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PLUS XXX
STUDIOS

CONTENTS

MAY 2001 Volume 43 Issue 5
POSTPRODUCTION • RECORDING • BROADCAST

ANALYSIS

FEATURES

RECORDING

BROADCAST

TECHNOLOGY

REVIEWS

COLUMNISTS

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The pro software sensibility issue

THE CHASM THAT divides pro audio and MI sensibilities is promising to be closed by the onslaught of smart software. However, old habits die hard and appraisals of what professional users actually want remain more difficult to change.

In hardware outboard processors, manufacturers targeting those rising from the MI side countered 'the less costs more because it's pro' ideology by producing boxes that had higher knob and LED counts and more densely populated rear panels for substantially less. The upshot is that, almost without exception, outboard equipment is now more tweakable and better endowed regardless of whether you really need it.

Differences in approach to recorder-editor software from the two camps have largely retained these distinctions and the chances are that you will, for example, enjoy many more crossfade envelope types and other bells and whistles in an affordable PC-based DAW than you will in a higher end proprietary system. Software manufacturers that still have a foothold in the MI sector continue to challenge predominantly on the features-cost ratio.

However, the number of Cool Edit and other even more rudimentary systems being used at desk top level within large broadcast infrastructures suggests there is a window of opportunity. Software editing from the high end is not available as a simple and cheap kernel and, strangely enough, stripped down and relatively 'feature less' versions of established MI rooted systems do not enjoy any form of kudos with the pro fraternity despite the fact that there is a requirement for simple, fast and

bombproof editor-recorder software from established and reputable brand 'experts' for Cool Edit money.

If you believe that the features-price equation in editing-recording software leads ultimately to an uncomfortable stalemate then you will acknowledge that differentiation and specialisation is a way forward. Not everybody needs all the bells and whistles, for many they are even off putting, and many would pay well for systems built by these 'experts' that address their needs specifically be they news compilation, ADR or intensive track laying.

The beauty of software is that in skillful hands it can be made to do everything. It is a worrying trend that this is precisely what it is being forged in to doing, when a definable 'something' would often be just enough.

Zenon Schoepe, executive editor

Hostile environments

THE POPULAR view of recorded sound has it either presenting an accurate record of some actual acoustical event or opening a Pandora's box of musical possibility. Generally, the emphasis falls on the pursuit of pleasure of countless kinds. Discounting its friendlier applications, however, sound regularly helps describe endless desolate soundscapes of discomfort, destruction and death.

Of course, it's reassuring to know that the pursuit of 'accurate' microphones, 'transparent' preamps and processors and 'reference' monitor speakers goes on and it's exhilarating to track new recordings and new musical styles. But it's downright harrowing to endure the maelstrom of bullets in the opening scenes of *Saving Private Ryan* or to weather the body blows of *Fight Club*. Yet it's a big part of what audio does, and the public seems to like it.

The fact is that apart from—as well as—being a proven social and historical archive, established news channel and essential entertainment medium, audio is a passport into a myriad hostile environments. From the destruction of the human body, through the trials of fire and radiation to the inhospitable environments of deep sea and deep space, sounds people would never live to hear (whether real or imaginary) are offered to them by today's audio industry.

It's hard to imagine Thomas Edison conceiving of Foley artists and sound designers as we have come to know them—even if he could accept the impact of records, radio, television and film. But, as with the best of good ideas, their application regularly outstrips their designer's vision. And so we find ourselves fearing the roar of a dinosaur that never walked, ducking a bullet that was never fired, and hearing ghosts that never lived.

Sound—that stuff that the hi-fi press doesn't understand and all but the deaf take for granted—has insidiously become more than a telecommunications medium, more than music for pleasure, more than the rumble in the cinema... For the general public it's become a microscope and a telescope, access to the deep and the distant, a channel to the subconscious and the supernatural. It's their pain as well as their pleasure; their education as well as their entertainment.

Someone should tell them to be careful what they hear.

Tim Goodyer, editor

May 2001 Vol 43, No 5. ISSN 0144 5944

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SUBSCRIPTIONS
UK £52; Europe £69; Overseas: $130; Single £6

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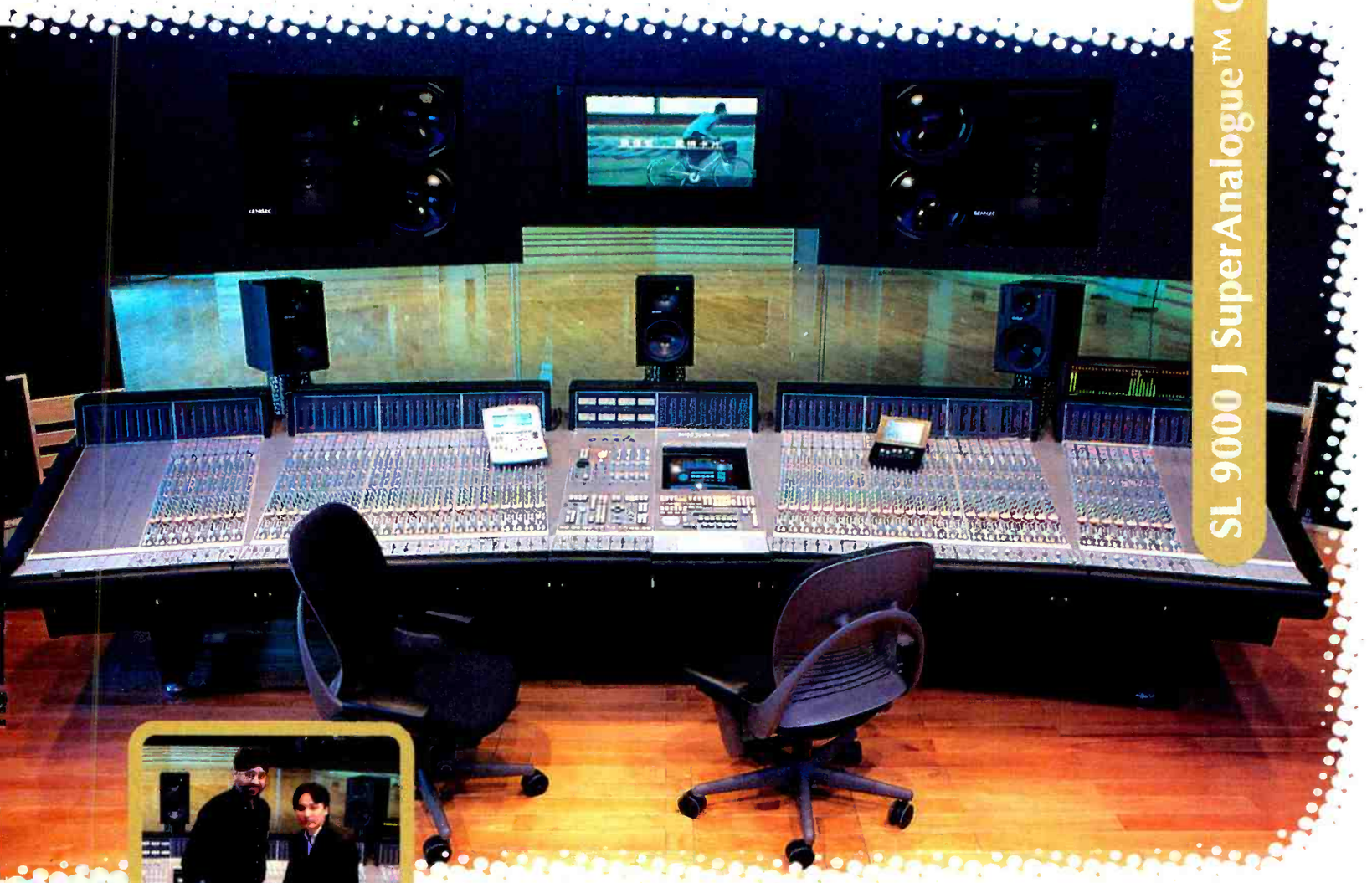
"For us, the 9K was the only way to go"

