-production fraternity. Music Annex also operates eight digital music and new media studios in Menlo Park, California.

Music Annex, US.
Tel: +1 650 328 8338.
Euphonix, US.
Tel: +1 415 855 0400.

■ Holland's 'School of the Future' has recently installed two Tannoy speaker systems for installation into the Metaforum auditorium. Affiliated to the Koning Willem I College, The School is a futuristic modern college used for showcasing new technologies in education and evaluating new media. The Dolby Surround system consists of three pairs of Tannoy i12 speakers with a Tannoy TX2 controller for each pair and two Tannoy B950 sub bass speakers, all mounted behind the screen. An additional ten Tannoy CPA5 compact speakers are mounted at the rear of the auditorium to provide surround effects. The central cluster and distributed speaker grid uses eight Tannoy CMS65 ICT 6.5-inch ceiling monitor speakers for vocal reinforcement towards the rear of the auditorium, with the speech system comprising a cluster of two i12 speakers flown centrally above the screen.

Tannoy, UK. Tel: +44 1236 420199.

◀ UK: Trevor Barber, owner of Barbershop Sound in London's West End recently purchased a Fairlight MFX3plus as the new facility's audio production and postproduction system. The MFX3plus is running with a Yamaha O2R digital mixer and was chosen for its speed of operation and reliability. Barbershop Sound, opened in August 1999 and serves London's television post-production market, working on nature documentaries for Survival, Discovery and National Geographic 'The market is very busy right now,' Trevor Barber noted. 'Since opening we've been working 12 hour days, 6 days a week.'

Pirates downed

US: The Recording Industry Association of America (RIAA) has filed the suit in a US District Court in New York City, claiming San Diego-based MP3.com Inc (MPPP.O) web-site illegally offered an online library of 40,000 copyrighted albums. The lawsuit names new MP3.com features offered through its personalisation service called My.MP3.com which established that a user possesses a particular CD in MP3.com's database and then streams, or plays, it on any computer. The suit also identifies MP3.com's Instant Listening service that lets people buy CDs from MP3.com partners and listen to them instantly online.

'The foundation on which these services are built is an unauthorised digital archive with the most popular and valuable copyrighted sound recordings in the world of music that is not owned by MP3.com,' the RIAA said in a statement. The legal action seeks to shut down the new services, but the RIAA did not say if it was seeking monetary damages too.

In an emailed statement, MP3.com Chief Executive Michael Robertson said he was disappointed that the lawsuit had been filed and vowed that MP3.com would fight it vigorously. 'My.MP3.com provides more choices for consumers to do what they want with music they already own. Our technology also enables artists to communicate directly with their fan base,' Robertson said. 'We believe My.MP3.com will stimulate CD sales and be a financial boon for the music industry overall,' Robertson said.

MP3.com's core business is its library of more than 250,000 songs from 40,000 mostly unsigned musicians. Visitors to its

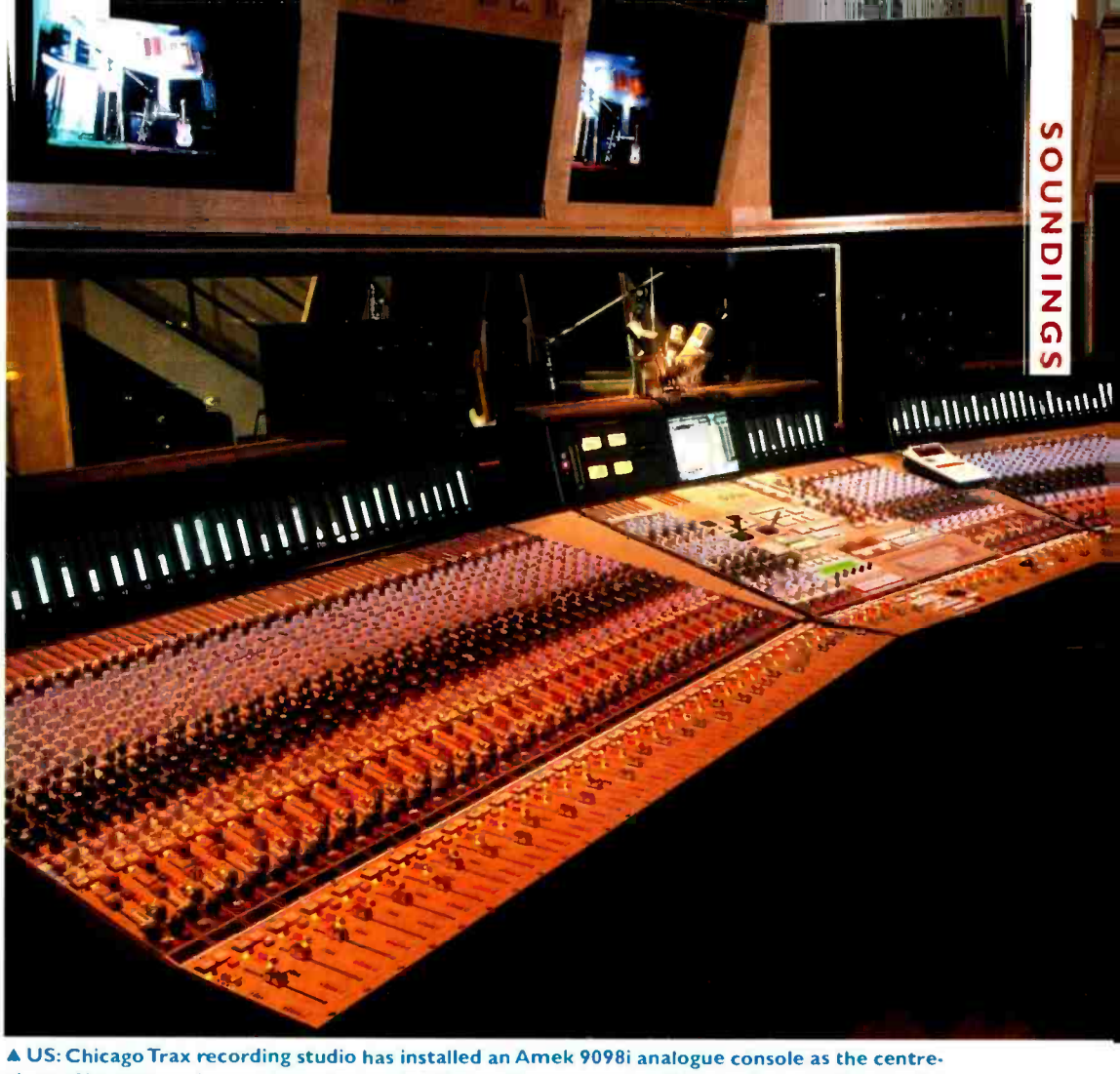
▲ Denmark: Stenlosevej-based Ark Recording Studio has replaced its old Soundcraft desk with an SSL SL4048B console further complementing its 2-inch analogue MCI analogue machine, 24-track Akai DR16/DR4 hard-disk system and SLT custom active monitoring system. Owner Kristian Dalsgaard (pictured) has also amassed an impressive selection of classic microphones and outboard equipment to meet a diversity of recording projects.

site can download the songs for free and buy CDs and other merchandise from the artists.

Logica trust

US: Cirrus Logic and InterTrust Technologies Corporation, a leader in DRM (Digital Rights Management) solutions for digital commerce, announced last November a joint development and marketing agreement aimed at delivering the Internet industry's first secure system-on-a-chip (SOC) solution for digital audio players, PDAs, electronic books, cellular telephones, and other information appliances. The developers believe that manufacturers of portable digital audio devices will be able to more quickly develop 'trusted' players designed to exceed the latest Secure Digital Music Initiative requirements for Internet security.

It is predicted that consumers will be able to take advantage of InterTrust's robust DRM technology, which will keep e-commerce transactions private as well as supporting highly secure digital audio transfers using a Cirrus Logic's Maverick-based hardware solution. A Cirrus spokesman added: 'This agreement should also drive the availability of Internet-delivered music since it will ensure unprecedented protection against theft or piracy of content—a real concern among record producers that have delayed distribution of copyrighted audio via the Web.'



▲ **US: Chicago Trax recording studio has installed an Amek 9098i analogue console as the centrepiece of its surround room. Intended to give the studio a unique profile as well as excellent audio, the 9098i has already attracted the likes of R Kelly, Smashing Pumpkins and Koko Taylor as well as playing its part in the soundtracks to *Stigmata* and *End of Days*.**

Broadcast content event

UK: The British Library in central London will be host venue for Broadcast Content Management 2000, an industry conference to be staged on 22nd and 23rd June by our sister publications *TVB Europe* and *Content Creation Europe*. A project that teams the editorial teams from both titles with industry pioneers working along business chains from content creation and 'repurposing' through to new delivery models, this Miller Freeman event will explore the many technologies and terminologies that are currently emerging.

Its driving philosophy is to aid European broadcast operators in developing strategies to move from channel management, towards content management. To compete in the 'battle for eyeballs', broadcasters must maximise the advantages they currently hold—large bandwidth, a distribution system and attractive programming. To do that, efficient content management must be placed at the top of the priority list.

Broadcast Content Management 2000 will be a 4-part conference, covering content creation, storage, metadata attachment, and delivery—plus breakout sessions. It will look inside broadcasting at prime asset management developments like the BBC's Jupiter Project (integrated production), at the defining values of leading metadata initiatives, and at partnership work by the EBU, SMPTE and MPEG on future TV archives.

Other subjects to be discussed will include WAP mobiles for their delivery potential, how to get quality content onto the Internet; the caching ideas behind Personal TV; the economics of tiered storage; problems of turning the DVB's MHP specification into a market reality; and live streaming to the Internet. The speaking talent—a mix of top-end users and executives from niche companies or divisions—have already promised delegates a mix of 'synergy and fun'.

Broadcasters have been slaves for decades to fixed technology and revenue models. The reality of digital television means they must now adopt reformatting and repurposing, and start thinking in terms of intellectual property, data flows and profiling their consumers. The film studios and sports producers have been quicker to exploit their assets, while some broadcasters have lost time in valuing and digitising archives, and finding the right tools for exploiting content rights securely. Broadcast Content Management 2000 is designed to provide answers and directions, in a European context. Email: bcm2000@unmf.com

▲ **World: Satellite Information Services has upgraded its facilities to include an S5000IEM transmitter with two receivers and two S5000L systems. SIS produce and broadcast the Racing Channel as well as live racing programmes and associated bookmakers' information for Europe, the UK and Far East.**

Picture perfect

IN CONTRAST to Neil Hillman's highly informed review of the Sennheiser Series 3053 54 wireless in-ear monitoring system (*Studio Sound*, January 2000), the more observant of your readers will have realised that the accompanying image we erroneously supplied to the magazine was of a radio microphone system—the 1081 1083 channel switchable VHF system to be precise—and not an in-ear monitor system. A picture of the SR 3056 dual channel UHF transmitter system and EK 3053 miniature stereo receiver is enclosed herein and our apologies extended for any momentary confusion caused.

Sally Milne, Marketing Manager, Sennheiser UK.

Flaky performance

CADBURY'S FLAKE eh? (*Studio Sound* December 1999 'Millennium Sound Bites', page 48) Easy now… But thanks for the best laugh of the day so far!

Nick Price, Ingenium Limited, UK.

Sound Bitten 1

GREAT READING (*Studio Sound*, December 1999 'Millennium Sound Bites'). Please note the correct spelling —Colin Sanders.

Sean Fernback, Motionworks, UK.

Sound Bitten 2

IF YOU are going to rate Colin Sanders in the top five audio personalities of the last century (*Studio Sound*, December 1999, 'Millennium Sound Bites') you could at least try to spell his name right —especially as you made a point of correcting Sergeant! Or are we reverting to the Richard Elen days?

Graham Hinton, Hinton Instruments, UK

Yes of course, apologies are due. Richard Elen? And shouldn't that be 'correctly'?

The music makers

WHAT A GREAT ARTICLE—Dan Daley's column in December's *Studio Sound*. Thanks a lot. It's a first time I read a magazine article that deviates from a 'norm' and with a view at the industry from a completely different angle. You very observantly pointed at the growing trend in the industry where everyone in essence pretty much 'chases its own tail'. Lately, it's become quite blurry as to who is the leader and who is the follower in the music arena. No one seems to be concerned anymore with the very reason as to why we are in this business in the first place—namely, music! When you get self-proclaimed businessmen who have very little to do with music, start governing the industry, you pretty much get the results —the state of music at its present.

Yes, there's been a huge technological leap forward and breakthroughs in the area of communication, such as Internet, but I haven't seen the same in the music arena. Unfortunately, it hasn't progressed as much. Yes, life dictates its own rules, and we're forced to stay abreast or at least follow, (even though it's also a growing trend 'to be like others')—I just hope that we, as musicians and creative artists will not loose ourselves and our identities-individuality in this ever so rapidly changing world. Thanks again for the insight.

Alexander Kritsky, US.

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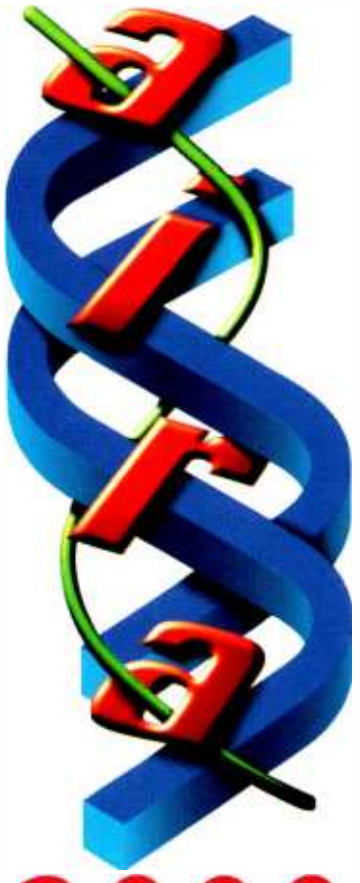

2000 SSAIRA VOTING

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

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 VOTE

VOTING

1 Large scale console

2 Medium to small scale console

3. Outboard dynamics

4 Outboard preamp

5 Outboard equaliser

6 Outboard reverb

7 Combined outboard device

8 Monitors

9. Microphone

10 Convertors

11 Audio editor

12 Audio recorder

14 Location portable equipment

15 Plug-ins

16 Special category

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VOTING

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Dolby DP563

The options for encoding in Dolby Surround are expanded with the arrival of Dolby's DP563 encoder. **Andy Day** welcomes the new unit and compares the dedicated and plug-in opportunities

WITH ALL THE HYPE about 5.1 audio at the moment many people have forgotten about its origins. While the new discreet (or 5.1) formats such as Dolby Digital and DTS are very exciting creatively they do rely on the necessary 'carriers' or formats to deliver to the masses of consumer land. DVD is the most obvious recent example, however there are still a few years to go before DVD reaches the market penetration of other stereo formats such as VHS, NICAM stereo and CD. Dolby Surround has been around for the past 13 years and still going strong.

Broadcasters, video distributors and games developers have realised this and to date over 10,000 productions are available. For those people that don't already know Dolby surround is what's called a matrix system, instead of needing a 4 or 5-channel carrier the 4 channels of information (LCRS) are encoded into a 2 channel format (called LtRt). This 2-channel signal can be distributed on any normal stereo format such as VHS hi-fi, CD, NICAM transmission or games consoles such as Playstation or N64.

The major problem facing postproduction studios up to now has been that the actual hardware needed to encode into the Lt Rt format. This has always been available from Dolby only, in the form of the SEU-SDU4 analogue-only units—a problem for the typical all digital postproduction studio. This was partly addressed by the availability of Dolby Surround tools, a software plug-in for Pro Tools, that allows Dolby surround encoding-decoding and panning all within the Pro Tools environment.

The plug-in was reviewed in an earlier edition of *Studio Sound*, but as a reminder here are the basic functions. The plug-in is used by inserting master and slave versions of encoder and decoder into two stereo aux masters; this is the only way to fool Pro Tools into working in multichannel. The TDM mixing environment is basically a stereo routeing system, that is only pairs of buses can be accessed at any time from each channel (without using extra sends). In order to do true surround panning (move a sound from left to centre to right to surround) four outputs are needed plus some kind of pan control. The master and slave parts of the encoder plug-in handle the left-right centre-surround inputs which are fed from both the assigned TDM buses and a direct feed from the output of the Dolby Surround tools joystick panner. This allows true surround panning for channels (only two unfortunately) that use the joystick panner and normal left-right or centre-surround panning for channels without the panner inserted. It's not perfect, but the only way to date to encode Dolby Surround digitally, and as a result several studios bought Pro Tools systems purely for the plug-in, just to use as an all digital encoder-decoder. However that is about to change.

The DP563 is a new all-digital hardware unit for encoding in Dolby Surround, with a few neat extras thrown in. It looks like any other Dolby unit, a standard issue black front panel with a few buttons for menu access, LCD, status LEDs and some dedicated function switches. It's certainly not going to win any design awards, but it does have a certain bulletproof feel to it.

There are no analogue connections at all on the unit, just 6 AES-EBU inputs, two AES-EBU outputs, an external sync input and a 9-pin serial remote control connector. Given that there is plenty of space on the rear panel it would have been good to have standard XLR connectors for the AES-EBU connections. Instead Dolby has opted for BNC connectors as used on the DP569—this is very annoying to say the least—from experience of the DP569 (Dolby Digital encoder) I would point out that cable length is an issue when installing an unbalanced (BNC) digital unit in a balanced digital studio. I would strongly advise getting the optional balancing transformers (£195, UK) when buying either the DP569 or DP563.

It is quite important to make sure the DP563's left, centre, right and surround inputs are correctly aligned. With the SEU4 analogue unit this involved sending a tone +4dB or -20dBFS and setting trim pots on the input and outputs. This has been simplified on the DP563, by just sending a tone to the left input and adjusting the reading on the LCD display for 0dB using the cursor keys, everything is done quickly and efficiently.

Apart from doing the 4-channel to LtRt encoding (called 4-2 encoding) for Dolby Surround the DP563 is capable of some other useful tasks. In some cases it's useful to be able to take a 5.1 master and simultaneously create a Dolby Surround (LtRt) mix from it. Normally this would be done using an external mixer to increase or decrease the surround and centre channel levels for the best result. Dolby has included the extra inputs and level adjustment to allow you to do just that (called 6-4-2 encoding).

There are adjustments for the centre, surround and LFE levels as well as controls for how the left and right stereo surrounds are combined—options are Ls+Rs, Ls-Rs, Ls, or Rs. The LFE channel can also be filtered at 120Hz and limited before combining into the LR inputs of the Dolby Surround encoder. All these parameters are contained in the preprocessing menu, which leads me into the menu structure. Most modern equipment uses an LCD-button combination to access various options and features, the approach taken by Dolby on this is very straightforward with the most commonly used features such as the LFE limiter and output limiter accessed from their own dedicated front-panel switch. The menus are logical and self-explanatory, no need to spend hours over the manual with this one. Other menus include a postprocessing menu, that duplicates the output limiter control available on the front panel, I-O control, that allows all the various input combinations to be catered for, without repatching or having to split AES-EBU inputs. Also within the I-O control menu are some of the more specialist features, the output word length can be switched between all flavours (16, 18, 20, 22 or 24-bit) of AES-EBU. For broadcast routeing applications the delay in the encoding can be adjusted from the normal 2ms to exact divisions of PAL or NTSC frames. This allows the synchronisation between input and output LtRt signals to be controlled in frame steps in complex routeing configurations.

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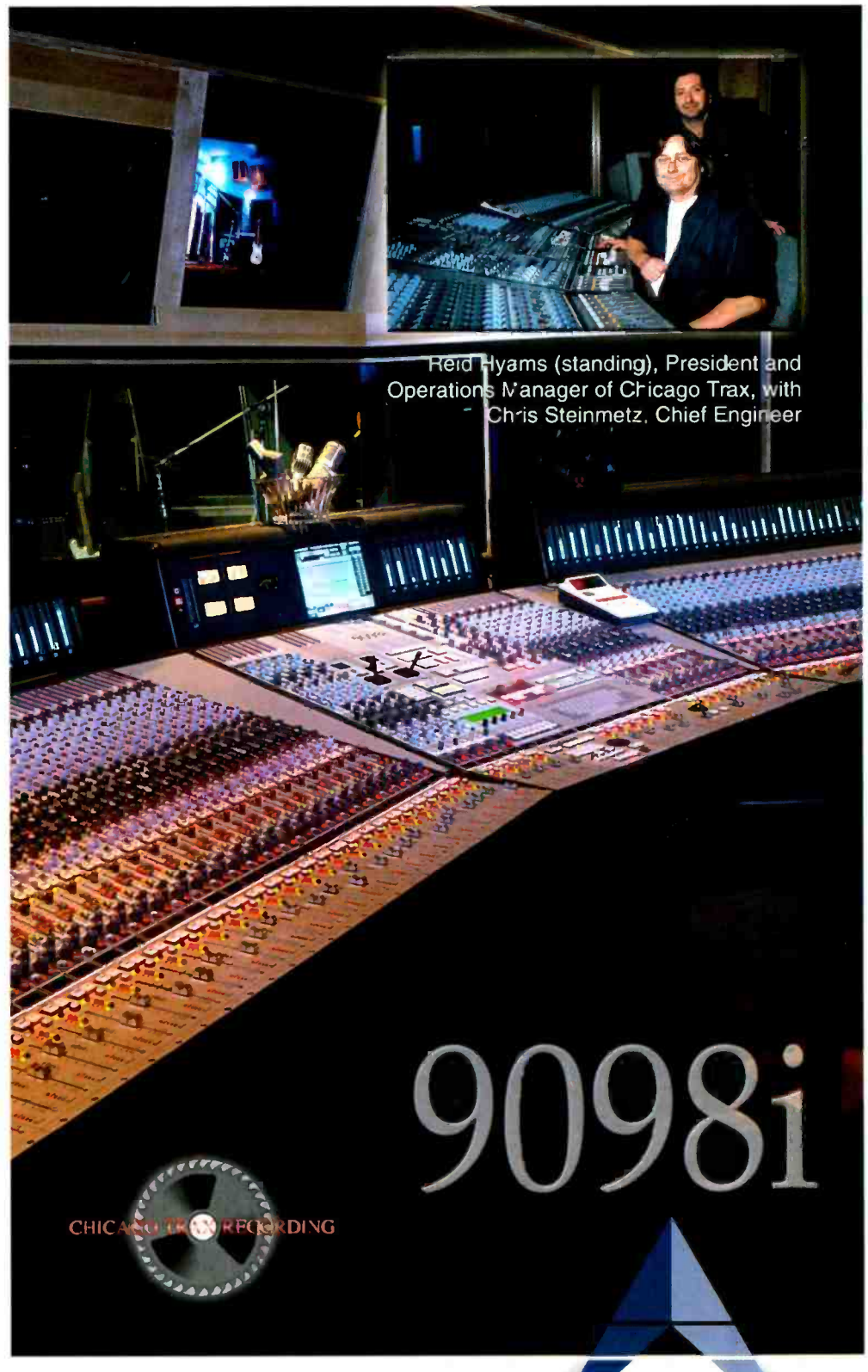

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< has provided some presets for common configurations, there are three in total called 4-channel—a simple 4-2 with output limiting, 5.1 film—a 6-4-2 with output limiting and 5.1.music—a 6-4-2 with limiting and 24-bit output. You can name and save your own and with a maximum of 32 memories most configurations can be stored as presets.

I used the unit to encode some LCRS masters into the LtRt format first. The results were very good particularly the output limiter which was reasonably kind to the signal. The limiter works on the LtRt output only and is preset with no controls, there is an LED on the front panel to indicate when the limiter is working. Next I took a finished 5.1 master and used the 6-4-2 encoding to create a LtRt master. This is where the preprocessing functions were particularly useful allowing control over centre and surround levels to get the optimum level of the dialogue and surround channels. Level and limiter enable controls for the LFE channel are available for encoding audio from a mixture of theatrical and studio sources which use different reference levels for the LFE channel alignment. The finished LtRt signal was decoded through the DP562 Dolby Digital Surround decoder, an ideal partner for the DP563.

For those debating the choice between Dolby Surround Tools and the DP563 there are pros and cons to each. The advantages of using Dolby Surround Tools include full integration with the Pro Tools mixing environment, an automatable panner and that it is a relatively cheap option (encoder-decoder and panner cost £1,200 in the UK). If, however, you don't already use Pro Tools and just want to encode digitally in surround it is a more costly proposition. There are only two panners available for use in any session, it only works with regular DSP farms (there is no support for Mix- and Mix+), there's no 6-4-2 mode (however you can emulate level controls within the Pro Tools mix environment) and there is no output limiter.

The DP563 Dolby Surround encoder has the advantage of being a dedicated unit requiring no supporting computer platform. It offers 6-4-2 mode and preprocessing controls that allow standalone operation for 5.1 to LtRt encoding and the output limiter is of good quality using presets for ease of use. On the downside, the DP563 requires a suitable decoder (such as the DP562) and offers only unbalanced BNC connectors for digital connections. The actual encoding process is identical in both units so whichever you choose you can be sure that you have 100% compatibility with all the decoders out there in consumer land. Its also worth noting that neither Dolby Surround Tools or the DP563 can be used for Dolby (previously called Dolby Stereo) film encoding. The encoders for this process are available from Dolby on a project-by-project basis. However, you can use either Dolby Surround Tools or the DP563-562 as monitoring only (referred to as 4-2-4 monitoring) for premixes or music mixes to be used in Dolby film productions.

At last digital facilities can produce Dolby Surround programs without having to resort to analogue for mastering. The DP563 is a well thought out product with some genuinely useful extras, especially the output limiter. As to which is best, well it really depends on what you're doing and whether you are a Pro Tools user or not. My preference would be for the DP563/562 combination purely because I believe in the dedicated hardware approach; something about eggs and baskets springs to mind. But at about £5,500 for the pair against £1,200 for Dolby Surround Tools I can understand why some people would opt for Dolby Surround Tools. Whichever you choose you can be sure you have 100% compatibility with all the Pro-Logic decoders out there, so now there is no excuse for not adding to the 10,000+ productions currently available. Have fun. ■

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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*.

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New York

LSR. Profiles

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NO.1: New York / Los Angeles

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Cooper Sound CS104

Coming into line with the cream of the crop of location mixers, the CS104 is bidding for a life in the limelight. **Neil Hillman** checks its credentials

IN A SLEEPY, sunny town in California, behind the innocuous facade of a small drug-store shop-front on Main Street, lurks the high-tech hide-out of a Super-Hero. Here is the home of Sonus, whose mission to mankind is to provide clarity in the face of cacophony, melody in the wake of maelstrom and to transform heterodoxy to harmony. Assisted by his aged, yet eminently capable butler Clarus, Sonus has mixed with the likes of Batman and other such contemporaries; for this heroic figure has played a part in their success. He is, quite simply, the All-American, bullet headed, Saxon mother's son: Cooperman; or in this particular guise, and as we might more easily recognise it, the Cooper Sound CS104.

The CS104 has come of age by offering what is now *de rigeur* for all professional location mixers, an M+S matrix. In the over-the-shoulder stakes, it now stands cheek and jowl with fine products such as Audio Developments' AD 261, SQN's 4-S series IV and models from Filmtech. Unsurprisingly then, elements of these mixers can be found on and in the CS104; but who said that good ergonomics and operational ease should be the preserve of one particular manufacturer?

The Cooper Sound CS104 is a 4-in, 2-out stereo mixer securely housed in a sturdy metal chassis with brushed aluminium face and sides. Square and sharp in appearance, with an abundance of oil-blacked, knurled control knobs, the mixer has a delightfully retro feel that would not look out of place in an eighties studio outboard rack, with just the hybrid Audio Developments-SQN fader knobs aligning it to current styling.

Audio signals are fed into the CS104 through four Neutrik female XLRs on the left-hand side of the mixer, with Channel 1 being furthest away from the user. Above and to the left of each XLR input socket is one of the mixer's many metal knurled knobs, these used as a course gain preset between Line and Mic 1, Mic 2 or Mic 3. My preference would be to have the calibration marked as the actual gain figure in dB rather than a nominal index number; but from the operating manual the Line input gain for 0dBu out is 16dB, for a maximum input at 1kHz of +32dBu; with Mic 1 achieving a similar output corresponding to 60dB, 2dB to 70dB and 3dB to 80dB, for inputs of -12dB, -22dB and -32dB respectively. At least the gain is not calibrated in the milliVolts-per-HectaPascal favoured by a certain European recorder manufacturer. Directly above each input and over the gain presets are the microphone powering options: 12V Tonader, Dynamic and 48V phantom. These are selected via a small recessed slider-switch that to operate either requires a ball pen, a 'tweaker' screwdriver or FloJo fingernails; but one thing is for sure—the microphone powering will not be moved by accident. A similarly recessed slider-switch sits alongside the powering controls of Channels 2 and 4, and allows for phase changing these two inputs, between N- (normal) or R- (reversed); an obvious need being when a recordist changes from holding the stereo microphone 'over the top' of the subject to working 'underneath' the camera shot. A stereo headphone socket is located at the nearest end to the user on this left-hand panel, with the monitor volume level pot directly above it. The M+S decoder for the inputs is switched in or out by a small toggle switch—recognisable to all those familiar with Nagra ¼-inch products—which is sited above the monitor level knob.

