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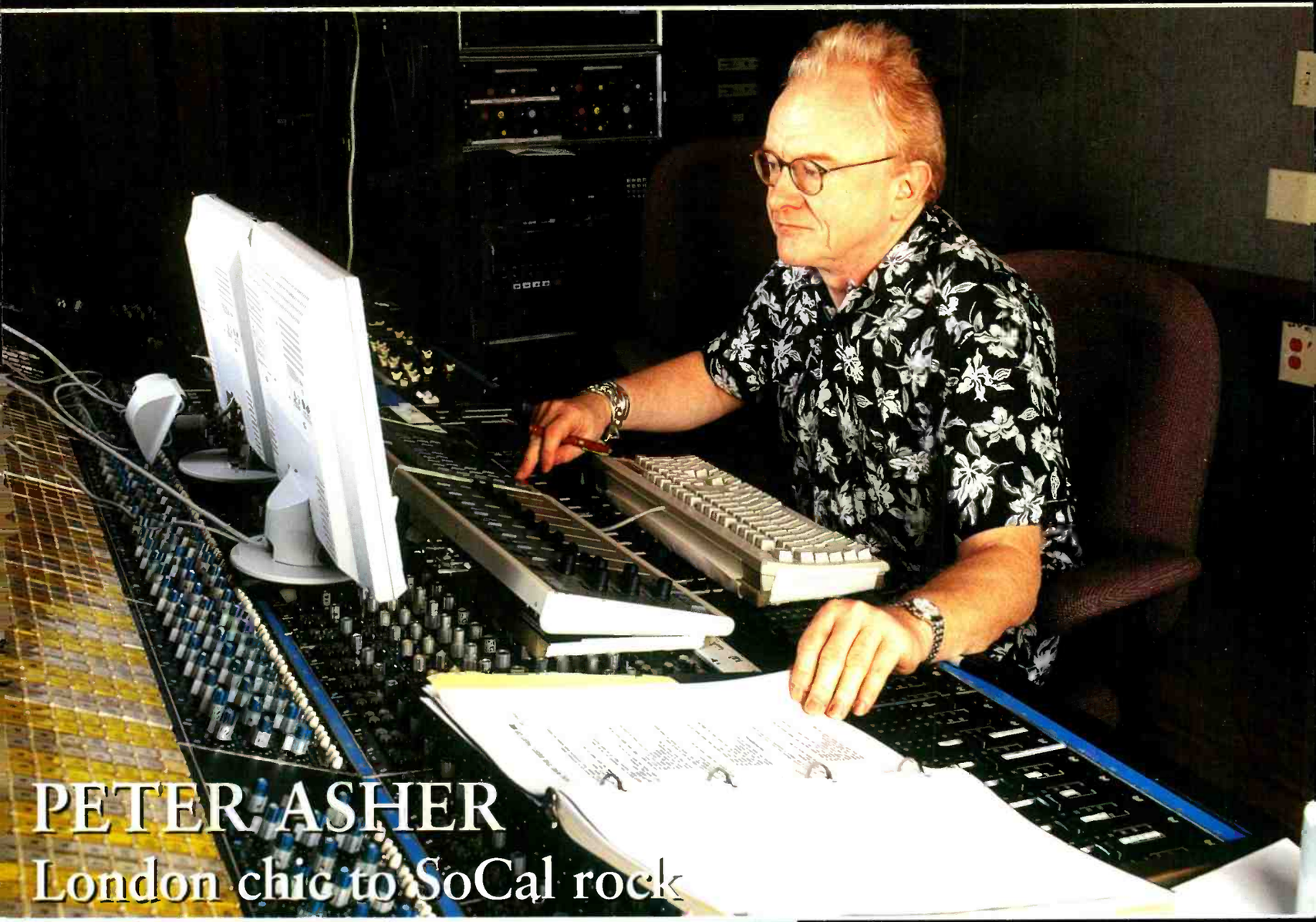

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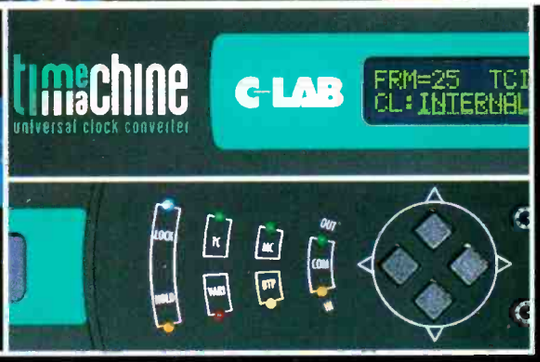
London chic to SoCal rock



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- C-Lab Time Machine
- Acutron Electroacustica Digiroute 8
- Funk Logic 3P-III Palindrometer
- Antares AMM-1 Mic Modeler
- Trident-MTA A-Range
- Eventide DSP7000
- Marantz CDR500
- Requisite L2M
- Presonus VXP
- Bel 7220

Reuters' latest: Delivering the news to the street

Recording: Atlantis rises in Hollywood, Oasis found in Beijing

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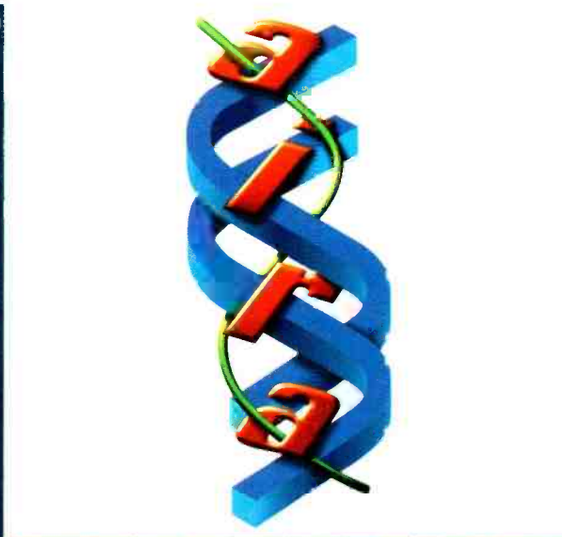

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For richer, for poorer

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WE CARRY A LETTER THIS MONTH from an elderly campaigner who expresses reservations on the relative qualities of original vinyl releases compared to their more modern CD issues. He raises valid points and while his observations are anything but yet another resurrection of format strengths, there are deeper concerns being voiced.

While I have no experience of evaluating the recordings he mentions I have been frequently disappointed by the lack of disparity in performance between even prerecorded cassette and CD issues and underwhelmed by CD reproductions of intensely strong memories of now worn-out vinyl. The conclusion that emerges from such analysis is that quality vinyl, for the most part and for all its limitations, existed as the very pinnacle of audio reproduction in its day and was handled, mastered and processed by craftsmen to the best of their abilities.

In the case of reissues, CD too often represents a rekindled opportunity to take another bite at the cherry of return and the priorities are different. Incorrect or inappropriate masters are often sourced and are denied the sympathetic treatment that they might deserve in the rush to release and to keep an already relatively low overhead down. Add to this the vagaries of convertors at the input and the output in to the home, any blanket processing that may qualify for a closest suits-all fit, plus the preposterously low

levels that such re-issues are still regularly burned at and it's a wonder that they sound as good as they do.

The tragedy is that CD re-issues represent a longer term means with which to preserve older recordings but unless they are done well they will so quickly be consigned to the unremarkable bin and the odds are stacked increasingly against them ever having another chance to be done properly in best. It is yet another example of the record companies gashing out the family heirlooms to make a quick buck to cover for their inadequacies and short-sightedness in their other areas of operation.

They leave us poorer and future generations may wonder what all the fuss was about.

Zenon Schoepe, executive editor

The audio landscape

CHARACTERISED BY CLASSIC landscapes that continue to sell coffee-table books and posters long after his death, the work of American photographer Ansel Adams remains equally popular on the high street and in elite photographers' circles around the world. Adams, who derived new methods of determining the exposure of B&W photographs, also helped found various institutions including the photography department at New York's Museum of Modern Art, ensuring a place in professional as well as popular photography.

But before Adams took up the camera he had trained to be a concert pianist, and many of his photographic analogies are derived from his understanding of music and audio. For example, he likened the photographic negative to a musical score, in that each print might be like a distinct performance of a work allowing a new interpretation of the original. He also distanced himself from colour photography on the grounds that it captured 'the obvious', preferring the purity of 'abstracts and relationships' in which restricted media—including monochrome photography and stand-alone audio—might be determined to work.

Adams also noted that exposing photographic film might take a fraction of a second, but that it takes 'days, weeks or months to see the image' referring to the artistic content of a picture rather than how long it takes to get your holiday snaps developed. So, while few significant recordings have taken less than a second, some—'Mary had a little lamb, its fleece was white as snow...' (Thomas Edison, a tentative 5s plus), 'I have in my hand a piece of paper...' (Neville Chamberlain, a rash 4s or so), 'There will be no whitewash in the Whitehouse' (Richard Nixon, a bold 2s), 'I did not have sex with that woman' (Bill Clinton, a guilty 1.5s)—have come close. The weeks spent on *Sgt Pepper* pale into insignificance when compared to the months absorbed by *Rumours*, but both have commanded far greater periods of listening than were consumed by their recording.

Next year marks the centenary of Ansel Adams' birth.

Tim Goodyer, editor

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"I wish all our investments could be as successful as the SL 9000"

Pictured at Studio Davout is Studio Manager, Olivier Kowalski.

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Olivier Kowalski, Studio Manager, Studio Davout.

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Russia: Legendary state-owned film studios Lenfilm and Mosfilm are both to install 48-fader, 192-channel SSL Avant digital film consoles. Mosfilm's Avant will join has two SL4000 series and two SL5000 series analogue consoles (all having been substantially upgraded) relegating one SL5000 to a smaller room. Mosfilm has produced over 3000 films collecting over 400 international awards, Eisenstein's *Battleship Potempkin*, Kurosawa's *Dersu Usula* and Bondarchuk's *War and Peace* among them.
Mosfilm, Russia. Tel: +7 95 143 9108.
SSL, UK. Tel: +44 1865 842300.

US: New York City's VidiPax has become the first facility in North America to offer fully automated audio archival services through its installation of Quadriga software on the Spectral Design AudioCube platform. VidiPax is the world's largest magnetic media restoration company with clients ranging from museums to broadcasters, and has restored and remastered over 100,000 video and audio tapes.
VidiPax, US. Tel: +1 212 563 1999.
Spectral Design, Germany.
Tel: +49 421 22 1440.

Eire: Dublin's Cauldron Studios has purchased a 32-channel TL Audio VTC console to work alongside its 32-track ADAT system and 48-track hard disk. As well as serving its owners, session

guitarist Bill Shanley and freelance engineer Ciaran Byrne, the studios host sessions with the likes of Mary Black and U2 engineer Richard Rainey.
Cauldron Studios, Eire.
Tel: +353 1 860 3633.
TL Audio, UK. Tel: +44 1462 680888.

Japan: DSP Postation II sales have recently been made to numerous high-profile postproduction facilities throughout Tokyo including Nao, Shikoku Broadcasting, Incam Studios, L'espace Vision, Techno Max Studio and Otemae Video Centre.
DSP, US. Tel: +1 818 487 5656.

France: Tele Diffusion de France, has installed 120 Orban OPTIMOD-FM

When George met EveAnna

US: Leaving its Van Nuys base for Chino, GML has entered a partnership with fellow American outboard specialist Manley Laboratories for the manufacture of its equipment. The announcement was made jointly by Manley CEO EveAnna Manley and GML CEO George Massenburg. The move will see GML's inventories, specialised assembly fixtures and production staff cruising across California to build its units alongside Manley and Langevin products currently manufactured at Manley Labs.

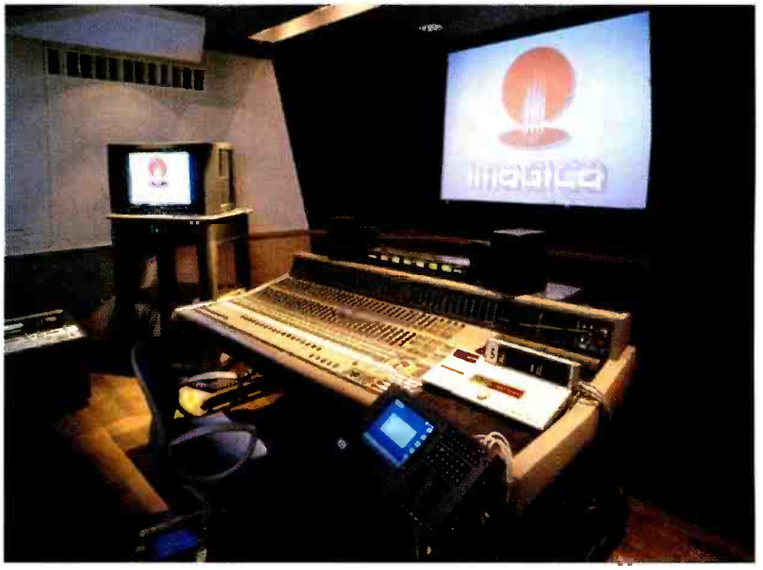
George Massenburg comments, 'I have admired EveAnna Manley's production capability for a long time, but even so I was impressed when I saw her factory for the first time last year. Like the best manufacturers I know, they do just about everything in-house. Metalwork, silkscreening, engraving, printed circuit board manufacture, hand and wave soldering, transformer winding, assembly, all with meticulous quality control. Her team of 40 is highly experienced and efficient. I thought, "Why should I be tearing my hair out trying to duplicate this? We should just team up".'

EveAnna Manley adds, 'Building the GML outboard gear will be a piece of cake for us as George's manufacturing methods and philosophies are so much like ours. We already share numerous high-quality component vendors, and even specific parts. GML is the high-end solid-state equivalent to our Manley high-end vacuum tube gear. It fits perfectly. But it's the opportunity to work with George that is really exciting for us.'

GML production testing, as well as peripherals service and automation support and service, will be relocated to Franklin, Tennessee to join the R&D lab, all to be directly supervised by George Massenburg. Frank Wire will maintain the GML sales and support office in Los Angeles.

GML units to be manufactured by Manley Labs include the 8200 Parametric EQ and 9500 Mastering EQ, the 8302 and 8304 all-discrete-transistor, transformerless microphone preamplifiers, and the 8900 Dynamic Range Controller. Production of the 2020 combo unit introduced by GML at AES 2000 will also begin on the Manley assembly line.

GML, US. Tel: +1 615 790 1016. Manley Laboratories, US. Tel: +1 909 627 4256.



Japan: Leading postproduction facility, Imagica, has ordered a second AMS Neve DFC console for a new room at the Shinagawa Video Centre where it will be used for television programmes and 5.1 surround mixing for DVD.

Old dog, new tricks

EMI HAS CLOSED its manufacturing and R&D facility at Hayes in Middlesex, where the company had produced and stored LPs and other recorded formats since the 1930s. This was the site used by the His Master's Voice label, and among memorabilia recovered from the site is a stuffed dog and gramophone modelled on the original illustration used by HMV. Specialist building services company AVD has not only undertaken the dismantling of five prefabricated recording booths, but has also brokered a deal in which the redundant soundproofed booths are to be shipped to North Glasgow College in order to equip new teaching and rehearsal facilities. In response to a suggestion by AVD, EMI has agreed to donate the units to the college. AVD's Alan Stewart spoke to *Studio Sound*...

Q: *How did you get EMI to release the units free of charge?*

We were working on the two jobs at the same time. EMI wanted the site cleared, while North Glasgow College had commissioned three teaching rooms and two large rehearsal rooms to be built right in the centre of the college—in a location which required a very high level and standard of sound insulation. It was dead in the centre of the college's other classrooms and next door to a studio—with flats just 200m away.

Q: *Hadn't the college commissioned soundproofing?*

Yes, but calculating the degree of insulation and noise isolation required, it soon became apparent that the budget would not cover the cost of the project.

Q: *What did EMI have in mind for the units?*

Bob Bailey, EMI's operations director, wanted them to be dismantled, logged and shipped into storage for future use.

Q: *So what happened?*

During a coffee while waiting for the taxi to take me to Glasgow airport, I mentioned the project with EMI and suggested that if approached by a non-profitable organisation such as the college EMI may be able to donate the prefabricate units as a way of disposing of them.

Within two hours, Jim Brady of the college phoned me to say EMI were happy for the college to have the five units free of charge, and could we provide a scheme to fit into their plan and also arrange for the dismantling, transportation and reassembling of the units.

Q: *What scheme did you come up with?*

Subsequent talks with Jim Brady and Ronnie Knox from Glasgow have resulted in a scheme which will use in house college skills—mechanical engineering, planning—along with the expert advice of the AVD team. The college will finish up with a range of top quality professional facilities for less than half of the commercial price.

Q: *How are these booths constructed?*

Each booth consists of its own spring-floated floor, and inner walls each of which is a 100mm-thick metal panel perforated on the inside and a 3mm solid panel on the outside. These interlock to form the inner square of the room. The tops of the panels support steel members which, in turn, support a ceiling system which is of the same specification as the walls. That gives you the inner box of the traditional box-within-a-box acoustic build.

The outer box is a similar construction, except that it's 3mm of sheet metal either side of 100mm of rockwool made up into panels which also interlock. They're about 50mm-60mm higher than the inner box. And they really do the job...
AVD (FM), UK. Tel: +44 1760 441700. Email: info@avdco.com

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UK: Internationally renowned British classical music specialist Chandos Records, has become the latest recording company to adopt a Sony DMX-R100 console for 'go-anywhere' digital mixing. The console is being used with a Genex M-O recorder to provide digital recordings at 24-bit 96kHz fidelity, and subsequently being teamed with a SADiE system in one of Chandos' suites in Colchester for editing, enabling consistently high audio quality to be maintained through to mastering—a key requirement for the increasing classical DVD market. The DMX-R100 is also surround equipped and features dedicated monitoring and panning functions for multichannel applications. Ralph Couzens, Operations Director at Chandos Records, commented, 'We're extremely pleased with the sound quality of the DMX-R100, which is enormously important to us as a company whose reputation has been built on the high standard of its engineering.' On arrival at Chandos, the DMX-R100 was quickly dispatched to its first assignment; a recording of Elgar's String Quartet and Piano Quintet at Snape Maltings, featuring Ian Brown and the Sorrel Quartet. Further sessions are already underway with the first releases being available in March. Couzens further refers to build quality, size and feature set when commending the DMX-R100. Purchased from Sony Professional distributor Total Audio Solutions, the desk is fitted with three AES-EBU I-O cards and sample-rate conversion board to allow maximum flexibility when recording. Total Audio's Marketing director and product specialist Adam Heath views the sale as a testament to the design. 'The classical market has sometimes been very wary of digital equipment—especially when it costs less than might be expected. With the DMX-R100, the Sony design team has created a production tool that can hold its own in the most critical recording environment. The fact that an award-winning label like Chandos Records has chosen this product speaks for itself—the standards that the company sets leave no room for compromise.' The recording pictured is of the London Mozart Players recording Vranicky's Symphony in C Minor at All Saints' Church, Tooting Graveney which will form part of a series of releases from Chandos Music featuring works by contemporaries of Mozart. The occasion also provided the opportunity for Chandos to sample the unique (and highly regarded) acoustics of the church using the new Sony DRE-S777 sampling reverb and recently-released self-sampling software. Samples (using repeated sine wave frequency sweeps) were made at various points in the building, which allows the unit to build up a reverberation characteristic in either stereo or surround format.

Broadcast watershed

UK: Independent radio production company and studio service provider Unique Facilities recently completed a typical project at The Boat Show in London, the annual public exhibition of nautical leisure where it constructed ISDN-equipped studios within the Earl's Court Exhibition Centre in West London, enabling radio stations to undertake live transmission. Codecs installed included Musicam for G722-CDQ transmission and a Systembase C300xr for apt-X.

A custom-built desk within the studio housed two CD players and two MiniDisc players, while mixing and editing were conducted via a Mackie submixer and SADiE system respectively. Presenters were able to anchor bulletins and feature two guests, and further features of the set-up included a webcam in the studio; a live feed to a Ramsa-based PA system on the exhibition floor; and a radio mic-portable MiniDisc recorder for roving reports.

Unique's production co-ordinator Laurie King-Railton comments, 'It's a modular system which is assembled in a day, but with custom wiring for each location. Some stations want to take rushes of material and edit that up either on their own or with our on-site engineers, so we offer SADiE.'

The studio is available free of charge to radio stations, and in the case of The Boat Show is paid for by The British Marine Industries Federation to maximise radio coverage of the event.

'We also use this studio construction for The Ideal Home Exhibition,' adds technical liaison Tara Lewis. 'Smaller events like Live and Fine Wine & Food require little more than a codec, a comms rack and a roving microphone, but all of our services provide the highest standards of outside broadcast and postproduction.'

Unique has recently established a Content Division specialising in Internet material, preparing entertainment news bulletins for media web sites. It also has several permanent studios, including recently opened Q-Two near London's Leicester Square.

Unique Facilities, Tel: +44 20 7976 3000.

Next for Annex

US: San Francisco's Music Annex recording and post facility has changed its name to Annex digital—a move strangely timed to coincide with the American International Toy Fair that took place on the other side of the continent late last month. The cosmetic move follows the

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2200 digital audio processors at regional transmitter sites throughout France bringing the total number of 2200s installed by TDF to 270. TDF transmits public sector radio stations, and is the main transmission provider for Europe 1, RTL, Sud Radio, Nostalgie and over 650 private stations. The company also transmits the country's national and local TV channels as well as operating cable systems. Dalet Digital Media Systems, meanwhile, has supplied Radio Orient with a custom broadcast management system to allow announcements for the five daily Muslim prayers. Based in the Paris suburbs, Radio Orient has the third largest audience in the Middle-East, broadcasting news, musical and cultural programs in Arabic and French.
Orban, US. Tel: +1 510 351 3500.
Dalet, France. Tel: +33 1 4038 0139.

Denmark: Sun Studio has installed a second M&K 5.1 surround monitoring system for reference monitoring in its music production facility. The system consists of three MPS2510P fronts, two MPS2525 Tripole surrounds and an MPS5310 subwoofer.
Sun Studio, Denmark. Tel: +45 3832 0320.
M&K, US. Tel: +1 310 204 2854.

US: LA's The Village recording studio has installed a fibre storage network for the Pro Tools systems around its four rooms, designed in partnership with Glyph Technologies. The Coba-SAN setup provides fast networking and automatic backup from a Petra 10 RAID and 8-port Brocade Fibre Switch managed by TranSoft Networks FibreNet software.
The Village, US. Tel: +1 310 478 8227.
Glyph, US. Tel: +1 607 275 0345.

Iceland: Independent sound engineer Sveinn Kjartonsson has bought two gold DPA Type 4040 microphones for his portable recording studio. Used for location, jazz and classical work, the setup consists of a 32-channel Pro Tools 24/DA8000. The studio, called DILECO, is about to visit Munich for a project with EMI.
DPA, Denmark. Tel: +45 48 14 2828.

Korea: The Munhwa Broadcasting Corporation, the largest independent broadcaster in Korea, has purchased three 24-channel Calrec M3 analogue consoles desks for installation in the FM Sub Control Room at MBC Radio Studios in Seoul. Also in Seoul, Educational Broadcasting System has purchased a 32-channel S2 console as part of an overall refurbishment of its

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Studio No 1. Part financed by the Korean Government, EBS runs educational programming seven days a week and will use the S2 for pre-recorded educational programming, as well as for a weekly live show called Free Talk.
MBC, Korea. Tel: +82 2 240 0700.
Calrec Audio, UK. Tel: +44 1422 842159.

France: SIS TV is to install two AMS Neve Libra Post consoles into new television studios in Paris recently been acquired from Les Films du Rond Point. The consoles have been installed into Studios A and C as SIS intends to develop its television operation. Meanwhile, Paris-based Studio Delphine is to install an 80-channel SSL Axiom-MT console in its Studio B as part of a major refurbishment. The music recording and video post facility expects to extend its work to include surround mixing for postproduction, including DVD. The installation marks the tenth Axiom-MT in France.
SIS TV, France. Tel: +33 1 4652 7700.
Studio Delphine, France.
Tel: +33 1 4562 1122.
AMS Neve, UK. Tel: +44 1282 457011.
SSL, UK. Tel: +44 1865 842300

US: The California-based AudioVision post house has installed a Fairlight Prodigy audio workstation in its mix room. The two-room facility also operates an MFX3plus and intends to convert its MFX2 into a CMI—the classic Fairlight keyboard. AudioVision specialises in post for broadcast 'infomercials', radio spots and corporate work, and has been an all-Fairlight facility since its inception.
Fairlight, US. Tel: +1 323 465 0070.

Switzerland: Lausanne-based Radio Suisse Romande has taken the 100th Studer D950 M2 digital console for installation into an OB van. The truck is due to be commissioned in April and will be used for concert recording and live transmission as general outside broadcast operations.
Studer, Switzerland. Tel: +41 1 870 7511.

UK: London postproduction group Resolution has purchased a Pro Tools 24 MIXplus system to accommodate increasing audio work. The Avid-based facility handles TV projects from documentaries to commercials.
Resolution, UK. Tel: +44 20 7437 1336.
Digidesign, UK. Tel: +44 1753 653322.

Norway: Oslo's Masterhuset mastering facility has recently installed DynaudioAcoustics M3 monitors paired with Electrocompaniet AW 250W monoblock amplifiers in one of its main recent installation of a DVD authoring suite offering surround working on a Sonic Solutions Desktop DVD system and Sonic I-O.

Founder and president David Porter commented, 'Over the last five years we've seen a significant expansion of the kinds of work we do for our clients. We wanted a new look and feel that more accurately reflects the breadth of our business.' 'The branding effort will take several months to implement,' added director of sales and marketing, Debbie Hanley, 'and will include a new logo, identity package and web site.'

Some 28 years old, the facility continues to offer music recording, mastering and replication services to its music clients and has moved progressively into audio post for film and television projects, electronic toy development and digital audio production for new media applications such as telephone systems, computers and the Internet. 'This is an exciting opportunity to leverage the historic importance of the company with an eye to the future,' Hanley concluded.

CD trade inquiry

Europe: The UK arms of seven major record companies have been requested by the Office of Fair Trading to co-operate in a further investigation into the supply of CDs. According to a news release from the OFT, the inquiry 'will consider whether the way in which the record companies have responded to imports of cheaper CDs from elsewhere in Europe into the UK amounts to a breach of the Competition Act 1998. The Act prohibits cartels, concerted practices and abuse of a dominant position which stifle competition'.

Formal notices have been served on Sony Music Entertainment UK, Universal Music UK, EMI Records UK & Ireland, BMG International UK & Ireland, Warner Music UK, Virgin Records Ltd and Pinnacle Records, the largest independent UK distributor. In addition, a selection of retailers and wholesalers have been approached for further information. The move follows preliminary enquiries that have 'given reasonable grounds for suspecting that the record companies had taken concerted action to limit the parallel importing of CDs into the UK from other EU member states'. With the inquiry expected to take six months, the OFT is discouraging any assumption that the Act has been infringed at this time.

US: Hollywood-based mastering facility Mastering Lab has signalled the end of its 33-year association with vinyl record manufacture by removing its cutting lathes, clearing the way for the installation of digital-orientated mastering equipment. The new setup will service CD and DVD-Audio, although to date a precise inventory has not been announced. In tribute to the success afforded to the facility by its tube-based technology, Mastering Lab recently held a party attended by many of its most notable clients. This drew together such production and engineering luminaries as Glyn Johns, Al Schmitt, Richard Perry, Bill Schnee, Ron Nevision, Jackson Browne and David Gates. The event was hosted by Doug Sax, whose brother Sherwood first designed the lathes put to use on an estimated 20% of all Billboard Top 10 records during the seventies and eighties. Mastering engineer, mixer and producer Ron Hitchcock attended the party and commented, 'This was truly a scene to behold. This was an assembly of perhaps the finest producers and engineers from the past three decades. They filled this legendary mastering facility to celebrate the passing of the LP, and the removal of its lathes. Most of the conversation, however, projected the future of music. Removing the lathes makes way for additional digital equipment and tomorrow's mastering challenges.' Doug Sax's work at Mastering Lab on the direct-to-disc method of live recording earned him an honourary lifetime membership of the AES. Of his upgrade plans he comments, 'We're building a surround sound room out of town in Ojai, CA, which will handle any of the surround formats—DTS, Dolby Digital, DVD-A and SACD. I'll be installing my own monitors again but the DAW platform has yet to be decided. George Massenburg is building me an 8-channel digital console. 'The Hollywood facility will remain stereo, based around Sonic Solutions. Without the lathes, the digital processors can be a little closer to the operator, but we still do most of our processing in analogue. The one incoming format which is dominant right now is the Alesis Masterlink—they are everywhere. I'm getting important albums coming in on the Masterlink where they'll mix at 96kHz-24-bit and put them on the hard disk inside the Masterlink. 'Key to digital development is the performance and the cost of the convertors. Technics-Panasonic has a rack of eight channels of 24-96 A-D and D-A, and the performance is better than any of the esoteric $6000-for-two-channel things. And they're a fraction of the price—$2500 for eight channels. I'm Jewish, so that combination works well for me...' The Mastering Lab, Tel: +1 323 466 8589.

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The R-1 was put through its paces at the 20,000 strong Elton John Concert in Madison Square Gardens this year. A host of other stars also appeared on stage...

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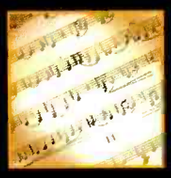

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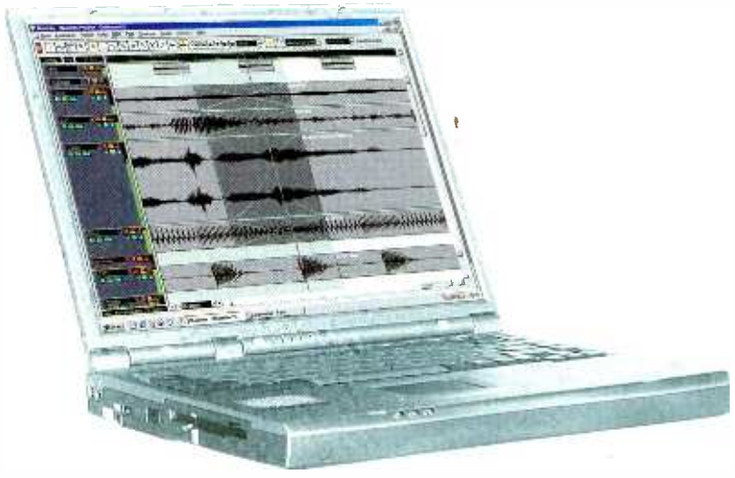

If you work with today's music, TV and film production facilities you will already understand that a high degree of flexibility is what you really require from the gear you use. This is where Nuendo steps in. With Nuendo you are not bound to just one platform, or forced to buy one brand of dedicated audio hardware. In fact, whether your setup is a Macintosh PowerBook, a PC laptop or even a high speed multi-processor desktop CPU; nothing stops you from working on any part of your project at different locations with the hardware at hand. While a composer, for example, can work on pre-production jobs using a laptop, the orchestra could be mixed in the studio on a dual processor PC. Foleys could be brushed up on your PowerBook, and then everything combined for final mix-down on a G4: Even working across platforms is no problem with Nuendo.

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CONTRACTS

mastering suites. Masterhuset, which masters almost every current Norwegian CD release, is also using Dynaudio BM15 close-field monitors.
Masterhuset, Norway.
Tel: +47 2238 2430.
tc electronic, Denmark.
Tel: +45 8742 7000.

Eire: Dublin post house Moynihan Russell has replaced an AMS Neve AudioFile with a Fairlight Prodigy workstation in one of its four rooms. The facility specialises in television documentaries and advertising spot work with clients including national broadcaster RTE, multiple independent film and documentary originators and many of Dublin's advertising agencies.
Moynihan Russell, Eire.
Tel: +353 1 661 4427.
Fairlight, UK. Tel: +44 207 267 3323.

The Netherlands: Total Touch, whose debut album gained triple platinum status, has recently equipped its studio with a 48-channel Audient ASP8024 analogue console and ASP8024MF moving fader automation. Groningen-based Square Wave Studios, meanwhile, has purchased a 32-input Amek Media 51 console. Destined for a variety of commercial recording duties, the desk has already seen service on a 5.1 video game soundtrack project. Hilversum's Studio Down Under joins Haarlem-based Zeezicht recording studios in installing SSL 9000j-series consoles, replacing a 14-year-old SL4000 desk with an SL9048.
Expotus, UK. Tel: +44 1923 252998.
Amek, UK. Tel: +44 161 868 2400.
SSL, UK. Tel: +44 1865 842300.

UK: London's new-look Orinoco Studios now offers a refurbished and re-wired Neve room, rewired studio, overhauled equipment (including the Neve console) and two Pro Tools rigs including a dedicated Pro Tools room.
Miloco, UK. Tel: +44 207 232 0008.
Digidesign, UK. Tel: +44 1753 653322.

Germany: Sports media specialist Wige Media has commissioned two state-of-the-art TV OB vans to expand its TV production fleet to six vehicles. Based around Lawo mc2 console, the vans will support all classical and innovative formats and media. ‹5 will carry 18 cameras (but is prepared for 38), two video control rooms and three slomo-areas. ‹6 is fitted with eight cameras, video control room, video equipment, VTR section, and an audio control room. Its first job is the opening of the Formula 1 season in Imola at Easter.
Lawo, Germany. Tel: +49 7222 10020.

DaD's favourite

US: Fairlight is to receive a Scientific and Technical Award (Academy Plaque) from the Academy of Motion Picture Arts and Sciences.

'This award is clearly among the highest accolades the entertainment industry can offer,' commented John Lancken, who will accept the award on Fairlight's behalf. 'This award also represents the strength of our relationships with our sound for picture customers around the world and the invaluable assistance they gave us in the development of the DaD dubber and our other digital audio technologies.'

The award citation will read: 'These digital dubbers have afforded the post-production community a faster, more cost-effective means of playing back hundreds of digital audio tracks for pre-mixing or final mixing in creating motion picture soundtracks. They also offer individual track slipping in multiple track configurations, random access recall and both destructive and non-destructive editing capabilities, eliminating the need for razor blade conforming.'

'The R&D team in Australia has every reason to be very proud,' Lancken added.

The chips are down for ADSL

US: A new chipset announced by Analog Devices is set to offer reductions in all key areas of chip usage for customer premise (CPE) ADSL equipment. The Eagle series is claimed to be the industry's smallest ADSL client chipset, requiring only two chips and reducing space, and power requirements as well as cost.

The design saving has been achieved by integrating industry-standard bus interfaces with an ADSL DMT data pump on one chip, and placing an analogue front end, line driver and digital receive filters on the second. A choice of three interfaces—ATM Utopia, PCI and USB—will be available.

According to Analog Devices estimations, Eagle-based CPE designs will require 55% fewer components and reduce materials costs by around 30%.

Analog Devices, US. Tel: +1 781 973 1622. Fax: +1 781 937 1058.