Dindae Sheena, Oasis Studios, Beijing

SL 9000 J SuperAnalogue™ Console



YYYD Productions Chief Operating Officer Dindae Sheena (left) and President Patrick Kwok (right)

Studio One at Oasis

OASIS STUDIOS

Great Studios Of The World

When YYYD Productions decided to create a world class recording facility in Beijing, the choice of console was obvious. "We did a market study on the standard that was currently on offer in other private facilities in China" says COO Dindae Sheena, "as we wanted to improve on them. We decided that the 9K was the only way to go and Oasis will be the first private facility in China to own one."

Oasis Studio, YYYD Productions Co. Ltd.
No. 16 Dong San Huan Beilu, Chaoyang District, Beijing, 1000024

SL 9000 J SERIES

SL 9000

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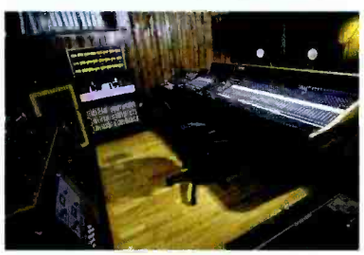
CONTRACTS

Egypt: Cairo-based Egyptian Media Production City has ordered an SSL SL8032GB console for installation in a new recording room in a push to attract international clients to the 'Hollywood on the Nile' facility. The desk joins six SSL consoles, including an Avant and Axiom-MT, serving regional music, drama and cultural programming. Media Production City, Egypt. Tel: +20 11 400 453. SSL, UK. Tel: +44 1865 842300.

Spain: Leading Spanish recording studio, Music Lan, has purchased a DPA Type 3541 large-diaphragm mic kit. Happily deplyed on brass, acoustic guitars, bass drum and vocals, the 3541 joins two new 4006 omnis serving as overheads for drums and percussion, and also on classical and jazz projects. Based in Girona, north of Barcelona, Music Lan offers a 56-channel SSL4000 and 8036 Neve consoles with RADAR II and Pro Tools Mix Plus recording systems. Recent visitors include Jarabe de Palo, Manolo Garcìa and Bunbury. Music Lan, Spain. Tel: +34 972 547 053. DPA Microphones, Denmark. Tel: +45 48 14 28 28.

US: Jarvis Studio's new 64-channel API Legacy console arrived through a sixth story window overlooking New York's Greenwich Village recently, to join the studio's Genelec 1031A and ATC 150 monitors, vintage Neumann Telefunken 47 and M49 microphones, and extensive outboard. The second largest Legacy in New York City, the desk boasts 64 768L input modules, 64 550L EQs, 16 212L preamps, four 225L compressors, four 235L gates, and two 215L filters. A 12-channel sidecar brings the channel count to 76. At just over a



year old, Jarvis Studio counts rock upstarts as Rivington, Preston Clark, and Laura Dawn among its clients. Jarvis Studio, US. +1 212 253 0079. ATI-API, US. Tel: +1 410 381 7879.

UK: A new high-end location recording setup called Studiolab is launched by the London-based Digital Audio Technology operation this month. Optimised for DVD-Audio, the Studiolab mobile recording setup is built around a 48-track Euphonix R-1 digital recorder with Pro

The mLAN plan

Japan: Yamaha and Otari have announced their intention to co-operate over the mLAN digital network interface and to develop a second-generation mLAN chip to meet the requirements of high-end pro-audio needs. Otari plans to use this chip in the development of new network technology based on Lightwinder technology. The objective of the project is to enhance the functionality of Yamaha's existing mLAN chip, mLAN-PH1, responsible for the interchange of digital audio data formats and the IEEE1394 bus that conform to the Audio and Music Data Transmission Protocol (A&M Protoco). Yamaha and Otari intend to create a new generation chip, mLAN-PH2, which is capable to handle 4x the channel capacity and features 32-input and 32-output channels at 24-bit/48kHz. mLAN licensees will begin receiving samples of the new chips in spring 2001.

UK: Abbey Road's Mastering Room 7 is the last of the studio's postproduction facilities to return to service after extensive improvement. Eastlake Audio's Dave Hawkins oversaw the renovation and acoustical treatment which included the installation of a pair of Meyer X-10 active monitors. After discussion and testing of several monitor systems, the X-10s were chosen for their low distortion, imaging, quality and performance at low monitoring levels. The suite includes the EMI TG 12410 transfer desk unique to Abbey Road and one of the facility's two Neumann VMS82 cutting lathes, as well as a Sony SDP 1000 digital desk and a networked Sonic Solutions system. Abbey Road has also installed a 96-channel SSL SL9096j

analogue console in the Sam Toyoshima-designed Studio Three. The console is 5.1 capable with a custom panel and replaces a 72-channel SL8000G. It is also the largest J-series in the capital. Abbey Road has also installed an Audient ASP510 Surround Sound Management System in Room 13, a restoration room set up for the restoration of old recordings in multichannel formats. Abbey Road Studios, UK. Tel: +44 20 7266 7248. Meyer Sound Labs, US. Tel: +1 510 486-1166.

Emagic gets in line with POW-r play

US-Germany: Emagic has licensed POW-r word length reduction for its audio and MID recording systems, bringing it in line with Digidesign, SADiE and Sonic Solutions. 'Emagic is one of the world's most popular PC-based audio suites available,' said John La Grou, chairman of the POW-r Consortium. 'We're pleased that artists and recording engineers world-wide using Emagic audio tools can now assure their customers of the most sonically realistic high-bit reduction technique available at any price.'