The right-hand panel of the CS104 carries the messages to the outside world. At the bottom of this face is the battery compartment that houses eight 1.5V AA cells, secured by a substantial door that is retained by a glove-friendly finger-screw. External power between 12V and 24V is introduced through a Canon —albeit made by Neutrik—5-pin, male socket next to the battery flap. The 3-way selector switch for internal, off or external powering is as similarly Nagraesque as the M+S matrix selector of the left-hand panel, and is sited nearest to the operator at the top of this right-hand side. Alongside the external >

At the bottom of this face is the battery compartment that houses eight 1.5V AA cells, secured by a substantial door that is retained by a glove-friendly finger-screw

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< power socket are two male XLR sockets for the left and right mixer outputs, which may be switched between Hi (0dBu line level) and Lo (nominal mic-level of -46dBu) by two recessed slider switches mounted above each respective XLR output. These selectors also govern the levels of the left and right outputs contained within the Hirose 10-way multiplug for the industry-standard camera umbilical, sited alongside the XLR outputs. Maximum output of both the balanced outputs and the Hirose multiway is given as +20dBu. Left and Right outputs are also available separately on miniature male XLRs, the chosen medium also for the -12dBu Tape Out feed and, curiously still on male pins, the Mix In socket for access to the mixer buses and ganging a further mixer for an increased number of input channels. The Monitor tape return signal arrives either through the Hirose 10-way, or through a 3.5mm stereo socket mounted above the multiplug. The return level of this feed is controlled from a minimum of -18dBu by another ubiquitous black knurled knob.

The front face of the CS104 is clear and uncluttered, yet a wealth of controls are available to hand. Like the Audio Developments AD 261, the Cooper Sound has succeeded in containing its control surfaces to those easily accessible, unlike the SQN, which requires much bag-delving from time to time. Each of the 4-input channels are controlled by a large rotary plastic fader, contoured like its contemporaries, and above which sits a centre-detented pan pot. Alongside it sits a red overload LED, to signify that the amplifier clipping level is being approached and that the sensitivity should be reduced through the channel-input presets of the left-hand panel. Below, and each side, of the fader are two toggle switches; a non-latching push-to-make, solo-safe individual PFL and a 3-position high-pass filter marked 0, 1 and 2 where 0 is flat. 1 has a 6dB/octave roll-over knee at 70Hz and 2 is set for 140Hz. Additional pre-input transformer filtering is also available through internal DIP switches which may be selected to achieve a turnover of 90Hz, again at 6dB/octave; allowing the HP1 switch to become 130Hz, HP2 rising to 190Hz. Two LINK switches exist between the faders of Channels 1 and 2 and Channels 3 and 4, which when selected disable the pan pot and the fader of the second side of each pair, allowing the first channel to control the gain of the linked inputs; the first channel pan pot controlling the balance between the two married signals. Twin PPMs of black lettering on white—audio-convention reversed, but in accordance with current racing car fashion—also add to the overall feeling of a different product. vu meters are an option, but given the intolerance of digital recorders to over signals, a peak registering meter is likely to be the most ordered configuration by today's recordists. Who will then almost certainly look on in disbelief as with the limiters selected, the needles continue to sail merrily onwards and curve themselves affectionately around the end stops. So when is a limiter not a limiter? Er, suffice to say that there is a modification available if you prefer to change the soft limiting of the CS104 to a fast attack, slow release dynamic. Another couple of design-detail dislikes are the ability to reduce the output levels via the MASTER pot without it registering on the meters of the mixer and being unable to alter the oscillator from its fixed 0 level.

Other front panel controls are a slate microphone; 1khz, 0dB oscillator on selector; battery test; meter back-light; limiter off, on or linked; direct or tape monitor selector and a monitoring matrix that switches between Off, Left, Right, Mono, Stereo or M+S decoded. Line-up advice in the manual is also curious, as it is recommends that after lining up with the recording device, the master pot should be reduced by some 6dB to prevent headroom problems—surely this would be unnecessary with a harder-working limiter.

The front face of the CS104 is clear and uncluttered, yet a wealth of controls are available to hand. Like the Audio Developments AD 261, the Cooper Sound has succeeded in containing its control surfaces to those easily accessible

Overall, this is a first-class product—even allowing for the facts that the microphone amplifiers appear to be ever-so-slightly noisier than those of the AD 261 or the SQN, and that the factory-set limiter should be fitted with an air-bag. The CS104 offers a high quality finish; which is probably more than can be said for this review; because it's not just sound recordists or other lower-order earthlings who can benefit from the wisdom of our Super-Hero Cooperman. Luke Skywalker's first visit to a Chinese restaurant was remarkable for his appalling lack of success eating with chopsticks. Thankfully for fellow diners, Cooperman was at hand to utter the immortal phrase: 'Use the forks, Luke.' ■

Contact

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Fax: +1 805 927 8565.
Net: www.coopersound.com

THE FUTURE STARTS HERE

Start - /sta:t/
[to move suddenly and violently]

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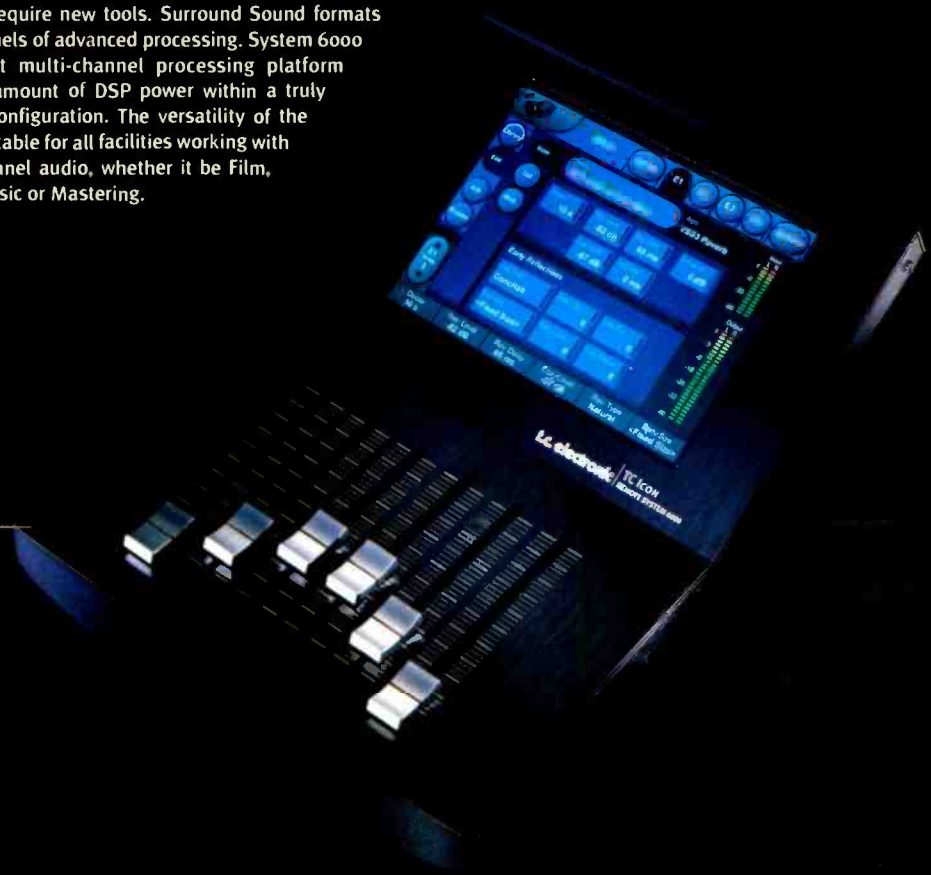

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Klark Teknik DN4000

The opportunity to apply serious DSP to equalisation applications has been largely missed by most manufacturers of digital outboard. **Terry Nelson** joins the programme

HIGH-END—and not so high-end—outboard equalisers often attain an almost mythical status and are attributed with magical qualities of a certain sound. This is all very well and good when it is artistically desirable, but equalisers, as the name implies, are also useful tools for addressing imperfections in programme material, whether it be recording, broadcast or live.

A company long associated with equalisers, Klark Teknik, has crossed the threshold into the domain of DSP EQ and introduced the DN4000 Dual Parametric Equaliser with Delay function. My first impression of the unit was that KT appears to be living up to its marketing promise: 'You talk—we listen'. In terms of facilities, the DN4000 has virtually everything that you always wished for in a good parametric EQ.

The equaliser is a dual-channel unit, each channel having five bands of parametric filtering, low and high-frequency shelving filters and low and high-pass filters.

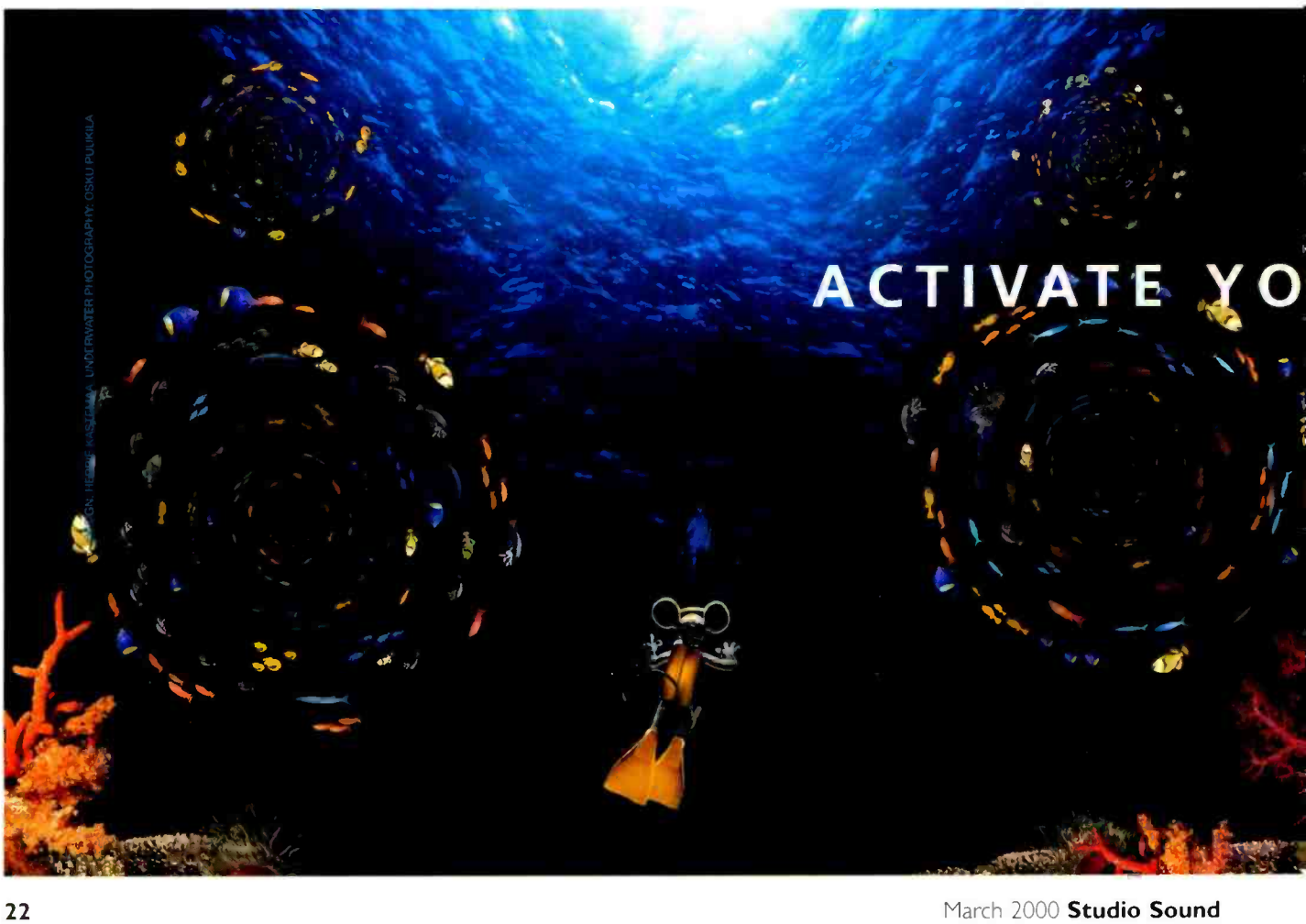
The review unit came fitted with the optional AES-EBU digital I-O module plus a couple of blanking plates for ports heralding future connection to the DN6000 RTA and remote control systems currently under development by Klark Teknik.

The front panel owes a lot to the DN3600 programmable graphic, and, from left to right, features four vertical Menu switches plus a switch, an LCD graphics display, a numeric display for current memory number and three rotary encoders. Underneath the LCD screen are two rows of switches for filter and delay functions for each channel.

The screen is divided into two sections and this can be selected to display either the composite frequency response of both channels or the composite response of one channel plus the response of a particular filter that has been selected.

The unit plugged into the inserts of my Neotek console with no problems and presented a creditable unity gain response when switching the insert points in and out. There was also no immediately discernible change in tonal characteristic when switching in and out of the signal path.

Switching the Filter sections in and out is either by holding the filter switch selected down and pressing the BYPASS switch or quickly double pressing the filter switch. An icon in the LCD screen indicates In-Out status. The three rotary encoders are labelled FREQ, Q and LEVEL respectively. However, in the case of the HP-LP filters, turning FREQ selects the turnover frequency, but the display said FLAT and it was only on turning the Q control that the various slopes available sprang into life. A small point but it is not made very clear and



could be annoying. It certainly needs to be mentioned in the final version of the manual.

The HP and LP filters can be individually switched to 6dB, 12dB, 18dB, 24dB octave slopes. I find HP and LP filters great for basic programme shaping and the DN4000 did a very good job. The shelving sections are totally intuitive, FREQ and LEVEL adjusting the turnover frequency and amount of cut or boost. From here it is a matter of selecting the parametric filter required where the rotary encoders are equally obvious. Even when tweaking programme material 'by ear', the display proves very handy.

The MODE switch in the Menu bank allows the display to be dual or single channel as mentioned earlier. For the latter, selecting a filter for the A channel displays the composite response at the left and the selected filter to the right. Pressing a B channel switch swaps the display so that there is no confusion over which channel is selected. When no filter is selected, the display shows the composite response for both channels. The unit can be set for dual channel or linked operation (stereo) in the Mode menu.

The DN4000 was tested with a variety of programme material and found to be very easy to use. The combination of HP and LP filters, parametric sections and shelving filters allows a lot of frequency shaping over the whole gamut of audio applications.

One of the things that particularly impressed was the neutrality of the EQ. Even though quite a lot of tweaking can be applied to a signal, the basic character remains the same. You could think of it as the difference between restoring a painting by retouching or by cleaning—one adds and the other brings out the original under the dirt. Mention should also be made of the control ranges. A feature I like is that the frequency range is the same for all filter sections, 20Hz–20kHz, as are the increments. These are 1Hz between 20Hz and 50Hz, 2Hz between 50Hz and 100Hz and gradually increasing to 60Hz in the very high frequency range. This allows a lot of precision. The Q for the parametric sections is variable from 3 to 0.08 of an octave with gain range of ±12dB in 0.5dB steps.

The DN4000 has 32 memory locations, accessed by pressing the MEMORY soft switch. This changes the screen to the Memory menu for either saving or recalling a menu. The memories can be locked out fully or partially by entering a password. The Save page allows you to name and select the location of the setting to be saved.

The final aspect of the DN4000 concerns the Delay function. Calling this up via the soft switch shows the minimum delay setting of 1ms and this can be considered the processing time of the unit —something to be aware of when using it with real time equipment. The delay range is 1ms–340ms and this can be selected in 1ms or 21µs increments.

The LCD screen indicates that the three rotary encoders are now the delay settings for the A, A+B and B channels respectively and the settings can be indicated in milliseconds, microseconds, feet, inches, metres, and centimetres. Two loudspeaker icons show relative positions of the A and B channels and this is a useful 'at a glance' feature.

I would put the DN4000 in the 'master programme control' class of equaliser, but the choice obviously remains with the user. It can be used to gently polish a recording or zero in on problem areas and cut them out without changing the overall character of the sound.

At this point, it is difficult to offer much criticism apart from on one point —I would really like to see a 3dB 8ve characteristic for the HP-LP filters. This would allow post studios to easily programme in an instant 'X-curve' to check soundtracks for both TV and cinema release. What about it, K-T? ■

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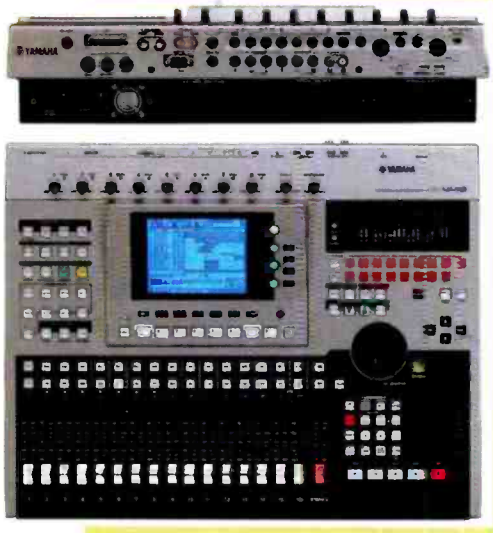
CCSE's 'audio gateway'

Described as 'the audio codec's successor that connects broadcast, IT and telecommunications' CCSE's Mayah Centauri features all known and new audio codec features but adds the capability of networking. Said by the company to represent a new class of product, which it is calling audio gateways the device is claimed to be the first audio codec with real networking capabilities, such as Internet, Intranet LAN and WAN. Features include 24-bit, 96kHz audio combined with coding algorithms from G.711 (hybrid), G.722, L2, L3 to MPEG 2/4 AAC, networking via ISDN, X.21 and IP. The Centauri model range consists of four products: the 2000, 2001, 3000 and 3001. With the introduction of the audio gateway concept product, CCSE is extending the distribution of MAYAH products and is entering a brand new segment of the market. The system is said to be suitable for conventional ISDN transmissions for reporting or concerts, dedicated line transmission for distribution or contribution, Intranet services for archiving, advertisements, jingles, local LAN or wide area WAN for digitisation in broadcast, telecoms and for studios.

CCSE, Germany. Tel: +49 811 551 60.

Yamaha PAW

The AW4416 workstation combines 16 track 24-bit hard disk recording and virtual tracks with what amounts to an 02R digital mixer. Assignable sampling pads can be routed to



mixer channels and can source from the hard disk or external sources. Mini YGDAI and CD-RW drive slots are provided for interfacing and CD burning.

Net: www.yamaha.co.uk.

Amek mult format

Amek has shown a prototype of a new Media 51 analogue recording and production console which handles formats up to 7.1 and, at under £25,000 for a 28-input frame, offers Supertrue automation, Virtual Dynamics and Recall. The desk has a mic preamp and EQ section designed by Mr Rupert Neve and comprehensive signal path switching and panning'. Two groups

MBHO Schneider Disc

In among the variety of stereo flavours lies the little known Schneider disc. **Dave Foister** concludes that it ain't no UFO

STEREO? ANYONE? What flavour would you like sir? We've got Blumlein crossed eights, we've got crossed cardioids, we've got spaced omnis, Decca trees, M-S arrays, dummy heads, and a whole menu of one-off ideas. Each has its place, and each is linked in some way to one or more of the others. The ones that catch the eye are often the ones attempting to replicate the spacing of the human ears with some kind of array, usually supported by a baffle of some sort, and while some of these specifically claim to be designed for binaural headphone listening and others don't, there is sometimes little difference between the results. These range from the full-blown imitation head as offered by Neumann and B&K to custom designs like the BBC's binaural perspex disc to specially built baffle arrangements like the Schoeps sphere, the Jecklin disc, and now the Schneider disc from MBHO. This looks as though it might be a cross between the Schoeps and Jecklin arrangements, but in fact is a refinement on the Jecklin design (also marketed by MBHO) intended to optimise the HF time alignment. Like many of the specialised arrays, the Schneider disc provides an interesting crossover between dedicated dummy head structures and arrays intended for loudspeaker listening. Systems like this are more awkward to rig than a single stereo microphone, but in some ways easier than many crossed or spaced arrangements.

The kit supplied to me consisted of a pair of MBHO's 603 microphones fitted with omni capsules and a disc about 30cm in diameter. The disc is aluminium with a centimetre of foam on each side, and either side of the centre is a hemisphere about 18.5cm in diameter similarly covered with foam. The disc attaches to a conventional microphone stand and the microphones fit into clips fixed to the edge of the disc. The positioning of the clips is such that the microphone capsules end up precisely at the centres of the hemispherical bulges, to all intents and purposes a pair of ears on the sides of a stylised head-shape.

The microphones themselves are part of MBHO's modular series reviewed here last year, comprising a universal preamplifier body and a choice of capsule heads. The heads offer a good range of options, with various polar patterns, built-in low cut filters, integral windshields, and so on. This particular application inevitably requires omnis, so the KA-100D heads, with their gentle HF and presence lift, are supplied.

Mounting the assembly on a microphone stand is more straightforward than it might appear, partly because the disc is surprisingly light in weight and partly because of the selection of mounting positions hidden under the foam layer. Of course if the mics were perfect omnis the orientation of the array would be unimportant, but since there is always some compromise at the rear of the microphones it feels better to have the fronts facing the thing being recorded. If the disc could only be mounted in one orientation on the stand this would be difficult, but the design allows the mount to be repositioned in six different places around the rim so as to point the microphones up or down as required.

Setting up an arrangement like this always demands a bit more thought and experimentation, as the optimum distance from any given source may be unlike that for any other set-up. Like all stereo techniques, positioning is critical for success, and the Schneider disc amply rewards a little time spent finding the right place. As usual, there are two conflicting considerations: too close and the image becomes unnaturally wide, too distant and the omnis give a lot of room sound. When the right place is found, the result is spectacular. On a grand piano it gave a tangible image, almost too strongly defined to be used for accompaniment—a bit larger than life perhaps—but ideal for solo work. The same character made it excellent for drum overheads, with a powerfully present picture of the kit that still managed to sit happily with the rest of the conventionally miked jazz octet. I had an interesting session recording percussion loops and samples, ranging from marimba to bowed vibraphone and including a lot of hand percussion, and everything was recorded with the disc with impressive results—a big natural sound with a physical presence.

Whatever the manufacturers say, an array like this is always going to make you reach for the headphones and check out its binaural capabilities. Here, too, the disc was very pleasing, with breathtaking out-of-head localisation. Of course the lack of ears or other details rules out front-back and up-down identification, but the up side is the good performance on loudspeakers that true dummy heads generally can't manage.

This is a worthwhile addition to the armoury. It's not quite as flexible as a more conventional array, and there will be times when its slight exaggeration of the stereo image will be out of place, but equally there will be times when a little extra spatial impact is required and the Schneider disc will deliver just that. ■

Contact

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MediaFORM CD-3702

MediaFORM's CD-3702 CD copier takes much of the drudgery out of short-run copying jobs. **Tim Frost** puts his feet up

WHEN YOU ARE USED TO autoloading CD-R copiers that resemble industrial microwaves, the CD-3702 presents itself as decidedly compact and lightweight. Its modest 49cm wide by 40cm deep footprint is part of the story but its open-plan approach—no more big metal sides and glass doors—go a long way to making it less imposing than the norm.

Getting the system up and running is simple, involving a small amount of assembly of the input, output spindles and plugging the system in. In my case, the total time from opening the box to being up and running was around five minutes. The CD-3702 has a central pneumatic lifting arm with detachable

input spindles for blank discs and masters on one side and a spindle on the right for finished discs. Detachable spindles makes it easier to load, or unload, up to 100 discs (off-line so to speak) and then its just a matter of putting the loaded spindle back in place. At the rear of the unit is the CD-R drive module that houses two SCSI 8x CD-R drives. The whole thing is controlled from a simple control pad with just four control buttons (copy, compare start, stop) and a 0-9 numerical pad for selecting other options.

The default setup of the system is what MediaFORM calls 'relay' operation. The input spindle is loaded with as many blanks as you need copies and then topped with the master disc. Press the COPY button and the CD-3702's robot arm picks up the master disc, opens the top drive and drops it in. The contents of the disc are analysed to check its format and then an 'image' of the disc is copied to the internal hard disk. Once copied (a process that takes around 10 minutes for a full CD) the master is automatically removed and put on the finished spindle and two blanks are loaded into the drives ready for copying from the image on the hard disk.

The system defaults to 4x recording, which is a good compromise between speed and reliability. Users can match the writing speed to their choice of blank media anywhere from 2x to 8x. Write reliability is dependent on the match between the blank media and the CD-3702, or you simply set your own preferences for write speed. Read problems from the master have already been sorted during the transfer to the internal hard disk.

Providing everything goes smoothly, the CD-3702 just gets on with the copying process, loading new discs until the input spindle is empty. A variation on the relay operation is the copier's ability to handle several masters in one copy session. If you have to make half a dozen copies of, say two masters, then simply load the input spindle with six blanks, then the first master, the next six blanks and then the second master. The CD-3702 loads the top master and does the first six copies and when it finds the next disc is not a blank, it loads that as a master onto the hard disk and copies that to the following blanks.

The system can identify when something goes fundamentally wrong during the write process, and rejects a faulty disc onto a spare area behind the input spindle. For those who like to be 100% certain that the copy is perfect, there are two compare functions. The complete compare uses the hard-disk image to verify every bit on the copy. TOC compare just checks the table of contents from the master disc. Both processes take around 10 minutes per disc.

One of the ORION buttons lets you check the status of the last set of copying and reports how many discs were successfully copied and how many failed, which is a good double check that everything went according to plan.

Other additional goodies built into the CD-3702 include the ability to store several CD images on the hard disk so eliminating the need to reload masters you wish to copy regularly, a continuous display of the current copy operation status, a track-by-track loading option, so that you can make a compilation audio CD directly on the copier's hard disk and the ability to update the operating software by running a CD-ROM with the latest version of MediaFORM's OS, which can be downloaded from the company's web-site.

One small niggle is the reject discs are just dropped on a space part of real estate on the copier, where MediaFORM could have at least put a small tray, but on the positive side...

Well the CD-3702 is certainly compact and easy to use. Rather than try and encompass all the different types of copier functions, this is meant for simple automated copying of small to medium quantities of discs. Its not as fast as a multidrive tower system, but it can still copy a dozen discs an hour, more or less unattended. And since the system has simple operation and decides for itself which of the twenty or so CD formats the master complies to, there is no need for any CD expertise to create reliable copies. ■

Contact

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Fax: +1 610 458 9554.

NEW TECHNOLOGIES

of six buses can be configured as multiformat bus stems while an optional panel, in place of four input modules, provides 2 joysticks and PEC/DIRECT switching. Media 51 shares the heritage of the company's Big desk and is available with 28 and 44 input modules. A rackmount PC is included in the price but not the monitor while options include a stand and provision for an internal jackfield. The first production versions of the console are expected to be shown at NAB and Frankfurt with shipping slated to start in May.

Amek, UK. Tel: +44 161 868 2400.

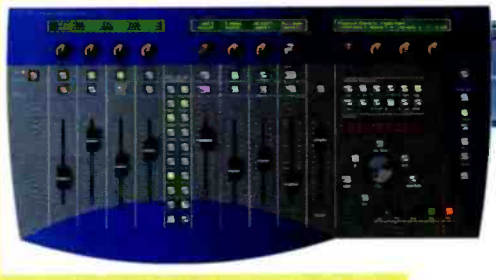
Roland sampler

Roland's VP9000 variphrase processor combines sampling with real time manipulation of pitch, time and formant using MIDI control. Phrase loops can be matched from different sources to the same key and tempo, notes can be bent in real time without changing the sample's length, and the duration of notes within a phrase can be altered. The rackmount's RAM can be expanded to 136Mb and file compatibility exists with the company's own products and those of Akai. On board effects include reverb, chorus and multi-effects while an internal 250Mb Zip drive allows storage of samples and their transferral to Mac and PC. Connectors include six analogue outputs and digital I-Os.

Roland, UK. Tel: +44 1792 515020.