New cast for Foundry

US: Sonic Foundry, the US developer and marketer of digital media and Internet software tools, services, and systems, has been forced to cut its workforce by 40%, resulting in the loss of around 150 employees, *writes PSNE editor Dave Robinson.* There have been layoffs in most areas of the company, including sales, marketing,

UK: The construction of London's all new Sphere Studios complex continues apace with orders having recently been signed for consoles from both AMS Neve and SSL to equip two of the three main studios. All three rooms will be 5.1 capable offering a 96-channel SSL SL9000j console in the main mix room, a 72-channel AMS Neve 88R in the recording and scoring room, and a Euphonix CS3000 presently in service in one of the 'white rooms'. Sphere's Malcolm Atkin commented: 'For commercial reasons we decided to install a console from each of the major manufacturers. AMS Neve was the obvious choice for recording and tracklaying, while SSL is unbeatable in the mixing arena. The Euphonix, which we already own, compliments both of these desks and provides our clients with an alternative recording and mixing option.' The 88R is the first placed with a UK recording facility and offers Encore automation, a 26-8 mix bus and 36 remote-controlled preamps. Says Atkin, 'Although the 88R's mic preamps were, for us, its main selling point, the EQ was also an important consideration because it is closely based on designs we developed for the Montserrat console. Bruce Davies, SSL product executive commented on the SSL sale, 'We are delighted with Sphere's decision. It makes good commercial sense as, with more than 170 SL9000 J-series' now installed in the world's premier studios, this console is justly regarded as the industry benchmark for analogue music production.' Following the official opening of its six 'white' production rooms, one has been taken up by producer Chris Kimsey and another by producer Tony Briscoe noted for his work with Craig David (pictured seated with Sphere's Francesco Cameli, newly-appointed studio manager Patti Nolder, and Malcolm Aitken left to right). A third production room has been equipped with a Euphonix CS3000 desk, Pro Tools 24 MixPlus system and Munro MA1 monitors and is being used as a mix room and overdub booth. Briscoe commented, 'Apart from a convenient location, Sphere's rooms are spacious and offer an excellent acoustic environment. I'm delighted that Sphere is incorporating the technology to link my room to the main studios which means I'll be able to transfer work and complete projects without having to leave the building.' Located in Battersea, designed by Munro Associates and being built by Form & Funktion, Sphere is being billed as the most significant new studio to appear on London's skyline since Air Lyndhurst.

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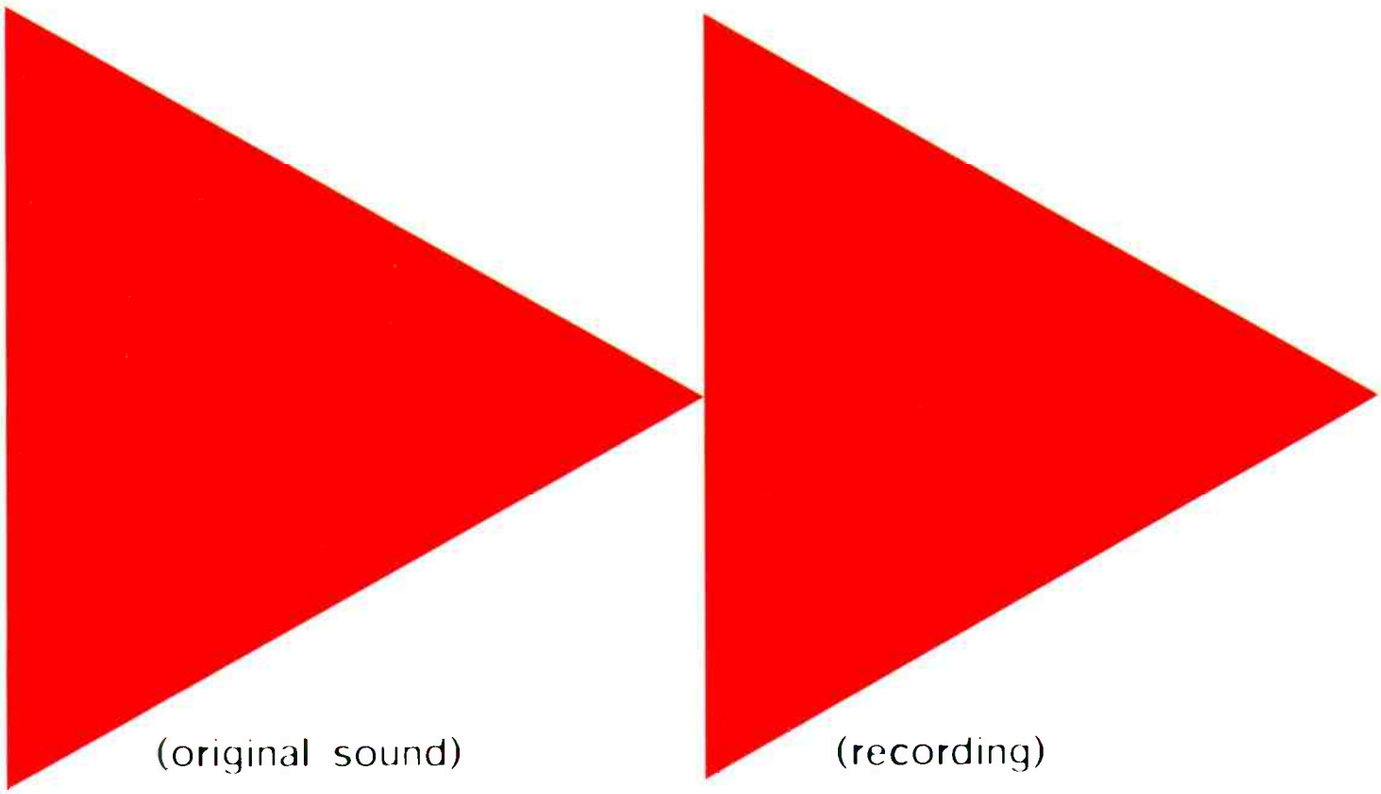

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APPOINTMENTS

Neutrik founder and president, Bernhard Weingartner, has handed over the Chair of the board to Dr Urs Sprenger (the son of one of the company's co-founders), completing his retirement from the company. Weingartner founded the Liechtenstein-based connector manufacturer in 1975 after serving as technical director at AKG in Vienna. 'I wish my old baby all the best luck,' he commented.

Mackie Designs has made Ivan Schwartz director of corporate communications for all of the Mackie companies. A veteran of professional audio, Schwartz has served with EAW, Mark IV Audio and earlier offered audio consulting and sound engineering for live events.

ADC Broadcast Products has named Geoff Ward as Associate Marketing Communications Manager at its Grass Valley-based HQ. Ward reports to Nigel Spratling, and will act as a marketing liaison with the parent headquarters in Minneapolis. Ward joined NVision, now owned by ADC, after working at The Grass Galley Group as a senior support engineer, and at The

Sports Network, Toronto, as senior engineer in the maintenance engineering department.

AMS Neve has appointment Gerard Fiocca eastern region sales manager responsible for AMS Neve products in the Eastern US. Fiocca reports to Chris Pelzar in the new position of Executive vice president of sales & marketing in North and South America. Pelzar returns to AMS Neve from Euphonix, while Gerard previously served with Studer North America and as technical director for The Hit Factory Recording Studios in New York.

Apogee Electronics has welcomed former vice president David Kimm as its new president. Spending time at JBL and Soundcraft (including Spirit) before his first stint with Apogee, Kimm returned to JBL as director of recording and broadcast before returning to Apogee to take the company into 'new markets and product areas'.

US: Mark Ruff's 15 years at the Chicago Recording Co have recently been rewarded by the complete refurbishment of his production studio facilities. The newly-installed Euphonix System 5 console is Chicago's first, and is paired with a Pro Tools system and 5.1 monitoring to provide greater flexibility for Ruff's work in mixing and producing broadcast television and radio spots for US ad agencies. Recent assignments include spots for Miller Beer and AT&T.

engineering, media services and administration. Only in engineering has headcount been preserved as much as possible. European customers are now being serviced directly from North America as the European office has been closed.

In a statement posted on its web site, the company says '(Christmas) holiday retail weakness and an overall softening in the PC industry', plus 'constrained growth by a world wide slowdown in dot.com business' has forced it to adjust its business plan, reducing headcount to approximately 245 and operating expenses by over $20m annually.

The statement continues, 'changes in the market may decrease quarterly revenue for the quarter ending December, 2000, by as much as $3m from previous quarterly results. Due to these reductions, the Company expects that fiscal Q1 operating losses will be greater than originally forecasted. However, the company expects to have sufficient cash resources to reach EBITDA (a US measure of cashflow) breakeven sooner in the fiscal year than originally anticipated, and will be providing more detailed forward-looking guidance in conjunction with formally announced fiscal Q1 2001 operating results.'

Rimas Buinevicius, chairman and CEO, says belt-tightening was anticipated at the close of 2000. 'It's obvious that after further industry warnings and a continued softening of the economy, additional cost-cutting measures are necessary,' he says.

'In light of these circumstances we now anticipate that year-on-year revenue growth may potentially slow to less than 20% and we are budgeting accordingly.'

Ironically, in the month before the cuts, Sonic Foundry was ranked number 224 on the Deloitte & Touche Technology Fast 500, a ranking of the 500 fastest-growing technology companies in North America.—though these rankings are based on five-year percentage revenue growth from 1995–1999. Sonic Foundry grew 1,856% during this period.

When asked to comment on this, Buinevicius says, 'While we were very pleased with the D&T results and hope that growth continues, the reality is that we are facing a major recessionary cycle in technology. Any company which doesn't face up to this is not facing reality. We have structured our business sooner and faster than the rest of the industry and have the wherewithal, the products, the people and new product introductions that will allow us to emerge from this downturn with an even stronger market position.'

Norway: A major refit of Oslo's Norsk Lydskole has seen its Studio A fitted out for digital operation based around a Soundtracs DS-3 production console. The Lydskole conducts degree programmes in recording and engineering for which general manager, Tore Teigland, believes learning in a digital environment is more appropriate. The DS-3 replaces a Tascam M700 analogue console. Norsk Lydskole, Norway. Tel: +47 2205 7550.

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5.1 Entertainment
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Andre Gauthier (Pilot Music)
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Bernie Becker
Berwyn Editorial
Blink Music
Blue Rock Editorial
Bob Ludwig (Gateway Mastering)
Brant Biles (Mi Casa Studios)
Brian Tankersly
Brooklyn Recording
Bruce Botnick
CBC Records
Chuck Ainlay
Clair Bros.
Classic Sounds Inc.
Clear Light
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Michael Wagener
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ATLANTIS RISES

Hollywood gets a new facility, on the site of one of its former ones. **Dan Daley** reckons that it's a renaissance of LA's historical recording arena and a harbinger of strength in rock

I CAME UPON STUDIO ATLANTIS at night, which is the correct way to be introduced to it. By day, this part of Hollywood is a mishmash of low-rise retail stores and warehouses and bungalow residences, a movie set for the seedy but not terribly threatening funkiness that has come to characterise the neighbourhood in the last several decades. It's not the Hollywood of well-known legend but it is the Hollywood that hosted so much of Los Angeles' music history, from Western Recorders and Studio 56, through Conway Recorders and Cello today, all within a square mile or so of each other.

At night, when the area's slouch takes on substance—it's mildly threatening, but that's part of its charm, when the honking horns that resonate in the studio's parking alley start to sound a little like jazz, and the shadows give the purposeful effect of stage lighting. This is the kind of place you come to make music. At night.

The space Studio Atlantis occupies has been a recording studio for a long time, starting as Music Box Studios, which opened in the 1970s. Music Box was small and cloistered within its own walls, and many of the now-quaint acoustical accoutrements of its era are still visible on the walls. But its own funkiness was accommodating to a wide range of rockers, from Roger Daltrey to Slash to Dishwalla, three generations or so of rockers who called LA home at one point or another. Jon Newkirk, a one-time drummer and percussionist in local rock bands who turned himself into a recording engineer and now a studio entrepreneur—not an uncommon evolution in this business—didn't want to lose any of that vibe when he got the opportunity earlier this year to buy the business from Music Box owner Mike Wolf (who was the first to give Newkirk a studio job there after Newkirk took the engineering course Wolf ran out of the studio in the early nineties). But Newkirk also wanted to create a recording space for a variety of music while still hedging his bet with a touch of post, also not an uncommon move in the studio business in LA, where the entertainment business—including music in the form of soundtracks, which these days appear regularly at the top of the album charts—has revolved around film for the last decade.

'I didn't get into this to make millions of dollars,' says Newkirk, without a trace of irony, which his surfer good looks might render him incapable of in any event. However, irony may have run its course even in jaded Los Angeles, and a blast of authentic enthusiasm may prove to be a welcome change in the studio world there. Financed with personal funds and those of two investors, Studio Atlantis is the sum result of Newkirk's stated love of music and a sense that LA needs more studios that can cater to the upper echelons of rock—an appropriate sentiment for someone whose university degree is in geology.

Studio Atlantis' A studio, and its first new room, occupies one of six storefronts in the leased building on Western Avenue, where Newkirk will turn them slowly into additional recording spaces. He retained Los Angeles-based Studio bau:ton for the acoustical and architectural design of the room and the rest of the facility. The control room houses a heavily modified Neve VR60 console with Flying Faders automation, purchased used and then modded by John Musgrave of Mad Labs. These include a CP-8 centre section—the so-called Conway Mod, which was developed originally for that studio's Neve V series desk by Musgrave—for multichannel mixing, along with other wiring, busing and power distribution adjustments. Newkirk says the changes wrought by the modifications make the VR into a new console—the only way he would have it. 'If it was a stock VR, I wouldn't have done it,' he says. 'But I'd listened to consoles with the Musgrave mod, and they all sound fantastic. This one now has a noise floor of about 112dB, and it still sounds punchy and fat.'

There was also a business aspect to the decision, however. 'In talking to studios around town, I realised that a number of studios were ditching their Neves for [SSL]

Michelle Moore and Jon Newkirk, studio manager and owner of Atlantis Studio

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9000j consoles,' he says. 'The thing about that, though, was that there were a lot of 9ks coming on line in town, and you know what that can do to rates. At the same time, the studios that had hung onto their Neves were staying booked. There was obviously a demand in the market for this kind of board. I just wanted one that sounds super-good, which this one does with the modifications.'

bau:ton's Peter Grueneisen was the lead architect on the project, which has already garnered an award from the Los Angeles chapter of the American Architectural Association for interior space design. Grueneisen's design called for excavating the floor and laying new floated slabs, one each for the control room, iso room and machine room, atop the existing foundational slab which supports the former storefronts. 'Floating the floors was a critical issue because Western Avenue is very noisy, with constant traffic from truck and buses—when the buses are running, anyway'—a reference to an ongoing transit strike in Los Angeles County—says Grueneisen. The solution apparently works: Grueneisen and Newkirk listened to tapes made in the old studio in the control room and could hear that traffic from years ago above the noise floor, something that the previous engineers obviously couldn't.

Grueneisen also integrated aesthetics with security measures, turning security bars on the glazed wall of the office and reception area into a sun shade.

Mounting full-sized monitors in a surround array is always an issue, regardless of the size of the control room. In this case, Grueneisen positioned the surround pair in a 110° pattern in a soffit that runs across the top of the back wall of the control room, angled 20° off the axis of the side wall. The soffits themselves are covered by a pattern of shingles made from medium-density fibreboard, which also act as resonators for the room.

Aesthetically, Studio Atlantis is a meld of yellow, green and blue hues, following the aquatic theme that was the only constraint that Newkirk placed on the design. The walls of the studio's reception and client area are designed and built to appear wavy and textured, as though they were distorted by being viewed through water. The interior design, though, like the choice of console, has some deeper business considerations.

'A studio has to have style and personality to work for musicians,' Newkirk states. 'Royaltone [an LA facility with a highly stylised Goth motif popular with rock bands and producers] was a real inspiration to me. It makes a statement the minute you walk through the door. People come to a recording studio and they want to forget about reality. Who wants to go to work making records in studios that look like doctors' offices?'

The final touch was the custom design and installation of the five full-range, TAD-fitted soffited cabinet and two subwoofers that comprise Studio Atlantis' 5.1 monitoring system, designed and tuned by George Augspurger. The main monitor is driven by Bryston 4B and 3B stereo amplifiers. The mains are augmented by KRK E8 and Yamaha NS10 speakers for close-field monitoring.

Studio A has no large tracking space, with a serviceable overdub iso attached to the side of the control room; instead, it will be mainly the mix room for the complex when a planned expansion is implemented over the next year, which will bring Studio Atlantis' total investment to over $2m, double what's been spent thus far. The costs haven't seemed to have fazed Newkirk, who observes that, 'I could have taken the money and put it in the stock market—which is what my financial advisor told me to do in the first place. But you don't think about money when you do something like this. That's not what it's all about.'

Major monitoring: The 5.1 Augspurger system is driven by Bryston amplification and augmented by KRK E8 close-fields

If Studio Atlantis represents Newkirk's vision of making music in Los Angeles, a lot of the mechanical details of that vision fall into the purview and the lap of Michelle Moore, Atlantis' studio manager. Moore is a 10-year veteran of managing studios in LA, including Ground Control, Studio 56, Private Island Trax and producer David Kirschenbaum's studio on the Paramount film lot. A decade watching the Los Angeles studio community buffeted by the changes in the music business and technology have focused her to a sharp edge.

'There are about six direct competitors in town which have high-end Neve V series consoles with Flying Faders, and those rooms are booked solid,' she observes. 'That tells me we're on the right track in terms of technology choices but it also tells me where the competition is. The strategy is to get the word out about the studio, to differentiate it from the old Music Box, to get the level of client service up as high as it can be, and keep the level of studio maintenance at a peak.'

In terms of the first, Moore is letting the modified Neve VR—and her experience—speak for itself. 'There are a lot of SSL 9000j consoles in town now," she says. 'The J is popular and has taken over the lion's share of mixing work in Los Angeles. But engineers tend to have long careers, so the guys who have been around for a long time [in Los Angeles] tend to be Neve guys. They form a potential core clientele for this studio, along with the artists and producers who worked here when it was Music Box.'

Which is to say, Moore agrees, that the vast majority of Studio Atlantis' revenues will come from local

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bookings. 'Which is fine, because this area is not saturated with Neves, as it is with SSL rooms,' she says. 'LA is a rock town and rock music and rock budgets are still coming back. Rock is making money again. We can do some post, like most of the studios in town at this level, and there are the high-end hip-hop and rap artists who want this kind of studio. But the bottom line is that rock is what really helps this studio make economic sense.'

Being a brand new studio—something that Moore is emphasising in her marketing strategy to differentiate Atlantis from Music Box—allows Moore to position Atlantis as a music haven, something that she believes will strike a resonant chord in a Los Angeles in which many music studios reached deeply into postproduction to counteract the drop in music production that hit LA like an unwelcome wave in the early 1990s. 'The whole market here shrank back then, when rock budgets got pared down, when rap started moving into people's houses and out of studios, and studios began to put in Foley pits to get the post business,' she says. 'That really hurt the musicians. I mean, emotionally. They felt like second-class citizens in their own music community when they would come into a recording facility, go into one of the smaller studios there, and watch as the post guys in the same facility got the bigger studios and were getting their meals catered while the musicians were lucky to get fruit baskets. We want to let these people know we want them as clients, and that we want to focus on album projects.'

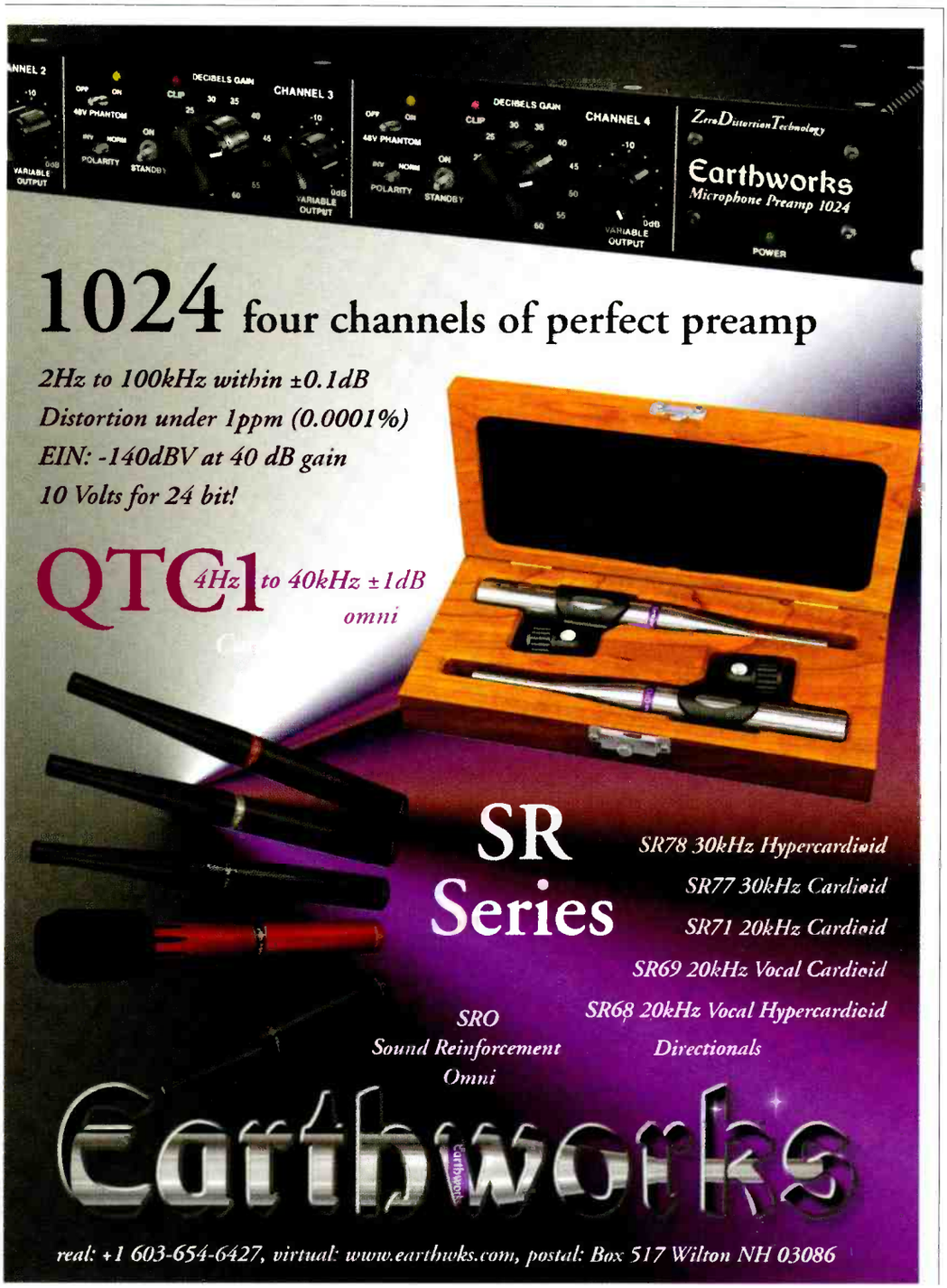
There are larger forces at work in Moore's thought processes. In addition to musicians becoming somewhat disenchanted and disenfranchised by post in the last decade, they are also facing an uncertain landscape in the future as Internet technologies threaten to undermine the entire concept of albums in favour of individual songs, a trend which would have significant effect on studios that depend on days, not hours, as the minimum booking unit, and which hope for bookings of weeks or months to keep cash flow steady and reliable. Only albums can do that in the long run, preferably albums in which the same producer works the entire project instead of various ones bringing bits and pieces of it around to different studios.

'There's a shift in the way that albums are being marketed and sold, and that can have an effect on how they get made,' Moore says. 'There will always be big-budget projects, and they'll always need this type of facility to get made in. Rock's been dead before and it's always managed to come back. And rock's always been about making the epic with the great artwork and graphics. You want a studio that matches those ambitions. You want a studio with great graphics as well as great equipment.'

Studio Atlantis' A room has a stated rate of $1,850

(£1,100) per day, an achievable target, Moore says, and one that's realistic in light of current realities in the music business. But though Studio A is the focus of attention since Atlantic did its first official session there the first week of October, the former Music Box, now dubbed Studio B, remains on line and acts as a counterbalance to the goals established for the studio with the A room. Studio B retains the Trident Series 80-B console, fitted with Uptown moving-fader automation, it had when Wolf operated Music Box, though it has undergone its own set of modifications, performed by Tom Herzer, whom Moore knew from the days they both worked at Studio 56 and who now also does contract maintenance for Atlantis. Herzer also worked on the Studer A-80 Mk.III 24-track and 2-track decks at Atlantis. At $850 (£510) per day, Studio B is designed to attract low-budget and independent-label acts, whose ubiquitous presence throughout the industry reminds all participants that rock's days of wine and roses will not return as lushly as they once did.

Studio B will serve their needs and give Atlantis an alternative client base (pun intended). At least, until it gets demolished sometime in the next 12 months or so to make way for a new Studio B. While the technology platforms have not yet been chosen, Moore and Newkirk expect that it will house an SSL console, and will also be designed by bauhton,



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POST PRODUCTION

MUSIC RECORDING

FILM SOUNDTRACK

Dubbing A

Dubbing B

L-R Darren McQuade, Billy Mahoney & Darren Woolfson

molinare

soho - london

When Darren Woolfson, Technical Director of Molinare, was faced with the major task of building two new audio suites to accommodate the arrival of Billy Mahoney and his team to specialise in TV drama, he decided to depart from the usual Molinare set up. In order to step away from the typical Soho structure, he gutted an entire floor and started from scratch. The end result was outstanding. The choice of consoles was also a break from the past. Says Darren, "We had all heard of Soundtracs digital consoles and thought it would be churlish for us not to take a look."

"We were thoroughly impressed, not just with the product but also with the Company. With Billy it was never ever an issue, he had previously worked with Soundtracs and really wouldn't have wanted any other console."

DPC-II

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with Augspurger monitoring. Just what Studio B will be, though, depends upon ongoing discussions Newkirk is holding with the building's landlord. While the Music Box control room is already firmly in his grasp, he needs additional space to construct what is hoped will be a 60 x 60ft tracking space, giving Atlantis a soup-to-nuts music capability. In the meantime, B sports a mid-sized tracking area, with two small isos. Once that happens, the B control room will also be converted to 5.1, the format that Newkirk believes will eventually come to dominate music recording.

Other small but critical gains have already been made, such as the procurement of a 16-space car park nearby, which will have remotely controlled access and video security monitoring. 'Of all the things that a studio in LA needs, secure parking can make or break a facility,' Moore says. An additional fader bucket is also expected to be installed next year in the Studio A Neve, bringing it to 72 inputs. EMT plates are also on the schedule for installation.

Music recording studios are, ultimately, emotional creations. And for all of the trends in the studio business that it reflects and underscores, Studio Atlantis is also Jon Newkirk's personal rite of passage, his place on a time-honoured evolutionary journey that sees musicians become engineers and then studio owners. It's a throwback to an earlier, more innocent time in the music business. But then, so is rock music, at its purest. But the realities of the business are too intrusive to allow fantasies to float free for long. As Newkirk puts it, 'It's funny: becoming a studio owner is like becoming a member of the mob, like becoming a 'made' guy. It's a magical feeling. But at the same time, I have to be careful about stepping on toes while I build my castle. It's a great thing. But I'm also very aware of what I'm getting into.' □

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WAKING THE DRAGON

Beijing's Oasis studio has put China on the international recording map and is opening the doors on a commercial future. **Karen Mitchell** reports

SET ON A LAKE lined with weeping willows, Beijing's Oasis Studio is housed in a picturesque agricultural exhibition park. Once an exhibition hall, the building's height and framework are ideally suited to house a recording studio complex, and Belgian-trained, Beijing architect, Deng Xiao Ai was ideally placed to design it. The old structure was gutted and transformed into a sleek, marble and wood-filled edifice that is exotic yet retains its intrinsic Chinese character. Acoustic design is by Sam Toyoshima and the SSL SL9080j console is the first to arrive in China, while the Genelec monitoring system and extensive outboard are set to satisfy the most seasoned of engineers and producers. As a result, Oasis is the first commercial studio of its scope in China and arguably in the whole of Asia.

'We believe in this studio, and look at it as a bridge between the domestic and international markets,' says Patrick Kwok, president of parent company YYYD Productions, a privately owned Beijing-based entertainment outfit encompassing artist management and production, international and domestic concert promotion, and video-film production. 'We have our own in-house production abilities, concert promotion and our own (signed) artists,' he continues. 'We anticipate that within three to five years China will be fully open and we want to be there ready.'

The spectacular location of the facility—a secluded park close to the airport, hotels and service apartments, and to the major restaurants and nightlife in this culture-filled capital—appears ideal for doing business.

'Oasis has incorporated all the necessary requirements to compete on the world stage: SL9080j console, Sam Toyoshima room, Genelec monitoring, Sony 3348HR DASH multitrack, and a comprehensive list of outboard equipment,' says SSL's Tim Harrison. 'The control room is large and the studio area will support large orchestras. With these criteria well and truly fulfilled, Oasis needs only to offer something extra and unique—and it does.'

Vice president and COO of Oasis, Dindae Sheena is a Singapore native who has worked with producers from the UK, as well as with Buddy Guy, John Farnham, INXS, Hothouse Flowers, and Asha Bhosle, the acknowledged queen of pop in India. Well versed in the regional Asian music scene, he was running a studio in Singapore when he took the call that lead him to a project as big as his imagination, in a country he'd never seen. The call came from the US office of Patrick Kwok, himself born in Shanghai and educated in the UK and Italy. At Kwok's request, Sheena flew to Beijing to cut a couple of demos in a small, home studio just outside the city. YYYD offered him an audio engineering contract for a studio they planned to build in Beijing, in just three months, with a budget of about US$650,000 and a select list of secondhand equipment including a console previously owned by LA producer, Baby Face. Sheena visited government facilities such as CCTV, China National Radio, and China Records to assess what equipment was being used in China. He advised Kwok that to set a higher standard in the country, the proposal would

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have to be expanded. Kwok readjusted his budget; he wanted a world-class facility.

Under Sheena and Kevin Nair, director of project sales at Singapore-based equipment supplier Team 108, the vision exploded leaving Sheena running a stunning, US$3m recording and production complex in the heart of Beijing.

The working formula of SSL, Genelec and Toyoshima produce what Sheena dubs a Paradise of Sound. 'We narrowed the console choice down, but we found out it was easier to sell an SSL room, both domestically and internationally,' he explains. 'Control Room B, the Jungle Room, is equipped with a full-blown Pro Tools 24 Mix Plus system with 32-track ProControl. The room is also equipped for 5.1 work. The Sony DASH 3348HR, which is also the first unit in China, is used for tracking and mixing and will allow clients the option of mixing and recording to tape. There are also various other formats available, ADAT, DTRS, analogue 2-inch or hard-disk. The Pro Tools room, with access to the big studio, will be used for audio for video, Internet-multimedia projects, and voice-messaging recording, in-flight entertainment—a variety of commercial projects. Clients have a choice of finish on a variety of formats including MP3. DTS and AC3 encoding is also done in this room.

'We've also got the tc electronic System 6000,' Sheena continues, 'the Lexicon 960L, and the Eventide Orville—all of which are the first units to be brought into China—and every piece of high-end studio gear from Avalon to vintage devices.'

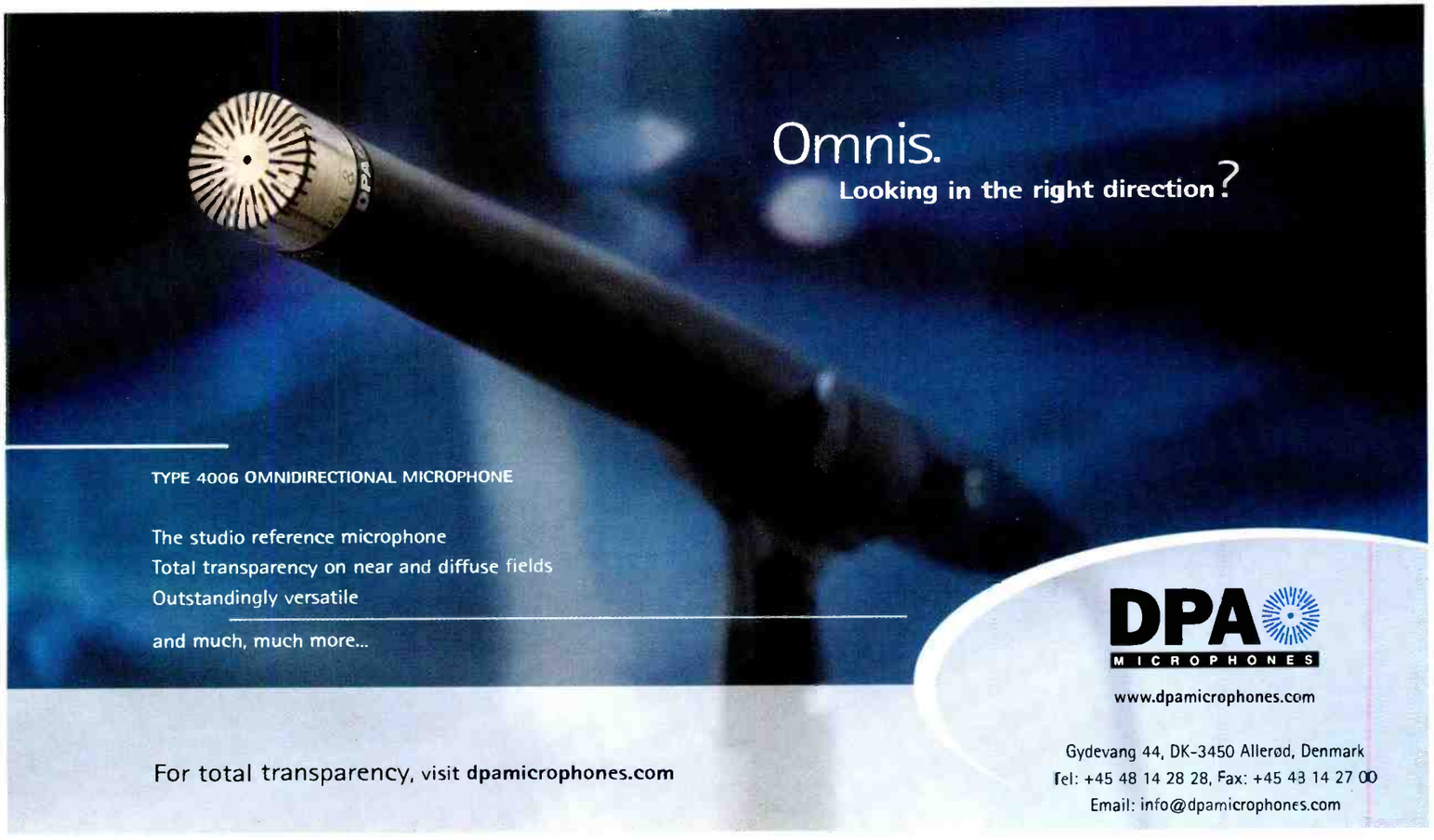
Team 108's Kevin Nair believes that the major challenge came in educating the various contractors on the particular requirements of building a recording studio. 'In the end, it is not just the studio hardware,' he says, 'trimmings such as 26 ISDN lines, broadband Internet and video conferencing communications systems, put this on a par with any international studio. Even prominent visitors from Japan, Europe, UK and USA are saying, "Wow".'