The POW-r Consortium development team includes Weiss Engineering, Millennia Media, Z-Systems and Lake DSP and it believes that the POW-r algorithms are 'considered by many top mastering and recording engineers as the ultimate method for ultra-transparent digital-audio bit reduction'.

POW-r—Psychoacoustically Optimized Wordlength Reduction—is a scalable algorithm that reduces word lengths to 16 bits while 'retaining a high degree of perceived dynamic efficiency and very low noise'. POW-r accommodates sample rates from 44.1kHz to 192kHz 'and beyond'. POW-r Consortium, US. Tel: +1 530 647 0751.

Audio approval in absentia

LONDON-BASED ISDN specialist H2O and its subsidiary music industry software specialist Totally Brilliant Software (TBS) has launched its MediaManager subscription service, with the first subscription contract going to EMI.

MediaManager is a server, with supporting software interface, based at H2O for use by A&R departments, publishers, managers and other qualifying interested parties who want see and-or hear production work in progress as it happens world-wide. Both music studios and video-audio postproduction facilities are also expected to subscribe, in order to enhance their appeal to the entertainment industry at large. TBS developer and H2O managing director Andy Hilton spoke to *Studio Sound*.

Q: *Is this an end to couriering DATs?*

Exactly. All the offices within the majors are on high-speed links, which means a song will typically download from here in 45s.

Q: *How?*

We've suggested Liquid Audio as the standard for MediaManager, using Liquid's Dolby AC-3 encoding—simply because we believe it to be the best-sounding compressed audio format, and the most secure. You can have full-bandwidth, but then the file sizes are much bigger, and speed is essential. But some people are okay with bigger files, so we've made our system flexible. You can choose what standard you have your songs delivered at.

Q: *Do suppliers have to send Liquid Audio-compatible files?*

No, we can receive stuff in literally any format—cassette, DAT, ISDN, emailed MP3s, you name it. And we can encode if necessary, or file convert into any file format. Think of us as a funnel. Effectively we then publish the content through MediaManager, which sends a simple email to the user informing them of delivery.

Q: *You're a part of H2O, the studio integration and ISDN specialist. Isn't ISDN enough?*

ISDN is fine, but using our ISDN service you still have to get a courier to pick up a DAT or CD copy from us and get across town to your office. And then you've got to get a few copies duplicated, as well. It's often the best part of a day before you hear the thing.

Q: *Does this mean the end of your ISDN service?*

No, in fact we're hoping that this will promote more use of ISDN, because you can get quite high-quality audio in real-time, and the boxes aren't that expensive now. ISDN is common in US studios, but very few have it over here.

But MediaManager is not restricted to ISDN. A lot of studios are taking up MP3, which we can also manage, of course. Some record companies don't like the sound of MP3 files; that's a matter for them to discuss with their studio suppliers. We have an upload page within the interface, so anyone with any type of audio file can go to the MediaManager site and upload the file onto our server. We then publish it to the right people.

Q: *So you don't need any special hardware to subscribe?*

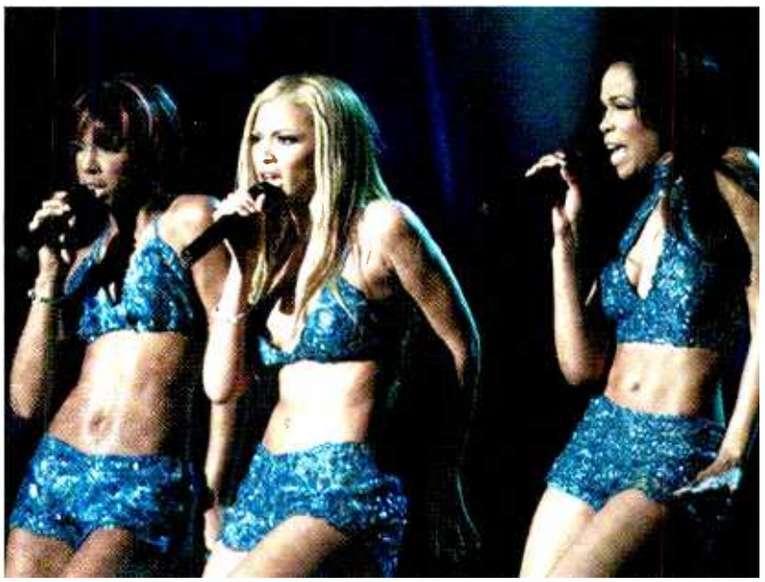
No, all you need is Internet access, and decent monitoring connected to your computer to make the most of it. It's just a browser interface, as far as the user is concerned. All the clever stuff happens at our end, at the server.

Q: *Is it safe?*

It's a secure, subscriber-only network. We keep account of who's played what, when and how many times—which is how we charge them at the end of every month. You get a user ID and a password from us, otherwise you don't get in.

Q: *How wide can the net be cast?*

All of the majors are regular customers for our range of services, but this will revolutionise the way they work. And it's called 'Media'Manager for a reason: streamed data files can be audio or video files, so film and TV companies, ad agencies and any media producers have good reason to subscribe. H2O, Tel: +44 207 737 9700.



US: The 43rd Grammy Awards saw the NYC-based Effanel Music mobile taking care of the broadcast sound once again, and Audio-Technica mics in action for the fourth year running. With John Harris mixing for the broadcast, the 370 mics used included AT4033a, AT4050/CM5, AT4047/SV, AT4041, ATM25, ATM23HE, ATM35 and AT4071a. In addition, the ATW-7373x handheld condenser wireless system was used for lead vocals on Destiny's Child (pictured), U2's Bono and Sheryl Crow. Effanel, US. Tel: +1 212 807 1100.

AC-3 for HK TV

Hong Kong: Following the circulation of a consultation paper by Hong Kong's Government Information Technology and Broadcasting Bureau concerning digital terrestrial television standards, Dolby Digital is being reported as the recommended audio carrier. Supporting the adoption of the DVB-T with Dolby AC-3 as the audio coding standard, Star TV commented, 'We believe the quality of sound from Dolby AC-3 will enhance viewers' enjoyment as it provides 5.1 channels of high-quality audio surround sound. We would also like to point out that both Australia and Singapore have committed to using Dolby AC-3 with their DVB-T transmission format.'

Pacific Satellite International also observed that. 'It is not wise to require that the audio signals are encoded in both Dolby AC-3 and MPEG2 formats, as it is costly to the operator. More importantly, it occupies more bandwidth, which ultimately will not benefit a lot of users. AC-3 is recognised as providing better sound quality than MPEG2. Therefore, the latter shall not be considered.'

No responses questioned the choice of Dolby Digital over MPEG audio. 'This is another big vote of confidence in Dolby Digital (AC-3) as the preferred audio for DTV systems,' said Dolby's Tony Spath from the UK. 'Where people have a choice, it is great to see them looking to the future of audio and choosing a format that will allow them to start today with stereo and go through to 5.1 when they are ready.' All consumer Dolby Digital decoders can receive a mono, stereo or 5.1 signal and output the decoded audio through whatever number of speakers the consumer has connected, without having to upgrade any software.