Hardware controller

Radikal's SAC-2K is a hardware remote controller for DAWs which can control and automate their internal functions and parameters. It features 100mm motorised faders, 31-segment rotaries and three large LCDs.



Radikal Technologies, US: +1 201 836 5116

Aspen Surround control

The Magtrax DownMix is a surround sound downmixer and format convertor that enables one surround track arrangement to be freely converted or reformatted to another, with applications across music, film and surround postproduction. The Magtrax DownMix complements the Magtrax MusicBox surround sound loudspeaker monitoring controller—designed to simplify the task of switching loudspeaker feeds between various surround formats. It allows a full remix to be converted from one surround format to another, as well as providing the ability to audition and test how a surround sound decoder will downmix a production when a full surround playback system may be unavailable. The

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...ie 1604-VLZ Pro

...assured, Mackie has turned its attention to audio quality. ...e **Shilling** evaluates the latest 16-channel mic-line mixer

WITHOUT DOUBT, Mackie mixers have empowered an army of musicians and DJs to record their efforts with greater control and flexibility than could have been imagined ten years ago. And Mackie is by no means the only company producing such products, but with the power of a well-oiled marketing machine and copywriters with a good understanding of the issues, not to mention a great sense of humour, they have captured the imagination of the semiprofessional recording market. The sound-reinforcement industry has also provided homes for many of these desks.

The 1604-VLZ Pro is the latest incarnation of the original CR1604. The main benefit of the latest upgrade to the '16:4:2' format Mackie is the inclusion of superior microphone amplifiers on every channel, designated XDR (for eXtended Dynamic Range). For studio recording, owners of budget desks often employ a high-quality outboard microphone channel for overdubbing, but when tracking with multiple microphone sources there is frequently little choice, but to employ the mixer's microphone amplifiers. This new design enables Mackie to boast some remarkable figures, with huge dynamic range of 130dB and extremely low noise and distortion. On paper, these are as good as many outboard microphone amplifiers costing more than the price of this entire mixer.

For the asking price, the Mackie offers a large array of features. This desk will typically be used with one of the popular digital 8-track tape machines, and Mackie has provided for this scenario by labelling faders 9–16 as tape returns 1-8. Also to this end, direct outputs appear for channels 1-8. All 16 channels are otherwise identical. Below the GAIN pot, each features six aux sends, the first two of which boast individual pre-post switches and master level controls. Sends 5 & 6 share the controls for Send 3 & 4 by the flip of a switch on each channel. The 3-band EQ on each channel features a sweepable mid and a high-pass filter at 75Hz and is okay for basic EQ, but fairly unrefined as fits this price bracket. The only way to bypass the EQ is to line up the gain pots with their subtle centre detents. The PAN pot is located next to a large channel MUTE switch, while the fader is accompanied by routeing switches to buses 1 & 2, 3 & 4, and LR mix, along with a SOLO button. An ingenious dual LED system shows signal present and overload (clip), which is useful in the absence of a meter bridge. The 'signal present' LED glows brighter to indicate Solo mode, and the overload light doubles as a mute indicator.

I found all the pots and faders stiffer than I remember from the last time I used a Mackie, but perhaps they loosen with use. Legending on the surface is remarkably good, considering how tightly crammed the controls are. However, I found myself constantly eyeing up the control surface from a low angle to make sure none of the shallow buttons were inadvertently depressed, and additional vertical travel for these would certainly be helpful.

The right-hand section includes the aux returns' level controls, Solo mode and level, monitoring controls, which offers an external stereo input. The effects returns and send masters include some neat routeing features to get you around tricky situations, especially when setting up musicians' monitoring.

The four Group Masters feature useful routeing buttons to L and R mix, and there is a socket for headphone output conveniently located near the main fader.

The whole mixer is quite weighty, (the power supply is internal), but packs in a lot for its compact size. The rear panel is described as the patchbay, which is not exaggerating the case at all, as there are nearly all the connections you could want taking up the whole surface of the panel. Nonlatching Neutrik XLR inputs are provided for the microphone inputs, along with a global phantom power switch. Balanced jack line inputs and unbalanced TRS Insert sockets are also provided. Rack ears for the desk are included, the width of the 1604 being a convenient standard 19-inch width. One notable feature is the ability to rotate the patchbay pod to different positions to make it more easily accessible for any given situation. However, an optional piece of hardware must be obtained to enable location of the connections to the same plane as the control surface.

Jeff Gilbert's manual, just like the advertising, is chatty, good-humoured and boastful. Lots of clear diagrams and plenty of sensible advice are included.

In use, there is little to grumble about, even for a user familiar with large-scale high-end desks. Outputs are all at +4dB, operation is very intuitive, and a number of neat little features help out in awkward situations. As for the new microphone amplifiers, they sound excellent. On vocals, they were noticeably more open sounding than a competitor's older design, and absolutely as clean and quiet as the figures suggest, certainly comparing favourably with other solid-state units.

All in all, Mackie have struck upon a great formula with a good balance of features and performance for a bargain price. ■

Contact

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NEW TECHNOLOGIES

DownMix incorporates a separate 8x8 routeing matrix on both the input and output sections, between which the relevant downmix processor is automatically inserted.
Aspen Media, UK. Tel: +44 1442 255405.

Fostex goes 24-96

Fostex's D824 8-track and D1624 16-track digital multitracks can now record in five different formats including 24/96. Both have removable front panels that function as remote controls, feature the use of 'ghost' tracks to expand track capacity, have .WAV file compatibility, a SCSI-II interface for archival, copy/paste editing, and a 9-pin port. Options include AES-EBU and timecode boards.
Fostex, US. Tel: +1 310 921 1112.

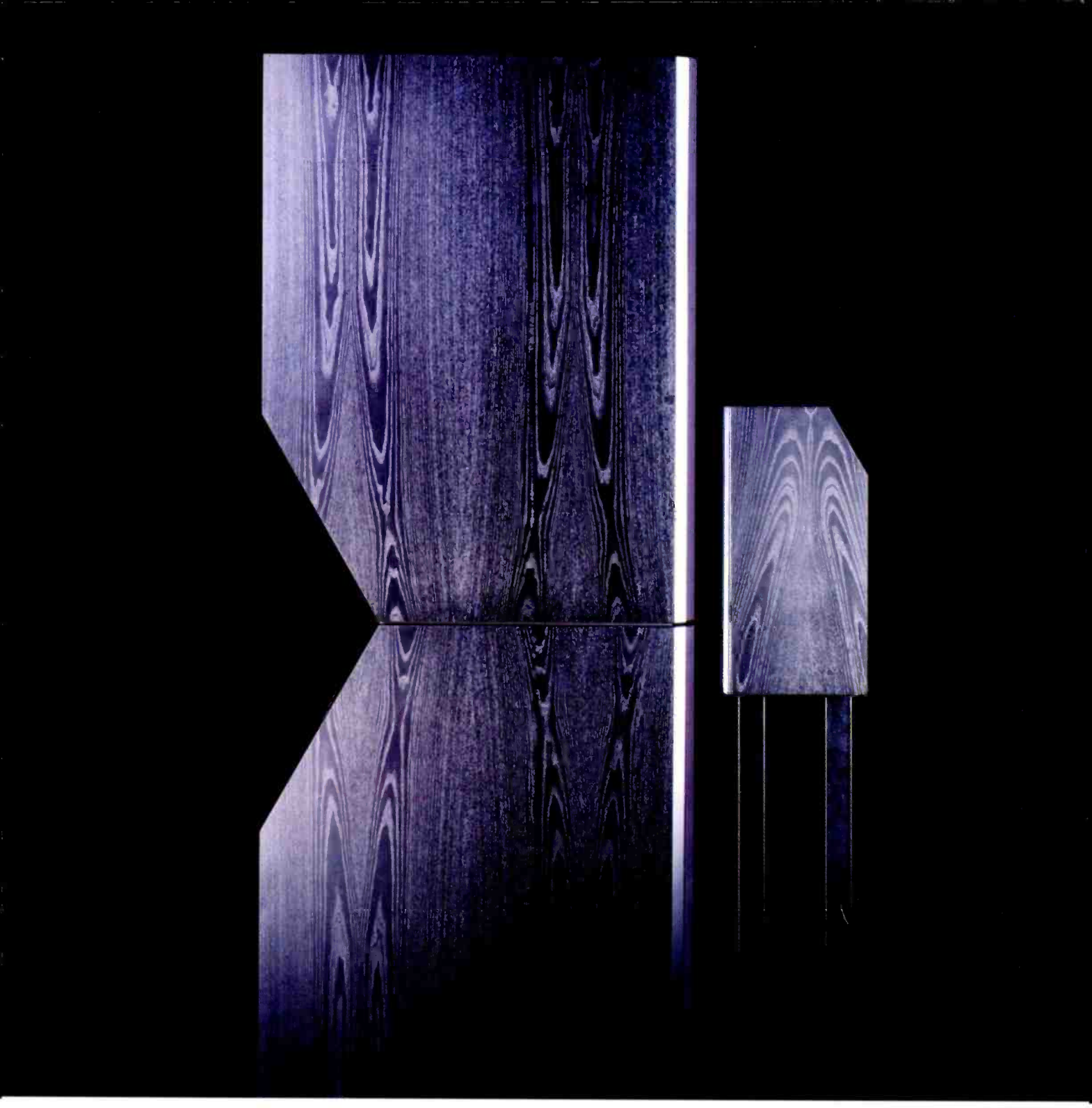
Apogee shows its cards

Apogee Electronics Corporation has added two eight channel conversion cards to its expanding range of high-quality digital audio conversion products. The AP8AD and AP8DA are for Yamaha digital systems equipped with YGDAI or 'Mini-Y' expansion slots such as the 02R digital console. The AP8AD A-D card includes Apogee's proprietary Soft Limit technology to deliver higher levels without digital overs. The AP8AD and AP8DA are 24-bit convertor cards, and are capable of operation at sample rates up to 96kHz as permitted by the Yamaha system software.

Apogee Electronics, US.
Tel: +1 310 915 1000.

DSPecialists

Acousticon, Motorola, Sennheiser and Siemens are just some of manufacturers to have taken advantage of services offered by German system house DSPecialists. The company supports customers in the development of DSP based audio products, from conception through preparation of prototypes up to manufacturing. Among the hardware and software components developed by the company are algorithms for audio compression and decompression, including MPEG2, G722 and TwinVQ, transmission, equalisation, echo cancellation and various audio effects (merging noise generation). The series of standard components can be customised for a variety of applications. DSPecialists projects include the development of guidance systems for museums, with automatic position recognition and digital wireless transmission and CD quality sound; measurements systems for hearing aids; voice control systems; a sensor transponder system and high



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DPA 3541

Offering separate valve and solid-state preamp stages, DPA's mic kit has something for all. **George Shilling** compares and contrasts

WHEN SCOURING the microphone cupboards of the commercial studios I use, I am always delighted to encounter Bruel & Kjaer models, (now available under the DPA name). Frequently, these are Type 4006 omnidirectional condensers, known for their bright, clear and true characteristics. Now, with the introduction of the 4041 models, two derivatives are available that use a larger diaphragm capsule (Type MMC4041). This provides all the traditional benefits of a larger capsule, although at 1-inch (24mm) across, it is not huge. Another DPA end-fire design, this is similar in performance to the special gold and glass limited edition Type 4040. With that model both solid state and valve preamplifiers are included in one microphone. Here, separate bodies are provided for valve or solid-state preamplification.

Type 3541 is a kit that includes one of these capsules, together with the two alternative microphone bodies: the MMP4000-S solid-state preamplifier and the MMP4000-T valve preamplifier. Both of these are similar in appearance to previously available 4000 series microphones, with black anodised metal finish and narrow cylindrical bodies which flare out at the top to accommodate the new larger capsule. These bodies are terminated with 6-pin XLR type connectors. The supplied cable connects to the HMA4000 2-channel microphone amplifier. Also included in the kit is a robust suspension mount with rubber straps, and an ingenious dual-layer vocal pop shield that includes an adaptor to enable both the suspension mount and pop shield to be mounted securely on one microphone stand. Furthermore, the pop shield mount ingeniously slides and locks to enable different spacing between itself and the microphone capsule. A large foam windshield is included for direct fitting over the microphone. All components fit into a luxurious protective Samsonite briefcase.

The microphone amplifier is a compact yet weighty box, which is designed to optimally handle the output of either the solid-state or tube microphone and provide a 200V polarisation voltage. The connector panels are painted a garish orange, not what you expect from the normally reserved Danes. On the front face are two 6-pin XLR connectors and a small gain switch for each channel. This enables coarse matching of gain, with -20dB/0/+20dB positions, enabling the vast dynamic range of the microphones to be most appropriately used in a given situation. Maximum SPL of 144dBA can be handled before clipping. However, without any finer adjustment, you will normally need further line amplification of some type before connection to a recorder. Of course, in many situations you will connect to a mixer of some type for balancing, panning or EQ. For direct recording, I found it easiest to set appropriate recording levels by inserting a high quality compressor, with or without compression. However, the inclusion of a fine level control on the HMA4000 would benefit many users. On the rear panel are traditional 3-pin XLR outputs and an IEC socket.

The diaphragm is uniquely manufactured from stainless steel—unscrew the grille and you can see your face reflected in it. Fitted onto a precision-made stainless steel housing, this is said by DPA to give the capsule a unique immunity against ambient temperature differences. It also has an extremely low self-noise (6dBA) and wide dynamic range (113dB). A treble lift of some 5dB around 8kHz gives a tremendous clarity on-axis; as might be expected with an end-fire microphone, the very high frequencies tail-off rapidly off-axis.

Swapping the barrel from the solid-state to the valve stage is a matter of unscrewing the capsule, which is located with a central pin. However, the grill unscrews from the top of the capsule, and the diaphragm also unscrews from the connector, so you have to be careful to twist the correct parts.

In use, the difference between the two microphones is subtle on some sources, but certainly noticeable with most singers. The immediate impression with either preamplifier is of a wonderful 'openness' of sound, terrific natural transparency with no discernable colouration. The response is extremely flat down to 10Hz, and this makes the 4041 a wonderful performer on all manner of instruments, as well as vocals. The tube microphone seems to subtly enhance, particularly in the upper frequency range. A pleasant blurring lends an aura to certain voices and instruments. The solid-state preamplifier, meanwhile, provides a beautifully accurate and detailed picture of the sound source. It is horses for courses, naturally, but if you are indecisive, it can be a nuisance to keep the singer waiting while you extract the microphone from its mount to swap the capsule over.

This kit provides similar performance to the extremely exclusive and desirable Type 4040. Although the two bodies are less convenient, I know of one incident where an owner broke the beautiful yet slightly impractical glass housing of the 4040. There are no such worries here; these microphones are extremely robust, and packed in a tough case. This is an excellent way to acquire what I believe are two of the best microphones currently available. ■

Contact

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Tel: +45 48 14 2828.
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Net: www.dpamicrophones.com

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Tel: +49 30 467 8050.

Digital Redboxes

The RB-DDA6S SPDIF 6-way distribution amplifier and the RB-DDA6A AES-EBU 6-way distribution amplifiers have D–A convertors that can be used for applications such as routeing an output from a digital mixing desk to multiple digital recorders, or for feeding an output from a DAT machine to multiple studios. Both products have buffered inputs which are distributed to six outputs at the same level and condition as the input signal. They can accept input sample rates in the range of 30-100kHz, and bit rates of 16, 20 and 24. Products to be released over the next three months include an automatic mix-minus generator, a silence detect unit, a 6-way headphone amplifier, a sample rate convertor and a combined A-D and D-A convertor which is 24-96 compatible.
Sonifex, UK. Tel: +44 1933 650 700.

New dbx Silver Series

The Silver Series 386 Dual Channel Tube Mic Preamp with digital out combines the warmth of a valve with the proprietary dbx Type IV conversion system. It has many of the features of other products in the Series, such as phantom power, phase invert and

low cut filtering but also includes digital outputs in AES-EBU and SPDIF. Features include selectable 96, 88.2, 48, or 44.1kHz sampling rates, 24, 20 and 16 bit wordlengths, selectable dither and noise shaping, word clock sync input and output and separate analogue and digital output control.
DBX, US. Tel: +1 801 568 7660.

24-bit Ultra-Curve

Behringer's DSP8024 Ultra-Curve is now available in a Pro version with 24-bit convertors. The fully automatic 31-band graphic EQ and real-time analyser now has the previously optionally available delays as standard. The flexibility of the MIDI-controllable mainframe has been left untouched and each channel sports a brick wall limiter, a noise gate and three fully parametric EQs. The device also functions as an automatic feedback killer. The Moduliser Pro DSP1200P is a multi-effect processor with balanced connectors, chorus, flanging, phasing and exciter algorithms, along with special effects, such as ring modulation, resonance, bass exciter, stereo widening and 3D effects. The device also features a Voice Canceller, various valve and speaker simulations, an ambience effect, several dynamic processing functions and a 'Vintager', which simulates lo-fi sounds, such as record scratches or other noise inherent to older recordings.
Behringer, Germany.
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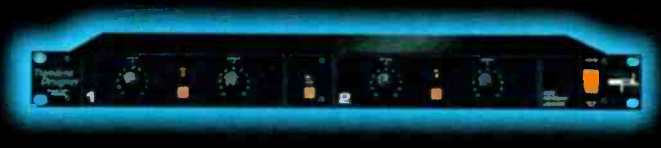

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MTR DI-6M

Making a DI box 'sexy' is one of the challenges of audio design. **Dave Foister** touches up MTR's 6-channel active DI and mixer

THE PRIME CANDIDATE for the title of 'Least Sexy Piece of Kit' has to be the direct injection box. It is about as exciting and as open to different design concepts and interpretations as a screwdriver, and, although there have been one or two that have tried desperately to liven things up by using valves, most of them remain anonymous black boxes that only distinguish themselves if they do something dumb like hum.

MTR is not the first company to spot the potential usefulness of a collection of identical DIs shoehorned into one rackmount box, but its new DI-6M is still one of a very small selection, and furthermore has managed to find a twist. It consists essentially of six active DIs in a 1U-high case, with almost all the controls and input-related connectors on the front and all the outputs on the back. The circuitry is simple and unembellished, yet has enough control to score over the passive type.

The front panel is arranged like six DIs

bolted together, with an illuminated power switch at one end. Each box has a single input jack, a loop-through Link jack for connection to a local amp, and a small selection of switches. Most of these are concerned with level attenuation; one toggle switch enables the pads while a further 3-position one selects the amount of attenuation, which can be 10dB, 20dB or 30dB. Curiously the switch doesn't offer these in the logical sequence, so that to get from -20dB to -30dB you have to pass momentarily through -10, which could give somebody listening at the other end a nasty surprise. As a guide to whether the pads are needed, there is a signal overload LED that comes on at +6dBu. Unfortunately, it also comes on and stays on when the output is connected to a destination that has its phantom power switched on: since the presence or absence of phantom should be an irrelevance it's annoying that this should happen, particularly as there will be occasions when the receiving console cannot switch its phantom off on individual channels.

The only other switch is a push button for earth lift, making it possible to deal with hum problems on a channel-by-channel basis. My own studio has a particularly difficult mains earth loop problem, and this front-panel switch was not enough to get rid of the expected hum. Fortunately there is an overall earth switch on the back that did the job.

Also on the back is the expected row of six output XLRs, delivering independent balanced microphone level signals from the six sources. But there is more besides, revealing the meaning of the M in the unit's model number. For the DI-6M incorporates a simple mono mixer, also delivering its output at microphone level for a separate feed to a monitor mixer, for instance. This is a curious little facility, made all the more so by the fact that the channel levels are adjusted with screwdriver presets on the back panel and so will be completely inaccessible if the unit is in a rack. MTR thoughtfully provides a little blue plastic adjuster, but in the absence of any kind of parking place, this is inevitably going to get lost almost immediately.

I frankly found it hard to envisage a situation where the mixing feature, particularly presented in the way it is, would be of much use. The first thing that springs to mind is a keyboard rig, where FOH could have splits of all the instruments while the monitor desk gets a mono premix; but since the premix would be effectively impossible to adjust after its initial setup, how useful would this be? There would appear to be room on the front panel for a small knob on each DI to perform the mixing function, which would transform its usefulness—even putting the screwdriver holes on the front would be better.

On the other hand, since the DI-6M is typically well-priced, the mixing thing could be seen as being thrown in for free with a set of good convenient DIs. The DI performance itself is very good, with the necessary high input impedance (1MΩ) and low output impedance. Importantly, the link output is not a simple parallel hard-wire, but is buffered through the active circuitry, avoiding the common situation where the well-intentioned high input impedance is compromised by being connected in parallel with a lower impedance at the amplifier. The result is a DI that does a good job of its fundamental task of delivering to the mixer everything the source has to offer, properly balanced and at an appropriate level. It needs neither phantom nor batteries, and the fact that it needs proximity to a mains source is offset by the presence of six complete units on the end of the one kettle lead. If you need lots of high-quality DI inputs without the mess of a pile of separate boxes that quickly become unidentifiable, the DI-6M certainly fits the bill. If, in addition, you can think of a worthwhile use for the built-in mixer, you're clearly on to a winner. ■

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NEW TECHNOLOGIES

IntelliMix

The 4-channel SCM410 automatic mixer is targeted at smaller installed and transportable systems and packs many of the performance attributes of Shure's 8-channel SCM810 mixer into half a rackspace, along with automation for several operator functions and proprietary circuitry which fights feedback, reverberation, and comb filtering. Other features include adjustable low-pass filters (25–320Hz), high frequency shelving filters for each channel, four balanced XLR inputs, a single balanced XLR output, an unbalanced RCA auxiliary level output, a peak output limiter, and master output level control. With IntelliMix, the SCM410 can automatically activate only the microphones being addressed in any given system to minimise the problems caused by multiple open inputs. This NOMA circuit enhances overall intelligibility by automatically making gain adjustments as additional microphones are activated. Not limited to use in smaller applications, the SCM410 can be linked with other Shure mixers in any combination within a system employing up to 400 mics and is fully compatible with Crestron and Panja (AMX) control systems.

Shure, US. Tel: +1 847 866 2200.

C3000B

An engineering and styling update has produced the C3000B which sports a specially designed 1-inch electret diaphragm, a cardioid polar pattern, a two layer wire mesh cap, a die cast metal body, improved pop filter, high impedance circuitry coated in PU varnish, surface mounted components

except for a few large capacitors, gold plated XLR output connector and an improved rubber compound for the capsule shock mount. AKG has improved on its original tiny dual diaphragm mic with the CK77WR which is said to be perspiration proof and water resistant. The WR version has no hole in the diaphragm with barometric pressure compensation made by a capillary tube that is connected to a compensation cavity sealed with a soft flexible diaphragm. Additionally, the model uses a 'ruff' of thin foil that makes liquids run off to protect the capsule. Improvements have also been made to the original mic's set of accessories and the mic is available in flesh, white and black finishes.

AKG, Austria. Tel: +43 1 866 540.

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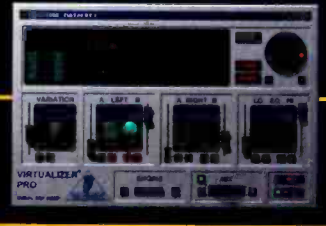

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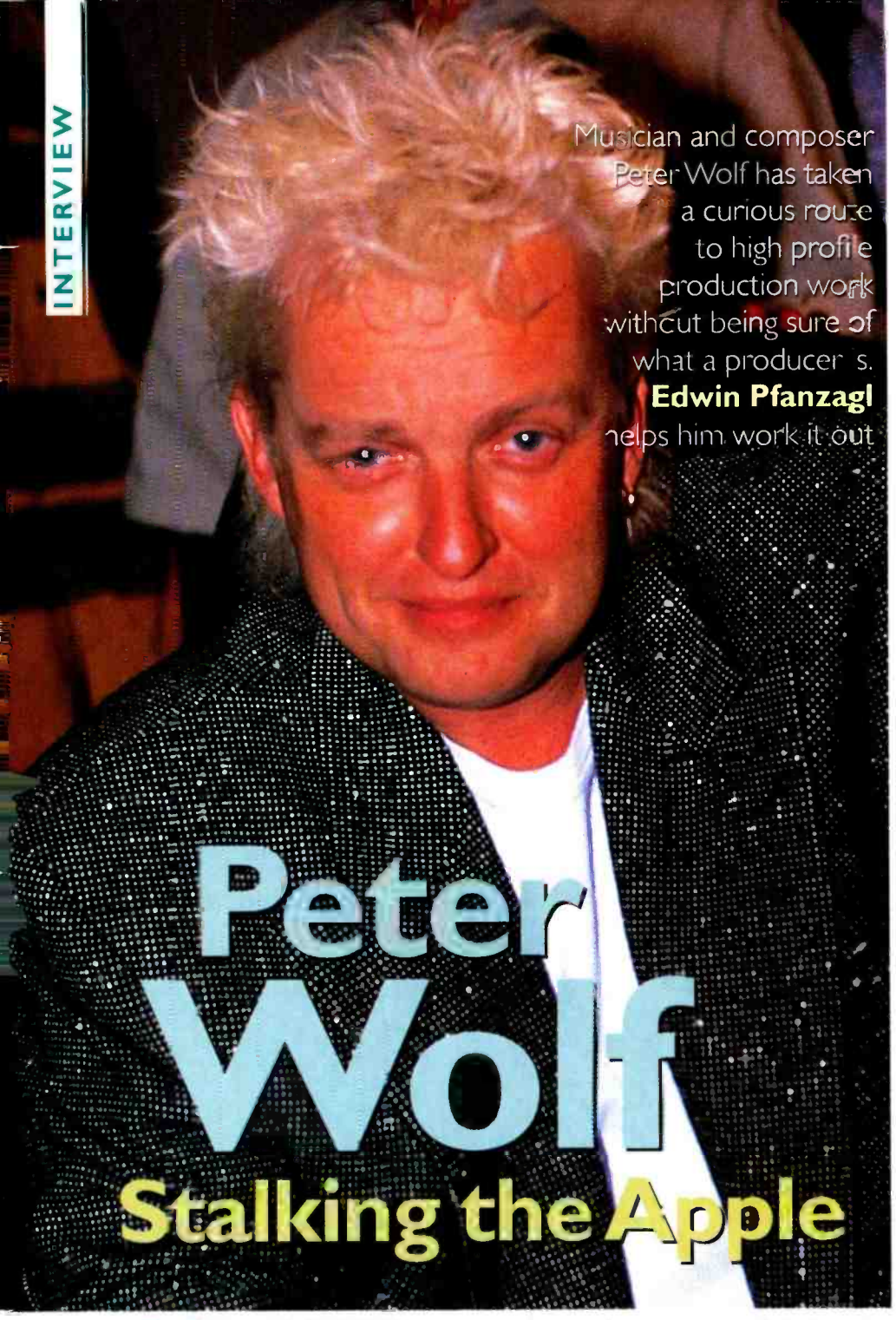

Musician and composer Peter Wolf has taken a curious route to high profile production work without being sure of what a producer is. **Edwin Pfanzagl** helps him work it out

Peter Wolf

Stalking the Apple

HIS NAME IS FOUND on over 60m albums, spanning the 30 years of his activity in the biz. To many of us he was the regular keyboard player in Frank Zappa's Mother of Invention, to others he is the producer and songwriter, responsible for The Commodores, Starship and El Debarge to name a few.

Austrian-born, Wolf moved to the US at the age of 23 to start what would turn out to be a remarkable career, but after the 1994 earthquake hit the city and damaged his studio—housing a big 8048 Neve console—he returned to his native Austria. Now he works out of his new studio called Little America located in the west of Austria, close to the Swiss-German border and about one hour from the airport in Zurich. 'And from there I can be in New York within six hours—I was never much faster going there from my house in LA'.

Wolf's satisfaction with his geographical location, however, is not reflected in his role as a producer. 'Producer? What the hell is a producer?' he demands 'A producer is a man who gets money from the record company and who is supposed to bring them back a finished record which they can sell. It's just like being a hair-products salesman—it's that simple. You go somewhere and you sell people hair products—and we sell music, disposable music, music which will be forgotten a few months later. That's what a producer is. I certainly never wanted to be a producer, but all of a sudden I found myself being one.'

It began when the teenage Peter Wolf studied piano at the Conservatory of the City of Vienna and played gigs as keyboarder in the Fatty George Band. He worked a variety of venues, including the famous nightclubs of downtown Vienna, that would never have welcomed him as a customer. At the age of 16 he won first prize at a European Jazz Festival. The following years saw him doing a lot of recording and working in radio and television until Austria grew too small for him. In 1975 he moved to the United States, where he started to work as a session keyboard player. After a year his name had spread and he received a phone call from Frank Zappa who invited him to join The Mothers of Invention.