It was Nair who introduced studio designer Sam Toyoshima to the project: 'I talked with Patrick and Dindae in October 1999 after they had already interviewed several acousticians from the UK and America,' Toyoshima recalls. 'It was competitive...'

Even with a design portfolio including London's Abbey Road, Town House and Sarm West, Toyoshima recognised the potential of the project from the outset. 'I had an image of a studio with no visual boundaries between it and the lake,' he says. 'The studio, I realised, should be one with the lake, a part of this natural setting. So we decided to install the large glass windows along the lake side of the studio; this reflective glass is one of the variable acoustic systems in the studio, as is the sliding absorption door.'

Toyoshima has also designed studios for Shanghai TV and for Radio Shanghai but Oasis is his first project in Beijing, and meets, he says, the highest standards in Asia. The design concept is simple: 'I wanted to create a natural and comfortable sound, one that the engineer and client want to achieve. And I wanted this to be an easy, comfortable place to work and live. The studio acoustics must match or meet every kind of music. I established this by means of the variable acoustic systems by which it is easy to change the reverberation time in the studio.'

There are two vocal booths, a drum booth, piano booth, and the Great Wall booth—with a back wall composed of irregularly-lain solid stone, ideal for percussive and wind instruments. The largest booth is able to house an 80-piece orchestra comfortably.



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'The acoustic characteristics are different in each of the booths,' Sheena comments. 'In the big studio, for example, they can vary from live to dead with the use of sliding and flipping acoustic panels.'

The selection of its 1036A monitoring brings Genelec into one of its biggest control rooms, says Genelec sales director Lars-Olof Janflod. 'We were excited about this project because it's the first commercial studio complex in PRC. The studios are imaginatively designed and are professionally run. Studio One—the Ocean Room—features one of the biggest control rooms we have ever come across. And the Beijing location is ideally placed to serve the burgeoning Chinese and Asian markets.'

With a Chinese community in virtually every Asian country, Sheena says, coupled with a lack of top recording facilities, the opportunity for the studio is magnified. 'If Oasis can supply good accommodation in Beijing, that will make it possible to attract clients from Europe and the US because everybody in the studio can speak good English.' Another draw is price: 'The Oasis SSL room is listed at $150 an hour including an engineer and all the equipment. That compares to about $250 in LA without the multitrack machines. Our Pro Tools room is listed at $120.'

At Oasis' opening in October, Toyoshima spoke with Otomo 'Da You' Koetsu, a prominent Japanese producer who is based in China where he produces pop music. 'Mr Otomo remarked that Oasis has a higher standard than that of studios in Japan, and that the rate is much cheaper,' he recounts. 'He said he wanted to use Oasis soon. I think many Japanese record and production companies are looking for Chinese artists for both markets.'

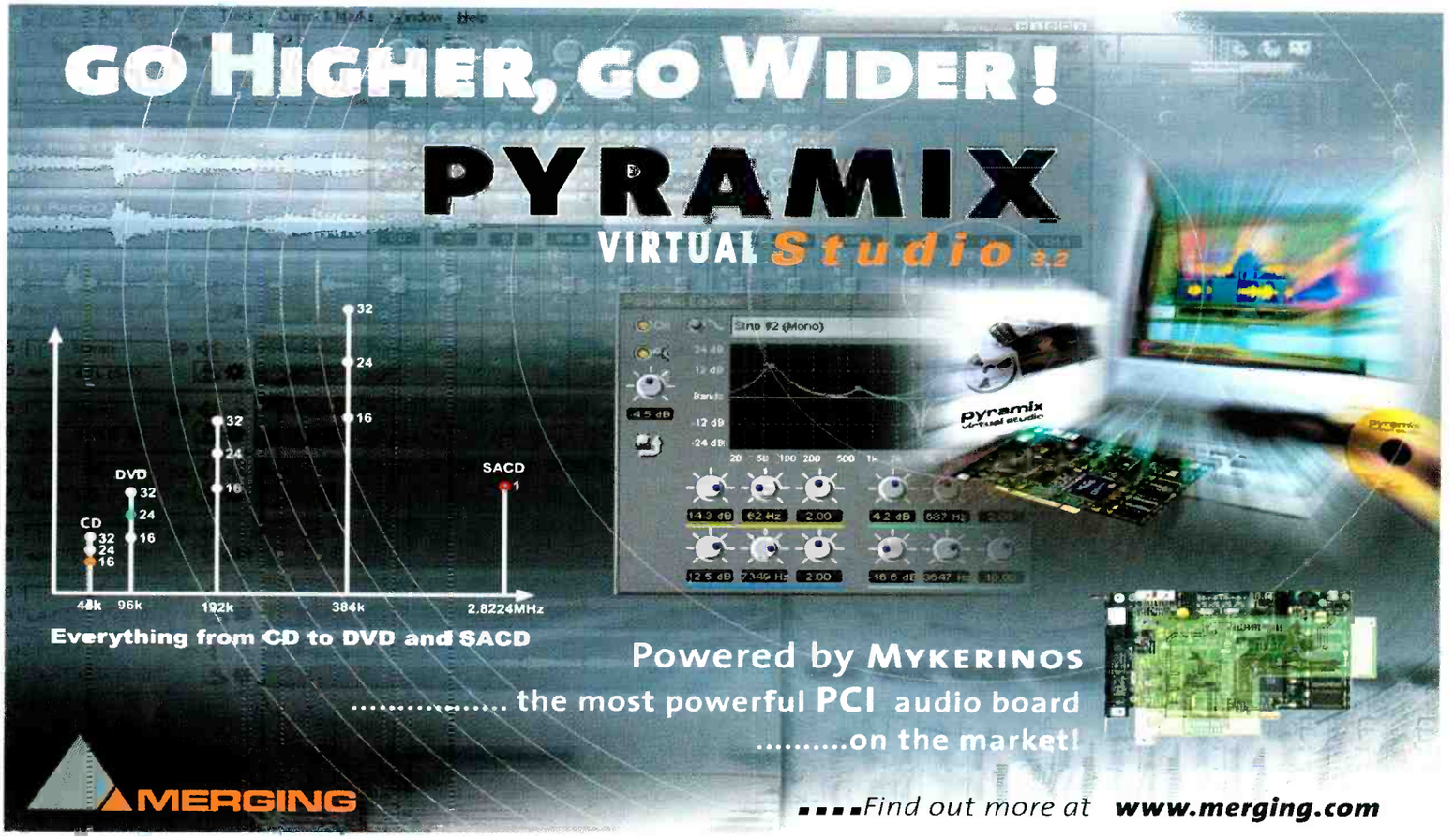
Tim Harrison believes that in addition to business from other Asian markets such as Taiwan, Hong Kong, Japan, Singapore and Malaysia, the new studio will attract business from within Mainland China as the internal market develops in response to the demands of the upcoming and 'upwardly mobile' younger generation.

'China's steady economic growth and her imminent entry into the WTO will accelerate economic and social development, and with it the market for a world-class recording facility,' he says. 'The studio area will lend itself to the recording of large orchestras of which there are many in China. Additionally, there is a rich and varied music culture of both traditional and modern music—all potential Oasis markets.'

Already busy, Oasis has hosted album projects for YYYD pop artists including California-born Jeffrey Kung and Mao Ning, and been engaged by an arm of the Chinese Ministry of Culture to record the indigenous music of China. The project will be conducted in the field and the music is to be archived.

'China is so rich in music,' Sheena says. 'We have great classical musicians so producers can come to Oasis to do string work, for example, or scores for movies, and find these session artists. We have a database that includes talent in jazz, blues, pop, percussion, even flute players. Currently, there are many producers who fly in from Singapore, Malaysia and Taiwan just to do live string work.'

He envisages Oasis as representing a collaboration between east and west. 'Producers in the west are looking for fresh sounds, and there is so much untapped music here, both material and talent. It's been a challenge to build a world-class facility in Beijing. And with China now opening its doors, Oasis is a testament, showing that China is willing to be a part of the world music culture. And we're ready.'



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REVIEW

Eventide DSP7000

Trading multichannel for old-fashioned stereo working, Eventide's latest pitch processor offers much in compensation. **George Shilling** enjoys a little instant gratification

EVENTIDE'S ORVILLE IS a Rolls-Royce effects processor, with 96kHz/24-bit capability and surround sound applications. But as it will be some time until we all work exclusively in a surround format, for many, 2-channel stereo is adequate, preferred, stipulated or more cost-effective. So more than a year after *Studio Sound* brought the first review of the Orville, here is the DSP7000, a 2-channel, single-DSP unit, as opposed to the Orville's four channels and two DSPs.

Not only is the 7000 much cheaper than the Orville, but, remarkably, it is also cheaper than the similar looking DSP4000 it replaces, yet with four times the processing power of that model. The internal clock can be switched to 48kHz or 44.1kHz, and by selecting High Speed mode you can choose 88.2kHz or 96kHz rates. However, you are warned that this mode disables some of the presets that require more processing—roughly a third of the programs. High Speed compatible programs are displayed with a lightning flash adjacent to their name in Bank-Program mode. If externally clocked, there is a display on the selection page to measure the exact sample rate, and a front panel LED to indicate this mode.

Construction is similar to the Orville. The case appears to be fairly thin (bare) steel but the whole package is weighty. The rear panel is crammed full of connectors and blanking plates. Stereo analogue input connectors are combination jack-XLR sockets, enabling you to plug a guitar straight in, while analogue outputs are XLR only. Digital connectors are on AES-EBU XLRs and SPDIF phonos; (the signal always appears simultaneously on analogue and digital outputs). It appears that the outputs dither to 24-bit unless using the Dither program, which cannot be loaded simultaneously with any other program. Word clock In and Out BNCs are provided. There are two footpedal control jack sockets, and a Relay jack output, which contains two separate connections that can deliver up to 1.0A at 30VDC to control external equipment.

There are MIDI In, Out and Thru connections, the In optionally accepting a 7-pin plug to provide power for a pedalboard. MIDI messages can effect program change, real-time parameter adjustment, or entire program dumps. For computer communication, there is also an RS232 serial connector, and on the review model, a gaping hole where there should have been an 8-pin RJ45 connector to enable hook-up to the optional EVE/NET remote control, which comes as standard with the Orville. This is a well-featured remote controller in the style of the Lexicon 960 LARC or tc M6000 remote. For program creation the VSigfile editor is available from the Eventide web site, enabling graphical editing on a Windows PC via the serial connector or MIDI. There are blanked panels for further inputs and outputs, and a large rectangular blanked Options panel, which is not mentioned or referred to at all by Eventide.

Switching on the DSP7000 prompts a number of relay clicks and test routines. I once encountered a bug with an early DSP4000 but there are no problems here. Once the Contrast adjustment (within a menu under the SETUP key) is correctly set, the large front panel display is bright, clear and easily readable, accompanied by the four familiar soft keys. LED input meters are clear, and at the opposite end there is a dedicated LEVEL key which accesses multiple menus for making adjustments to enable matching any equipment, analogue or digital. There are no dedicated front panel level controls, but the BYPASS button can be setup in a menu to Relay or Internal bypass or Output Mute for panic situations. One of four LEDs shows the currently selected sample rate. A PCMCIA memory card slot is on the front panel, (DSP4000 presets can be loaded), and a blank card is supplied. There is also plenty of internal capacity for storing user programs. These appear in the Program list with a letter 'U' adjacent to their name. Programs are arranged alphabetically within named, categorised banks. Card banks appear after the internal banks. As you wind through these with the large data knob, you can see the first few program titles and the number of programs in each bank. With 43 banks, each containing between three and 31 programs, it seems to take forever to scroll through the lists with the wheel, which is geared very slowly. You really have to get used to winding it round and round. Although it feels quite loose, flicking it round only skips one or two increments. However, using the keypad you can type in a number (if you know it) and press ENTER to jump straight to another bank or program within, although you are blocked if you enter a non-existent number. And the keypad still looks like it was sourced from a home-build electronics catalogue. Upon arriving at the desired bank, the Down arrow key takes you into the program list, where the knob scrolls down the list. The implementation of the arrow keys here is a little odd—you press the Left key to get back up to bank selection. Upon highlighting the desired program, press the adjacent SELECT key, or the LOAD softkey. The Program Delete function shared the same softkey on the DSP4000, this has now been sensibly moved to the opposite end. After a brief 'Loading...' message, the display continues to show the list. Personally, I would prefer the machine to go directly to the Parameter page, as the old faithful H3000 does. As the program is loaded, any remaining reverb or delay tails are unceremoniously cut off, and the unit momentarily passes through Bypass before the new program starts. Pressing the PARAMETER key takes you to the editing area. Parameters are selected using the arrow keys and adjusted with the knob (which generally works faster here than in the program selection), or directly entered with the keypad, and further pages of parameters are reached using the four softkeys under the screen; further pushes on the PARAMETER key usually reveal more options. A 3-D effect on a softkey label indicates 'stacked' parameter pages where multiple button pushes reveal further pages of settings. Most programs have a helpful Info screen on one of the softkeys, with a brief text description of the program, or a few hints and tips which can be scrolled through with the knob. Unfortunately there is no printed version of these Info pages, which vary in length from a line of text to pages of scrollable instructions. Oddly, there is not even a programs list in the manual, although you can print one out from the Eventide web site, or load the first program which simply contains this list.

The first bank, Favourites, starts off with just the program list, and Mute and Thru presets. However, this bank automatically stores links to the last eight loaded programs, a useful feature for backtracking. Linked programs display an 'L' by their name: this feature enables the same program to be accessed from multiple banks without the need for re-saving the whole program. The next three banks contain selections to get you started—'A Taste' contains links to some impressive demonstrations of the unit's capabilities, an Artist bank contains some wonderful user-created settings, then the Basics bank gives the user some simple effects. There follow plenty of delay-based programs, from the bizarre and com-

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plex down to easy to use simple delays. There is also a whole bank of dedicated Tap Tempo programs, tucked away in Bank 40, which also include such secondary effects as filters, panners, vibrato and more. The Dynamics bank includes a number of compression types including multiband plus a few noisegates, while the Equalizer bank contains mainly Graphic EQs, which can be a little fiddly and slow to set up using the knob. A Filters bank contains some terrific unusual synth and wah-type effects. The Fix Tools bank contains the surprisingly good Auto Pitch Correct, plus some presets for manually

'whipping' the pitch with the knob. Inst Clean and Inst Distortion contain a number of preamp settings with assorted effects, often with delay. Irritatingly, many of these are silent when loaded as they are expecting a volume pedal control input, and the parameter for this is often buried three layers below a parameter softkey. Some surprisingly good valve emulations are available here, and I particularly liked 'Big Muff W/Dead 9V'.

For a unit labelled Harmonizer, the pitch shifting programs are oddly tucked away in Banks 36-39. Most of these work at all sample frequencies, and include a number with unusual implementation of delays, a few with a BPM setting, some fine-tune and special scales and modes programs, and a collection of spectacular unusual programs for some outstanding special effects. Not especially usable in most music production, but great fun for creating something amazing from a simple input source. There are separate banks of phasers and modulation delays

Banks 28-34 include a huge palette of reverbs, which are clear, rich, warm, and easily editable. For a box labelled Harmonizer, this is a remarkably good reverb unit, with a rich flavour of its own. The reverb programs are subdivided into categories, so there are such banks as Halls, Plates, Small, Unusual and so on, and finding what you want isn't too difficult.

The nature of the modular program construction means that all sorts of 'optional extras' crop up in programs, leading to unusual parameters and possibilities. In the bank labelled Percussion, all manner of modules are combined together for some terrific beat-enhancing programs using filters, delays and reverb. The Vox bank includes smooth compression effects designed for insertion. Two banks are devoted to MIDI-controlled effects. Some of the more bizarre effects are found in banks labelled Manglers, Film Atmospheres and Multi Effects. A Utilities bank includes useful test signals, a Chromatic Tuner and a Spectrum Analyser. Mastering Suite contains some useful and clever presets—and with 96kHz available on all of them the 7000 becomes a superb mastering tool.

Even if you've never encountered an Eventide unit before, it is easy to locate, load and edit programs, and get on with the job in hand. However, the system for designing your own programs is extremely complex. As well as the 80-page User Guide, the ring-bound manual folder also includes two further sections. The first is a programming guide, and the second contains a description of each of the 177 modules used to build programs. The Programming Guide contains an extensive introduction to the concepts involved, then it is subsequently divided into two sections: 48 pages regarding VSigfile programming, and 33 pages regarding the front panel patch editor. Although the procedures are roughly similar, obviously the different mouse clicks-button pushes and displays are vastly different. For serious programming VSigfile is essential, including as it does features such as the construction of 'Supermodules', which can be stored and re-used, and of course the opportunities to save and email programs. No doubt, the EVE/NET controller makes programming easier, but the display on the remote unit looks to be no larger than that on the front panel of the DSP7000. The Modules manual consists of a description of each of the 16 module types, such as Filter, Oscillator, Reverb, Detector, Control Math, Nodes and so on. There then follows an alphabetically organised series of chapters describing each module, and listing its available parameters and ranges: Specifiers, Control Inputs and Outputs, Userobjects (for parameter display on the DSP7000 panel) and so on. To me this seems to take you nearer the deepest innards of the machine than is generally necessary. Fairly advanced maths and computer programming concepts are involved, perhaps beyond the average musician and even many recording engineers...

The DSP7000 lacks some of the elegance of some other studio units. The user interface is slightly clunky, the design looks dated, and it is very difficult to create programs. Despite this, the instant gratification available from the many fantastic sounding presets, and the indisputable signal quality make this a terrific machine, and there is nothing else quite like it. □

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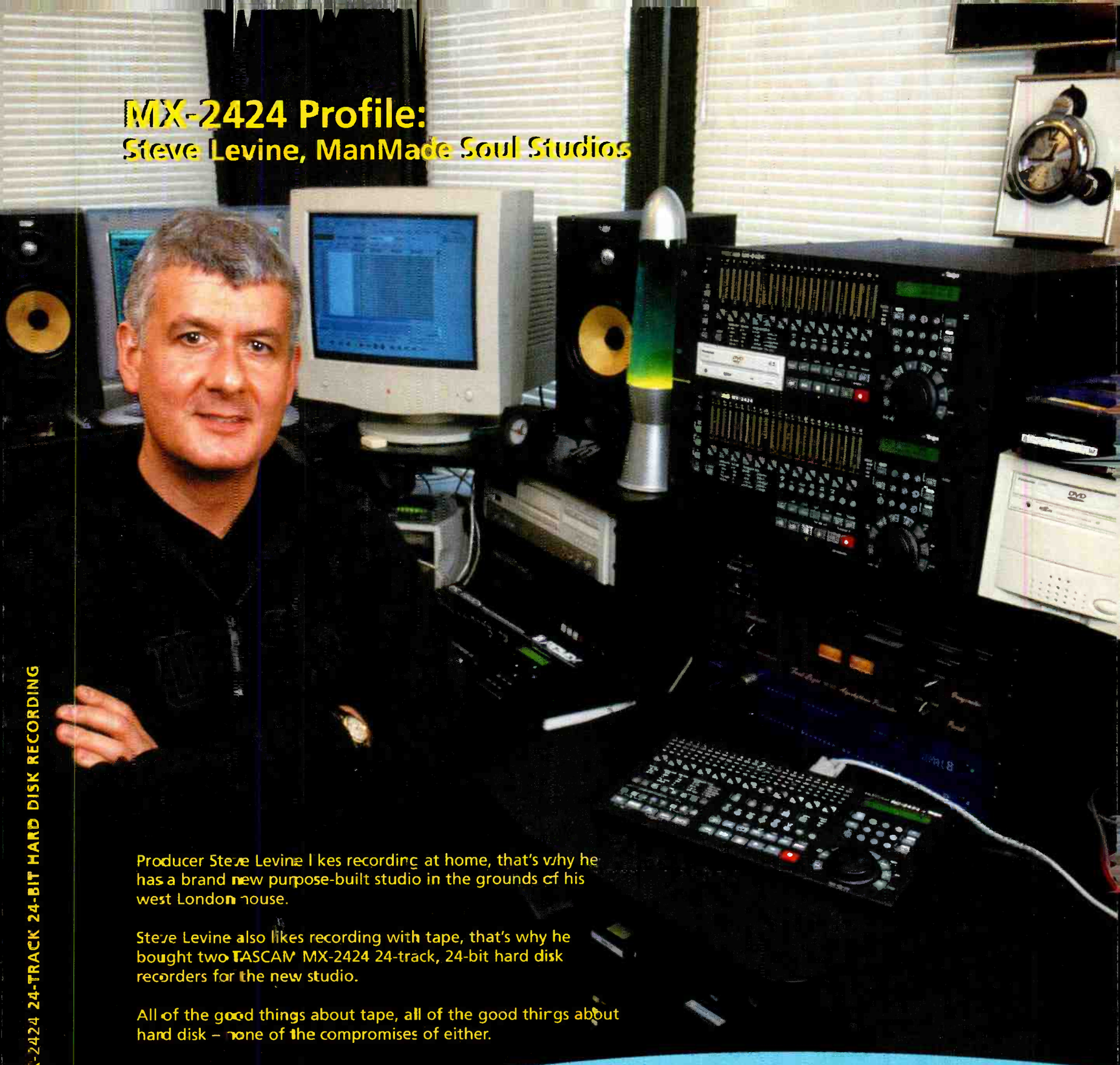
MX-2424 Profile:
Steve Levine, ManMade Soul Studios



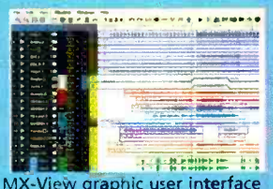
TASCAM MX-2424 24-TRACK 24-BIT HARD DISK RECORDING

Producer Steve Levine likes recording at home, that's why he has a brand new purpose-built studio in the grounds of his west London house.

Steve Levine also likes recording with tape, that's why he bought two TASCAM MX-2424 24-track, 24-bit hard disk recorders for the new studio.

All of the good things about tape, all of the good things about hard disk – none of the compromises of either.

Steve Levine: Culture Club, Honeyz, Denice Williams, The Beach Boys, West World, 911, Ziggy Marley, Gary Moore, Beckley-Lamm-Wilson, The Creatures and Quarterflash.



The new MX-View graphic user interface software, available soon for all MX-2424 owners. Includes powerful waveform editing and much more.

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C-Lab Time Machine

Unlocking the secrets of time, C-Lab's universal clock convertor promises to keep audio and video in line. **Rob James** finds Jules Verne in the detail

TIME IS ETERNALLY FASCINATING, both from a philosophical and practical standpoint. Subjectively or objectively, our whole existence is governed by the passage of time. Perhaps this is why we have contrived so many confusing ways of describing, measuring and manipulating it.

Concepts of time are intrinsic to concepts of sound. Rhythm, pitch and even timbre—all ultimately depend on time. When recording or reproducing sound, analogue or digital, there is no way of escaping time considerations. Once pictures or synchronisation of multiple machines become involved, the fun really begins. Only meticulous attention to detail can avoid serious problems.

Wherever digital recording and time code are involved, the same time base must be used for digital audio and time code. If the same clock serves both purposes or two clocks are locked, then a playback lasting one second of time code will output exactly the correct number of samples, the pitch will be correct and will play for one second of real time. (If the sample rate is identical to the one used for recording.) If the time code and sampling rate time bases are different, there will be a choice on replay. Either the sampling rate and thus pitch can be the same as the original or the time code can be made to run in sync—but not both.

This basic point has been known to confuse even the brightest of people and that's before any discussion of drop-frame and pull-up or pull-down. The tension which arises between these potentially conflicting requirements needs solid, engineering solutions. There are two well-trodden paths to sync nirvana. In an ideal world, everything is referenced to a single, common clock. Alternatively, one machine is designated as master and all others derive their sync from it. (Sometimes referred to as, 'the tail wagging the dog'). The first method is generally more reliable and less error prone.

In major studios, and especially broadcast houses, everything is referenced to 'house sync' (apart from machines incapable of external synchronisation such as most CD players). House sync is usually distributed throughout the facility as 'black and burst' from a video sync generator. Wordclock is derived from, and locked to, the black and burst. Wordclock at various rates can easily be derived from this. If wordclock is used as house sync, all studios in a complex are effectively obliged to work at the same sampling rate. In certain circumstances, the second technique may be usefully employed. However, where a machine cannot accept external sync, it is often a tidier, and many consider a preferable solution to use sample rate conversion or to convert to analogue and back to digital.

The second method is also commonly found in smaller studios due to the cost considerations of separate clock generation and distribution. C-Lab's Time Machine is designed to address common synchronisation issues at sensible cost. It also deals with many of the more esoteric permutations. A versatile sync convertor-generator is combined with other desirable functions. Time code reader-generator, 9-pin (Sony P2 protocol) controller-slave and a video inserter which allows time code to be 'burnt in' to either a composite or S-VHS video signal. MMC commands are converted to control a 9-pin machine. For more complex installations where the number of sync outputs would prove restrictive, C-Lab offers the option of a further six BNC outputs. Similarly, for multiple 9-pin control, there is the option of a further three outputs.

Wherever possible, wordclock and especially superclock connections should be kept short (ideally below 10m) and of equal length. This is restrictive in many situations. For example, where a noisy PC is installed in a machine room. To allow for super clock connections up to 30m to remotely sited equipment, a further option is planned. This will use the C-Net connection and a BoB (Break Out Box). BoB will also have RS422/RS232, a com port to connect to PC or Mac, a USB port and two BNCs. The bright panel LEDs give

Hands on

HOUSED IN THE ubiquitous 1U-high box, the front panel of the Time Machine is commendably simple. A two-line backlit LCD dominates the centre section. The only operational controls are four diamond-shaped keys for menu navigation. Two rows of four bright indicator LEDs radiate towards the LCD from the centre of the diamond.

The rear panel is busier but logically broken up into blocks. A pair of BNCs and mini DINs do double duty as VITC I-O and time code Inserter. Video sync input, with termination switch, is BNC as are wordclock I-O and separate X256 (superclock) output. LTC I-O are on 1/4-inch balanced jacks. COM is an 8-pin mini-DIN for connection to a PC or Mac. AES-EBU audio I-O are XLRs and expect-output 'audio black'. SPDIF out is a phono. MIDI I-O are DIN and there is a single 9-pin sub-D for RS422 machine control. Apart from the IEC mains socket, the final connector is an RJ 8/8S 'C-NET' socket.

Two option slots are labelled A and B. In the review machine the first slot was occupied by a sync board with six BNCs. One internally jumpered to give video sync (black no burst). The rest had options of word clock, superclock, 75Ω AES-EBU, video sync—there's even a RED light switching GPI. Some with impedance options to deal with 'difficult' equipment. Each output can be internally jumpered to output video or other options. A second sync board may be fitted if extra 9-pin outputs are not required. A 9-pin 'virtual machine' option is under development.

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you the essential information, at a glance and from the other side of the studio.

Since there are a large number of menu parameters and much information to impart, the display has eight Operational pages. Navigation is reasonably straightforward using the diamond keys. LEFT and RIGHT keys move between items in a page; UP and DOWN keys change parameters and, when the cursor is bottom right in the display, scrolls pages. The cursor will only move between parameters which are user adjustable and these vary according to other selections. Similarly, some menu items only appear when appropriate—Page 8 brings up options specific to whatever 9-pin machine is connected. (If the Time Machine recognises the machine ID code from its library, currently around 40 machines.) Pressing the LEFT and RIGHT keys simultaneously brings up the 'service' pages, SP1, SP2 and MA (Machine A).

The Time Machine can deal with a huge variety of permutations. To make things a little easier C-Lab has provided nine presets in three groups, Euro, US and US drop, subdivided into Internal, Video or LTC. These provide a good basis for most purposes and may be modified and the result saved in one of three user stores. When creating a setup from scratch the logical starting point is the local video standard followed by the frame rate. SP1 is where presets are saved and loaded. MMC and 9-pin parameters are set in SP1 and SP2. The Machine page, MA, has transport controls, used to check correct functioning of the 9-pin machine. Current settings are remembered on power down so the Time Machine wakes up in the same state it was left.

The devil is always in the detail. C-Lab has given it considerable attention and it has paid off. Sample rates from 16kHz to 192kHz all with pull-ups and pull-downs, auto or manual selection of VITC read lines, sensible display options for BITC (Burnt In Time Code), time code offset, 1/4- or full-frame MTC, dropout compensation and duration of validity check, MMC virtual machine and so on.

One socket is used for either 9-pin master or slave. This arrangement usually requires two cables, one with the Tx and Rx crossed. C-Lab has rendered this unnecessary. Selecting Slave changes the connection internally saving a lot of aggravation. I tried many of the possible configurations but by no means all.

It is easier to list the things which the Time Machine does not do. It is not a time code gearbox (or a Tardis). Once set up it should be the quintessential 'black box', sitting invisibly between other equipment.

Just for fun, as an example of its capabilities, I connected a Yamaha 03D to act as an MMC controller, with the 9-pin socket connected to the input of a CB electronics SR-3 controller-synchroniser and a Tascam DA-60 Mk.II connected as a slave from that. I used the inserter to burn in time code to a video source.

A Rosendahl Nanosyncs fed the Time Machine, video and SR-3 with Black and Burst and everything else with word clock. One press of the PLAY key on the 03D and—nothing. I eventually found the mug trap; MMC machine IDs can start at 0 or 1 depending on the machine. In this case the Time Machine starts at 0 and the Yamaha at 1... Once I'd sorted this, the setup worked well. The only thing I missed was some indication of whether MMC commands were being received.

After discussions with C-Lab's Achim Kruse, it was established that future Com In and Out LEDs will be used to indicate MIDI activity when the Com port is disabled.

When debugging a complex setup there are so many variables to consider you need all the help you can get. One advantage with this type of arrangement is that the machines can be controlled from whichever panel is nearest at the time. There are obvious dangers if several operators are involved but for a one person studio it's great. Drive the system from the sequencer controls, the video front panel or whatever you are concentrating on at the time.

Dealing with material shot at different frame rates in the same production used to be a real headache. You might think this should never arise but there are some good reasons for doing it—when using film cameras and HMI lighting, there is a danger of strobing effects when shooting 25fps with 60Hz lights. Many productions involving international locations in the same show shoot 24fps-60Hz in the US and 25fps-50Hz in Europe. If the material is to be edited at 25fps the 24-frame material needs speeding up to 25fps.

Ten years ago we had to bodge a video sync generator (worth around three times the Time Machine's asking price) to run at the wrong rate in order to do these transfers (audio went back to analogue). The Time Machine allows pull-ups and pull-downs to be accomplished by simply selecting the appropriate conversion without obliging you to do the maths. Varispeed can also be entered as a percentage (±12.5%) or semitones and cents. Varispeed is always referenced to the selected Master Clock.

The Time Machine is subtitled Universal Clock Convertor, and anyone who has struggled with productions involving multiple standards or machines which won't talk to each other for arcane reasons is likely to think these functions alone sufficient justification for its existence. When the time code and machine control aspects are considered, the scales tip further. With option boards fitted, the Time Machine can provide all the sync facilities many people will ever need. With the bonus of the inserter. In more complex installations, it integrates well with other synchronisers and controllers.

There are many vagaries in synchronising multiple machines from a variety of manufacturers. Time Machine is clearly the product of people with considerable 'real world' experience of many of the horrors. C-Lab has already covered most of the bases and I believe it will continue to do so as new problems emerge. It is already co-operating with Steinberg, E-Magic and Mackie to ensure compatibility. All 'maintenance' software upgrades to date, expanding the library of 9-pin machines and so on, have been free of charge.

The option slots confer a degree of future proofing as new 'standards'—24P video and mLan begin to take hold.

Any facility which deals with multistandard material almost certainly needs a Time Machine. These days this probably means most of them. Many smaller studios and individuals especially, struggle with synchronicity. In my own experience there have been countless occasions when this machine would have saved a lot of time, money and heartache. □

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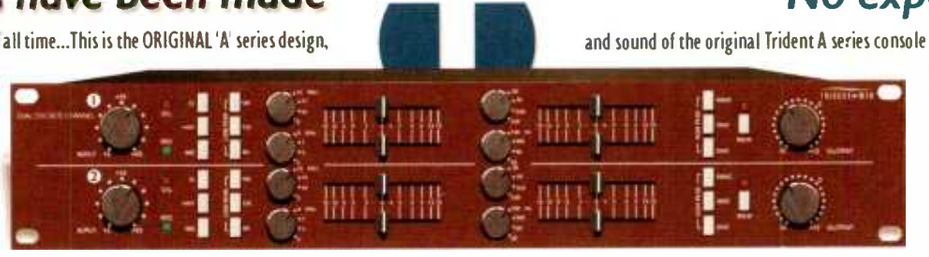

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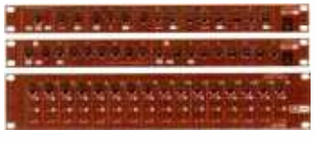

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REVIEW

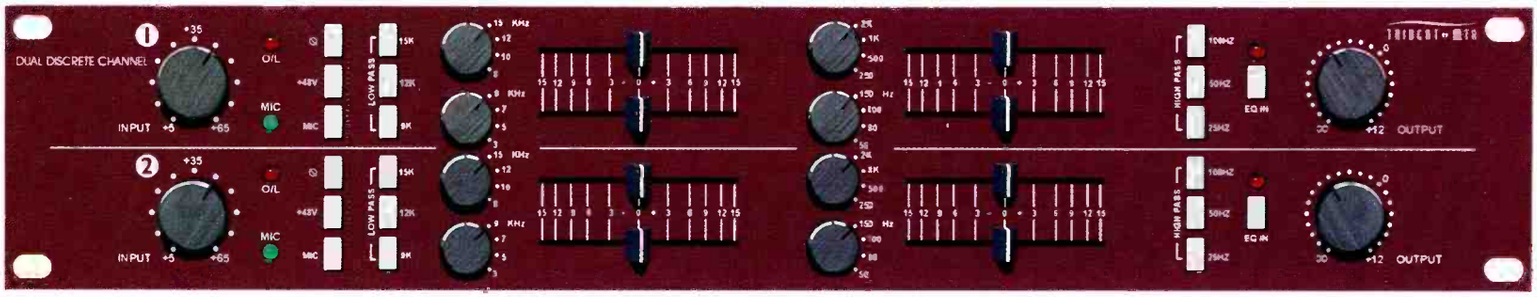
Trident-MTA A-Range

It's a crowded and busy world but there is always room for another mic preamp-EQ if its lineage extends back to an illustrious classic desk. **Zenon Schoepe** is knocked out

HARD ON THE HEELS of MTA's assimilation into Fletcher ElectroAcoustics and the rightful reconnection of the Trident console brand name with Malcolm Toft through Trident-MTA comes the first in a promised series of outboard that draws on Toft's contribution to the history of professional audio. It's a dual-channel EQ with filters and mic pres which has been put together to mimic the performance of the Trident A-Range mixers from 1974 but implementing changes that improve on the original's noise, distortion and overload figures. It's an approach that any re-creation must embrace if it is to cut it in today's studio environments.