XM radio revolution

US: XM Satellite Radio is set to become the largest radio automation installation in North America with the adoption of Encoda Systems' integrated automation and management infrastructure. The system will automate XM Radio's broadcast of up to 100 channels, a move labelled 'radio on a whole new level', by Tony Masiello, XM Radio's Vice President.

'XM Radio is pioneering, not only for the US but also world-wide,' says Roy Freeland, CEO of Encoda Systems. 'The infrastructure we are providing sets a precedent for radio broadcasting on this scale anywhere in the world.'

Encoda will supply XM Radio with its D-MAS automation system (a module of the DAL Channel Manager) and Paradigm management system. D-MAS, developed by the Media Delivery Management division of Encoda Systems, will control a routeing switcher along with a number of audio servers, digital encoders, as well as XM Radio's own uplink management system.

'XM Radio is in the process of revolutionising the radio industry,' said Nancy Jean Pennica, Encoda Systems VP. 'This installation will provide the efficiency advantages to make such a large scale operation practical.'

XM Radio is building a satellite radio service with music, news, sports, talk, comedy and children's programming available across the US beginning this Summer. XM-ready radios will be available through electronics retailers including Best Buy, Circuit City and Sears. XM also has a long-term distribution agreement with General Motors and Saab to integrate XM-ready radios into their vehicles. XM's strategic investors include America's leading car, radio and satellite TV. XM Radio, US. Net: www.xmradio.com. Encoda Systems, US. Tel: +1 303 390 8239.

Chemical reaction

UK: Alchemy Mastering, London's West End facility which also combines both audio postproduction and replication, has invested in new equipment in advance of a planned move to integrated new premises. Equipment acquisitions include two SADiE Artemis systems and an inventory of dCS convertors, while the control room at Alchemy's Goodge Place location has been re-built and expanded to incorporate DigiBeta delivery.

At present, Alchemy maintains its postproduction service in Goodge Place and its other facilities in Soho. Alchemy director Rowan Laxton comments, 'Mastering and duplication complement each other very well, but by integrating post into the same operation we will create something highly original. We will also double our audio postproduction capacity.'

Alchemy has just secured a lengthy and lucrative contract posting video training courses for Microsoft, in five different languages. 'There are about 3,000–4,000 .WAV files for each course, which we record straight into the SADiE and convert,' adds Laxton. Alchemy Mastering, Tel: +44 207 436 3736. Web: www.alchemymastering.com

NSCA 2001

US: The 2001 NSCA Convention was held in Florida recently, and according to most exhibitors and attendees, the show was a great success. The formula was changed a bit from previous years in that stands could be larger and there certainly seemed to be a plethora of demo rooms compared to other audio shows.

Contracting has been big business in the States for some time and it is only recently that this type of business has been taken seriously in Europe, even though the potential has always been there. Whereas sound contracting is not necessarily 'studio sound', it is evident from the range of products on offer that sound quality is more and more at a premium and that the pro-audio worlds continue to blur the dividing lines between the different areas.

Digital—or digital control—is much to the forefront and whereas Ethernet and CobraNet are more common than AES-EBU, I get the impression that the two will be virtually side next year in Colorado (this

CONTRACTS

Tools via the Euphonix FC727 format convertor. Also in the UK, Scottish producer and engineer, Calum Malcolm, has purchased a Sony DMX-R100 digital mixing desk for use with his 48-track Augan Atlantis hard-disk recorder-editor. The system will be used for location recording with the option of mixing if the acoustics of the venue allow.
DAT, UK. Tel: +44 208 450 5665.
Euphonix, UK. Tel: +44 20 8901 7510.
Sony BPE, UK. Tel: +44 1256 355011.

UK: The TArdiS mobile has commissioned Sonifex to supply a selection of its Redboxes in black

through distributor TAS. The order includes RB-DA6 distribution amplifiers, RB-BL2 balancing convertors, and RB-DDA6A and RB-DDA6S digital distribution amplifiers, in AES-EBU and SPDIF formats. TardiS MD Peter Knowles (pictured) has covered high-profile events for, amongst others, BBC Radio 2, 3 and 4, and Channel 4 TV, as well as coverage for BBC TV's *The Weakest Link* with the vehicle.
Sonifex, UK. Tel: +44 1933 650700.

Belgium: Antwerp's VRT Radio 2 has installed a Fairlight On Air CoSTAR system to meet growing requirements for news generation and broadcast. The system comprises five file servers, Pioneer 500 CD ROM jukebox and CoSTAR software with the central servers integrated with VRT's main IT system. Each of three new studios are equipped with CoSTAR playout workstations and an additional playout station handles pre-programmed automatic ovemight broadcast. Two existing booths were converted into CoSTAR cabins for telephone interviews and other reports.
Fairlight On Air, Netherlands.
Tel +31 26 368 4925.

UK: London's Mayfair Studios has installed a pair of DynaudioAcoustics M3A active main monitors in its Neve room. The system employs two custom 15-inch sub woofers and is driven by Chord 1032 amplification. Recent clients who have used the new monitors include Paul Weller, Finley Quaye, Julian Lennon and Radiohead.
Mayfair, UK. Tel: +44 20 7586 7746.
Munro Associates, UK.
Tel: +44 20 7403 3808.

CONTRACTS

France: Paris-based Lincoln Studio has purchased a Sony DMX-R100 digital console for its main dubbing and post room. The 3-studio complex handles major foreign language dubbing work including Star Trek Voyager. Additionally, broadcast production company, Visual TV, has taken delivery of Midas Heritage 3000 and Heritage 1000 consoles to add to its OB vehicles. The first job for the Heritage 1000 was the Euro 2000 football Championships in Belgium and Holland.
Visual TV, France. Tel: +33 1 4094 2007.
Sony BPE. Tel: +44 1256 355011.
KT Group, UK. Tel: +44 1562 741515.

Germany: Schwabischall-based Nightwalker Studios has installed a Sony DMX-R100 console to accompany a Pyramix workstation system in a major studio refit. Meanwhile Medienhaus Mainz has taken a second 64-channel SSL Axiom-MT digital console in response to an increased requirement for postproduction and music recording projects. In addition, Medienhaus Mainz is upgrading its Hub Router-based

audio networking by adding four RIO Grandes. Also Aschaffenburg-based Wachtmann Musikproduktion has purchased a Calrec M3 analogue production console for its location recording operation. The company specialises in high-quality classical music and has made recordings with Marion Verbruggen, Gerhard Reichenbach, Zubin Metha and the Israel Philharmonic Orchestra.
Studio Tonmeister, Germany.
Tel: +49 6131 2408 00.
Wachtmann Musikproduktion, Germany.
Tel: +49 170 373 8855.
SSL, UK. Tel: +44 1865 842300.
Calrec Audio, UK. Tel: +44 1422 842159.