'It was one of the most important periods in my life' Wolf recalls. 'To me Frank was the most intelligent, humourous and honest person that I ever got to know in the music business. "Yes" meant "Yes" and "No" meant "No", no discussions. Even when I left the band —our friendship didn't change.'

Wolf was a regular member of Zappa's band up until 1980, when his career as arranger-songwriter started to flourish. During the first half of the eighties he became one of the most sought-after keyboarder players and musical arrangers in Los Angeles.

'I was playing sessions in LA for a living,' he recounts, 'playing with everybody and for everything—no questions asked. I did something like 400 albums in that way. If you can play, read and write music one day you become the arranger of the project and producers start really liking you because you do their work—at least most of it, anyway. So one day a producer came to me and said, "Peter, I want you to do this record with me". And I said, "You know, I would really love to do this record with you but I can't because I'm already scheduled to work on another project with producer Y." He replied, "But I really need you because you have a good handle on new ideas and I think you are the perfect person that I would like to do this project with so if you blow out this other producer and come with me and do my project, I make you my coproducer with a royalty".'

Wolf's first coproduction was the Commodores' *Nightshift* album and became a No.1 hit in the US.

'You have to understand that the music business is a fashion business,' Wolf continues, 'so once we had a hit, the record companies thought, "Well, who produced that hit? There are these two guys, one of whom is a famous producer, who has not had a hit for a few years, so maybe that young kid at his side is the real starter. Why don't we let him produce something?" And since the Commodores is an old act they figured they'd do the same thing again with another old-fashioned band—Jefferson Starship. So I got to do another old-fashioned, outdated band which turned out to be a huge hit as well and all of a sudden I was a producer, full time.'

His success as arranger and producer came with the Starship album *Knee Deep in the Hoopla* (1985). In the following year he produced four No.1 hits—'We Built This City' and 'Sara' with Starship, 'Who's Johnny' with El Debarge and Wang Chung's 'Everybody Have Fun Tonight'. From this point, the doors in the music business opened.

While Wolf claims not to have a lot of respect for the profession of the producer he has a lot of respect for the work of his colleagues: 'Quincy [Jones] is a very intelligent man and he certainly is very, very good at what he does,' he asserts. 'I have a lot of respect for him and his whole camp, because as he is a musician he really knows what's good and what isn't, and what one should do. It doesn't mean that he can control success—nobody can. Quincy is doing it for a long time so he has a lot of experience, and boy, has he had success. More than anybody in this business, and rightfully so being a producer means much more than just being a good musician. It means that you can steer and motivate people.

'Once the record is done, another part of the job of a producer begins—to motivate the record company in the right direction and that is an even harder job—politics. Quincy Jones, for example, is really fabulous at that.'

Wolf is convinced that even after all these years in the business he still has to get much better in this respect: 'If you want to be successful I think you have to become master of politics,' he opines. 'That basically means you have to go to somebody who has to do something for you, because if he doesn't, the thing is not going to happen. It doesn't matter if you are selling hair products or records or if you have to make decisions about how a country is run—it's all the same thing. So if you have a good idea and you want something from this person, you have to go to him and plant your idea in his head in a way that he believes it's his idea. And then he will run to his company and tell them that he has just found the wheel and everybody goes haywire and they do the job that they are supposed to do in the first place because they are a record company. They do the job right and you are successful.

'Why are you successful? The answer is because you were a good politician. The record is exactly the same, but everybody was fully doing their job now and all of a sudden everybody wins. And at this point it is not important to run out and say, "Well, that was my idea." You let the guy—the A&R guy, or the marketing man, or the promotion man or the president of the record company—run out and say "I made that act!" and you go, "Yes, you did it. Fantastic. Thank you". It's like a team, you know. You have to know the team and you have to learn playing the team, like a coach. This is what you have to learn as a producer.'

According to Peter Wolf, making a record is only 30 percent of the picture, a further 30 percent is the perception that the public has of an artist and the remaining 40 per cent is devoted to the politics of production—looking at the fact the he has had 40 Top 40 hits and eight No.1s so far shows that this man knows what he is talking about.

'Do you know how hard it is to get a No.1? In America there are many producers who are really great, but they have never had a No.1. That's why my hat is off to Puff Daddy and Babyface and people like that, because they are doing something right. It has nothing to do with music, because many of these guys really don't have any clue about music. Remember, we're in the fashion business—can Versace or the Versace family actually tailor a suit? Can Armani sit down and make a suit? No, it's not important, because he has 100 tailors who are very good at it—and this is what you have to realise. A lot of young guys go into this business because they love music and then they have to learn that this is just such a little part of the whole thing.

'I think that, in my old age, I might become a real politician, I might be pretty good at it. I'm just kidding but Frank Zappa was ready to do it, he wanted to get into congress and become president of the United States. But then he got cancer and decided not to run for presidency. Well, since the United States have had a previous actor as president, why not have a musician or composer as well? >

Peter Wolf with Synclavier system and above views of Little America with Bösendorfer grand piano

his vast array of keyboards. When talking to his insurance company he had to find out—like many others—that just about everything except 'earth movement' was covered in the insurance policy. He decided to relocate his studio to a much safer place without earthquakes, fires or hurricanes—Austria. Little America studio is located near the Swiss border, but the roster of artists and clients he is working for has not changed. The new studio has already seen celebrities such as BB King, Zucchero, James Ingram, Oleta Adams, the German Rock-Group The Scorpions and Cliff Richard who recorded his last album at Little America.

Apart from his work as producer, arranger and songwriter, Peter Wolf loves to compose for orchestra. The film soundtracks he has worked on include *Weekend at Bernie's* (Part 2), *Never-ending Story* (Part 3), *Peanuts*, *The Fearless Four*, *Tanz auf dem Vulkan*, and *Die Cellistin*. In addition to that he has produced the title songs *King of Wishful Thinking* and *Playing With The Boys* for such films as *Pretty Woman* and *Top Gun*.

For one of his last film music projects (*The Fearless Four*) he was scoring with the Symphonic Orchestra in Munich. 'I really love to write for orchestra. I get a lot more chances to do that here in Europe than I got in America because the movie industry is another little "mafia" which is very hard to break into,

> Remember, we're in the fashion business—can Versace or the Versace family actually tailor a suit? Can Armani sit down and make a suit? No, it's not important, because he has 100 tailors who are very good at it—and this is what you have to realise.

even if you have a big name as a producer and composer of hit-songs. In the meantime I have done about 14 movies here in Europe and I get to work with a lot of orchestras, which is very important to me. I think you >

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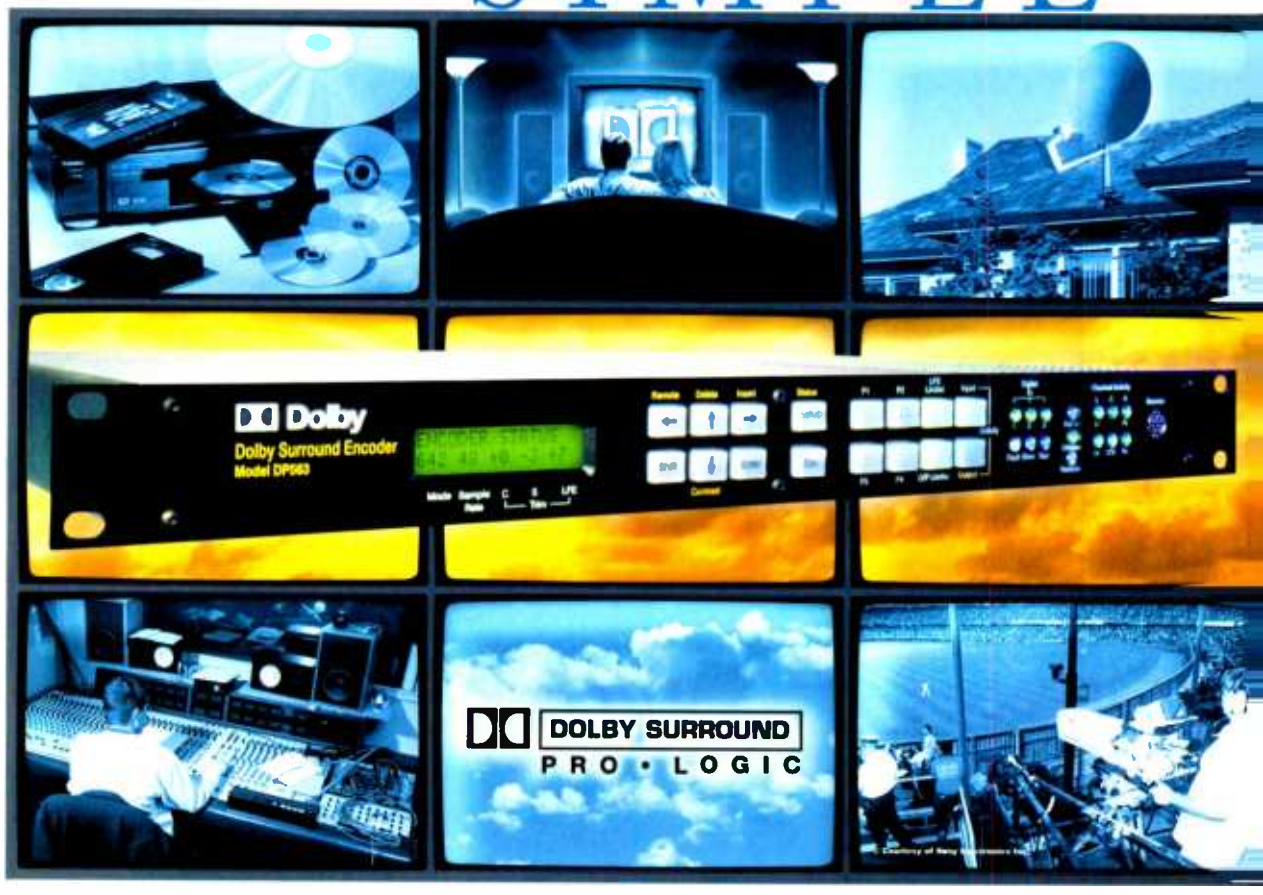

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< have to get good at your craft so you constantly have to write for orchestra and have your stuff played in order to see which things work and which ones don't. You can't sit at home in your chair, jump up and down and say, "I'm a composer". You have to do it. How good could you be, no matter how long you have been at some university or academy; it doesn't mean much—you have to really do it.

'I'm a "doer", that's why I have the studio here and why I am writing film music. But that's only on the side—I'm doing a lot of composing. The last major project was the symphony Progression which I wrote for in a big way the Klangwolke ('cloud of sound') which is part of the modern media and electronic arts festival Ars Electronica here in Austria.'

The world premiere of Wolf's symphony took place on 4th September last year at a huge open-air event next to the Danube and the Bruckner Haus orchestra hall. Peter Wolf got to work with the Bruckner Orchestra, combined with musicians from the brass section of Earth, Wind & Fire and an American rhythm section consisting of people like Vinnie Colaiuta, Abraham Laboriel, Paul Jackson Junior—as Wolf says: '...all the 'A' guys—you know. It is a Millennium Symphony in six movements and within every movement there is a different pop-superstar as singer. We had Cliff Richard, Coolio, Jennifer Paige, Vincenzo la Scola, James Ingram, Alex Birnie and Michelle Wolf, my wife, singing, who also wrote the lyrics for the songs which are woven into the symphony.'

Currently Wolf is recording and co-producing Natalie Cole's next album *Snowfall on the Sahara*, the last big album project that he completed was the new Scorpions record *Eye to Eye*, which went to No.18 on the US rock charts and sold more that 1m copies in south-east Asia.

'This album is quite different from what they have been doing' Wolf claims, 'but at the same time still with good melodies, which is what people always liked about them. It is much harder than their previous records, not as ballad-heavy as the last one. I thought it should be a medium to up-tempo record with a lot of attitude, because that is what they were famous for in the first place, so we concentrated on bringing this back. We wanted to bring back the believability that they are a rock act and—let me tell you—they sure are.'

Wolf claims that the majority of the energy goes into the actual process of song-writing, because recording is 'a piece of cake' in comparison. 'The important part is the thought procedure, how lyrics and music work together: is it new and interesting enough that people will go out and buy the record? That is the important question, and, yes, we all believe it is a great record. Rudolf Schenker alone had written 40 to 50 songs for this album, which is fantastic, because it put us in a position where we were able to pick the best 14 and work on them for the record. I don't believe in writing 10 songs and recording 10 songs for an album. I believe in quantity, doing it, doing it, doing it, until you have reached a point where you can say, "Now I have really nailed it". And I think this is what it's all about: getting really good at something is always great in life. It doesn't matter whether you are a shoemaker or a hair-products salesman or a producer—get good at it.' ■

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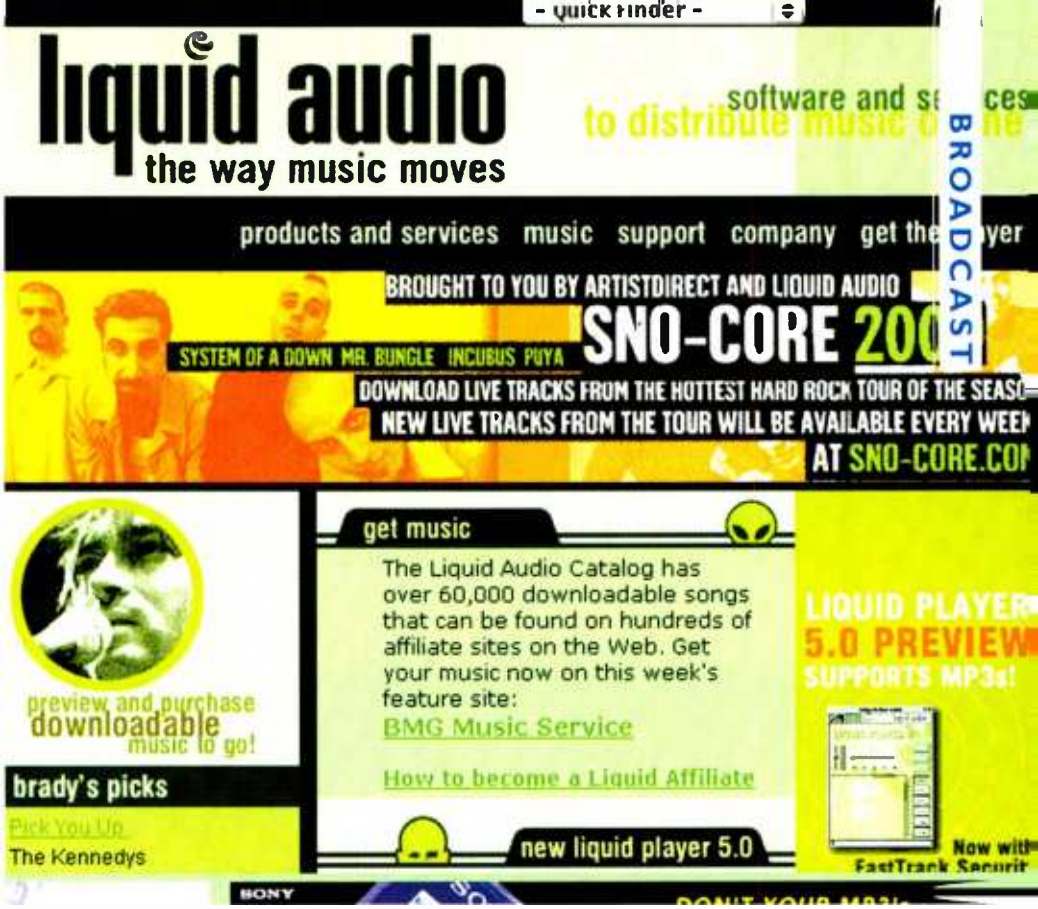

Downloading audio

Continuing his exploration of audio on the Internet, **Simon Trask** discusses the relative merits of downloading

THE COUNTERPART to streaming audio delivery over the Internet, which was discussed last month, is the network transfer of audio via file download. While with streaming the audio can be listened to as it's being delivered over the network, with downloading it can only be listened to once the file containing it has finished downloading. However, with bandwidth in the network and into the home scaling up and compression technology improving, the 'download gap' can only decrease and so become ever less significant, till it reaches the point of insignificance.

In fact, as we move (jump, more like) from dialup data rates into the sort of broadband data rates provided by ADSL and cable modem connections to the Internet, downloadable audio suddenly becomes a lot more attractive. Consider, for instance, music tracks encoded in Windows Media Audio format at 64kbps (which Microsoft claims gives equivalent audio quality to MP3's 'near CD' 128kbps) downloading over a 512kbps ADSL connection (which is the download data rate that BT has said it will provide in the UK for both business and residential ADSL). Given continuously optimal ADSL and network bandwidths (admittedly more ideal world than real world), a 60-minute album so encoded would take 7–8 minutes to download. Looked at another way, you could feasibly download an entire album in the time it would take you to work your way through 30-second streaming previews of every track on the album.

When streaming audio over the Internet began in the mid-nineties, a 14.4kbit sec modem was considered to be the state of the art in dialup access, the streaming audio quality possible over such a modest bandwidth was poor, and the only way to keep downloadable files to a practical size was to opt for an also somewhat constrained 8-bit 22kHz audio quality. Things have progressed since then, if not as quickly on the bandwidth front as many Internet users would like (particularly in the UK, where the most noticeable Internet audio has been the sound of dragging heels, courtesy of BT). Essentially, streaming and downloadable audio both deliver the content of a file which is stored on a server, but they do so in different ways (and of course streaming can also be done live from a real-time off-server feed). Downloading provides the content wrapped up in a file that can be (re)played locally, integrated into jukebox-playlist software, burned to CD, and-or downloaded to a portable digital audio player for 'take-away' playback. In contrast, streaming technology typically delivers the content in a way that precludes it from being retained locally as a digital audio file by the listener. The content file itself is neither copied nor copyable to the hard disk of the listener's computer. Typically a small file containing a pointer to the location of the content file is downloaded to the hard disk, and the streaming client software uses this to access the content; the stream can then be accessed again at any time (assuming it's still available on the server) by double-clicking on the pointer file. This way you have to be online whenever you want to listen to a stream again (local analogue out recording notwithstanding), which isn't very appealing when being online again means more call charges.

US Internet users, of course, are used to unmetered Internet access, and the different online mind-set that goes with not having to worry about racking up hefty phone bills. But this is starting to happen in the UK too, through the introduction of Telewest's £10 month SurfUnlimited (albeit limited to Telewest's own ISP) and BT's proposed Surftime tariffs (including a less attractive £35/month for unlimited access, plus any additional monthly ISP charge, and in this case usable with any ISP that provides a dialup number with the 0844 Surftime prefix). ADSL by its very nature as an 'always on' technology requires flat-rate monthly pricing; and because it provides data and analogue voice channels on the same single copper wire that presently only provides analogue voice, being online won't block incoming voice calls. Residential ADSL pricing is expected to be similar to Surftime's unlimited access tariff, but with a setup fee; business pricing and setup will be around double the residential charges, for the same download rate but a reduced contention ratio and an Ethernet as opposed to a USB 'modem' connection. Rollout of ADSL, and perhaps Surftime, will initially be to selected city and (sub)urban areas. With the unbundling of the local loop next year (giving any service provider access to BT's treasured 'last mile' copper loop) the telecoms landscape is set to undergo more radical change.

While we're on the subject of telecoms infrastructure and bandwidth changes and advances, the general consensus is that when it comes to next-generation (so-called 3G) broadband wireless technologies, which will start to fall into place over the next couple of years, the European market—and the UK in particular—is actually ahead of the US.

Quite how this will play out in terms of the balance between downloadable and streaming audio is unclear, but one possibility is that streaming will come to the fore. This ties in with what has >

< been called one of the Internet's hottest trends, namely online storage or 'virtual hard drives'. One of the leading companies in this market, FreeDiskSpace.com, recently introduced the Internet's first 300Mb virtual hard drive. The company says that it has more than 500,000 registered users and is signing up 8,000 new members per day. Web metrics firm WebSideStory, which measures FreeDiskSpace.com's web statistics, comments: 'Free online storage is apparently attracting everyone, from consumers to small businesses'.

Files uploaded to a virtual drive can be accessed from anywhere and any time, are hidden behind password access, and can include shared folders. The company has recently set up a network of communities, including FreeLinuxSpace.com, FreePDAspace.com, and, inevitably, FreeMP3Space.com.

The new Internet-centric Apple has also got in on the online storage act with the introduction of its iDisk service, which provides a relatively modest 20Mb of free online personal storage to any OS 9 owner (currently in the US only). And providing a specifically music-centred service, myplay.com provides what it calls 'virtual lockers' where customers can store, share, organise and download their MP3 and other digital music files from anywhere in the world (the principle is the same as web-based email, which also has been massively successful). But the boldest step has been taken, perhaps inevitably, by the always boundary-pushing MP3.com—so bold, in fact, that the RIAA (Recording Industry Association of America) is taking the company to court. Two new services from MP3.com, Instant Listening Service and Beam-it, both essentially substitute online streaming-based listening for CD listening. You need to have a My.MP3.com account. With Instant Listening, within a minute of buying a CD online at a participating retailer you can be listening to streaming MP3 versions of the CD's tracks online from your account page. Beam-it, on the other hand, allows you to listen to streaming versions of albums which you already have in your CD collection—you just insert a CD in your computer's CD-ROM drive and the Beam-it software identifies the album and makes a streaming MP3 version available from your account page. And because streaming doesn't transfer a readable content file to the listener's hard disk, neither service can be used as a way to endlessly reproduce MP3 versions of CDs.

MP3.com has a 40,000-album library of MP3-encoded music, and says that if there's heavy demand for albums not in its library then it will add them (which suggests that more obscure albums might not get a look-in). MP3.com CEO Michael Robertson explains the thinking behind the new services: 'I can go to work, I can go to my home, I can go to my hotel room—anywhere where I have Net connectivity—and have access to my entire music collection'. Meanwhile, Jupiter Communications analyst Aram Sinnreich paints the bigger picture as he sees it: 'These programs are likely to push along the inevitable drift of consumers toward music less as a physical product and more as digital sound. This is going to be a driver for consumers accepting that psychologically.' The advent of networked music downloading to computers, and the associated jukebox-database approach to music storage and access which is becoming a natural way of handling music for today's younger generations, are indeed introducing something new at the vanguard of a post-CD, network-centric future, maybe. And meanwhile physical media are perhaps shrinking towards invisibility. From the 12-inch vinyl LP to the 12cm shiny silver disc to the 6.5cm MiniDisc on down to postage stamp-sized flash memory cards, the trend is for ever-smaller media. Currently CD-R/RW and DVD-Video are unleashing a boom in shiny silver disc sales, but the diverse market for flash memory cards (which can be used in all manner of compact portable devices, from mobile phones to digital cameras, PDAs to portable digital audio players) is by all reckonings set to take off, with memory (but not physical) size scaling up while prices fall (and it has to be said that currently CD-R/RW, let alone DVD-R, is hands-down winner on both price and storage capacity, and will continue to be so for some time). Interestingly, veteran recordable media manufacturer Memorex, which hasn't survived by not changing with the times, announced at the CES show in January that it was entering the flash memory card market with card lines in the two main formats, CompactFlash and SmartMedia. Speaking at the launch, Memorex president Michael Golacinski commented that 'Memorex has made a huge commitment to this explosive new media category with an expansion of manufacturing capabilities. We're the first major consumer brand to embrace the category, and we're excited about its rapid acceptance and future expansion'.

Sony is also making headway with its 'bubble-gum-sized' Memory Stick flash memory cards. With their elongated shape, the cards are used to perhaps most striking effect in the company's VAIO Music Clip portable music player, which looks more like a pen than a music player. But the award for most daft-inspired portable digital audio device has to go to Casio's MP3 wristwatch, introduced at CES. Yes, a real, functioning wristwatch which just happens to double as an MP3 player, complete with built-in 26Mb, 32Mb or 64Mb flash memory, a USB port for downloading tracks from a computer, and >

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< of course an audio output for plugging in a pair of stereo earphones (supplied). Dick Tracy eat your heart out. While it can (perhaps too) easily be written off as mere gimmickry, Casio's wizardly watch cum music player should provide a timely reminder, so to speak, that music playback technology is no longer in Kansas. Bear in mind that 64Mb of memory can hold a CD's worth of MP3 music tracks encoded at 128kbps. As built-in memory, of course, the Casio watch's 64Mb has to be re-used. But it's also the case that at today's prices the plug-in cards which other portable MP3 players can take are just too expensive not to re-use. But then with today's jukebox software and digital downloading via USB, it's easy to put together new track playlists and download a different set of tracks into a player. Another development in downloadable music is online distribution to retail outlets. Digital On-Demand and its RedDotNet system is leading the way Stateside with its ATM-based secure digital distribution network. The company has reached agreements with both EMI and Sony Music on the distribution side, along with specialist music retailers such as Virgin and Wherehouse as well as mass goods merchants such as Kmart on the retail side.

The advantage of this approach to record companies worried about online music piracy is that they get the advantages of online digital distribution in an enclosed network environment, and the punters only get hold of the music once it's been burned to CD or copied onto some other format such as MD or flash memory card (the system supports digital downloads to SDMI-compatible devices). Digital On-Demand puts its preview and distribution stations into record stores or other participating retail outlets, customers browse and search for music via previews then place their order. If the requested album is cached in-store (for instance, if it's been downloaded recently or it's a popular album) then a physical copy can be generated and packaging printed up in-store without recourse to the network. Otherwise it will be downloaded from a central server (a quick process on Digital On-Demand's dedicated high-bandwidth network). This system enables traditional record retailers to get into the digital download loop, where otherwise they were being squeezed out by the Internet. A potential advantage is that record stores can carry a much larger digital-networked stock than they can physical stock, which may attract more customers, who in turn may be willing to wait 10 minutes for a CD to be burnt if it means they end up with an album they otherwise wouldn't have been able to get hold of. On the other hand, RedDotNet also gives the same advantage to other retailers whose main business isn't selling music.

Much closer to home, Arcadia Group, one of the world's largest fashion retailers, recently announced that it is working with Liquid Audio to create a new in-store, kiosk-based music service called Chemistry in its flagship Top-Shop-TopMan store at Oxford Circus in London. The service, which will be the first multikiosk digital music service in the UK, is being aimed at 15–24-year olds, the shop's key consumer base, and will allow customers to preview and purchase digital download tracks and create custom music CDs. Liquid Audio will provide the kiosk software and virtual fulfilment with a regularly updated music catalogue, and will also handle the e-commerce transactions. The CD-R technology, including full-colour label printing, will be provided by CD-R system specialists Rimage. Liquid Audio and Rimage have worked together previously to provide a similar music-on-demand kiosk system in a cyber-cafe in Seoul, Korea (not so surprising as it may seem - Korea has

emerged as a hothouse of MP3 player and online music technology development). Whether the London venture will be successful remains to be seen. London-based online music pioneer Cerberus has tried the in-store kiosk approach before in conjunction with Levis' flagship central London store, an experiment which didn't exactly set the world of downloadable music alight.

Cerberus and Liquid Audio were of course the two pioneers of secure online music download technology back in the mid-nineties. While Cerberus seems to have faded away, Liquid Audio has done a fine job of rolling with the flow of the rapidly changing online music landscape and maintaining its role as a significant player in the market. Meanwhile, the AT&T-backed a2b music, which championed the MPEG AAC encoding format, also appears to have faded from the stage, seemingly having never recovered from the blow of losing its two founders and around half its staff to digital rights management company Reciprocal last year. But undoubtedly the biggest development has been Microsoft's full-on entry into the streaming media market with Windows Media Technologies 4, a full-blown streaming audio and video, downloadable audio, and digital rights management technology package. As well as championing the take-up of broadband technology and the development of broadband content, Microsoft has been striking deals left, right and >

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< centre to establish its technology, and predictably has turned itself into a major player in the online audio marketplace—helped, inevitably, by the presence it was able to give its technology in the Windows OS. BMG, EMI and Sony have all announced support for Windows Media audio and-or video to deliver content online, and Sony has said that it will build Windows Media support into its portable audio devices and work with Microsoft on interoperabiltiy between Windows Media and its own OpenMG copyright protection technology.

Most recently, Microsoft has struck two major deals, one to establish Windows Media as the digital media platform of choice for T-Online, Germany's largest ISP with 4.15m subscribers, the other to incorporate Windows Media Audio support into Liquid Audio's music system. The Liquid Audio deal will see Liquid's catalogue of 50,000 downloadable songs and one million music previews encoded and distributed in Windows Media format: in addition, Liquid Audio will deploy Windows Media servers in its data centres, and integrate Windows Media's anti piracy features such as watermarking and encryption into its own IP rights management and reporting technologies.