It's a smashing looking box finished in a shade of dark red not dissimilar to the colour used on the highly desirable collection of 'ruby' outboard, recorders, speakers, and mics that marked *Studio Sound*'s 40th anniversary celebrations. It's a 2U box and you'll notice the use of centre detented sliders for the gain controls in the EQ section but what the picture won't communicate is the retroness of the switches and the super feel of the knobs.

The two channels are stacked one above the other and flow left to right from input controls to the output stage. The input gain control is followed by an overload LED and Mic selection indicator. There are switches for phantom power and phase reverse and the three switches each for the high- and low-pass filters that are 3dB down at 25Hz, 50Hz and



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100Hz and 9kHz, 11kHz and 13kHz respectively. The two mid frequencies centre around 3kHz, 5kHz, 7kHz and 9kHz and 8kHz, 10kHz, 12kHz and 15kHz. Boot and cuts are 13dB across all bands as on the original.

I have to admit that aside from familiarity with the provenance and importance of the Trident A-Range, like many (ahem) younger operators I have had no practical experience with the desk so my comments and evaluations are those of a first timer. Those with a (ahem) broader experience of life would need to play with this box and draw any comparisons and conclusions for themselves but they are going to want to like it.

The thing is that I was predisposed favourably towards this unit before I even turned it on because it's different and if you know your Trident history you know that it's probably going to be a bit special. As a consequence my expectations were actually quite simple to satisfy—a smattering of brilliance and magic was all I was looking for as the controls kind of suggested that I was not entering the realms of surgical precision. By the same token no EQ hacks me off more than one that goes from nothing to too much in a quarter turn.

This A-Range falls precisely into top of the pile of tracking EQ. Perhaps limited by components, expectations and imagination but older console designers had the right idea about EQ long before every desk from budget to flagship was equipped with every budding designer's idea of full-blown multiparametric band EQ for all seasons and all things. The classic recordings sound as good as they do because the sound was created at source and tonal shaping was, if we're honest about it, fairly limited. The engineers of those days would probably not have been that impressed with the sort of circuits we currently use now, condemning them for 'screwing up' their sounds. The A-Range is all about less and more of what ever frequencies you choose to home in on. It is impossible to screw up a good sound with these channels and there's stacks of headroom available to absorb the sort of wide boosts that can be applied.

The mic preamp is especially classy with a warm mid-range and broad bottom end yet it's still wide enough and quiet enough to be up there with all-new modern designs. But the EQ is quite simply fantastic. The word 'musical' has been frequently attributed to so many equalisers but I have to say that this one really deserves it. The response is so unlike modern designs and so unobtrusive. You can pull down a 2kHz shelf across a stereo programme and still feel the track come through without artefacts further down the spectrum. The mid bands are so gentle and uplifting and sit on top of the signal rather than in it imposing a refined envelope. It's an enlightening education process because while the effects of the bands are slightly surprising at first to ears tainted by years of using modern circuits, they begin to make sense and quickly become accepted as being better—kinder to the signal, more sensible, preferable, just plain better. Treble and bass control is exemplary for those who want to put a smile on a dance mix but the same logic transfers to classical and jazz with the same musicality. Not a one trick box then.

Apologies for ranting about this A-Range equaliser but I can't remember the last time I got quite so excited about a piece of analogue outboard. It is superb in every respect with a sound that is right out there on its own. If one of these were placed in every single domestic hi-fi and every studio then the common appreciation of sound would be changed and the world would be a much better place. I can't recommend it highly enough. □

Circuit update

SYSTEM DESIGN FOR the Trident A-range desk was by former Trident founder and MD Malcolm Toft with electronic design by Barry Porter. Toft has reinterpreted the design in this new unit with electronics by Ted Fletcher. Superb pedigree then.

The mic preamps retains transformers but with a modified ratio to the original plus an integrated amp and multistage amp for the gain stages switchable in 11 steps of around 4.5dB each. Filters are recreations of the original's Sallen and Key arrangements for rates of 12dB-octave which claim minimal phase shifting close to the selected frequencies.

The A-Range's EQ was 4-band with Baxendall HF and LF shelves and 4-frequency broad mids (Q circa 1.2) and this has been recreated and it has to be said enhanced. The latter use inductors that are said to be an improvement on the original which was compromised by available desk panel space and employ two large hand-wound inductors. In place of the original's channel fader the new model uses an output stage with gain control.

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Acutron Digiroute 8

Addressing numerous key issues, this Portugese router, distributor and sample rate convertor may prove to be a studio essential. **Rob James** preaches about the converted

DIGITAL AUDIO, wonderful as it is, has made life a lot more complicated in some areas. Leaving aside considerations of impedance matching and so on, the only thing you really had to worry about with an unknown analogue signal coming down a line was the reference level. With digital, there are also sampling rate, bit depth and synchronisation considerations.

Acutron Electroacustica is a new name to me. The company is based in Portugal and manufactures a range of analogue, digital and digitally-controlled analogue equipment. In fact, the company uses two registered trademarks, Acutron and Larsen—the second of which will be more familiar to some, chosen in homage to Danish Physicist Søren Larsen, the man behind the acoustic feedback theory.

The Digiroute 8 is an 8 x 8 AES3 router, a distributor and, perhaps most importantly, a multichannel sample-rate and bit-depth convertor. In fact it's really an 8 x 9 since there is an extra AES output ostensibly for monitoring.

There are plenty of 8 x 8 AES3 routers and distributors around these days but several things separate the Digiroute from the rest of the herd. For a start it can handle sampling rates up to 96kHz. It also has analogue and AES3 monitoring outputs. This gives 8+1 outputs on board, since the monitor output is available both as digital and as a variable gain balanced analogue. Thus it can be used as an ordinary AES3 output (that extra one you didn't think you would ever need...). But for me the key feature is independent sample-rate conversion on each input. This operates over a maximum range upwards or downwards of 3:1 in relation to the selected output rate.

The Digiroute stores up to 50 configurations in onboard non-volatile memory. Once programmed these may be recalled from the front panel keys without the need for a PC. Programming is achieved using a PC terminal application, also called Digiroute 8. This runs on any PC under Windows 98 or Windows NT4 Service Pack 6. If the supplied application doesn't do it for you, or you need to integrate the Digiroute into a larger control system, the communication protocols are readily available from Acutron. Digiroute's serial ports are ES-bus compliant. This means up to 32 ES-bus machines of various types, tape recorders, synchronisers, and so on, may be connected to a single bus.

Normal operation from the front panel keys is ridiculously simple. If the unit is powered up without any keys pressed it enters Preset Select mode. The increment-decrement keys are used to select the required preset and the ENTER key pressed to load it. Where Digiroute is to be used with other ES-bus machines it is useful to be able to set the machine address from the front panel. If powered up or reset with the UP key depressed the unit enters address setting mode. The UP and DOWN keys are used to select any suitable address, 1-32 then the ENTER key stores the value and exits to Operating mode. A Test mode can be entered or the unit completely reset to the default condition by powering up with other keys depressed.

With the unit connected to a PC and the basic parameters set, connections are made in the familiar manner—on an 8 x 8 grid. Clicking on a crosspoint puts a green square in the box and makes the connection. An input may be connected to any number of outputs but only one input per output is permitted. This is a router not a mixer.

When a configuration is complete it can be saved by selecting a suitable location number and clicking the RECORD button. Previously saved configurations are loaded by selecting the number and clicking RECALL.

If the design of a router is inadequate, changing crosspoints while passing audio will result in high level clicks. This is especially true where signals are not synchronised. In the case of Digiroute switching it is almost always silent.

Whenever an input error is detected the label background turns red. The indication appears very sensitive since I rarely heard any disturbance.

Recalling a complete configuration results in a momentary muting of the outputs, not surprising and much preferable to clicks or other artefacts.

I can foresee several applications for the Digiroute 8. Any facility that regularly has to deal with digital audio of dubious parentage will find it invaluable—outside broadcasts are a good example. It is also an ideal method of increasing the number of inputs to a console. Used in a transmission or central switching area it can accept a variety of sources, convert and route or distribute them as required. The monitor outputs could be particularly helpful here.

Thanks to the 32 unit addresses, multiple Digiroutes can be controlled by a single computer although there is no way for interconnecting units to produce larger matrices. (16 x 8, 16 x 16 and so on.) Most impressive are the conversion functions. Sample-rate conversion deals with wide variations in input rate without audible disturbance, in my experience even where a source is dynamically varying in rate. Inputs of less than 16 bits are automatically dithered to 24. These features help the Digiroute fulfil its promise by making life in the fast lane easier and safer. Anything which helps to make interconnection easier, especially in a high pressure broadcast environment, is most welcome and the Acutron Digiroute 8 96kHz does exactly this.

Software installation is simple. Double-clicking or running instal.exe installs the application files and adds a line to the autoexec.bat file. After a reboot you're in business. Clicking any button on the main screen brings up a Select Unit screen. With the unit number selected, a button with a green door icon allows you to proceed, or another with a red cross icon exits. Next comes a password—although this can be disabled. There are two levels of password, operation and configuration. Once the correct password is entered the entire main

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screen appears. Most of the space is occupied by an 8 x 8 crosspoint grid. The right-hand side of the screen is divided into four blocks. Output sampling rate display, a monitor section with an OK or Error indication, analogue output level indicator and increment—decrement buttons to set the level. The configuration selector has SAVE and RECALL buttons, configuration number display and increment-decrement buttons.

The final block is 'housekeeping'; Configuration with a key icon, Configuration Erase with a square icon which erases the current configuration both in software and the current unit and INFORMATION and EXIT buttons. Before making any crosspoint connections the output sampling rate and sync source should be selected. This and other basic configuration items are accessed via the button with the Key icon. On this screen output sampling rate can be set to internally generated rates of 32kHz, 44.1kHz, 48kHz or 96kHz or to external house sync. There is also a setting for User Default sampling rate which comes into play if the house sync is lost. Also available in this screen are Unit Address number setting, Unit keyboard lockout, ES-bus termination switching, Reset Defaults which resets everything except passwords and configuration memories and Erase all presets which does what it says to both the PC and the unit. The EDIT button allows inputs and outputs to be given meaningful names by placing the pointer over an input or output and typing into the text box on the main screen. The remaining button brings up the serial port configuration screen.

The Status bar is used to provide information and on-line help as the pointer is moved around the screen—moving the mouse pointer over an Output number or name brings up which input is feeding the output, the format (Professional or Consumer) and an approximate indication of the input sampling rate. The accuracy of this is limited by the hardware so if you need to accurately diagnose a sampling rate, for example whether a signal has been pulled up or down between drop and non-drop (0.1%), an external analyser will be required.

Any input or output may be routed to the monitor outputs by simply right-clicking its label. □

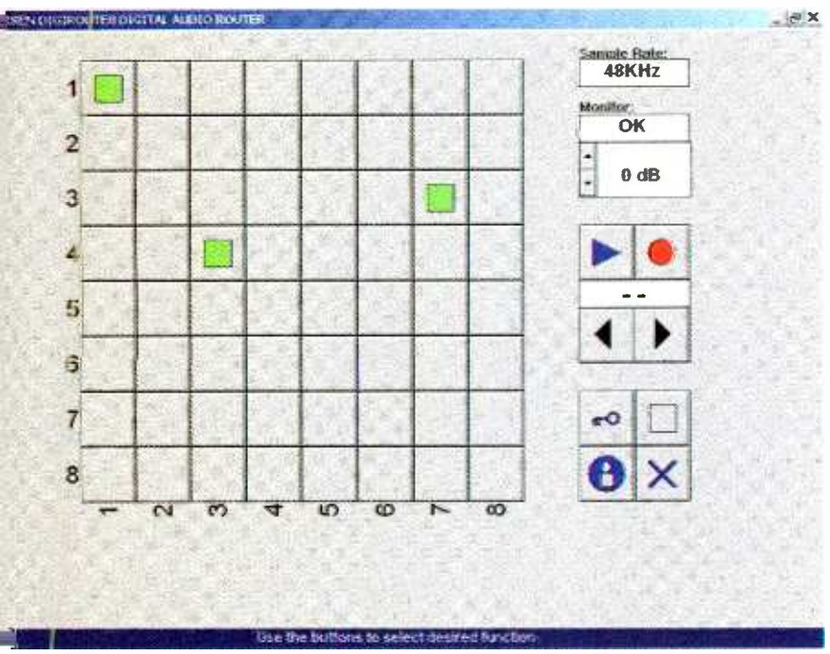
Hard news

HOUSED IN A SHALLOW, heavy, 2U-high box the rear panel contains 16 XLRs for digital audio I-O and a further five XLRs for AES house sync I-O, AES monitor out and analogue left and right monitor outputs. Two 9-pin sub-Ds are labelled ES-BUS IN and THROUGH. Power is IEC with a combined voltage setting switch, mains switch and socket. Delay through the unit is quoted at better than 2ms and dynamic range at better than 120dB. Inputs of less than 24 bits are dithered to 24 bits. All the digital outputs are 24 bits wide so if feeding a 16-bit destination, dithering is up to the receiver.

The front panel has a large and very bright two-character LED display and four square keys, ENTER, UP, DOWN and, RESET.

Contact:

Acutron Electroacustica, Portugal
Tel: +351 1 940 1785



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Antares AMM-1

Making a lesser microphone into a classic is the dream of recordists and the fear of mic manufacturers world-wide. **Dave Foister** dares to dream

DIGITAL TECHNOLOGY has finally brought us the ability to turn something into something else. Its similarity to the Philosopher's Stone has best been shown so far in the form of Autotune, making singers out of people who previously could never have hoped to be worthy of the name, and saving time at the expense of musicality and performance. If the only way people can appear to be in tune is to make themselves sound like Sparky's Magic Piano then fair enough; just don't expect us not to notice. Other transformations are perhaps more laudable, but one we might never have expected to see is the conversion of the sound of one microphone into that of another. The character of a microphone is something so diaphanous, so indefinable, that we might expect it to elude the analysis of DSP, yet here we have the Antares Microphone Modeler.

In principle it would appear simple. Analyse the transfer function of a known microphone, invert it so as to negate its effect, then superimpose the analysed behaviour of another known model. Hey presto: the world's most basic microphone becomes the world's most sophisticated, or more to the point the cheapest sounds like the most expensive. Or, more subtly, a microphone choice that in retrospect might not have been the most appropriate can be changed at the mixing stage. Sounds fine in theory, but one can't help feeling that if it was that simple somebody would have done it long ago.

But when you look at the detail, Antares has gone into with the AMM-1 it becomes clear that this is a major project, a significant investment in time and R&D that must remain an ongoing commitment. Within this simple-looking 1U-high box are contained the models of dozens of microphones, and there are several variants on almost all of them. It's not enough to take the behaviour of a given microphone in just one configuration and let that stand as representing it in all circumstances; where there are variations provided on the original, such as different polar patterns and low-cut filters, they must be available on the model as well. Thus the model of the AKG C414 has four polar pattern settings and both high-pass cut-off frequencies available. Proximity effect is also individually modelled for each microphone type; you enter the distance from source to microphone and the unit calculates the correct character of bass lift for the microphone in use. As the icing on the cake, a couple of the classic models have two versions available, being models of two individual specimens representing the variation that can occur in the real thing.

Antares is keen to stress, without giving details, that the process is a proprietary modelling technique that makes no use of FFT analysis or anything else that adds significant processing delay. The treatment is designed to be used live, with no more delay than that present in the acoustic path to the modelled microphone.

The process of using the unit is straightforward—first you enter the type of microphone used as the original source, complete with its variable settings. The table of available models can be scrolled through either by manufacturer, with a single move of a cursor to select models within that manufacturer's list, or by going directly through the lower-level list of all the models. Once the model is chosen, three buttons take you directly to pages that select polar patterns, filter settings and source-to-microphone distance. If you're using something like a B&K 4007 that has no variable settings, then none appear in the display. It's also worth being aware that some of the more elaborate microphones don't have fully comprehensive models—there are not nine polar patterns available for the C-12A for example, although there is a representative selection. The available list runs from dynamic classics from Shure and Sennheiser through many familiar and unfamiliar condensers right up to a rare Telefunken version of the U-47, still with its original tube. More have already appeared on Antares' web site and can be downloaded as MIDI files ready to be transferred into the AMM-1's flash memory.

Having matched the source model to the actual microphone being used, another model can then be chosen to have its character imposed on the sound, again selecting from the same list. Both source and model selections have A and B presets to match and compare settings, making it even easier to find the right model for the job. Putting the AMM-1 fully through its paces would require a lot of time and a better-stocked microphone cupboard than mine but I found it was able to do what it sets out to do—convert the sound of one microphone into that of another. I had a 414 on a sax and was able to make it sound like a U47; an E609 on a snare turned into an SM57; and most interestingly, a DI'd double-bass with a fairly nondescript electric-sounding bug was made to sound as though it was miked with a 4038, with particularly convincing adjustment of the distance to control the warmth (but no spill).

A usefully warm variable Tube Saturation stage completes the sonic adjustments, and a small set of system variables includes selecting digital or analogue ins, outs and formats, and managing the flash memory for additional models.

The manual warns (unnecessarily one would hope) not to expect silly things like making a $20 mic sound like a U87, or for the polar pattern adjustment to alter the amount of room pickup but within what can reasonably be asked of it the results are impressive—the kind of thing that keeps bringing a knowing smile to your face. It's cheaper than buying even one of the classic models it emulates so well, and consequently has enormous appeal to large and small studios alike. □

Contact:

Antares Audio Technologies, US
Tel: +1 831 461 7800
Web: www.antarestech.com

NEW TECHNOLOGIES

Universal audio codec

apt's WorldNet Rio-X21 is a full duplex multichannel, multialgorithm audio codec aimed at the broadcast and post markets. It offers backwards compatibility with the

NXL 384A, NXL 384D and DSM X21, which it is designed to replace, and has one X21 main line and one X21 as backup. It is the first commercial product to incorporate the enhanced version of apt-X, offering 20-bit and 24-bit operation. With the ability to deliver high-quality audio in inter-studio networking, remote-outside broadcasts and STL-TSL applications, the WorldNet Rio-X21 is suitable for AM, FM, DAB and other broadcast environments. Bandwidths will range from 3.581kHz to 22.856kHz depending on the network. apt, UK. Tel: +44 28 9037 1110.

Euphonix for broadcast

New enhancements for the System 5-B High Performance Broadcast Console offer features developed specifically for on-air broadcasting and postproduction. The v2.5 Software Suite includes the Model 403 Modular Postproduction Panel equipped with PEC-Direct monitor controls, dual motorised joysticks plus space for user customisation, the GPIO interface, a new graphical user interface (GUI) that allows 32 switch closures to be created from objects on the control surface, as well as allowing 32 external inputs to implement console functions. Frame options include a 48-fader desk that can be outfitted with two Producer's Desks plus loudspeaker shelves and a script tray. The Producer's Desk can be supplied with a large 16:9-format TFT screen for monitoring external video sources or workstation displays. System 5-B incorporates Multiformat Channels that enable an operator to control up to eight channels at a time from a single channel strip. Stereo channels can implement MS mic techniques, plus L-to-Mono, R-to-Mono and Balance. A Stereo Backstop PFL routes pre-fader signal to speakers. The console's Integrated PatchNet I-O Router can accommodate 672 x 672 sources and destinations at a sampling rate of 48kHz (336 x 336 at 96kHz). A Fail Safe and Diagnostics System provides hot-swappable redundant processing modules and cards that will automatically take over in the event of a DSP or control failure (failed cards may be hot swapped without having to reboot the system). On-Screen Diagnostics constantly report status of all system components, and provide confidence checks as well as troubleshooting. Other broadcast-savvy features include Red-Light and Floor-feed Cut switch closures. V2.0 software for the R-1 multitrack offers fail-safe and self-diagnostics, multiformat channels, expansion of the integrated PatchNet, plus a number of features developed specifically for the postproduction and broadcast industries.
Euphonix, US. Tel: +1 650 846 1142.

TL Audio front end

TL Audio's latest addition to its Valve Classics range, the VP-1, combines the best elements of the PA-1 pentode preamp, C-1 compressor and EQ-2 parametric equaliser to create a flexible valve front end. Additional features include an expander-gate, de-esser, peak limiter

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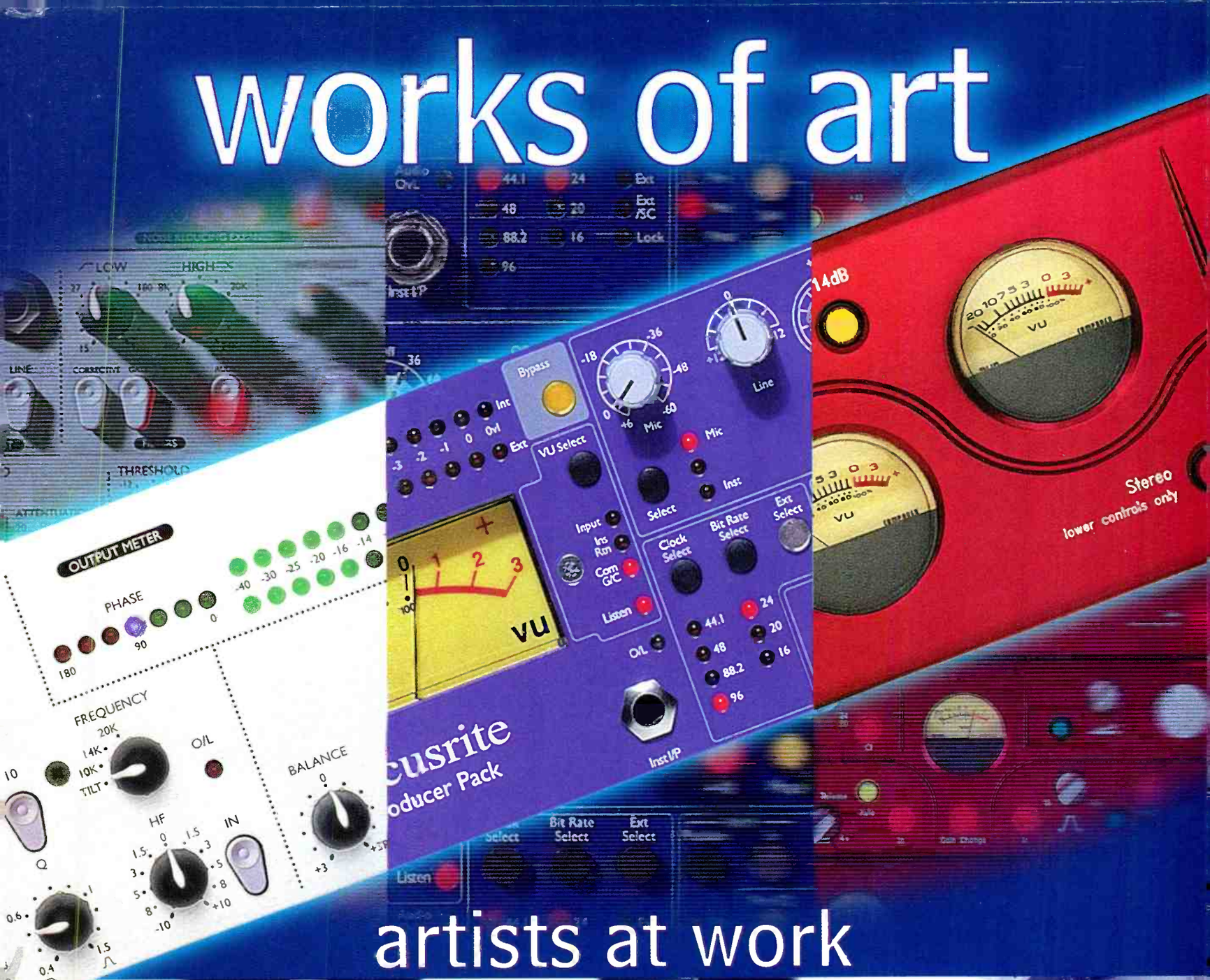
works of art



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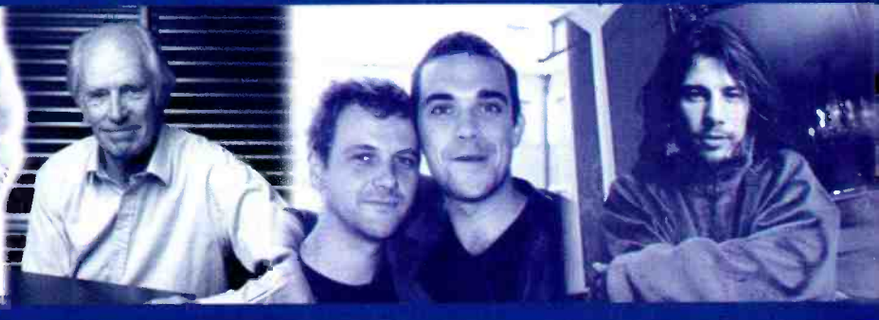

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Presonus VXP

Presonus' new voice-channel combines excellent audio, flexibile functionality and keen pricing. **George Shilling** racks it up

PRESONUS IS A YOUNG AMERICAN company based at Baton Rouge, with an unusual range of professional studio hardware solutions, including a number of preamplifier products. The company is rightly proud of its sturdy build quality, and all units include onboard mains transformers rather than 'wall-warts'. Internal power rails run at ±15V rather than the 5V of much of the competition, and components are often 'overspecified'. The VXP, although modestly priced, is no exception.

The VXP is an extremely well-featured voice processor-channel strip, crammed into a small 1U-high case.

The front panel is similar in style and material to those of the Focusrite Red range although the quality of the knob tops lets the side down a little—they look cheap and lightweight even though the pots themselves are nicely damped and notched where appropriate. On the rear panel are XLR balanced inputs and outputs: the XLR input is for microphone level inputs. There are effects loop send and return balanced-unbalanced jack sockets; and line level inputs may be inserted into the effects loop return jack. A large blanking plate hides the space where in the future might appear an optional digital interface, which would no doubt be useful to many customers. On the front are controls for the Mic Preamp, Compressor, Expander, De-esser, 4-band EQ, Limiter and Output. Each section includes LED indications of what is happening, and all the pushbuttons helpfully illuminate.

The Input section features a GAIN control and an 8-segment LED meter which is helpful when setting the level, reacting very quickly, although a slightly slower release ballistic might have been better. The preamp utilises a FET, with 'discrete class-A input buffers' which sounds clean and full, and is admirably quiet. There is a PHANTOM POWER button, and a useful 20dB pad. The Input section also features a knob labelled IDSS. This was also present on the M80 8-channel mic preamp (*Studio Sound*, April 1999) and adds even-order harmonic distortion. On some signals, with the knob up full, you can detect a loss of top-end, with slight added warmth and fuzziness, but often you can turn the knob from one extreme to the other and hear little difference. It is best at removing some of the brashness from such sounds as acoustic guitar and sounds like a Dolby A decode but more subtle. It is only available at the mic input, not for line signals. The Compressor section features an IN button, a 16-way preset pot, and input and output levels on a dual-concentric knob. The presets are divided into sections labelled Light, Medium and Heavy, and within each section the variations available are apparently differing characteristics. However, the only difference apparent is a gradual change of ratio, with an 8-segment LED meter showing gain reduction clearly. This simple arrangement allows a reasonable variation of effect but I would have preferred more conventional, meaningful labels on the MODE knob. The compressor seems to be preset with very fast attack and release, although it can sound fairly invisible even when many of the LEDS are glowing. The following section is a simple expander with dual-concentric controls for threshold and ratio which can work fairly unobtrusively if required, with subtle noise reduction achievable. Four LEDS indicate gain reduction.

Next comes the De-esser, and another a dual-concentric knob (for threshold and frequency) and a further four LEDS. This works well, reacting more quickly than other budget de-essers I have come across. It's certainly easy to find the correct frequency, and the range of threshold adjustment is wide. The following EQ section takes up the largest space on the front panel. The Low section is fixed at 100Hz shelf, and the High is a 12kHz shelf but dual-concentric pots for mid bands allow for fully sweepable frequency controls, both bands accompanied by a NARROW Q pushbutton. However, without this button pressed, the bandwidth already seems fairly narrow, allowing wah-wah style frequency sweeping, particularly with the High-Mid section. This doesn't seem so bad on the Low-Mid section, where both Q settings are useful. An 80Hz low-frequency filter is also available in this section. The Output section features a LIMITER knob, particularly useful for digital recording situations but there is no specific indication of limiter gain reduction. This is something of an oversight, as the only way of bypassing this is to fully turn the knob, so accidental limiting is a possibility. A single LED would suffice.

Overall, this unit performs well for its price, both in specification figures and audibly. Although the VXP tries to impress with its sheer number of LEDS and features, the latter all work well, making this an excellent front-end for digital recording set-ups. My only reservations are the cheap knobs, and the lack of limiter gain reduction LED. Although there are many voice-channels available, there is less competition at this midway price range. And the VXP is undoubtedly a match, sonically, for far more expensive units. □

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NEW TECHNOLOGIES

and optional digital output. The VP-1 features seven valve stages, run from a stabilised 250V DC supply. The first stage is a Siemens EF86 pentode in the front end of the preamp, followed by six Sovtek ECC83/12AX7A stages—one in the secondary stage of the preamp, one in the compressor and four in the EQ section. The preamp stage accepts mic, instrument and line level signals and the mic input is transformer balanced and offers a choice of valve or class A signal paths.
TL Audio, UK. Tel: +44 1462 680888.

ART 31-Band EQ

ART is now shipping the 1U-high Model 353 single-channel 31-band EQ. The unit has constant Q circuitry, 20mm centre detent sliders (with boost or cut range of 12dB), balanced XLR and 1/4-inch and unbalanced phono I-Os. Other features include a recording output, selectable low cut filter, LED level metering, variable input level controls, internal power supply and selectable line voltage switch.
ART, US. Tel: +1 716 436 2720.

A-T no frills UHF

Audio-Technica is describing the ATW1400 series as 'a new standard' in reliable, low-cost and easy to use UHF radio systems. Offering three fixed channels on license free frequencies, and five additional regulated frequencies, the beltpack system can be used in conjunction with a wide range of microphone options from A-T's Wireless Essentials range, including lavaliere, headset, boundary and gooseneck microphones. The ATW1452 handheld system uses an internal shock-mount and a high-energy vocal capsule for improved output. Systems feature the 1U-high ATWR14 true diversity receiver, and employ Audio-Technica's Invisible Link technology to optimise signal strength between receiver and transmitter.
Audio-Technica, UK. Tel: +44 113 277 1441.

Wireless fishpole

Sennheiser has introduced a wireless fishpole kit that works with any brand of mic. The kit comprises a Sennheiser evolution 500p UHF miniature plug in transmitter and RF receiver system, a K&M long or short mic boom, a Rycotte Universal suspension and universal clamp. The evolution transmitter dispenses with the requirement of attaching a separate power supply as it generates 48V phantom and has 16 preset channels tunable from a 32MHz window, and an LED display.

Sennheiser, UK. Tel: +44 1494 551531.

DSP Releases AVtransfer v2.1

DSP Media's v2.1 for AVtransfer is the company's multiformat, multistandard conversion software which opens, plays, combines and exports audio files and projects in any of today's leading professional formats. With v2.1, AVtransfer is able to store long clip names (up to 64 characters), allow exporting of 8-bit wave and AIFF files and most significantly, can import CD tracks and index points as separate clips, already correctly named from a SFX database from any CD library. It enables

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NEW TECHNOLOGIES

sound effects CD libraries to be transferred onto hard disk easily using the software's SFX browser and import feature and recognises multiple indices per track, bringing each index across as a separate audio file. The sound effects name databases supplied with the CD can be merged with the CD tracks as they are being imported for automatically naming the imported clips (tracks and indexes). Sync points, not just at the head, can be defined when tracks are being imported to the OMF format. AVtransfer can be utilised for file conversion from existing CD-based libraries into the format of choice and can also convert existing disk based libraries to other formats.
DSP, US. Tel: +1 818 487 5656.

Seasound Soloist
Seasound's Soloist is a rackmounted multi-input interface for PC or Mac with a phantom powered mic preamp and instrument preamp, MIDI I-O and a headphones amp. The device includes the company's zero latency monitor mixer and is compatible with the Solo Expander which adds six discrete input and output channels for a total of eight I-O channels with 24-96 convertors. Soloist comes with Cubasis VST and Sonic Foundry's Acid Rock.
SCV, UK. Tel: +44 20 7923 1892.

Requisite Audio Engineering L2M

A new mastering limiter-expander from California adds modern cons to proven performance. **George Shilling** weighs it up

THE L2M IS BASED on the Teletronix LA-2A Levelling Amplifier, which was recently re-issued by Universal Audio Classics in America. Requisite already manufactures an LA-2A based unit in the L1, but the L2M has more to it than two L1s bolted together. Both models are built to extremely high specifications, and boast a number of improvements over the original design. Due to the care that goes into their manufacture, only five to six Requisite units are made each week. Danny McKinney, a former professional musician, oversees a team of only three people handcrafting units in California.

The 3U-high L2M is fairly large for a stereo limiter but although fairly shallow, the original LA-2A was 3U-high and mono. However, the sheer mass of this thing is something to behold—my bathroom scales indicated 10.5kg. It is beautifully constructed, both externally and internally. The thick deep red metallic front panel is host to a large number of big toggle switches and black knobs, all clearly legended. On the rear are recessed alcoves, which house the valves, enabling inspection and replacement without taking the lid off. Inside is a huge torroidal mains transformer, which accounts for much of the weight, and all connections are soldered point-to-point.

Other improvements over the LA-2A include a vastly increased frequency response: from 10Hz, down less than 2dBs at 80kHz. The input impedance is higher for better interfacing with modern equipment. Unlike the LA-2A there is a useful BYPASS toggle switch, separate for each channel, making a straight connection from input to output. Switches and valve sockets feature gold contacts. On the rear are XLR signal connectors, along with jack link sockets for multiple units to connect together for 5.1 operation.