US: LA's Conway Recording Studios has chosen a Neve 88R analogue console for its prestigious Studio A, while the Detroit studio being setup by rapper Eminem has taken Requisite Audio's L2M compressor and PAL mic pre-limiter from US dealer Vintage King as part of a larger order.
Conway Recording, US.
Tel: +1 123 463 2175.
AMS Neve, US. +1 818 753 8789.
Funky Junk, UK. Tel: +44 20 7609 5479.

convention does move around). In the area of sound reinforcement, line arrays continued to hog centre stage and both Meyer Sound and EAW launched their new systems. JBL took the word 'launch' literally and chose the Kennedy Space Centre (or Cape Canaveral) to introduce their new M-Pro Series of loudspeakers for 2001.

Apart from the big stuff, there were also some interesting items with direct applications to studios and the Jensen range of isolation transformers for audio and video installations could be extremely useful. Smaart 4 users will also be interested to know that Smaart now have a list of recommended mic preamps available. And if you are interested in really checking the physical alignment of your monitors, then you need some of the laser pointers from Checkpoint. NSCA 2002 will be in Denver, Colorado (the AES could learn a thing or two about venues from these people).

N people

Germany: SAE founder Tom Misner has added Cologne's Sound Studio N to his string of high-profile commercial recording studios. Studio N joins Stockholm's Soundtrade Studios and Sydney's Studios 301 under Misner's care and will be run by new studio manager Uli Pallemans. With the Neil Grant-designed Studio A offering a 72-channel SSL J-Series console and Grant's T5 surround monitoring, and Control Rooms B and C having 120-channel Sony OXF-R3 digital consoles, Sony PCM3348 multitracks and Fairlight MFX3s, Studio N is well place to cater for the likes of The Scorpions, Backstreet Boys, Bon Jovi, and The Fugees.

Control Room C is soon to install a 48-channel Pro Tools 5.1 system and Procontrol surface, while mastering duties are to be taken care of with Control Room D offering Sonic Solutions Sonic DVD-Creator. Sound Studio N, Germany. Tel; +49 221 530 4061.

Singapore: Opuz Studios is set to provide Singapore with its first 5.1 post studio. One of two new rooms in the city's Circular Quay, the new Studio 3 has been designed by Sam Toyashima and is centred on a 25-fader Soundtracs DS-3 digital console and Genelec monitoring. The facility will serve the likes of HBO Asia, the Discovery Channel and Zomba records. Opuz, Singapore. Tel: +65 557 2777.

BBC keeping new company

UK: The BBC is to set up a new company, BBC Technology to offer access to engineering skills across a range of broadcast and Internet related technologies. Digital technology The company will have six specialist business categories: Internet Services (providing web site hosting, narrow-band and Broad-band streaming Internet delivery); Consulting & Projects (creating media technology solutions); Broadcast Network Control Systems (offering simple touchscreen controls to complex broadcasting operations); Communications (providing switching services and satellite links); Media Technology Services (offering media rich IT solutions and Intranet services); and Kingswood Warren Ventures which has access to IPR from the source of many of the world's most advanced broadcast technology developments.

Russia meets EU on carnet

RUSSIA HAS FINALLY ACCEPTED the official transport documentation which must accompany all rental equipment leaving and returning to the EC. From now on, studio equipment rental companies and PA crews can present the EC paperwork—known as the ATA Carnet—at Russian border patrols. Theoretically, the move should ease the flow of pro-audio equipment in and out of the former Soviet Union, and boost recording and concert activity on location there. ATA Carnets are in common use for rental to the US, the Middle East and Asia.

However, it seems old bureaucratic habits die hard. In one recent incident, specialist pro-audio transport company Audio Moves was delayed for nine-and-a-half hours at the Russia-Finland border, despite being in possession of the correct ATA Carnet. Audio Moves' Graham Cook spoke to *Studio Sound*:

Q: *Where were you headed?*

We were using the route from Helsinki to St Petersburg, which has a no-man's land area at the border where you get stopped by the border guards. Our destination was the Marinsky Theatre, which had rented extensive recording gear for a concert.

Q: *How does the carnet work?*

What happens when you cross a border is that customs control removes certain sheets from the carnet, which signifies - and keeps a record of—the fact that you've entered the country. When you leave, they remove further sheets to validate your departure.

Q: *Presumably it wasn't as simple as that?*

The border patrol didn't take out the importation page, which you need stamped to get your deposit back from the Chamber of Commerce. But they did take out all six of the transit pages.

Q: *Oops. What happened then?*

We were met at the border by two representatives from the Marinsky Theatre. But even with interpreters, it still took nine-and-a-half hours..."

Q: *What other help did the guys from the theatre give you?*

They arranged for customs officers to meet us in St Petersburg, but all they did was take the carnet off me and disappear. Now, without the carnet, you have no legal hold on your gear, so I was a little worried. They returned it, but they'd stamped and removed both the importation and exportation sections—so to all intents and purposes I had already left Russia.

I went back to the border with an empty carnet, apart from one single sheet left for re-entry into Finland. You can imagine the consternation that caused at the Russian border patrol.

Q: *How did you get out?*

I'd managed to get a Russian translation of the carnet while I was in St Petersburg, and that was the key.

Q: *What are the tips of a seasoned traveller?*

My recommendation to anyone engaged in moving gear in and out of Russia is to make sure they know which sheets are to be removed from the carnet at which point—and to make sure that it happens. Also get the carnet translated, if you can. Because, let's face it, the Russians are new to this game... Audio Moves, Tel: +44 208 450 9127.

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...

...all still very much alive!

There were 80 tracks on two R-1's at 24bit 96kHz – nearly three hours of non-stop recording for two separate concerts without a hitch.

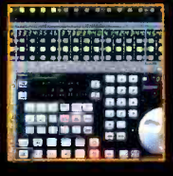
It makes you think!

Tape-based recorders cannot keep up with today's demands for sound quality and speed.

The concerns of familiarity of traditional multitrack are addressed in the R-1.

Last year Euphonix Inc and Audio Export established Euphonix Europe to support Euphonix' many European users. We have built a team second to none to provide top level support to our customers.

So... you didn't die before you got old, now what ?



R-1 is available in 24 and 48 track versions. The unit is the perfect companion for the System 5 digital console.

R-1 can support hard drives of up to 100Gbyte capacity enabling the system to comfortably manage long-format recordings, and drives can even be hot-plugged.

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CONTRACTS

Japan: The first TL Audio VTC console destined for Japan is scheduled for Rick Nakajima's Sound House distribution company. The 16-channel valve console will be used as a demonstration unit with a further 32-channel VTC going to Young's Music in Korea.
TL Audio, UK. Tel: +44 1462 680888.