As far as music compression formats are concerned, Liquid Audio is format-agnostic—one reason for its continued success. The company started out with Dolby Digital, then added MPEG AAC support, then MP3, and now not only Windows Media Audio but also Sony's ATRAC3 format. ATRAC3 provides around twice the data reduction of the ATRAC format used for MiniDisc: the newer version supports multiple bit rates, with 132kbps providing around 10:1 compression. In a deal struck with Sony, Liquid Audio will also add support for Sony's OpenMG copy protection technology and provide a custom-branded version of the Liquid Music Player that will be available to buyers of Sony's new VAIO Music Clip and Memory Stick Walkman devices. Liquid Audio also saw the importance last year of ensuring that its technology had a presence in the fast-growing portable player market, and developed and freely licensed the Secure Portable Player Platform (SP3) to help hardware manufacturers integrate Liquid Audio support into their players: currently the company is working with 12 manufacturers, including Sanyo, Toshiba, HP and S3 Diamond. Liquid Audio is also allied with e.digital, a company that has developed an SDMI (Secure Digital Music Initiative)-compliant multi-codec and multi-DRM (Digital Rights Management) Internet music player design built on a Texas Instruments DSP chip, with support for CompactFlash and the new Secure Digital memory cards as well as IBM's 340Mb Microdrive for storage. Codecs supported include Dolby Digital, MPEG AAC, MP3, Windows Media Audio, and Lucent's EPAC. e.digital's design could well become the basis of the next generation of portable audio players.

Meanwhile, MP3 is still the populist online downloadable music format of choice. As well as being championed by Emusic.com, it received a major boost last year when RealNetworks bought Xing for the company's MP3 expertise and integrated MP3 file ripping, encoding and playback support into its RealJukebox software. Given that Microsoft is RealNetworks' chief competition in streaming media, the company needed to look to an alternative to Windows Media for downloadable audio, and that meant MP3. There again, MP3 is so prevalent that Windows Media Audio, Liquid Audio, and Sony's VAIO Music Clip and Memory Stick Walkman all support MP3 file playback, no doubt more out of pragmatism than enthusiasm. For the components of a post-MP3, SDMI Phase II online music world in which the majors will finally be happy to deliver their secure, copy-restricted music are falling into place. Interestingly, a recent review of Sony's Music Clip praised it for its design cool but slated it for its poorly designed and unnecessarily complicated and restrictive OpenMG music management software. Teething troubles or a sign of a deeper malaise?

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Listen and Learn

Whether you are listening to bird song or a heavyweight monitoring system your ears play a larger role than you may imagine. **Philip Newell** examines your ears

AROUND A HUNDRED YEARS ago Lord Rayleigh wrote: 'The sensation of a sound is a thing *sui generis*, not comparable with any of our other senses. Directly or indirectly, all questions concerned with this subject must come for decision to the ear... and from it, there can be no appeal'. Sir James Jeans concluded his book *Science & Music* (Cambridge University Press, 1937) with the sentence 'Students of evolution in the animal world tell us that the ear was the last of the sense organs to arrive; it is beyond question the most intricate and the most wonderful'.

Just how individual and how wonderful our hearing is can be readily understood from a few basic facts. The spectrum of visible light spans about one octave, whereas the spectrum of our audible perception range spans around 11 octaves. Thought of another way, the upper and lower limits of visible light span a frequency range of about 2:1, whereas the upper and lower limits of hearing span a frequency range of around 1000:1. What is more, the sound power difference between the faintest perceivable sound and the threshold of pain is in excess of 1012, or one million million to one (Yes, 1,000,000,000,000:1). The displacement of the ear drum when listening to those quietest perceivable sounds is around one-hundredth of the diameter of a hydrogen molecule, and even a tone of 1kHz at a level of 70dB still displaces the ear drum by less than one-millionth of an inch. Add to all these points the fact that our pinnae (outer ears) are as individual in their shape as our fingerprints, and one has a recipe for great variability in human auditory perception as a whole, because the ability to perceive minute differences is so great.

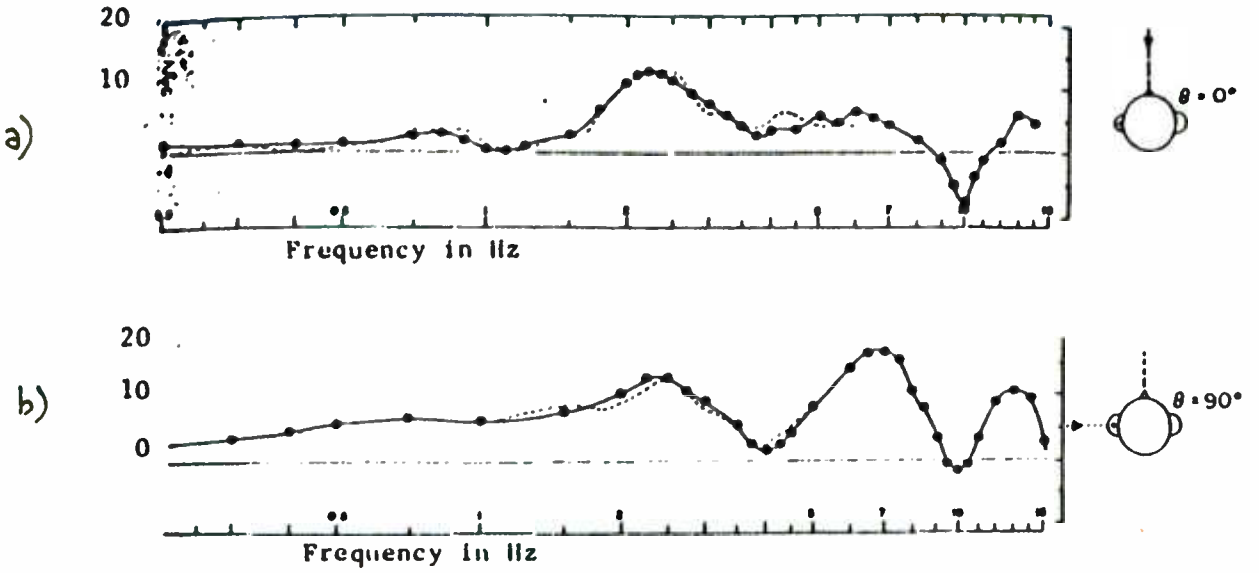
In fact, if the ear was only about 10dB more sensitive than it is, we would hear a permanent hiss, of random noise, due to detection of the Brownian motion of the air molecules. Some people can detect pitch changes of as little as 1/5th of a semitone (as reported by Seashore). Clearly there is much variability in all of this from individual to individual, and one test carried out on 16 professionals at the Royal Opera, Vienna, showed a 10:1 variability in pitch sensitivity from the most sensitive to the least sensitive. What is more, ears all produce their own nonlinear distortions, both in the form of harmonic and intermodulation distortions. I had one good friend who liked music when played quietly, but at around 85dB SPL she would put her hands to her ears and beg for it to be turned down. It appeared that above a certain level, her auditory system clipped, and at that point all hell broke loose inside her head.

Of course, we still cannot enter each other's brains, so the argument about whether we all perceive the colour blue in the same way cannot be answered. Similarly we cannot know that we perceive what other people hear when listening to similar sounds under similar circumstances. We are, however, now capable of taking very accurate in-ear measurements, and the suggestions from the findings is that what arrives at the eardrums of different people is clearly not the same, whereas what enters different people's eyes to all intents and purposes is the same. Some people may be colour blind, while others may be long-sighted, short-sighted, or may have one or a combination of numerous other sight anomalies, nevertheless what arrives at the eye, as the sensory organ of sight, is largely the same for all of us. On the other hand, if we take the tympanic membrane (the ear drum) as being the 'front-end' of our auditory system, no such commonality exists. Indeed, even if we extend our concept of the front-end to some arbitrary point at, or in front of, our pinnae, things will still not be the same from person to person because we all have different shapes and sizes of heads and hair styles. This inevitably means that the entrance to our ear canals are separated by different distances, and have different shapes and textures of objects between them. Given the additional diffraction and reflection effects from our torsos, the answer to the question of whether we all 'see the same blue' in the auditory domain seems to be clearly 'no', because even what reaches our ear drums is individual to each of us, let alone how our brains' perceive the sounds

At around 85dB SPL she would put her hands to her ears and beg for it to be turned down. It appeared that above a certain level, her auditory system clipped, and at that point all hell broke loose

There is abundant evidence to suggest that many aspects of our hearing are common to almost all of us, and this implies that there is a certain amount of 'hard-wiring' in our brains which predisposes us towards perceiving similar sensations from certain stimuli. Nevertheless, this does not preclude the possibility that some aspects of our auditory perception may be inherited, and that there may be a degree of variability even in these genetically influenced features. Aside from physical damage to our hearing system, there may also be cultural or environmental aspects of our lives which give rise to some of us developing different levels of acuteness in specific aspects of our hearing, or that some aspects may be learned from repeated exposure to certain stimuli.

It would really appear to be stretching our ideas of the evolutionary process beyond reason, though, to presume that the gene pairings which code our pinnae could somehow be linked to the gene pairings which code any variables in our auditory perception systems. Furthermore, it would seem totally unreasonable to expect that if any such links did exist, that they could function in such a way that one process could complement the other such that all our overall perceptions of sound were equal. In fact, back in the >

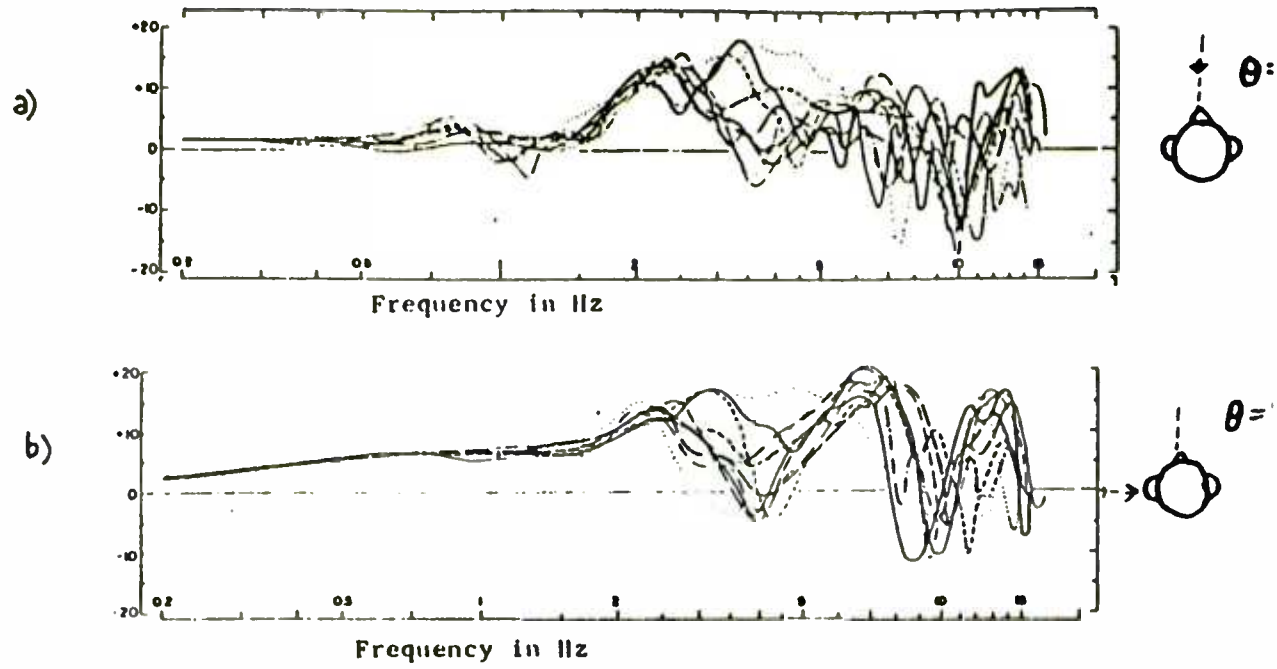


Figs 1a and 1b. Shaw's data showing the ratio (in dB) of the sound pressure at the ear canal entrance to the free field sound pressure. The Curves are the averages of ten responses. Fig 1a shows the average response for a sound source at 0° azimuth and Fig 1b shows the average response for a sound source at 90° azimuth

< seventies, experiments were carried out (which will be discussed in later paragraphs) which more or less conclusively proved that this could not be the case. Almost without doubt, we do not all hear sounds in the same way, and hence there will almost certainly always be a degree of subjectivity in the judgement and choice of studio monitoring systems. There will be an even greater degree of variability in our choice of optimum hi-fi loudspeakers, which tend to be used in much less acoustically controlled surroundings.

In fact, many people seem to be of the opinion that we all hear the recordings at their best if our own pinnae mouldings are used, but this is not necessarily the case

Much has been written about the use of dummy head recording techniques for binaural stereo, and it has also been frequently stated that most people tend to perceive the recordings as sounding more natural when they are made via mouldings of their own pinnae. In fact, many people seem to be of the opinion that we all hear the recordings at their best if our own pinnae mouldings are used, but this is not necessarily the case. It is true that the perception may



Figs 2a and 2b. Shaw's data showing the ratio (in dB) of the sound pressure at the ear canal entrance to the free field sound pressure. Fig.2a shows the response for each of the ten subjects for a sound source at 0° azimuth. Fig.2b shows the response for a sound source at 90° azimuth

be deemed more natural, by reference to what we hear from day to day, but it is also true that some people naturally hear certain aspects of sound more clearly than others. In my first book, *Studio Monitoring Design*[1], I related a story about being called to a studio by its owner, to explain why hi-hats tended to travel in an arc when panned between the loudspeakers; seeming to come from a point somewhere above the control room window when centrally panned. The owner had first begun to use one of my rather reflection-free control rooms, in which the recordings are rendered somewhat bare. On visiting the studio, all that I heard was a left-to-right, horizontal pan. We simply had different pinnae.

In a well-known AES paper, and in her PhD thesis, the late Puddie Rodgers[2,3] described in detail how early reflections from mixing consoles, or other equipment, could cause response dips which mimicked those created by the internal reflections from the folds and cavities of different pinnae when receiving cues from different directions, and which give rise to our ability to discriminate source direction. In other words, a very early reflection from the surface of a mixing console could cause comb filtering of a loudspeaker response which could closely resemble the in-ear reflections which may cause a listener to believe that the sound was coming from a direction other than that from which it was actually arriving. Median plane vertical perception is very variable from individual to individual, and in the case mentioned in the last paragraph, there is almost certainly some source of reflection which gave >

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< the studio owner a sensation of the high frequencies arriving from a vertically higher source, while I was left with no such sensation.

In the 'Letters' of the October 1994 *Studio Sound*, recording engineer Tony Batchelor very courageously admitted that he believed that he had difficulty in perceiving what other people said stereo should be like. He went on to add, though, that at a demonstration of Ambisonics he received 'a unique listening experience'. Clearly to Tony Batchelor, stereo imaging would not be at the top of his list of priorities for his home hi-fi system, yet he may be very sensitive to intermodulation distortions, or frequency imbalances, to a degree that would cause no concern to many other people.

Belendiuk and Butler[4] concluded from their experiments with 45 subjects that 'there exists a pattern of spectral cues for median sagittal plane positioned sounds common to all listeners'. In order to prove this hypothesis, they conducted an experiment in which sounds were emitted from different, numbered, loudspeakers, and the listeners were asked to say from which loudspeaker the sound was emanating. They then made binaural recordings via moulds of the actual outer ears of four of the listeners, and asked them to repeat the test, via headphones, of the recordings made using their own pinnae. The headphone results were very similar to the direct results, suggesting that the recordings were representative of 'live' listening. Not all the subjects were equally accurate in their correct choices, though, with some, in both their live and recorded tests, scoring better than others in terms of identifying the correct source position. Very interestingly, when the tests were repeated with each subject listening via the pinnae recordings of the three other subjects in turn, the experimenters noted 'that some pinnae, in their role of transforming the spectra of the soundfield, provided more adequate (positional) cues... than do others'. Some people who scored low in both the live and recorded tests, using their own pinnae, could locate more accurately via other peoples' pinnae. Conversely, via some pinnae, none of the subjects could locate very accurately. The above experiments were carried out in the vertical plane. Morimoto and Ando[5], on the other hand, found that, in the horizontal plane, subjects generally made fewer errors using their own head-related transfer functions (HRTFs) —via recordings using simulations of their own pinnae and bodies. What all the relevant reports seem to have shown, over the years, is that different pinnae are differently perceived, and the whole HRTF is quite distinct from one person to another. All of these differences relate to the different perceptions of different soundfields.

Studio Monitoring Design[1] also relates the true story of two well respected recording engineers who could not agree on the 'correct' amount of high frequencies from a monitor loudspeaker system which gave the most accurate reproduction when compared to a live cello. They disagreed by a full 3dB at 6kHz, but this disagreement was clearly not related to their own absolute high frequency sensitivities, because they were comparing the sound of the monitors to a live source. The only apparent explanation to this is that because the live instrument and the loudspeakers produced different soundfields, the perception of the sound field was different for each listener. >

Nevertheless, the last 20 years have seen great strides made in the understanding of our auditory perception systems, and this has been a great spur to the advancement of loudspeaker and control room designs

< Clearly, all the high frequencies from the loudspeaker came from one very small source, the tweeter, while the high frequency distribution from the instrument was from many points such as the strings and various parts of the body. The 'highs' from the cello therefore emanated from a distributed source having a much greater area than the tweeter. Of course, the microphone could add its own frequency tailoring and one-dimensionality, but there would seem to be no reason why this should differ from one listener to another. So, given the previous discussion about pinnae transformations and the different HRTFs as they relate to sounds arriving from different directions, it does not seem too surprising that sound sources with spatially different origins may result in spectrally different perceptions for different people. Tony Batchelor's statements about his not being able to appreciate stereo yet readily perceiving Ambisonic presentations of spatial effects would seem to be strongly related to aspects of the soundfield. He and I would no doubt attach different degrees of importance to the horizontal effects of stereo if working on a joint production. Martin Young (the aforementioned studio owner) and I clearly had different vertical perception when panning a hi-hat; and the two well-known engineers, who perhaps I should not name, could not agree on a natural high-frequency level in a live versus loudspeaker test.

When any reproduction system creates any imbalance in any of its characteristics, as compared to a natural event, the aforementioned human variables will inevitably dictate that any shortcomings in the reproduction system will elicit different opinions

The implications of all this would suggest that unless we can reproduce an accurate sound field, we will never have anything approaching universal agreement on the question of 'the most accurate' monitoring systems. Add to this a good degree of personal preference for different concepts of what constitutes a good sound, and it would appear that some degree of monitoring and control room variability will be with us for the foreseeable future. Nevertheless, the last 20 years have seen great strides made in the understanding of our auditory perception systems, and this has been a great spur to the advancement of loudspeaker and control room designs. As far as it has gone, though, we have still barely seen the tip of the iceberg, so it will be interesting to see what the 21st Century can reveal.

To close, let us look at some data that has been with us for 35 years, or more. The plots shown in Fig.1 and Fig.2 were taken from work by Shaw[6]. Fig.1 shows the average, in-ear-canal, 0° and 90° responses for 10 people. Note how the ear canal receives a very different spectrum depending upon the direction of arrival of the sound. Fig.2, however, shows the 10 individual sources from which Fig.1 was derived. The differences from person to person are hardly subtle, and the response from one direction thus cannot be inferred from the response from a different direction.

Given these differences, and all of the aspects of frequency discrimination, distortion sensitivity, spectral response differences, directional response differences, psychological differences, environmental differences, cultural differences, and so forth, it would be almost absurd to expect that we do all perceive the same balance of characteristics from any given sound. True, whatever we each individually hear is natural to each one of us, but when any reproduction system creates any imbalance in any of its characteristics, as compared to a natural event, the aforementioned human variables will inevitably dictate that any shortcomings in the reproduction system will elicit different opinions, vis-a-vis the accuracy of reproduction, from different people. So, to the question of whether it is more important to reduce the harmonic distortion in a system by 0.02%, or the phase accuracy by 5° at 15kHz could well be an entirely personal matter, and no amount of general discussion could reach any universal consensus. No, Lord Rayleigh was right; the sensation of sound is a thing, *sui generis*. Note to non-native English or Latin speakers: '*sui generis*—of its own type', indeed. ■

References

1. Philip Newell, *Studio Monitoring Design*, Focal Press, Oxford, UK, and Boston USA, (1995).
2. Carolyn Alexander Rodgers, PhD Thesis, *Multidimensional Localisation*, Northwestern University, Evanston, Illinois, USA, (1981).
3. CA Puddie Rodgers, 'Pinna Transformations and Sound Reproduction', Journal of the Audio Engineering Society, Vol.29, No.4, pp226–234, (April 1981).
4. Belendiuk, K, and Butler, RA, 'Directional Hearing under Progressive Improvement of Binaural Cues, Sensory Processes, 2, pp58–70, (1978).
5. Morimoto, M, and Ando, Y, 'Simulation of Sound Localisation', presented at the Symposium of Sound Localisation, Guelph, Canada, (1979).
6. Shaw, EAG, 'Ear Canal Pressure Generated by a Free Field Sound', Journal of the Acoustical Society of America, Vol.39, No.3, pp465–470, (1966).

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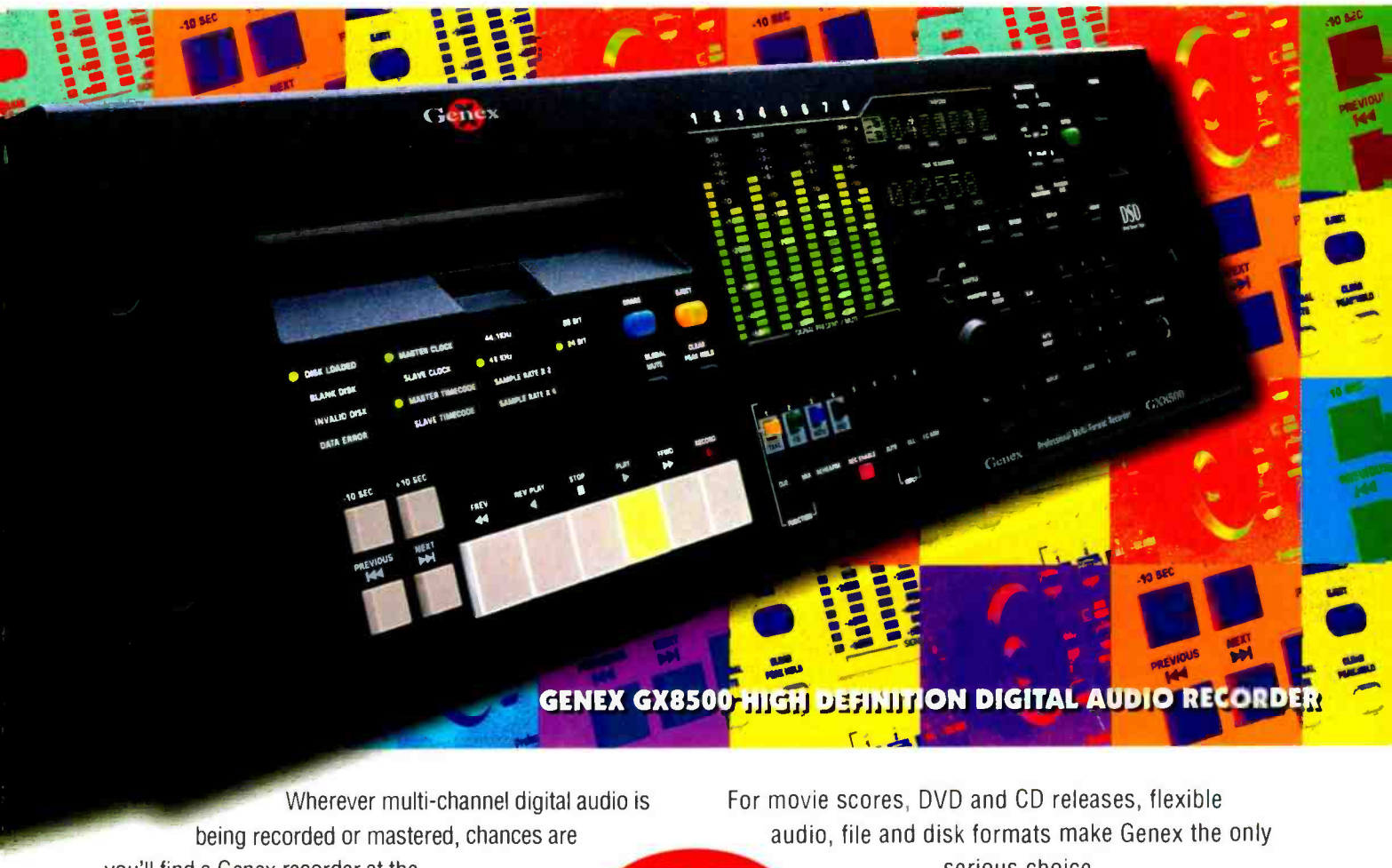

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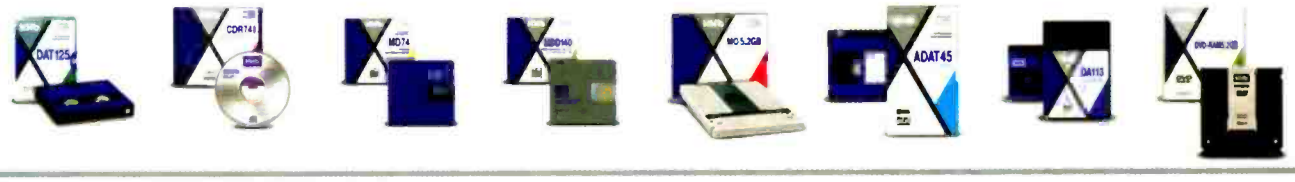

Sample session

Blurring the distinction between recorder and synthesiser, the sampler is now an integral part of most recording studios. **Derek Johnson** and **Debbie Poyser** round up what's current

AS BEFITS a technology that has become so all-encompassing in recent years, sampling now takes more forms than ever before. Professional studio rackmounts, dance-orientated groove machines, comprehensive sampling features built into synth workstations, and now, increasingly, software samplers for powerful desktop computers, are all available. At the same time as this diversification has occurred in response to perceived needs in different market sectors, the cost of serious studio samplers has fallen precipitously. The most serious, capable units now sell for a fraction of the price pro samplers commanded ten years ago, and as the features deemed essential for professional use cascade down the manufacturers' ranges, so it has become possible to pay a lot less for a sampler worth its salt, even buying from the middle ranks rather than the top of the range.

For many, Akai remains the name of choice. The deluxe new-generation S6000, with reworked graphic interface, brings a feeling of quality to any recording environment, its detachable, remote-style display hosting a huge LCD. For convenience this feature is hard to beat, when one considers that samplers are usually racked out of the way, and it taps into the average engineer or musician's love of gadgetry, too. The S6000 is also as good as it gets in terms of RAM capacity (a gargantuan 256Mb, from an 8Mb base), polyphony (128 notes), multitimbrality (32 parts), and audio outputs (18). Wordclock input and SPDIF and AES-EBU digital I-O are standard, while a dual ADAT option adds this important multitrack interface. Akai's powerful 20-bit effects, offering two multi-effect and two reverb blocks, augment the machine's capabilities, as do 3-band digital EQ, stereo phase-coherent time-stretch algorithms borrowed from the DD1500 DAW, and synthesis facilities. These comprise two LFOs, three EGs, and 26 types of digital filtering, with resonance. It's possible to attach an ASCII keyboard for naming, and direct-to-disk recording further enhances the 6000's flexibility. The S6000 pioneers a new approach to sample formats, too: its native format is the WAV standard, though it can read S1000-S3000 samples and E-mu EIII CD-ROMs.

Buying into the Akai range at a lower point (£1,000 lower in the UK), you still find power and facilities to spare. The S5000 has half the 6000's polyphony and outputs as standard, and effects are optional, but upgrades can bring it to 6000 spec, with the exception of the detachable display—the 5000's is the same size, but fixed. Below the A5000 is the long-lived S3000XL, once at the top of the range. Though it's not new-style Akai it remains thoroughly respectable, with a 64Mb RAM capacity (including a 32Mb Flash RAM slot), 32-note polyphony, 16-part multitimbrality, optional effects, and the ability to read Roland and E-mu samples. Top sample rate, however, is 44.1kHz to the 48kHz of the newer models, and though an SPDIF connection is fitted AES-EBU isn't supported.