On the front, the two channels' controls are arranged in an unusual mirror or 'butterfly' formation, so working on both channels takes a little thought at first. The POWER toggle mirrors the STEREO LINK toggle. All other controls are duplicated for each channel. A pair of smart black vu meters dominates, switchable between Gain Reduction and Output level (calibrated to +4dB) modes. These are beautifully illu-

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minated. At the top outer corners are the Output Level knobs. These are gain make-up controls with stepped half-dB notches from -3dB to +8.5dB—each step has a separately wired resistor. Now that's what I call obsessive. A set of +10dB toggle switches introduce a boost making Unity equal to +10dB, enabling larger make-up gains. Adjacent are the Peak Red/Exp knobs, which are continuous pots, used for increasing the side-chain signal and effecting more gain reduction. The Response Curve pots bring to the front panel a feature more often found as a screw-pot on the rear. Designed for broadcast use in the 1960s, these now have a useful function when compressing programme material, effectively providing a variable high-frequency boost in the sidechain. This goes from Flat to 10dB boost at 15kHz, tapering down to no boost at 1kHz. This works superbly to reduce pumping caused by energetic bass frequencies, as the compressor responds more to the high frequency part of the signal. Ratio switches select between 3:1 and 10:1 modes, the equivalent of the LIMIT/COMPRESS toggle on the LA-2A.

The optical compression and limiting is terrific, with similar fast attack and two-stage auto release characteristics to the LA-2A. With no attack or release adjustments available, you must decide simply which ratio, and how much. By using the Response Curve knobs some terrific mix enhancement can take place. All kinds of material sounds full and punchy, without pumping. Indeed, the manual interestingly boasts, 'no loss of high-end or undulating bottom'. This I can personally vouchsafe.

The Expansion Range knobs form part of a circuit designed by Bob Norberg, a Capitol engineer since 1967 with a fantastic recording and mastering CV which includes The Beach Boys, Nat King Cole, Frank Sinatra and the Ultra-Lounge series. The idea is to restore some dynamic range to mixes that have been over-'finalised' or compressed. In my experience, expansion can rarely undo compression, but this circuit can be effective in some situations. When the LIMIT/EXPAND toggle is flipped, this circuit comes into operation. By increasing the Expander Range knobs, the input level is reduced, with expansion occurring from this new lower level to the former level, at a threshold set by the Peak Red/Exp knobs. Although the range is only about 7dB at full tilt, this is plenty for restoring some excitement to 'squashed' sources. The meters indicate expansion in a kind of back-to-front manner, simply because there is no practical way to make them work the other way round. Expansion relies on you wanting the loudest bits even louder, so it is not always successful, but by using the optical circuit's attack and release character, this is more forgiving than most.

The L2M is by no stretch of the imagination 'cheap' but at around the same price as the reissue (mono) LA-2A, and with so many 'improvements', this represents excellent value, especially as a 5-year warranty is included. For the LA-2A fan, the Requisite is required listening. □

Contact:

Requisite, US.
Tel: +1 818 247 2047

NEW TECHNOLOGIES

Acoustic bricks

A high performance Coustone acoustic brick has been launched by CEP Acoustics for applications where architecturally complex surfaces make the use of acoustic panels impractical. The bricks retain the sound absorbing and sound insulating properties associated with Coustone panels and have a double bonded fixing method. They are constructed from bonded flint with air cavities with 0.95 NRC absorption and sound insulation averaging 46dB SRI.
CEP Claddings, UK. Tel: +44 113 2304411.

Web-based logging

LogDepot is described as a solution for registration and logging of audio channels using MPEG Layer II, MP3 and Windows Media Format. It has a web-based interface and export functions offer the possibility to convert to other formats with sample rate conversion

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Marantz CDR500

Proving that CD-R is not now just all about price, a machine has arrived that is a recorder and a duplicator and much more. **Zenon Schoepe** prepares for the glass master

HAVING RECENTLY DECRIED the lack of anything substantially new in the way of standalone CD-R machines apart from the irresistible drop in price with no appreciable difference in quality, performance or features, it is refreshing to be confronted with Marantz' CDR500, a machine that breaks new ground and introduces a few new concepts.

Few manufacturers have attempted to address multiple drive issues in professional circles and the observer may regard this as something of a missed opportunity. This new box contains a reader and a writer drive in a

2U-high chassis but with a wealth of rear panel connection possibilities. For starters the recorder gets balanced XLR inputs with rear panel individual trims and phono I-Os—input selection is via a rear panel switch. It also gets SPDIF coax I-Os and a loop-through coax SPDIF plus an SPDIF optical input. The player has phono outputs and an SPDIF coax output. Needless to say connection between the two drives for duplication purposes is performed internally and digitally. Dupes can be made at normal speed, double speed, which naturally can't be monitored, with and without autofinalising. Of special note is the CDR500's ability to perform Disc At Once duplication from the lead-in to lead-out without interruption which gets around the *Orange Book* linking points that are created when recording is started on a CD-R. These points are 'sorted out' by the CDR500 as it does its Disc At Once pass resulting in a disc that a CD plant will be able to cut a glass master from directly, something it won't do from a disc with the aforementioned linking points.

Operation of drive to drive dubbing is a tad involved on first encounter as there are a variety of permutations on offer and deciding precisely which mode you require, for example programming a play cycle of a number of tracks for a compilation, involves a degree of familiarisation. Thankfully the CDR500 is prepared for all eventualities and effectively takes over control and gets on with the job seamlessly and quickly.

Recording from external sources follows processes which are not dissimilar from those employed in the Marantz CDR631 CD-R recorder (*Studio Sound*, December 2000) and it also shares a similar infra-red remote control. You can record with and without auto track incrementing (manual track increments can only be entered from the remote) and auto stop and there's CD-Sync and the usual CD-RW erasing functions.

Most important on the front panel is the centrally positioned PLAY MODE key which selects between dual transport (both play independently) and a changer mode in which the drives will play sequentially. Each drive has a SELECTION button that dedicates the display and front panel control to it and tracks on the selected drive can be incremented using a dial. The CD drive has PLAY/PAUSE and STOP while the CD-R drives has to have a RECORD button as well. Forward and Reverse cue is available and the remote duplicates all the front panel controls and access plus has some extras of its own.

Other front panel controls cover erase functions, finalising, input selection for external sources, display modes, and the initiation of programmed play. A MENU button accesses copy protection status (on, off and single copy), auto track and auto stop setting, recording balance and, of course, CD Text entry and editing. The CD Text capabilities are very similar to those on the CDR631 and don't warrant any further explanation with the one proviso that it feels even fiddlier. The built in SRC cuts in automatically when it detects ±100ppm 44.1kHz.

The front panel dial doubles as a record level control for analogue or digital inputs (down to -63dB from 0 and +6 respectively) and is also operable when dubbing between drives. Three second silences can be inserted with a press of the PAUSE button while in Record.

The metering has no scale, I know this is all fairly arbitrary but it makes a difference, but most importantly they are too small to be genuinely helpful. CD Text remains an ease of use issue on all current capable CD-R machines.

I have to say that I really like this machine although some features confuse. For example, would 2-drive sequential playback be of use outside of background music installs and is this likely to be a sideline interest for someone who is drawn by Disc At Once burning? It is best regarded as a standalone duplicator-replicator with half of the box catering perfectly well for external source recording, a matter that is wonderfully well accommodated by good interconnectivity possibilities. Look at it as a CDR631 with a player bolted on plus a level of integration between the two drives that would be impossible with two separate units and it has all the unmistakable traits of fantastic value for money.

The importance to you of the Disc At Once feature will depend on where you commonly sit in the production chain but there's no getting away from it being a unique selling point. It can cover all duties as a first CD-R machine but unusually, in the current spate of machines, it makes a lot of sense as a second purchase because it also offers self-contained and convenient duplication. It has winner written all over it. □

Contact:

Marantz, UK
Tel: +44 1753 686080
Net: www.marantz.com

NEW TECHNOLOGIES

and for export to broadcast automation systems in MPEG Layer II or PCM linear.
ArborCommunications, Netherlands. Tel: +31 314 399055.

MotU Firewire and DP3

MotU's 828 is a 1U audio interface for Mac and PCs which connects via Firewire. It's 828 provides eight channels of 24-bit analogue I-O on TRS jacks and two

analogue inputs are on Neutrik combo connectors and are equipped with a microphone preamp with phantom power. All analogue inputs have 40dB of trim provided by front panel trims. A further eight channels of ADAT optical I-O can be switched in software between ADAT format and stereo optical SPDIF. An SPDIF I-O is also provided on phonos and the 828 includes an ADAT sync input. There's also a punch in-out jack, a headphone socket, a volume control and a monitor level knob controls the volume of any two analogue inputs being monitored. The 828 includes ASIO drivers and AudioDesk and CueMix Plus software for zero latency. Digital Performer version 3.0 is a described as a major upgrade. The user interface has been completely redesigned and Apple G4 multiprocessor support is introduced, effectively doubling the available processing power for plug-ins running across multiple tracks. A new Sequence Editor provides combined viewing and editing of MIDI notes, audio soundbites, audio automation and MIDI controller data in one window. Additionally the Sequence Editor includes a QuickTime movie track that displays movie frames side by side with MIDI and audio data. Other enhancements include the ability to import and export entire multitrack projects from and to any OMF compliant system via DigiTranslator and OMF. Surround sound recording, mixing and mastering is big news for support to 10.2 and four panner plug-ins are included with USB joystick control.
MotU, UK. Tel: +44 1767 313447.

Cable testing

CableJoG256 is described as a portable intelligent cable and cable harness tester with 256 test points. It uses four 64-way male insulation displacement connectors and will identify any pattern of connections between the test points by true pin number or letter. The device has an internal memory for ten different

cables with 512 pairs of connections in each and can probe a cable that has one of more unconnected wires and perform staged sequential testing.
CableJoG, UK. Tel: +44 1925 764471.

PC control UHF

MIPRO has launched the higher-end model ACT-707 UHF wireless microphone system. Each 1U-high chassis is capable of housing four separate, hot swap diversity receiver modules. Featuring a clear colour LCD and an auto channel targeting selection method, it interfaces with computer software capable of controlling 16 x 4-channel receivers for a total of 64 simultaneous

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re·verb (rĭ-vûrb) 1. Lexicon

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Funk Logic 3P-III

Mixing vintage styling, enduring gear envy, and old-fashioned opportunism, two Americans have the definitive line in outboard accessories. **Frank Wells** asks the panel

ESTABLISHING ITSELF some two years ago with the Algorhythmic Prosecutor and the Digilog Dynamicator, US panel pioneer Funk Logic has carved a unique space for itself in America's audio racks. With the recent addition of the 3P-III Palindrometer, the outfit is now vying for a wider audience among studio owners and engineers. But where other outboard manufacturers are constrained by such mundane factors as noise floors, sample rates, component performance and availability of obsolescent valves, Funk Logic is pioneering parameters such as 'tuberation' and 'acceleration'. And where other manufacturers consider aesthetics important but not essential, Funk Logic are aesthetically driven to the exclusion of everything but a sense of humour...

From the embryonic days of the modern audio engineer, the unsightly blank spaces in an outboard rack have caused consternation. Prior options have included leaving the unused space empty (which means it becomes a magazine storage area), or invested in blank rack panels that either default to black or—occasionally—offer a manufacturer an advertising opportunity at the studio owner's expense. And it is against this backdrop that Funk Logic has developed its remarkable line in entertaining panel blanks.

With convincing authenticity and a great deal of humour, the early AP-302 Algorhythmic Prosecutor (offering controls like the Funkerator knob, which ranges in effect from The Bradys to Thumb Poppin' Good) and the DD-301 Digilog Dynamicator sought to give the look and feel of real gear without cluttering the patchbay or compromising the signal path. And their cost was barely more than a stock blank rack panel.

The concept is paying off, funding the team's first trade show presence at NAMM, where their latest invention was on display—the Pultech/Tube-Techish 3P-III Palindrometer (with controls like Level, Bass A/B), and a line of stunning wood panels (that are actually blank).

'You'd be surprised how difficult it is to even make something so simple,' says president Derek Van Choice. 'With the selection of the wood, the laser engraving and all of that, it's amazing. We laugh weekly about how technical simplicity can be.'

Last year marked another milestone for the company—the jump from direct sales to retail distribution, with dealers or distributors now in five countries.

'We had been selling direct for our first year out,' explains Van Choice, 'in order to plant the seed for a lot of growth. We edged away from the discounted

direct sales and have now gone up to retail only, as with most other manufacturers, and that should really open the doors for a lot of coverage—people can now go into their local stores and twist the knobs, and play with switches, and all the good stuff, and really see them in person.

More recently Erik Pellaton, the electronics engineer on the Funk Logic team, has added a bit of 'function' to some of the Funk's units—there are light kits for the meters on the original units, and the Valvecaster 1960 picks up sounds from its surroundings, and beats a vu meter in time.

One of the biggest selling Funk Logic units is more practical, however—the RN Chevy (which has the aesthetics of a '57 Chevy) allows a pair of RNC compressors to be conveniently racked up. Further 'practical' innovations are planned, but simplicity and fun won't be ignored. If you want to crash a Funk Logic brainstorming session, head for the beach near the San Diego County home base. 'Literally,' explains Van Choice, 'several of our designs have been conceived in the sand with a stick—we try and make that a general rule, if it can't be designed in the sand, we don't want to build it.' □

Contact:

Funk Logic, US
Tel: +1 760 305 6213
Net: www.funklogic.com

NEW TECHNOLOGIES

wireless channels and access to 641 UHF frequencies in each 16MHz band. It comes with a built in mixer, antenna divider and detachable universal power supply. MIPRO, Taiwan. Tel: +886 5 238 0809.

NETIA editing tools

NETIA's Snippets program in the Radio-Assist range was designed in collaboration with radio technicians and journalists and gives access to all-digital audio editing techniques in a single screen. Sequences can be selected at random while playing. They can also be played in a loop with instant integration of any modifications. Several sounds can be edited on a single track, each one identifiable by a different colour. The interface gives direct access to the spectrum and modifications in each cut are immediately visible. There are two ways to make a cut: if it is outside the selection, the selection is retained, whereas an ordinary cut deletes the selection. When items are cut, they are dropped in a bin where they can be played, named, pasted or saved in a database. After a cut, the reading head is automatically positioned two seconds before the cut point so the user can listen to the sequence lead-in. Fade points can be set directly while editing, either to restore the sound level of two different sounds, or to create a fade between two sound items. The actual time function displays the start of an item at the time when its recording began. Nine markers are directly accessible via the keyboard and a number of command modes can be accessed at the same time (left and right mouse clicks, special keyboard, shortcuts, drag & drop).
NETIA, France. Tel: +33 467 59 0807.

Verity TrueCopy CD-R/RW

Verity Systems range of Automatic CopyDisc CD-R-RW duplicators and manual duplicators has been enhanced by the addition of the TrueCopy 12s CD-R-RW writer. Operating at up to 12x writing speeds, all Track, Session, and Disc at Once Formats are automatically recognised.

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Bel Digital Audio 7220 v1.1

It's a small step from delay to synchroniser action. **Rob James** finds Bel's new 7220 delay synchroniser aimed squarely at solving audio-video sync problems

BEL WAS AMONG THE EARLIEST companies to produce commercial digital audio delays. Today, the Bel name is seen in many studios but is perhaps best known in the broadcast arena for profanity delays, digital shufflers and especially lay-off recorders—known to generations of on-line VT editors as 'the Bel box', these remain extremely popular. Continuing the line, the 7220 is a stereo plus time code delay aimed principally at correcting audio for video synchronisation.

In nature, sound is never heard before we see the event which generates it, so humans are particularly sensitive to sync errors where the sound arrives early.

Ideally, wherever a device delays the video it should also delay the sound. Unfortunately the real world often isn't like that, hence the need for devices such as the 7220.

Many video processes delay the signal by amounts varying between the irrelevant (from an audio perspective) to several frames. Time base correctors usually delay by one field or more, as do standards convertors, satellite transmission and DVEs (digital video effects). Delays can also occur in the terrestrial transmission process. I remember a complaint from an eagle-eyed producer (ex-sound mixer) that his programme was transmitted out of sync. On further inquiry it transpired that he was viewing the signal from a repeater transmitter and the pictures were indeed being delayed by a frame.

With the 7220, the required delay must be determined and manually adjusted by the user. Adjustment can be made in samples, milliseconds, fields or frames. The actual time delay of the field and frame step values reflect the selected video standard. Duration of delay may be altered while the unit is passing audio. The nudge keys increment in whichever time format is selected. If they are held down setting will steadily increment or decrement. The rate of change depends on the units chosen—frames are fastest, samples slowest. Once the displayed value is changing, the rate is increased by pressing and holding the other nudge key. To avoid a succession of one frame (or whatever) jumps, the actual delay is not altered until the nudge keys are released whereupon it jumps to the new value. I found the 'soft track' algorithm to be largely successful in avoiding disturbances with most material.

Operation of the internal memories is a little odd on first meeting. Pressing the PROG key selects the next memory and loads its parameters. However, at the same time it also stores the previous state of the machine in the store you've just left, overwriting the original contents. Once understood, this need not be an operational hazard. Currently, the memories are returned to factory defaults by powering up with the SET key depressed. Since the power switch is on the rear this isn't the most convenient arrangement for a box which is likely to be buried in a rack full of other equipment. After discussions with Bel, v1.2 will use two of the front panel keys for this function.

The 1U-high sculpted alloy front panel is smartly finished in anodised petrol blue and a backlit LCD keeps you informed. The upper part shows the current delay, bottom-left is an input level indicator in 9dB steps. Six small recessed keys operate the machine. BYPASS overrides any delay settings. SET enters setup mode and steps through adjustable operating parameters. PROG accesses the eight internal program memories. LOCK locks and unlocks the keys UP/DOWN nudge keys increase or decrease the delay and change parameters in the setup menus. When in Setup mode, a momentary press on LOCK, PROG or BYPASS returns you to Operating mode.

Analogue (24-bit) and AES digital audio I-O and sync are presented on XLRs. Analogue gain is adjustable between -30dB and +10dB; digital from -40dB to +20dB. RS232 serial for PC connection is on a 9-pin sub-D as are four GPI inputs to select memories. This socket is also used for SMPTE time code I-O. A BNC does double duty as wordclock (48kHz only) or video sync input. IEC mains, switch and fuse complete the rear panel.

As might be expected of a unit aimed at broadcast, the 7220 is optimised for 48kHz. This is the only internal rate available. The digital input has a sample-rate convertor which accepts 32kHz and 44.1kHz sources. Inputs of less than 24 bits are padded with zeros. Output is normally 48kHz but, with a suitable AES reference, may be anywhere between 32kHz and 50kHz.

The 7220 is extremely simple and logical in operation and passed the 'when all else fails, read the manual' test with flying colours. An optional PC remote control application is available and the RS232 protocol and commands are in the manual for those who wish to 'roll their own'. Alternatively, four of the memories can be switched by simple GPIs.

If you need a fast, accurate and reliable way of manually correcting video-audio sync errors, the Bel 7220 will not disappoint. It will also delay a SMPTE time code source by the same amount.

Another model in the range, the 7310 allows for automatic adjustment using source and reference video sync, an external TTL pulse or RS232 commands. □

Contact:

Michael Stevens & Partners, UK
Tel: +44 20 8460 7299
Net: www.bel-digital.com

NEW TECHNOLOGIES

Additional features include data tagging, dynamic laser adjustment, and the prevention of illegal copying. The CopyDisc 7P is targeted at those who want to duplicate and print CD-Rs and combines the Rimage Perfect Image Thermal printer with Verity Systems CopyDisc automatic duplicators. Upto 220 blanks can be loaded in the machine and the machine has 6Gb of hard disk storage which can be expanded.
Verity Systems, UK. Tel: +44 1252 317000.

Beyer's new Opus

Beyerdynamic is to introduce five new Opus models including the Opus 53, Opus 67 and Opus 87, which are optimised for percussion, the Opus 82 for high output level wind instruments and the Opus 54 a high specification neckworn vocal microphone.

A 'light' version of the MCS conference system will be launched which is configured for smaller conference situations with a maximum capacity of 30 delegates.
Based on the popular DT 231 Headphone, the DT 234 Headset will complete the range of this product series designed for use with computer systems and situations where comfort over long periods of use is important.
Beyerdynamic, Germany. Tel: +49 71 31 61 70.

AirTools from Symetrix

AirTools from Symetrix address the changing requirements of broadcast and streaming media. The first product is the 6100 Broadcast Audio Delay which builds on the legacy of its predecessor, the 610 Broadcast Audio Delay. The 6100 is a 24-bit digital delay unit for live broadcast that prevents unwanted profanity or comments from reaching the airwaves. As the program begins, the 6100 gradually and unobtrusively 'stretches out' the program until up to 20 seconds of 20kHz bandwidth stereo audio is stored in memory and can be dumped when needed. The 6100 also includes an automation interface for network broadcasts.
Symetrix, US. Tel: +1 425 787 3222.

RIEDEL partyline

RIEDEL's RPL 2000 partyline intercom combines the advantages of existing systems, it is compatible with ASL, Clear-Com and Telex/RTS, but stations are connected via standard microphone cables which carry power and two intercom talk channels. The PS-2002 powers the master stations and beltpacks. The MS-2002 and MS-2004 are

2- and 4-channel master stations and offer integrated loudspeakers, plug-in gooseneck microphone, stage announce output and XLR headset socket. The 4-channel master station MS-2004 allows remote muting of active microphones from other control panels on each partyline channel and can tie several channels together via the link function. The 2-channel master station MS-2002 offers an integrated electret microphone and additionally allows the use of a gooseneck microphone and connection of a headset. The programmable beltpacks BP-2001 and BP-2002 feature ergonomic designs and low power consumption.
RIEDEL, Germany. Tel: +49 202 2 70 370.

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end. We always used a U-67 microphone on her voice, the same microphone we used on James Taylor's voice.

Did you ever own your own studio, or want to?

No. I'd always rather be able to choose where I want to make a record. Then you can ask them to keep up with the technology. I would not want to have those responsibilities. That would also be a conflict of interest between the producer and the artist, I think. The system of checks and balances goes out the window.

The musicians were a big part of the sound that was being created for the Southern California records. A special group that acted like a communard or an 18th Century Paris salon...

We were creating a sound, it's true. Now it's moved to Nashville because that's where all those players moved. [Laugh] But it didn't feel like a movement or a Renaissance at the time. But the new players were good. Russ Kunkel is a good example. *Sweet Baby James* was the first [major] record he had ever played on. I heard him play with a John Stewart rehearsal. In those days, studio drummers were playing fancy Hal Blaine-styled stuff. [Russ] was a drummer who had learned more by listening to Ringo than Hal Blaine. I was excited when I heard him play. I hired him on the spot. He also had a good attitude: he came in an hour early and polished his cymbals. Linda had a lot of input into hiring these players, too; don't forget, she had people like Glenn Frey in her live band. I'm not sure how we found Andrew Gold, but we certainly came to find him invaluable. Everyone knew each other in that scene then—JD, Linda, Jackson [Browne]—and we all hung out at the bar at the Troubadour.

Where did that scene go, besides retiring to Nashville?

In a way, it never did end. Just a few months ago, they all got together and did a benefit for Fred Walecki, who owned a popular musical instrument store in LA, who had contracted cancer of the larynx, and was not properly insured. Immediately, Jackson threw together two nights at the Santa Monica Civic Center and Bonnie [Raitt] and Linda and the Byrds all came together in no time at all, very quickly. As a musical movement, that time's relevance may have passed, but as a community, it still exists. That show was living proof of it.

Starting around 1987, more and more of your productions were individual tracks for film scores. Like Linda and James Ingram on 'Someone Out There' for American Tail. *What brought about that transition, if it was one?*

It wasn't so much me, but that the industry was changing, starting to wake up to the potential for the soundtrack to push the movie. I was doing a record with Cher anyway ['Love Hurts' 1990] and she asked me to do a track for a film ['It's In His Kiss' from the film *Mermaids*].

You were also doing more one-off tracks for various artists, such as Natalie Merchant and Diana Ross, instead of complete productions.

I did complete albums with them, too. But again, the norms of the industry were changing, and I liked that. Whole-album projects are exciting, but I like doing individual tracks, as well. To get one song as good as you can. Also, it engenders a sense of competition between producers on the same album which is actually good for the overall production. You want your cut to sound as good or better than everyone else's so maybe you put that much more effort into it. It's not the best way to make a coherent album artistically, nor is it the cheapest way, but it's a good way. □

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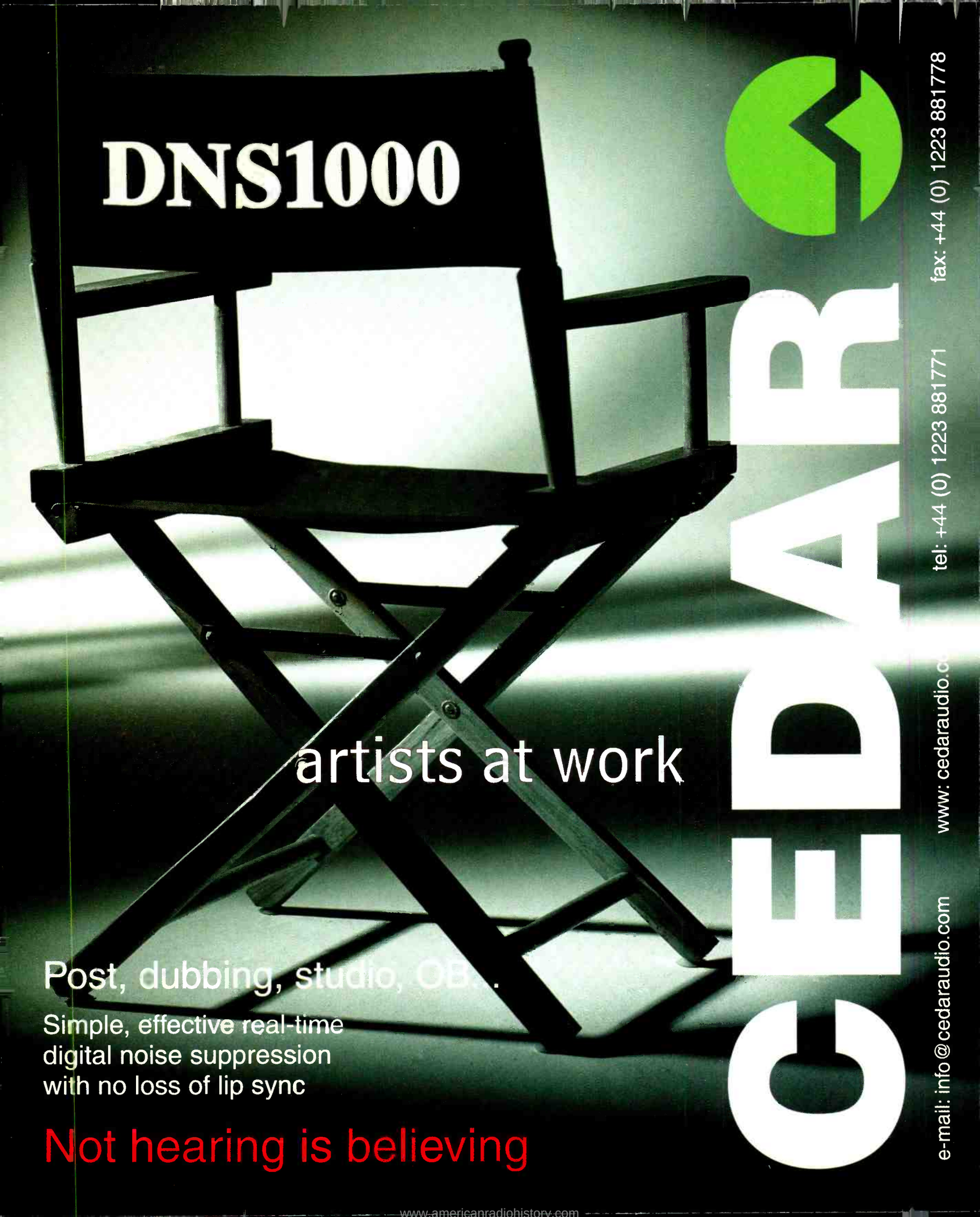

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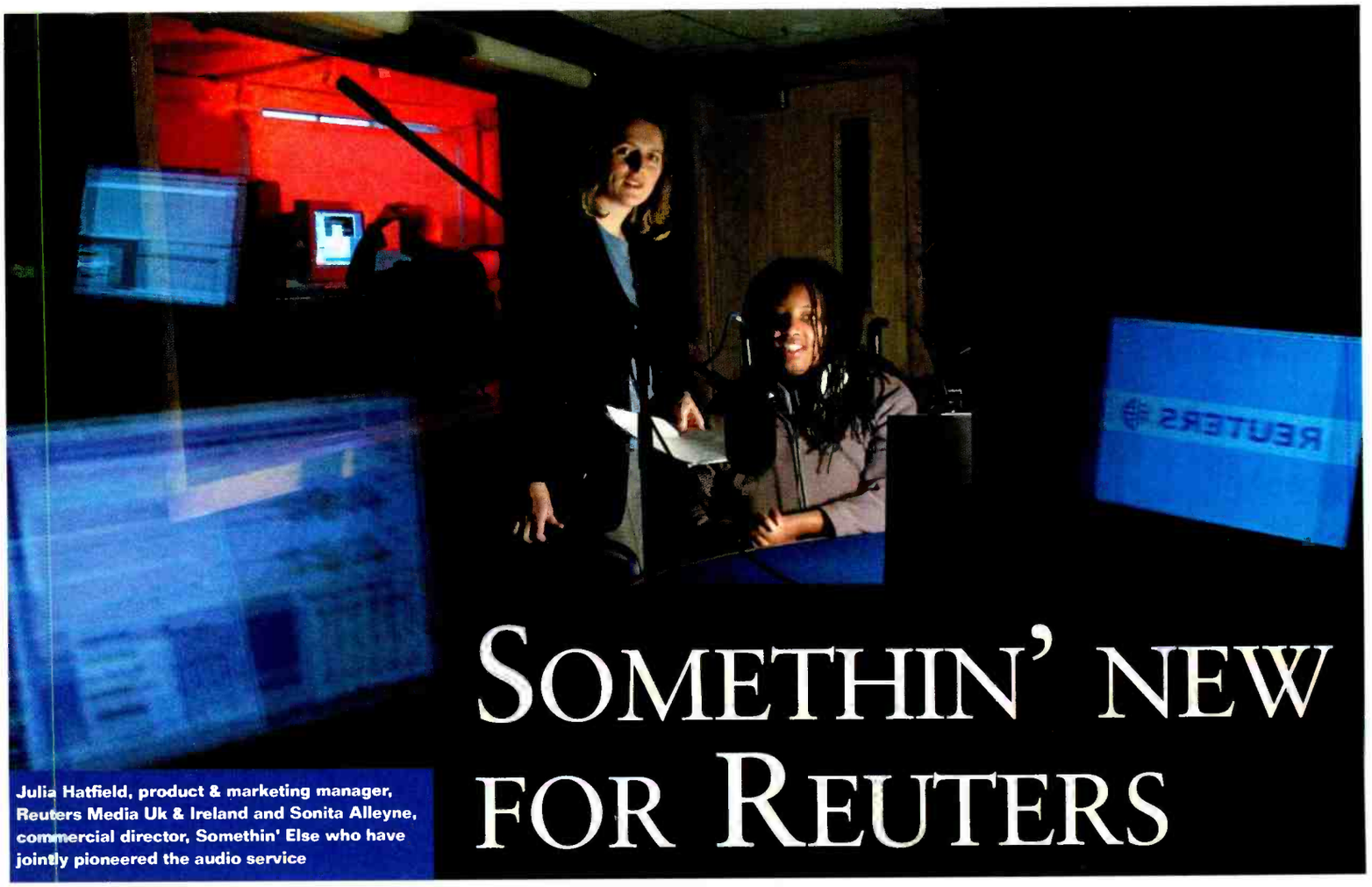

Julia Hatfield, product & marketing manager, Reuters Media Uk & Ireland and Sonita Alleyne, commercial director, Somethin' Else who have jointly pioneered the audio service

SOMETHIN' NEW FOR REUTERS

Taking Reuters' 150-year history in news gathering and delivery into the new Century, a new alliance with Somethin' Else will carry audio news to mobiles and the Net. **Kevin Hilton** rings the changes

IN AN AUDIENCE AND RATINGS hungry broadcast market, the news has become both an assured draw and a troublesome public service broadcasting obligation. In Britain the time of the main evening news bulletins on the BBC and the ITV network has even been discussed in parliament, with the two now going head-to-head at 10pm.

This seems rather incongruous in a world now dominated by new technology. There are 24-hour news services, while entertainment channels are experimenting with video and audio on demand. This concept is being applied to news by one of the most recognisable names in news gathering, Reuters. The agency, established in 1849 by Paul Julius Reuter to supply financial information, is providing reports to independent production company Somethin' Else to craft bulletins specifically to be heard on mobile devices and through Internet portals.

Modern technology is crucial in the gathering and distribution of news and Reuter was an early pioneer. Ironically, telecommunications nearly killed off his business, which relied on providing a bridge between the end of the Belgian cable system and the start of the German network. Ernst Werner von Siemens intended to lay a telegraph wire alongside the rail link between Brussels and Aachen, nullifying the need for Reuter's carrier pigeon service.

The story runs that when Reuter approached Siemens asking him not to build the link, the engineer advised him to relocate to London, which was set to become the hub of a European financial communications network due to cables laid by Sir Charles William Siemens, Ernst's brother. Reuter made a good living supplying European stock prices to the City of London but craved greater recognition. This, combined with the growing demand from English newspapers for overseas news, led him to establish a news gathering service. Reuters won a reputation for objectivity at a time when many newspapers were backed and run by political parties; by taking advantage of the ever growing telegraph network, it rapidly became a world-wide organisation.

This global outlook has created the world's biggest international news and television agency. The news is gathered, prepared and edited in 24 languages by 1,957 journalists, photographers and camera operators, working out of 185 bureaux in 153 countries. Reuters loudly proclaims the quality and impartiality of its reports, something to be expected, although the word reuter entered a Chinese dialect as a synonym for 'truth'.

From a newswire service taken by international, national and local newspapers, Reuters has expanded into television. This is not only a shift in how news is prepared and written, there is a fundamental difference in how it is received and absorbed. The two media are not the same and information cannot be presented in the same way to both; that is a fairly simple fact to grasp.

The new media of the Internet and mobile communications has somewhat confounded many publishers and broadcasters. There is a screen but much of what is up there is in text format. This was something Reuters wanted to address. 'Technology is moving on but the Internet itself is quite a quiet place,' explains Julia Hatfield, product and marketing manager of Reuters Media. 'Efforts have been made to make it more complete by adding multimedia in the form of text and graphics. The natural step was audio.'

Much has been claimed in the names of the Internet and WAP; while content has to be considered in a different way, it has already been shown as unwise for producers and journalists to assume that they must treat that material in a completely new way. 'From Reuters' point of view, we consider all technologies,' says Hatfield. 'It is possible to turn around huge amounts of information using synthesised voices, except the quality isn't up to the task—it doesn't sound very good, whatever the streaming rate. Then we looked at voice recognition software working with plain text but this just sounded like someone reading off the page. It dragged the offering down. Eventually we decided to go with proper broadcasters working with specially tailored copy, something traditional.'

