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STUDIO SOUND



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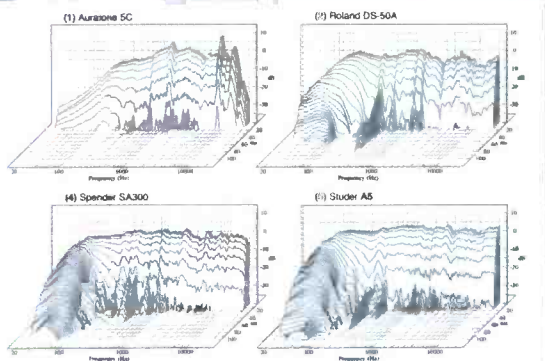
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CAPTIVE AUDIENCE

US Prison hosts classic country recording



REVIEWS

- Sony Oxford EQ plug-in
- Gaylor Design Whizzer
- Tascam CD-RW4U
- Eventide Eclipse
- Dolby DP570
- Genex GXA8
- Genex GXD8
- Weiss DAC1



The NS-10M: A monitoring myth exploded
Yamaha DM2000: Latest digital console previewed
DVD: Record company lifeline or missed opportunity?
UFO: Digital audio broadcasting lands in Taipei

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Todd AO



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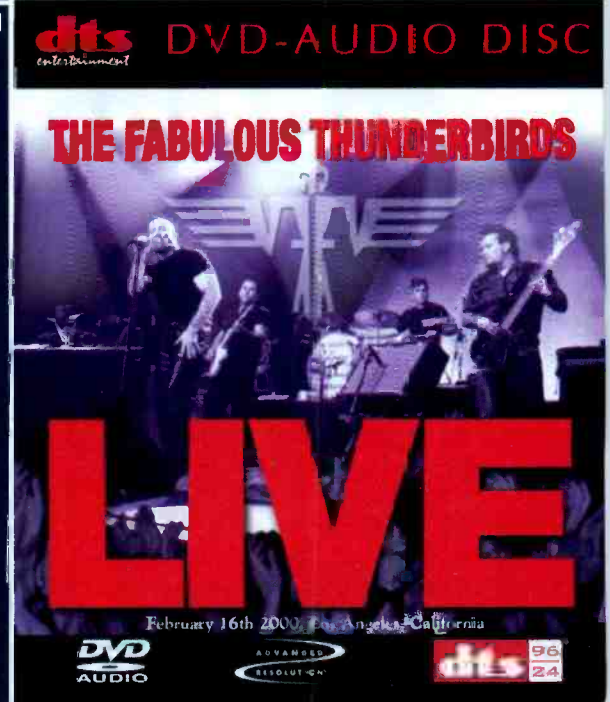
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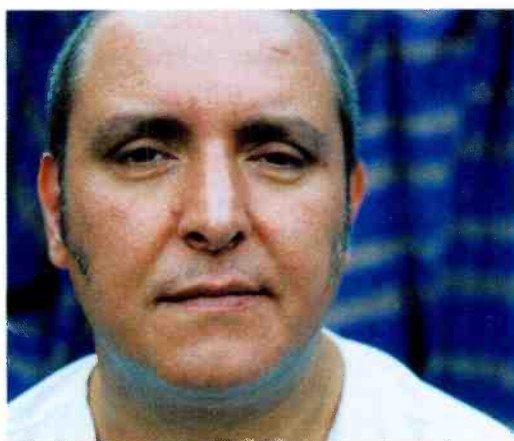


Out of sync

THE AFGHANISTAN conflict has demonstrated precisely how cheap and predictable broadcasters can become when they really want to. Surely few can now watch CNN's own particular brand of 'news' and take on the subject without longing to find solace somewhere else. Created seemingly by some news equivalent of Sonic Foundry's Acid music looping program, the joins are unfortunately too openly apparent and serve only to illustrate how the repurposing of content has moved on in leaps and bounds even since the Gulf War.

More disappointing still are the early attempts by a number of broadcasters at remote live Internet delivery. Not so long ago we were content with a phone-in by the reporter in question talking over a picture of himself overlaid on a still of the location. Today some bright spark has decided that more is now technically possible and we are subjected to streaming audio, often with drop outs, running alongside, as opposed to in-sync with, brutal resolution and jumpy 'motion pictures'. They've even had the audacity to include accompanying and extra edited footage from the scene. While I can understand the technical difficulties that can plague such ambition the general viewer will be left wondering what is going on.

It does nothing for the cause of quality broadcasting and is actually a step back towards the use of



subtitles and the employment of a live piano player in the studio to add sobriety to what are very serious matters.

It comes down to the incongruous behaviour of large corporations blinded by technology and hell bent on penny pinching who have lost touch with their market. They have also lost sight of what they have and what function they are supposed to perform.

Zenon Schoepe, executive editor

The end of innocence

AS THE REDISCOVERY of a 400-year-old music manuscript in the Spanish city of Lerma settled many of the scholars' debates about early Catholic church music, *Studio Sound's* loudspeaker analysis promises to settle the protracted discussion surrounding the NS-10. For while Yamaha's much-debated and recently discontinued loudspeaker has found itself cast as a 'reference' monitor, the reasons have remained unclear... until now.

Having run a carefully-considered test programme on some 36 close-field contenders at *Studio Sound's* behest, Dr Keith Holland was in a unique position to compare their respective performances and identify what—if anything—might account for the perceived performance of the maligned NS-10M. Unique because, unlike those of us who might have sought to compare manufacturers' own specifications only to find mismatches in measurements and measurement techniques, Keith had a consistent picture of every monitor measured using the considerable facilities of the Institute of

Sound & Vibration Research. And with the assistance of studio designer Philip Newell and his son, engineer Julius, the game was on.

Seeing the project through to its conclusion wasn't without its setbacks, but the summarised results are in your hands now. And they make revealing reading.

Far from being simply the consequence of an opportunistic marketing campaign, affordable studio chic or plain happenstance, the suitability of the NS-10M to the recording studio now seems based on readily identifiable aspects of its performance—aspects not

generally shared by purpose-designed speakers. Whether these are circumstantial or the result of a canny design is less likely to be scientifically proven.

On the eve of *Studio Sound's* publication of these findings, Philip Newell presented them in full to attendees of the recent Reproduced Sound 17 conference in the UK. He described the opportunity as 'a pleasure' while one of his audience commented, 'I've just realised that I've been designing speakers wrongly all my life'.

Now he knows the truth. We all do...

Tim Goodyer, editor



CMP Information,
7th Floor, Ludgate House,
245 Blackfriars Road, London SE1 9UR, UK.
Fax: +44 (0)20 7579 4011.
Net: www.studio-sound.com

Emails: (initialsurname@cmpinformation.com)
Direct lines: +44 (0)20 7579 (extension).

EDITORIAL

Executive Editor: Zenon Schoepe. X: 4604
Editor: Tim Goodyer. X: 4719
Production Editor: Dawn Boulwood. X: 4157
Secretary: Eileen Sullivan. X: 4169

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Chris Wolters, VTM, Brussels.
Postproduction: Paolo Biondo,
International Recording, Rome.
Lloyd Billing, The Tape Gallery, London.
Recording: Arthur Baker, producer-remixer.
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Publisher: Steve Haysom. X: 4459
Executive Director: Paul Gallo

SUBSCRIPTIONS

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For subscriptions contact:
Studio Sound, United Business Media International
Ltd. Tower House, Lathkill Street, Market
Harborough, Leicestershire, LE16 9EF, UK.
Tel: +(0) 1858 438893
Fax: +(0) 1858 461739
Email: lmulholland@cmpinformation.com

STUDIO SOUND

ANNOUNCEMENT

As part of an ongoing evaluation of its business strategy and consolidation across its core markets, CMPInformation has announced that it will suspend publication of *Studio Sound* following this December 2001 issue.

The *Studio Sound* brand will remain the property of CMPInformation and will form part of the CMPInformation product portfolio during 2002.

Sister publications *Pro Sound News Europe*, *Installation Europe*, *One To One* and *TVBEurope* are unaffected by these changes.

STUDIO SOUND

CONTRACTS

UK: London's Air Lyndhurst has added four Sennheiser MKH800 mics to its mic cabinet, in line with the greater requirements

of 24-96 digital recording. Air has also taken a number of Marantz CDR500 CD-R recorders for use

throughout the facility. It has installed Chameleon ULH3000 amplifiers to handle its sub-woofers. The new amps compliment the 2kW Chameleon DP/2s presently used to drive 'everything from Yamaha NS-10s to Dynaudio M1s'.

Air Studios, UK.
Tel: +44 20 77940660.
Sennheiser, UK. Tel: +44 1494 551551.
Marantz, UK. Tel: 1753 686080.
Chameleon Audio, UK.
Tel: +44 1594 827602.

Australia: Sydney's Global Television has chosen a 48-fader AMS Neve Libra Live Series II digital broadcast console for its new OB vehicle. Designed to be a rapid deployment vehicle, DP3 is a semi trailer with expanding sides, accommodating up to 16 cameras. Global Television, Australia.
Tel: +612 988 3222.
AMS Neve, UK.
Tel: +44 1282 457011.

US: Milwaukee-based Narada Productions recently installed an AudioCube 4-ii in its mastering suite. The Narada Cube is configured with Dual Pentium processors, CD-Writer, CD ROM, 100Mbit Ethernet and several VPIs including Analog EQ, Loudness Maximizer, MultiComp and FreeShaper. Now part of Virgin Music Group, Narada is the principal US licensee for Peter Gabriel's Real World Records and the world-wide licensee of David Byrne's Luaka Bop label. Cube-Tec, US. Tel: +1 905 469 8080.

Portugal: Broadcaster SIC has gone to air with a 32-fader Calrec Audio Alpha 100 digital desk, and a second 48-fader Alpha 100 in its 54-ft OB vehicle. The static console serves SIC News, a 24-7 news station while the OB also packs a 48-track recorder, FX units and Dolby processors for 5.1 transmission. It has already covered football matches, music shows and spent two months on a 24-hour reality show. Calrec, UK. Tel: +44 1422 842159.



CNN breaks Korean barrier

Seoul: Turner Broadcasting Korea is remaining tight-lipped about its presentation of CNN News in this country, as currently an affiliated company, CSTV, is providing local cable networks with programming that includes both English open captions and a simultaneous translation in Korean. Local sources say that since the Korean Broadcasting Commission has not yet allowed stations to provide local dubbing of foreign programmes, the broadcast is probably technically illegal.

Local company CSTV only distributes CNN as a re-transmission of the programming coming from Hong Kong. In Korea though, much of the programming is derived from the European version of CNN, rather than the American version. The 'bilingual broadcasting' is a simultaneous translation into Korean, with the original English soundtrack slightly audible underneath. Korea does not have Nicam stereo or separate LR soundtracks, which would allow the individual languages to be isolated.

The open English captions, which run as two lines of white text on a black background in the top 15% of the screen area, lag about 2s-5s behind the words being spoken by CNN reporters. But, rather than being produced by advanced voice-recognition

software running on a powerful computer, as some suppose, they are produced by a team of courtroom-style CNN stenographers in the US. Since stenography—basically typed shorthand—involves the typing-in of sounds, rather than words, this occasionally results in nonsense words appearing in the visual transcript.

A source revealed that PanAmSat 8 is used to provide the English open captions, subtitles and local supers for international ads from Hong Kong, while KoreaSat 2 is used for the simultaneous Korean translation. While the bilingual broadcasts can mostly be heard in daytime hours, at other times CSTV switches to open captions. For many hours there is simply the original sound.

Masters of the blues

US: Over nine months of restoration work has paid off for Boulder, CO's Airshow Mastering, whose use of an Audiocube and Sonic Solutions' No Noise system on ageing recordings have made possible the new box-set, *Screamin' and Hollerin' the blues: The world's of Charley Patton*.

The 7-CD retrospective has been released by Revenant Records, and is described as 'the most impressive package I've ever seen; it must weigh 12lbs' by Airshow Mastering founder, David Glasser. Following extensive restoration work by Matt

Sandoski, Glasser mastered the recordings, which were compiled from a large number of separate collections in the US and Europe.

'We would do clean up work on one of the tracks, then we would hear from a different collector who had a better version,' Glasser explained to *Studio Sound*. 'We probably ended up doing most of the tracks three times.'

Glasser and Sandoski primarily used an Audiocube and Sonic Solutions' No Noise system on the project—the first time that a Cube had been used at Airshow. Glasser explained that 'we saw the cube at AES and were impressed with its real-time capabilities. And I figured we'd save time with Sonic Solutions'. However, he added, 'it was mostly having the luxury of time. That made it possible to do the project properly.' Airshow Mastering, US. Tel: +1 303 247 9035.

Romania revamps radio service

Romania: State radio broadcaster SN Radiocomunicatii has signed an \$85m contract with Harris Corporation as part of a program to modernise and expand its nationwide broadcast infrastructure. Under the arrangement, which is expected to run for three years, Harris will be Radiocomunicatii's prime supplier. It is anticipated that this will involve the provision of radio transmission systems for approximately 90 sites through-

Telex gives debt plan more time

US: Creditors of debt-ridden US manufacturer Telex Communications have been granted a deadline extension to consider the company's latest plan for writing off its massive interest payments—some of which are at credit card rates. The company announced its plan for 'financial restructuring' on 13th September, proposing that senior creditors accept 'various combinations of cash and securities' issued by a newly-founded operating company, thereby making the senior creditors Telex' new owners. In anticipation of their consent, the company missed an interest payment in September and announced that it would also ignore a 1st November payment. The same announcement also imposed a 12th October deadline for the creditors to agree.

However, the manufacturer has now decided to extend the October deadline to early November, and says it has rejected the previous plan in favour of a simplified version. On the day the extension was announced, company president and CEO Ned Jackson explained the changes to *Studio Sound*.

Q: What's different about the new plan?

It's fairly much the same. What happens is they create a new company and they pass all of the revenue, the assets, to it. What you've really done is pass the ownership over to the bond-holders. People get new bonds at a lesser extent and more common stock, and then there is one small group of people who get nothing but warrants, which would mean that they would get common stock in the future when we hit certain earnings targets. So it's a much simpler program and it's very good for the company because it keeps us involved with our original bankers. It basically gives the equity to the bondholders and we, the company, end up with considerably less debt in interest payments.

Q: Why the deadline extension?

These things never come down the way you start them. There were negotiations between bankers and bondholders and the previous owners and people like that. It just takes a long time. I don't think it'll go on any further. By the first week or so in November it will close.

Q: What happens if the creditors say no?

Well, they're not going to! They will say yes. We're pretty certain at this point in time that everything is moving smoothly. And if they said no... I mean, there's a recognition by people that our capital structure is wrong for the company, and there's a willingness among those involved to correct that.

Q: Is there a contingency plan in case they say no?

Yes. But we're pretty confident at this point that everything is fine and moving very nicely. We've been negotiating very strongly and in good faith and we have pretty good support on this matter.

Q: Will the plan involve any staff changes and how will it affect you internationally?

The makeup of the board could change because now some of the larger bondholders could come on, and I see that as a very positive thing because you want people on the board who have a strong interest in the company. Internationally, I think it'll strengthen us. Certainly in the United Kingdom we feel like we have outstanding brands with Midas and Klark Teknik and if anything it will make them much stronger. The same thing is true with our subsidiary in Germany, Dynacord.

Q: Are you planning to sell off any brands?

I've had people come to me and ask if we'd like to sell Klark Teknik or Midas and my answer has always been 'not unless you want to part with a hell of a lot of money!' Of course we always continue to look at things which you ultimately conclude are more valuable to other people than yourself, but at this moment in time we have nothing on the horizon. What we want to do is regroup and with our new-found capital structure, compete like crazy.



US: New independent Hollywood audio post facility, **The Post House**, is to install two 80-fader and one 48-fader AMS Neve DFCs and Avid picture editors for its spring opening. Designed by Hanson Hsu of LA's Delta H Designs, the Post House will address the feature film mixing and image editing market. According to Hsu (pictured with AMS Neve's John Hart), 'The whole facility will be digital. We're installing facility-wide Fibre Channel, with facilities for real-time, uncompressed on-line video from the Avid suites onto the dub stages. Being an independent facility gives us the ability to be flexible, nimble and creative in a quickly responsive manner.'

out Romania, along with microwave links, and centralised network management systems. Harris will also provide engineering, installation and commissioning services.

The contract was formally signed when Romanian Prime Minister Adrian Nastase visited Washington, DC. Prime Minister Nastase, other Romanian officials, and Bruce Allan, president of Harris Corporation's Broadcast Communications Division participated in the signing. 'Harris is honoured to have been selected by Radiocomunicatii for this project which, in addition to being the largest in the history of its Broadcast Communications Division, will include market-leading products and technologies from Harris' Microwave Communications and Network Support Divisions,' Allan said. 'This project will strengthen Harris' position as a supplier of integrated solutions for the world-wide broadcast industry.'

Top firms promote datacasting

Europe: Ten of Europe's leading communications companies are working together to promote Internet protocol datacasting across multiple formats, naming themselves the IP Datacasting Forum. The formation of the group was announced on 13th September at the IBC convention, with founding members including Nokia, Deutsche Telekom, Philips and NTL Broadcast—whose president, Ken McCann has been named the group's chairman.

Speaking exclusively to *Studio Sound* immediately prior to the forum's second meeting, McCann explained that its members 'share a common vision of an IP-based datacasting system that will enable the mobile information society'. He added that such a system would use 'both the DAB

and DVB broadcasting systems to deliver audio, video, data, graphics and other broadband information directly to people whether they are in their homes or on the move'.

Asked whether this meant that the IP Forum would be pushing the uptake of mobile phones with built-in DAB receivers, McCann conceded that DAB would fall under the Forum's remit, explaining that 'it will certainly help the take-up of DAB'. But he added that the use of mobile phones had 'not cropped up as a specific issue at the moment'. Nevertheless, the prominent role of mobile communications world leader Nokia in the Forum is surely an indication of the organisations' future priorities.

Also included among the forum's original 10 members are wireless infrastructure provider Crown Castle International, Finnish broadcaster Digita OY, software developer The Fantastic Corporation, broadcaster Retevision, networking infrastructure company SkyStream Networks and Swedish network operator Teracom.

'It started off with informal talks between interested people meeting at various exhibitions. Now the forum is moving to become a more open organisation,' explained McCann. Asked about initial speculation that the forum would be concentrating more on visual media, he added, 'IP datacasting is a common mechanism that can deliver either audio or video. It's flexible'. NTL Broadcast, UK. Tel: +44 1256 752000.

First BAFTA for Music DVD

UK: The Super Furry Animals' much hailed DVD *Rings Around The World* has become the first music DVD to be nominated for a BAFTA Interactive Entertainment award, having been placed in the running for Best

Interface Design and praised by the award committee's chairman Malcolm Garrett as the first release of its kind not to treat the medium as 'glorified VHS'.

'Most of the DVDs you buy are simply linear media with moving menus,' explained Garrett. 'But I've been trying to get bands to see DVD as a creative form in its own right, not just a glorified version of VHS. The Super Furry Animals are the first band to do that.' The sentiment was echoed by the disc's producer, Mike Gillespie of Metropolis DVD. 'We've seen a lot of people since that disc who want to do more on DVD for music,' he reported. 'The music market hasn't really broken through yet, but it's happening.'

Released simultaneously with an audio-only album of the same name, *Rings Around The World* includes a special 5.1 surround sound mix, videos to accompany each track, a large 'extras' library and a specially designed menu system intended to encourage repeat viewings. Metropolis Group, UK. Tel: +44 208 742 1111.

Playing at work

Manila: Along with Broadcast Electronics' VaultXPRESS computer software, Manila radio station DWTM-FM, 89.9MHz, has recently acquired a BA 1230 digital console from Fidelipac as well as an Optimod 8400 from Orban, replacing its 6-year-old model 8200. At the same time the station has finally retired its Fidelipac CTR-90 cart machines.

Explains Armand Ursal, the station's chief engineer, 'The cart machines had been part of our operation for more than 10 years and proved to be the one of the best and most reliable ways to deliver the commercials to our listeners.' The role of the machines will now be taken over by VaultXPRESS.

Ursal explains, 'VaultXPRESS is an open-architecture system which provides broadcasters with sophisticated digital recording, editing, storage and playback of audio. In this system the digital or analogue audio is converted to digital audio data files and stored on a computer hard disk. The system provides dynamic access to the digital audio for playback, so that the same audio can be played on multiple computers at the same time.'

Station DWTM-FM, popularly known as Magic 89.9, is using 700MHz Pentium III computers with 2x 128MB of RAM, and a 7200rpm, 60GB hard disk. The operating system is Windows 2000, and the computers are linked via a 100Mb/s LAN. The station is wired using CAT 5E UTP cables, and the hub for the network is a D-link DFE-2624i intelligent hub.

Ursal says the station's announcers and newscasters were 'thrilled' the first time he introduced the system to them, '...especially since we also replaced the two large CRT computer monitors with much smaller TFT LCD flat-panel colour monitors from Sony.'

Ursal maintains that it took only one hour-long session to train users on the functions and operation of the system. And since DWTM-FM put it in, he adds, 'it hasn't

CONTRACTS

Germany: Hit Radio FFH has installed six Orban Optimod-FM 8400s at its new digital studio complex, where their TCP-IP facility allows the units to be located in the machine room and controlled from the studios. Based in Frankfurt, Hit Radio FFH owns three radio stations—classical Hit Radio, Planet Radio, and new easy-listening station Harmony FM. Bayerischer Rundfunk meanwhile, has ordered a 48-fader Soundtracs DPC-II digital console for its new Dolby EX-equipped mixing theatre. Public service broadcaster ZDF is to install a 24-fader, 48-channel SSL Avant digital in Synchron Regie 1 in a refurbished dubbing studio in Mainz. Hit Radio FFH, Germany. Net: www.fhh.de Bayerischer Rundfunk, Germany. Tel: +49 89 380602. Orban-CRL, US. Tel: +1 510 351 3500. SSL, UK. Tel: +44 1865 842300.

UK: Nottinghamshire-based Serendipity has installed a telectronic System 6000 surround processor. The operation's activities range from mastering through location recording, to specialist restoration and most recently surround processing. Serendipity's audio is handled by a Sadie 24/96 system before being recorded to a Genex hard-disk recorder. Clients are mid-level record companies and include Demon and Voiceprint. Serendipity, UK. Tel: +44 1777 707404. The M Corporation, UK. Tel: +44 1425 479090.

Denmark: Andreas Johansson has installed a Miller & Kreisel surround monitoring system at his



Tonemesteren studio in Ry from which he provides sound design to the Danish Broadcasting Corporation and Nordisk film. The studio is centred on a networked Pro Tools setup with three new M&K MPS 2510P front monitors, two MPS 2525 tripole surrounds, one MPS 5310 sub and an LFE 4 bass management system in support. Tonemesteren, Denmark. Tel: +45 86 89 11 00. AB Global, Denmark. Tel: +45 8619 8733.

CONTRACTS

Sweden: Skylark Studios has installed an Amek Media 51 multiformat analogue console at its new facility in Norrköping. The studio also uses a Pro Tools system, four Fostex D-160 16-track recorder-editors, Alesis ADATs, and Genelec monitoring. The studio is owned by producer-arranger Lars-Åke Svantesson and engineer-musician Ronnie Roos and serves a range of production duties, including DVD, film and video projects.
Skylark Studios, Sweden.
Tel: +46 11 343044.
Amek, UK. Tel: +44 161 868 2400.

Japan: Imagica's programme production and satellite TV channels employing over 40 digital video edit and associated suites will see the installation of three SSL Avant Plus consoles. The first 160-input post console, is already at work in Imagica's Ginza-based Dio Group facility. A second 32-fader, 128-input Avant Plus will start operation imminently at the company's Akasaka Studio. Imagica Shinagawa, in the south west of Tokyo, has specified a 32-fader, 128-input MT Plus console for the end of September. Imagica, Ginza, Japan.
Tel: +81 3 3542 1681.
SSL, Japan. Tel: +81 3 5474 1144.



UK: Picturesquely located beneath the walls of Cardiff Castle, the Welsh College of Music and Drama also offers an impressive new recording studio—thanks to the support of the Sony Europa Foundation and the generosity of Cardiff native Sir Howard Stringer, chairman and CEO of Sony Corporation of America. The studio was designed by Roger D'Arcy Associates and centres on a Sony DMX R-100 digital console and Pro Tools system with a Sony DRE-S777 sampling reverb taking pride of place among its outboard. The studio has played a significant part in enabling the College to offer its 4-year music course for music technology specialists and will also be used for mixing and posting OB work. Head of Music Technology, Roger Butler commented, 'The widespread adoption of the DMX-R100 by the professional audio community made it an obvious choice for the college, as students are increasingly likely to come across it in the commercial world after completing their studies'.

bogged down once yet. Not only is maintenance easy, he says, but the station is able to eliminate the delay in getting produced material on-air. 'Once the production of a project is finished on one workstation,' Ursal says, 'VaultXPRESS automatically puts the material in the database ready to be used by any other workstation.'

Magic 89.9 FM is currently using the system for commercials, promos, station liners and jingles. 'However,' Ursal cautions, 'our music tracks are not yet converted to digital audio files. We are still using Denon CD players, as the DJs prefer to play the music direct from CD's. I guess that way they feel they are still working!'

Ursal eventually plans to put the station's music onto the computer and to put another VaultXPRESS station in the on-air booth. 'This will serve as a back-up should one of the VaultXPRESS stations fail,' he explains, adding, 'But of course we will not retire our CD players. For two reasons—both obvious.'