> It has become possible to pay a lot less for a sampler worth its salt, even buying from the middle ranks rather than the top of the range

Topping E-mu's range is the E4XT Ultra, which matches much of the S6000's basic spec. It can be stuffed with up to 128Mb RAM, but ships with a generous 64Mb. Audio outputs, however, number just eight, though an upgrade doubles this complement. Polyphony of 128 voices and 32-part multitimbrality are easily up to scratch, and as well as featuring serviceable effects as standard the E4XT accepts E-mu's R-Chip effects upgrade for improved signal processing. Wordclock and AES-EBU provision is made (ADAT interfacing is optional), an ASCII keyboard can be connected, and there's a useful 48-track SMF-compatible sequencer on board. The E4XT reads AIFFs and WAVs from diskette, as well as importing Roland S700-series and Akai S1000-1100-3000 libraries. E-mu samplers have historically been appreciated for their synthesis powers: the E4XT Ultra boasts Z-plane filters derived from the innovative Morpheus audio-morphing synth, three EGs, two LFOs, and Digital Modular Synthesis architecture, which allows the creation of complex, modular synth-like routeings within the sampler. Other ways of manipulating samples include Beat Munging, a DSP process that changes a loop's feel in real time.

The E-Synth Ultra has been given a twist with 16Mb of general-purpose ROM sounds, in addition to 16Mb sample RAM. Total RAM capacity is 128Mb, and in most other respects the E-Synth is comparable to the E4XT. Where it falls short (64 voices rather than 128), it can be upgraded, and like the other Ultra machines accepts R-Chip effects and additional sound ROMs. Coming a little further down the scale, the e6400 Ultra competes with the S5000 on price. No digital I-O or wordclock is provided, and the machine has just one set of MIDI I-O, while polyphony is half that of the E4XT—but, as with the E-Synth, the e6400 Ultra can be upgraded to E4XT spec.

The professional sampler market's current young pretender is undoubtedly Yamaha, who recently made a successful return after years of absence. The cost-effective A3000 has been superseded by the A5000 and A4000, which seem equally keenly priced considering their capabilities. (E-mu has since hit back at the inexpensive A4000 with their own budget contender, the ESI2000.) The flagship A5000 offers a large graphic LCD, 126-voice polyphony, 32-part multitimbrality, and a 128Mb RAM capacity, though just 4Mb is supplied. Digital I-O isn't provided, but a cheap upgrade features coaxial and optical SPDIF, also adding a 48kHz sample rate, and six extra analogue outs to the A5000's existing four. There is no wordclock option, but the unit's advantages include wide sample-format compatibility (Akai, E-mu, Roland, WAV and AIFF), free waveform editor, generous effects, and sample-processing tools. The last includes resonant filtering, LFOs, EGs, DSP facilities, and the adventurous loop divide-loop remix. A Zip can replace the diskette drive, and there's a CD-burning option if the sampler is connected to a SCSI CD writer. The lower-cost A4000 halves effect capability, polyphony and multitimbrality, compared to the A5000, and isn't upgradable later, but still accepts the digital-output expansion and is otherwise similar to the A5000. ■

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Otterino Respighi's 'Pines of Rome' expressed by flying whales

Fantasia 2000

Sixty years after Disney's most controversial cartoon appeared on the big screen, **Richard Buskin** views a picture that, in addition to its 35mm release, has the distinction of being the first ever I-MAX animated feature

OPINIONS ARE DIVIDED with regard to *Fantasia*, Walt Disney's 8-part fusion of music and animation that began production in 1937 and was premiered in 1940. Disappointing box office returns upon its initial release appeared to confirm that a large section of the general public was as disinterested as music buffs were disenchanted by images of hippos and alligators dancing along to classical works.

Performed by the Philadelphia Orchestra and conducted by Leopold Stokowski, said pieces were also edited down in order to match the popular entertainment medium, further alienating the purists. Nevertheless, sequences such as 'The Sorcerer's Apprentice' (starring Mickey Mouse), 'Dance of the Hours' (with the hippos and alligators), 'The Rite of Spring' (which features dinosaurs stalking the earth), and 'A Night on Bald Mountain' (with the hellish Chernobog), have gained popularity with age, while the film itself was also notable for its innovative use of multichannel stereophonic sound.

At the time, Disney envisaged his classical spectacular as a permanent work-in progress—with each successive rerelease it would combine some new sequences with a few old favourites. Perhaps due to its mixed reception, this never happened and it would be more than half a century—and nearly three decades after his legendary uncle's passing—before Walt's nephew Roy E Disney initiated the sequel. At that point, during the early nineties, the concept was to retain 'The Sorcerer's Apprentice', 'Nutcracker' and 'Dance of the Hours', and devise several new sequences for what was initially being referred to as *Fantasia 2* and *Fantasia Continued*. Numerous ideas were considered, most were discarded, but in the summer of 1993, under the auspices of the film's producer Don Ernst, and after settling upon the peerless combination of maestro James Levine conducting the Chicago Symphony Orchestra with Jay Saks as producer, work began on Ottorino Respighi's 'Pines of Rome', with Hendel Butoy directing the animation while the music was recorded at Chicago's oversized but acoustically rewarding Medina Temple.

Throughout the rest of the decade, as digital technology evolved from 16 to 24-bit, more new sequences were devised, 'Nutcracker' and 'Dance of the Hours' were discarded and the feature took on the revised working title of *Fantasia 97* which gives some indication of how much over-schedule the project eventually ran. Indeed, the animated realisation of George Gershwin's 'Rhapsody in Blue', which had originally been conceived as a totally independent Disney short, was incorporated into the film as late as 1998, with a studio orchestra being recorded at MGM in Los Angeles under the guidance of conductor-producer Bruce Broughton.

As for 'The Sorcerer's Apprentice', the original tracks had been transferred from optical to 4-track mag tape during the early fifties, and it was this which engineers at Sony in New York had to work with. Given the Sonic Solutions No-Noise treatment, the tracks were basically put in alignment as much as possible in order to eliminate the inherent phasiness. Consequently, while this segment is audibly not cut from the same cloth as the rest of the picture, it still stands up as one of the stronger pieces.

Whereas a record producer ordinarily helps to arrange the music and attempts to coax the best performance out of the artist, in the case of classical recordings much of this work is taken care of by the conductor. Therefore, the producer largely serves as a second pair of ears to monitor everything that is going on, and this, for the most part, was the role fulfilled by Jay Saks in conjunction with maestro James Levine for *Fantasia 2000*.

'Theoretically, one wouldn't need a producer if the players sat down, performed one take through from start to end, and it was perfect,' says Saks. 'However, that just never happens. There again, another reason I was there is that there would be a room full of people from Disney in various capacities, and rather than have half a dozen

of them trying to communicate with the conductor all at once—and not speaking the classical music lingo—they often need somebody to act as their interpreter and go-between.

'Right from the start the Disney people knew that this was going to be a long-term project,' Saks continues, 'but I don't think they ever knew that it was going to be this long-term. Our original release date was specified as 1996, and then it crept later, and later, and later. Pieces were added and subtracted as we went along, and recording sessions were scheduled intermittently between 1993 and 1997. In turn, these were pretty straightforward. Levine knew very clearly what the animators wanted—they had shown him all of the storyboards and he therefore knew the purpose of each piece of music and how it fit into the film.

'The musicians, on the other hand, weren't probably as aware of all that. Occasionally, Levine would mention it to them if he thought it would enhance their performance of a certain section, but I'm sure none of them had the slightest notion that 'Pines of Rome' would be about whales. You know, these musicians are notoriously hard-boiled. They have a standard they want to uphold, they don't tolerate fools, and they all feel very dignified and so on, but at the same time I think they were also very conscious of their contribution to what could be an historic film. So, with them it all comes down to 'Should we do it fast or slow, loud or soft?' and 'Can I phrase it this way?' without so much knowing that Mickey Mouse is going to grin or the whale is going to break through the ice. They just played the tunes, so to speak, and they played them very well.'

In addition to recording the music, recording engineer Shawn Murphy made the final mix for film and CD, and then handed the results over to head rerecording mixer Terry Porter for integration with the interstitial material.

'In terms of the technology, we actually thought ahead a little bit,' Murphy recalls. 'During the time that we started making the recordings, Sony Classical in New York had a system of bit-splitting to acquire first 20 and then 24-bit resolution on a multitrack machine. I'd already used that system on some recordings that I had done for them, and so I asked them if it would be possible to use it for *Fantasia*, and they said, "Okay". Originally it was only eight tracks of bit-splits, so eight tracks wound up taking 16 tracks of a Sony 3348, and we therefore had 40 tracks available to us; 32 16-bit tracks and eight 20-bit tracks on the first few sessions, and then 24-bit tracks later on. As a result, all of our main mics—which is really the bulk of what you hear—are all 20 or 24-bit original material. It was just one of those happy events that we were able to get a system together that early, because that was quite some time before any normal bit-splitter or hardware existed anywhere in the world.'

Nevertheless, for Shawn Murphy one of the main challenges of the *Fantasia 2000* project was consistency; to come up with a recording plan and a venue that would sound good and be consistent throughout what was always perceived as a long-term project. Then again, another challenge was to provide the animators with enough flexibility to basically isolate certain orchestral instruments should they elect to animate to them, while still maintaining a symphonic picture of the work.

'This meant not going as far as the original *Fantasia* in terms of isolation,' says Murphy, 'but to just have the ability—through careful seating and placement—to emphasise things if need be.'

Another consideration was the ability, following Jay Saks' and Ken Hahn's own editorial work, to put things in a format that would facilitate the remixing and dubbing of the musical material further down the road.

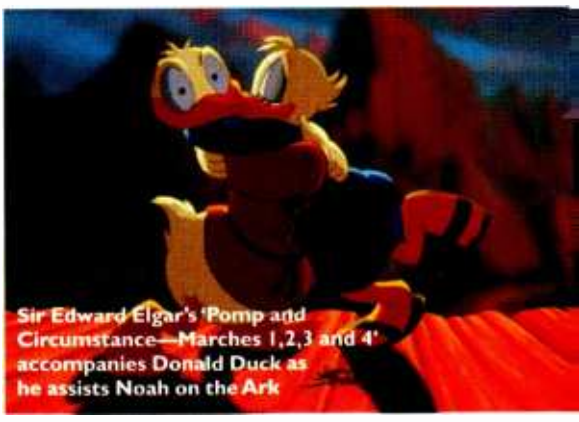
'Even in 1993 and 1994 we didn't know what the release format would be,' says Murphy. 'It was prior to SDDS, Dolby Digital was still in its infancy, and DTS had just come in with *Jurassic Park*. So, we knew it was probably going to be a 5.1 mix, whereas the I-MAX thing, of course, came in very late and we didn't really make much allowance for that. Had I known about it a lot earlier I don't think the main pick-up would have been much different, but I probably would have asked for some additional isolation on things which, at least on the story-boards, were looking to have height information.'

This being due to the fact that the sonic difference between I-MAX and 5.1 is the addition of a top speaker, often referred to as the 'Voice of God'.

'When we made the rerecording mix we elected certain percussive or woodwind elements that tended to work with the picture there,' Murphy continues. 'We isolated those on another set of tracks on the MMR8 that we gave to Terry [Porter], so that if they decided to stay with that idea—and they subsequently did in only a few cases—he had that separate. We therefore made the mix all the way through the piece to everyone's satisfaction—animator, Don Ernst, Roy Disney—and then we went back with the animator and Don and isolated certain multitrack elements to put in that extra 5.1 unit which also had a top speaker.'

The reasons for recording inside Chicago's downtown Medina Temple were two-fold. For one thing, both Shawn Murphy and Jay Saks were very impressed by the classical recordings that Decca had already made there, and for another, the CSO's Orchestra Hall was due to undergo renovation.

'I didn't want to get involved in two Orchestra Halls—in the before and after—and also have to use a third venue while Orchestra Hall was under construction,' says Murphy. 'We would have been dealing with two or three different acoustics, and I'm sure it would have been no better and probably worse than what I wound up having. >



Sir Edward Elgar's 'Pomp and Circumstance—Marches 1,2,3 and 4' accompanies Donald Duck as he assists Noah on the Ark

George Gersh... 'Rhapsody in ...' an Hirschfield-style Manhattan Jazz ...ge

Paul Dukas' 'The Sorcerer's Apprentice' was the genesis of Fantasia back in 1937

< 'The Temple is very large—it has 4,000 seats—and it's got a big thrust stage, so it's not really a concert hall. You look up and there's a big dome above the stage area, and you'd think it's going to be nothing but trouble, but it's a little bit like some of those places in England, like Watford Town Hall. It's a bit of a barn and it sounds very slappy, but you put an orchestra in there and it sounds terrific.'

As consistency was certainly a feature of the tracks layouts, microphones, preamps and seating arrangements at the Medina Temple, the only differences that really had to be dealt with were those relating to temperature and humidity.

'Again, knowing we were going to be working long-term on this film, we did very careful paperwork right from the start,' explains Shawn Murphy. 'Our sampling rates were all 44.1, based on NTSC video, and that was carried throughout the project on the mix-downs and so forth.

'The mic placement was very Decca tree-like. We had the standard spacing on M50s over the podium, about 3m spacing on the outriggers, everything running at a height—depending on the piece—of between 10 and 11 feet. Very, very traditional, with a pair of surround mics up in the balconies.'

Not so straightforward were recording sessions for the *Fantasia 2000* CD, which saw James Levine conducting the Philharmonia at AIR Lyndhurst in London when Abbey Road was unavailable.

'Those were a struggle,' Murphy concedes. 'The room was just much too small, about a third of the size of Abbey Road [Studio One], because in one case we had as many as 118 musicians crammed into what I consider to be a 60-man room. I couldn't get anyone to adequately acknowledge that the acoustical energy we were generating in that close setting was not going to be a good thing, and sure enough I wound up having to use mostly close mics on those recordings. I really couldn't go to the room mics because there was just too much congestion and not the clarity that we would have liked. I objected all along; I objected to the size of the orchestra and I objected to the venue, but overall I have to say that the results weren't that bad. Only the doorknob and I would know...'

A co-owner of Sync Sound, a high-end TV and film post facility in New York, Ken Hahn manned the controls there of the AMS Neve Logic 2 inside Studio B for the 48-track to 48-track digital editing of the music.

'Our editing system is unique in that it is all time-code based,' Hahn explains. 'We don't use the Sony system. It is one that we developed. We use Adam Smith synchronisers, but all of the front-end synchronising and editing is our own. The system produces an edit list that can be referred back to if anything needs to be redone or restructured, and on *Fantasia 2000* there were a number of times when people wanted to modify things, so it came in really handy.

'After Jay Saks had selected the best material for us to edit, we had a complete cast of Disney animation directors, producers and animators here to verify that not only was the material musically correct but that it also worked for >

Camille Saint-Saëns' 'Carnival of the Animals Finale'. What happens when flamingos get hold of yoyos

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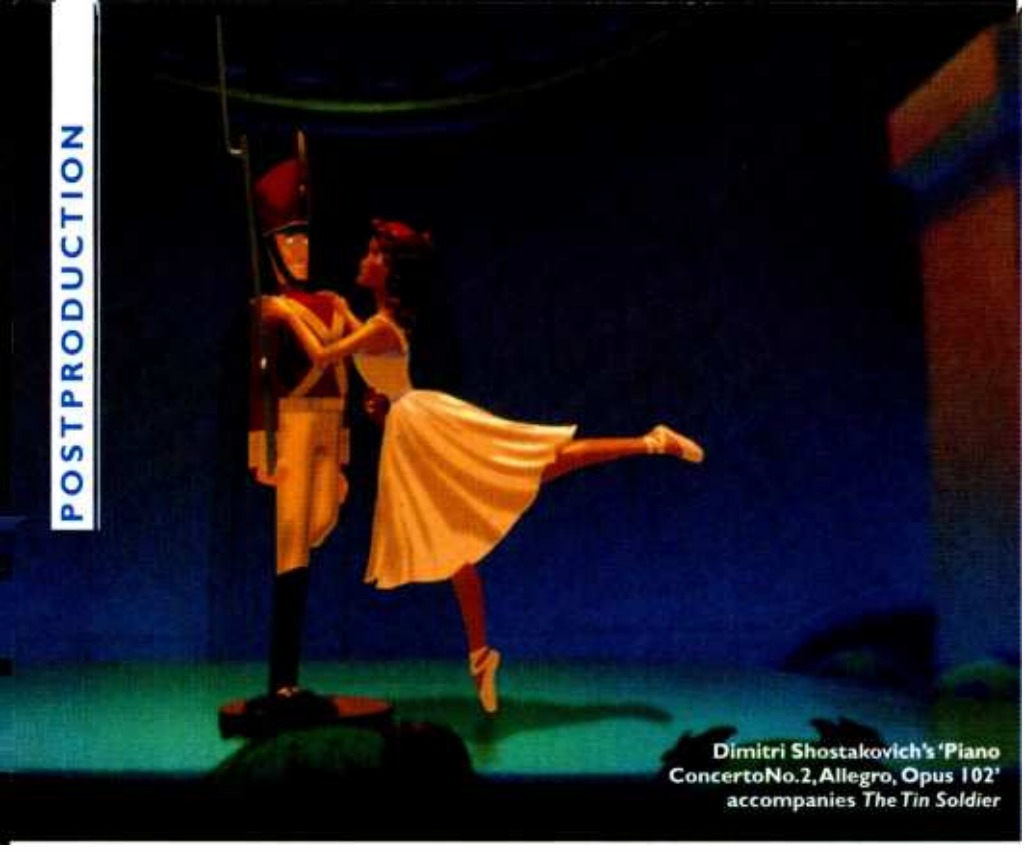

Dimitri Shostakovich's 'Piano ConcertoNo.2, Allegro, Opus 102' accompanies *The Tin Soldier*

< them. We were dealing with a couple of complete takes and a lot of pick-ups to make things more as the animators had envisioned, so it was very much a co-operative effort. Everything was so well planned. It had to be. So it really was a matter of executing the plan and working on things until we got them right.

'As for the 16, 20 and 24-bit recordings, I would defy anyone to hear the difference. I would be hard pressed. Maybe in the right places, and only doing an A-B, but you're not going to be sitting there saying, "Oh yes, this is 16-bit, this is 24-bit...". Shawn Murphy made really dynamic, rich recordings, and so it was tremendous to be working with great music performed by the best musicians and captured with such wonderful sound.'

Since five-year-old children don't cope very well with subtitles, all of Disney's classic animation films undergo foreign language dubbing for overseas territories. *Tarzan*, for instance, was released in 33 different languages. *Fantasia 2000*, on the other hand, with its proportionately larger adult audience, has undergone more subtitling, yet even the theatre-limited I-MAX version is being released in 14 different languages.

'In theory, aside from the dialogue, everyone gets the same thing,' says Theo Gluck, director of foreign post-production at Disney Character Voices International. 'We strive to match all of the treatments for the dialogue stem, and on *Fantasia 2000*, where the interstitial characters were dubbed for certain foreign territories, all of the mixing was done at Disney after we had consulted with Terry Porter about how he had treated the material on his own dialogue stem. In fact, as a reference, we also ran with a copy of Terry's dialogue stem directly from his master.'

Sound effects, of which there are a bare minimum in *Fantasia 2000*, played a minor role in Gluck's work this time around.

'This was not as complex as a normal feature,' he confirms. 'Our biggest concern was making sure that all of our transfers maintained the integrity of the music, so we cloned off original masters and punched into the clones in order to keep the nuances and impact of the original mix both for the I-MAX release and the 35mm version.'

As usual, the foreign language dubs were all recorded in their respective territories with local artists under the auspices of Disney's regional representatives. Nevertheless, as seen and heard in the I-MAX version, these did present a somewhat unusual challenge.

'James Earl Jones is a wonderfully expressive man and he has an incredible speaking voice,' notes Gluck, 'but his very expressive mouth can be problematic when he's 20 feet tall and speaking Cantonese. Therefore, ensuring that everyone nailed their recordings in sync was one of the keys to making this project happen.'

So, was it all worth it? In a word, yes. Once again the classical pieces have been edited down, and, as with the predecessor, the marrying of music and animated images is sometimes perplexing, often endearing. Overall, *Fantasia 2000* is first-rate entertainment, and, what's more, its I-MAX release with 6-channel surround—in addition to 35mm with 5.1 surround—provides the eclectic imagery with (quite literally) more depth than ever before. Some classical afficionados may echo the opinions of their own predecessors, yet this film is a worthy successor to what is now widely regarded as a ground-breaking movie. ■

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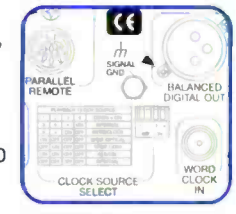

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Dolby E and Metadata

Targeting the the seemingly rudimentary duty of distributing multichannel programme throughout facilities and beyond, Dolby's **Tony Spath** and **Peter Cole** look at the concept of Dolby E and delve into the wonderful world of metadata which ties it all together

AUDIO IS HEADING inevitably from stereo towards Surround and 5.1 presentation. Aware of this, digital TV broadcasters are eyeing the large pool of feature films as their first port of call for 5.1 content, as many titles already exist with 5.1 soundtracks. The trouble is that there has been no medium available to carry picture, and insufficient audio tracks to allow a broadcaster to transmit this. Until now.

The Dolby E delivery format, debuted in its European version at AES, Paris, finally allows a multichannel audio mix to be put on the video tape, along with the picture and even a 2-track Stereo /LtRt mix for analogue broadcast. The tape can be edited and switched on picture frame boundaries, just like regular video. Or it can be transferred to a server and used from there.

Dolby E 'fits' up to eight channels of high-quality audio onto a single AES3 pair, so any device, such as a VTR, server, or audio 2-track machine with AES Digital I-O, has the potential to transport eight channels of audio. Dolby E has been developed specifically for such applications.

The DP571 Dolby E Encoder and DP572 Decoder will allow broadcast facilities to convert to multichannel audio, while still using much of its existing AES3 distribution equipment. The result is efficient, cost-effective post-production and distribution of multichannel programmes.

Multichannel audio mixing and post-production have been with us for some time: engineers and studio people are familiar with the techniques, and a lot of equipment exists already to help them create multichannel audio soundtracks. Getting this audio on the air is now possible using Dolby Digital transmissions with the European DVB or US ATSC DTV systems. However, the problem is in transporting six tracks of audio around a TV station, where routers, VTRs, switchers and cabling are all stereo at best, and where the audio and video must remain in sync: dual media linked by time code is not a practical option. Dolby E overcomes these potential showstoppers, bridging the gaps between studio and broadcaster, and passing through the bottlenecks that exist within the broadcast infrastructure.

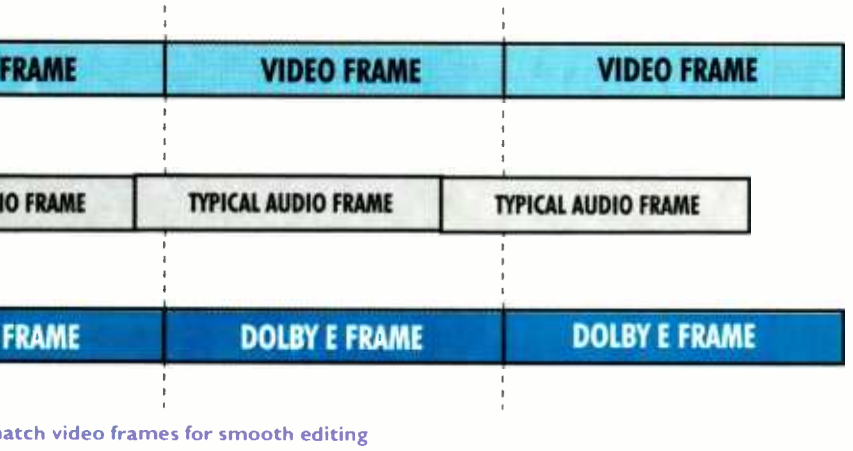
The idea is that Dolby E will be used to encode 5.1 audio mixes (or any audio up to eight tracks) and carry the audio with embedded time stamps through this 'bottleneck' stereo infrastructure. Wherever conventional audio operations are needed—mixing, sweetening, adding tracks, voice-overs,—the Dolby E is decoded back to base-band audio for these operations. If the audio needs to be sent on down another stereo 'pipe' to the next stage, it can simply be Dolby E encoded again. As a result of a very sophisticated algorithm and high data rate, Dolby E programmes can withstand ten or more of these encode-decode cycles without audible degradation.

One operation that frequently needs to be done is editing to picture. Dolby E is unique as an audio coder, in that audio frames match video frames exactly. This ensures that audio-follow-video edits are free of mutes, glitches, or other aberrations. This also makes it possible to switch, route, and perform assemble edits directly on the Dolby E bitstream without decoding and re-encoding.

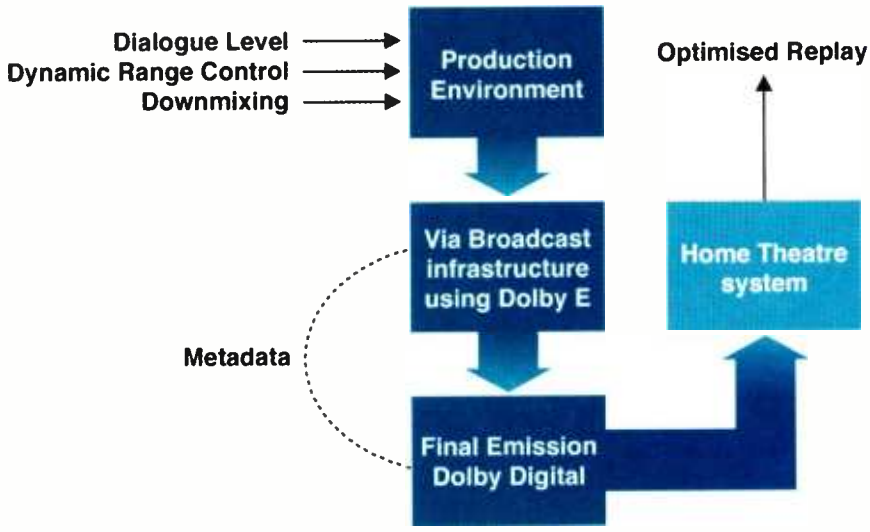
Using Dolby E as a way to send audio from postproduction studios to the broadcaster also lets mixing engineers include metadata parameters along with the audio mix. These parameters are carried all the way through the distribution chain to the Dolby Digital emission encoder and on to the home; there they are used to optimise the decoding to fit the audio system the viewer has.

The values of these metadata parameters are important 'audio decisions' that need to be made in the audio studio. By carrying them in Dolby E, the broadcaster can take them and pass them unchanged, and insert them into the Dolby Digital transmission.

For post studios, DTV will open up a whole new outlet for their 5.1 work. As more and more DTV broadcast facilities equip with Dolby E, postproduction facilities will be increasingly called upon to deliver multichannel mixes in the Dolby E encoded format. In addition to audio sweetening on 6-track film masters, demand for 5.1 audio on sport and drama is bound to follow. This single format for programme delivery. >



Dolby E frames match video frames for smooth editing



Metadata is carried from production through to the consumer

< distribution and play-out is the logical link between post facilities and broadcast. It gives 5.1 audio providers the medium their customers can use directly, just like they deliver stereo audio today.

A Dolby Digital bitstream contains compressed audio, and metadata. This metadata is basically 'helper' information that the home decoder uses to optimise the incoming audio feed to the audio system that will be used to present it. So what exactly does it do? And how does it get from the audio 'experts' in the audio production and postproduction studios—some of which may be in different cities from the TV station—into the Dolby Digital bitstream and thus on to the home? The simple answer is: it is carried by Dolby E.

Dolby E aids the conversion of TV production and broadcast facilities to multichannel audio. With Dolby E, up to eight channels of high-quality audio and metadata can be distributed via an AES3 pair, or recorded onto two audio tracks of a digital video tape or video server, making transport and broadcast operations on 5.1 soundtracks a lot easier.

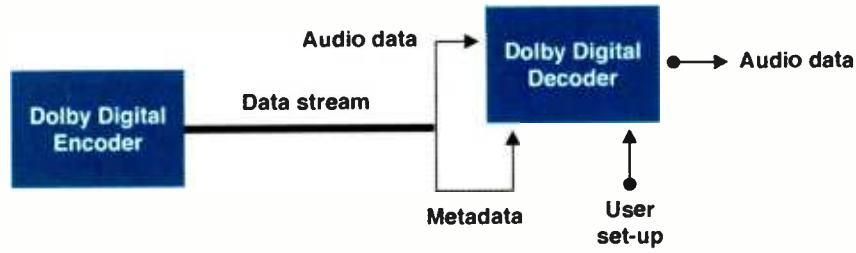
Dolby E is a professional coding system; it will therefore not be used for consumer applications. The main differences between Dolby E and Dolby Digital that make it more applicable to a professional infrastructure are: much higher bit rates, allowing for up to 10 encode-decode cycles at 20-bit depth; Dolby E frame lengths match the video frames either at 29.97 or now at 25fps. This means that Dolby E sources can be cut and edited on frame boundaries without any artefacts and in sync with the associated video feed.