The now obligatory research was carried out, asking customers what they were looking for and what they

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would consider exciting for 2001. 'Over 90% said audio,' Hatfield states. Although Reuters has ties with Independent Television News (ITN), a UK TV news organisation that also provides material to British commercial radio stations, Hatfield explains this project called for experience in production and digitisation. 'We also wanted a company with knowledge of the Internet,' explains Hatfield, 'and because the service is UK driven rather than global, it meant we could outsource. The key to the Internet is quick delivery.'

Reuters approached Somethin' Else, which it knew through XY Network, an Internet radio station and associate company to Somethin' Else. Sonita Alleyne, the independent producer's commercial director, echoes Julia Hatfield's comments about fitting traditional media into the new technology: 'This is exactly what the mobile Internet has been waiting for—why continue to scroll text headlines when you've got audio news on demand?'

Bulletins are tagged as being 'powered by Reuters'. The news content for the Reuters Online Reports is prepared by the Online desk, based along with the agency's other London editorial services at its Grays Inn Road offices, housed within a towering glass and steel building with a central atrium that Reuters shares with a number of other news and broadcast-multimedia technology companies, including ITN.

Stories are filed by correspondents from around the world: the copy editors back in London decide on what category a piece fits into and look for a particular hook, including a UK focus. Stories are ranked in a 'Top 10' format for easy selection by Reuters' customers. 'There are a lot of portals out there looking for material but they don't have a news background, so they come to us as the experts,' says Online editor Lyndsay Griffiths. 'It's one of our main points of difference.'

Julia Hatfield, product & marketing manager, Reuters Media UK & Ireland

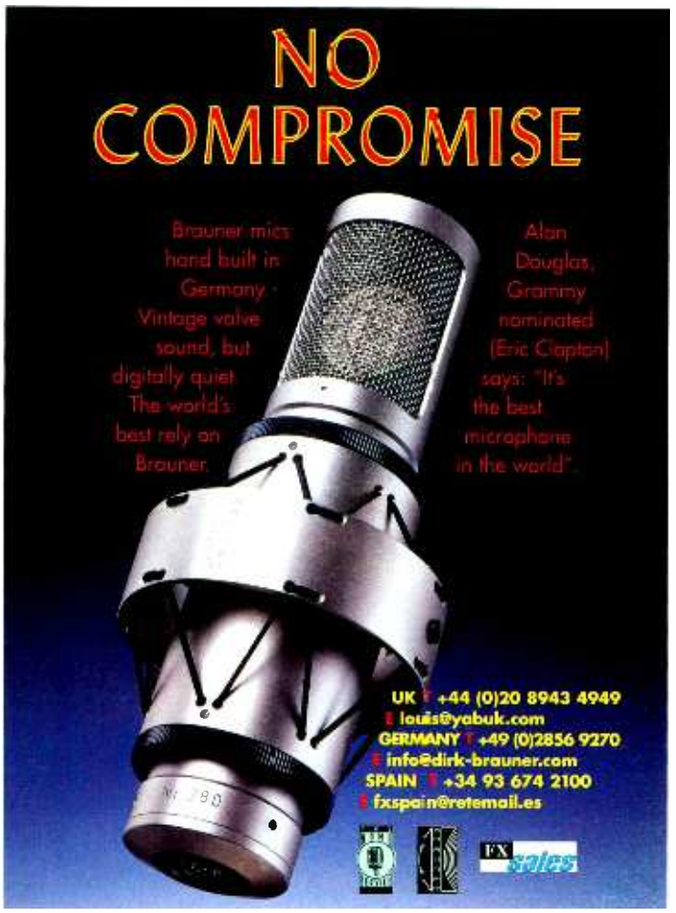
Reuters Online styles itself as a 'one-stop shop' for news, supplying Internet service providers and thematic Web sites with material. 'We have to adapt for different styles,' acknowledges Griffiths, 'editing stories for specific territories, with secondary editing for tone and style. Traditionally our clients are newspapers and other professional news organisations but Online is talking directly to the consumer, through outlets like Yahoo. It's more informal and so is in more of a broadcast style already.'

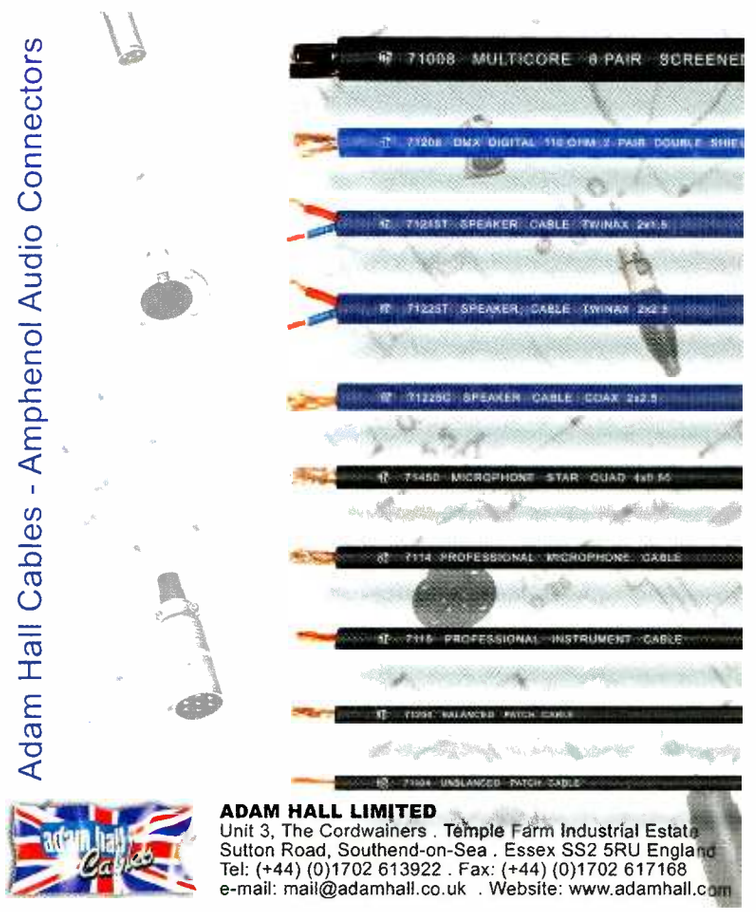
Writing news for print and broadcast are two different techniques: while the basic skills remain the same, the trick in radio or television reports is to give the impression that the newscaster is merely relaying information to the listener or viewer, rather than reading it. While the broadcast style translates easily to the burgeoning mobile communication market, there is another perceived shift in approach.

'Mobile, on-demand services are very segmented and focused,' observes Julia Hatfield, 'and what we are doing here is taking much of the effort out of the process for the Somethin' Else team.' While those journalists rework the copy into a specific broadcast style, the effort Hatfield identifies is in packaging and rating the stories. 'Our clients would be at a loss if they had to deal with raw Reuters copy,' explains Lyndsay Griffiths, 'because we receive so many stories. They stick with our prioritisation and then make it their own.'

Text stories are posted onto the Web and downloaded by the Online service's clients. Each story is accompanied by a summary and a link list, underlining the importance of metadata in modern communications. Griffiths makes the point that careful and accurate news gathering is more crucial for the fast moving online and mobile markets. 'The Internet is full of half-truths,' she says, 'people are looking for a level of solidarity.'

Somethin' Else has assembled a team of radio presenter-journalists to prepare and front these Online Reports, which are divided into six categories: World News, UK Top News, Sport, Business, Entertainment and Oddly Enough (the obligatory collection of off-beam





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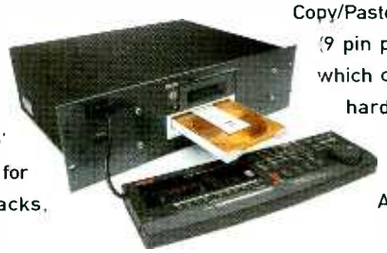

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stories). Each bulletin lasts around two minutes and one presenter will voice a specific category. The journalists were chosen for their style of delivery and tone of voice, the intention being to reflect the 'personality' of each report.

The Online Reports are updated regularly by the Reuters Online team and automatically and quickly sent to the Somethin' Else studios As the stories are received, they are assessed, re-written according to style and recorded, with the bulletins updated every hour, 24 hours a day, seven days a week.

While these reports are being heard over the Internet or mobile devices, they are still treated as traditional radio broadcasts. 'It was really important that although we were doing a service for a different medium, we didn't chuck the baby out of the bath water,' says Sonita Alleyne. 'People are used to listening to radio news, so we have purposefully gone for a broadcast news presentation style. These are pretty traditional news bulletins.'

Alleyne identifies Somethin' Else as operating in a 'content hungry environment', a sentiment that other broadcast service providers would no doubt echo. She says the Online service's target audience changes according to the category; as the use of technology has grown, the age range has expanded, creating what is being called an age corridor of between 18 to 40.

'The entertainment news obviously has a younger audience,' says Alleyne, 'but business is slightly different again. Sports is probably 18 to 35, while world and UK news is a broad offering. The style we've gone for is a step up from Capital (the London commercial radio station whose news is presented in a staccato, breathless fashion) and more accessible than BBC Radio 4. It's young-sounding but with the gravitas you would expect from a news report.'

As a production house, Somethin' Else produces programming for all BBC radio networks, commercial stations and British Airways' in-flight audio services, plus television material for BBC1, Channel 4, Rapture TV and Artsworld. A recent move into online and WAP audio, of which the Reuters service is only a part, has brought about expansion, with the company upgrading its existing equipment and facilities and acquiring a neighbouring building.

In these new premises have been built a multipurpose TV and radio studio, video and audio editing rooms and a voice booth designed specifically for the Reuters Online service. This facility, and associated areas, are housed on the upper floor of the building; equipment comprises SADiE workstations, a Behringher mixer, beyerdynamic microphone and Denon Professional CD players.

Somethin' Else has 11 SADiEs networked around its facilities, two of which are dedicated to the Reuters service. These DAWs work in tandem with Apple Power Mac G4 computers; Somethin' Else company director Paul Bennun says there have been 'horror stories' about this kind of combination but adds that integration is possible and that it works in this situation. The G4s are used to encode the reports, which are made available on a central media server.

Bennun says that central to this kind of operation is plenty of bandwidth. Somethin' Else has 4M coming in and going out of its facilities over 1000-T leased line connections. 'We've made sure that everything we've got and everything we do is networked,' he comments. 'Some organisations are still using sneakernet but that just wouldn't work for us. Once a Reuters journalist has pushed the "send" button, a report is with us and available to be on air within about two minutes. It would be impossible to do that without a lot of automation and a networked infrastructure.'

Somethin' Else has developed its own automation system and designed a custom despatch software package for moving the reports around. While the basic journalistic and broadcast skills are the same, this emphasis on encoding technology shows that this is something apart from traditional radio. Bulletins are compiled on the SADiEs and then dispatched via the software and media server.

In addition to the report itself there is the crucial metadata, containing both copyright information, special identification tags and data that formats different versions for different bandwidths. The encoding software is XML-based and four format versions are currently created, including CTI. 'There is really no limit to how many formats we could create,' Bennun observes. The reports are streamed using Apple's QuickTime system. 'The whole system is very flexible and we haven't even started to stretch it yet,' Bennun adds.

This currently unused capacity means that interactive components or even video could be added in the future. As far-sighted as he was, it is doubtful that Julius Reuter could have foreseen where his vision and his name would go when he was starting out with his pigeons and wireless telegraph. □

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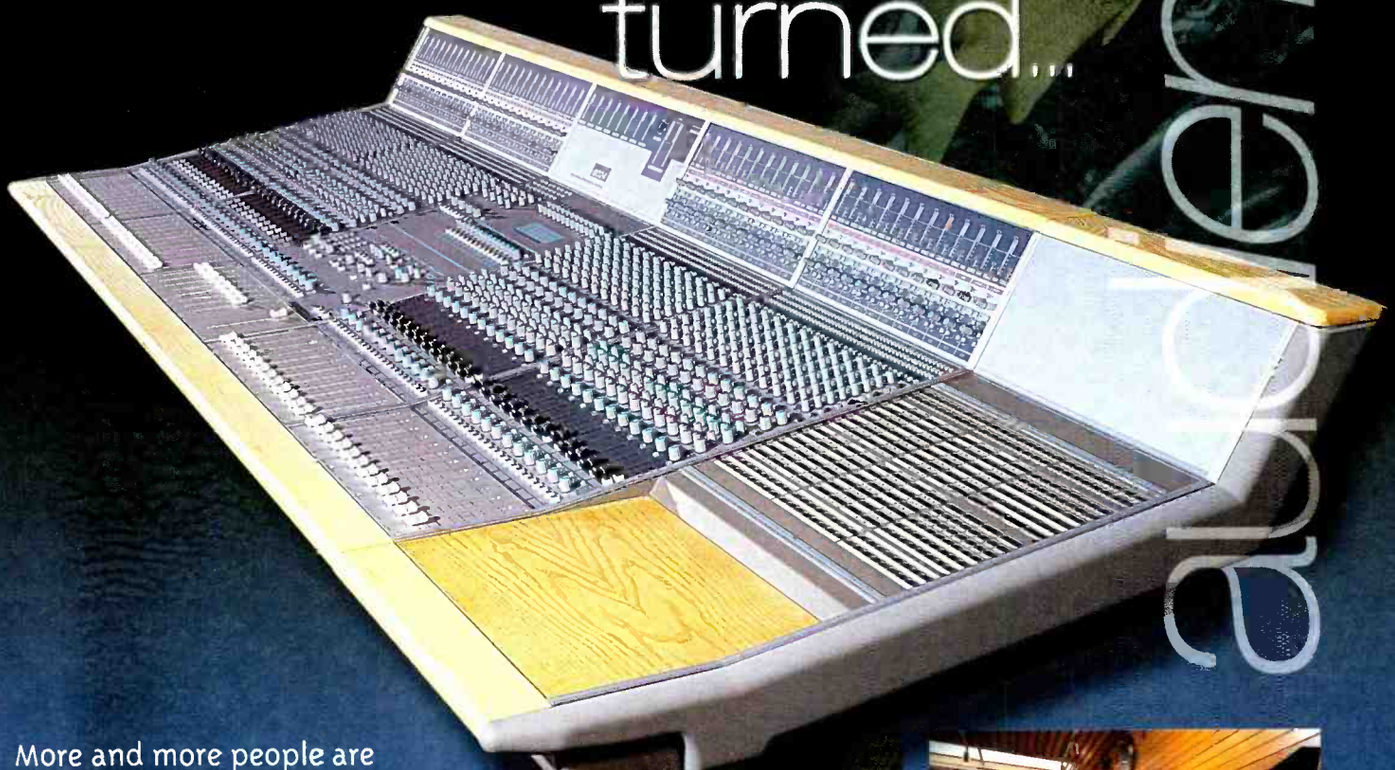

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BUFFY THE VAMPIRE SLAYER

Cult TV horror series *Buffy the Vampire Slayer* mixes blonde glamour and blind terror in a cocktail of custom sound effects. **Kevin Hilton** narrowly avoids dusting

NOW INTO ITS FIFTH SEASON, *Buffy the Vampire Slayer* is that unusual thing, a television series that is superior to the film that inspired it. While *M*A*S*H* was of equal quality to but more consistent than Robert Altman's theatrical original, the 1992 movie *Buffy the Vampire Slayer* is pretty woeful. Apart from the title character and the basic premise, there is none of the knowing, post-modernism, in-jokes and sharp writing that have made the TV series such a success.

Buffy is the blonde high-school girl who, secretly, is the Chosen One, the only person able to stem the seemingly never-ending tide of vampires, demons and other assorted evils that invade the Californian suburb of Sunnydale. (This preponderance of nasties is explained by the town sitting on a Hell Mouth, just in case you were wondering.)

Like many American prime time shows, *Buffy* looks like a mini-feature film. It sounds like one too. 'Almost every US TV show, with perhaps the exception of sitcoms, is a little feature,' agrees Cindy Rabibeau, who has been supervising sound editor on *Buffy* from the beginning. From the start of the show, sound design was seen as important to the creation of evil as make-up and special effects. 'The soundtrack is built in the same way as a movie, it's just that there aren't as many tracks," Rabibeau adds.

Buffy sound, and that for the spin-off series *Angel*, is post-produced at Todd AO Studios West in Santa Monica. The audio team is six strong: Rabibeau herself, an effects editor, one dialogue editor (sometimes two are needed, the extra person working on ADR loops, a work intensive process) and three re-recording mixers (one each for dialogue, effects and music-Foley).

Joss Whedon, executive producer and creator of the series, had some basic ideas as to how he wanted *Buffy* to sound but aside from that, Rabibeau says that the audio design 'pretty much developed' as the series progressed. The most obvious elements of the soundtrack are the creature effects and the 'dustings'. While this new breed of vampire is dispatched by being staked or exposed to daylight in the traditional manner, instead of gently decomposing they dramatically turn to dust with a fizzing crescendo.

Rabibeau and her team came up with the dusting effect, which hasn't changed much since the beginning of the series, presumably as all vamps die in the same way. What does change are the creature noises; not only are the vampire growls changed from season to season, each vamp and demon has to be given its own sound to match its character. 'For the vampire growls the producers wanted something organic, an animalistic sound,' Rabibeau explains. 'What we've done it to take the sounds of bears and leopards, combine them and then mix that with processed human growls. About six to eight elements make up a single vampire growl.'

These are then tailored to match the character of specific vampires. The obvious example of this is the difference between Angel, the brooding vamp cursed with a soul who loves Buffy but cannot experience happiness with her for fear of reverting to his former evil self, and Spike, at one time the embodiment of the 'Big Bad'. 'Their growls are not the same,' says Rabibeau, 'the intensity of growl is different. There is also a difference between the growls of Angel when he is bad and as he is usually.' She adds that as Buffy and her friends encounter new demons during each show, sounds are being created on a weekly basis.

The various animal effects are sourced from Todd's

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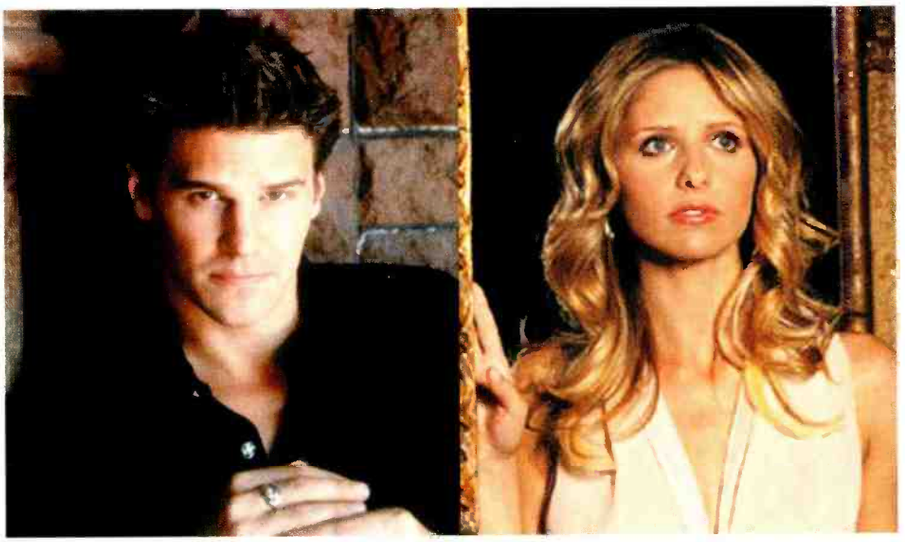
extensive self-recorded library; like many sound designers, Ribibeau avoids using commercial libraries as their tracks can often be identified, particularly by others in the industry. Another set of effects is those that accompany magical and mystical scenes. Some of these are swirling, warbling-type noises and are often blended in with the music score, matching its rhythm and pace.

Ribibeau acknowledges that such effects can be difficult to create because they are often for CGI sequences that have not yet been produced. 'It makes it hard, trying to come up with something just from the script or what the producer says the effect will look like,' she says. 'Sometimes we have to re-cut a track, either because it does not fully match the visual or because the CGI has been re-done.'

Because the production sound is generally clean, there is not much ADR to be done on Buffy but group ADR sessions are arranged for background voices, recording voice artists as demons and vampires. All ADR is shot in a day and recorded onto a Fairlight. Dialogue and effects are recorded and prepared on Digidesign ProTools.

There are usually 24-tracks of effects, mixed down from six to eight tracks of music (sometimes more for scenes in local club hang-out The Bronze), eight of dialogue, around eight for principle ADR and nine of Foley. As this is television, the team has only five days to prepare all this from the beginning of the post-production process.

Ribibeau tends to play safe by cueing everything except major punch sounds to be Foleyed. 'A sword fight will be done in both Foley and effects,' she says, 'so we don't come up short. We'll usually combine the two or use one as a sweetener. Every movement, like picking up a coffee cup, is Foleyed too.'



Angel has now relocated from Sunnydale to Los Angeles, where the scowling 300-year old vampire works as a private investigator, helping the city's many lost souls. Cindy Ribibeau set the sound design for this show too, before handing over day-to-day responsibilities to Robert Ewing. 'The creatures aren't that different between the two shows,' she says, 'the same library is used for both. But *Angel* is darker in tone, so the backgrounds are different. It's a more serious show than *Buffy*.'

Three re-recording mixers are assigned to each episode of both series, working on an automated Otari Premier console. Adam Sawelson and Kurt Kassulke mix dialogue and effects respectively for both shows; Tom Perry mixes music and Foley for *Buffy*, a role Ron Evans handles for *Angel*.

Like other US TV shows, everything seems to be vying for position in the final mix of both *Buffy* and *Angel*, something Cindy Ribibeau attributes to the filmic approach. 'We cut it like it's going to be a feature,' she says. 'But as well as mixing on the main monitors, we play-back on small loudspeakers because this is ultimately for TV. If the mix were as we wanted to hear it in the big room, a lot of it would be lost on people's TVs.'

Adam Sawelson adds on this issue: 'We look at everything as one track. Ideally what we are trying

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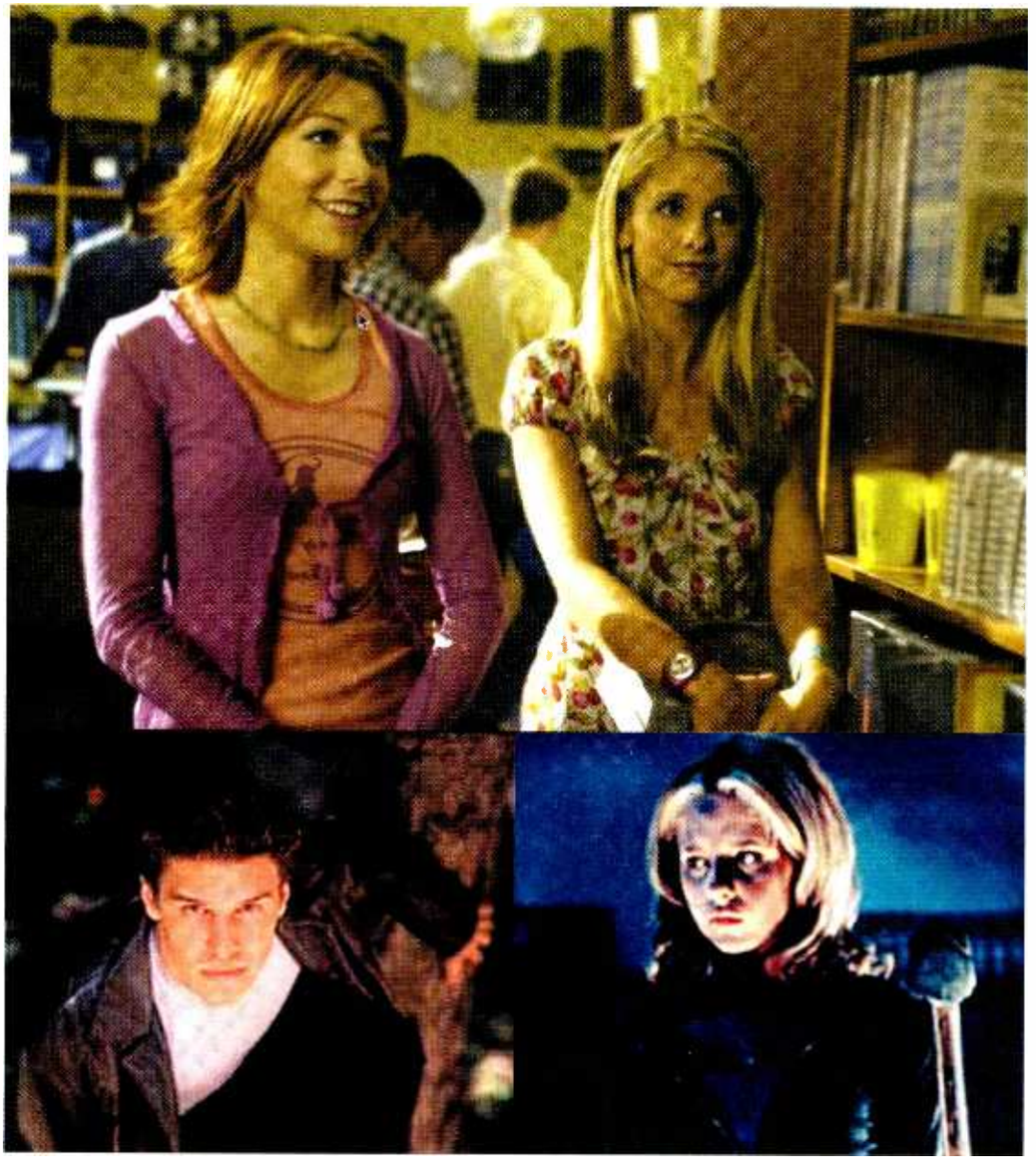

to create is a soundtrack where there isn't one thing that overwhelms the other elements. We are shooting for one integrated whole that sounds like a feature film. But because the shows are primarily played back on TV, we have to adjust things a little.' This means that some of the higher frequencies, and consequently some detail, is lost, which Sawelson acknowledges is a compromise.

All episodes are mixed to a big screen, behind which are large monitors that were designed and built by Todd's in-house engineering department. *Buffy* mixes are played-back on Auratones, while medium-sized loudspeakers are used on *Angel*. 'It's getting tricky to simulate what people use at home these days,' Sawelson says. 'Some have home theatres while others are still watching on mono TVs.'

The Otari Premier has a total of 56 inputs over its three sections. 'We use all of them and then some,' Sawelson laughs. The 'then some' is often the sweeteners, which may be needed if a sound is deemed unsatisfactory. 'The show can be mixed and the effects cut but the producer and director may say that something is not the sound they were looking for from a particular monster or they want to make a punch beefier. Sweeteners are when we add something to produce the quality they're looking for, or simply they are replacements for another effect.'

Due to the tight schedule, mixing is only allocated two days. By keeping each element—effects, dialogue, group ADR and Foley—separate, the whole mix does not have to be recreated when elements are sweetened or replaced. This is particularly helpful as only the mix is automated on the Premier, not the processing; in this way not all EQ or processor settings have to be re-done.

Both shows are mixed in matrixed Dolby Surround (LCRS). Sawelson comments that the surrounds are used quite often. 'Tom Perry puts some of the music in the rear speakers,' he says. 'Putting effects back there depends on what is happening on screen and what the surrounds would actually enhance. If there are big crowd sequences there will be dialogue in the surrounds but personally I don't like to put things there because it takes the attention to the back speakers—it's distracting. If there are scenes in caves or something I'll put reverb on the voices to create a space, a more 3D effect.'

As Buffy, Angel and their friends spend much of their time in sewers and tombs, such 3D sound will continue to be a feature of prime-time TV for some time to come, which must be reassuring for the immortals amongst us... □

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THE QUALITY COUNT

The audio chain is made up of a number of stages enjoying a variety of technologies and techniques. **Richard Salter** traces sound's journey and assesses its fortunes along the way

IN THE LAST CENTURY, when the word 'digit' meant a finger and not some nebulous portion of an audio signal, quality was considered a straightforward issue. There was the time and money in all the various branches of our industry to strive for the highest quality even if this was not the cheapest option, with much gratitude due to the state broadcasters who were such supporters of standards and quality.

Quality was often explained by one of two maxims, as though they were *de fide* pronouncements (i) the overall quality is only as good as the weakest link in the chain, and (ii) there is gradual degradation through each step in the chain, and so to achieve a given quality at the end of the chain each preceding step must be of higher quality in order to allow for the degradation.

These observations are both self evident in some respects but neither explains the whole story. Both make a simple, direct and valid point in a non-technical manner, so often essential in explaining to those who now make the quality and fiscal decisions, the bean counters. When viewed a little more closely they are partially contradictory. The first suggests that all the components and processes in the chain should be of equal or better quality to that desired at the end of the chain. The second suggests that it would be better to put more quality effort into the earlier steps in the processes. The wave particle duality type of debate as both can produce excellent theoretical and practical demonstrations.

That was then and this is now, with myriads of diverse processes and technologies being used. So while these two maxims can still have partial validity, increasingly there are more elements which contribute or detract from the overall quality and some are far from obvious.

The first difficulty is the subjective versus the objective—what exactly is the quality of the signal path? Tradition, so often an excuse for not thinking a problem through properly, puts much emphasis on a trio of objective measures: frequency response, signal to noise ratio and distortion, usually total harmonic distortion. A frequency response at least as wide as the range of sounds to be processed is clearly a valid requirement and whilst the industry seems to agree roughly on a 20Hz-20kHz bandwidth there are those who would beg to differ, some with quite reasonable logical arguments. A signal-to-noise ratio sufficiently large to accommodate the dynamic range of the sounds to be processed is also a valid requirement. However, in recent years even this has become more of a marketing figure than an actual measurement, for example all those machines where 96dB is quoted, is that an actual signal to noise measurement? When in truth it is more often a theoretical calculation of dynamic range or coding range with no reference at all to circuit noise. A minimal distortion figure is clearly desirable, but the figures resulting from this traditional measurement are much more difficult to correlate with what is heard, hence the variety of differing distortion figures. How often is this figure published for loudspeaker performance?

Despite all the vagaries, this trio of measurement figures have stood the industry well and the quest for improving these figures has produced better overall performance with many other parameters. However together they do not provide a complete coherent comparison between the objective and the subjective assessment of quality. Neither do they serve particularly well in the digital domain, where there are other factors which have a better claim to being fundamental to the quality of the signal handling. Let's run through the various elements of the audio production chain...

Acquisition by microphone and its mating preamplifier is certainly a mature area of audio engineering. There are numerous mechanical and physical attributes of microphones which those specialist in the art appreciate and have honed over time. The performance of the best examples are very close, subjectively and objectively, and it would be reasonable to deduce that these are typically better at quality than many of the subsequent processes. The first stage of amplification is not quite so clear-cut as the microphone and there are more divergences in opinions and figures in this area and the quality is bounded by the limitations of analogue electronics.

Here the engineering of the production chain diverges into either digital or analogue for the manipulation and or storage of the signals. Each of these technologies has its quality defining parameters and the aspects of finance begin to impinge. At this point we can begin to see some serious non-linearities in the quality versus cost equations; the business decision may dictate that the quality can be whatever you can achieve but only within the limits of the affordable technology which may not be the best for the process in hand.

Analogue manipulation and storage, like microphones, is a reasonably mature branch of engineering and the boundary limits are reasonably well known, if not entirely understood. Our trio of figures is a good starting point, but two further parameters are beginning to attract attention amongst designers and others. A little study of our hearing mechanisms can suggest that phase response is rather more critical than previously traditionally assumed. And although inferred by A–D convertor parameters, the resolution is more often overlooked than examined. Both of these parameters are somewhat easier to consider in the digital domain as the first is easier to manipulate and the second is easier to correlate.

Digital manipulation and storage is well past the adolescent stage and in many cases the most economical technology and has the irresistible attraction of

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more bells and whistles than can be done with analogue. One of the basic tenets of digital systems in that the quality of a properly engineered digital process should be independent of the medium, attractive though this is there is no free quality lunch, because the quality of the digital system is dependant on other things, principally the conversion stages and their supporting structures, meaning the timing and clocking systems. Whilst conversion quality is recognised and well understood in the industry, sadly the same cannot be said about clocks and timing and certainly re-clocking, phase locking and concatenation are barely understood.

The distribution of the finished product is predominately by radio and television broadcasting, CD and cassette tape. These media have been chosen for reasons that have nothing what-so-ever to do with quality but for fiscal and commercial reasons, ironic that CD was launched as a better quality medium, which indeed it was and is, but gained most consumer preference because of ease of use. The quality of these media are limited by their format designs and there is little can be done on a project or production basis to improve these carriers, however with CD there are few examples on the market that fail to outperform the systems on which they will be heard.

The last step in the chain being the system through which the audio is actually listened to. This applies both to the consumers' audio systems and the monitoring systems used throughout the production. Amplifiers are still mostly in the analogue domain, another mature technology and governed by similar quality limits as analogue signal processing and evaluated mostly using the same traditional measurements.

Loudspeakers however are a different kettle of fish entirely, and for the avoidance of any suggestion of impropriety or envelopes stuffed with cash (all will be gratefully received) let me declare a business interest in the design and production of good loudspeakers. It seems that the evaluation of loudspeakers is more fraught than most other pieces of audio equipment and the quality judgement often left to the ears of the listener alone. Elsewhere in this learned journal over the last couple of years there has been much good sense written about the objective measurement of loudspeakers and which parameters may be critical and which might correlate to the subjective. Long may this one continue as a fresh working consensus would be beneficial.

In this very brief run through the production elements there are a couple of areas that doesn't fit conveniently in the scheme; first compression or companion systems, second concatenation.

The most common compression scheme is the Dolby technique for analogue cassettes, a truly excellent piece of engineering that transformed the cassette into a music carrier with exceptional quality for such a low cost. The television industry, and by default associated formats such as some elements of the DVD, has adopted various forms of compression and companion. This trend has not been driven by the pursuit of quality rather for the reduction of bandwidth and often guided by the assumption that audio data rates can be reduced just the same as video, which for those of you in any doubt they can't without affecting the quality in some cases severely.

Perhaps these systems have not been around long enough for traditional wisdom about their effects and limitations to be learned, but the seemingly universal ignorance about compression systems should be a cause for concern. Recently I was asked (in a professional capacity) what had gone wrong with the sound of a particular CD by the producer who had 'carefully' monitored the entire production process. The CD in question sounded both harsh and lacking in detail. It transpired that part of the main mix was taken from the video which had been stored on hard disc using an MPEG process with a low data rate for the audio. And nobody, producer nor engineering staff, had paused to listen to or question the use or effect of using MPEG in this production. With the exception of lossless compression schemes, such as the Meridian Lossless Packing, all compression has a quality price to pay for apparently free bandwidth reduction, most often a reduction in resolution.

In the digital domain there is a trend, often not very helpful, to try and equate the quality of any system to

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the sample rate and a given number of bits. For describing a particular convertor this may be technically absolutely accurate, but when applied to the whole of a digital mixing and editing machine can be confusing. The desire of the average marketing department to be able to put an objective number to a product or process to indicate quality is understandable, particularly when describing such quality is difficult and perhaps more complex technically speaking than the intended reader. Thus describing quality as a number of bits is a partial attempt to quantify resolution, which is an aspect of quality which is often overlooked and for which there is no clear objective measurement technique. Perhaps this is the next figure to join the traditional stable of frequency response, noise floors, signal-to-noise ratios and distortion.