New digital OB trucks down under

Australia: A total of 15 new outside broadcast trucks are being constructed for use in Australia and New Zealand following a round of key contract renegotiations—and all of the trucks are to be fully digitised.

'The Australian market is going through

The Digital Broadcast System

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Software upgradable
Network option



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CONTRACTS

US: California's The Village Studios has placed a Neve 88R analogue console in its Studio D, seeing first use with veteran producer Roy Thomas Baker. Responsible for the recent blockbuster, *Moulin Rouge*, the console is providing competition for The Village's Neve 4048. The Village, US. Net: www.villagestudios.com AMS Neve, UK. Tel: +44 1282 457011.

UK: Virgin Radio has fitted Klein and Hummel O300D and O104 speakers in its new complex in Soho's Golden Square. The O300Ds were chosen for the presentation studios and O104s for the production areas. Meanwhile national UK news provider ITN has installed a Cedar DNS1000 dynamic noise suppressor following the use of a Hiss-2 system for the 1997 General Election coverage. Eicotec, UK. Tel: +44 7720 404 624. CEDAR Audio, UK. Tel: +44 1223 881771.

Brazil: Andre Guidon's Sao Paulo-based Estudios Guidon has installed a 40-channel D&R Octagon console. Estudios Guidon, Brazil. Email: andre@estudiosguidon.com.br D&R Electronica, Holland. Tel: +31 294 418 014.

digitisation,' explained Peter Adams of the Grass Valley Group, who are supplying Kalypso switching systems for each of the new trucks. 'It's been going on for a couple of years but more so in the last six months. We're broadcasting in high-definition and the digitisation is off the back of that.'

Adams explained that the exchange of key sports contracts plus an increasing thirst among the public for outside broadcasts has spurred on the ordering of the new trucks. 'The rights for all of the cricket coverage were previously held by New Zealand Television, but they came up for renewal some months ago. A company named Outside Broadcast formed a consortium with Sky TV and put in a bid to broadcast all cricket into New Zealand.'

The consortium has since ordered three new trucks, while major domestic broadcaster the Australian Broadcasting Corporation has ordered a further eight. Meanwhile, three more are being built for Global Television, the first of which was ready in November. 'Global TV is the biggest independent broadcaster in this region,' continued Adams, who added that the company mostly provides OB for Australia's Channels 9 and 10—the new owners of Australian Rules Football on domestic television. 'People are realising that it's a false economy to re-equip a truck when they go digital, because digital is so different,' Adams reasoned. 'It's better to trash the old truck and build a new design.'

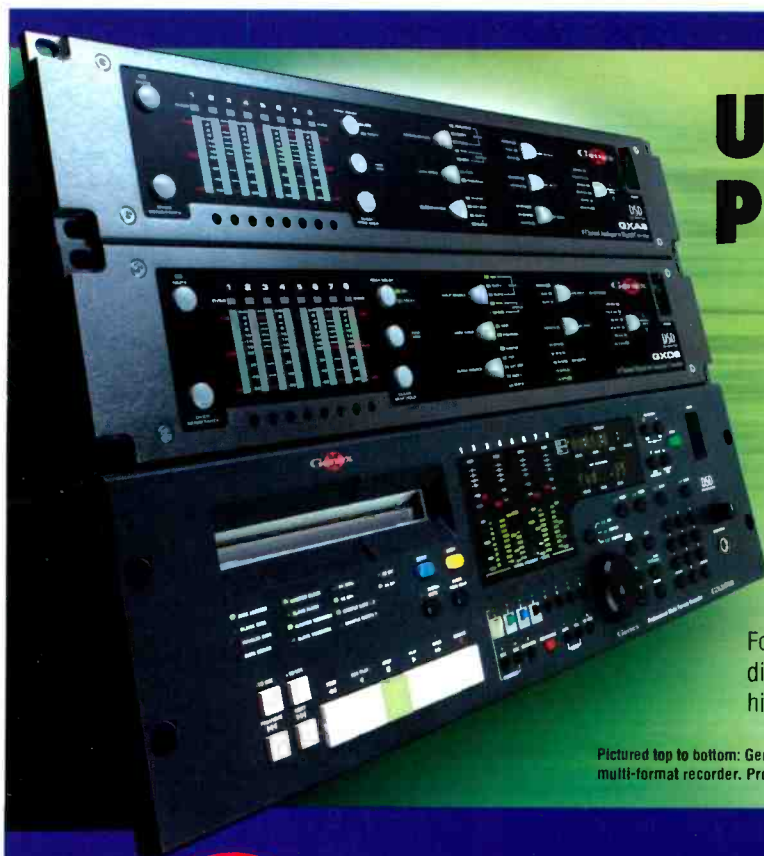


Hong Kong: Avon Recording Studios' has completed its new Room M, a 5.1-channel editing and mastering suite, pictured here with mastering engineer Raymond Yu. Described as 'the first fully-professional surround sound suite to be built in the former British colony', Room M features a fully-loaded Sonic Solutions SonicStudio HD workstation and a 5.1 monitoring system comprising matched Genelec 1030A and a 1092A Sub. Yu and studio manager David Sum explained that local stores are offering a range of Super Audio CD material but, to date, very few DVD-Audio releases.

The move towards digitisation is seen by Adams as part of a wider trend towards high-definition broadcasting throughout the Asian hemisphere, commenting that 'part of the deal has been that we will provide a path to high-definition in these trucks'. However, he believes that Australia's prospective adoption of the standard is likely to attract more attention than other countries in the region. 'Asia in general is embracing high-definition,' he declared, citing 'Japan, China and even

Korea. We're not an isolated circumstance. But maybe we're more vocal than other countries. Plus, HD rollout in the US has been less than satisfactory, so people are now saying that's not how to do it.'

On the sales of Kalypso systems into the new trucks, Adams concluded that 'we are pretty happy. The release of Kalypso two years ago heralded the beginning of a new age for the Grass Valley Group'. Net: www.grassvalleygroup.com



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APPOINTMENTS

Sennheiser has promoted Jeff Alexander to the new position of director of distributed brands, following the promotion of Karl Winkler to director of marketing communications. Alexander will be responsible for developing the company's organisational structure.



Harris has appointed Roland Eid MD of its digital broadcasting R&D unit based in Rennes, France. Eid will report to Eduard Schlauch, MD of Harris Broadcast Europe and will manage all operational aspects of the R&D operation. Previous director of operations, Jean-Luc Pavy, is to be director of business development reporting to Eid. He will work within the new Harris Broadcast Europe on product standardisation and co-ordination of new business for the Rennes operation.

DTS Europe has appointed Ted Lavery director of business development, Europe, based in Northern Ireland. He will expand the role of DTS surround in the broadcast and DTS gaming projects. Lavery is an active member of the AES and Electrical Engineers.

Fairlight ESP has named Robert Trebus director of European operations, reporting to John Lancken. Previously MD of Fairlight Germany, Trebus is responsible for the German, UK and French offices the European audio production and postproduction markets. Prior to joining Fairlight, Trebus was MD at Berlin-based distributor and developer, Audio Sonic.

Logitek Electronic Systems has appointed of Cam Eicher as director of sales and added John Davis to its sales and support team based at the company's Houston, Texas headquarters.

Business

UK console manufacturer **Calrec Audio** has signed up for **Dolby Labs'** E Partner Program. With Dolby E designed to ease the transition for DTV broadcasters from 2-channel to multichannel audio, the move has enabled Calrec to equip its Alpha 100 line of digital consoles with 5.1 monitoring for the Dolby E-Dolby Digital Encoding process. New software allows the Alpha 100 to interface with Dolby's DP570 multichannel audio 'tool', enabling the desk output to be heard while monitoring the effects of Metadata and downmix options in real-time.

Klotz Digital Europe has opened a new sales office based near Helsinki to head sales, marketing and customer support for Scandinavia and the three Baltic republics Lithuania, Latvia and Estonia under sales manager Andreas Wirth. 'As we continue our growth strategy, beyond France,

Great Britain and Germany, Scandinavia is one of our key markets in Europe', commented Thomas Klotz, chief executive officer and founder. 'By opening this new sales office we strengthen our commitment to the Scandinavian market.' Klotz' strategic Finnish partner Noretron will continue its sales activities.

Newly-established Norwegian company, **Seemix Sound**, has taken over all rights for Seem products including service and spares. The company's NTP audio routing system, however, will remain with Telecast. Established products and those already planned will now bear the name Seemix. Seemix Sound has been established by Seem Audio founder Finn Tuft. Net: www.seemix.no

US-based signal processing specialist, **Symetrix** celebrated 25 years this autumn under the guidance of founder and owner, Dane Butcher. From its first noise gate

released in 1976, the company's products have found niches in the recording, broadcast, film and video postproduction, live sound, and installed system sectors. Today the company offers three brands: Symetrix processors, its line of A-D, D-A, and sample-rate converters, and AirTools line of traditional and multimedia broadcasting tools.

Broadcast specialists **Netia** and **Hardata** have agreed a partnership addressing of software for the digital radio broadcast sector.

'This agreement teams two of the world's most powerful players in digital broadcast solutions and brings a new impetus to the market,' claims Christophe Carniel, company chairman and founder of Paris-based Netia. 'The most impressive cross-distribution agreement that this industry has ever had,' is how Gustavo Pesci, CEO and founder of Hardata, viewed the agreement.

Bryston targets US East Coast

US: Bryston, the US distributor of the Professional Monitor Company, has appointed one of its former key dealers as an independent sales agent for areas including New York City, in a move intended to reinforce the PMC brand on the East Coast. The deal sees former Washington Music Center manager Mark Towles take charge of the brand with his Baltimore based sales office TMG, which also represents Behringer, Pioneer Pro, CAD and ADK Microphones. Alongside NYC, Towles will represent the brand in Virginia, Maryland, Delaware, Pennsylvania and New Jersey. Following the appointment's announcement, Bryston's US-based vice president of US sales and marketing, Craig Bell spoke to the *Studio Sound* about the new appointment and how business on the East Coast has been affected by the 11th September terrorist attacks.

Q: Why did you choose TMG?

You know, we get a lot of people wanting to represent the product but I'm really not interested in bringing people in that don't understand what we do and what we're after. Mark worked for one of the larger dealers on the East Coast for 15 years and he understands the client base. He's got a very good connection with the studios and the broadcasting networks and National Public Radio.

Q: Are you committed to expanding your rep network?

Oh, absolutely, I'm opening it up. The PMC factory has

changed locations and doubled their factory size over the last three months and so now their output is far greater. We could only sell what they could make there for a while, so now as our market share increases I'm going to continue opening up more reps and more dealers. We also have other products in line that are going to address secondary markets such as home composers.

Q: TMG is covering NYC—has 11th September affected business there and on the East Coast?

The nice thing about having reps located in particular zones is that most of their travelling is done by automobile, and automobile travel hasn't really changed much at all. A couple of weeks after the attacks you had a tough time getting into NYC, but now it's completely open. But it's affected the overall attitude. I just went to Philadelphia, Washington DC and then I went up to Toronto and the overall attitude of the East Coast is very withdrawn. On the West Coast I haven't seen any difference. People on the film-lots and big facilities out here, people talk about it but it didn't affect business at all. But on the East Coast everything kind of slowed down. It's certainly put a clamp on the money coming out of the East Coast. If people don't need it right now they certainly aren't buying it.

Q: Is the US economic slowdown also affecting the new network?

I think it's a very temporary effect. Where we're at right now is pretty much where we were at before the attacks. For about 30 days you could feel kind of a drag but now the Dow Jones and everything else is back to where we were. We had a big dip which we wouldn't have otherwise seen, but I don't think in general where its sitting now is any different to where it would have been sitting without them.

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TAIPEI'S UFO

As Taiwan moves progressively towards digital audio broadcasting,

Martin Green visits Taipei's UFO Radio for the inside story

THERE'S NO MYSTERY to Taipei's UFO Radio station. Though it occupies space on the 25th floor of one of the taller buildings in the Taiwan capital, the UFO image aligns with the station's attitude rather than its altitude. It was drawn from a company called UFO Music Company which was one of the station's investors when it opened in October 1996. Now having over 100 employees, about a third being on-air staff, UFO is definitely flying.

Lambkin Ling Chia-yang, UFO Radio's chief recording engineer, says that its target audience is different from that of radio stations in the US and other countries. 'We are a variety station rather than a format station,' he begins. 'We have "day-parting" programme segments—like music, talk shows, and a variety of other types of programme, because the age group we aim at is from 10–100.'

UFO aims to attract the public in general, not just a niche market, like classical, religious or jazz stations. 'In Taipei we broadcast on 92.1MHz FM,' says Ling, 'but we are island-wide, with eight other transmitters including [the southern industrial city of] Khaosung, and Taichung [on the west coast], as well as Hualien, Ilan, and Taitung [also on the west coast], and the Penghu islands [close to mainland China].'

Ling claims UFO is rated the No. 1 station in the metropolitan area. 'Our competitor, BCC [Broadcasting Company of China], will say that they are No.1, the biggest, but that's only in terms of coverage.' BCC is held by the KMT—the Kuomintang party, which used to be in government, but now is in opposition, just as the SBC here in Taipei used to be owned by the military and, although it is no longer, it is still state-funded. We also have the Police Radio station [known in English as the Public Radio System, or PRS—not to be confused with the police operations radio system], and Hansen,

a military radio station. Back when we had martial law, Taiwan was a controlled environment for TV and radio broadcasting, just like mainland China today.'

About six years ago, when the government liberalised the laws on broadcasting, more radio stations started to spring up, and UFO Radio was among the first. The most well-known radio station that started then was the Voice of Taipei, or VoT. 'In fact, they started a year before us, and they were No. 1 at the time they launched,' says Ling.

To begin only two or three new radio stations were allowed, 'because radio broadcasting is not like cable TV,' says Ling. 'That technology came to Taiwan in the eighties and at first it was underground, figuratively speaking, as they were pirate stations. But once the law on cable TV was promulgated, many cable TV stations could start up since they were using cable, not the radio frequency spectrum, access to which was restricted.'

Things have moved along since then. Currently UFO and several other stations are doing digital audio broadcasting trials. Tests are being conducted in conjunction with radio stations like Taiwan's BCC and CBS [Central Broadcasting System, which also used to be run by the military], with them sharing the airtime or frequencies.

'We use the ITU's frequencies 10B at 211.648MHz, 10C at 213.360MHz, and 10D at 215.072MHz,' says Ling. 'Using DAB we can have six channels of programmes. Since we are already broadcasting DAB right now, anyone with a DAB receiver in Taipei can hear us in digital sound. However,' he notes, 'although Britain, for instance, with perhaps the largest number of listeners, has around 2m so far, very few people in Taiwan have digital radios.'

Taiwan's BCC began broadcasting digitally in March 2000; state-funded CBS, combined with the Police Radio station, started in April; and UFO followed in June the

same year. VoT only started in February this year. UFO is using the European Eureka-147 format for its digital test broadcasts. Ling notes, 'Engineers here feel that it will most likely be used for transmissions in the future, as it is better than other systems, like America's IBOC [In Band, On Channel].'

Currently UFO offers four music channels, a news channel and a data-only channel—PAD, or Programme Associated Data. All the technology is from Europe, mainly from manufacturer Hirschmann. 'Right now we are focussing on improving quality, and solving some transmission problems,' says Ling. Asked what problems he foresees, implementing the DAB system, he replies quickly, 'Getting people to buy digital radios, first of all... In the studio, it is just the same. We can easily have simul-casting going on. UFO's sister company, right across the corridor, is News 98, so we provide Music Channels 1 to 4 and they provide the news channel.'

'In Europe,' Ling observes, 'it seems the EC committee is pushing to get the infrastructure developed first, and after that they will start to pay attention to pushing the receiver market.' He puts the problem in a nutshell: 'It's always a chicken-and-egg situation, even here. Do we start broadcasting first, in which case we could be broadcasting to nobody, or do we try to get people to buy the digital radios first, in which case there could be nothing to listen to? Obviously we must have some digital broadcasts for people to listen to when they buy a digital radio, or what's the point of spending so much money for something that doesn't appear to work? All they've got is a piece of circuitry that is tying up money, getting older, and of no obvious use yet. But the same goes for the radio stations too—and our equipment is much more expensive.'

Currently there is only one company that Ling knows of in Taiwan making digital radios—Tai Ming Company, which uses the brandname TMC. 'I've seen some on sale,' he says. 'They have a "walkman" style digital radio, but it is too big, as it is a prototype. Their standard home receiver is about NT\$10,000 or around US\$295.'

But what are the advantages for a radio station like UFO, to go to DAB? 'From both an engineer's and a listener's point of view, it means better quality audio,' Ling responds. 'But I think management are focussing on the potential for data broadcasting. And they are also concerned about when the analogue frequencies will be taken back by the government. They don't want to be behind in this—they want to be ahead. In Europe I believe they are talking about taking back the FM frequencies in five years. In Taiwan certainly it will take longer, but I haven't heard any dates mentioned.'

However, Ling worries, 'There is an organisation responsible for promoting DAB here, but it is not so powerful. And if no one promotes DAB sufficiently well, I think the government will not be able to take back the FM frequencies—because most people will still be using their old radios.'

Asked whose interest is best served by the move to DAB—the government, which wants the FM frequencies back, the radio stations wanting to broadcast in better quality and with more channels, or the listeners wanting to hear music in CD quality, Ling speaks remarkably candidly. 'As a consumer who is also a radio engineer, I think I would like



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that. I mean, there is no noise, no multi-path distortion, and the sound is clear. But I am a professional working in the audio world. And frankly, for many listeners, I don't think they really need it. Even the data part—why do you need a screen, just to listen to a radio station? With FM, there is a sub-carrier, but there is no big market for data, like paging, using that. In the nineties, many countries tried using the sub-carrier for information about the radio station—the so-called RDS or Radio Data System. Even in Taiwan we tried it, although we didn't continue, because it was not found to be worthwhile. So I don't know if the ability to get data with DAB will "sell" the idea to the public.

Ling is not totally sold on the move to digital audio either. 'It has been said that digital sound is somehow rather cold, and I have to say that it does seem less human. I think the main problem is the

NT\$10m (US\$295,000) each. That's the transmission equipment, not the equipment in the studios, which is already mostly digital. We will need to change the transmitters and we will need to change things on the tower. We will also have to install coding machines, because, even though we send a digital signal from the studio, more coding is required, for compression, to have frequency efficiency. Coding can also introduce scrambling, which can help prevent missing bits.'

But are there any reasons why a station might have one DAB channel which is scrambled—a premium channel, for which listeners would need to pay money for the access code—for instance, a channel offering new releases on CD?

Ling observes, 'Sure, DAB could do that. But to my knowledge no radio station is doing so right now. I don't think there would be any reason for it in the future, basically because radio is for the



sampling rate and the quantisation, although nowadays technology is providing more data, so it may improve over time. Some people maintain that analogue sound is warmer. I believe that is because there is more good distortion. Even harmonics are better, and that is what you get with vacuum tube amplifiers. With digital, there is no distortion. It is nothing to do with sampling. Even harmonics sound good.

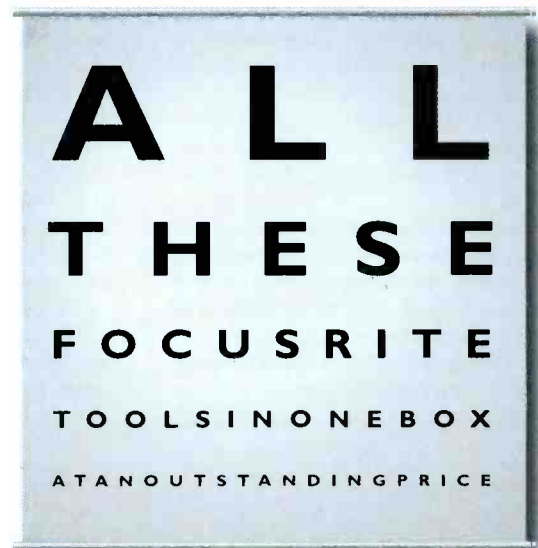
'At the same time,' he continues, 'there really seems to be no pressure from the consumers to move over to DAB, and the government doesn't need to get back the FM frequencies. But as engineers we make recommendations to our bosses, and maybe they are focussing on the perceived advantages to them, from the data broadcasting, and the increased number of channels. Of course, the receiver manufacturers will sell a lot more radios! I believe there are even some radio stations which are sister companies of, or owned by, receiver manufacturers...' he won't reveal the names.

What does Ling imagine will be the total cost for the move to DAB in Taiwan? 'I can't speak for any others, but for our stations in Taipei, Taichung and Kaohsiung, it will cost us about

public good. We make our money from the advertisers. I can't see radio stations becoming like Pay TV.'

Ling reckons that the main target for radio stations are car and truck drivers, and students. 'A lot of students here listen while they study. However, the percentage of listeners in America is higher than that in Taiwan, probably because we have a higher population density here, and so a lot more activities are done indoors, where they can watch TV instead.' To try to draw listeners away from watching round-the-clock television, UFO has round-the-clock radio broadcasting.

'We are a 24-hour radio station, with a total of five hours per day of political talk shows. For instance, we have UFO Breakfast for two hours, then UFO Lunch for an hour and UFO Dinner running for another two hours. We devote about 30% of our broadcasting time to information—including talk shows, although they are not always political. We have actually reduced the percentage of call-in programmes, because it seems the listeners prefer to hear the DJ talking rather than to hear other listeners. About 50% of air time is given to music—



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some oldies, but mostly nineties and current hits.'

He continues, 'Until recently, we didn't have any Mandarin or Taiwanese soap operas, but recently we started with one hour of Mandarin soap per week, and I am proud to say that it is produced by my department. That's because we do more computer sound editing than anywhere else in the station. We take about five hours to record the one-hour show, which is about a young love affair.'

'Most of our programmes are live shows, so of course we cannot do any postproduction work. Even if we pre-record a programme, we do it as live, with no post-production work later. It is time consuming, and anyway, many of our DJs are famous—for instance, we even have congressmen who are DJs—so we don't 'tweak' their programmes in any way. And our listeners like

that; they like the sound of the occasional mistake or miscue. And if, say, someone's mobile phone rings in the studio during recording, or they cough, we keep it in. We record the programme for convenience, because the DJ is available at that time, and then broadcast it later, just as it was recorded.'

While at least one radio station in Taipei (Radio Wave, FM 90.5) uses Taiwanese exclusively as the language of broadcast, Ling notes, 'We don't have any Taiwanese-speaking programmes because we focus on the metropolitan market. And in Taiwan, "metropolitan" means Mandarin-speaking.'

What equipment does UFO Radio use for audio editing?

'We have a sound card made by Digigram, running on a Windows NT platform in a Taiwan-made generic computer with a 300MHz CPU. We have 256Mb of

RAM with a 10Gb hard disk. At another station [BCC], they do their soap opera live, with stereo mics in a big studio, so the actors can move around just like a stage play. Which means they need to remember their moves, too. But in our station, the soap opera production is fairly simple—I guess because we don't really care so much about that market. We do multitrack recordings, but I admit it is less lively, although we can bring in many sound effects. We get them off CDs coming from Europe, America and Japan.'

With so little attention being devoted to it, how popular is the series? 'Actually it is a midnight show—Sunday midnight, in fact. On Saturdays and Sundays we have very few commercials, so it is not a main programme. It is really more for fun—and we can train editing skills for instance, as we need those for the commercials we have to produce. The scriptwriter is not a full-time scriptwriter—she writes the script in her break time, and after work! And the actors—well, we have several famous people, like DJs, who play the characters. And they are very professional.'

'For instance, most of our DJs come here just on time. And when they start reading the script, they can add some ab-libs on the way. Even without a script, they can just chat. It's quite informal. Once, for example, we wanted a DJ to read a chapter a day from a book. So we gave him the chapter to look over first and he said, "What is it—in English or something? It's in Chinese. I don't need any preparation. Let's go!" So, after the commercials, he went straight into it. I think this sort of informality is why we are so popular among the younger listeners. Other stations are more formal.'

Indeed, UFO's chief recording engineer feels the station is different from, say, American radio stations, where the DJ may do everything—including operating the equipment. 'In Japan,' he explains, 'it is more like a TV production with announcers, sound technicians, producers and directors. And the director controls everything, even saying when to open the mic. In our station it is rather like those in Japan, but there are less people on the team. We don't have a director, so we have more tacit understanding between DJ, sound technician, and producer. Our producers do the preproduction, the songs, arranging the guests. But in the live show, our hosts are famous, being TV stars, singers, or congressmen, if it is a political show. So they are the star, and they run the show—the others are just helping them.'

But even with a variety of programmes to handle, Ling would like to embrace more. He says, 'I'd like to do other things in the radio station, also, like marketing, producing, and so on. I would like more variety—but I have 10 staff under me, and also if I step outside my normal job, I can't keep up with what is happening in engineering so well. I know people say, "Do you want to be a big fish in a small pond—or a small fish in a big pond?" Me, I'd like to be a big fish in a big pond!' □



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Dolby DP570 Multichannel Audio Tool

Offering a faster, simpler, implementation of Dolby Digital encoding, the DP570 is sure to find favour with broadcasters and beyond. **Rob James** reports

MANY PEOPLE reckon to detect the whiff of sulphur around Dolby Digital. Some people with vested interests maintain the myths: dealing with metadata is a black art and data compression a Faustian pact. But ignorance breeds fear and the pursuit of knowledge requires effort...

A Dolby Digital encoder combines coded audio with metadata to produce a single data stream for recording or transmission. Until now the only way to hear the effects of metadata during mastering was to pass the audio through an encode-decode chain. This process is not real-time or particularly convenient and making metadata decisions for live broadcast has been awkward and

largely empirical. The DP570 aims to make the decision making process simpler and more transparent.