France: Paris' Studios Guillaume Tell is to replace its SL9080j with a 96-channel surround-capable version, the largest SL9000j installed in continental Europe. The new SL9000 will be installed in the Tom Hidley-designed control room in Studio A, the largest in the complex, making it the fourth SSL console to have been installed in the control room since the facility opened in 1986. It's clients include Phil Ramone, Bob Clearmountain, Pet Shop Boys and Joan Baez as well as the French film industry. Paris' Top Master mastering house has taken a Requisite L2M compressor while Studio AF has taken a Requisite PAL. Additionally, Corsican studio Total Record Productions has taken a PAL.
Studios Guillaume Tell, France.
Tel: +33 3 8856 6724.
SSL, UK. Tel: +44 1865 842300.
Funky Junk, UK. Tel: +44 20 7609 5479.

US: New York's Wax Music & Sound Design has redesigned its Control Room B for the needs of composer-sound designer James Wolcott. Key to the room's transition to digital is the new Macintosh G4 running Pro Tools MixPlus 24 alongside a Mackie 8-bus desk. With networking via Ethernet to Control Room A, all of WAX' personnel have access to works in progress in all the audio suites. Recent projects completed in the new room include composition arranging for Intel and agency Messner Vettere Berger McNamee Schmetterer Euro RSCG, and Proact Technologies for DiMassimo.
Multi-Video Group, US.
Tel: +1 212 986 1577.

UK: BBC Resources, part of the largest television facilities company in Europe, has installed a 24-fader, 96-input SSL Avant digital film and postproduction console in Dubbing 1 at its Pebble Mill site. Dubbing 1 has been completely refurbished for Dolby 5.1 mixing and remixing for DVD and other applications. The room has already been used to create the Dolby 5.1 remix for Doctor Who: Five Doctors, a DVD for the BBC that features extended scenes and untransmitted sequences from the original production broadcast in 1983.
SSL, UK. Tel: +44 1865 842300.

Belgium: Charleroi-based Belgian National Television (RTBF) is now fully equipped with FAR active monitors, in line with the design of its main control room by the company. The main control room is centred on a Stagetec Cantus digital mixer and is equipped with Dolby surround SDU4 and SEU4 and a Nexus fibre optic network. LCR speakers are 3-way FAR AV-20s, with four AV-2s serving the rear. The speakers are connected via FAR's RC-2 remote control unit, which allows remote selection of frequency response.

BBC Technology chief executive Philip Langsdale said. 'We are very pleased that BBC Technology has got the government's go-ahead and can now set about offering our expertise to companies wanting to use digital technology to improve their communications. We will continue to provide cutting-edge solutions to BBC programme makers while bringing in additional money which will directly contribute to what we offer our television, radio and online audiences. With our track record at the heart of one of the largest and most complex broadcasting systems in the world, I am certain BBC Technology will prove an irresistible proposition to businesses across the globe.'

Clients who have already invested in BBC Technology products and services include Fox Television Network and DirecTV in the US.

Rocket's London landing site

UK: First to offer Rocket Power to London's A&R community is Planet Audio, the city's newest Neve mix room. Based on two Mac G4/500s running both Logic 4.6.5 and the Pro Tools Mix Plus, the computers run on a 100/1000 baseT peer-to-peer network and use a broadband ADSL Internet connection. Along with its ability to facilitate remote postproduction collaborations, Rocket technology allows A&R staff to 'listen in' to rough mixes posted from a session over desktop Internet access.

Dedicated 'virtual studios' are being setup by Planet for clients' ongoing projects so that sessions can be accessed at anytime from any location prior to project completion. Planet Audio is also setting up a global talent pool and studio partner directory where clients can choose to use session musicians from a database of session players from the US, Europe and the Far East.

Planet Audio is actively marketing Rocket Networks technology to the London Film and TV production community as a fast, interactive alternative to ISDN. Rod Gammons, co-owner of Planet Audio Studios explains, 'The key advantages gained by Record Companies using Rocket technologies is that their artists can collaborate on sessions from anywhere on the globe, and the A&R department can track exactly what is going on in the session, saving travelling time and costs as well as expense and delays incurred by tapes being transferred by courier between all concerned.'

Legal connections

Liechtenstein-US: The German District Court of Frankfurt am Main issued a preliminary injunction against two Korean audio equipment dealers at the recent Musikmesse trade show. The two wholesale dealers—Shinajoo Trading Corp and Dae Hung International, both based in Seoul—received preliminary injunctions from the Court preventing them from displaying their cables with infringing imitations as Neutrik quality products.

Werner Bachmann CEO of Neutrik commented, 'Neutrik is not willing to accept any infringement of its copyrights and will take all action necessary to stop it. Misleading the end-user is a problem not only concerning our legal department, but especially our valuable customers. Where there is a Neutrik Logo on the product, customers expect it to be a real Neutrik.'

In case the offense is repeated within Germany, the companies may face fines up to 250,000 Euros. Additionally, imports of the infringing imitations may be seized by the German customs authorities.

In a subsequent ruling from the US District Court, Southern District of New York, Switchcraft was granted summary judgement in the patent lawsuit filed by Neutrik regarding Switchcraft's HPC connector series. The Court ruled that Switchcraft has not violated Neutrik's US Patent on the Speakon connector. The Court also ruled that Switchcraft is not in violation of trade dress infringement, unfair competition, or unlawful use of a trademark, the other aspects of the lawsuit filed by Neutrik.

UK: Legendary producer Adrian Sherwood has taken a Trident Series 75 console and 24-track RADAR recorder from UK dealer Funky Junk. Having sold his On-U-Sound studio, Sherwood and FJ's Mark Thompson matched Sherwood's considerable collection of quality outboard with a refurbished classic console to accommodate the producer's unorthodox work. US rapper Eminem also had to turn to Funky Junk for a Requisite Audio L2M compressor (see *Studio Sound*, March 2001) for his new Detroit studio. Funky Junk, UK. Tel: +44 20 7609 5479.

"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.

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APPOINTMENTS

SSL has two new product specialists serving the east and west coasts of America in the form of John Pastore and Ryan Hewitt. Responsible for product training on and demonstration of all SSL consoles, Pastore will report to John Herman in New York while Hewitt will report to Phil Wagner in LA. Both have colourful histories within pro audio including developing Otari consoles (Pastore), and mixing and recording the likes of Ringo Starr and Burt Bacharach (Hewitt).

Digigram has appointed Wlodek Sielski as director of business development for Digigram Asia where he will be in charge of strategic partnerships and special projects, and will provide commercial support to the sales force. Sielski previously managed the Pro audio and MI markets and set up the international distributor network. Stephanie Masegosa takes over responsibility for the Pro Audio and MI markets for Digigram Europe.