And lastly there is the phenomenon known as concatenation. The cumulative effects on the quality of several processes performed one following on from another is in effect the whole audio production process. But there is a more insidious element to all of this. Some of the processes being used perform to their respective specification and description when viewed in isolation, but whose performance is radically different when preceded by one or more other processes. For example, certain of the compression systems suffer badly from this, as can often be heard on the output of some broadcasting systems. There are some metadata bandaids around, sometimes called mole data, that can be applied to such problems. However this is only really another reason for questioning the use of systems whose concatenation performance is dubious. And this is not limited to complex compression systems, it can be observed in the noise performance of mic preamplifiers when connected to a real microphone in a real studio in front of a real performer.

Room for compromise

Between 1979 and 1984 a series of papers was published that for the first time accurately described the mechanics of control room design in non-statistical spaces. Why then, given the time elapsed, and the continual development of the last 17 years, is it still perceived as so complex and expensive to design and build a modern control room?

In reality, there are only two aspects of contemporary control room design that are necessarily expensive—isolation and originality. Isolation is expensive because of the structural implications for the base building and the cost involved in the construction of multiple shells.

Competent isolation is bought with mass and the effective de-coupling of this mass from the base building structure by a resilient mounting system. Obviously there is a range of costs dependent on the sophistication of the isolation shell and mounting system, but in the main this is one area of control room construction where cost is directly linked to isolation bandwidth and performance achieved.

Originality, in its turn, bears a high-cost because any single process is by definition more expensive than the commercially-available and mass-produced. Design and building costs have then to be amortised across a single project. Scarcity also bears a cost.

The commercial pressures of a market that has long been over-supplied would indicate that a new facility must, of course, provide exceptional noise criteria, but more importantly must be sufficiently original so as to put competition out of business, else there is no financial model at all for developing a studio for rental. If, however, the intention is to build a control room as a reference and monitoring environment in a situation where isolation is not commercially critical, and where the facility is either supported by an existing complex or is owner-operated, then there is no reason why it is not possible to produce a room of exceptional performance for very little real cost in

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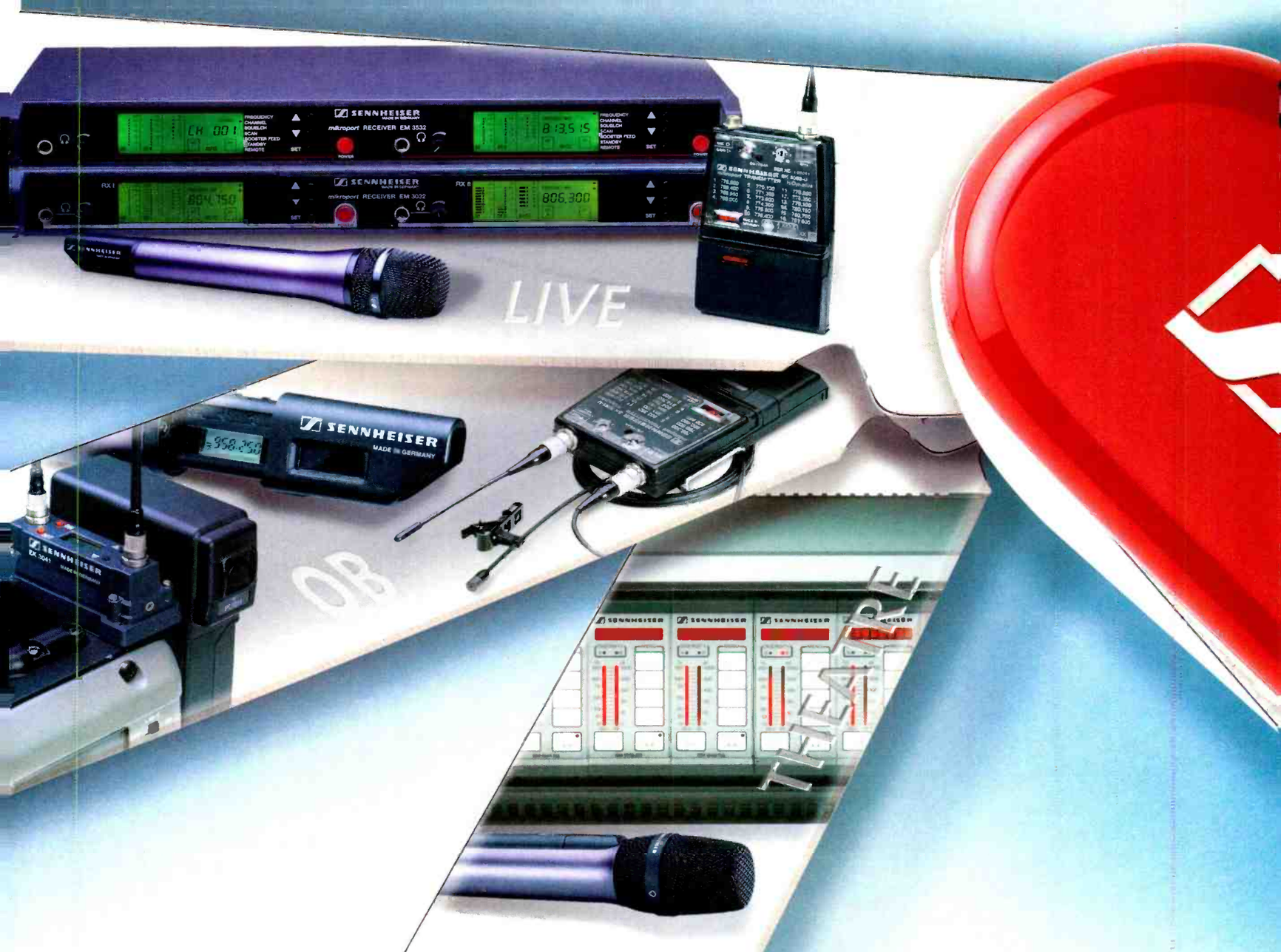

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relation to the total overhead.

Assuming the simplest and most predictable of spaces (the rectangular room), inexpensive commercial software exists which will provide analysis of the room modes, predict the low frequency performance of the optimised room, and allow adjustment of the ratios of length, width and height to provide the best compromises available. Similarly, it is quick and easy to use software to position loudspeakers within this room so as to minimise the speaker-boundary interference and optimise the low frequency performance of the speaker system—regardless of whether this is a stereo pair or a multiple format surround system. The same package will provide data on the precise location in the room for the three key acoustical components—reflection, absorption, and diffusion.

Given the power and simplicity of the tools available, and the inexpensive acoustical 'kits' available from the same manufacturers, there is little reason why it should not be possible to design highly competent monitoring and playback installations—isolation is then a secondary issue, and originality entirely at the creative discretion of the owner.

Neil Grant, Harris Grant Associates

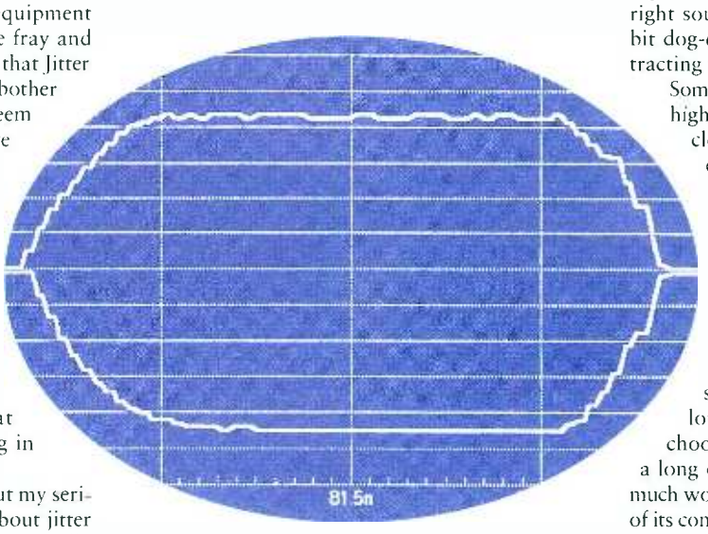
Keeping an eye on the jitter bug

I REMEMBER JITTER in its glory days, the mid-nineties when witchcraft was becoming less popular than hitherto, and computer viruses hadn't been invented. In its heyday, Jitter was the poltergeist responsible for all unexplained audio problems. Jitter lurked in studio back rooms and equipment racks. We didn't understand its mysterious ways, but we knew it was there and we feared it.

But that was an age ago. Gradually equipment manufacturers' marketing men joined the fray and equipment brochures began to reassure us that Jitter had been put to flight and wouldn't dare bother us any more. The bad old days began to seem like a distant nightmare. How could we have been so stupid? We laughed nervously in the bright morning light. To many in professional audio, Jitter seemed to have been banished to a humbler habitat, to lick its wounds in sullen defeat in the pages of hi-fi magazines whose reviewers groped desperately for ever-more-obscure and tenuous benchmarks to distinguish this box from that. But have a care: Jitter never went anywhere—and it doesn't read brochures. It laughs at the bunches of expensive cable hanging in our windows.

Okay, possibly a little melodramatic; but my serious point is that we seem to worry less about jitter than we used to, even though things haven't actually improved much. Some interesting folk remedies have sprung up, but science hasn't been applied to the areas of system design where it's needed. Understanding of jitter is still poor among equipment manufacturers and users, but I'm not sure that users would need to understand jitter at all if more manufacturers did.

Discussions of jitter in audio usually centre on the infamous 'eye pattern' (pictured) and 'sampling jitter' whereby an A–D or D–A convertor (or maybe a sample-rate convertor) performs its conversions at a slightly irregular rate, thus distorting the converted audio. Common sense suggests that the distortion would he worse for greater degrees of irregularity, and for faster-varying audio signals (loud high frequencies), and this is so. Since sampling jitter produces phase modulation, the distortions are not harmonically related to the audio so they can be surprisingly objectionable even at low levels.



Subjectively, it has sometimes proved difficult to reconcile the 'sound' of sampling jitter with our as-yet simplistic theory. The widely-reported muddying of brass, cymbals and so on, is consistent with our model, but what about the oft-cited blurring of stereo (or surround) images or the even more amazing (but rare) reports of loss of resolution in the deep bass? These are harder to square with our current ideas. Because of this, and because the choice of material and other variables can cause subjective effects to vary greatly, reliable system diagnosis usually requires test equipment.

Present system problems obscure the fact that jitter only matters in A–D and D–A convertors. Jitter in digital interfaces, transfers, on and off tape, CD and so forth can't affect sound quality unless subsequent convertors are affected by it (excluding unusual cases where data actually gets corrupted). Digital audio samples are more like a score than a recording—they're just instructions as to how to make the right sound, and it doesn't matter if the score is a bit dog-eared, unless it's flapping around and distracting the violins.

Some low-quality A–D and D–A convertors have high 'intrinsic jitter'—they are jittery even when clocked internally or by a low-jitter external clock. More damaging, however, is the inability of nearly all available convertors to remove any audio-band jitter from an incoming external clock, so that the whole lot appears as sampling jitter. In the real world, most A–D convertors operate from an external clock, as do nearly all D–A convertors (from their data input), so this behaviour is key. While this situation persists, all we can do is choose the shortest, lowest-capacitance cables we can find, and choose our clock formats carefully (AES11 with a long or capacitive cable, for example, performs much worse than a wordclock on video co-ax, because of its complex waveform). We could even invest in de-jittering boxes. But as well as being costly, these methods can never adequately solve the problem in high-end applications since an acceptable amount of jitter at the point of conversion is so much less than can be achieved with ANY practical cable over a practical distance. The correct approach is for A–D and D–A convertors to be made rugged against incoming clock jitter. Then, all cables will be good cables and all clocks will be good clocks.

But hey, this is audio, right? So some could still be really excellent!

Ian Dennis, Prism Sound

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Discs of Confusion

As the Vegas Consumer Electronics Show saw a hardening of the battle lines between DVD formats, the professionals are watching and waiting, writes **Barry Fox**

DVD-AUDIO USES high-rate PCM, is officially blessed by the DVD Forum and promoted by manufacturers like Panasonic. Super Audio CD, meanwhile, uses DVD disc technology and 1-bit recording but is rejected by the Forum and independently promoted by Forum members Philips and Sony. But despite grand talk at a Panasonic press conference and a trade meeting hosted by the DVD Entertainment Group, there remains little music available to buy on DVD-A. Neither BMG nor Universal sent representatives, leaving Warner to carry the flag. The Warner DVD-A discs (like Natalie Merchant) also have Dolby Digital tracks, so play in surround on DVD-Video players. Another disc handed out at the Entertainment Group event boasts Dolby Digital, DVD-A and DTS versions. The sleeves are awash with technical notes and logos. Confusion reigns.

Testimonials on gee whiz DVD-Audio from Daniel Barenboim, Elliott Scheiner, Neil Young and Mick Fleetwood all centred on the surround-sound effect—which plain old DVD-Video can already provide.

Although the first SACD discs and players were stereo only, the format now extends to surround and a remixed 4-channel version of *Tubular Bells* (*Studio Sound*, January 2001) could spark wider interest. Philips plans eventually to build SACD playback into all DVD-Video players and if a record company is prepared to pay a premium on mastering and pressing, hybrid SACDs will play on CD players. The previous warning that hybrids will not play on all CD players now looks increasingly like a false alarm, sounded by Panasonic because of shortcomings in its own test pressings and fanned by the clumsy way Philips and Sony responded.

All this distils down to a clear message for studios. New recordings should be made in surround, at high-bit rate, so that they can be mastered for DVD-Video, DVD-Audio or SACD, depending on which way the format wind blows. Old analogue surround recordings, made in the quadraphonic craze days of the 1970s, could be ideal fodder for DVD or SACD re-issue. But be warned: some of these old tapes may have gone sticky in store—*Tubular Bells* only survived intact because Philip Newell had bought a job lot of instrumentation tape for use as echo loops.

The time is now also coming right for recordable DVD to bury VHS, just as CD buried vinyl. But first there is an even more absurd standards battle to resolve, again between blessed and unblessed formats. This follows from a severe case of short sightedness by the DVD Forum.

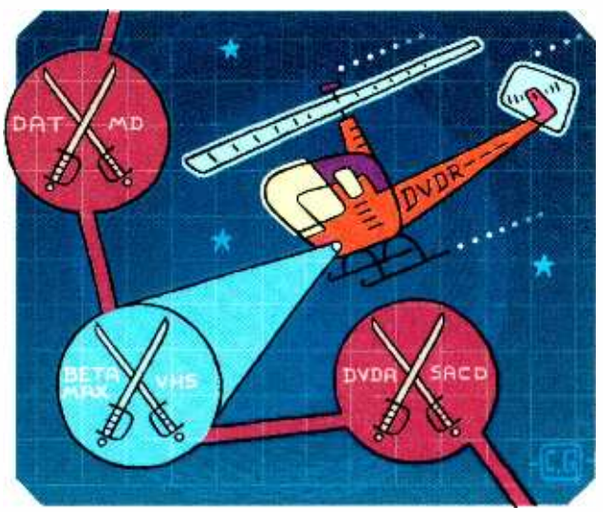
The Forum was so in awe of Hollywood that it saw DVD-Video only as a playback format. So when the official standard for recordable DVD was belatedly set, it was for DVD-RAM and data capture. The RAM standard was later modified for video, by increasing capacity from 2.6Gb per side to 4.7Gb, but there has always been basic incompatibility between RAM recordings and existing players. Apart from differences in the pit layout (RAM writes data down in a guide groove and up on the land between the grooves), the RAM disc comes in a caddy.

The industry abhors a vacuum, so several companies have tried to fill the gap left by the DVD Forum. The only thing they have in common with RAM is the use of erasable phase-change discs. NEC's Gigastation Multimedia Video Disc, is now seen as a professional format only.

Sony, Philips and Hewlett Packard came up with DVD+RW, which is backwards compatible with at least 90% of existing players (the disc does not use a caddy and data is written to make it look to players like a pressed DVD). The first +RW home recorders will go on sale this year, costing at least $2000. Hewpie will sell PC drives for around half the price.

The DVD Forum rejects DVD+RW as 'unofficial' because Pioneer had come up with DVD-R, a write-once format that should be backwards compatible with all players. Pioneer then extended DVD-R to DVD-RW, with erasable discs, and claims good but unspecified backwards compatibility. The Forum has officially approved both DVD-R and DVD-RW. Apple is putting DVD-R SuperDrives in new top-end Macs. Pioneer will launch home DVD-RW recorders head to head with Philips' +RW decks.

DVD-RW also records only in the groove and also uses no caddy. There are only small differences between -RW and +RW. But they are enough to make the formats different. Pride, politics and patents have prevented any merger. Sony's solution is to promise a Dual Compatible recorder that will use either kind of blank.



This sledgehammer approach could prove obsolete before it goes on sale next year. By then enough +RW and -RW recorders will have been sold and tested for the world to know from first hand experience which format best meets the key requirement—playback of new recordings on old players. Meanwhile Sony also promises DVR-Blue, a completely new format which uses a blue laser to record 22.5Gb on a single side. But this will not be ready for several years yet. For the time being, then, stick to good old VHS?

Welcome to New York

Power struggles and conflicting interests are conspiring to shake the audio mountains of New York's audio industry, writes **Dan Daley**

NEW YORK CITY is in the eye of yet another media hurricane, and this eye is not the usual calm one. Perhaps a better way to put it is that the city is actually being rocked by overlapping storms, the confluence of which is fracturing the famous bedrock that recording studios and other media facilities are built on.

The most immediate situation is the turmoil surrounding Avatar Studios (*ne* Power Station). Reports indicate that the studio is paralysed by a civil suit between its owners, both Japanese, one based in New York, the other in Japan. The situation has ripped the lid off long-simmering reports that the facility had been teetering. It's one more chapter in the landmark studio's tumultuous history. Power Station faltered after a bankruptcy filing six years ago, after which Japanese investors bought the studio, renamed it, but apparently did little else other than upgrade a few consoles. The upshot of this round may not turn out the same as the last. Information indicates that a Manhattan real estate company could obtain control of the building who may or may not continue to try to operate it as a recording studio. And in the current business climate, that seems unlikely as a long-term scenario. One way or the other, this episode of the soap opera should be resolved by mid-year.

Another squall line hit New York about this time last year, when the commercial wing of AFTRA, the television and radio actors' union, went on strike nationally, virtually shutting down commercial production and, by extension, audio postproduction, for seven months, until the strike was settled last October. Within a few months of the strike's onset, business began drying up for Manhattan's audio post houses, for which commercials are the lifeblood of revenues. And though the strike was eventually settled, it would take three or four months before the work began to trickle back to the studios. As one post house owner told me, 'We're at the end of the production chain, so it was going to take a while to get things moving again'. Not enough for a few commercial studios, which closed shop during the strike.

Now New York is bracing for another round of entertainment industry work actions, the first coming when the current Writer's Guild contract, between script writers and Hollywood studios, ends on 1st May. Shortly thereafter, the Screen Actors Guild contract does the same. While the effects of these actions will likely hit Los Angeles harder than New York at first, the long-term effects will wend their way eastward—New York is one of the top three cities in the US for film production, along with Hollywood and Orlando.

As if that wasn't enough, the production infrastructure that helps support audio post has been undergoing its own turmoil in the Big Apple. Companies like Astoria Studios and Silvercup, across the East River in Long Island City, Borough of Queens, had been doing well with a mix of episodic television (*The Cosby Show* had been done at Silvercup for most of its run), commercials, music videos

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and film work. Barring another round of strikes, the more these Queens-based facilities keep productions coming to New York, the better it is for the entire city's collection of music and audio post facilities, who benefit from the spill-over.

A big boost would have come from a massive new production facility, on the site of the old Brooklyn Navy Yard, originally proposed by Sony several years ago. The banner was later taken up by a consortium headed by actor Robert Di Niro and Miramax Films honcho Harvey Weinstein in 1999 but then the idea got caught in the maw of New York politics, with no less then Mayor Rudolph Giuliani steering the site to a pair of relatively unknown but wealthy mini-moguls, Louis Madigan and Cary Dean Hart. If the facility ever sees the light of day, it could be during the administration of ex-president Bill Clinton, who has already floated trial balloons about running for mayor of New York in four years, a possibility made more plausible by the fact that his wife, Hillary Clinton, is the newly elected junior Senator from the state of New York. And considering the financial and moral support that Clinton had received during his administration's legal woes from the liberal wing of the Hollywood machine (including scorned Navy Yard suitor Weinstein), that could put Weinstein and Di Niro back down the other end of the field. (You can't make this stuff up.)

Add to these specific dramas the general downturn in Silicon Alley, Manhattan's high-tech neighbourhood, where dot.coms were pink-slipping employees most of last year and all of this one. And personal recording studios continue to proliferate.

But all of the dramas being played out in NY at the moment also underscore the singular nature of doing business there, the Navy Yard deal being the perfect example. An outgoing mayor isn't the only deal-breaker here. Manhattan's small but highly focused and influential Jewish Satmar Hasidim sect, whose Brooklyn neighbourhood abuts that of the Navy Yard, has weighed in. Extremely conservative, the Hasidim are both regular sights around Manhattan (they are heavily centred around the electronics and clothing industries) and very influential in New York politics. The Rabbis' concerns are that their insular neighbourhood and way of life will be threatened by the glamour and glitz of show business, and since they tend to vote as a bloc, no politician in his or her right mind would ignore them.

Basically, welcome to New York, from its vertically-driven real estate market, to a trendiness that affects the media business as much as the restaurant business, in which a studio might be able to raise rates just because its neighbourhood made the front page of *The Observer* that week. So come on over and enjoy the chaos. And, we have lots of free parking.

Wonder years

Accurate crystal ball gazing is frequently more a matter of good timing than absolute prescience, writes **Kevin Hilton** (1984-2001)

MANY JOURNALISTS ENJOY making predictions but I fight shy of it. Sifting through available data and suggesting possible directions is fine but to make big pronouncements about what will be happening 10 years hence is potential professional suicide—and maybe not even that useful.

This belief was confirmed recently when I was researching a piece on digital television and unearthed a series of magazine features I had contributed to in 1994, which included the obligatory time-line. I provided the early parts of this; two other well-known commentators chronicled the present day, projecting up to the end of the nineties. One of the more off-beam predictions was that analogue technology would have been completely switched off by now.

This is only wrong, however, in chronological terms. Analogue will be turned off: European broadcasting organisations have advised that it should happen before 2010; UK Media Secretary Chris Smith has said that it could happen in Britain as early as 2006 if the domestic take-up of the technology is fast enough. Perhaps we should not be abashed by getting the timing of future events wrong. Because it is the year that it is, Arthur C Clarke has been taken to task over his vision of a space-dwelling, computer-controlled future in *2001: A Space Odyssey*. Defending himself and Stanley Kubrick, Clarke has said: 'We got most of it right, apart from the date-line. The odd half-century delay won't matter much in the great span of human history.'

As fantastic as the movie *2001* may have appeared in 1968, the concepts and applications of space travel and artificial intelligence do not now seem that crazy. The more I think about this, the more I realise that the problem is being carried away by the potential of technology—not into the visionary realms of Clarke or Philip K Dick but just the muddled thinking and extravagant claims that were common in the mid-nineties.

Back in 1994, CD-i was seen as the future of pre-packaged entertainment media. Not only would it offer high-quality digital games and movies, it would be possible to interact with the content; a Philips press release of the time made much of the future ability for consumers to craft new endings for *Casablanca*.

Anyone who predicted CD-i as the next big thing would have got it hopelessly wrong. As for the ability to change the ending of Casablanca—it would have involved creating alternative denouements and the benefits of doing so would have been doubtful.

Big claims have been made for convergence and interactivity over the past few years. Both are happening but the rate of change and the level of acceptance by the public are key elements. Various reports published at the end of 2000 agreed that the future is multimedia but it is clear the pace of change and consumer uptake of emerging technologies are in different speed lanes.

Digital TV, Internet and Mobile Convergence, a report prepared by consulting group Digiscope and published by Phillips Global Media, predicts that by 2005 there will be nearly 70m convergent consumers in Europe. While stating that this new breed of consumer will be using all three of the currently emerging platforms—digital television, the Internet and mobile-wireless communication—the report observes that true convergence is still some way off.

The author of the report, Barry Flynn, comments: 'The message of the report is that many of the perceived values of convergence are actually years away. The new digital platforms allow a much more sophisticated development of the customer relationship, tracking and managing their likes and dislikes across platforms.'

Flynn makes the further point that, in many respects, new technology has resulted in greater fragmentation of service than true convergence. What has emerged, however, is a more sophisticated service provider-customer relationship, with meta content—data about the customers themselves—becoming as important as the main content itself.

At the end of last year, according to figures published

by *Inside Digital TV*, the five big European TV territories (France, Germany, Italy, Spain and the UK) accounted for over 15.7m digital pay-TV homes. In the UK, 6.5m-7m homes have access to digital TV. Digital satellite is clearly prevalent: SkyDigital had notched up 4.5m-5m subscribers at the end of last year. ONdigital only hit its much sought after 1m subscribers during January; doubts over digital terrestrial continue, particularly as satellite is an easily expandable medium, while DTT has a finite capacity. A Reuters survey forecasts that there will be 12.4m digital TV households in the UK by 2003. This is tempered by a report in *Broadcast* magazine stating that 10m UK households will attempt to withstand the move from analogue to digital.

Digital is assured; uncertainty will manifest itself in the way people view and interact with new technologies. Which is how it should be. Hanging onto predictions shows a fear of change—just let it happen and then decide how to deal with it.

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BUILDING PRO TOOLS

Following last month's study of Pro Tools, Digidesign's **Dan Muchmore** discusses the differences between postproduction and music recording optimised systems

WE COVERED THE BASIC SETUP of Pro Tools and any system extras you may need in last month's Masterclass so now we will look at the optional hardware and software extras that are relevant to both postproduction and music recording.

A key element of postproduction and music recording is that of synchronisation. Digidesign offers the Universal Slave Driver with which you can resolve and synchronise to almost any clock or positional reference—LTC-VITC, bi-phase, pilot tone, house sync and so on. The USD's proprietary connection to Pro Tools hardware achieves near sample-accurate lock to time code. This sync is much tighter than using MIDI Time Code (MTC).

If you need to expand your system from the original Core system you may be able to add extra farm cards—or you may not, because Apple has sensibly limited its CPUs to 3-slot or 4-slot machines. For such cases, Digidesign has an expansion chassis that extends the capabilities of Pro Tools|24 and Pro Tools|24 Mix based systems and frees you from the PCI slot limitations of today's computers. There are 7-slot and 13-Slot Pro Tools Expansion chassis available and they allow you to add up to 10 supported Digidesign PCI cards for additional mixing, processing, sample power or for integrated supported Avid video cards (see Net: www.digidesign.com/compato/).

For maximum performance, Digidesign has the Digidrive 10,000rpm hard drives, available in 18Gb and 36Gb capacities. Digidesign-Avid's technology reduces drive noise by 10dB-12dB, improving the monitoring environment for critical listening. The latest generation of Digidrive is compatible with both LVD and single-ended SCSI buses.

Digidesign's involvement in postproduction draws heavily on the video options in Pro Tools. AVoption and AVoptionXL are hardware-software enhancements designed to integrate Avid Video into Pro Tools. Combined with Pro Tools|24, Mix and MixPlus, these options provide complete video integration, conversion-free Avid Media compatibility, and tight audio-video sync. AVoption and AVoptionXL both support instant capture, import and playback of Avid-compatible video media directly within Pro Tools.

AVoption makes it possible to capture, import and play broadcast-quality video at any Avid video resolution up to AVR77 (roughly 2:1 compression ratio) within your Pro Tools sessions. AVoptionXL is based on Avid's newer Meridien hardware, and adds a breakout box for component, composite and S-Video I-O. It captures and plays back media from 15:1 compression all the way up to uncompressed 1:1 video.

DigiTranslator is Digidesign's interchange application, which delivers reliable, accurate conversion of OMF files to and from Pro Tools. With DigiTranslator the complex process of file interchange is made simple and dependable. DigiTranslator makes a powerful partner for AVoption and AVoptionXL and helps to facilitate the exchange of sound and picture elements. The OMFI (Open Media Framework Interchange) is now supported by dozens of manufacturers and helps Pro Tools users exchange files with other workstations, such as Media Composer.

Sony 9-pin (RS422) interfacing is a major issue and to gain full control over outboard transports, Digidesign offers Machine Control. As the name suggests, this software option controls external machines connected to Pro Tools with near instant lock, and also allows

Core system components

Pro Tools|24

A D24 Audio Card: Provides track count and connects to Digidesign audio interface(s) including up to 16 channels of I-O and a serial port for optional connection of a Digidesign USD or machine control-support device.

One DSP Farm: Provides mixing and DSP power to run TDM plug-ins; plus up to eight channels of I-O.

Digirack Plug-ins: These are a special selection of TDM and file base Audiosuite plug-ins.

Latest version of Pro Tools software.

Pro Tools|24 Mix

A Mix Core Card: Provides track count and connects to Digidesign audio interface(s) including up to 16 channels of I-O and a serial port for optional connection of a Digidesign USD or machine control-support device.

Digirack Plug-ins: Latest version of Pro Tools software.

Pro Tools|24 Plus

A Mix Core Card: Provides track count and connects to Digidesign audio interface(s), including up to 16 channels of I-O and a serial port for optional connection of a Digidesign USD or machine control-support device.

Mix Farm Card: Provides additional mixing channels and-or real-time processing, plus up to 16 channels of I-O capability.

Digirack Plug ins: Latest version of Pro Tools software.

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2001

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Pro Tools to be controlled as a 9-pin device (new in Pro Tools 5.1). Using standard Sony 9-pin protocol, Machine Control allows you integrated access to commonly used transport functions of virtually any external deck within the Pro Tools graphical interface.

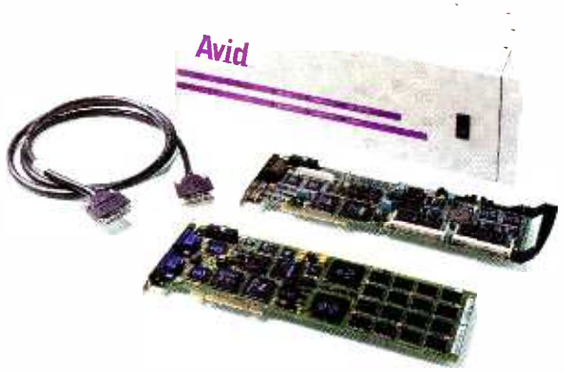
PostConform, Digidesign's EDL import-autoconform software, enables automatic capture and spotting of audio elements to picture. With PostConform, the time-consuming process of loading and conforming field audio and other audio elements can be accomplished automatically. PostConform imports and auto assembles industry standard CMX Edit Decision Lists.

The ProControl control surface connects to TDM based Pro Tools systems (Mac and NT) with a fast standard 10baseT Ethernet connection. Ethernet makes it possible to network ProControl main and expansion units throughout a production facility and it is designed to serve as the sole control surface in a Pro Tools TDM mixing and editing environment. Expansion packs are also available for ProControl—fader expansion packs include eight additional Digifaders and contain all the features of the main unit fader section as well as eight stereo meters. Five Fader Expansion packs can be added to the main ProControl unit (new in Pro Tools 5.1). As Pro Tools

moves into fully-implemented surround mixing and editing with version 5.1 software, Digidesign has introduced the Edit Pack add-on to ProControl for surround applications, with two patented DigiPanner joysticks and eight 40-segment, high-resolution meters for multichannel output monitoring. It also provides intuitive access to many of the advanced editing capabilities of Pro Tools. Edit pack comes with its own laptop sized QWERTY keyboard with customised coloured keycaps, and ergonomic two-button trackball.

The use of Pro Tools in music invariable touches on mastering. Masterlist CD Mastering software provides the link between the Digidesign workstation and the creation of *Red Book*-standard CD masters, used as the direct source for glass mastering by many duplication facilities.

Digidesign offers RealAudio G2 and MP3 file export for mass distribution and promotion over the Internet and the new export option uses the compression technology of Germany's Fraunhofer Institute.



Control|24—the newest collaboration between Focusrite and Digidesign—is a control surface engineered by Focusrite and built specifically for Pro Tools. It offers an ergonomic control surface and analogue front end for TDM-equipped Pro Tools systems. With 16 class-A mic-line preamps engineered by Focusrite, Control|24 provides a highly sophisticated front-end to audio interfaces such as the Digidesign 888|24 I-O, 882|20 I-O, or 1622 I-O. It even includes two DI inputs on the first two channels for plugging in instruments. There's also a comprehensive analogue monitoring section capable of up to 5.1 surround monitoring and includes talkback capabilities and an integrated submixer section with eight stereo inputs for control over your submixes.

We haven't mentioned the range of Digidesign branded and third-party plug-in support available for Pro Tools TDM systems, but there is one last piece of advice I would like to leave you with—look after your system. In my time in support I have had to deal with many problems that could have been avoided had the correct maintenance tools been installed. A must when purchasing any digital audio system is to make sure you have three things—antivirus software, drive maintenance software (Norton Utilities and Antivirus are recommended) and a backup utility.

If you are going to be taking files from other users, then it is essential to protect your system against viruses. If you get infected, it could mean the end to your session, or even your system so, be warned. Also, drive and file maintenance is important. It is a sad fact that drive structures and files can become damaged and so being without any recovery software can leave you up the creek without a paddle. In a perfect world we wouldn't need to be so cautious, but our world is not perfect. And lastly, I'm sure anyone who has spent more than an hour around a computer doesn't need to reminded about backing files up! With the new autosave feature in Pro Tools 5.1 things will be made easier but any Mac or NT compatible backup utility-medium will be money well spent: CD, AIT, DVD-R being good examples. □

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2001 SSAIRA NOMINATIONS

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THE FOURTH SSAIRAs—the *Studio Sound* Audio Industry Recognition Awards—follows the outstanding success of the last three years' awards in which the readers of *Studio Sound* voted for their preferred products in assorted categories. However, we first need to gather the nominations from which the winners will be selected which is where you come in.

Anyone can nominate a product for a suitable award category, but only fully qualified readers of *Studio Sound*, not manufacturers or related personnel, will be permitted to vote.

To nominate a product simply fill in the form or send your nominations via email by listing the category number followed by the product. To be eligible, a product should have started shipping since the Paris AES Convention (held in February 2000) and obviously needs to conform to the description of a particular category.

The resulting nominations selection will be published in future issues of *Studio Sound* for postal voting and for interactive voting from the *Studio Sound* web site.

With regard to the categories, it should be noted that, in the case of outboard equipment, this is described by function rather than product description—hence a 'voice channel' may legitimately be entered as an EQ if you feel it excels in this area.

There is also a special category in which you are invited to nominate equipment, people, initiatives or anything else that falls outside the other categories yet warrants acknowledgement. Nominate only in the categories you feel comfortable with. Do it now!