Dolby uses metadata—data about the data—carried along with the program in an encoded Dolby Digital or Dolby E stream to convey control parameters to the domestic decoder. Metadata carries

use, and metadata can help ensure the producers original intentions are realised whether the consumer is using a full-blown Dolby EX setup, 5.1, a modest Dolby surround system or a mono or stereo television. Broadcasters are lured by the promise of attaining two of their desires. Consistent dialogue level between programmes has long been a Holy Grail. Another is dynamic range control appropriate to individual listeners'

circumstances without resorting to the sledgehammer of indiscriminate compression or the expense of altering the source material—not to mention keeping artistic integrity intact.

The DP570 enables real-time monitoring by applying metadata parameters to conventional dig-



information about the production and various parameters and instructions about the dialogue level, DRC (Dynamic Range Control), ProLogic decoding, bass management plus a number of down-mixing options. A number of challenging objectives can be achieved with skilled and intelligent

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ital audio to provide an emulation of the consumers experience. In addition, it offers a relatively simple and convenient method of setting these parameters, generating the metadata and outputting it in a format suitable for encoding with the audio.

Dialogue normalisation is fundamental to successful encoding. Therefore the Dialnorm parameter

is perhaps the most important. The DP570 includes an analysis tool which helps decide on the correct setting. The operator simply plays sections of 'normal level' dialogue and invokes the Measure function. This measures average loudness over time (LeqA). Choosing Measure again stops the measurement and displays the calculated value. If the

value is below -31dB the level of the source audio must be raised before re-measuring. Once measurement is successfully completed the value can either be set manually or the measured value set with the Accept function.

Physically, the DP570 is a 2U-high rack mounting box. All digital audio connections are AES 31D BNCs. Four AES input pairs accept any of the permissible Dolby Digital program formats. Another AES input accepts an encoded Dolby Surround PCM mix with loop through. The eight main channels are fed into a router which enables the input channel assignments to be altered, if necessary, to conform with the configuration expected by the emulator. One set of AES outputs takes the output of the router without any further processing, the other set outputs the post emulator, post bass management signals for monitoring. Alternatively, monitoring may be via a Dolby Cat548 analogue option card. This uses the same post emulation, post bass management signals and routes them to D-A convertors. The option also provides analogue level control, muting and level trims before the balanced outputs presented in familiar Tascam pin outs on a 25-pin D-sub connector. A stereo solo input and Left only, Right only and mono outputs aid integration with existing monitoring arrangements. Three serial ports allow for two input and one output metadata streams. Two further serial ports, one on the front, one on the rear deal with remote control and a 10baseT networking socket is for future development. Thirty-two presets store complete setups for future use.

The key to success is not simply what the DP570 does but how it can be controlled and integrated into production, mastering and broadcast environments. There are several methods of controlling the unit; from the front panel keys and indicators, a dedicated hardware remote, via a (supplied) PC application and crucially, serial and GPIO connections and protocols which enable the unit to directly interface with mixing console control systems. With well thought out installation this will allow a sound balancer to audition the effects of metadata decisions on a variety of monitoring systems simply by using keys on the console surface. Without making life impossibly complicated. In fact, the unit provides many functions normally in the province of a monitoring controller.

While it is perfectly possible to use the front panel controls to access most functions of the unit, Dolby makes the point that it is far more conveniently operated with the remote control software or from a console surface. For live work it is likely to be impractical to routinely change parameters during a performance and it is here that tried and tested preset setups will be invaluable. Empiricism still has its place.

The DP570 is well thought-out and, in a carefully considered installation, will make the task of setting metadata parameters a great deal easier. It will also play a significant role in demystifying the process and help banish the suspicion of witchcraft. Anyone involved in multichannel content creation, mastering or live broadcast is likely to find the DP570 indispensable. □

TUBETECH SMC 2B ANALOG STEREO MULTIBAND COMPRESSOR



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"Everything that Prism Sound makes is always of the highest build quality and technical specification and the ADA-8 is no exception. In A-B comparisons, the difference is like night and day."

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Gaylor Design The Whizzer

Bringing comprehensive control of tapeless recorders to SSL console operators, The Whizzer is worthy of its name, as **George Shilling** demonstrates



IN RECENT YEARS, more projects have dispensed with the reel-to-reel multitrack, leaving SSL users with a blank reel of tape striped with time code acting as the master machine in order to run computer, hard disk or MDM audio in conjunction with the SSL computer. This ludicrous situation results in the loss of much of the benefit of a tapeless system—you wait for the (blank) multitrack to rewind, instead of getting on with the business of mixing. As far as I am aware, the Whizzer is the only unit currently available specifically designed to tackle this problem.

The earliest Whizzer—described as a ‘virtual tape machine’, as its chief task is to fool the SSL computer into thinking that a real machine is attached—was developed by Brian Gaylor in about 1996 during his tenure as Technical Manager at London’s Roundhouse Studios for the benefit of Atari 1040ST users. And with Pro Tools and RADAR becoming more prevalent, the need for such a device is greater than ever.

The command to play mix automation data on an SSL E or G-series console is inextricably linked with location commands. And a successful location operation is dependent on the desk receiving tach pulses, time code and direction information from a multitrack recorder. With the expensive Motionworker machine control system no longer available, SSL introduced a virtual machine solution for J-series desks, however this will not varispeed.

The Whizzer comes as a 1U-high box, although behind the front panel the actual case is significantly narrower than 1U and the front to back depth fairly shallow. The front includes a number of latching and momentary toggles, plus some status LEDs. A 25-pin D-connector is wired to connect directly to the SSL’s S29E connector found underneath the patchbay on SSL desks. Communication between the Whizzer and the SSL is handled via this connection: the SSL receives tach pulses and direction information, issues switch commands and receives back 24V tallies to light the appropriate SSL transport buttons in the centre section of the desk. A 24V external power supply is provided; Gaylor’s maintenance background has led to such features

as an either-polarity power input, and a thermal-reset internal fuse. A gold-plated balanced jack socket supplies linear time code at -10dBu which is connected to the SSL’s reader input and any device that chases time code. Alternatively, the MIDI Out socket outputs MTC exactly the same as the LTC output, with a processor delay of only 4µs. Default mode sends MMC Record keystrokes only and MTC. Full MMC commands are also available. All front panel toggles are wired to a 9-pin D-connector



allowing the wiring of any switch to appear as a button on the centre section of the desk. There is a BNC for external video sync: the format is auto-detected when activated by the front panel toggle. The Whizzer can also then be used as a frame rate converter, as it will output a different frame rate from the incoming signal. Via the toggles, 25fps, 30fps and 30fps drop frame can be chosen, all of which are very accurate, running from a micro-processor governed by a crystal.

Setting up the unit is straightforward: all front panel toggle switches are in their default position when switched down. On the SSL computer a new Master Tape Machine must be created, and a recommended list of parameters entered from the Whizzer manual. Within a couple of minutes I was up and ‘whizzing’ on a G+ desk at Roundhouse Studios. When locating, the Tach LED on the front of the Whizzer flashes as the virtual tape speeds up

within seconds to an incredibly fast wind speed—approximately 100x play. This speed is not reached instantly, some speeding up and slowing down occurs if direction is changed, giving the feel of a tape machine with incredibly responsive ballistics. Alternatively, with the Fast-Slow toggle set to Slow, the unit behaves more like a conventional tape machine, winding at approximately 15x play. This is roughly comparable

to a Studer multitrack, and enables old-fashioned ‘to-ing and fro-ing’ with the buttons to locate a spot. Furthermore, this ‘normal’ wind speed is also achievable in Fast mode by holding down either fast wind button. SSL locates were initially not very accurate when using the recommended settings, but I soon achieved times within 10 frames by setting Autolocate Type ‘2’ rather than the recommended ‘3’ on the SSL menu (The manual has now been updated). Burst mode plays six frames of time code after

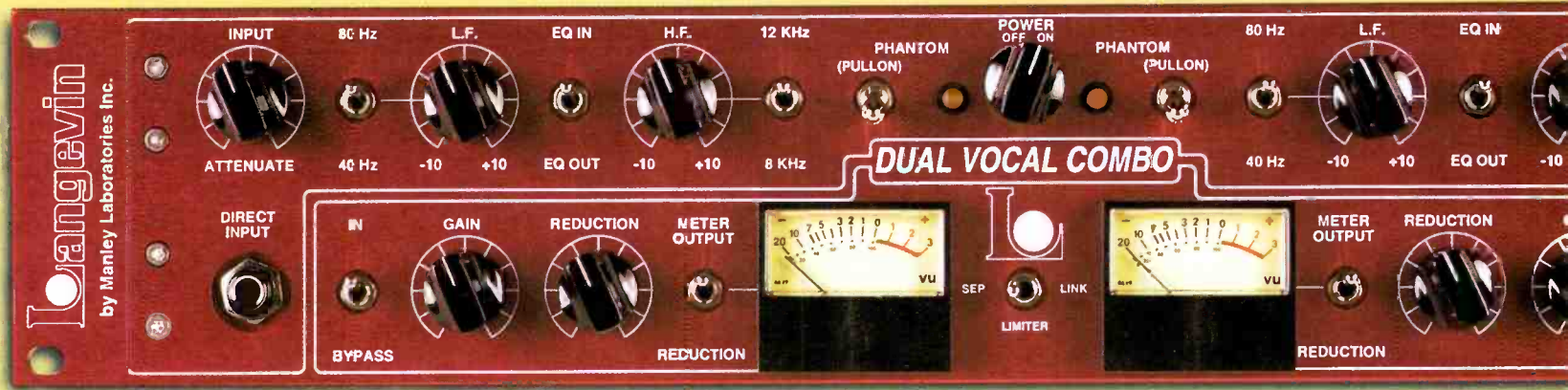
to locate for the benefit of MDMs.

Varispeed range is about ±30%. There is no visual indication, however exact settings can be achieved in a repeatable manner by referring to the manual and flicking the momentary Up-Down toggles the required number of times. For coarse adjustment these can be held to rapidly change the speed setting. In tests running LTC to a MotU Timepiece with Pro Tools I was able to achieve over ±8% varispeed before lock was lost.

SSL operators will love this box: it does exactly what it is supposed to, transparently and reliably. Bottom line? All SSL owners need one of these. Now! □

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NEW TECHNOLOGIES

Yamaha DM2000

Developed for the production market, Yamaha's DM2000 digital console will ship in the first quarter of 2002 for around £14,500 (UK). The digital console offers 96 input channels at 24-96, extensive surround production features, and integrated digital audio workstation and Pro Tools control. Providing more than nine times the processing power of the 02R, no loss of channels while in 24-96 mode is attributed to the use of DSP7 LSIs with 32-bit (accumulator 58-bit) internal processing. Yamaha has included a range of 96kHz-compatible stereo effects, many that are specifically designed for surround mixing, and the user can manipulate up to eight internal multi-effects processors simultaneously.



Weiss DAC1

With the tip of the top-end in its sights, Daniel Weiss' new digital-to-analogue convertor offers no compromises. **Dave Foister** counts the bits

IF THERE'S ONE NAME you find in top-end digital rooms and nowhere else it's Daniel Weiss. When digital EQ was viewed by many with suspicion, Weiss' was the exception, and the versatility, performance and repeatability of Weiss designs has made them standard equipment in mastering and elsewhere. Now the processing units are joined by a reference digital-to-analogue convertor which has a place in mastering and duplication facilities as well as studio control rooms.

Sporting the Gambit badge common to the familiar processors, the DAC1 shares their laboratory styling and simplicity. Virtually everything you need to know about what it does can be gleaned from the few front panel controls, which are neatly and clearly laid out but have something of a home-built look about them. The back is more densely populated than the front, since it has no less than three AES-EBU inputs with associated loop-through output connectors. The total of four inputs is completed by an optical SPDIF terminal with no corresponding output. Digital signals at sampling rates of up to 96kHz are automatically recognised, and LEDs on the front indicate not only the frequency of the selected input but its bit depth as well, a useful check in case you've forgotten to dither something down for a 16-bit medium.

The DAC1 is software based, allowing Weiss to con-

tinue to upgrade the features and performance. The current version runs everything at double sampling rates, using upsampling in DSP to multiply the standard base rates to 88.2kHz or 96kHz before hitting the converters themselves. A development in the pipeline will accept 192kHz signals, using Inputs 1 & 2 in a two-wire configuration.

Currently the unit will provide a master word clock if required. For this it has to be switched to Master mode, and the sample rate selected with the input buttons. However, as part of a policy of continuous improvement, Weiss is actually going to take this feature out, as the jitter rejection of the converters is claimed to be so good that it makes no difference to the quality of the output whether the DAC1 is slaved to a less-than-perfect input signal or holding everything together with a precise reference. Since it never tries to mix sources, but locks to the selected input, this is all that is needed. Several re-clocking schemes are used to achieve this, and it's claimed to be virtually immune to jitter frequencies from a fraction of a Hz to tens of kHz.

The inputs are switched with simple illuminated push-buttons, and the output thoughtfully mutes for a few seconds (perhaps a few too many some might say) while the new input is accepted and synchronised. It is then fed to a conversion circuit that, like the companion ADC1,



uses two convertors per channel; the correlation technique is intended to give superior signal-to-noise and distortion figures. The analogue output stage is a discrete class-A circuit designed with a very high drive capability, almost zero output impedance, and no-compromise audiophile performance that is quoted as going all the

can't wait for a commercially-available remote, or who want to build its functions into a custom desk, full technical details of the remote pin-outs are given in the manual.

If you've used outboard D-As you'll be familiar with the kind of difference they can make to the performance



way down to DC. The output level from this stage is adjustable by means of screwdriver multitem pots on the front panel, up to a maximum of +27dBu.

With an eye to the kind of installations that might make best use of the facilities the DAC1 has to offer, there is a remote control connector on the back that can be used to integrate the front panel functions into a central monitoring console, adding features not found on the unit itself. Weiss is considering making a dedicated remote available, although there is nothing currently on offer apart from a very home-built demo remote that was supplied to me to show what could be done. Connections for source select switches and mimic LED feeds are provided on the connector, but the big bonus is the facility to strap a straightforward analogue fader across the appropriate pins to control level. The demo unit had a simple rotary control for this function, which is carried out in the digital domain complete with the necessary dither, and it was remarkably smooth and natural in operation. For those who

of even quite decent professional gear. Any expectations that a Weiss D-A would do this and more are emphatically confirmed by its sonic behaviour, with the kind of clarity that should be mandatory listening for those who underestimate the effects of jitter. There's no question that the performance of both digital and analogue elements in the DAC1's signal path warrants its description as a reference convertor, and its ability to get the best out of disparate sources makes it an ideal component in a multi-machine monitoring system. An electrical SPDIF input would have been a useful addition—perhaps more so than the optical connector provided—but otherwise this is a very complete and useful box. □

Contact:

Weiss Engineering, Switzerland.
Tel: +41 1 940 2006.
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NEW TECHNOLOGIES

The board employs 25 100mm touch-sensitive faders to access the four layers and surround features include panning, joystick, monitoring, bass management, and a downmix matrix. The work surface houses 16 user-defined keys which can be assigned to such things as monitor switching. All available inputs, outputs, effects and channel inserts can be assigned to any console channel or output via a versatile patching system. A direct out function enables signal from any of the 96-input channels to be routed directly to any digital or analogue output. A 22 x 8 (4-stereo) matrix system is included while a patching system enables the 24 buses to be assigned to any output connector. The desk has six mini-YGDAI slots for I-O option cards and two desks can be cascaded together.

Yamaha, UK. Tel: +44 1908 366700.

Radio-Assist 7 enhanced

In its new Radio-Assist 7 range, Netia has designed a database which can be fully customised for each user group or sub-group. This system implies powerful filtering management in a single database. 'Multi-Radio' being the objective, Radio-Assist 7 can handle several different groups of broadcasting stations. Radio-Assist 7 provides new tab management functions and enables each personal work space to be entirely customised. Users enter their name and password to gain automatic access to the functions they require. With dynamic tabs, each department can have direct and sole access to its own files. Netia, France. Tel: +33 4 67 59 08 07.

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Sony Oxford EQ plug-in

Offering the equalisation of Sony's prestige Oxford console as a plug-in is as bold a move for Sony as it is an endorsement for the Pro Tools platform. **Rob James** weighs it up

THE SONY OXFORD GROUP has built itself an enviable reputation. The OXF-R3 console has a loyal following and the DMX R-100 is widely regarded as one of the best sounding, affordable digital consoles going. EQ has played a not inconsiderable part in this success. Now, the same algorithms have been packaged as plug-ins though at present these are only available for Pro Tools on the TDM Mac platform. But plug-ins are crucial; without them, Pro Tools and its ilk would not have become ubiquitous. Hardware DAW manufacturers obviously agree, since several have been working hard to incorporate them in their products.

Breaking the Oxford EQ out into a plug-in is something of a departure for a console manufacturer, and the marketing channel chosen is equally adventurous—they are only available direct from Sony via the Internet. There will be no dealers, no CDs, no printed manuals and no trial versions.

I am not a huge fan of this method of distribution although I can appreciate it keeps costs down. On the plus side, Sony's e-commerce system seems well sorted and very fast. I think there is another question of speed. By circumventing the conventional production and marketing chain the product is probably available months earlier than would otherwise be the case.

Once Sony has contact details and a credit card number, a version of the product is 'built' for the individual customer to download using a temporary 'pass number'. This is all part of stringent anti-piracy measures Sony feels it necessary to employ to combat rampant plug-in piracy. Once downloaded and installed, Pace Interlok software generates a unique 'challenge' code. The plug-in will work for 30 days. Thereafter it is deactivated until the correct 'response' code is entered. Sony will provide this once payment is cleared. I have had trouble with this style of payment protection before, but this time the only irritation was changing the order of a couple of system extensions.

A new license will be required if the hard drive is replaced or the system hardware altered but Sony assures me they will make this as painless as possible.

The EQ is 5-band parametric with separate filter section providing variable slope (6dB-36dB in 6dB steps) low- and high-pass. Four types of EQ are supplied with the option of a fifth at extra cost.

Type 1 has minimal gain-Q dependency and so remains precise and well defined with small amounts of boost or cut. Type 2 is identical when boosting but uses constant Q when cutting, useful for removing resonances while applying a more subtle boost to fill other areas. Type 3 has moderate dependency between gain and Q. The more gain is changed, the higher the Q. This is reminiscent of the behaviour of classic Neve designs. Type 4 uses a greater degree of gain-Q depen-

dependency providing a soft and gentle response. Graphically there is a strong resemblance to the OXF-R3 with substantially the same layout and controls.

In these types, when top and bottom EQ bands are switched to shelving, the Q control controls the degree of 'overshoot'. This produces similar complex interactions to classic Neve, later SSL G-series and other EQs where boosting one frequency also cuts another. This sounds 'natural' to our ears.

When purchased, the GML8200 option appears as the fifth EQ 'type' and emulates the GML8200 outboard unit but with a full 20dB of boost and cut. The Oxford filter sections may be run at the same time if required.

The OXF-R3 uses 32-bit, fixed-point proprietary processors while the DMX R-100 uses 32-bit float SHARCs and Pro Tools currently uses Motorola 56k processors. Regardless of these inconsistencies, Sony insists there has been no compromise in porting the DSP code between platforms. Controls are fully interpolated with all coefficients calculated 'on-the-fly'. In plain

English this means no zipper noise when twiddling the virtual knobs and a consistent response. Such purism has a down side. Two 5-band EQs with filters use one DSP chip on a Mix Plus card. This is a whole lot greedier than DigiRack or similar EQs but you don't get anything for nothing and a quick listen will leave no doubt as to why the Sony EQ uses more processing. I had hoped to do a direct comparison with a DMX R-100 but this was not to be. From memory, the plug-ins sound every bit as good with more options.

EQ is a deeply personal thing. Different types suit different people and applications. Whilst I love the surgical precision of many digital EQs for their power and lack of coloration, I often miss the more subtle shades obtainable from the best analogue EQs. With this plug-in Sony manages to evoke a similar emotional response. You can warm things up, or cool them down in a highly musical and satisfying manner. When something more drastic is called for there is plenty of range but the Q could do with being higher for really tight clean up work.

If the asking price seems a little high, compare with the hardware equivalents. I have always considered excellent EQ to be beyond price and the Sony offering is well into this category. No amount of flashy effects are a substitute for really good EQ and this plug-in will lift the game of any recording. For mastering in Pro Tools, it borders on essential. □



Contact:

Sony BPE, UK
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NEW TECHNOLOGIES

Stereo direct box

New from Whirlwind, the pcDI is designed to interface unbalanced stereo sources with professional balanced low impedance equipment. Signals can be routed with one 3.5mm mini TRS stereo jack, or two sets of colour-coded RCA type phono input and through jacks. Output is via corresponding colour coded XLRs. Each section features a ground lift switch to help eliminate hum, and a 20dB pad switch for connecting to hot signals. Selectron, UK. Tel: + 44 1634 840500.

Cat5 extension

Computer peripheral extension is what Gefen's ex-extend-it suite of Cat5 extenders is all about. Latest additions are the CAT5-1000 and CAT5-5000. CAT5-1000 is a compact cross-platform KVM extension enabling VGA analogue displays and USB peripherals to be placed up to 330ft from the computer while the CAT5-5000 is a cross-platform KVM extension that extends two monitors in addition to USB peripherals. Each monitor has the ability to be placed either locally or remotely with one output for each. All of Gefen's Cat5 ex-extend-it products have built-in rackmount enclosures and are equipped with Cat5 cable connections. Options include the RMT-16 remote control unit and front panel buttons that allow the user to switch and assign computers to a specific workstation. Gefen, US. Tel: +1 818 884 6294.

Studio sync generator

Lucid has introduced the GENx6-96 studio sync generator, an extremely low jitter clock source outputting word clock or Digidesign's superclock format. The GENx6-96 generates clock frequencies of 44.1, 48kHz, 88.2kHz, and 96kHz. All six BNC clock outputs have corresponding front panel switches to select word or super on a per output basis. It can reference an incoming word, superclock, or AES sync signal via selectable AES and BNC inputs. It also functions as a simple 1x6 clock distribution amplifier if desired. Lucid, US. Tel: +1 425 742 1518.

Panasonic DVD burner

Panasonic's DVD Burner can burn write-once DVD-Rs which can be played on standard DVD-Video players and DVD-ROM drives and can also burn DVD-RAM media



with a rewritability of 100,000 cycles and fast access. This combination of features combined with CD variant playback compatibility and a highly attractive price make the drive an interesting proposition for desk top systems. The LF-D311 drive can read and write to 4.7GB DVD-R, 4.7(9.4)GB DVD-RAM and even older 2.6GB DVD-RAM discs. For 4.7GB media DVD-R media transfer rate is 11.08Mbps with twice this attainable with DVD-RAM. The latter hits an average seek time of 75ms, the former 65ms. The internal drive is relatively easy to install and works

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reliably and consistently and comes bundled with software that includes Veritas Primo DVD for burning DVD-R, Sonic DVDIt! for DVD Video authoring, Cyberlink PowerDVD for DVD Video playback and Cyberlink PowerVCR II SE for TV and video capture. Price is £399 inc VAT (UK). Panasonic, UK. Tel: +44 845 600 3535.

Signal processing from ADC

ADC's NV500 Series signal processing equipment comprises 10 modules, including a variety of AES, analogue, video, SDI, plus HD-SDI distribution and processing modules. The DA processing platform provides support for the requirements of today and tomorrow via a series of AES3, SDI and HD-SDI-DAs, plus others to be added in the future. The NV500 2U tray accommodates front-loading, slide-in card slots for up to 10 distribution amp and/or processing modules, many of which offer dual-channel modes. Three rear-module connector types are offered: BNC for digital video SDI and HD-SDI, BNC for AES digital audio, and Phoenix for AES digital audio. ADC's NV500 Series signal processing equipment comprises 10 modules, including a variety of AES, analogue, video, SDI, plus HD-SDI distribution and processing modules. ADC, UK. Tel: +44 117 987 3306.

New Creative card

Creative has made a move on the higher end of the market with the introduction of its Sound Blaster Audigy line of PC audio cards with 24-96 capability. The range includes three models with steps up in

Eventide Eclipse

Industry standards can be a blessing and a curse as Eventide has found in trying to supersede its H3000 Harmonizer. **George Shilling** evaluates its latest bid

THE H3000 IS STILL AVAILABLE after many years of remarkable service. And it's still popular with audio engineers, despite numerous attempts by Eventide to introduce a 'better' model—witness the DSP4000, DSP7000 and Orville. Despite the technical superiority of these newcomers,

The main display is exceptionally clear with a bright green dot matrix on a dark background; the display can be set to dim automatically after a preset time. Four softkeys appear beneath the screen, and onscreen to the right of their labels there often appears a page number to indicate clearly that additional settings are available.



there is something more immediate and bullet-proof about the friendly H3000. Perhaps with the Eclipse, Eventide hopes to finally, err, eclipse its old workhorse.

In half the rack space, Eventide has managed to pack in five times the processing power of an H3000D/SE, along with 24-bit/96kHz capability, all for several hundred pounds less. It's pedigree is unmistakable, the thick and robust, yet elegantly-finished front panel bears many features obviously derived from previous models. An astonishing array of connections is crammed onto the back panel: analogue jacks and XLRs, optical SPDIF or ADAT, phono SPDIF, XLR AES-EBU, word clock in and out BNCs, two footswitches, RS232 and full MIDI are all provided.