Audio Processing Technology has appointed Noel McKenna as its new managing director, with immediate effect.

Previously Technical Director at APT, Noel has been with the company for six years. APT has also Jon McClintock has been promoted to commercial director with overall responsibility for the company's sales strategies and Patrick McGrath, previously APT's customer support manager, has been appointed to the position of licensing manager.

Klotz Digital America has appointed Jonathan Burtner-Cawley as project manager, to oversee system design and all project administration, including management and training of engineering teams and providing customer support. Previously Burtner-Cawley has been senior staff engineer Westlake Audio.

Total Audio Solutions has recruited David Anthony Otañez, into UK post and studio sales. Formerly of Yamaha Commercial Audio, and Denmark Street Studios, Otañez brings experience of digital mixing consoles and workstations.

Awards to court

UK: For the fourth consecutive year, CEDAR's annual Awards will recognise achievement in the field of audio restoration. Nominations are invited in the categories of CD Remastering from a Modern Recording (post 1949); CD Remastering from a Vintage Recording (pre 1950); Remastering of a Film Soundtrack; Audio Restoration for Broadcast Use; and Audio Restoration for Forensic Use.

Past winners include Skywalker Sound (*The Star Wars Trilogy*); Jon Astley (*The Led Zeppelin BBC Sessions* on Atlantic Recordings); Ted Kendall (*The Goon Show* #17 'The Silent Bugler'); and BMG New York (*Elvis Presley: The Essential 70s Masters*). The rules for the CEDAR Awards can be obtained from CEDAR Audio, and all nominations must arrive before 30th June 2001.

Recently, CEDAR has established its first Asian office—CEDAR Asia—based in Bangkok. The office will act as a centre for CEDAR's customers in Brunei, Cambodia, China, Hong Kong, Indonesia, Laos, Malaysia, The Philippines, Singapore, Taiwan, and Vietnam. CEDAR Asia, Thailand. Tel: +66 1 822 9227.

CEDAR Audio, UK. Tel: +44 1223 881771.

US: Fairlight has won a Scientific and Engineering Award (Academy Plaque) from the Academy of Motion Picture Arts and Sciences 'for the design and development of the DaD digital audio dubber specifically designed for the motion picture industry'. Fairlight's John Lancken commented, 'This award is clearly among the highest accolades the entertainment industry can offer. Just as it is an affirmation of Fairlight's commitment to pushing the envelope of audio design, it 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.'

Studer Marantz' business dance

World: Swiss-based Studer Professional Audio has abandoned its proposed merger with VCS Nachrichtentechnik of Germany (*Soundings*, January 2001) although the companies will continue to co-operate on commercial and technical endeavours. Co-incident with the announcement comes the appointment of Walter Derrer as the new MD of Studer Deutschland, former managing director, Donald Dilocker having left Studer to concentrate his own company Delec.

Marantz Japan (MJI), meanwhile, is to buy the Marantz trademark and the European and American sales organisations from Philips. In addition, Philips is to sell 1.5% of its shareholding in MJI reducing its share from to 49%—subject to board approval and the outcome of discussions with relevant bodies. MJI has provided the technology and development for Marantz-branded products for over 30 years and still owns the distribution rights of the Marantz brand in Asia and Japan. Kazuya Suetake, CEO of Marantz Japan commented: 'The new situation provides Marantz with the freedom it needs to pursue its own interests. We are excited about the possibilities it opens for us. Co-operation with Philips in areas such as Super Audio CD remain as important as they are today. We have had many successes together and we want to continue to do so. We see more opportunities for relationships with different Philips product divisions then ever before.'

The master race

WEST LONDON'S METROPOLIS studio complex has announced a dedicated pre-mastering service for DVD-Audio. The studio is already well-known for its audio mastering and DVD-Video encoding, as well as being one of London's premier music recording and mixing facilities.

The service includes 24-bit/96kHz 5.1 surround sound mixing, plus 5.1 mastering to Dolby Digital, DTS, Meridian and MPEG1 and MPEG2. Creative services, production management, DVD reference discs and DLT output are also included. In-house graphic design, DVD-Video and surround mixing expertise will all be exploited in order to boost the service, which aims to second-guess rapid growth in DVD-Audio as a consumer format.

Creative director of Metropolis DVD Mike Gillespie spoke to *Studio Sound*:

Q: *Why now?*

A number of major labels are pushing DVD-Audio hard, for albums. DVD-Video will exist alongside, more for live and multimedia projects, but DVD-Audio is the natural next step from CD. The bandwidth is dedicated to the audio rather than the video, of course.

Q: *What new facilities are you creating within Metropolis?*

There are two sides to the process. One is getting audio assets prepared for DVD-Audio, to handle 96kHz uncompressed multichannel mixes and up to 192kHz stereo. Studio E is a permanent 5.1 mixing studio, and we've now got two 5.1 mastering and editing rooms.

One priority is to be able to premaster to Dolby Digital and DTS, because some labels - Warners especially - are putting these streams on their DVD-Audio discs so they can be played on existing DVD-Video players.

The other side is expanding our in-house graphics effort to encompass menus and other interfaces on the disks.

Q: *Why only premastering, and not authoring?*

There are a number of platforms, particularly the Sonic HD, but we don't feel any of them are quite ready yet. They're at the stage DVD-Video was about three years ago. The process of authoring is still very labour-intensive, so initially we'll farm that out to preferred suppliers. We're waiting to assess which platform will be right for us.

Q: *Do the record companies want you to do all the menus and so on?*

It's an important part of the service. The designers they use for packaging and web sites aren't trained for what is effectively TV-standard graphics. It's a different process, and all of our DVD graphic designers have come from postproduction. There's no difference between a DVD-Audio menu and a DVD-Video menu, so we have the experience necessary. Metropolis, Tel: +44 208 742 1111.

5.1

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EMERALD'S NEW HORIZONS

The horizontally integrated business model is unique to the studio industry but is it precarious as well? Nashville's jewel tells **Dan Daley** it can handle a full plate of services

THE MUSIC STUDIO BUSINESS has had its bedrock shaken almost continuously since the late 1980s. First shocks came as the beginnings of the project studio began to erode the primacy of the conventional recording studio in the process of making records. More recent tremors came as online music technologies like Napster and MP3 rattle the foundations of studios' main client—the music industry itself. Changing landscapes call for new approaches to business and one of the more unique ones is found at Emerald Recording in Nashville, where the horizontal business model—multiple and complementary services integrated along a continuum—is looked to as the way to keep the studio's fortunes on a vertical path.

Emerald's owner, Dale Moore, bought the then-one-room facility, located at the western end of Music Row, from record producers David Malloy and Even Stevens in 1985. Emerald chugged along through much of the nineties but Moore, cultivating a string of radio properties on the plains of Montana, didn't invest much in expanding the studio during the period, a time when sales of Nashville's base of country music were going through the roof and studios were jumping into town at a record pace.