Nominations can be made by photocopying this page, filling it in and returning it to: SSAIRAs Nominations, *Studio Sound*, 8 Montague Close, London Bridge, London SE1 9UR, UK. Fax: +44 20 7407 7102. Alternatively, you can email the category numbers and your nominations to SSAIRAs@ubminternational.com

Nominations:

1. **Large scale console**
2. **Medium to small scale console**
3. **Outboard dynamics**
   A 'by-function' category covering any outboard featuring dynamic processing.
4. **Outboard preamp**
   A 'by-function' choice from outboard including microphone preamps.
5. **Outboard equaliser**
   A 'by-function' choice from outboard including EQ.
6. **Outboard Reverb**
   The final 'by function' category addresses reverb processing.
7. **Combined outboard device**
   Some units thrive on the combination of their processes.
8. **Monitor**
9. **Microphone**
10. **Audio editor**
11. **Audio recorder**
12. **Location-portable equipment**
    Gear for guys on the move.
13. **Plug-in**
14. **Special category**
    Your opportunity to recognise anything or anyone that has benefited pro-audio. Think carefully and laterally.

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MORE COLOUR

Continuing the tour of colour television broadcast working, **John Watkinson** encounters luma, color time and discovers the significance of 29th February

COLOUR TELEVISION CAMERAS are effectively three monochrome cameras in parallel, each responding to a different part of the visible spectrum. As Fig.1 shows, the light entering the lens passes through a splitter block where it is divided on a wavelength basis to pass to three sensors, typically red, green and blue. The signals leaving such an RGB camera are heavily redundant and this redundancy can best be exploited by processing the signal is a way which is parallel to the human visual system.

As Fig.2 shows, the RGB signals are added together to form a signal called luma, and given the symbol Y. The addition is weighted to take into account the different sensitivity of the human visual system to different wavelengths. The luma signal is essentially the signal that would have come from a monochrome camera having the same spectral response as the eye.

The eye has poor resolution with regard to colour changes but high resolution with regard to brightness changes. If the brightness can be eliminated from a signal, it no longer needs high resolution. Consequently further matrixing is used (also shown in Fig.2) whereby the luma signal is subtracted from the R and B signals to produce a pair of colour difference signals, R—Y and B—Y. Consequently RGB is converted to Y, R—Y and B—Y by a linear matrix operation from which R, G and B can easily be recovered by an inverse operation. There is a strong parallel here with the interchange between LR and M-S stereo in audio systems. The use of B and R is dictated by the fact that the G signal will be the largest and so can most readily survive the errors implicit in being derived from the luma and colour difference signals.

Why do we go to all of this trouble? Simply because by subtracting the luma from a video component, that component no longer has high resolution and can be low-pass filtered with no ill effect. The R—Y and B—Y colour difference signals can have their bandwidth dramatically reduced with no ill effect, but with a saving in cost.

There is a further advantage of this approach, which is compatibility between monochrome and colour television signals. The luma or Y signal can be displayed alone on a monochrome system, whereas the addition of the bandwidth limited R—Y and B—Y signals will result in a colour system. As a result the use of colour difference signals is widespread, being used in analogue, PCM digital and MPEG systems alike.

In analogue colour television systems such as PAL and NTSC, the two colour difference signals are used to quadrature modulate the subcarrier which was introduced last month. Monochrome receivers simply fail to process the subcarrier and a black and white picture results.

NTSC is the oldest colour television standard, dating from the fifties. As was mentioned last month, the subcarrier frequency was chosen to be 227.5x line rate so that there would be an inversion of subcarrier phase from line to line, helping to make the subcarrier invisible on monochrome receivers. However, in the monochrome standard, the sound carrier had been placed at an odd multiple of half the line rate so that spurious harmonics of line rate fell either side of it. With the introduction of colour, the spurious harmonics of the chroma now fell on the sound carrier.

The developers of NTSC wanted to change the sound carrier frequency by a minute amount to prevent this clash. Although this would have worked, the FCC wouldn't allow it because it was a standard and they were unable to see the wisdom of a correct engineering solution, an attitude that they have recently repeated over ATSC. Instead the broadcasters were forced to band-aid the problem by changing the field rate by 0.1% from 60Hz to 59.94Hz.

As a result dividing the field rate by 60 no longer gave real seconds so that the clocks locked to video all ran slow. Initially this was handled by the invention of 'color time'; a new band-aid timing standard which was 0.1% different from the real world. The final band-aid solution was the development of drop-frame time code in which 0.1% of the frames counted didn't exist so that a real world seconds clock can be locked to 59.94Hz. The use of 29th February which is a drop-day except in leap years has an identical effect.

Computerised video editors look for specific frames in a video recording, but if the frame being searched has been dropped it will never be found. Consequently the frames which are to be dropped are closely specified by an algorithm which all time code generators must implement. All editors must have software which disallows selection of the dropped frames and substitutes the nearest existing frame instead.

The repercussions of this disastrous decision are widespread. In PCM adaptors which converted digital audio signals so they could be recorded on VCRs, the 0.1 percent drop in frame rate meant that the 44.1kHz sampling rate used for CD became 44.0559kHz when used with NTSC VTRs. Consequently these could not be used for CD mastering, which had to be done on monochrome VTRs running at exactly 60Hz with non drop-frame time code.

In NTSC, simple quadrature modulation is used. This worked well except in some urban areas where multipath reception caused phase shifts which changed the displayed hue. In the later PAL system this problem was eliminated by a modification. In PAL, the colour difference signals are low-pass filtered to produce a pair of signals known as U and V. As Fig.3 shows, the V signal is inverted on alternate lines. When this is done, a given transmission phase error has an opposite effect on alternate lines. For example, if a phase error on line 51 causes the U signal to appear to be too large, the same phase error on line 52 will cause the U signal to appear too small. Thus by averaging the colour difference signals over two lines, phase errors

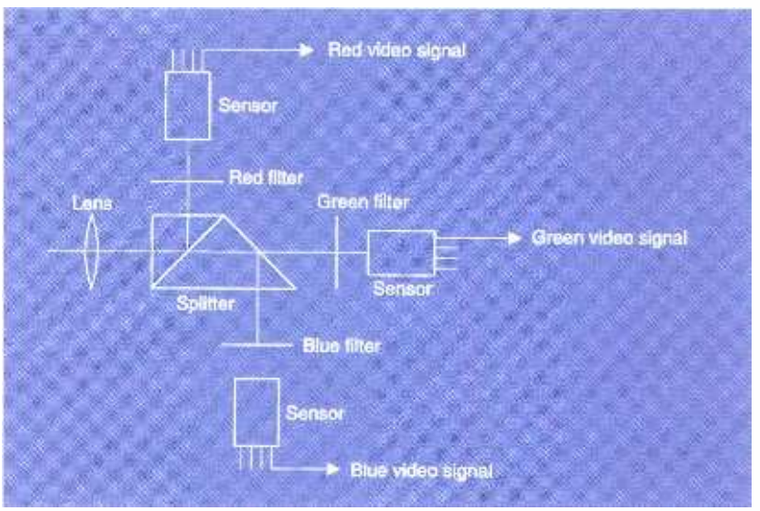

Fig.1: Simple colour television system. Camera image is split by three filters. Red, green and blue video signals are sent to three primary coloured displays whose images are combined

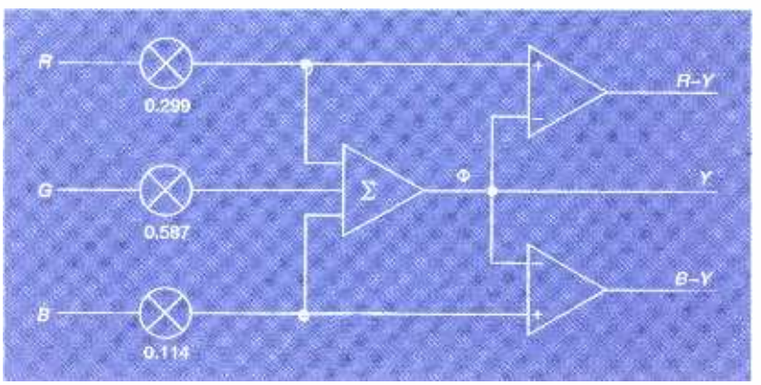

Fig.2: Colour components are converted to colour difference signals by the transcoding shown here

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can be eliminated.

In PAL the receiver needs to know the sense of the V-switch so that the V signal can be re-inverted properly. This is indicated by having two different burst phases. The phase locked loop in the receiver is filtered so that it runs at the average phase of many burst, but the sense of the phase error on each line reveals the sense of V-switch.

V-switch has some further consequences. Fig.4a shows that inverting the V signal on alternate lines means the fundamental period of the V signal is now two lines instead of one. Consequently the spectrum of V is rich in multiples of Fh/2, whereas that of U remains rich in multiples of Fh as Fig.4b shows. Spectral interleaving of luma and chroma Fig.4c has to be done by siting the subcarrier frequency three-quarters of the way between multiples of line rate. The frequency chosen is 283¾ x line rate. This achieves the necessary spectral interleaving, but the visibility of the chroma on the screen is worse because now it doesn't invert between lines. Instead it has a quadrature relationship over a 4-line period.

The solution adopted was to add an offset of 25Hz to the subcarrier. This is the same as the frame rate and as there are two fields in each frame, the effect of 25Hz is that the subcarrier at a given place on the screen will be inverted in the same place in the next field. This has the required effect but the subcarrier is no longer a multiple of line rate. One obvious consequence of this is that when using an oscilloscope triggered from horizontal sync, the individual cycles of the burst cannot be identified. This is because the scope superimposes many bursts in different phases in successive sweeps, resulting in the burst taking on the appearance of a sausage.

A more serious problem is that the 4-line period of subcarrier phase changing with respect to horizontal timing does not divide into the 625 lines of a frame. As a result there are in PAL four different types of frame each of which starts with a different combination of V-switch and subcarrier phase. In transmission this causes no difficulties at all, but editing of composite recordings is difficult because edits can only be made in such a way that the 4-frame sequence is unbroken. Synchronising different PAL signals so that they are at the same point in the sequence is known as colour framing.

In practice a video editor would select the desired in- and out-points for an edit, and the edit computer would move one or other of the points as needed to colour frame the edit. This would sometimes conflict with the artistic intention of the edit. This conflict would be resolved by the development of production equipment which used separate video components such that there was no colour framing and any frame could be edited to any other.

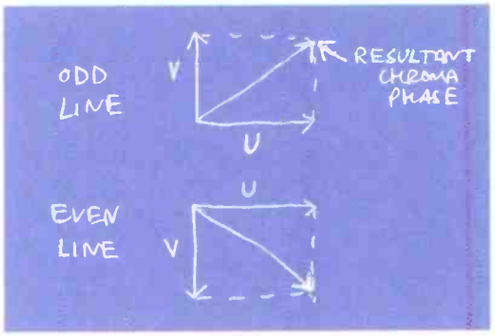

Fig.3: In PAL, phase of V signal is inverted every other line

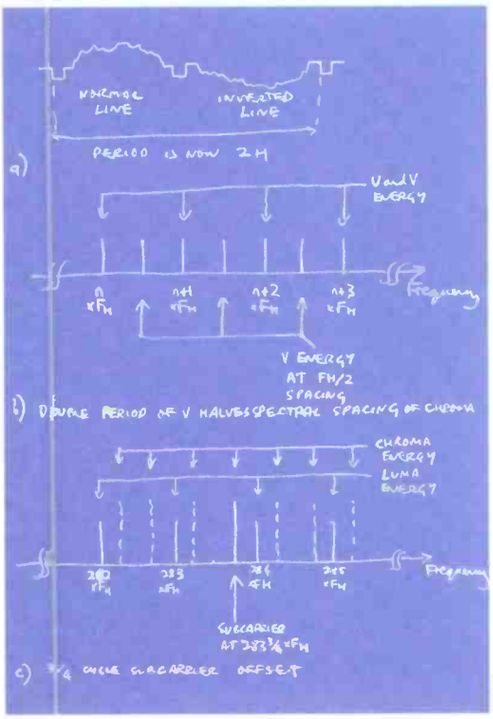

Fig.4: PAL spectrum and origin of subcarrier frequency. See text for details

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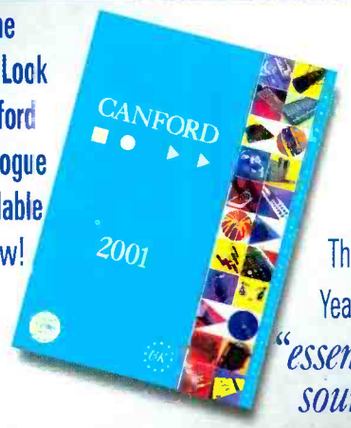

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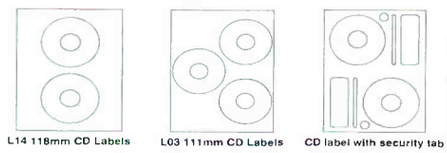

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Weakest Link: weaker audio

IN THE LATE FIFTIES I was working at IBC Studios 35 Portland Place, London W1 along with people such as Ray Prickett, Phil Yeend, and Joe Meek, and a brand new tape recorder arrived. It was a twin-track 300 model Ampex. The then studio manager, Allen Stagg, said, 'Howard, you've used Ampex machines before, there's a classical session in Studio A, get yourself a couple of mics and do an experimental stereo recording'. So I suspended from a boom a pair of STC 3033 mics as a pair of crossed cardioids.

The session, I recall, was for Oiseau Lyre and the orchestra was the *Pro-Musica* conducted by Thursten D'Art (I hope I have got his name spelt correctly). The monitor speakers were a pair of Klipsch corner horns and the system was set up in the foyer of Studio A. As it was so near the studio, I could not monitor off tape as the delayed signal may have been picked up by the mics in the studio with the obvious problems. So I had to wait for the lunch break to check playbacks. Then I had a lesson on what stereo was about.

The various sections of the orchestra coming from the correct respective positions, that is violins on the left, basses on the right, violas middle left, cellos middle right and a good central image. One of the musicians listening with me commented that it was the very first time he had heard the 'wood' of the violin recorded.

British TV presenter Anne Robinson who went from consumer champion on *Watchdog* to hate figure on quiz programme *The Weakest Link*, has now been associated with declining standards in television broadcast. Is her catchphrase, 'You are the weakest link; goodbye', a coded message to audio engineers?

In those early days we did not have mixers with pan pots and EQ to make things sound different, we took it as it was performed. I notice today with recordings, radio, and TV that with all our modern sophisticated equipment everything seems to be very middle-biased, with little information on the left and right. This applies to all genres of music, both serious and popular. I have been listening recently to stereo LPs recorded in the late fifties and I think that they sound a lot better and have better stereo spread than the majority of today's balances.

I suggest that the Decca recording of Drove's *New World* symphony on SXL 2005, and *Music for Bang, Barroom and Harp* on RCA SF5031 along with Bob Fine's Mercury recordings of Stravinsky's *Rites* on AMS16065 and *Fennel Conducts Gershwin* on CMS18050 be given a good listen to, preferably not as CD re-issues.

Obviously we do not want 'ping-pong' stereo but it would be great to hear stereo spread rather than a strange sounding 2-track mono.

A problem that I have also noticed on TV is that a great deal of NICAM stereo has the music out of phase with dialogue. If you switch your monitor amp (Quad in my case) to mono, the music often disappears to a very low level. A recent episode of *The Weakest Link* suffered this problem. Is it being caused by a funny in some kind of surround sound?

Howard L Yentis, UK

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THE WISH LIST

< Continued from page 86

Plus codec; AEQ TLE-02D

'The TT 3080 is a satellite phone that looks like a laptop and has an external unfolding antenna. In addition to the fact that our star reporter could carry this on his way through a desert or any place that is not covered by a cellular network, it provides a Euro ISDN connection—together with ISDN modem—RJ 11 jacks for a standard analogue phone line, a PCM-CIA interface, and even an extra line input for playout from an external source.

'If the job is done in less remote areas, chances are there will always be a phone at hand, or better, an ISDN connection. In these cases, we should have at least one portable ISDN codec that also has a normal telephone hybrid built-in. If an ISDN connection is at hand, the Telos Express is a user-friendly all-rounder. The Musicam also offers a terrific package, because next to the codec there's an ISDN terminal adaptor, a modem and an analogue line interface card, all packed into a small attaché case. This equipment, if connected in the right way, supports MPEG Layer 2 and 3, G 722, and can deliver ±10 kHz (via modem) audio on a normal telephone line. What's more, it has three mic inputs—one switchable to line—and two totally independent headphone feeds.

'The AEQ TLE-02D looks like a small mixer but is actually a combination of a speech-quality ISDN codec with built-in terminal adaptor and a real—digital—telephone hybrid... no loose modem this time. It is only available for G 722/711 algorithms—limited to ±7.5kHz—while the audio via the hybrid is, of course, limited to ±3kHz. It gives you, however, the security that you can communicate wherever you are in the world if there's a phone line available—You could use the normal phone that's usually connected to that line, but then you'd lose all of the facilities that are built into this unit. The AEQ also has two microphone inputs and two independent headphone feeds.'

Summary Considerations:

'The star reporter's ultimate setup will always be a configuration of different items. The choice is driven by the job and the location: do we need 20kHz bandwith or high-quality transmission, or simple speech transmission? Do we need to mix International Sound and-or intercom signals into our reporters headphones? Will they be commentating on an event with a guest speaker? Are we going to send the reporter alone to the Himalayas or the Kalahari Desert, or just downtown? Will they be working with an OB vehicle and technical crew or just with a cameraman? Have they all the time in the world to record and edit the programme material or will it be hush-hush live work?

'Depending on the situation, we can have several different minimum configurations of equipment.'

The Minimum:

MD 421, HD 25 or Beyer DT100 series as preferred; Sonifex Courier; mobile phone. Alternatively, if only live transmission is necessary: HD25 headset with dynamic mic (two if necessary); AEQ TLE-02D with batteries or a Telos Express if ISDN is available and hi-fi quality is required; mobile phone

For TV:

One or more SK 50 transmitters; one or more EK 3041 receivers; Lavalier mics (such as Sennheiser MKE40 or MKE102); in-ear monitoring consisting of AudioClarifier, plus a scanner or a Sennheiser Evolution set

'If you can transmit a video signal from a remote place, then the audio will fit in easily.'

For high-quality line-of-sight broadcasting:

MD421; HD25; Jotron Reporter 2000 (alternatively SER 20 OB system); mobile phone

For recording and editing:

MD 421; HD25; HHb Portadisc (or a Sonifex Courier); laptop PC

For maximum security when hi-fi quality is required:

THE BALANCE SHEET

Total expenditure: €50,000

THE BALANCE SHEET

Excluding the Jotron digital transmitter-receiver, Chris is right on budget. The Jotron, however, is manufactured by a Scandinavian company that specialises in marine life-saving transmission equipment, and as such it pushes the costs a whopping £15,000 into the red—and Chris scurrying frantically to his bank manager.

MD421; HD25 headset with dynamic microphone; HHb Portadisc; laptop PC; Musicam Roadrunner package; mobile phone

And for the Himalayas or the Kalahari:

Satellite phone

Although don't go on to the North Pole afterwards, because even satellite phones have difficulty operating there. For recording, make sure you get hold of a good old, well-oiled Nagra. A Sonifex Courier could also do the job, but you'll have to defrost it in time. □

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2	(Don't Fear) The Reefer	⇦	7	Land of Dope & Glory	⇧
3	La Rizla Bonita	⇩	8	Toke 5	⇦
4	The Bong Remains the Same	⇧	9	A Reefer Shade of Pale	⇦
5	Black in the USSR	⇦	10	Classical Grass	⇩

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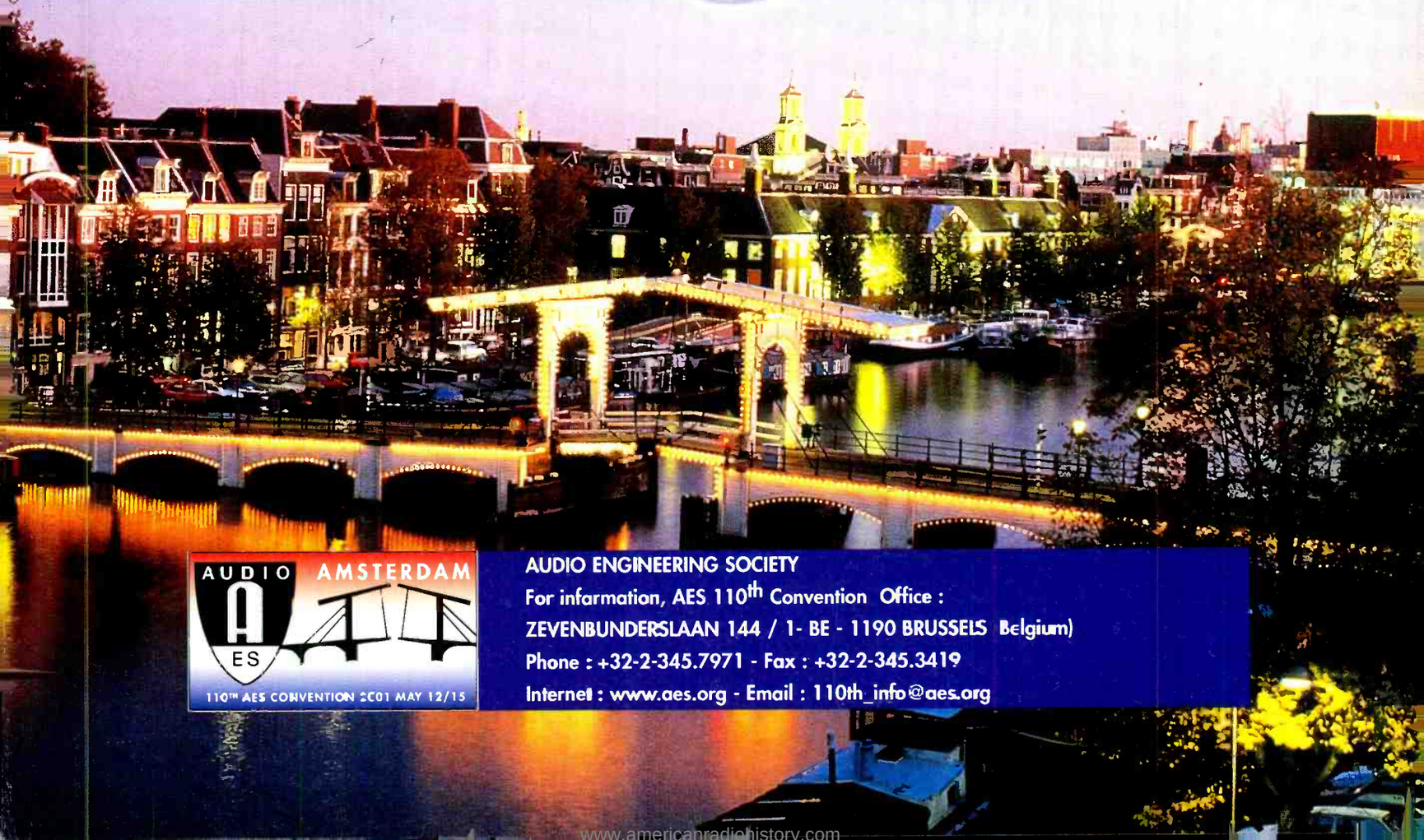

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CHRIS WOLTERS' STAR REPORTER'S KIT

It's no use sending out a radio reporter to cover a hot story unless you've provided them with the means to capture and deliver it. VTM's Chris Wolters tells **Richard Buskin** how

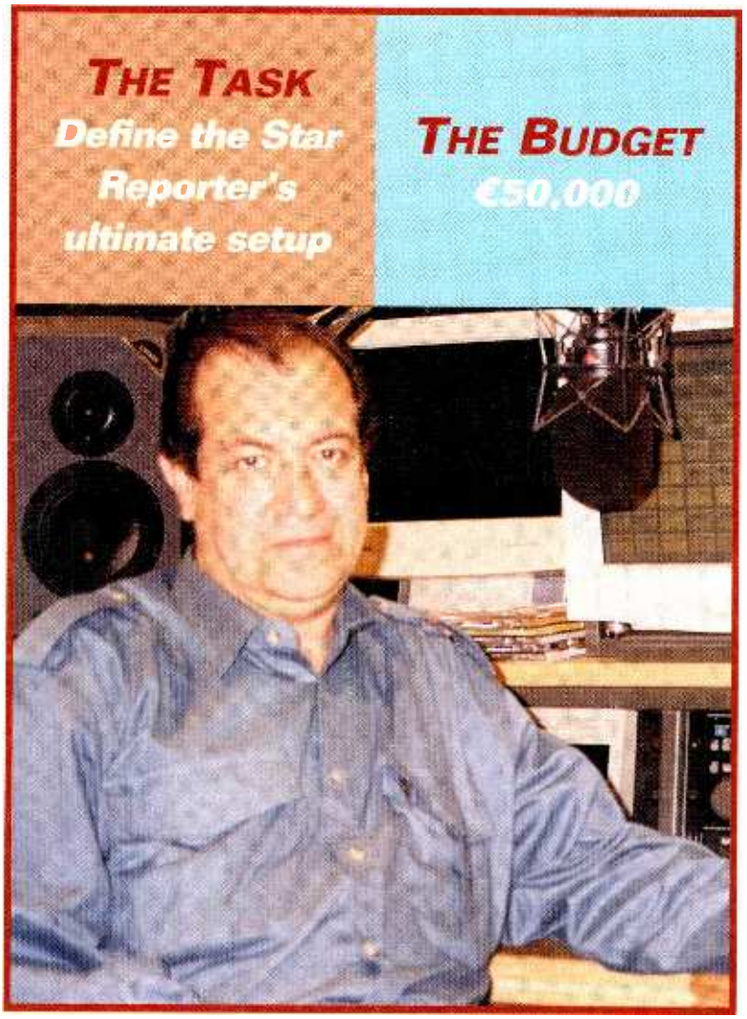
'IN THE BROADCAST environment there is a saying that if you give the average person a box with two buttons on it, there's a 50% chance that he or she will push the correct one,' says Chris Wolters. 'Give that same box to an actor or reporter and the chances are more like 30%.

'Many people working within an audio-video environment are not interested in the technical aspects, and some even resent the fact that there needs to be equipment to record and transmit audio or video signals in order to get their message across to the masses. Journalists and reporters are no different in this respect.'

With this in mind, Belgian native Chris Wolters—who began recording music some 25 years ago, and is now the radio unit manager and all-round audio consultant for TV-radio broadcasters VMMa in the city of Vilvoorde—has opted for a state-of-the-art yet user-friendly mobile setup for the roving reporter; one that provides a choice of gear, catering to a variety of locations and circumstances.

'We'll need a package of different items to get a signal from the field into our studio... and back,' he muses, 'in the event of a live report. We'll need one or more microphones—wired and wireless—headsets, in-ear monitoring for TV work. We'll have to mix, record and edit programme material, and we'll need to be able to transmit over the normal phone line or via ISDN with IFB and mix-minus capabilities...'

Okay, let's get shopping.



Microphones:
Sennheiser MD 421; Beyer M58; Coles noise-cancelling, close-talking microphone; Sennheiser 5000 series pocket transmitters; SK50 UHF, with EK 3041 receiver; Sennheiser SER20 OB transmitter; Jotron Reporter 2000 digital transmitter

'The 421 is a winner. It's cardioid, sturdy, easy to handle and weighs enough so that you'll be aware it's around. Besides, it has a very efficient multistep high-pass filter, and more than anything it sounds great. The only drawback is the fragile stand adaptor that's made partly from easy-to-break plastic.

'The M58 is very sturdy, high-output omni-directional dynamic mic. Above all, it is insensitive to handling noise and has a high output signal. This also makes it a universal tool. It has no low frequency roll-off, however.

'The Coles looks like a pre-war machine-gun handle, but it is build to outlast many generations of users, and what counts most is that it works in noisy environments.

'The Sennheiser is necessary in case a reporter does TV field work with a crew, or at least a cameraman. The SK50 is small yet sturdy—except for the plastic battery holder—and it has proven it's ability to deliver clean RF and excellent SN. It also has 16 externally switchable TX frequencies and can be easily reprogrammed to neighbouring bands, if necessary. For field work, this transmitter would be complemented by the on-camera—or on-mixer—attached EK 3041 receiver. This is a true diversity receiver with 32 switchable synthesised frequencies, and it fits to most small mixers or portable broadcast cameras.

'The Sennheiser OB is for the more elaborate field transmissions where Tx and Rx functions need to be available. It's a powerful broadband transmitter that can be received over long distances and under difficult circumstances by a normal camera receiver—like the EK 3041, and has talkback facilities if used with a location mixer or an OB van. Meanwhile, another option is the Jotron, which provides CD quality audio from the transmitter to the receiver and an analogue return transmission path for IFB or N-1 signals. This is done deliberately because, if the reporter wanders too far from the receiving site, he can still be reached by a fading FM carrier, telling him that his digital signal fell out and that he's now only talking to himself.'

Headphones and In-ear Monitoring:
Beyer DT100 series and Sennheiser HD25 headphones; David Clark noise isolating headphones; Audio Implements Audio Clarifier in-ear monitors; Sennheiser Evolution in-ear monitor; Icom pocket scanner

'The DT100 isolates outside noise very well, it is well-built and is comfortable to wear even for a long time. The only drawback; it is rather bulky. The Sennheiser HD25 offers excellent sound quality and is more lightweight. There again, its drawback lies in its non-latched connectors at the earshells.

'The David Clark headphones are for when the reporter is in a helicopter or next to a Formula One racing circuit. I still prefer the old vacuum, suction pump-type, super-isolating headset for one simple reason; it always works, whatever the situation. Not to be worn for too long, however.

'The Evolution in-ear monitor works fine and is very cost-effective. The Icom is flexible, pretty robust and easy to tune. The advantage of scanners is that they operate within a wide range of frequencies, making them almost universal... though not legal in some countries, so beware.'

Recording & Editing:
HHb MDP500 Portadisc; Cool Edit 2000 software editor; Nagra ARES recorder; Sonifex Courier portable hard-disk recorder

'The Portadisc is the next best thing to the good old Nagra tape machine. It is robust and it has all of the bells and whistles you could wish for; mic and line inputs, a 6s pre-record buffer, and a large memory buffer. More importantly it has a USB port that allows the audio file to be transported in no time to a PC, where it can be elaborately edited.

'Cool Edit is comprehensive, easy to use and known world-wide, mainly because of the excellent price-quality ratio. The Nagra, of course, provides portability and an all-inclusive approach, while the Sonifex can not only record and edit, but also act as an ISDN codec. It can record in either linear or data reduced—MPEG Layer 2-format.'

Transmitting and Live Reporting:
Thrane & Thrane TT 3080 Capsat Messenger; Telos Zephyr Express; Musicam Roadrunner

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"REASONS NOT TO BUY A MACKIE D8B...ZERO."

—Roger Nichols, EQ Magazine

PLUS 3 MORE REASONS TO GO FOR IT.

OS Version 3.0 NOW SHIPPING!

Download direct from www.mackie.com

1 FREE UPGRADE! NEW OS 3.0 ADDS OVER 30 NEW FEATURES!

Our Programming Department has been chugging the double lattés to create Mackie Realtime OS™ Version 3.0, packed with more new features and enhancements than you can shake a mouse at. Here's just part of what 3.0 adds to the already amazing D8B.

- **New key (sidechain) inputs** for all 48 onboard dynamic processors featuring soft knee architecture and single band 20-20k parametric EQ for frequency dependent processing such as de-essing
- **3rd-party plug-ins** via our new UFX card. Up to 16 simultaneous plug-ins on the first 48 channels, pre or post DSP, pre-fader via up to 4 UFX cards. Each plug-in is available twice — once when tracking, and again at mixdown!
- **Multiple Undo List** — 999 levels!
- New **Snapshot libraries**.
- Externally or internally accessible **inserts across Mains and Buses** plus **channel inserts pre and post DSP**.
- **Updated GUI** including 48-channel fader bank view screen.
- **Time Offset** (delay) adds a delay of up to 255 samples to the signal at the pre-DSP (dynamics / EQ) point in the signal path.
- **New surround capabilities** including depth-of-center control (LCR mixing with divergence), multiple surround panner window, individual LFE channel level control.
- **Multiple direct outs** per channel.
- **Optional level to tape** fader control.
- **Assignable, bidirectional MIDI control** of all parameters.
- **Cross patching** allows substitution of channels between various banks.

2 DSP PLUG-INS!

Antares' Auto-Tune for the D8B uses advanced DSP algorithms to detect the incoming pitch of a voice or solo instrument as it's being tracked and instantly pitch-correct it without introducing distortion or artifacts. Fully automatable.

Massenburg Parametric EQ. MDW 2x2 High-Resolution Parametric Equalizer plug-in from Grammy-winning engineer/producer George Massenburg. Mono/stereo EQ at 96kHz sample rate for unprecedented clarity and high frequency smoothness.

Drawmer ADX100 includes their industry standard frequency conscious gating, plus compression, expansion and limiting.

IVL Technologies' VocalStudio provides real time vocal doubling, multi-part harmonies and pitch correction in an easy-to-use interface. A free demo is built-into the Digital 8 • Bus. Just add a second MFX card to own this innovative plug-in from a world leader in vocal processing.

TC Electronic Reverb (bundled with the D8B UFX card) provides Reverb 1 and Reverb 2 algorithms from the renowned TC Electronic M2000 Studio Effects Processor.

The list of top engineers and producers who use the award-winning Mackie Digital 8 • Bus is growing daily. For info on the D8B, new UFX and Optical • 8 cards, 3rd-party plug-ins and how D8B owners can get their free OS upgrade, visit www.mackie.com or call your local D8B dealer.

3 1999 TEC AWARD WINNER!

Normally we don't name competitors in our ads. But in this case, Mix Magazine published the other nominees for the 1999 TEC Award for Outstanding Technical Achievement in Small Format Consoles: Allen & Heath's GS-3000, Digidesign's ProControl, Panasonic's WR-DA7, Spirit's Digital 328 and Yamaha's 01V. Thanks to all who helped us win this prestigious award.

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"I thought I owned the best preamp...
...until I heard the Aphex 1100."

Stephen Krause, award winning recording engineer and producer with over 60 films, 10 TV series and 20 records to his credit, is always in search of better tools. He compared just about every preamp that came on the market to his favorite. Nothing impressed him—until he tried the Model 1100 tube preamp from Aphex Thermionics.

"I always had to choose either an intimate, detailed sound or a large image. The 1100 gave me *both* at the same time. It was so dramatically better than any other preamp I had to get the composer and other engineers to hear it for themselves. Everyone was blown away."

The Model 1100 is a 2 channel discrete Class A tube microphone preamplifier with 24-bit/96kHz A to D converters. Proprietary designs and highest quality components achieve the performance that has set a new standard for "the best preamp." Doesn't your music deserve the Model 1100?

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