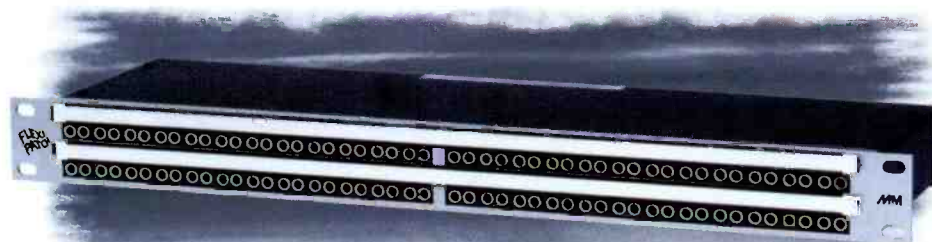
The LED level meters are accompanied by a LEVELS key which accesses many related options, including fine adjustment of inputs and outputs and myriad metering options. LEDs indicate the sample rate.

This was initially set to 48kHz so obviously I was itching to switch it to 88.2kHz or 96kHz. I pressed the SETUP key and found my way to the Dig In Clock setting, but I found only 44.1, 48 or External. Resorting to the manual I discovered that it wouldn't switch if one of the non-96-compatible programs was loaded. Some programs feature versions for high and standard sample rates, some others work only at rates above 50kHz and have a little '96' by their name. There is a 'splat' on the output when the rate (or dig-



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ital source) is switched. Pressing the PROGRAMS button allows you to scroll through the programs with the knob. However, a marvellous innovation is the categorising of effects, so you can sort Programs by effect type, (Reverb, Pitch...), Source they were designed for (vocals, drums...), a combination of the two, or User Groups for saved programs. And Programs can be listed numerically or alphabetically. This is an immense help when you know vaguely what you are looking for, unlike the rather hit-and-miss techniques required for previous Harmonizers, and is better executed here than similar ideas on rival units. The HOTKEYS button brings up the essential adjustments for the currently loaded program. These can be user re-defined, and consist of two pages (up to eight parameters). PARAMETERS takes you deeper, with access to the routing of the two effects blocks and more expert adjustments. The keypad enables direct entry of Program numbers and parameters as an alternative to scrolling with the knob, and a useful flashing TAP button works much like those found on rival manufacturers' units for setting delays and so on.

The card slot is for Compact Flash cards to store programs (although plenty can be stored internally)—better than the harder to find PCMCIA card format used previously. The H3000's confusing LINE IN button has been replaced by a configurable BYPASS.

Each Program can use two FX Blocks which each use one of 90 algorithms, routed in parallel or series. Each parameter can be modulated by setting a modulation source such as an internal LFO or ADSR or an external MIDI control. Some parameters are linked or include further options on the same key, and the display indicates this with graphic clues. Despite a Global setting for FX mix which was set to 100%, a number of pre-

sets are internally set to a 50% mix which is slightly confusing and irritating. However, the 200 or so Programs are excellent, with a number of the best ones transplanted from the H3000 and DSP4000 series units. The effects are impressive, with clarity, roundness, smoothness and depth of character. Pitch changing is unsurprisingly the area in which Eventide excels, but there are plenty of unusual delay effects and some very good sounding reverbs, although these sometimes have unusual parameters, (what exactly is Glide?) But all those super flanger effects are there, along with some mad filtering and tremolo Programs. Many clever combinations are provided, including some very effective fuzz and distortion.

The manual is, unfortunately, true to usual Eventide form: the pages fell out of the binder, it is poorly printed and more akin to a workshop manual than something for the average sound engineer. Even the Quickstart section includes unnecessary waffle, although thankfully I didn't seem to receive the Algorithms manual.

As a main studio effects unit, I suspect that most will go for a more meat-and-potatoes reverb-orientated unit before splashing out on such luxuries as a fairy-dust Harmonizer, and Pro Tools users might be content with plug-ins. However, if you like previous Eventides, you will love this—it sounds great, the search feature is excellent, and contains some unique and beautiful effects. □

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Eventide, US.
Tel: +1 201 641 1200.
Fax: +1 201 641 1640.
Net: www.eventide.com

NEW TECHNOLOGIES



extra arc features culminating in the Audigy Platinum EX (€229 inc VAT UK) which includes an external drive for connectivity and EAX Advanced HD optimised driver with its ASIO support. This comes with dual SB1394 connectors and a wireless remote control plus a software package that adds Sonic Foundry's AC3 2.0 and Image Line's Fruity Loops to the basic package of Steinberg's Cubasis VST Creative Edition, Auraria's Storm Platinum Edition, Ulead's VideoStudio 4.0 SE Basic, MaxMeister Technologies' MixMeister, Unibrain's FireNet, Vienna SoundFont Studio 2.3 and iM Networks iM Tuner. The board claims four times the processing power of the previous Creative audio processor and supports discrete multichannel playback.
 Creative, Europe. Net: www.europe.creative.com

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Genex GXA8 & GXD8

Breaking out the convertors from its high-end digital recorders may bring British-based Genex broader international acclaim, reckons **Dave Foister**

WHEN SOMEONE MAKES bold claims for elements of a system, there's often a feeling that they should put their money where their mouth is and release the elements as separate units. If a desk has preamps the equal of esoteric outboards, let's have them as outboards as well; and if a digital recorder has convertors as good as separate dedicated boxes then let's have the option of using them with lesser recorders. Euphonix did exactly this with the convertors out of the R-1 hard-disk recorder, and now it's the turn of Genex to give us the benefit of the GX8000 technol-

ogy to use with other MDM systems.

Hence the release of two separate 8-channel units, one for A-D and the other for D-A conversion. In place of the home-grown image of early Genex products comes a styling reminiscent of Apogee, with a slick panel finish sporting contoured buttons for setting up the various configuration options. LEDs showing in the acrylic panel indicate the status of the various functions, including the eight level meters, and in combination with the solid edge and rack ears the result is a sleek and expensive-looking package. The button count is high enough to suggest that there's more going on here than straight conversion, and the option slots on the back panel confirm that Genex has done much more than just lift the circuits out of the recorders.

The basic units deal simply with AES-EBU on four XLRs and analogue on eight. What's available on the digital connectors depends on what's being converted, as the units will deal with 2-wire or single-wire double rates and dual- or quad-wire quadruple rates. Obviously the existing four XLRs cannot handle eight channels at more than single-wire, so for these modes to be fully exploited the AES expander card must be fitted, although even then quad-wire working only allows four channels. This is one of several options that add to the basic usefulness of the units, and the others can be guessed easily: direct interfaces for ADAT, TDIF and the DAW data standard, plus an SDIF2 card. Two slots are available in the back for these interfaces, and the front panel decides whether it's one of these or the standard AES-EBU inputs or outputs that are fed to or from the convertors. The big bonus is the option of a DSD card on either unit that can handle conversion of the full eight channels to and from Direct Stream Digital. DSD can also be handled via the DSD-over-AES 4-wire format, although the manual's warnings about the possible corrupting effects of PCM error correction on a DSD signal recorded in this way are enough to put you off trying it. The units are also equipped to encode and decode bit-split high-resolution recordings in the PAQRAT format on 16-bit

8-track MDMs, with the appropriate interface in place, although it's a bit alarming to see these already referred to as 'legacy' in the manuals.

The A-D is the GXA8, and as well as the expected selection of sample rate and bit depth functions, it has features clearly designed with reference precision in mind. These include a special metering mode where incoming tone at one of several levels can be accurately calibrated using front-panel screwdriver presets, and a useful ability to set how many consecutive maxima constitute an Over, again available and indicated on the front panel. One quibble is that all the functions reset to defaults on power-up, so that for example if you're working with 16-bit media you always have to remember to reset the word length before starting work.

The complementary D-A is the GXD8, and it looks virtually identical, except that some of the function indicators simply show the status of the received signal rather than allowing it to be altered. The word length indicator seemed unsure of itself with certain signals, defiantly showing 24 bits

when the source machine could only have been producing

16, and only flickering the 16-bit LED when 24 were present. The output was unaffected though, remaining at a very high-quality throughout. The received sample rate is shown, together with little arrows that indicate whether the actual frequency is significantly above or below the lit value. The convertors use two alternative internal modes to track incoming synchronising clocks, selected on the front—Precision uses a very heavily damped phase locked loop to seriously attenuate jitter on the source, while the more tolerant Wide mode will accommodate greater variations in the source rate with an inevitable trade off in jitter rejection. Even so I managed to find one signal that it didn't like at all, refusing to lock to it without glitches and complaints, but since this was the same one that confused the wordlength indicators it perhaps suggests a problem in the source. As with the A-D, precise level calibration is provided, this time on the analogue outputs obviously.

These units between them offer a range of options and practical solutions to compete with anything else on the market. Audio performance is excellent in all respects, with a quality and precision available that allows their use as reference convertors for all kinds of media. Genex has already cornered a little market in the classical recording field with its recorders; these convertors could well make them a familiar name right across the board. □

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NEW TECHNOLOGIES

Lectrosonics news

The UCR301 compact receiver is compatible with all 300 Series transmitters, and provides up to 256 selectable UHF frequencies as programmed by the dealers and/or Euro service centre to alleviate interference problems and meet licensing requirements. A highly visible LCD provides all audio and RF activity and adjustments, plus a RF site scanning feature to perform radio spectrum surveys and identify clear operating frequencies. The balanced XLR audio output is adjustable in 1dB increments and is powered by 9V battery or external DC. The UH300D transmitter is an XLR plug-on capsule with selectable 48V, 15V or 5V DC phantom power for use with high-end microphones and all 300 Series Lectrosonics receivers. Sufficient current is provided to properly power any known electret microphone. A bias OFF setting is also provided for use with dynamic mics and modest line level inputs. The transmitter provides 50mW output power and up to 256 selectable UHF frequencies. A wide input adjustment range is combined with a high performance dual-FET input limiter and dual LEDs allow accurate input level adjustment and mark the onset of limiting.

The LecNet range of automatic mixers for standalone or patch-point use with mixing desks feature a mixing algorithm that provides seamless NOM attenuation to eliminate feedback and background noise. The model AM16/12 provides 16 mic-line inputs and 12 assignable line level outputs, with four outputs switchable to mic level. The model AM8/4 provides 8 mic-line inputs with 4 assignable line level outputs. The models AM8 and AM8TC provide 8 inputs with a single master output and direct outputs on each channel. All models can be mixed, matched and stacked to accommodate large, complex system requirements. LecNet software for Windows operating systems is included with all models to simplify setup, control and monitoring. Raycom, UK. Tel: +44 1789 400600.

2-inch ATR-108C

Twenty five years after it was introduced, the Ampex ATR-102 is now available in a 2-inch version as the Ampex/Aria ATR-108C 16/8/2-track convertible recorder which can

be reconfigured easily for 16 or 8-tracks on 2-inch tape, or stereo on 1-inch or 1/2-inch. All machines will be supplied standard with Aria Reference Electronics, an all-discrete pure class-A package of record-playback electronics designed by David Hill of Crane Song. Heads are Flux Magnetics Mastering Series.

Although the basic deckplate and motors of the ATR-100 Series is sufficiently robust for 2-inch operation, converting to the wider tape required custom fabrication of all tape path parts as well as upgrading reel motor electronics and the power supply. ATR Service Company, US: +1 717 852 7700.



Tascam CD-RW4U

Bridging the gap between the standalone and the integrated PC drive, Tascam is the first to go USB with a CD-R/RW. **Zenon Schoepe** investigates

A NUMBER OF YEARS AGO, in the time well before the advent of a CD-R/RW drive in absolutely every off-the-shelf PC in existence, I spied the inclusion of a SCSI port on the back of an early Marantz CD-R machine and had to have its presence explained to me. Apparently computer users would be able to employ the drive not

just for audio but for plain old data storage purposes as well. I couldn't see the point of it at the time but since then all standalone audio CD-R machines have been devoid of any interconnectivity to the PC world. That is until the Tascam CD-RW4U. This little box is unique to the standalone recorder market in having a USB port on the back together

with the software that will install it on Mac or PC. I'll not concentrate on this aspect but it will appeal to those who want to bolt such a machine to their systems. However, for those who don't, the CD-RW4U defaults to 'audio' mode and can consequently be treated just like any other standalone recorder.

Now it's a fine looking machine as most things can if they



NEW TECHNOLOGIES

Serial digital analyser

The SDA11 is described as a 'Swiss army knife' for digital audio. Visual indication is provided to indicate sample rate, line errors and channel status. The three output BNC connectors when connected to an oscilloscope will allow further investigation of data, word length, eye pattern, and jitter. Word clock output is also possible from the incoming AES/SPDIF signal.

The hand-held battery device will accept sample rates up to 96KHz at 24 bits and will allow monitoring via headphones or internal loudspeaker of the incoming AES or SPDIF signals. The analyser can also edit and retransmit channel status bits to establish a temporary working connection between two devices. ADT, UK. Tel: +44 20 8977 4546.



New software for tc's 6000

Release 1.30 for tc's System 6000 includes multiple icons controlling one or more M6000s. Up to eight icons can control the same or several mainframes. The icons will update each other constantly but different engines can be controlled individually from each icon. SMPTE time code automation is enabled and by having the automation generated from the icon, one common cue-list can be shared across several mainframes. A new algorithm, BackDrop, incorporates an ear model, taking human perception into account to combat artefacts found in other

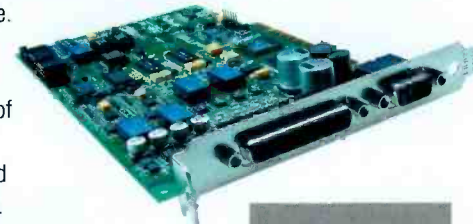
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With 24-bit analogue inputs, sampling rates up to 200kHz, a low-jitter PLL sample clock and a choice of three multichannel analogue configurations, the new LynxTWO audio interface rivals the performance of many of the world's most desirable standalone converters. And with a list of features that includes AES/EBU and S/PDIF digital I/O, expansion modules for ADAT and TDIF support, powerful synchronization and timecode facilities plus an on-board digital mixer, you'll find its surprisingly low price tag equally attractive.

Unusually, the LynxTWO is the product of dedicated, visionary hardware and software engineers working together, not the wishful thinking of some marketing department. So you can count on exceptional compatibility with all major Mac and Windows-based audio and video applications.

For full details of the ultimate PCI audio interface card and a list of dealers, contact HHB or visit hbb.co.uk

Also available: LynxONE 2-channel audio interface card
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equipment for this application. There is also a new algorithm improvement for the VSS-5.1 Reverb. The multidirectional rendering model has controls to discriminate between angles of arrival as well as a balance control between early and higher order reflections. The SP-1 Surround Sound Panner Joystick for System 6000 is now shipping. It is designed to compliment tc's future generations of interactive multichannel algorithms and parameters as an option to the existing virtual joystick on System 6000's Icon touch screen remote control surface. The SP-1 features Learn and Grab program modes and is also a general purpose device capable of controlling features and parameters within several System 6000 algorithms. tc electronic, Denmark. Tel: +45 87427113.

Pure mics

Pure Distribution has introduced the XIX range of studio microphones with the Pure 1 and Pure Valve models. The former is a large diaphragm condenser supplied complete



with a shockmount and aluminium flightcase (£129 inc VAT UK), the latter is a large diaphragm valve microphone

supplied with power supply, shockmount and aluminium flightcase at £399 including VAT (UK). Pure, UK. Tel: +44 20 7328 0660.

are free of the constraints of the 19-inch rack format. We're majoring on the brushed stainless steel plastic look here right down to the chunky leading edge of the drive door which opens to prove that it is just as flimsy as any drive you will find in a PC. Control layout is fairly simple with a shallow menu and a push-to-make parameter, value and track increment-decrement dial. Larger buttons control PLAY-PAUSE, RECORD and STOP with small ones doing for MENU SELECTION, FINALISE, SYNC RECORD and INPUT SELECT which chooses between the phono analogue and coaxial digital inputs. The same flavours are available as outputs and 20-bit convertors are used at both ends.

Tiny pots control analogue input level (there's no balance control) and the headphones output level. A infra-red remote is provided which adds the CD-RW functionality, accesses program and repeat play modes and tracks directly, activates the 4s record mute, and instigates fade in and fade out.

Menu parameters include auto track incrementing, threshold level, SCMS status, and fade times (up to 24s!). Unusually there's a power save function that powers down to a standby mode following five minutes of inactivity. It's commendable and the CD-RW4U is the first piece of audio gear that I have checked out that has this planet-friendly feature. Expect to see many more implementations of this principle in these increasingly energy conscious times. Full marks to Tascam.

There really is very little more to say about this machine's feature set. As a new release it lacks CD-Text, which is not an enormous drawback, and I shudder to think how it would have been implemented on this compact little unit. The display is adequately

informative and no smaller than that found on full size machines but contains fewer icons as there is less to write about. Metering is peak hold and a bar shows available tracks. Like all Tascam machines of this sort, a monitor mode is available for straight through conversion without a disc in the drive. The sample rate convertor cannot be hard bypassed but works automatically which is a process that is not always the ideal that it ought to be.

It's hard to dislike it as a box and it certainly is painless to operate and get around. If you're an experienced CD-R driver then you really won't need the manual but it is difficult to assess how welcoming it will seem to the absolute beginner that it is clearly aiming to attract. The USB feature is unique.

And it sounds good if you can live with the connectivity restrictions which will be significant if you absolutely do have run balanced.

Ultimately this machine will appeal to first timers who will be drawn by the incredibly low price and a pretty idiot proof operating process that is about as close to compact cassette in its simplicity as CD-R machines get. There are undoubtedly compromises for more serious users for whom the simplicity will translate as minor irritation. For the money it is unbeatable, it is all down to whether this is all you want and whether this is all you want to spend. □

Contact:

Tascam, UK.

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Tascam US.

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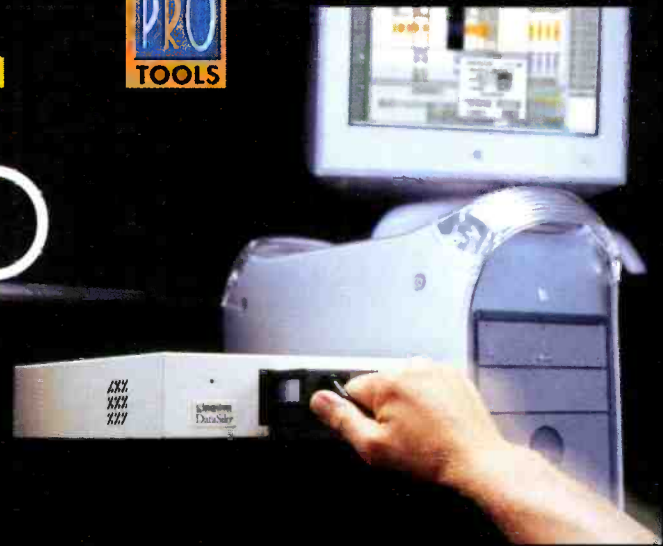


If you have one of these...

The perfect thing about the **TASCAM MX-2424** is that it is designed to work alongside your computer based DAW, not instead of it. The MX-2424 is intended to integrate with computer based DAWs, providing an incredibly powerful expansion path, by bringing additional linear and non-linear recording, playback, storage and processing capabilities to your system courtesy of six dedicated audio SHARC DSP chips.

Time-Stamped Sound Designer /ard Broadcast Wave Audio File Formats The MX-2424 operates with both Sound Designer II on HFS/HFS+ Macintosh formatted drives and FAT-32 Broadcast Wave on PC disks. Both support time stamping giving you a fast, convenient way of transferring audio into your Pro Tools or other DAW system. MX-2424's time-stamped files will appear in the exact location in which they were originally recorded.

Hot-Swappable SCSI Drives The MX-2424 records to reliable, robust, hot swappable SCSI drives. Unlike IDE drives, you don't have to shut down every time you need to exchange a drive. SCSI format drives ensure the highest degree of compatibility with all DAW systems.



Portable Solution Transporting your computer based DAWs around studios or recording locations is hardly convenient. The MX-2424 on the other hand is a sturdy, stand alone recorder that fits into just 4U of rack space. Leave your computer in the studio – the MX-2424 is your mobile recording solution.

Feels Like A Tape Deck The MX-2424 transport controls, jog/shuttle wheel and editing buttons give you the familiar feel of a tape based recorder instead of being forced to mouse through your tracking session.

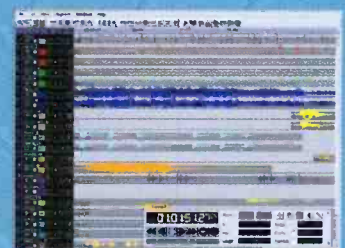
Superb Audio Quality While the power of nonlinear editing is hugely creative, the sonic fidelity of your DAW may not satisfy your highest expectations. The high quality 24-bit converters on the MX-2424 and its 24-channel analog interface module have found favour with professional engineers, even for audiophile classical recording.

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All mod cons: making music for the Brushy Mountain Inmates

BACK TO THE FUTURE

Country music rediscovers its roots in Brushy Mountain Prison, where **Dan Daley** finds Tony Brown, David Z, Mark Collie, digital recorders and the spirit of Johnny Cash

IT WAS A CHILLY DAY in January, 1968, when Johnny Cash took to a makeshift stage inside a cell-block at California's Folsom State Prison. In the process, Cash, along with his backup band the Tennessee Three—Luther and Carl Perkins, drummer WS Holland and abetted by Cash's soon-to-be wife June Carter on vocals—stepped into history. *Live At Folsom Prison* has become a touchstone not just of country music, but of American music. The recording was audio cinema *vérité*—a black and white Polaroid snapshot of an America already being torn by social upheaval. The recording tellingly includes the organic soundtrack of prison itself: on the tracks you can hear the din of hard surfaces filled with hardened men, with the occasional reminder of where you really are, such as when the warden calls out on the PA system, 'Sandoval, prisoner 88-419, is wanted in reception.'

Cash, no stranger to the criminal justice system, went into one of the most notorious and vicious prisons in the US, stood in front of a few hundred seriously violent convicts, and simultaneously declared himself to be one of them and challenged them to change themselves. To re-route their self-directed anger at something more meaningful, as he was trying to do through his music. He was also challenging the system itself, and more than just the penitentiary system: country music performers were known for their conservative inclinations, so to have one of country's luminaries declaring solidarity with the inmates and suggesting that the penal system could do better than it had was a double whammy.

The record changed music itself. Cash's contempt for pitch and rhythmic precision, and stripped-down music contrasted sharply with the pop glossiness of the Beatles and the Beach Boys, the icons of the day, as well as with the lush 'Countryopolitan' sound that the late Chet Atkins was refining on many Nashville record-

ings. The pop stars were singing of free love and fast cars. Cash was singing about the impulsive, coke-fueled slaughter of his girlfriend on 'Cocaine Blues': 'Shot her down 'cause she made me slow/I thought I was her daddy, but she had five more.' And Charles Manson was still developing his act.

On another chilly day 33 years later, another country music performer mounted a temporary stage at another US prison. Mark Collie lifted his guitar, hit a chord and showed that little had changed in three decades save the need to keep trying to change the world and yourself.

Collie was born 45 years ago in south-west Tennessee. He had his own problems with the law but by 1991 had moved himself to Nashville and signed with MCA Records to make the first of what would be four albums with that label. He was signed after performing a showcase at a club called Douglas Corner, where Tony Brown, then head of A&R for MCA Records and its future president, and current president (now chairman) Bruce Hinton sat mesmerised by how Collie could grab an audience by the collar and get them to follow him.



Mark Collie and Tim McGraw

'He had that place in the palm of his hand that night, remember?' says Brown to Hinton, who nods vigorously in agreement. Brown had already established himself as one of Nashville's and the music industry's leading producers, producing huge hits for artists including George Strait, Reba McEntire and Vince Gill, but was also known for bucking Music Row's cautious approach by signing and producing artistically brilliant but commercially marginal talent such as Steve Earle and Lyle Lovett. Earle's *Guitar Town* album is still regarded as a leading progenitor of the alt-country and Americana music movements. Brown produced Collie's first two albums, and of the four he would record on MCA, a couple yielded a handful of hits, such as 'Even the Man in the Moon is Crying.' But Collie's career path was more ordinary than extraordinary. In Cash's era, Collie's smattering of hits would have allowed him to make a nice living off the bar and small-theatre circuit for the next 20 years. In post-modern Nashville, you hope the next lawn you mow doesn't belong to anyone who bought your records.



But Collie didn't put the time to waste. He turned some of his songwriting fire towards screenplays, and began acting, shuttling between Nashville and Hollywood, using the natural cragginess of his sharply creased face to gain minor roles, usually as the villainous heavy. At some point, he connected with a young director, John Lloyd Miller, with whom he scripted and acted in a short feature called *I Still Miss Someone*, also the title of one of the songs from the Folsom Prison recording.