Dolby E in postproduction also lets mixers include metadata parameters along with the mix. This metadata is then carried within the Dolby E bitstream all the way through the distribution chain to the Dolby Digital emission encoder. By using this metadata in the Dolby Digital decoder, viewers at home will have an audio soundtrack that is optimised for their home audio setup, be it a single mono speaker in the TV, stereo, Dolby Surround or a full 5.1 home theatre setup. Just as they now can from DVDs. Before we dive into explaining Dolby metadata, it is worth taking a quick look at the consumer end of the chain, where it used.

Dolby Digital is an advanced form of digital audio coding enabling the storage and transmission of high quality digital sound. This technology can provide a full cinema sound experience in the home with 5.1 channels. 5.1 provides five discrete channels each with a range of 20Hz–20kHz. Speaker configuration is typically positioned: Left, Centre, Right, Left surround, and Right surround. The '.1' refers to a bandwidth limited LFE (Low Frequency Effects) channel (100Hz–7kHz).

Dolby Digital is widely available on the majority of DVD titles and is the only universal multichannel standard available. All consumer DVD players contain a Dolby Digital decoder as standard. With a vast array of consumer hardware already in the market place that can decode Dolby Digital, the expectation of the 5.1 experience has been well set in the mind of the consumer.

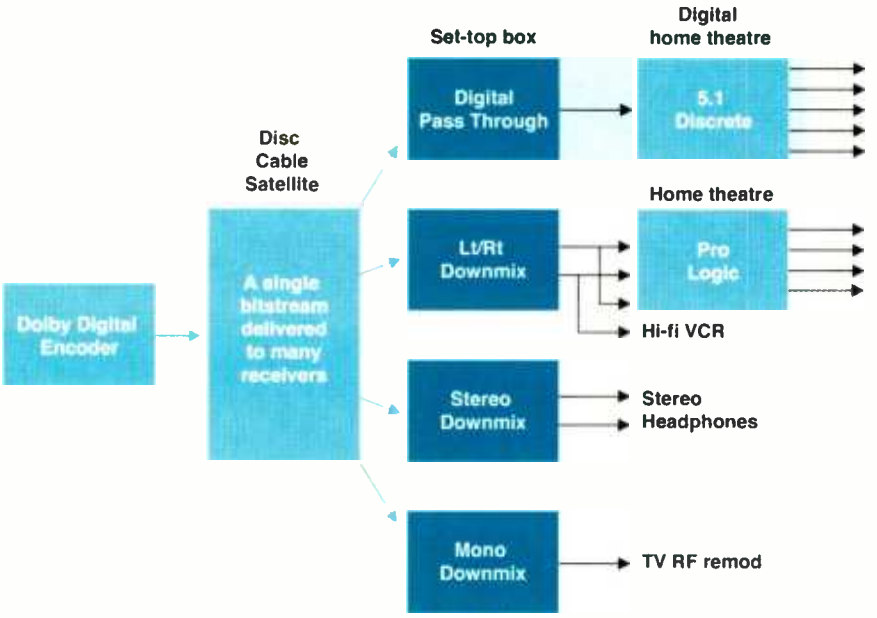
For broadcasters, Dolby Digital is the mandatory audio transmission standard for ATSC, the digital television transmission system adopted by the USA, and is now an option within the European DVB system, already



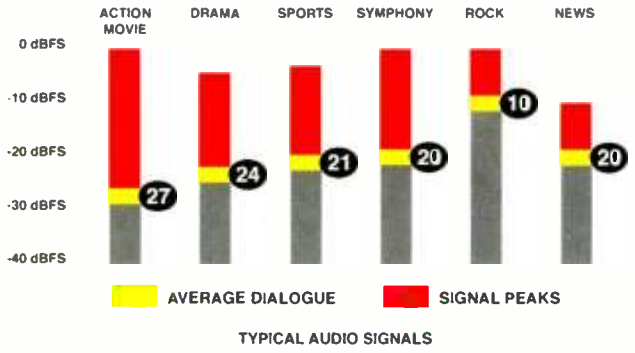
Metadata is used together with local setup information to configure the consumer decoder

exploited in Germany.

As we have seen, the Dolby Digital bitstream not only carries the audio content, but 'helper' information for that audio content: metadata. Metadata allows the audio content within the bitstream to be used in a number of ways by the consumer decoder. With metadata, a single high quality, wide dynamic range 5.1 audio bitstream can be adapted to mono, stereo, or Surround; and, if required, at reduced dynamic range, as clearly a loud cinema soundtrack will not replay from a single mono TV speaker—at least not for very long. metadata also brings about the end of having to control programme levels with a compressor. This is because the ideal actual replay level of the programme can be transmitted to the decoder. The result is simply better audio. The key metadata parameters which need to be transmitted to the decoder (and thus auditioned and entered into the bitstream) are: Dialnorm (a dialogue-average level indication used for level setting Downmix parameters (for setting Centre and Surround levels in a stereo downmix) Dynamic range control (information the decoders can use or ignore, depending on the capabilities of the audio system being used in the home.



Downmixing. Potential listening environments for a multichannel Dolby Digital bitstream

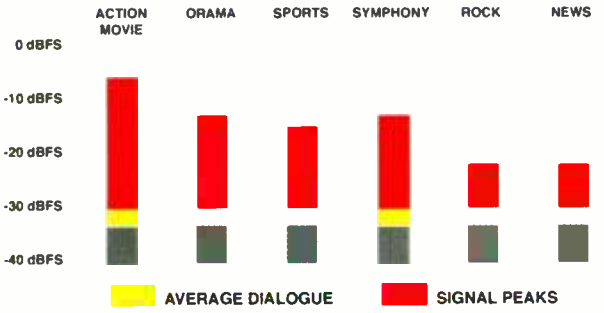


Relationships of various programmes with respect to Dialogue Level

Downmixing enables a consumer with a mono, stereo or Dolby Surround Pro Logic audio system to obtain an appropriate mix of the original 5.1 channels, based on information set by the programme producer during the final mix. Specific Centre and Surround levels can be sent to apply to the downmix, without affecting the 5.1 audio.

Dynamic range parameters can also be set during the production. While some viewers will enjoy a wide dynamic range reply, others will want less, either for social reasons or because their system just will not be able to handle it. Rather than let the decoder use a fixed one-setting-fits-all process in the decoder, the DRC data allows audio professionals to place specific control data in the bitstream. DRC data uses high level gain reduction (limiting) and low-level boosting to provide gentle yet intelligent dynamic range processing. Currently this gives a basic choice of six presets tailored to specific programme types. Future developments will allow more precise control of dynamic signal level in 1ms timeslices.

Dynamic range control also has uses in downmixing. Clearly a full 5.1 mix of an action movie will not fold easily into a 2-channel mixdown, without reducing the dynamic range. >



Output levels of various programmes using Dialnorm -31 as a reference

< Consequently, if the decoder realises that five into two won't go, it will apply the DRC data: as this has been auditioned and selected by the mixing engineer, it may be assumed that this will provide the best audio downmix possible from the 5.1 elements.

Dialnorm (in effect, Dialogue Level) is a new parameter conceived by Dolby Laboratories to describe the average 'loudness' of a programme. Today a viewer will subjectively listen to a programme and adjust the volume to a comfortable level within seconds. This decision is almost always based on the volume of the dialogue. Where there is no dialogue, as in music, the average programme level is the driving factor in deciding at which volume people want to listen.

A current problem is that programme levels change from programme to programme, and TV channel to TV channel, forcing the consumer to ride his volume control. As audio dynamic ranges get wider, and more 'hi fi' through digital delivery systems, the problem will get worse. Despite good practice within broadcasters, it is still necessary to use on-air compressors and limiters to control level variations. While at best this can sound 'good', a compressor is the wrong tool to use to control level. Ideally a VCA fader would be used. Dialnorm is in effect the VCA control on a 'fader' in the decoder.

Dolby conducted a study of all typical programme genres: film, drama, news, and music in order to establish typical dialogue levels and dynamic content. Movies were clearly found to contain the most dynamic range. Dialogue level for movies are typically around 26dB–29dB below digital peak. In our example, a Dialnorm value of 27 is used to describe this to the decoder. For other types of programme the dialogue-average levels may be as shown here, illustrating the problem that different programmes have different dynamic ranges (which we want to keep), and different levels, which is annoying.

When these signals (along with their metadata) are applied to the decoder, the audio levels are adjusted, with the result that the audio levels are consistent from programme to programme, and no change in volume control is required. Importantly this is achieved without reducing the dynamic range (and hence potential quality) of any programme.

To achieve this, the Dialnorm value must be carried in the Dolby Digital bitstream. But as with other metadata parameters, it is clearly a decision that needs to be made by an audio expert, typically the person mixing the programme. If Dolby E is used to carry that finished audio programme to the broadcaster, on a video tape for example, this metadata can be included and carried with the programme at all times, through editing switchers, in the archive vault. When the programme finally goes to air, Dialnorm, along with the other audio metadata, is transferred into the Dolby Digital bitstream, synchronously with picture and audio, for delivery to the home.

Combining the Dolby E and Dolby Digital technologies arms the audio professional with a flexible and creative set of tools to deliver audio productions. The facility to audition the effects of metadata at the final mix, allows the programme director to establish exactly how that audio soundtrack will play in the home —from a full 5.1 experience, right through to a mono downmix. The ability to send metadata from the studio through the broadcaster to the home achieves several ideals that audio engineers have been aiming for. Dolby E provides the link to make this possible. ■

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Aquarium

Split spectacularly by a river, and historic home to dynasties that influenced Europe during sensitive times, Budapest has contributed significantly less to audio. **Zenon Schoepe** reports on the coming of international standards to the city

COMING TO AUDIO prominence first as an alternative and amenable venue for classical film-score recording on a budget, Hungary has a relatively low-key music industry of its own. It represents a microcosm of big world pressures applied in the context of a country that is still close enough to remember the communist oppression that governed it until a decade ago. Other problems are more specifically Hungarian in their nature: a language that incongruously shares similarities only with Finnish, and a population of some 10 million spread out over varied terrain and a largely rural backdrop that still owes a lot in thinking and outlook to the days under the old regime.

Budapest as the capital is the centre of all recording activity and it is a beautiful city split between industrial and residential areas by the incredibly wide and fast flowing Danube. It now boasts something of a recording high spot for the area with the recent opening of Aquarium Studios' 2-room setup complete with the still relatively rare occurrence in the region of big Genelec monitoring and the only SSL for quite some miles.

Tracing the origins of the studio requires a trip back to the communist era and centres around the friendship and working partnership of musician Pasztor Laszlo and engineer Lakatos Gabor.

Laszlo was the lynch-pin of one of Hungary's top bands and had toured extensively throughout the Eastern Block and beyond while Gabor had cut his teeth in the state broadcaster and had moved into private studio operation. The two became shareholders in a small independent Hungarian independent record label which was acquired eventually by Warner Music International in 1993. Gabor went from engineer to studio manager and producer and Laszlo went from creative input to MD of Warner Music Hungary.

'Being a small label but the market leader at the time we were very heavily involved with Hungarian artists and Gabor ran a small studio which we frequently used,' recounts Laszlo. 'We worked together and eventually we pooled resources and it was this concern that Warner bought. Usually major recording companies do not pay a lot of attention to establishing their own studios and with the setup we then had we were under a lot of pressure. I was asking Gabor for quality recordings, but I wasn't able to supply him with the necessary investment to achieve that.'

A few years ago a new financing approach was raised within Warner in Europe which encouraged up and coming national companies to come up their own ideas and solutions. 'As you can imagine I wanted to forget the old studio and start again with a new one rather than establishing ticket offices for concerts because I believed a new studio was essential for our recording industry. We had the expertise through Gabor who had worked for Hungarian Radio and was experienced in running a studio, we had a lot of Hungarian artists that would need this level of service, and last, but not least, it would be marvellous if we could produce real European standard recordings in Hungary because that was not the case before.'

Laszlo cannot hide his surprise that his plans were supported and backed from the top at Warner Music. 'It took two years to plan it all and to negotiate with the suppliers because to be honest we didn't have enough money for what we wanted to do so we had to be

resourceful in saving money in any way we could,' he says.

The studio was opened at the end of 1998, although full operation really only commenced in May 1999 making the Budapest operation the only Warner Music site in continental Europe with its own studio. The beauty of the Warner tie up has meant that the original record label has kept its artist roster and its original identity and accounts for more than half of all domestic artists. The studio is a fully commercial facility, but predictably serves all the Warner artists as its mainstay. 'We are used by other record labels, but our prices are higher than other studios in the country, but then we provide a higher level of service,' adds Gabor.

Like all regional recording operations it hopes to attract international trade through its competitive pricing compared to other European recording centres and at around £500 per day for the main room including an assistant, it's an attractive proposition. 'The console, outboard and all the other equipment is to a European standard so anyone who comes here from anywhere else will feel comfortable and be able to work here,' says Gabor.

Competition in Budapest comes from a few studios that Gabor describes as on a par with their previous facilities plus a host of home-recording-style setups—'We are in a league of our own, the next SSL is near Salzburg,' he says.

The Hungarian artist roster includes around 35 acts and each year some 30 new releases are put out in to the domestic market and will accounts for some 30% of all domestic sales. The biggest selling record last year did in excess of 50,000 copies. There has been a step up in radio diversification in Hungary in the last three years, according to Laszlo, with the changes in ownership and alignment. However only one country-wide music-radio station exists and this errs on the side of MOR with the next biggest station concentrating on golden oldies. It's a tough one if you're trying to break an Hungarian rap artist and it means that local stations that are dedicated to broadcasting new music remain the most important new release outlet.

'It makes our job as a record company that much harder,' says Laszlo with his Warner Music hat on. 'When it comes to the countryside outside the cities, it becomes very difficult for us to reach the kids. That is the main problem. The byproduct of this is that they do get to hear Madonna and there is a very big difference in the European and international standard sound and any Hungarian music that they might get to hear. Add to this the fact that most of the kids in the countryside like the kind of music that existed ten years ago in western Europe, that's out of date and doesn't really open doors or minds to new music like rap.'

However, Hungary is very lucky in having its own Hungarian language music television channel (Zplus) which according to Laszlo is very keen to broadcast local produce and is in tune with moves in domestic music fashions. Delivered on cable it reaches about a third of the population. 'That has been good for us because before its arrival there really was no reason to shoot a video of an artist because there would have been very little opportunity to play it,' adds Laszlo.

Aside from the SSL G Plus in Studio 1 the second room houses the MCI that the partnership brought with it from its old studio. The desk is clearly of >

< significance at Aquarium as it serves to remind them that at the time of its purchase Laszlo and Gabor thought they had truly arrived in the big league.

'The MCI was the desk to have in Hungary in those days and all the sound engineers were familiar with it,' recalls Laszlo. 'After the privatisation of the Hungarian state recording company the desk became available and it was completely refurbished before the move to our new studios here.'

The MCI continues to earn its keep and is used for MIDI recording and pre-production work. The two control rooms are completely interconnected

allowing access to racks and sound modules across the facility.

The studios, housed in a light industrial plot, were designed by Gabor with the SSL room sporting an unusual triangular shape that is reflected in the much bigger triangular live area. Ceiling height is considerable and the recording area regularly hosts string sections.

The installation was very much a learning exercise for the team which pooled its considerable experience together with local Genelec distributor Atec. Mounting the large and heavy 1039's in the wall was harder in practice than the drawings had suggested and involved rebuilding the front wall frames with extra reinforcement and damping.

'We were keen on the Genelec because we like the fact there there is a consistency in character between low level and high level listening,' explains Gabor adding that there are two pairs of 1034s in Hungarian Radio which are dedicated to classical music recording. 'The other consideration is that you are buying a complete system, there are no amplifier choices to make, you just switch them on. That simplifies matters and you know that the system is optimised.'

The next step is stated as being the installation of a 5.1 system for DVD work in to the smaller MCI room. Aquarium argues that with a high proportion of the music recording market already under its belt, it would be foolish to ignore any new format work that may emerge. 'It stands to reason that we'll be looking in to the possibilities of DVD with our own artists,' says Laszlo. 'When will depend on our financial situation and the sort of returns we could expect, but it makes sense for new releases and for back catalogue. There is still a lot of work to be done in the adoption of CD in Hungary as it only accounts for 50% of the market, cassette is still strong here. DVD will then be a natural progression as it will also serve to bind picture and audio together.'

The studio is clearly hitting the mark as it has been busy consistently since going on line and splits its load 50/50 between Warner originated and outside sessions. The Genelecs and the SSL are deemed as crucial to the success. 'I've wanted an SSL since 1985,' says Gabor. 'I thought seriously only about SSL and Neve—there is an AMS Neve Libra in a private studio in Budapest. I'm proud that we were able to bring one to Hungary because it puts us on the map.' Multitracks are a Studer A800, Otari RADAR IIs, Akai 16-track hard-disk systems and a Fostex 16-track analogue.

Record sales make larger country results seem preposterous with a good single in Hungary accounting for between 1,000 and 3,000 copies. 'That might not seem like much, but we work hard >

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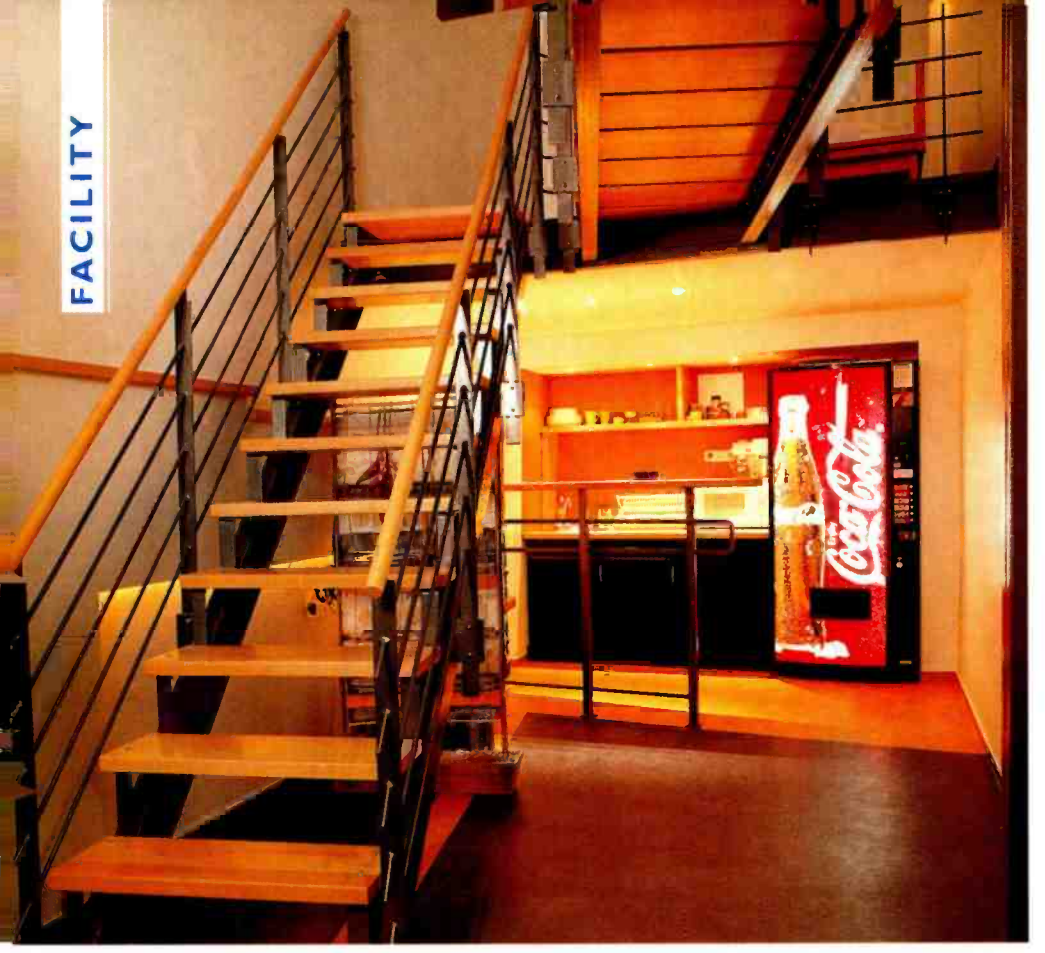
FIRST WE LISTEN



< at developing it because we know that the singles market is the way to develop long-term acts,' says Laszlo who aims to sign around ten new acts a year and claims a 50% success conversion rate.

The country's live circuit is headed by an upper echelon of nightclub appearance spots. An act needs a record contract to get a look in, but when it's in it can earn good money. 'These clubs take anything from 50 to 300 people and I used to say that if a new act could go around the country playing in front of 300 people then I would sign them because by Hungarian standards that already qualifies as a success,' laughs Laszlo.

Piracy, always a problem in former Eastern bloc countries, looked as though it was in decline, but the advent of CD-R has rekindled its fortunes according to Laszlo. 'In the early eighties it was a real problem in the markets and even in the shops, but it was mostly of international artists; Hungarian artists were not being targeted because they weren't seen as important enough. That has now changed due to the increasing importance of domestic talent and the availability of CD-Rs on computers. In 1998 around 3.5m CDs were sold and CD-R imports increased from 120,000 units in 1997 to more than 1m in 1999 which is getting on for a third of official CD sales. Not all the CD-Rs are used for pirating music, of course, but you can see the scale of the problem. Some estimates consider that at least half that number are used for music piracy. Alarmingly you'll often find the CD duplicators in the back of record shops.'

Gabor and Laszlo originally started producing together as a team for third parties and found their skills complementary and sought after in a market in which most sound engineers seemed unable to cross over in to production duties and in which most musicians had little knowledge of technical issues. They describe the market as still in the early stages of ascendancy.

'You have to be sensitive to these realities and if an artist isn't comfortable with the technical issues it's important to put someone in with them who can translate and interface for them. It's very much a matter of education but it will change,' says Laszlo. 'There are few technical courses for engineers and a lack of real studios for engineers to learn in, most of the smaller studios are run by people who are entirely self-taught and self-contained and have had no chance to see proper studio practices.

'Hungary is no different from anywhere else in one respect and that is that there are examples of successful recordings made on smaller consoles and lower quality systems,' he continues. 'However, the fact remains that most of the big hits are made on good equipment with good operators. If you look at the international market then you'd have to admit that being Hungarian is something of a handicap: it's not a rich country, and if the studios aren't very good at recording technique and don't have good equipment then these are also handicaps. If you add all these handicaps up it doesn't seem to give us much chance in the international market. Here, we are most interested in reducing these handicaps and have separated ourselves from the rest. We're giving Hungarian artists the best chance possible at Aquarium.'

Given the international success of artists from such unlikely places as Iceland, Denmark and Sweden, he may well have a point. ■

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Huvosvolgyi ut 54.VI ep,
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Ash Howes

Photo: Chris Hook Studio: Battery Studios, London

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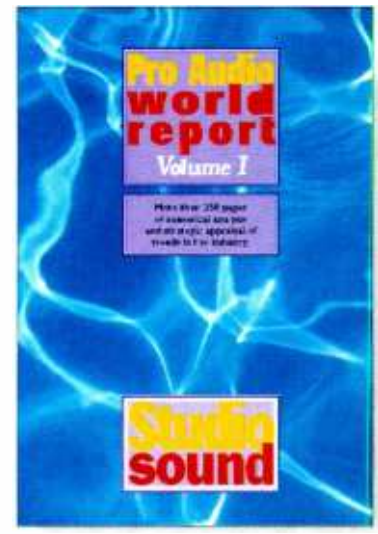

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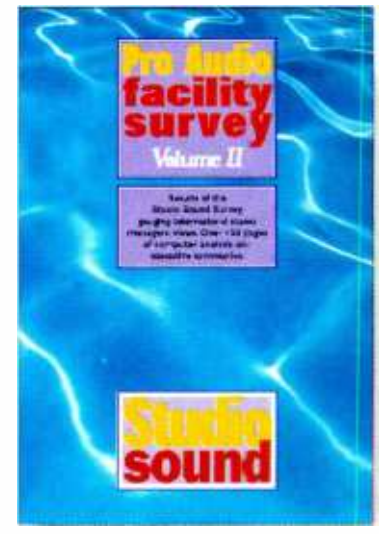

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US: The Emperor's new clothes?

It's certainly a hot topic but is it actually all hot air? Assessing the real potential for surround sound music is a tricky job writes **Dan Daley**

I KEEP WONDERING why Rupert Murdoch hasn't latched on to the pro-audio industry. The Australian tabloid impresario should have a field day considering how quickly and rabidly the trade media can chomp down on a trend once it's discovered, regardless of how much meat is actually on the bone.

At issue here is the matter of surround audio. The procrastination over DVD did not stop the professional audio industry and its media from looking to surround as the saviour of the business in some regards, or portraying it as the Second Coming, the sacred successor to stereo. Surround even got its own eponymously named magazine on these shores, much like its two-pronged predecessor back in the sixties.

The reality is that multichannel sound, while viable, simply hasn't excited the real powers that be in the recording industry—the content providers (pka 'record labels') and consumers (pka 'the idiots who never seem to recognise the genius of what we do'). A recent private conference at the Consumer Electronics Show in Las Vegas put representatives from content and pro-audio, as well as the consumer electronics hardware manufacturers (who one assumes represent the interests of the consumers), into the same room. And while the discourse that took place there was meant to remain confidential, enough of its fallout has drifted past my window (I wasn't there myself and thus am not subject to any nondisclosure arrangements) to realise that there continues to be significant confusion about how to deal with music in the future. Consumer electronics makers worried that the content providers were not supporting multichannel sound; content providers expressed concerns that there wasn't enough in the way of hardware to interest consumers, and that what there was was being diluted by the simultaneous arrival of more than one format (DVD-Audio and SACD), which served only to confuse consumers. The fact that many content providers and consumer electronics hardware makers who so often find themselves at loggerheads are also often part of the same multinational corporate entity has been an irony that has constantly escaped attention over the years. Remember when Sony Electronics tried to make DAT into a consumer format and Sony Music expressed concern that digital copying could endanger royalty revenues?

Surround music and DVD-Audio also was a casualty of the boisterous arrival of streaming Internet audio, most notably MP3. As the record labels scrambled to accommodate that new development, something to do with old-fashioned discs probably seemed like a quite low priority.

That's about where it remains. Some labels, including constituents of the RCA and PolyGram label groups, have reportedly been slowly stockpiling multichannel mixes of certain artists and projects. The amount of surround music that's part of DVD-Video releases continues to grow at a quite quick clip—concert videos and the like. But in terms of DVD-Audio-only releases, you have to scrounge quite deeply into the more arcane corners of Tower and Blockbuster to find any of the less-than-100 music-only titles that have seen the light of day thus far in the States. (And none in Europe to date, I'm told.) And even these titles are evidence of the rarefied nature of this niche market: mostly jazz, classical and new age releases on small independent labels. Not Hole, not Korn, not Backstreet Boys.

Surround music has little more to show for two years of hoopla than a lot of optimistic press clippings. The DVD-Audio specification, for all its corporate politically motivated inclusiveness, implicitly pushed the boundaries of audio upwards with the promise of higher resolution. Naturally, that resonated nicely with audio engineers, producers and musicians. But it did so at a time when what was exciting the consumers and concerning the content providers was lower

Europe: Past, present, future

As with the London bus, you wait an hour for a biography then two come along in convoy writes **Barry Fox**

WE WAITED half a century for a biography of Alan Blumlein, father of stereo and groundbreaker in many fields of electronics, TV and radar. Now two come along as a pair.

The first, *The Life and Works of Alan Blumlein* by Robert Alexander, was published in late 1999 by Focal Press and launched with a bang. Focal tied up with EMI-CRL to stage a reception at the research labs in Hayes where Blumlein worked before being killed testing radar during the war.

I was pleased to recommend the Alexander book as a remarkable achievement, given the way the biographer initially approved by the Blumlein family, Francis Thomson, spent 30 years gathering all available material and then did absolutely nothing with it. Thomson died two years ago after dispersing the collection so that no-one, not even Blumlein's two sons, can retrieve it. Personal documents, including treasured family photos, are still missing. The least said about the late, unlamented Thomson, the better.

For a variety of reasons the Alexander book was rushed into print. The rush shows in the editing. But the research was painstaking.

Now we have another biography which Russell Burns has been working on for many years. *The Life and Times of AD Blumlein*, was published in January 2000, by the Institution of Electrical Engineers.