Any thoughts that Collie was trying simply to cloak himself like Cash and seeking to recreate and exploit a moment in history are trashed by this 14-minute film, which cost a mere \$2,500 to make and which took first place at the 1999 New York Film Festival. Collie does

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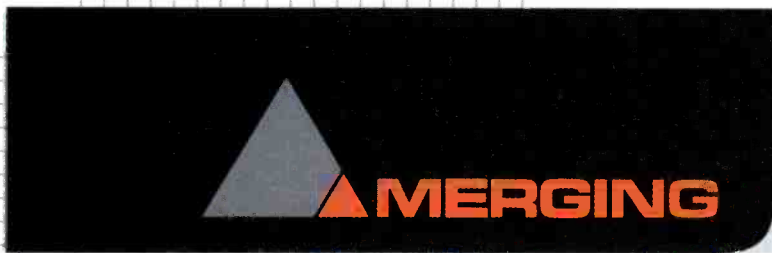


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RECORDING

not play Johnny Cash—he becomes Johnny Cash, portraying him first in a dream-like drug sequence which morphs into a sweat-stained performance of 'Ring of Fire,' and then turns sharply onto the fast straightaway of an anxious and disturbing narrative in which Cash's internal demons are plainly visible in Collie's eyes. It is a *tour de force*, a transference worthy of a Lon Chaney. And that is what stepped up on the stage at the Brushy Mountain State Prison that October morning: not an imitation of Johnny Cash at Folsom Prison, but an evocation of a tortured soul at the gates of a landscape which toggles endlessly



Mark Collie and Kelly Willis

between heaven and hell.

And they got it on tape.

Collie had been spending time in Nashville developing new songs with producer David Z, and Memphis, where he ran through a slew of first albums for an array of blues-tinged artists. Collie's fixation with Johnny Cash led to his own authentic interest in prison reform. He and film producer Chris Zarpis, a former associate of director Ridley Scott in Hollywood but who had recently moved to Nashville, would go out to Brushy Mountain and interview prisoners, sculpting the foundations of what was hoped would become a feature-length documentary. At its core, the film would be a concert movie, a paen to Cash's Folsom Prison and later San Quentin live recordings. (While the Folsom Prison record was the ground-breaker and gave Cash his strongest record in the previous five years as well as his first Grammy, Johnny Cash at San Quentin, released a year later, was the bigger commercial success, his first and only No.1 album, driven by several hit singles including 'A Boy Named Sue' and 'I Walk the Line'.)

Collie, who continued to maintain a friendly relationship with his former producer and label head, pitched the idea to Brown several times over the course of a year, each time piquing Brown's interest a bit more, until intrigue turned into enthusiasm. Brown is a record producer, and it was the music that appealed most to him. But he and his label co-leader Bruce Hinton also agreed that the documentary was critical to doing a record,

simply because of the nature of the country music business. 'You know going in that there are not likely going to be any hit singles off a record like this,' Brown explains. 'And you need hits to drive radio, which is what drives all of country music. So the CD would need something that could be used to market and promote it, and a documentary, especially one that got a theatrical run, would be one good way to do that.' Outside financing for the film project fell through several times, and finally Hinton and Brown offered Collie and Zarpis \$150,000 for the lot—concert, recording, mixing, mastering and documentary, as

well as a pair of music videos and a sixties trailer which could be edited from it. Collie and Zarpis vowed they could do it. And though the film is far from complete at this writing, that vow was sealed the moment Collie stepped up on stage at Brushy Mountain.

Brown and Z had been brought together by Collie, and they readily agreed to co-produce the live concert recording. Co-production does not come naturally to either man. Brown has increasingly shared production credits with any artist that he produces, but hasn't piloted a recording from the outset with another producer since he apprenticed under Nashville legend and his predecessor as president of MCA Records, Jimmy Bowen. Z is a self-acknowledged loner in the studio, creating his own trance as he builds drum machine loops and does much of his own engineering. However, this seemed to make them a good fit for this project. Brown's success is due in large part to his exceptional ability to pick the right songs for each project, then step back and give the artist room to unfold; Z is one of the industry's more technically adroit producers, which dovetailed well with Brown's self-admitted but self-imposed technical limitations. 'I did what I always do and concentrated on the songs, and let David worry about the recording,' Brown says.

David Z was specific about the tools he wanted for the recording. 'There was only going to be one chance to get this right, so I wanted people I was sure about,' he says. '[Record Plant Remote truck owner] Kooster [McAllister] and I had worked together before, most recently on a Johnny Lang concert video done at Disneyworld. We also had done the live parts of *Purple Rain* together. So Record Plant Remote got the call for the remote recording. Tony and I also wanted to pick musicians we knew would nail it right away.' The band included noted session and touring players, including bassist Willie Weeks and keyboardist



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RECORDING

Mike Utley, as well as singer Kelly Willis, another one-time MCA artists signed and produced by Brown.

Brown had envisaged a show structure similar to touring country shows of a half-century ago. 'You'd have the star come out and do a few songs with the band, then one of the other band members would do a few songs, then maybe a guest artist,' he explains. 'Then you bring it down with ballads before you take it to the big finish.' In fact, the concert went exactly along those lines, with Willis doing a pair of songs—much to the delight of the female-deprived captive audience—and guest appearances by country superstar Tim McGraw and legendary bluesman Clarence 'Gatemouth' Brown.

The concert took place in the central courtyard of the prison, a space about the size of an American football field. Hugh Johnson, long-time production

coordinator for Vince Gill on tour, was tapped by Brown and Z to handle the same role here. He constructed a stage in front of the prison's gymnasium, built in 1941 and the newest structure on the prison grounds. Brushy Mountain Prison is well over 100 years old and is notorious as a holding pen for unruly prisoners, including convicted Martin Luther King assassin the late James Earl Ray, who escaped twice from the prison grounds. He stayed out for about 77 hours before he voluntarily returned to the prison, defeated by the harshness of the surrounding terrain. 'Once you get outside these walls,' the Warden told David Z, 'the only thing out there is you and the snakes.'

'It was definitely a strange gig, being in a prison and all,' says Z. 'But it was a pretty standard microphone setup, like most concerts. The key was to do everything

possible to create a positive live performance environment and then get the best performance possible out of the musicians.'

And that's what happened. Not without the occasional glitch, including a conflict between Kooster McAllister's need for 30fps non-drop time code and the



23.98fps rate the high-definition cameras were generating. 'In the past, when we've done shoots, we've always supplied the time code—30fps non-drop,' McAllister explains in the truck as the Sony PCM3348 and Tascam DA-88s rolled. 'The problem is, they want to use their own time code, which is a derivative of 24fps [which my digital machines don't want to lock to because [the camera crew] can't give me a video reference signal.]'

McAllister, normally unflappable, is clearly annoyed, adding that the camera crew was working with the high-def cameras for the first time, and also had never before interfaced them with a remote truck. The first set was recorded with compromise of 29.97fps house-synch generated by the truck and recorded on the 3348's control track, which was also used to feed the electronic slates that were flashed before the cameras at the start of each song. 'So even if they have to hand-synch this in the end, they'll at least have something that will relate to what's on their tape,' McAllister concedes wearily. The second set saw the same procedure in place, with the high-def cameras' 23.98 recorded to an audio track on the 3348.

There was also the dramatic change in temperature that an autumn day in East Tennessee brings, which affected the tuning of the many guitars on stage during the morning performance. But this was to be expected on a live recording under the best of circumstances, and several days were booked at Nashville's Ocean way Studio A for minor touch-ups; the studio's B room, equipped with a Neve VR, was booked for both a stereo and surround mix.

Yet the serendipity of the day seemed boundless—the director of human resources for the Tennessee State Department of Corrections, Merlin Littlefield, had previously been an executive at ASCAP in Nashville for 19 years. 'I don't know how you could have found anyone more perfect for making sure that this event would happen,' says Brown. 'Anyone else and it would have been tied up in bureaucracy for years.'

The project might also provide a turbulent music industry in Nashville with a visceral reminder of how Johnny Cash reinvigorated country music over 30 years ago. Brown is quick to point out that Mark Collie has a lot of aspects to his talents. But the manner in which he has assumed even some of the subtlest movements of Cash on stage are quite visible, such as raising the acoustic guitar up to the vocal microphone for the final chord of a song. At the same time, though, Brown says he's beginning to see some of the old Mark Collie, the one he signed to MCA in 1991, shining through again, rejuvenated by the task at hand. Observes Brown from the couch of the tour bus taking us out to Brushy Mountain Prison, 'Mark is more now like who he was when I first met him.'

Collie, sitting across from him, nods in agreement, adding, 'I've missed me. I'm glad to have me back.' □

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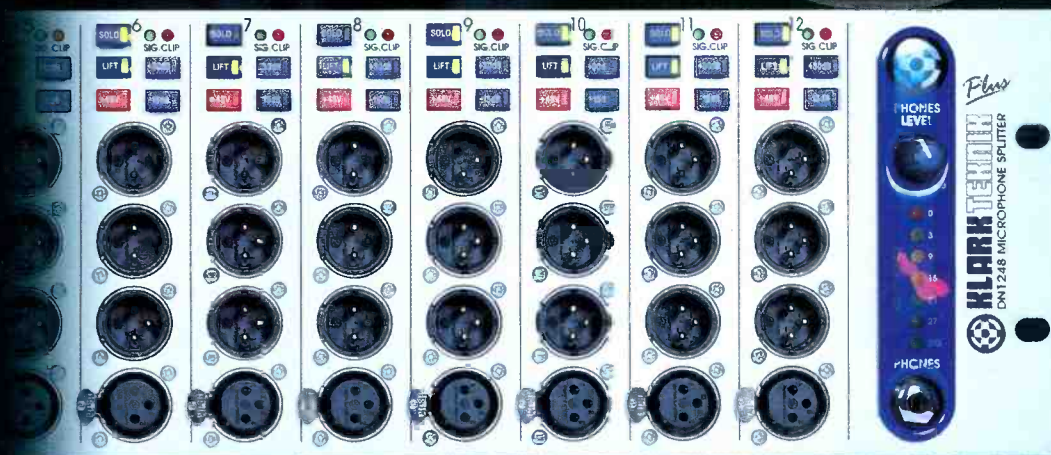
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FUTURE TENSE

Is DVD the lifeline the record companies so desperately need or another media misdemeanour in the making? **Chris Hollebhone** reports on an opportunity being missed

IF YOU REALLY WANT to know all about DVDs, I can recommend an excellent book: the 691 pages plus a DVD-ROM that comprise *DVD Demystified* by Jim Taylor. This book is now in its second edition and I imagine there will be others. Such is the complexity and rapid development of DVD, that I am not going to attempt to summarise Jim's magnum opus.

Instead, we will focus on the opportunity that DVD offers the record companies, and should be providing a lot more business for studios both now and in the future. Unfortunately, the record industry does not yet seem to realise the importance of DVD to its future. That is to say, it is producing DVDs but generally not ones that do justice to either the material or the medium. This may seem a little curious since there are already endless streams of statistics that prove that DVD is the fastest-growing consumer format ever. CD rejuvenated the record industry before, so why would this opportunity be wasted? Furthermore, the success of DVD has been assured by the video and film industries so there is no risk attached to supporting DVD. It is the proverbial 'free lunch' which always used to be so popular in the record industry.

Part of the problem is that CD was a free lunch in the sense that it was an opportunity to reissue material with little or no production or postproduction costs. Having now had 20 years of doing the *Greatest of the Best Hits Ever...*, it goes against the grain to spend money to further develop the catalogue. However, simply putting the CD on a DVD or transferring VHS to DVD will not do. There is also a lot of market research that indicates that the major reasons

for DVD's success are improved sound and video quality, and these are in almost equal measure. The out-takes, director-producer's commentary, subtitles and all the other extras that can be seen on many DVDs, are well down the popularity list. The bottom line is that, whether you are talking about DVD-Audio or DVD-Video, the buyers expect better sound and picture quality, which they get with most film releases on DVD. The sound obviously takes on even more importance when a music project is involved. How is it, then, that the vast majority of music DVDs are only in stereo, whereas the opposite is true for movie releases? A number of the more famous releases have even been remixed to 5.1 when the original was only stereo.



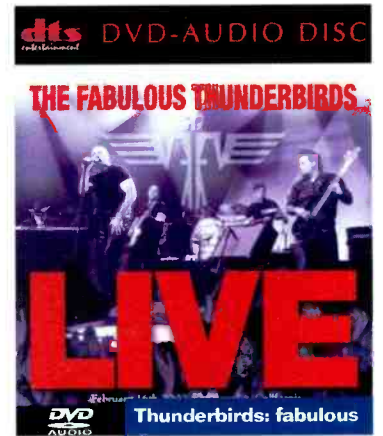
Hancock: over half an hour

People will nod their heads sagely and mutter about the disaster of quadrasonic haunting the record industry. It is quite true that quad failed but mainly because the home delivery system could not provide sufficient improvement to the sound, but not because of lack of support from the record industry. In fact there are many hundreds of quad tapes in archives all over the world which could easily be released in surround on DVD. Now the position is the opposite; the hardware works and is accepted by the public; it is the software producers that are not really supporting the format.

There is another factor that is certainly not helping the development of music-only surround products. It is the usual format war so hated by the record industry and which provides an excellent excuse to sit on the fence. SACD is pitched against DVD but in fact the two are not mutually exclusive, as we will establish. Despite early statements to the contrary, the proponents of

SACD know that surround sound is the key to their future as well. The world does not need a higher quality stereo format because it does too little to enhance the listening experience and will only be appreciated by a small minority of the listening public. DVD-A also suffers from the same problem so the motivation to buy a DVD-A or SACD player is not very great considering that the cost is typically significantly higher at the moment. The format that is already successful which will fuel sales of surround music software, is DVD-V not DVD-A. Virtually all current SACD players are modified DVD-V players so are quite capable of playing back a DVD-V disc (or the video zone of a DVD-A). All DVD-V players can also play the video compatibility part of the DVD-A as well as playing a DVD-V in surround with the video. All DVD-A players will also play DVD-V discs and there are already some players that support SACD as well as DVD-A and DVD-V. Are you following this? In case you missed the point; any disc containing surround information in a DVD-V format can be played on any of the players mentioned.

It is necessary to explain the video zone and what it means for the production of software. A DVD-A disc provides for a number of higher quality PCM stereo options but the multi-channel portion of the disc has to be encoded in MLP (Meridian Lossless Packing). This requires a DVD-A player to decode the surround sound



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information. The specification allows an optional zone to be used using either (or both) of the lossy compression systems that are a standard feature of DVD-V, namely Dolby Digital and DTS. This allows the disc to be played back in excellent quality 5.1 on all existing DVD-V systems. In real terms, the difference between MLP and DTS will be very subtle and will depend on the quality of the playback system as a whole. This feature has been exploited by Warner Bros, DTS, Naxos, 5.1 Entertainment and other early adopters of DVD-A, but there are some major labels still not convinced to produce DVD-A let alone use the video zone. This is most unfortunate for them as well as us since they clearly control a lot of the catalogue.

I have been involved with DVD long enough to

know how effective a good concert DVD-V can be. A great widescreen picture and a well-mixed 5.1 track in DTS is an entirely different proposition to watching a VHS in stereo, and offers a whole new market to the copyright holder. This fact seems to have been grasped eagerly by such companies as Image Entertainment and Eagle Rock but many of the major labels still produce very inferior products with indifferent picture quality, no 5.1 track and a paltry number of extras. These products are competing with the latest blockbuster movie disc, which increasingly has so much on it, that it has now become a two-disc set. Under these circumstances, sales are probably nowhere near as good as they could be, and consumer satisfaction is probably fairly low. More investment in the postproduction of these titles

would yield far better sales over a longer period.

Attendees of recent AES Conventions and other audio events have been bombarded with information on the importance of surround, the techniques, the technology; there have been any number of surround sound events all over the world. Famous artists, engineers and producers have pontificated at great length, on the wonders of working in surround, yet the record industry seems to be hoping that surround will fail as it did before. Having been involved with several new format launches since CD, this phenomenon is not new, yet it is remarkable that there is virtually no correlation between hardware and software producers and artists and record companies. This time, as with CD, I think the record companies have got it wrong and my suspicions are that it will take something extra to bring them round. Any record executive who has not heard 5.1 in a car probably ought to be fired, but accepting that most of them have not, we will probably have to wait until they have. This is really an interesting place to appreciate how exciting 5.1 audio can be. I know it is hardly an ideal listening environment in some respects, but then you can really use all those speakers to the full. The major car manufacturers are all taking this very seriously and it is a certainty that 5.1 DVD systems will be options or standard equipment on a wide range of vehicles within two years. The car also avoids one of the other difficulties of 5.1; where to put the speakers in the average European room and since many of us spend time in cars alone, this does not require lengthy negotiations with other members of the family. They like to hear the results of surround sound but they prefer not to see it.

So I hope we have established that there really is a business to be made from surround mixing and it is unfortunate that there is so little material being mixed in 5.1 at the time of the stereo mix. This will result in a terrific shortage of titles and it will cost substantially more to go back to these tapes in the future and remix them for surround. Those people that have issued dire warnings about the expense of working in surround are not doing anybody any favours because the real point is that to do the surround mix at the same time adds very little time relative to the whole project. Certainly any and every opportunity to discuss surround with A&R staff and the management of the record companies should be grabbed, because there are some clear messages emerging from sales of DVDs and most companies probably have some examples of where the numbers may have surprised them. The weight of evidence is slowly starting to bear on the decision making process but until then, the market is being led by the smaller companies, who are hampered in many cases by having less effective distribution. Scanning the music racks in a Tower, HMV or Virgin is still a little depressing if you are a surround enthusiast but it can only get better. If you are in a position to help, I urge you to do so. □



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WHY THE NS-10?

With comparable measurements for 36 close-field studio monitors to hand, it is now possible to identify specific reasons for the success of the Yamaha NS-10M.

Philip Newell, Keith Holland and **Julius Newell** present the facts



STUDIO SOUND'S LOUDSPEAKER measurements began in 1998, partly with the aim that the collated data would prove to be useful as an analytical tool, especially in cross-correlation with subjective experiences. The cessation of production of the Yamaha NS-10M loudspeaker provided an opportunity to test that hypothesis on a widely-known but no longer commercially sensitive example. Indeed the measurements were used as the basis for a paper presented to the Reproduced Sound 17 conference of the UK Institute of Acoustics in November 2001. (The paper contains 112 figures, all the plots being accessible on the *Studio Sound* web site.)

The original NS-10 was conceived as a domestic hi-fi loudspeaker for bookshelf mounting. As such it was not a great commercial success, and neither was it well received by the international hi-fi press. However, it was readily adopted by many recording personnel as a close-field studio monitor for rock-pop recording, effectively taking over the mantle carried by the Auratone 5C Sound Cube. Despite the output of the Auratone being prodigious for its size and era, its limitations had led many users to seek other loudspeakers with higher output levels and wider frequency ranges. Nevertheless, many still sought loudspeakers which exhibited the more valued characteristics of the Auratones. The NS-10 was widely considered to fill that need.

The original NS-10 fell short of the requirements on two counts; firstly it was somewhat lacking in output capability, and secondly it was considered to have an excess of high frequencies. The former problem prompted frequent driver replacements, while the second was commonly solved by the fixing of a piece of toilet paper

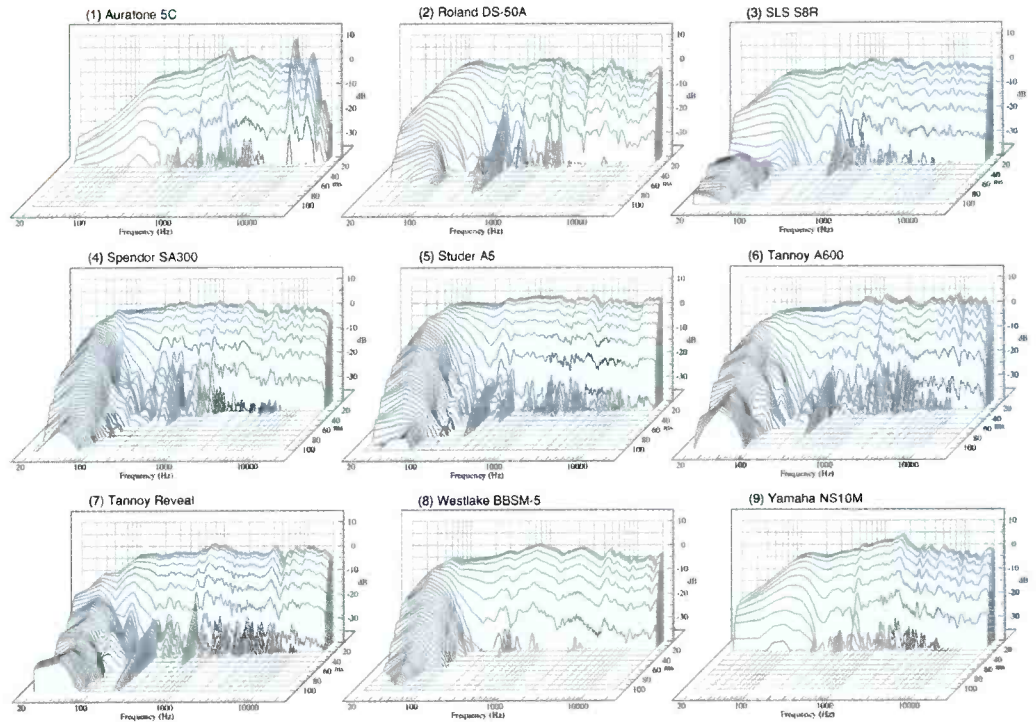


Fig. 1: Waterfall Response

over the tweeters. Tales of discussions over which brand was most appropriate and whether one sheet or two were required, were not a joke—such discussions did take place. Yamaha subsequently dealt with both prob-

lems in the mid-eighties through the NS-10M Studio, hereinafter referred to as the NS-10M.

The NS-10M is a 2-way loudspeaker consisting of a 180mm paper-coned low-frequency driver and a



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35 mm soft domed tweeter, all in a 10.4l sealed box. The crossover is second-order passive with asymmetrical turnover frequencies and in-phase connected drivers. The frequency range is quoted as 60Hz-20kHz, sensitivity is 90dB for 1W at 1m, and maximum (peak) input power is rated at 120W. The crossover frequency is 2kHz and the nominal impedance 8Ω.

The review of the NS-10M (*Studio Sound*, August 2001) revealed a frequency response with a deviation of +5dB over the range from 85Hz-20kHz under anechoic conditions. This would hardly be impressive in itself but closer examination shows that this deviation is due to an 'inverted-V' characteristic response shape, rather than the irregular wiggles shown by some loudspeakers.

Fig.1 shows a selection of nine of the 36 waterfall plots published in Reference [1] (and previously in *Studio Sound*). These represent the last eight of

response is shown in Fig.3. A battery connected to the loudspeaker terminals via a switch can also be used as a crude source of a step function. Rise time, simultaneous response of all drive units in a system, and ringing in the decay tail are things which step functions show up well.

Fig.4 shows the harmonic distortion performances of the same nine loudspeakers as in Figs.1 and 2. Again, neither the NS-10M nor the Auratone are bad performers. This is made even more emphatic when we consider that the other seven loudspeakers (and the other 34 represented in Reference [1]) are all of reputable make and are designed for professional use.

It is widely considered that a reference monitor loudspeaker should exhibit a relatively flat frequency response. However, it should be remembered that the loudspeaker and its mounting in a room are part of one system. It is the frequency response of that system which really needs to be flat in order for the

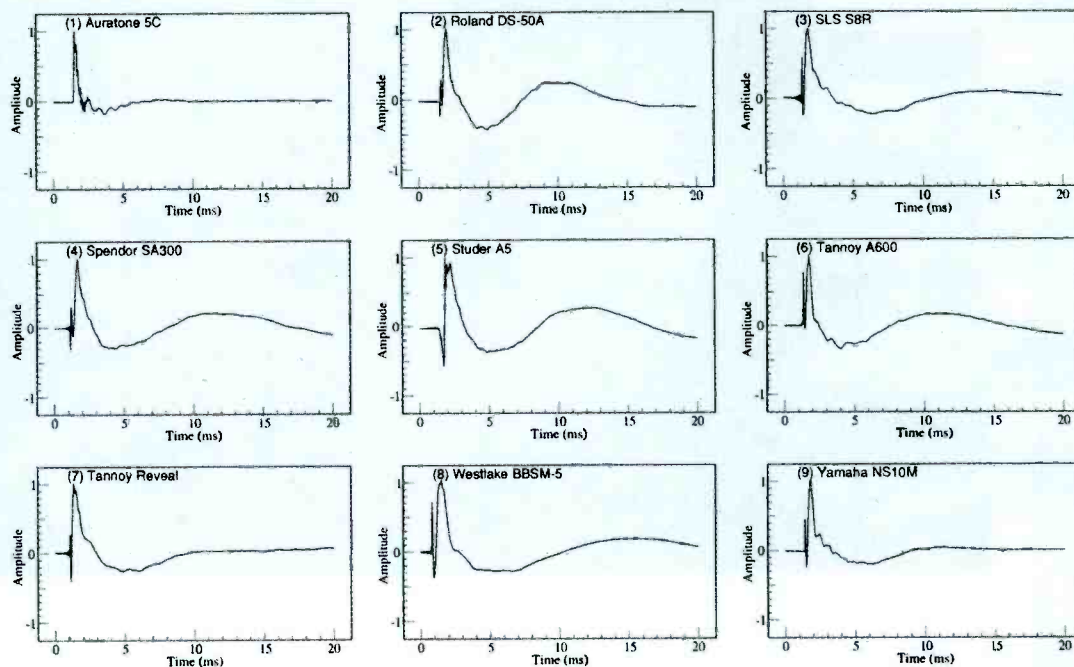


Fig.2: Step Response

the alphabetical order of the 36 plots, plus the Auratone. The two outstanding features of the Auratone and NS-10M are the inverted V response shape and the very rapid response decay over the entire frequency range. Both of these characteristics are largely due to the sealed box nature of the designs. We will return to this point, but suffice it to say that of the 36 waterfall plots published in Reference [1], the only other loudspeakers exhibiting a similarly rapid response decay were the ATC SCM20A, the AVI Pro 9, and the M&K MPS-150.

Fig.2 shows the step function responses of the same nine loudspeakers. All of these are very good compared with many typical monitor loudspeakers of 20 years ago. The Auratone exhibits the more exemplary rise because of its single driver nature. The separate peak of the tweeters responding early can be seen in most of the other plots. The Yamaha shows a better than average step function response, which is a good indicator of its transient response. The response tail is also well damped, which corresponds with the rapid decay shown in the waterfall plot. Incidentally, for anybody not familiar with a step function, an electrical input signal having such a

recording personnel to perceive a frequency-balanced representation of the music being recorded. The free-field response of the loudspeaker is not what is heard in a control room. Figs.5-8 help to clarify this point.

Fig.5 shows the response curves of an idealised loudspeaker of approximately similar size to the NS-10M, both in free-field conditions and flush mounted. Fig.6 shows the response of an NS-10M suspended in the open air about 4m from the nearest reflective surface. The response wiggles are due to the reflections from nearby surfaces, but the overall shape can be seen to be very similar to the free-field response shape in Fig.5. Fig.7 shows an NS-10M mounted on top of the meter bridge of a mixing console both suspended in mid-air. Additional comb-filtering of the response is evident due to the proximity of the top surface of the mixing console, but the overall trend is that of the flattening of the bass response. Fig.8 shows the response of an NS-10M on top of the meter bridge of a mixing console in a room typical of many recording studio control rooms. Despite the extra irregularities due to boundary reflections, the trend of the low-frequency

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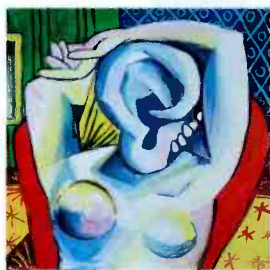
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response shape is in the direction of the flush mounted response shown by the dashed line in Fig.5.

In the article published in August, Nick Cook was quoted as saying, 'They also sound good when sitting on top of SSL consoles'. Well, the structure and shape of the console on which they are mounted will affect the response, and although a serious discussion of the subject is way beyond the scope of this article, perhaps it is likely that the more solidly-built consoles like SSLs will colour the sound less than would be the case with lighter, more resonant consoles. Nevertheless, Figs.5-8 seem to reinforce the concept of the NS-10M, plus a mixing console and a typical control room, yielding an overall frequency response of a nature that many recording personnel wish to hear. That the mixing console plays its part in the

response is perhaps reinforced by the number of people who work daily with NS-10Ms but who do not choose to use them at home—where mixing consoles are usually conspicuous by their absence.

The mid-range response peak which is clearly observable around 1.7 kHz in Fig.1 and Fig.6 appears to be responsible for the 'harsh' description which is often referred to. This could objectively be considered to be a negative asset. However, in the August issue, London-based songwriter-producer-studio owner Michael Klein said 'What I really like about the NS-

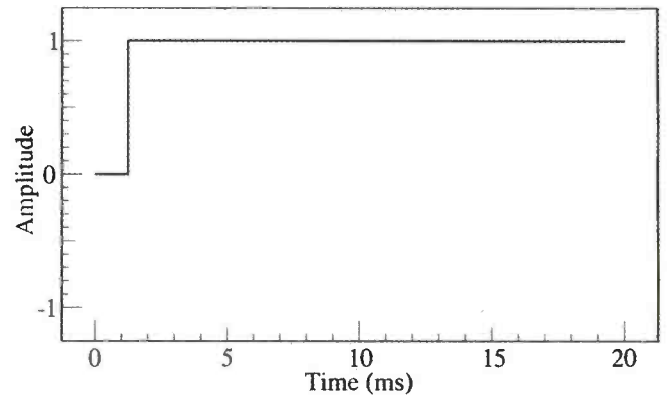


Fig.3: A Step Function

10Ms is that they make the mid-range clear and prominent. This is normally where many instruments are fighting for the same space. The NS-10Ms allow me to concentrate on getting the mid-range finely balanced, and once that is done the basis of a mix is usually well established. I don't record on them though, and I certainly wouldn't use them at home, but for mixing they are a great help'. Many people would no doubt echo Michael's comments (although of course, many would not), but his words again highlight how the NS-10M has been seized as a tool to help to get a job done.

Certainly in terms of frequency response, the NS-10M appears to have a free-field response which, when in the typical surroundings of a recording studio, gives many people what they need in order to get a job done. The relatively low distortion no doubt also helps.

But what of the time response? Let us turn again to the waterfall plots of Fig.1. Again, during the interviews leading to the August article, several people referred to the 'rock and roll punch' or the 'rock and roll sound' as Alan Douglas was quoted as saying. This clearly relates to the rapid decay of the NS10M. Two other things can also be said to result from the time response. The first is that the rapid decay is reminiscent of many good, large monitor systems in well-controlled rooms. Such systems often have cabinet resonances tuned way down below 30Hz, and they are usually without any protective filtering in the audio frequency band. The tuning ports and protection filters which are typically inside the lower bass region on smaller loudspeakers give rise to the low-frequency ringing which is typical of most of the plots shown in Fig.1. The NS-10M has neither tuning ports or protection filters. The tightness of the bass can, however, be influenced by the amplifiers driving the NS-10Ms, and amplifiers with extended low-frequency responses should be used if the full potential punch is to be realised.

The second point is that the rapid decay of the low frequencies from the NS-10M is less likely to cause confusion by distorting the time responses of the bass drums and bass guitars. One repeated complaint from many mastering engineers is that people who mix on a variety of small monitors often get the bass-bass drum ratio wrong. As these exist in the same frequency range, an inappropriate balance between the two can often not be resolved by equalisation (or any other process) at the mastering stage. It could be that fast decays are less likely to lead to such erroneous relative balances. Although this is conjecture, there is nonetheless much evidence to support the case.

From the above investigations it would appear that the following four statements can be made:

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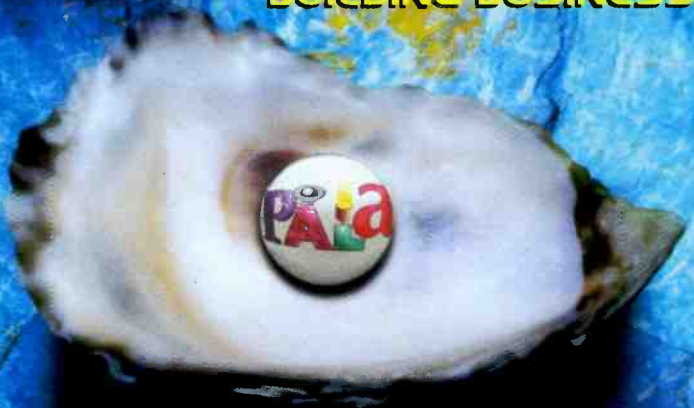
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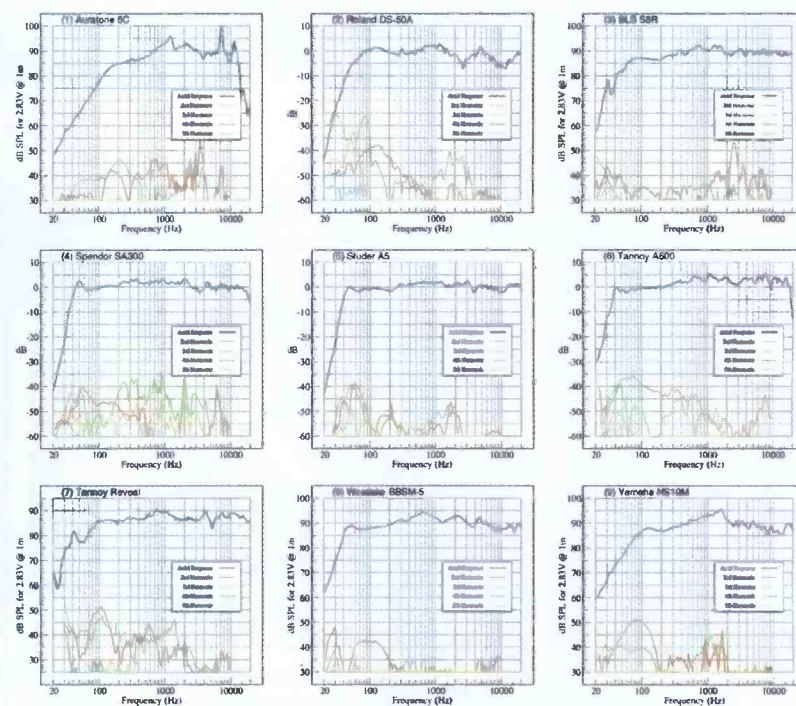


Fig.4: On-Axis Frequency Response and Distortion

The free-field frequency response of the NS-10M gives rise to a response in typical use which has been recognised by many recording personnel as being what they need for pop-rock mixing. The principal characteristics are the raised mid-range, the gentle top end roll-off (which is typical of many large monitor loudspeakers) relatively low distortion and a very short low-frequency decay time. The last of these is aided by the 12dB/octave low-frequency roll-off of the sealed box design.

The time response exhibits a better than average step function response, which implies good reproduction of transients.

The output SPL is adequate for close-field studio monitoring with good reliability.

They appear to mimic, in many ways, the characteristics of good, large monitor systems (within their limited range) and hence they are recognisable to many recording personnel in terms of their overall suitability for their needs.

Of course, the information presented here will only be deemed to be

truly worthwhile if it can be used in the design of future loudspeakers for studio use. General acceptance of any such loudspeakers is, however, not merely a technological challenge. Widespread acceptance requires widespread exposure, which implies mass manufacture with good world-wide distribution networks and an affordable price. These are non-technical realities which nonetheless affect the choices in today's recording industry.

A strong implication from this investigation is that loudspeakers which exhibit a flat free-field response will not have a flat response characteristic when placed on top of a mixing console in a control room. Many of the manufacturers of active loudspeaker systems provide significant ability (via dip switches and the like) to contour the low-frequency response to the mounting conditions, yet it is remarkable in how many studios the switches are set 'flat' in a belief that this provides the flattest response, even when mounting conditions dictate otherwise.

One alarming result of looking at

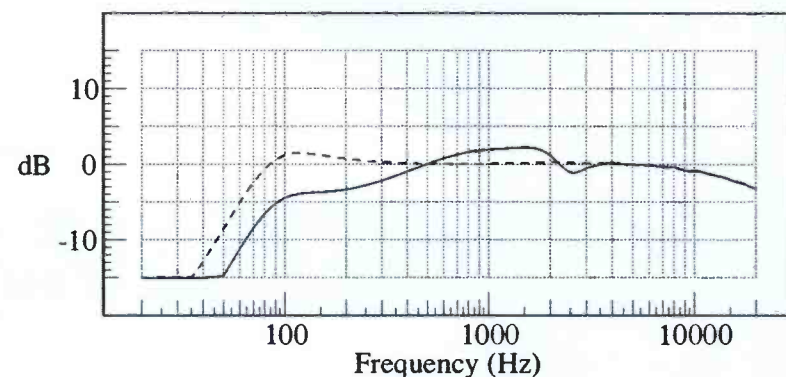
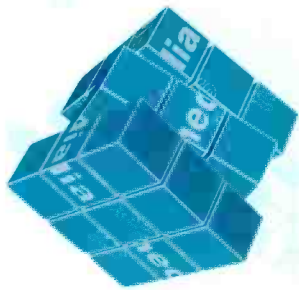
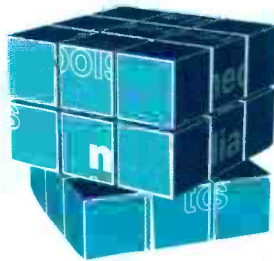
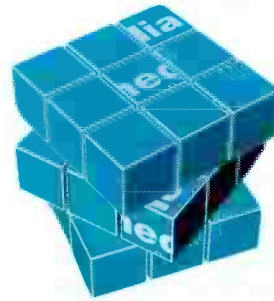
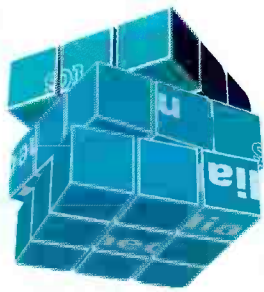
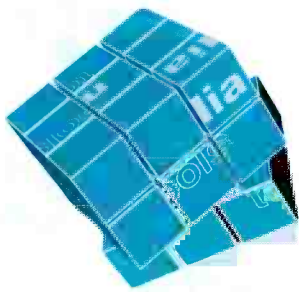


Fig.5: Response of Idealised Loudspeaker: Flush Mounted (---) Free Field (—)

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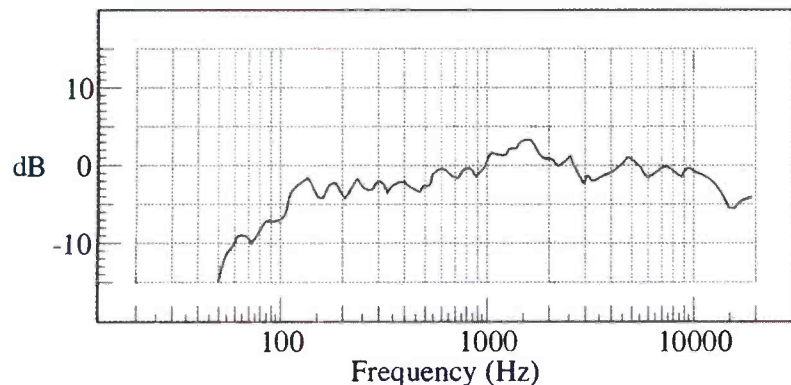


Fig.6: Response of NS-10M outside from 4m from Floor to Wall

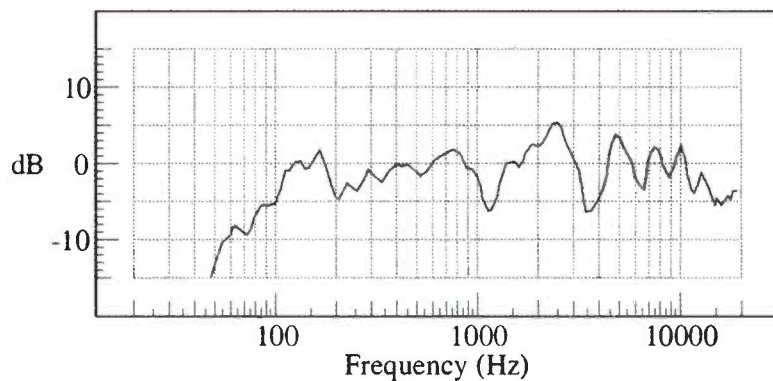


Fig.7: Response of NS-10M on Mixing Console Meter Bridge, Outside, Flown 4m from floor to wall

all 36 waterfall plots is the enormous variability in the low frequency time responses. However, this is another huge subject in itself.

Another great controversy is whether it is wise to place the loudspeakers on the meter bridges or whether they should be on stands just behind the console. The latter system does tend to give a more open stereo imaging and less comb-filtering because of the reduction of desk-top reflections. On the other hand, you then lose the desk-top bass reinforcement shown in Fig.7. There are obvious compromises being made here. Clearly, though, it would seem that for optimum mounting behind the console, a design with a little more bass than the NS-10M would be desirable.

It would therefore seem probable that the NS-10Ms are placed so frequently on the

meter bridges because that is where they have been found to exhibit their flattest overall response, even if some other aspects of their performance are com-

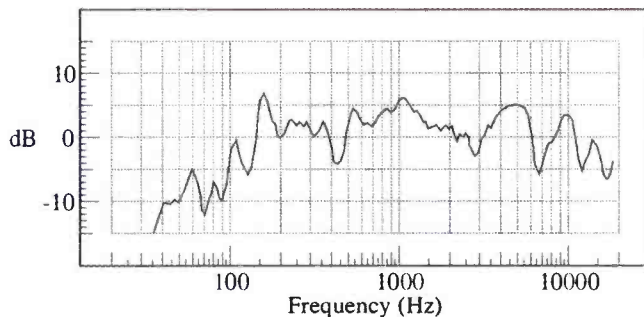


Fig.8: Response of NS-10M on Mixing Console Meter Bridge, Inside with Console on Floor

promised. The NS-10M therefore almost certainly found a waiting gap which it was at least reasonably well suited to fill. It had many of the characteristics needed for the then relatively unconsidered (1982) task of close-field monitoring in rock-pop music studios. Nevertheless, whether by design or accident, it has made its presence felt in the music recording world, perhaps like no other loudspeaker to this day. □

Reference

[1] Newell, Philip R, Holland, Keith R, Newell, Julius P, *The Yamaha NS10M: Twenty Years a Reference Monitor. Why?* Proceedings of the Institute of Acoustics, Vol 23, Part 8, (2001)

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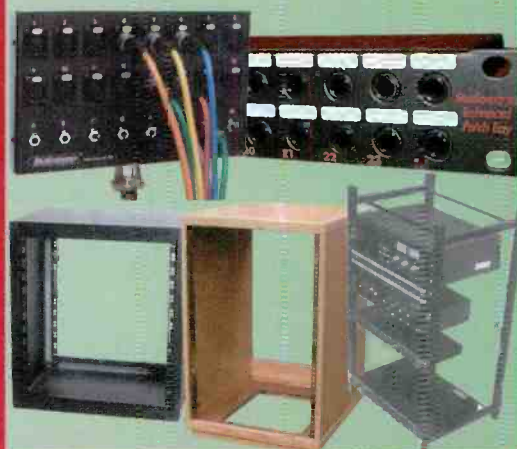
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The opportunities offered by technology are only as good as the creative and commercial applications they find—as DVD and SACD amply demonstrate, writes **Barry Fox**

JVC FOUND OUT the hard way when it tried to launch Super-VHS with tapes that would not play on standard VHS decks, that the public at large is not interested in buying into a new format simply because it offers marginally higher quality sound and pictures. So it is wholly unsurprising that DVD-Audio already looks dead in the water, and will survive as a format only because DVD-A playback will be built into future DVD-Video players as a 'free' feature.

The audio benefits of MLP lossless compression will be lost by the budget circuitry manufacturers use to cut costs. Only a few artists will be able to afford the luxury of wide-band 5.1 recording or remastering. Most surround recordings will be sourced from stereo masters, tricked up with reverb, electronic processing or—as EMI is doing with its DVD-A releases—playing stereo tapes through speakers in Abbey Road and re-recording in surround.

Super Audio CD is a good system with far more interesting software, but it will only survive as a format if manufacturers build SACD playback into CD and DVD players as a free feature.

The masses of extra bits pace available on DVD when there is no movie material would be far better used to squeeze higher quality from existing formats running at higher rates. This is exactly what is happening in the US with Superbit DVDs.

The DVD format lets the video coding rate vary so that scenes with a lot of movement and detail are allocated more bits than stationary views. But the bit average has to be kept down to let a single 'side' store a full-length feature. The movie studios want the second 'side', or second recording layer, for 'added value' features—like interviews with the cast and their dogs

—which justify charging more for the DVD than its VHS equivalent.

Sony-Columbia TriStar in the US has now released special edition DVD movies, including *Crouching Tiger, Hidden Dragon*, *The Fifth Element* and *Air Force One*. Instead of wasting bit space on cringe-making extras, Superbits double the coding rate, from an average of 3–4Mbits/s to 6–8Mbits/s. There is also a choice of Dolby Digital 5.1 or DTS, and at higher audio coding rates.

Benjamin Feingold, president of Columbia TriStar says: 'Standard DVDs are like fully-loaded luxury automobiles. In contrast, Superbit DVDs are like Formula One race cars; built for pure performance'.

It is significant that the move comes from Sony, Philips' partner in SACD. If Panasonic, Warner and Universal were to promote SuperBit DVDs, it would just underline their mistake in making DVD-A a new format.

The data rate used for 6-channel Dolby Digital on the Superbits has been upped from 384kbps to 448kbps, and all decoders in consumer equipment will cope with this. Indeed some ordinary DVDs already use 448kbps. The theoretical maximum bit rate for Dolby Digital is 640kbps, but Dolby Labs warn that although all decoders can handle this rate, there may be some compatibility issues with some DVD players; so 640kbps is only occasionally used for demo discs.

Consumer DTS decoders can handle much higher 6-channel rates, anything from 384 to 1.5Mbps. Superbits use the same 750kbps used on most DVDs and theatrically, but future discs could go to 1.5Mbps.

German digital satellite broadcasters are already transmitting Dolby Digital 5.1 and this winter Sky in the UK starts adding 5.1 to the widescreen Movie channel and a couple of Box Office channels. BBC and Channel 4 may follow. This is possible because the DVB standard for digital television provides for a 'private' stream that can carry any extra data. The receiver strips out this data and delivers it through the SPDIF socket, provided of course that the digital receiver has one. The socket then connects to a home cinema system decoder. There is no restriction on what kind of data is slotted into the private stream.

This is why DTS is now publicising a deal with Canadian company Leitch to slot DTS 5.1 surround sound into the private stream, at any bit rate between 384kbps and 1.5Mbps. Unfortunately the announcement has been confused, by garbled talk from DTS and Leitch about using apt-X compression. This is the proprietary system which DTS uses for cinema sound, and has no relevance to consumer DVD or consumer digital television. The apt-X coding is used to route the signals between studios and transmitters. (Tip: it really would help all round if someone with technical knowledge checked press releases before the companies sent them out.)

Digital terrestrial broadcasters, like ITV Digital (formerly OnDigital) can only offer matrix stereo surround. They are so strapped for bit space, already desperately trying to squeeze six or more TV channels into a single multiplex, that they cannot afford to spend any of that space on digital surround.

Big trouble in little Havana

Race, politics and race politics have rarely laid such clumsy hands on the music business as they have over the Latin Grammys, writes **Dan Daley**

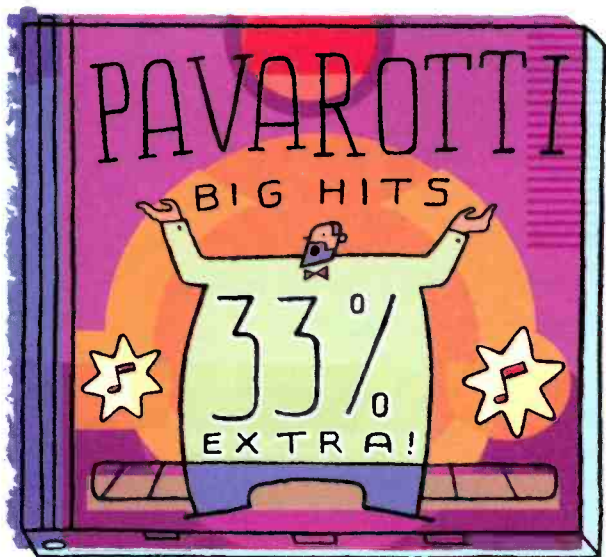
POLITICS AND MUSIC have long been familiar bedfellows. But what's gone on in Miami recently takes this relationship to a new level. Latino music has become one of the fastest-growing music genres in the US, and because Hispanics populate so much of the rest of the hemisphere, from Spain to the Caribbean to Latin America, the implications for the overall music business are significant, particularly when the music industry in the US is starting to show a noticeable decline, dropping from 488.7bn units in 1999 to 447.7bn last year.

Latino music seems to hold a lot of long-term promise for the US record business. It is, in many ways, a parallel universe unto itself—Hispanics now make up nearly 20% of the US population, and they are projected to be nearly 50% by the middle of the century. This Hispanic concatenation is as diverse as the rest of the music-buying public here—there are Latino rock and pop categories that range from the glossy sound of Gloria Estefan and Enrique Iglesias to the edgy rock of Argentinean rocker Fito Paez; the Mexican category is the largest, comprising Tejano and Mariachi and is driven by the fact that 60% of the US Hispanic population is Mexican or of Mexican descent. And all this hardcore Hispanic music acts as the backdrop to the Latino which crosses over into mainstream pop, and 2000 was a watershed year for that, from Ricky Martin's 'Livin' La Vida Loca' to Carlos Santa's 'Smooth', which between them moved over 20m records.

Small wonder that Miami quickly got hot as a music recording destination over the last two years. The acquisition of the legendary Criteria by The Hit Factory set the stage for a number of new and rejuvenated studio ventures. Miami has become a magnet once again, as it was in the seventies, for engineers and producers.

So the advent of the Latin Grammys, which were inaugurated in 2000, seemed to be a perfect fit with Miami, which had clearly become the hub of the hemisphere's Latino music business. Los Angeles could take the attitude that its Mexican heritage gave it at least an equal claim on that assertion, and LA has been a hothouse of much of the new generation of contemporary Latino music. But LA simply could not match the sizzle that a rejuvenated Miami could bring to a new awards show, and apparently NARAS president Michael Greene and the CBS network agreed: Miami was the place to base the Latin Grammys. That is, until politics got involved.

A brief primer on Cuban-American relations: Cuba became a US protectorate in 1898, after a quick war against Spain—incited by publisher William Randolph Hearst to sell more newspapers—gave the US its first overseas empire. For the next half-century, the States treated Cuba ambivalently, offering a little more freedom than Spain had but casting a larger shadow over virtually every aspect of Cuban life. Still, Havana thrived as an entertainment metropolis after the Second World War; by the fifties, it was everything Las Vegas strived to



Breaking the news

The immediacy with which information can now be delivered to the world is changing the definition of the word 'news', and moving us from onlookers to players, writes **Kevin Hilton**

THERE IS A TRIVIAL PURSUIT question that asks 'Who was the first murderer to be executed on live television?'. Answering this is made more difficult by the brain saying that such a thing has never happened, all the while wracking itself for the correct answer. The solution is, of course, Lee Harvey Oswald, who was gunned down by Jack Ruby in the full glare of TV cameras while being transferred to jail.