I saw no publicity and heard nothing direct from the IEE on it, despite the fact that the Institution is well aware of my interest in Blumlein. As far as I can see only IEE members have been privy to the secret.

Although the Burns book missed the publicity boat and the writing has a dusty IEE Faraday feel, it is probably the better of the two, especially on the birth of radar which is the author's special field of interest.

Those with a serious interest will want both books. If the Thomson material is ever located, there will doubtless be more. But don't hold your breath.

Sound and vision engineers appreciate the technology that is working behind the scenes, and under the ground, at Disney theme parks. Anyone visiting London and hoping for anything remotely similar at the Millennium Dome will be sorely disappointed.

The enormous upturned saucer, built on the meridian date line over waste and polluted land at Greenwich is an impressive structure. But it's what's inside that matters.

My dealings last year with the committees of headless chickens that were responsible for this national embarrassment (the New Millennium Experience Company) gave me a quite good fix on what we could expect. But I made a duty visit to find out for the benefit of any readers visiting London this year.

> Infra-red cameras peered into a smoke-filled cabinet that was waterlogged because the Dome is colder than Marconi expected.

There is nothing to match the audio-visual experiences that Disney offers, the educational excitement at Epcot in Florida or the hands-on fun education you find in science and technology museums in London, Chicago and San Jose. There's no Imax. No 3-D. No creative use of sound. And so few hands-on exhibits or simulator rides that there are hour-long queues even when the place is half-empty.

The hotel shows in Las Vegas are light years ahead for buzz. The Museum of

resolution formats, where the Internet's bandwidth inherently limits the potential quality of music delivery. But consumers don't seem to care about that —they seem far more mesmerised by affordable and cute little RIO devices and Talking Sticks than by impressive $3,000 SACD players. And the content providers are gearing up to give those consumers what they want, because that's what they're in business for.

Surround music was an elegant lady that stepped into the cultural equivalent of Rick's Casablanca Lounge one night, dressed to the nines and wearing Halston and Chanel. But while she was eyed by a lot of suitors at first, she was ultimately passed over for a flock of more affordable floozies from New Jersey. (Now there's a metaphor I can relate to.)

So is surround music dead as a concept? Not at all. We live in a time of increasing specialisation of consumer products, an era of so-called 'mass-customisation' in which consumers can be offered a wide variety of personalised products at mass-market prices. CD-R, for instance, is creating an entirely new market with in-store kiosks that allow listeners to pick and choose which songs they want on their CDs. (So much for the concept album.) Surround still holds the promise of developing its own niche in this fickle environment. But as for its prospects as the next big thing, let's put it this way: I hope you didn't soffit-mount the rear speakers in the control room.

Sewage in Osaka (yes there really is one —I've been there) is more interesting than the exhibit Zones inside the Dome. And whereas most museums are free or inexpensive, entering the Dome costs £20.

Marconi's Mind Zone is a good example of missed opportunities. Several exhibits were unfinished or already broken. Infra-red cameras peered into a smoke-filled cabinet that was waterlogged because the Dome is colder than Marconi expected. There were no signs to explain how a computer-generated starfish, projected from the ceiling onto a horizontal screen, learns from human touch by infra-red sensors and neural networking. Bewildered visitors were funnelled through a room with electronically generated surround sound, but no guidance on what it is for. Projectors screened large video pictures, with no clue to what they mean.

At first Marconi just ignored my request for comment; then they passed it round in circles. Finally, after repeated nagging, a spokesman admitted that 'there have been some operational and design issues which need further adjustment', and promised more explanatory signs.

Pride will probably prevent the UK government cutting losses and shutting the whole mess down. Perhaps they will offer free entry. But then the queues to the few excitements on offer will be even longer.

Dangerous liaisons

The lines between broadcast and telecommunications continue to blur as technology and politics soldier on writes **Kevin Hilton**

IT IS WELL KNOWN that BSkyB channels have long been available on cable networks; more recently the broadcaster entered into an uneasy relationship with digital terrestrial provider ONdigital. BSkyB has now not just come down to earth, it has gone beneath it by entering into a joint venture with telecoms operator Kingston Communications, with plans to carry pay-TV services over telephone circuits.

For Kingston Communications, this is a further move into broadcasting; something that underlines a general belief, even fear, that telcos are actively targeting the broadcast distribution business. The company made the transition last year when it bought TLI, formerly the uplinking, studio and systems division of the Services Sound and Vision Corporation. It was generally accepted that Kingston only wanted the uplink farm, giving it a valuable introduction to the lucrative links market, but it has retained the other businesses, despite the misgivings of some staff.

Kingston was long a lone example of the potential for deregulated telecoms in the UK. By dint of one of those historical blips that occur in most countries, the city of Kingston-upon-Hull, and parts of its Yorkshire environs, was able to create a municipal telephone operator separate from the post office system in the rest of the country, which became BT. Even today, the city council holds 49.9% of Kingston Communications.

The technological basis of the joint venture with BSkyB is ADSL (Asynchronous Dial-up Single Line), a telecoms development that Kingston Communications is pioneering in the UK. While BT is still running isolated tests, Kingston offers the first and only commercial ADSL service in the country. Further changes to the structure of British telecoms will enable Kingston— and BSkyB and other carriage partners, Flextech, Discovery, Viacom and Turner —to expand high speed Internet connection and video-on-demand beyond Hull. In July 2001, BT's local network will be 'unbundled', giving competitors the opportunity to put their own high bandwidth technology on the existing copper wires.

Much has been claimed in the name of ADSL. There is little argument over its potential: download speeds of 256kb as opposed to ISDN's 56kb. The doubts arise over exactly where and how it can be applied. High speed connection to the Internet is the application that has been most talked about; all fine and dandy in itself, but, in the converged world, only a small part of the whole. The Kingston-BSkyB agreement emphasises the importance of such new connections to broadcasters.

As an always dialled-up connection, ADSL appears to offer more to television than it does to the post-production sector or radio. The future of distribution and transmission may appear to have been staked out by digital satellite, cable and terrestrial but some in the trade believe that wide-band communications will have a dramatic impact. 'Systems like ATM and ADSL could sound the death knell for terrestrial transmission, which could be replaced by wide-band services and distribution,' Bob McCourt, chief engineer at Ulster Television said to me last year. 'The government is moving towards digital terrestrial services freeing up the video spectrum in general terms but ADSL eliminates the need for it in specific TV terms. It makes Webcasting a reality and could move beyond DTT.'

As McCourt explains, any such move could have serious political implications. There is some resentment that governments are foisting DTT on broadcasters so they will be able to sell off analogue spectrum. If, after spending vast amounts on new digital transmitters and collaborating with manufacturers on set-top boxes, ADSL becomes the new transmission standard, the recriminations could be immense. 'The government is pushing broadcasters to spend money on digital transmission systems, so they couldn't necessarily go to a telecoms solution in ten years time,' McCourt summarises.

Political shenanigans notwithstanding, permanent high band connections make sense for broadcast distribution and transmission. It is in the area of links that their usefulness is doubtful. 'The problem is in ADSL being a permanent connection,' says Gareth Jared, a project engineer at BBC Digital Radio. 'For sports broadcasts there is the need for dial-up, occasional use and ISDN is firmly established for that now.'

Like any new challenger, ADSL's merits have been both over and underplayed. Chris Gould, head of operations at independent radio production company Unique Broadcasting, says, 'Some say ADSL is brilliant, others say it's like a cable modem and once a lot of people get on it, speeds will slow considerably.' Quentin Howard, chief executive of UK national DAB multiplex provider Digital One, observes, 'ADSL will have an effect on the way people move files around. People are now talking about high capacity because the Internet as it is does not guarantee delivery of real-time data.'

Convergence means not only the coming together of technologies but the coming together of companies, as the Kingston-BSkyB venture shows. Wide-band communications will have a great influence but their use must be fully considered. After all, it will be a waste of technology if ADSL just allows people to play their Dreamcast without fear of logjams.

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Tape heads

The critical part of an analogue tape machine is its heads. **Raymond Budd** and **Martin Berner** examine the maintenance considerations of the Studer A80 and A800

WITHOUT A DOUBT the most important feature on any tape machine is the quality of its heads. Head maintenance is something that is often overlooked with poor head maintenance leading to poor frequency response, excessive tape noise and, in extreme circumstances, damaged tape. Regarding the Studer range of analogue multitrack machines, the head type can be an important factor if you're about to delve into the realms of the second-hand market. Good quality heads are generally very expensive (although in recent years prices have dropped dramatically), and if you buy a second-hand A80 or A800 with the wrong heads it could be a very costly mistake.

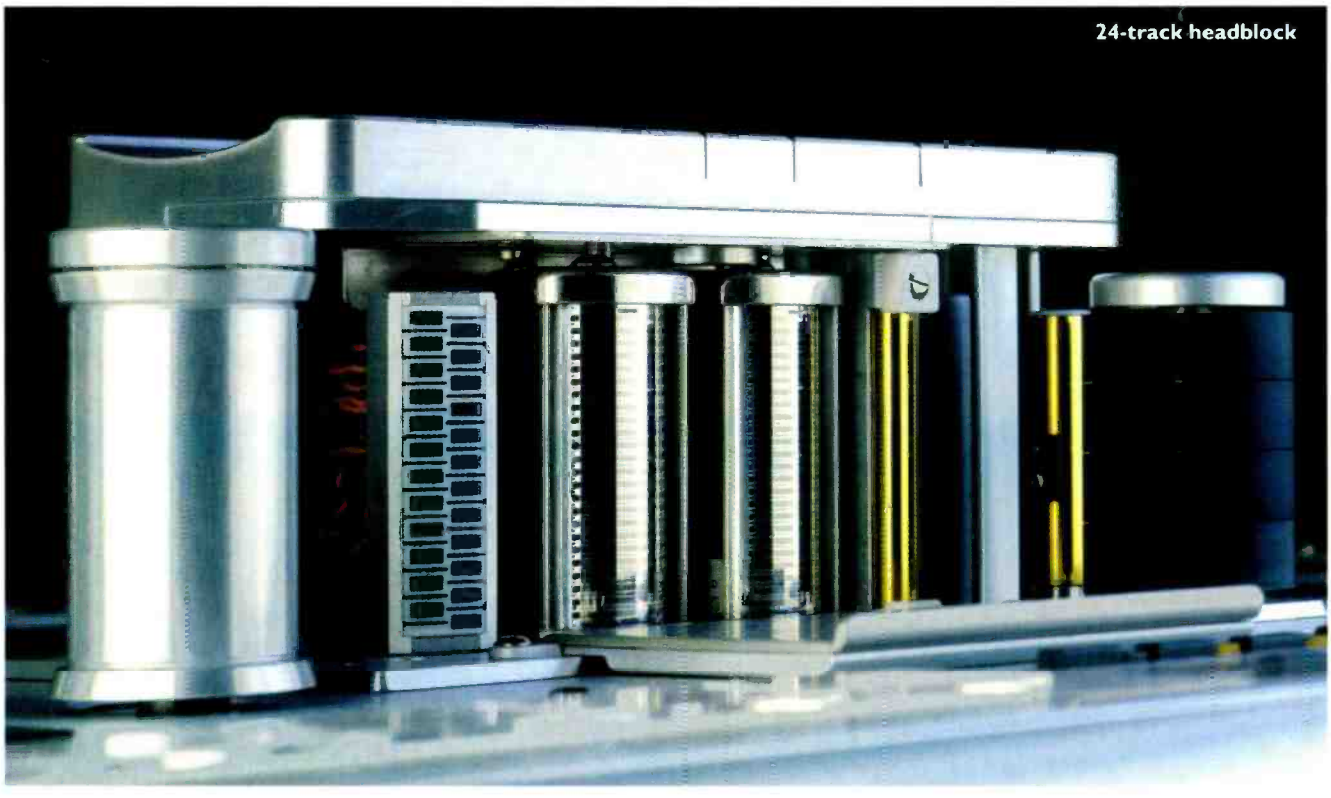
The A80 Mk.I, Mk.II and the A800 Mk.I tape recorders were equipped with the so-called wide head block; the stabiliser roller was in between the record and the reproduce heads and there were two erase heads fitted—one for the even-numbered tracks and one for the odd. The compound that makes up the head is very soft. From the Mk.II onwards, Studer developed a head with a much harder compound, namely the 317 head. Looking at Table 1, original 316 heads are no longer available. If you are looking at purchasing a second-hand machine, therefore, you should look at the index number printed on the sticker located on the head. If it starts 1.316 then be aware that exact replacement heads may not be available.

As with many items, correctly maintained heads can last a lot longer than those that aren't. A well-maintained set of heads can last up to 10,000 hours before requiring replacement. The engineers at Studer often see heads requiring replacement after as little as 7,000Hrs. Good head maintenance is a combination of accurate tape tension, regular cleaning, regular demagnetising and accurate tape path alignment.

Accurate tape tension is particularly important for steady head wear. Using >

Machine Type	Record Head	Reproduce Head	Erase Head
A80 MKI, MKII	*	*	*
A80 MK III, IV	1.317.184.00	1.317.185.00	1.216.824.00
A800 MKI	*	*	*
A800 MKII, MKIII	1.317.380.00	1.317.385.00	1.216.825.00
A820	1.318.780.00	1.317.785.00	1.216.826.00
A827	1.318.780.00	1.318.785.00	1.216.826.00

* = No longer available



24-track headblock

are available through all Studer dealers with the index number 10.042.002.01. The correct procedure is to switch off your recorder ensuring all tapes are at lest 12 inches away from the demagnetiser. Approach the component to be demagnetised with the plastic coated probe. Bring the tip of the probe within ⅛-inch or ¼-inch, it is rarely necessary to actually touch the component. Wave sideways slightly, and withdraw slowly (while still energised) at a rate of no more than 3ips-4ips to a distance of 12 inches.

Accurate tape path alignment is crucial to performance; if the path is not set up correctly not only does it have the potential to damage tape, it will produce different audio levels, as the gap is uneven and will also increase wear on different tracks. With the final result being that the head is too worn on certain tracks and the head becomes unusable. ■

< the A827 as an example, the tape tensions should be 380g-450g. The important part of this figure is the 70g difference, which is the tension across the head. If the difference in tension is increased at any point from 70g, then there is going to be more wear across the head. It is really a false economy not to check the tensions on a daily basis; a tentelomer is not expensive and can save money in the long term by giving better head life. Cleaning your heads should be undertaken using a soft cloth (or cotton wool) and some methylated sprit.

Demagnetising on a regular basis is a basic necessity of tape machine maintenance, most parts along the tape path become magnetised and the heads are no exception. Heads are made up of magnetically soft material and therefore pick up magnetism more readily. The tape guides are made of harder steels and are more difficult to magnetise, however they do retain their magnetism and are much harder to demagnetise.

> Good quality heads are generally very expensive, and if you buy a second-hand A80 or A800 with the wrong heads it could be a very costly mistake.

The magnetic coating on tape is generally very sensitive to extraneous magnetism, since the recorded signal itself is a modulation of the residual magnetism retained in the thin layer of magnetic coating compound. Any exposure to magnetic fields can degrade recorded signals, resulting in noticeable loss or attenuation of high frequency and an increase in background noise of several dB.

It is recommended by Studer that demagnetising should be undertaken every 100 hours of use. Demagnetisers

DR JOHN

Headphones 2

Listening on headphones normally doesn't give the same results as listening on speakers. **John Watkinson** looks at the problem and what can be done about it

WHEN LISTENING to a pair of loudspeakers, both ears hear both speakers (Fig.1a). The result is that each ear receives the sum of two signals that have travelled different distances. The signals launched from the speaker differ only in amplitude, but because of the different distances travelled this addition process produces a timing difference between the sounds arriving at the ears. This fools the hearing system into detecting a virtual sound source somewhere between the speakers. The position of the virtual sound source is controlled by the relative level of the signal at the two speakers.

When headphones are supplied by the same pair of signals, the result is quite different. Firstly, each ear only receives one signal (Fig.1b) so the mechanism which creates timing differences is defeated. Secondly, the sound is presented to the ear from a different direction (Fig.1c). Sound from the loudspeaker arrives from typically about 60° off the axis of the ear whereas sound from a headphone arrives on-axis. A further difficulty is that if the head is turned, the sound direction from the loudspeakers changes, whereas the headphones move with the head. No wonder it sounds different.

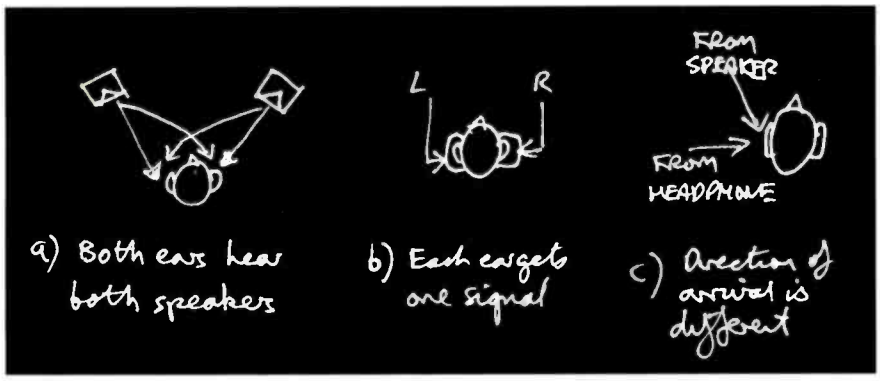


Fig.1: Differences between speakers and headphones

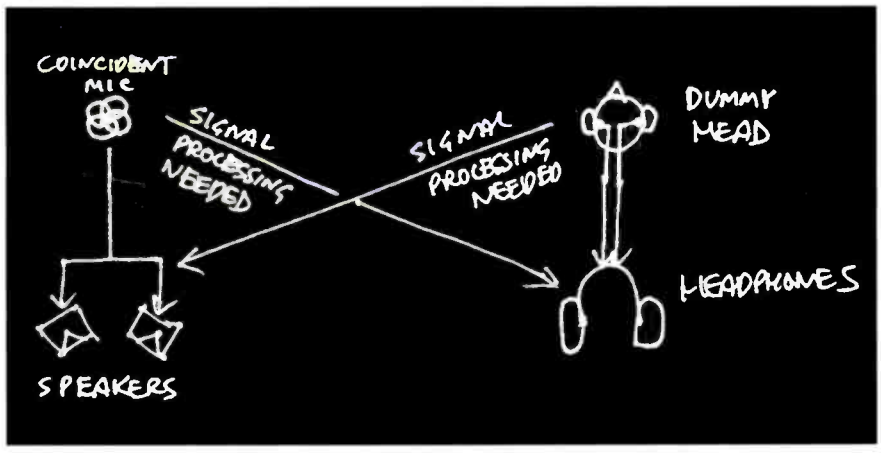


Fig.2: Standards conversion is needed between incompatible signals

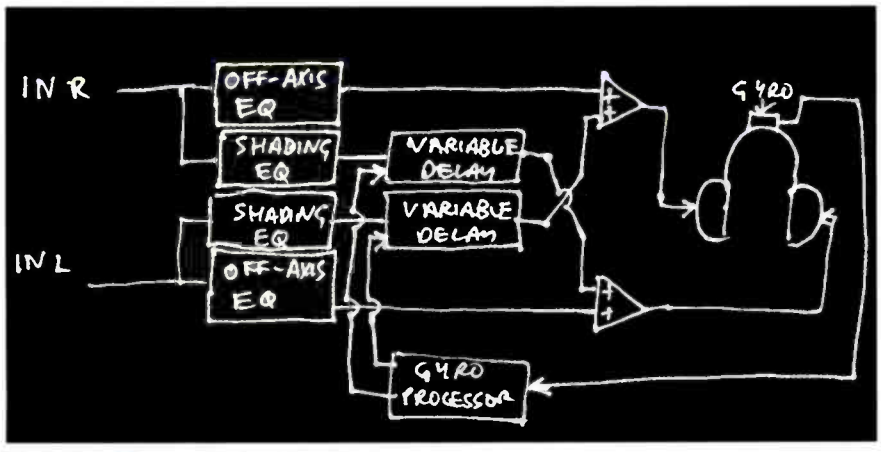


Fig.3: Headphone standards conversion

The result of naive connection of headphones to a source intended for loudspeaker reproduction is that the sound appears to be created inside the listener's head so that there is no forward image. As a result headphone listening of this kind cannot meaningfully be used to monitor for any spatial attributes of a stereo signal. Defects in the stereo image that would be obvious on loudspeakers might go unnoticed on headphones. For the consumer, not interested in monitoring, listening in this way is simply unrealistic.

The problem is that intensity stereo signals are incompatible with headphones. Fig.2 shows that coincident microphones are compatible with loudspeakers and a dummy head is compatible with headphones. Interchanging the signals requires standards conversion.

The majority of headphones do not have the necessary standards convertor and are therefore naive. It is particularly astonishing that devices specifically intended for use with headphones, such as personal tape and CD players, don't have such circuitry as standard.

In professional audio we can take no comfort from the fact that the high ground in noise cancelling headphones and standards conversion has been captured by the aviation industry. Take the example of an emergency helicopter pilot who needs to listen to air traffic control, the medical attendant on board, and police, fire and ambulance services on the ground. The latest generation of aviation headsets allows the pilot to perceive each signal as coming from a different direction so it is immediately apparent who is talking.

Fig.3 shows how a headphone standards convertor works. The intensity stereo inputs represent waveforms that would have come from a pair of loudspeakers so we have to simulate what happens. The headphone creates sound which is pointed straight into the ear canal, whereas sound from the loudspeaker has arrived by a different route.

Considering first the ear and the speaker on the same side, the directivity of the ear is such that the frequency

response will roll off at high frequencies for sound coming from the speaker, but not for the headphone. Thus an equaliser is needed to simulate the difference in frequency response of the ear between sounds on-axis and 60 off axis. One of these will be needed between the left input and the left headphone and likewise between the right input and the right headphone.

Turning now to the ear on the opposite side to the speaker, sound reaching this ear has arrived from 120 off-axis, and has also travelled a greater distance. The obstruction caused by the head results in shading. Long wavelengths travel easily around the head which is small in comparison, whereas short wavelengths find the head a significant obstruction. It is necessary to model the frequency and phase response of this shading, as well as the fixed delay due to the additional distance from the speaker.

The outputs from the shading models are cross connected so that the left headphone gets the sum of the signals from the left equaliser and the right shading model and the right headphone gets the equivalent. This now simulates the effect of listening to a pair of loudspeakers with a fixed head. The sound image is brought forwards out of the head and better decisions can be taken about the nature of the image.

Just going this far is a significant step because it turns the usually problematic headphones into a much more useful tool for the professional as well as being more realistic for the consumer. However, the simple steps outlined above have one fundamental flaw. If the head is turned, the realism is shattered because the sound stage turns with it and this is unnatural. For best results the sound stage should stay exactly where it is when the head makes small movements.

In real listening, head movements are often used to improve the accuracy of direction sensing. These head movements are frequently involuntary. For example, sound sources in front appear to move left if the head is moved to the right, whereas sound sources behind move right if the head is moved to the right. If the sound source is fixed to the head, as is the case with headphones, this mechanism is defeated and the brain is not convinced that our carefully equalised and delayed signals really represent forward sources.

The solution is to measure the angular movement of the headphones and correctly to adapt the signals to give the illusion of relative movement of the sound sources. Thus if the wearer turns 5 right, the apparent soundfield in the headphones should move 5 left, so that the sound sources appear static with respect to the earth.

The movement of the headphones about a vertical axis is easily measured using a piezo-electric gyroscope which weighs a few grams. A piezo-electric gyroscope is a crystalline beam that is set in vibration like a crystal in an oscillator. The vibrational energy exists in the axis of vibration. If the gyroscope is rotated such that the axis is turned, energy has to be taken from the existing axis and transferred to the new one. This results in lateral forces on the beam that can be measured. One can consider the vibration to be a one-axis version of rotation, and the lateral forces are the equivalent of gyroscopic precession.

These units are used in image stabilised camcorders and model helicopters and are inexpensive. They output a signal proportional to the velocity of rotation which can be integrated to provide a position signal. The head position signal is then used to control variable delays in the audio signal path to simulate the changes in path length as the head turns.

There have been a number of attempts at implementing headphone standards convertors, but the number of commercially available models is limited. One of the difficulties is that it is important to consider the time-domain response of all of the circuitry, yet most audio designers have a preoccupation with the frequency response and usually neglect the time domain. A slight knowledge of communications theory will show the significance of the error. From an information standpoint a sine wave, which is a single frequency, has no bandwidth and thus carries no information. No wonder they can be compressed easily. The only time that information is carried is when a sine wave starts and stops, and of course this results in the creation of harmonics so that there is finite bandwidth. Consequently the majority of information in an audio signal is carried in transients and if they are not reproduced properly realism will suffer.

Ambience is transient rich because it is not musical. The disappearance of ambience and reverberation when lossy compression is used is now well known. One wonders what tests the designers of these systems could have made to think that they had achieved high quality.

If the filters used to simulate off-axis sound sources and shading in a headphone standards convertor do not simulate the time or phase response of the real process, the correct illusion will not be obtained. In some systems the delay is implemented in analogue all-pass filters and it is difficult to obtain a sufficiently accurate time-domain response when these are used. Of course in the digital domain the creation of variable delays and filters of specified phase response is much easier. In a production device the use of digital circuitry would probably have a cost advantage over an analogue implementation. ■

Advertisers Index

Reasons to be fearful

As technology erodes the distinction between audio disciplines, audio people are challenged to learn new skills. **Simon Croft** sounds a warning to the audio devotee

THE PROPOSITION behind this month's 'Open Mic' is a simple as it is unpalatable: within a few years the job function performed by many readers of *Studio Sound* today will have essentially disappeared. I'm not talking about mass unemployment —although that is frequently a consequence of technological advance. What I am suggesting is that the remit of many audio editors and sound mixers will change so much that their new role could no longer be considered the same job.

When I first edited a magazine in the mid-eighties, there were numerous jobs that simply do not exist today. Journalists wrote with typewriters and the corrected text was later rekeyed by typesetters. The conceptual page designs were usually done in-house before being slavishly copied by paste-up artists. These days, the text that journalists key into their computers is reformatted, sub-edited and laid out to page on the screen.

Perhaps you are unwilling to believe that this applies to workers in the audio industry. Remember when it seemed like every third person you met ran a commercial 24-track studio with an Otari recorder and a DDA, or a Trident desk? But gear was getting better, cheaper and almost maintenance-free. Affordable digital multitrack was on its way. Musicians and composers were spending more time sequencing and sampling in preproduction. Quite soon, a lot of them became CAMPs (Composer, Arranger, Musician, Producer) and spent their money on equipment, rather than studio time. Did it kill commercial studios? No, but it sounded the death knell for the middle of the market. Today, similar forces are starting to erode the position of sound workers in the broadcast industry.

Let's cut to the chase here, what broadcasters need is more programme hours for less money. With terrestrial, cable and satellite in analogue and digital incarnations, there are more hours of material broadcast today than ever before. But that doesn't increase the advertising spend which supports most of this activity. As television becomes increasingly nonlinear and the lines between television and the Internet get more and more blurred, the medium will consume yet more programme material. This can only increase the pressure to reduce manning levels.

Camera operators are no keener on this trend than are sound operators. Being a one-man crew can be a lonely and dangerous business. And freelance camera operators will tell you that almost getting killed to obtain footage is no guarantee of being paid. We have a new generation of 'video jocks', who set up their sound and shot before stepping in front of the lens to deliver their report. Radio and television journalists are increasingly editing their own material, as part of a drive towards 'multiskilling'. Like the CAMPs, that's four jobs in one.

Video editors are also under increasing pressure to edit sound as part of the job. Do video editors like doing this? Not very much because they don't get any more time or budget for their troubles. Are they prepared to do it? Yes, because they either embrace the new requirement or lose the work. At the beginning of this piece, I referred to what is 'technologically possible'. This criterion is obviously key: if broadcasters in the seventies could have got away with one guy in a van, they wouldn't have sent out massive trucks with as many as 11 staff to cover a simple story. But technological advance does more than make things possible; it frequently makes them easy to learn. It makes hard-earned craft skills redundant—in every sense. If you can drag and drop segments of video onto a timeline using the computer's mouse, performing a similar function using audio segments is not such a challenge (and *vice versa*). Almost every nonlinear video editing system includes multitrack audio facilities and some of them have very sophisticated DSP. Audio editing systems have very few—if any —video editing capabilities. I don't think you need to be Nostradamus to predict who the winners and losers are going to be in the new audio-video world.

A CNN executive said bluntly in a recent interview: 'People who can't adjust to multiskilling better go and get themselves single-skill jobs.' For audio people that has to translate to: 'Catch up with video editing before it catches up with you.'

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