Marshall McLuhan—who more or less invented media studies but is best known today for his cameo in Woody Allen's *Annie Hall*—suggested that the inability of the cops to prevent the incident was more to do with the influence of television than any conspiracy. In his seminal yet almost impenetrable tome *Understanding Media*, McLuhan wrote: 'Jack Ruby shot Lee Oswald while tightly surrounded by guards who were paralysed by television cameras.'

This may sound fanciful but what is striking about that footage, even after 38 years, is the shock and confusion, with flashes of clarity—'Oswald's been shot!'; 'It's Jack Ruby!'—that create a more effective commentary than anything scripted. So it was with the newsreel of the Hindenburg collapsing into flames; the commentator's exclamation of 'Oh my God! This is terrible! Terrible!' is more eloquent than anything half an hour in front of a typewriter could have produced.

The 21st Century now has something to rival, if not surpass, those distant, monochrome images. The disbelief that an airliner was seen to plough into a tower of the World Trade Center on live TV is equal to that of Lee Oswald being summarily executed on prime time, despite this being a more televisually aware and, up to the 11th September, blasé age. As has been said many times since, it looked like an elaborate CGI sequence: the sky was almost unnaturally blue and the impact had a terrible beauty.

The day after the attacks on the World Trade Center and the Pentagon, I flew out to Amsterdam for IBC where the talk was predominantly of what had occurred in the US. This was partly because it is such a huge event and partly because of the part television was playing. Some of my colleagues were surprised when I said that for a large part of the coverage I had been listening to the radio, not watching the TV. I had heard the news on a music station, when it was initially believed to be a terrible accident, and then switched to a rolling news service when it became clear that this was a deliberate act. Because I was working to clear my desk before leaving for Amsterdam, it did not occur to me to turn on the TV until a few hours after the attacks.

The radio reports had given a fair impression of what to expect but seeing actual pictures was both a shock and vaguely unreal. As with the Hindenburg

footage, the confusion and unvarnished shock of reporters helplessly watching the story grow larger by the second added to the effect. Since the second jet became a living missile, the whole affair has been played out on television, with unexpected non-professional video footage of the aftermath of the first crash turning up later.

After that, it was pretty much continuous news coverage on the majority of channels. Sometimes being away at an exhibition for a week can isolate you from what is going on in the world; not so this time. CNN, BBC News 24, RTL and the main Dutch channels were dedicated to the story, almost to the point of saturation. As the various elements developed it became too much for a friend of mine, who became very upset. The rest of us vacillated between this and attempts to numb the shock.

Since then we have experienced George W Bush's deeply unimpressive and uninspiring TV addresses and strange editorial decisions designed not to offend anyone directly affected by the tragedy. The BBC pulled an episode of *Sienfeld* because it featured a joke about an airship exploding (echoes of the Hindenburg again). As far removed as October, Sky One edited an episode of *The Simpsons* that origi-



nally showed Homer messing up a hostage negotiation.

As trivial as it sounds, the advances in television delivery have enabled us to be almost a part of this event; there has been an immediacy to the coverage, rather than images reaching us some time later when we are less emotional. When the US began bombing Afghanistan, pictures from the al-Jazeera network were on Western screens within half-an-hour. As Albert Brooks said in *Broadcast News*, 'I talk into here and it comes out there'.

Al-Jazeera, the Qatar-based news channel, has become a major tool in this affair, being used by Osama bin Laden, British prime minister Tony Blair and the Archbishop of Canterbury. Filtering real life through the lens of a camera usually gives it a sense of unreality; and while world leaders continue to posture, the underlying truth remains. Many people died on that day and people continue to die. It must be real—I saw it on TV.

become, with the added benefit of being truly exotic—and beyond the immediate reach of US laws.

Everything changed on 1st January, 1959, when Fidel Castro rolled down out of the mountains and finalised a

decade-long struggle to replace the US-backed Batista government with a Cuban revolutionary one. And for the last 42 years, the new Cuban-US relationship became a trope for the Cold War, and has remained one even after the Berlin Wall became a memory. That relationship infuses everything in Miami to this day. And it cost Miami the honour of hosting the first Latin Grammys last year. That particular instance was traceable to a specific law, on the books at the time in Miami's Dade County, that prohibited the use of any county facilities by any Cubans, and applying it in the case of the Latin Grammys was heavily backed by the mega-conservative Cuban exile community in Miami, from which the city's mayor and much of its leadership is drawn. That would have made it hard for Cuban artists to attend the Grammy, let alone perform at them. And few could argue that Havana still held onto its reputation as the musician's capital of the Latin world. So NARAS threw up its hands and took the show to Los Angeles.

Once the dust had settled on the show, it became evident that Miami had screwed up royally. Not only did it lose the prestige of hosting the show on an international broadcast stage, it lost an estimated \$30m-plus in revenues that the Latin Grammys reportedly generated. To top it off, the Dade County law forbidding the use of municipal facilities by Cubans was ruled unconstitutional in the meantime and struck from the books.

For this year, Miami's executive leadership sought to rectify what they recognised as the previous year's blunder. During the regular Grammy broadcast, in February, in Los Angeles, a delegation convinced Greene to give Miami another chance. The show was set for 12th September, at the neon-lit American Airlines Arena in Miami. But less than eight weeks before the show, NARAS pulled up stakes and vacated Miami once again, steering the show back out to LA.

The reasoning on this one was purely political. The group of anti-Castro demonstrators which had been cleared to participate, but from a specified distance from the Grammy red carpet, had enlisted the aid of the American Civil Liberties Union and got the local police chief to agree to move them closer to the front of the Arena. Greene, who had seen a video of how similar demonstrators had pelted concert attendees with batteries at a show by Cuban rock group Los Van Van earlier in the year, didn't want a similar confrontation.

How politics has such an impact on music is something that a Basque or a hard-core IRA member might readily understand. However, it seems anachronistic in the US, as though it were some kind of parody of our own immigrant roots. But there's nothing funny about what has happened *vis-a-vis* the Latin Grammys and Miami. And the city that is best positioned to become the next (and, in the Internet Age, possibly the last) major centre of music production in the world, has managed to shoot itself in the foot twice now. At least with the recent spate of shark attacks in Florida, you can say that they were just hungry. In the case of Cuban-American relations, however, it's just todos estupido.



Pro Audio A to Z directory now available to aid global contact

WORLD – CMP Information reports that the second volume of the *Pro Audio A to Z* is now available.

Launched in September 2000, the *Pro Audio A to Z* directory was the first ever comprehensive and definitive listing of all the world's leading audio manufacturers and distributors. The 300-page volume has since become an invaluable source of reference for anybody in the business of professional audio, particularly for manufacturers

seeking new distributors and dealers (and vice versa).

Produced by CMP Information (part of United Business Media) – publisher of *Studio Sound*, *Pro Sound News* (Europe, Asia, USA), *Installation Europe*, *Systems Contractor News* and *EQ* – the *Pro Audio A to Z* brings together key market contacts from a multitude of information sources.

The eagerly awaited second edition was published in October

2001 and features all the new contact details for companies that have re-located, changed their company name or come into existence in the past 12 months.

The *Pro Audio A to Z* costs £25 (40 euros or \$35) and can be ordered by calling CMP Information on +44 20 7579 4169, (fax number +44 20 7579 4011) or by emailing esullivan@cmpinformation.com.

PSNE

New publication provides global database of pro audio contacts

WORLD – The *Pro Audio A to Z*, published by CMP Information, contains a wealth of contacts essential to anyone in the business of pro audio.

The first section, **Manufacturers**, is a comprehensive list of pro audio companies from around the world – 186 pages of them, in fact. Where that information was available, an address, phone and fax number, email address and website have been printed. And where a particular manufacturer has invested in an 'enhanced' entry, all its distributors are listed too. Readers can see at a glance how to reach a certain product in a certain region of the globe – from Albania to Zimbabwe. Contrarily, a distributor can see where a manufacturer *doesn't* have coverage, and act on that information.

The second section lists **Distributors**, by A to Z of country of operation. Here, at least one contact is given, be it telephone, email, or both. Got a product range that needs an outlet in Fiji? There are several distribution companies to choose from here...

The third section, **Fast Track**, is a collection of useful numbers and contacts for a variety of essential services: **industry organisations** (NSCA, Institute für Rundfunktechnik, EBU...); **equipment hire**; **exhibition organisers**; **pr/marketing/publicity** businesses; a round-up of **publications** and magazines; **studio design and construction**; and **support services** (finance agencies, hire firms, and more).

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Total number of power amplifier makers revealed

WORLD – Ever wondered how many businesses are producing amplifier tech? There are over 120 manufacturers listed in the *Pro Audio A to Z*! But that's nothing compared to loudspeaker manufacturers – there are 150 of those!

Section four of the directory lists all the manufacturers under a variety of headings (mics, IEMs, mixers and so on – alphabetically, of course), and these can be back-referenced with the first section so you can locate a company making just what you want.

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DIGITAL MAGNETIC RECORDING

Getting further into the details of recording and data integrity, **John Watkinson** continues his examination of the vital topic of digital magnetic recording

AS DISCUSSED last month, digital heads and media do not know they are digital. It is only the associated signal processing which makes it possible to recover discrete data from the medium. The head and the medium together can be considered as a channel or signal path having certain characteristics. Fig. 1 shows some of these characteristics, which include a frequency response that may be irregular and restricted, along with the addition of noise, distortion and timing errors or jitter.

Digital recorders have to overcome all of these issues adequately rather than perfectly. In the digital recording domain, there is only one thing that can go wrong: the recovered data is not identical to the original. When an error correction system is available, it is not necessary for every single bit to be correct, as any which are incorrect will be put right. This means that the recording and data recovery circuitry do not need to be perfect.

The characteristics of most channels are that signal loss occurs which increases with frequency. This has the effect of slowing down rise times and thereby sloping off edges. If a signal with sloping edges is sliced, the time at which the waveform crosses the slicing level will be changed, and this causes jitter. Fig. 2 shows that slicing a sloping waveform in the presence of baseline wander causes more jitter.

The slicer is implemented with a comparator that has analogue inputs but a binary output. In a cable receiver, the input waveform can be sliced directly. In an inductive magnetic replay system, the replay waveform is differentiated and must first pass through a peak detector or an integrator. The signal voltage is compared with the midway voltage, known as the threshold, baseline or slicing level by the comparator. If the signal voltage is above the threshold, the comparator outputs a high level, if below, a low level results.

Fig. 3 shows some waveforms associated with a slicer. At Fig. 3a the transmitted waveform has an uneven duty cycle. The DC component, or average level, of the signal is received with high amplitude,

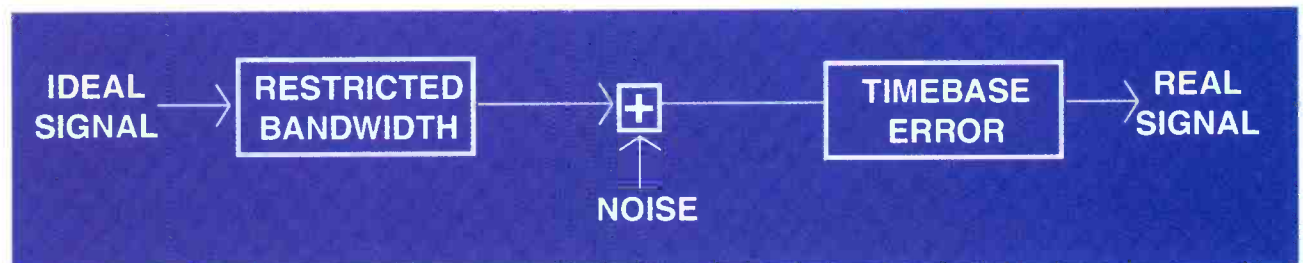


Fig. 1: Digital replay signals are non-ideal

but the pulse amplitude falls as the pulse gets shorter. Eventually the waveform cannot be sliced. At Fig. 3b the opposite duty cycle is shown. The signal level drifts to the opposite polarity and once more slicing is impossible. The phenomenon is called baseline wander and will be observed with any signal whose average voltage is not the same as the slicing level. At Fig. 3c it will be seen that if the transmitted waveform has a relatively constant average voltage, slicing remains possible up to high frequencies even in the presence of serious amplitude loss, because the received waveform remains symmetrical about the baseline.

It follows from the above that it is not possible simply to serialise data in a shift register prior to recording because successful slicing can only be obtained if the number of ones is equal to the number of zeros; there is little chance of this happening consistently with real data. Another problem is that if there is a run of identical bits, the serial signal maintains a constant state and there is then no timing information to help count the bits. Instead, a modulation code or channel code is necessary. This converts the serial data into a waveform which is DC-free—or nearly so—and which has a guaranteed clock content.

As ideal transitions occur at multiples of a basic period, an oscilloscope, which is repeatedly triggered on a channel-coded signal carrying random data, will show an 'eye pattern' if connected to the output of the equaliser. Fig. 4 shows that study of the eye pattern reveals how well the coding used suits the channel. In the case of transmission, with a short cable, the losses will be small, and the eye opening will be virtually square except for some edge-sloping due to cable capacitance. As cable length increases,

the harmonics are lost and the remaining fundamental gives the eyes a diamond shape. The same eye pattern will be obtained with a recording channel where it is uneconomic to provide bandwidth much beyond the fundamental.

Noise closes the eyes in a vertical direction, and jitter closes the eyes in a horizontal direction. If the eyes remain sensibly open, data separation will be possible. Clearly, more jitter can be tolerated if there is less noise, and vice versa. If the equaliser is adjustable, the optimum setting will be where the greatest eye opening is obtained.

In the centres of the eyes, the receiver must make binary decisions at the channel bit rate about the state of the signal, high or low, using the slicer output. As stated, the receiver is sampling the output of the slicer, and it needs to have a sampling clock in order to do that. In order to give the best rejection of noise and jitter, the clock edges which operate the sampler must be in the centre of the eyes.

The only way in which the sampling clock can be obtained is to use a phase-locked loop to regenerate it from the clock content of the self-clocking channel-coded waveform. In phase-locked loops, the voltage-controlled oscillator is driven by a phase error measured between the output and some reference, such that the output eventually has the same frequency as the reference. If a divider is placed between the VCO and the phase comparator, the VCO frequency can be made to be a multiple of the reference. This also has the effect of making the loop more heavily damped. If a channel-coded waveform is used as a reference to a PLL, the loop will be able to make a phase comparison whenever a transition arrives and will run at the channel bit rate. When there are several detents between transitions, the loop will flywheel at the last known frequency and phase until it can rephase at a subsequent transition. Thus a continuous clock is re-created from the clock content of the channel waveform.

In a digital audio or video recorder, this clock will have a defined relationship to the sampling rate of the original material. For example, in compact disc, the master clock is 98 times the sampling rate.

In a recorder, if the speed of the medium should change, the PLL will, within reason, change frequency to follow. This mechanism is adequate to allow for speed irregularities due to disk run-out or

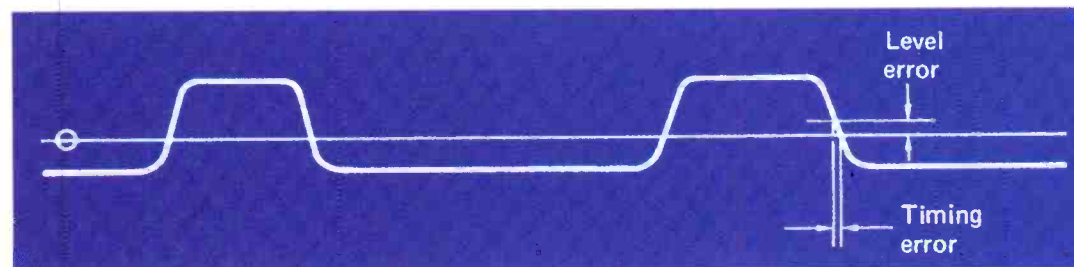


Fig. 2: A DC offset can cause timing errors

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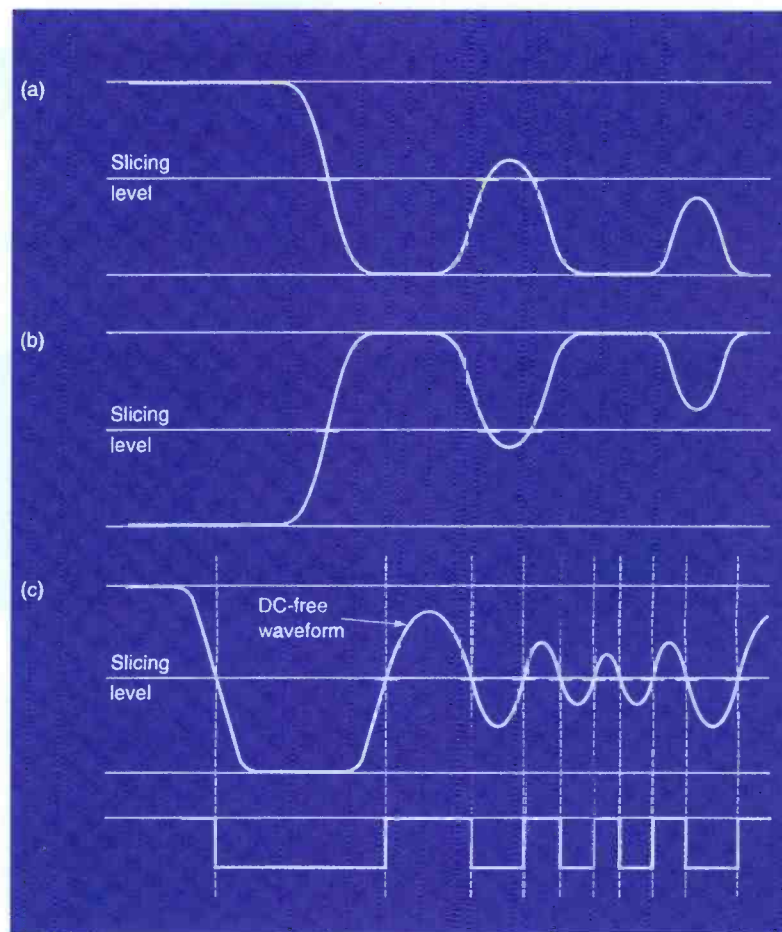


Fig.3: Slicing a signal which has suffered losses works well if the duty cycle is even. If the duty cycle is uneven, as in (a), timing errors will become worse until slicing fails. With the opposite duty cycle, the slicing fails in the opposite direction as in (b). If, however, the signal is DC free, correct slicing can continue even in the presence of serious losses, as (c) shows

warp, tape stretch or capstan eccentricity. Data recovery continues with timing locked to the instantaneous speed of the medium, and the timing errors are removed in the subsequent time-base corrector which outputs samples at a constant rate.

However, phase-locked loops are optimised to reject jitter and this makes them limited in the frequency range that they can accommodate. This is the reason why the variable speed range of stationary-head digital audio tape recorders is limited. In rotary head machines it is possible to vary the head speed as a function of tape linear speed so that the off-tape bit rate stays the same. This head speed variation can clearly be heard in DAT machines and DVTRs during shuttle.

Once the loop is locked, clock edges will be phased with the average phase of the jittering edges of the input waveform. If, for example, rising edges of the clock are phased to input transitions, then falling edges will be in the centre of the eyes. If these edges are used to clock the sampling process, the maximum jitter and noise can be rejected. The output of the slicer when

sample the received waveform at the centre of the eyes. The sampled bits will be more prone to noise and jitter errors. VCO centring can simply be checked by displaying the control voltage. This should not change significantly when the input is momentarily interrupted. In the Serial Digital Interface (SDI) a large number of problems can be avoided by correct adjustment of the VCOs during installation. □

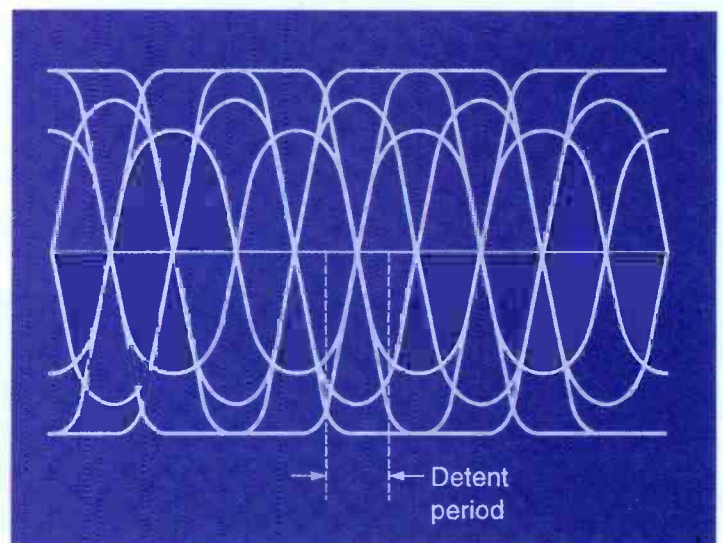


Fig.4: The eye pattern resulting from the use of channel coding

sampled by the PLL edge at the centre of an eye is the value of a channel bit.

Clearly, data cannot be separated if the PLL is not locked, but it cannot be locked until it has seen transitions for a reasonable period. In data recorders, which have discontinuous recorded blocks to allow editing, the solution is to precede each data block with a pattern of transitions whose sole purpose is to provide a timing reference for synchronising the phase-locked loop. This pattern is known as a preamble. In interfaces, the transmission can be continuous and there is no difficulty remaining in lock indefinitely. There will simply be a short delay on first applying the signal before the receiver locks to it.

One potential problem area frequently overlooked is to ensure that the VCO in the receiving PLL is correctly centred. If it is not, it will be running with a static phase error and will not sam-

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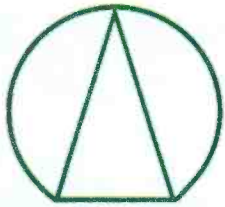
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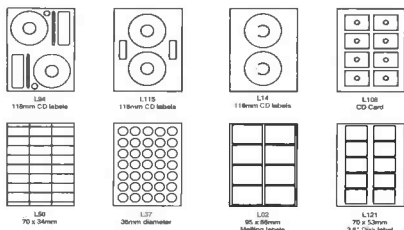
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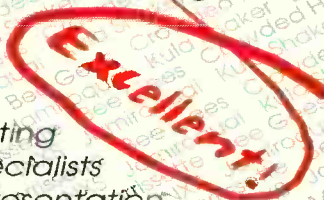
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LETTER OF THE MONTH

Public image

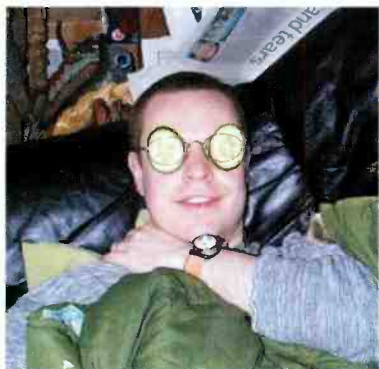
I WRITE WITH REFERENCE to Stuart Tarbuck's letter, your reply, and the published photo of myself (Letters, *Studio Sound* November 2001).

Ambushes from man-hole covers is one thing, but reviving paparazzo shots from a drunken Christmas outing (just look at the table in the picture!) approximately seven years ago when I was sporting a rather unwise hairstyle, not to mention an enormous analogue mobile phone, is grossly unfair, and surely against all the principles established by the Press Complaints Authority. I shall be speaking to my lawyers—and stylist—forthwith. Please see more recent photo enclosed.

George Shilling,
 sound engineer and
Studio Sound contributor

Tim Goodyer replies

The camera never lies, George, though sometimes the photographer does. We heard from your stylist this morning, although your solicitor has yet to return our calls. Strangely, however, the CMP



switchboard is now closed to teenage girls calling simply for 'George'. The office sweepstake is open on the likely response to your latest 'persona'—my money's on a February *FHM* cover.

This month's letter of the month wins a free copy of the latest edition of *The Art of Digital Audio* by John Watkinson from the Focal Press range

A pedant writes

ALLOW ME to preface this by stating that it is not my intention to be an irritating pedant, but to seek clarification of one of your always thought-provoking editorials.

I'm sure you will agree on rereading Tim Goodyer's editorial this month (November 2001) that the sentence '...the statistics tell that if you're not still listening to new musical forms at the age of 23, there's a 95% probability that you never will', is grammatically confusing. My question, to avoid me making a false assumption, is what exactly does the research tell? And which research are you referring to, that is where can I look to read more of it?

I would be grateful to hear from you.

Mike Robinson, UK

Tim Goodyer replies

The missing word would be 'again'.

The study—picked up on a BBC *Open University* programme, if I remember correctly—describes wo/mankind's increasing inability to accept change with age. What struck me was that while so much of the record business betrays its 'youth culture' status through the old bastards that populate its key areas, the recording industry remains uncharacteristically open-minded about the development of music

and the technology behind its creation.

Sad to say that I can't point you in the direction of the source research, apart from to comment that it was American. It was all grabbed from a broadcast on the fly—in the best musicians' tradition.

After digital

IF TDK produced a reel-to-reel tape of cassette quality, digital recording would become a thing of the past. Ampex 456 is prehistoric compared to the quality of TDK cassette tape. With this in mind, I have designed a 24-track tape recorder on completely new principles:

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3. Tape profile head on the edge of the tape stores every noise (music-white) and registers the position of the tape (profile of tape noise).
4. Transport is entirely logic—there is no play or loose tape to compromise for inaccurate tape transport... precision tape handling.

B Braunds, Worcester, UK

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Long words & warm ale

I AM WRITING to you after finally recovering from a bout of exhaustion foisted upon me during the reading of the second sentence of the Soundtracs D4 review in the April 2001 issue of *Studio Sound* for which Zenon Schoepe is designated author and executive editor. And while I could only manage to conjure up a paltry 46-word sentence compared to yours, the requirement for long-windedness and mental acuity necessary to follow the apparent train of thought is obvious (and that was only 35).

All in good fun—I certainly appreciate those authors who are capable of writing more than eight or 10 words per sentence. They are (dangerously!) assuming that the reader is capable of retaining a train of thought across so many words in succession. I'm of the view that it's the writer's task to challenge them, rather than the all-too-obvious 'word bytes' for the fast-food/MTV acolytes. I was actually moved to write you, as I had previously similarly chastened another British contributor to a classic motorcycle periodical. I will refrain from the obvious refer-

als to warm ale as the culprit, and rather consider it fortunate that we have such credible contributors to your most-preferred industry periodical.

Lincoln Zimmanck, Audio Intervisual Design, US

Zenon Schoepe replies

I thank you for your comments on your breath-taking experience. I am particularly pleased with the sentence in question and, while I cannot pretend that it is anywhere near my Personal Best, it serves to demonstrate that our readers are selected on application and the need to know as well as lung capacity and unbroken attention span. (Paah! 47 words and I'm not even trying. Deeper breaths Lincoln).

The temptation to resort to the lazy snippet approach to writing in this soundbite-driven age is strong but ultimately the quality of the readership is what decides whether or not it is acceptable. *Studio Sound* readers expect more, and that is what we deliver.

References to 'warm ale' are not that obvious as we don't imbibe nearly as much as we perhaps ought to but it's an interesting concept. If nothing else, it should put the wind in 'long-windedness'.

I thank you

LIKE SO MANY OTHERS, I was born to the explosion in affordable personal recording technology that transformed the recording industry in the early 1980s. I bought and I learnt but very quickly outgrew the information provided by the so-called 'audio' magazines available in newsagents. A chance invite from a record duplicator to an APRS show saw me enter another world. It was a world I suspected existed and it was where I saw my first copy of *Studio Sound*. Your magazine has been with me ever since and I feel deeply grateful that it has existed to grow up with.

The last ten years have seen the biggest changes in the technology that I have used professionally and to your credit you have always been ahead of the game. You've changed the format and content in line with my changing information needs. It's incredible that the magazine has evolved so dramatically yet still retains the values that attracted me to it in the first place. It looks great, is so current and my colleagues and I look forward to every issue because it is the best.

I don't think there is a point to my letter. I just want to say thank you.

Nick Frieze, Paris, France

BOOK REVIEW

Creating a Music Website

Mike Simmons
ISBN 1-870775-72-4

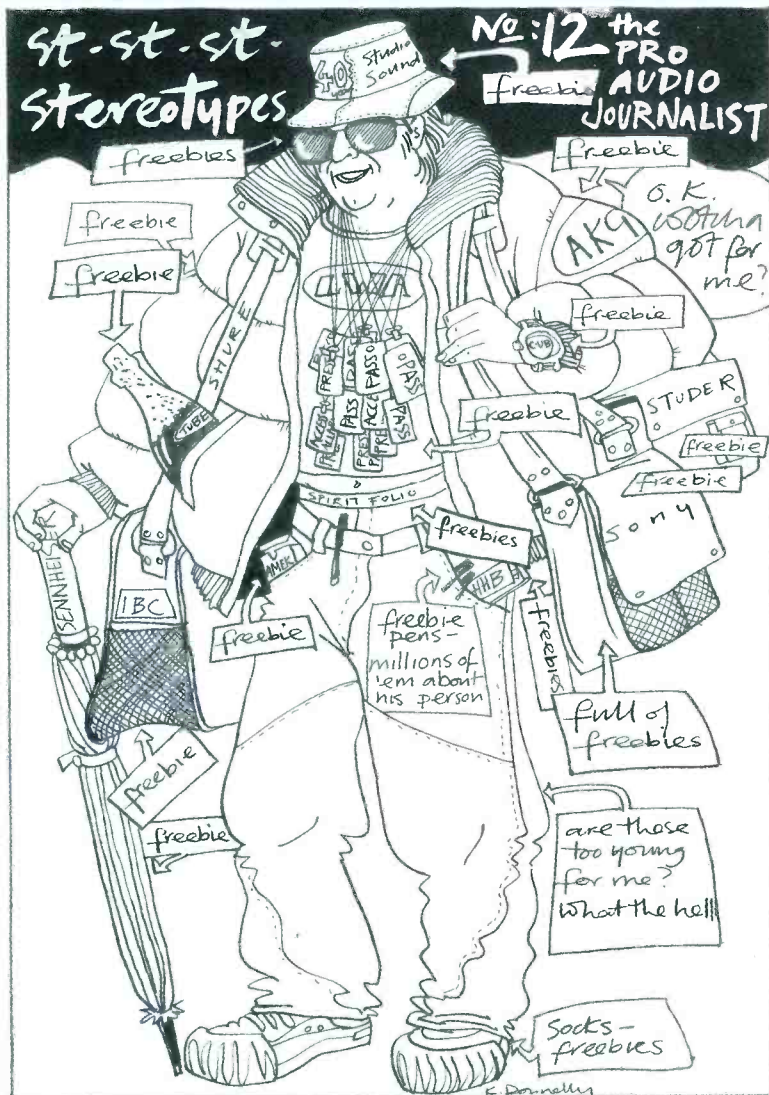
Bedroom musicians around the world have long argued that the World Wide Web has the record industry gasping its last breath, and whether right or wrong, you'd think that Mike Simmons, author of *Creating a Music Website*, would have seized upon this as a nice marketing angle for his book.

But thankfully Simmons avoids the soap-box—well, almost. His rather gung-ho introduction begins with the declaration, "The music industry is changing", then gives way to enthusiastic chatter on the potential of the Internet as a marketing and sales tool. However, as befits a book that started life as a series of articles within the pages of the UK's *Sound on Sound* magazine, the first chapter's tone quickly settles into a purposeful amble, taking the reader step by step through every conceivable element of establishing a web site for audio.

It's all here, from basic HTML coding and site construction to streaming media—even

brief walkthroughs for popular packages such as RealAudio and QuickTime are included. Nor does Simmons rest there. Readers are taught to register their site with search engines, sell their music from the web and find a decent domain name. It's an holistic approach to a broad subject and it occasionally feels shallow in places (web authoring software is skimmed over in three paragraphs, and even the author recommends tracking down a HTML manual).

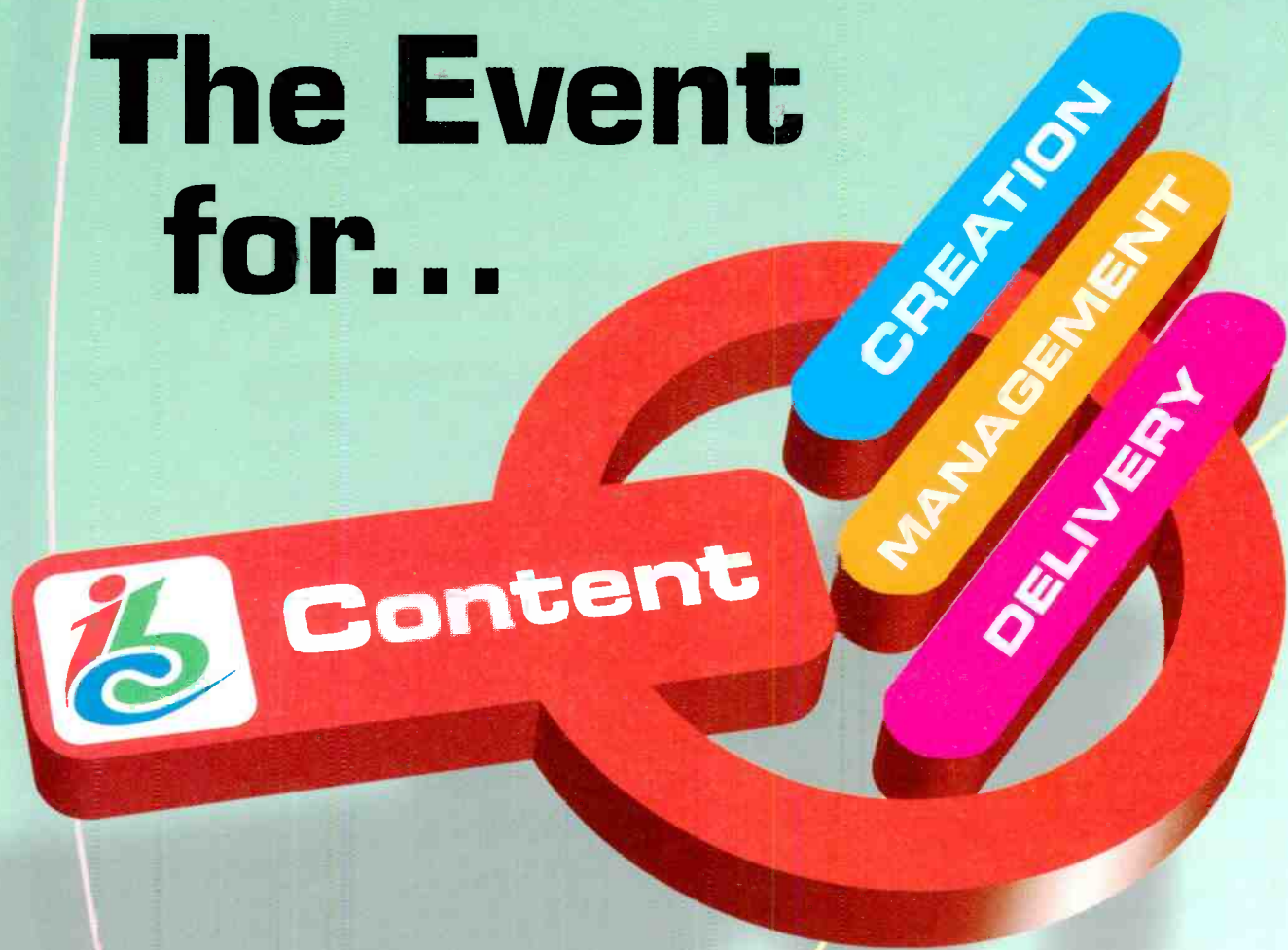
Nevertheless, with such a wealth of information on offer it's impossible not to learn something, and a novice using *Creating a Music Website* to establish their on-line presence could certainly deliver the kind of site those DIY enthusiasts believe will take over the music business. In order to create something of a high enough quality to make Sony tremble in its Gucci loafers, however, prospective moguls would have to read a little deeper into the subject.



ALMOST TOP 20

- | | | | |
|-------------------------|---------|-----------------------|---------|
| 1 Hey June | ♣ † ♣ ↑ | 11 Stairway to Devon | ♣ † ♣ ↑ |
| 2 Blame it on the Bogie | * * ♣ ← | 12 Route 99 | † † ↑ |
| 3 Aladdin Pain | ♣ † ↓ | 13 Paperback Reader | * ← |
| 4 Cum on Feel the Noze | ♣ * * ↑ | 14 Willenhall Lineman | ♣ ← |
| 5 Massage with a Bottle | * ← | 15 It's Raining, Then | * † ↓ |
| 6 I'm Nót in, Love | ♣ † † ↑ | 16 Horse With No Mane | ♣ † ↑ |
| 7 Joan Genie | * * ♣ ← | 17 Sexual Earring | † † ↑ |
| 8 Colonel Boogie | ♣ † ↓ | 18 I Zebra | * ← |
| 9 Singing in the Rhine | ♣ * * ↑ | 19 Shopbuilding | ♣ ← |
| 10 The Sound of Muesli | * ← | 20 Bohemian Rap | * † ↓ |

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ADRIAN LUCAS

Adrian Lucas is the original founder of Imerge, British-based pioneer of cutting edge audio and video deliver systems. Currently, the company's XiVA is bringing the Internet to your hi-fi

AN EXPERIENCED and proven international business developer and strategic leader, Adrian Lucas has taken Imerge from its early embodiments in 1994 through incorporation in 1997, all funding rounds to its present leading and mature position in the market. Previously, he worked at Sony in the digital TV arena and then moved to Cambridge-based consultancy, Scientific Generics, to head up its digital New Media group. Here he was responsible for all business development and strategy for digital broadcast consulting, hard-disk-based media server products and New Media services.

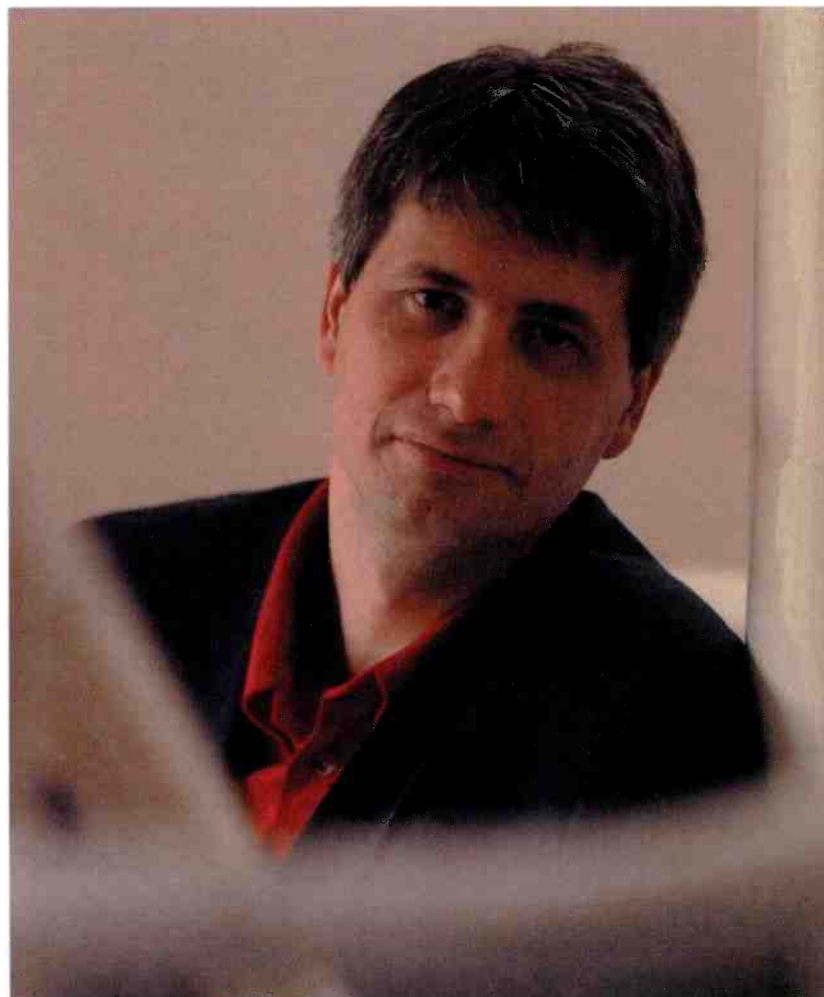
At Scientific Generics, he lead pioneering work in streaming video from hard disk drives in 1994 and took this to market ahead of the competition with clients such as the *Financial Times* (for financial TV distribution) and Thorn. He was the leader of the team which developed the seminal thinking behind today's digital TV receivers for Sky, back in 1994, incorporating interactive TV applications alongside video programming.

With Sony, he worked on high-definition TV systems for the TV and film industries. His career started in electronic engineering, cutting his teeth in military radar in the mid-eighties.

Adrian has a PhD in machine intelligence and an electronic engineering degree from the University of Surrey. Outside work, he plays guitar and dabbles in home music recording projects on the rare occasion where time permits. He enjoys sailing (but only in the warmer waters of the world).

In 50 words, what is your vision for the future of domestic entertainment?

Much of today's PC functionality will migrate to 'living room' products. 'Whole house' entertainment—any content, anywhere, anytime—will become more mass-market, available at the touch of button in most rooms. The Internet will be connected directly into the domestic entertainment system to drive content and services directly into the main entertainment centre, not just the PC. Today's music and video broadcast scheduled programming will co-exist with time-shifted content (delivered at various speeds and times, watched in an order defined by the listener or viewer) as well as streamed content sourced directly from the Internet.



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Will older generations buy into it?

The features, convenience and benefits of XiVA-based products are attractive to all generations. My aunt is 84 and has owned a CD player for about five years... unthinkable 20 years back?

What suspicions should pro-audio people have about the future of domestic audio?

None—it's a great opportunity. Here's why: (a) No longer will people be restricted to the choice of music available in high street stores (pretty limited in most towns)—the entire wealth of the world's music content will be available through your hi-fi system, easily. Early recordings, unsigned artists, massive back-catalogues, out-takes... The demand for getting more music to the 'online' market will explode as suddenly we can find more music we like. You can see this happening on the Internet already with companies like PeopleSound/Vitaminic. (b) Convergent products, like those based on XiVA, don't necessarily mean nasty MP3 music—full-CD quality, surround sound music, and so on, can all be stored and accessed on convergent products. (c) New software upgrades and features can be downloaded to convergent domestic players of the future, making it possible to access sound processing applications as after-market upgrades to living room products.

Will there be any use for vinyl in five years?

Most hard disk-based audio players can, or will shortly, be able to record from any source (LP, cassette) directly onto the hard disk giving a new lease of life to old collections.

What was the last film you paid to see?

Amelie.

What CD is presently in your car CD player?

Shaun Colvin, *A Few Small Repairs.*

How smart will the average western household need to be to use the home entertainment system of the future?

Hmmm, hopefully, with an easy to use TV interface controlling all music and video functions, I hope they will need to be much less smart than today.

With Americans staying at home instead of boarding aeroplanes, is this a good time for the entertainment industry?

The gut feeling is that it's a very good time, but we don't have enough history or data to really confirm this. □

RECORD! EDIT! PLAY!

Save your computer for e-mail.

Plug in the HDR24/96 Recorder/Editor and start recording. No external computer to boot up. No hardware and software configuration nightmares. No compromises like settling for 20-bit audio or just 12 tracks at a time.

Recording is easy with the HDR24/96.

Simultaneously record 24 tracks of 24-bit digital audio...without waiting for lock-up, tape shuttle or CPU lag. Drop up to 192 alternate takes into "virtual tracks." Record onto affordable, removable media that you can swap in and out for each project.

And do it all with your hands on a familiar, analog-style machine (or two sizes of wired remotes) instead of resorting to myriad mouse clicks. All basic functions are right on the HDR24/96 front panel including transport buttons and a Record Enable button for each track.

Editing is easy with the HDR24/96.

Twenty-four track masters for under £10 each*!! Divide the cost of a Mackie Media M90 into the 20+ pop tunes you can record on it and you'll appreciate why we

call it an affordable medium. Non-linear hard drives store audio data only, not silence. Tape (and linear hard disk recorders) just roll merrily along...eating oxide and costing money.

Plug in an SVGA monitor, keyboard and mouse, choose from 2x, 4x, 8x, 12x or 24-track views and then watch them scroll smoothly past a centerline.

Mark hundreds of cue points and four locate points for looping and auto-punch-in modes.

Use the mouse to "scrub" individual tracks, Cue, Punch and Loop points with continuously variable velocity.

You can mark a segment (or multiple non-adjacent segments) as a region and then cut, copy and paste it anywhere — onto a blank track or right in the middle of

an existing track without erasing anything. The part of the track after the insert just "slides down".

You can audition regions or modify their start/end points instantly, capture them as "sound elements" for later use or quantize them to user-defined time grids.

Create fade-ins, fade-outs and crossfades just by dragging and dropping them...and then set their length by dragging the mouse.

Add volume envelopes for simple level automation of regions or whole tracks.

Then use Track Render to combine all or selected regions of a track just as you hear it complete with crossfades, volume envelopes, mutes, etc.

Play with the HDR24/96.

Play back 24 tracks of pristine digital audio — instantly without any pause or lag time. It will be synced rock-solidly to everything in your studio — from MIDI-based sequencers to VTRs (via SMPTE and video black burst). Then

let your partners, clients and friends "play" with your tracks anywhere in the world, thanks to the HDR24/96's Ether-net port and built-in FTP server.

Get a demo at a Mackie dealer.

We honestly believe that we've created the best of two worlds: the best standalone non-linear digital recorder, and an extremely robust editing system with ultra-functional graphic user interface.

Call toll-free or visit our web site (using that computer you won't need to tie up) for more info.



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UK +44.1268.571212 email: mackie.uk@rcf-uk.com
 Germany +49.2572.96042.0 email: info@mackie.de
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"...the HDR24/96 is a stunning development with excellent sonic quality, (and) an extensive feature set...it's easy to use and priced right. This one rocks!"

George Petersen
 Mix Magazine March 2001

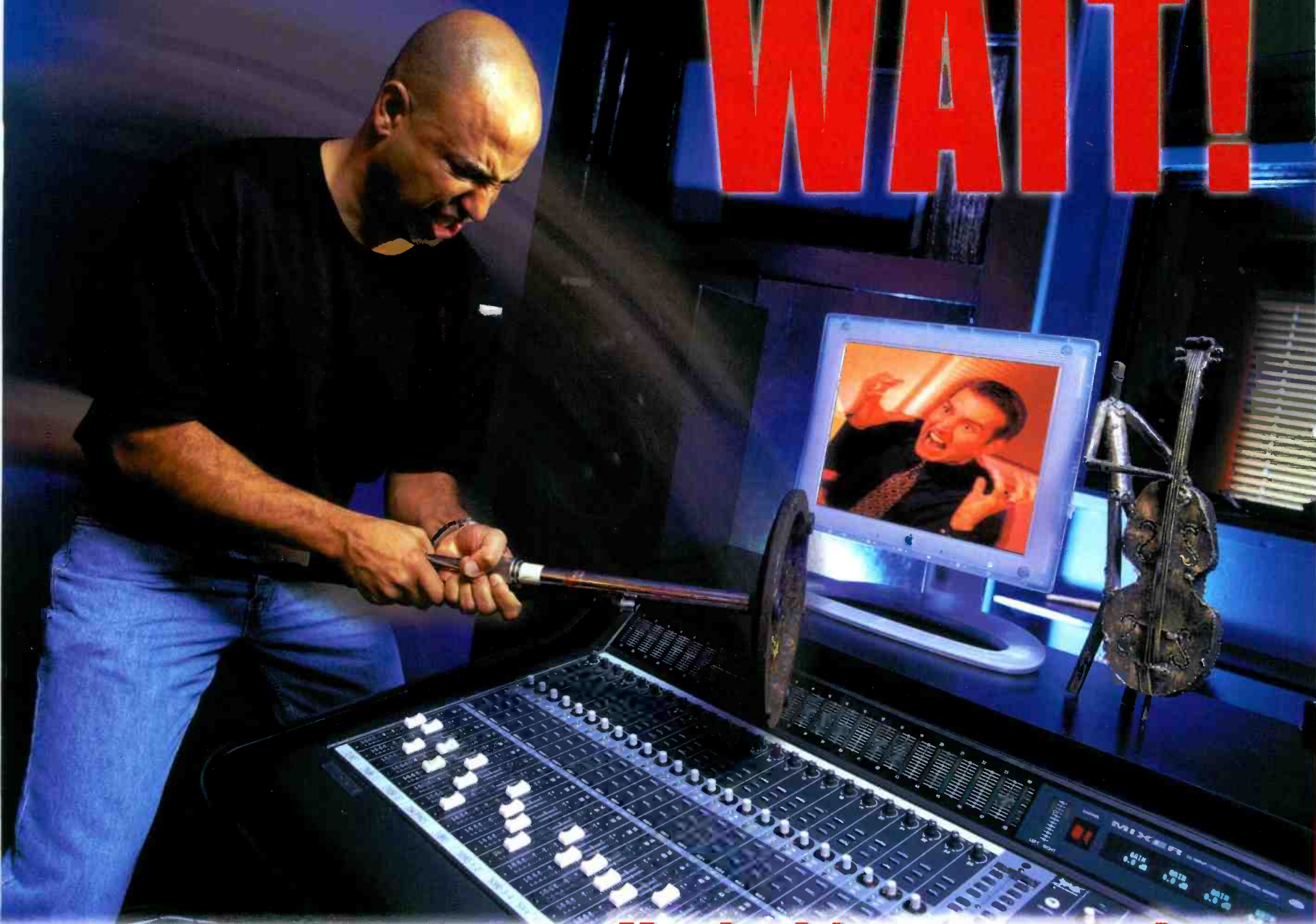


* based on average of length of current pop songs using 24 tracks @48kHz/24-bits and allheral number of extra regions and virtual takes. Does not apply to extended trance remixes. ©2001 Mackie Design Inc. All Rights Reserved. Mackie and the Running Man figure are registered trademarks of Mackie Design Inc. Mackie Media™ is a trademark of Mackie Design Inc. ORB is a trademark of Castwood Systems.

Need to back up a couple of songs? Plug a Mackie Media™ Project drive into the HDR24/96 external bay and transfer over 2GB to an ORB™ disk.



WAIT!!



Maybe it's not your mixer

You know how impact and detail get lost through recording and mixing. And you just can't EQ, compress or mix the life back in. When you're at wit's end, the Aphex Model 204 can save your sanity.

The Model 204 renews and vitalizes your sound. The Aural Exciter® restores and improves definition and detail. At the same time the Optical Big Bottom® solidifies and strengthens the bass without hogging all the level.

If you need professional and impressive sound you owe it to yourself to get a Model 204. You'll probably save your sanity and a lot of perfectly good mixers. You've got a problem - We've got the solution!

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