For whatever reason Moore chose to sit out that studio arms race, it turned out to have been a good move. By the late nineties, country music had tanked, hitting a 10.8% market share in 1999—nearly half of its high-water mark of 18.7% in 1993—and taking much of the studio business in Nashville with it. Moore sold his radio stations and returned to Music City with something that was in short supply in the music business there at the moment—money. He promptly began a buying spree of facilities. These included the venerable Masterfonics, with its two globally renowned mastering suites and its large and costly The Tracking Room studio (which featured Nashville's first SSL 9000j console), after Masterfonics announced bankruptcy in 1998. Moore also acquired the technical assets, on a joint venture basis, of the Workstation, owned by a consortium of successful producers including Mark Bright, John Guess, Marty Williams and Dann Huff; and of The Parlor, a small publishing-demo studio which was picked up by Moore before it was even finished.

Emerald Entertainment, as it was now known, didn't stop there, adding Digital Audio Post as a joint venture; expanding the radio promotional touring business and broadcast engineering business started by former studio manager Milan Bogdan; implementing a DVD authoring division; and most recently starting an artists sponsorship division, which seeks to pair recording artists with corporate sponsors. This whole kit and kaboodle now gives the Emerald complex eight studios in four buildings in a single city and makes it the largest studio complex in the Southeast, rivalling Ocean Way in Los Angeles, CRC in Chicago and Hit Factory in New York in size and certainly exceeding them in scope. Therein lies the issue: can recording studios expand and diversify the number and type of services offered to this degree without sacrificing their core competency of recording music?

Joe Romeo says Emerald can. Romeo, whose name and whose street-wise locutions seem to have been lifted from an Elmore Leonard novel, is a linchpin of this strategy. Romeo started out as a jingle composer from New York who went on to start music library Killer Tracks before selling it to BMG, and running purpose-built studios for advertising and related applications, as well as consulting to EMI on leveraging commercial opportunities for Beatles music and products. (He still wears his Beatles promotional necktie on occasions. 'One of three ever made,' he laughs.) Romeo came to Nashville from Hollywood at a time when Music City was being pounded by a changing media industry and was looking for new solutions. At the same time, though, it was reverting to its old insular self, putting out songs like the self-accusatory 'Murder On Music Row', which bemoans the dilution of pure country music by pop music, even as several of country music's leading artists like Faith Hill and Shania Twain had already bolted for pop's greener pastures.

Recognising the bell curve-like parallel relationship between country music and the studio

business in Nashville is critical to understanding the situation that Romeo faced when he came to Nashville in 2000 to take on the position of CEO of Emerald Entertainment. With a transition that included lining up the Dixie Chicks with the Dairy Council for one of its now-famous Got Milk? white mustache ads, his job, ostensibly, was to develop the artist/corporate-sponsor division; however, it became clear that the mentality which created that division was the key to managing and marketing the now brachiated Emerald Studios complex.

'Do I wish I was able to explain this vision and have it understood inside of 10 minutes?' he asks rhetorically. 'Yes. But I also knew that this was such a different approach to the studio business that this was going to take time and patience.'

The strategy's most tangible manifestation is what Romeo has dubbed 'The Emerald Advantage,' which is comparable to London's Metropolis 'Optima' package and offers the opportunity for combining facility resources into packages whose economic incentive increases as the number of resources used does. 'For instance,' Romeo explains, 'you could use the Parlor for preproduction, then move to The Tracking Room for tracking, use Emerald for overdubs, use the Mix Room [at the former Masterfonics] for mixing, use Masterfonics' mastering services, have your video shot and posted at DAP, have the video and audio elements authored into a DVD, and then have the artist linked with a corporate sponsor for promotional purposes. Any combination of those services will lower the overall cost of doing the entire project. The more you do within the Emerald framework of services, the more you save.'

Integrating the technical aspects of all of these services is the purview of Scott Phillips, Emerald's vice president of studios, who supervises the facility's seven audio studios and one broadcast suite, and who came to Emerald when it acquired Masterfonics, where Phillips had worked ever since The Tracking Room came on line in 1996.

Jewels in the Emerald Recording crown: Digital Audio Post and Masterfonics

'The ultimate goal is to have one centralised machine room that feeds all of the studios,' Phillips says. 'It's definitely feasible—even though we're spread out over a number of buildings that are blocks apart, there's lots of potential to use the sewer system to run cable between them.'

At the moment, SneakerNet dominates the integration process, with tapes and hard drives being runnered around the facility's rooms, though Phillips acknowledges they may be wearing out more than just Nike soles in the process. 'There's a lot of wear and tear on the employees when you have to move big tape machines around, and we do have a lot of formats on hand.'

This brings up another interesting aspect of creating a complex horizontally integrated set of services in a city like Nashville, which tends to latch onto formats and stick with them. For instance, Nashville embraced the 32-track ProDigi format early, and much of modern country music's multitrack catalogue is still archived on the format, meaning that 32-track machines are in use every day in Nashville. However, one of the main tenets of the Emerald Advantage strategy is to bring in clients from outside of Nashville, which is understandably critical to supporting such a large facility in any city and particularly important as the Nashville's country music base continues to tank.

As a result, Phillips' task is to integrate new technologies that have broader appeal to a wider range of clients, such as the Euphonix System 5 console and R-1 hard disk multitrack recorder it recently installed in The

Mix Room, and to educate and sell the local engineer-producer client base on it while Romeo markers it to Los Angeles and New York. 'We had a tough time of that in the beginning,' Phillips concedes. 'People often don't want to try anything new in Nashville.' Yet getting local clients to accept new technologies is economically critical, both Phillips and Romeo emphasise, since revenues from outside Nashville are still a minority component of the facility's overall revenue stream.

While consoles such as Emerald's SSL G-plus and 9000j are widely accepted platforms, some of Emerald's technology base is a double-edged sword. The Harrison Series 12 digital desk that was part and parcel of the Workstation acquisition, is not widely used in Nashville. However, it is the choice of the producer-engineers who started the Workstation, notably John Guess and Marty Williams, who book three-quarters of that studio's time, and remain clients of Emerald's other services.

Increasing the facility's client base from the US and the world is part of Romeo's mandate, and he's as creative as one would expect a veteran of Madison Avenue to be. The most recent programme put into play is one targeted at UK clients, in which $75,000 gets a solid month-long booking in The Tracking Room, hotel rooms for four at the Loew's Vanderbilt Plaza, and return business-class airfare for two from London, as well as a rental car for a month, plus the standard amenities of the facility, such as catering. 'A studio of the same calibre alone in Los Angeles or New York would cost that much,' Romeo states. 'We're trying to provide a turnkey sort of arrangement for overseas clients, just like we're giving any client access to a turnkey set of services from demos to DVD.'

Emerald's plans are ambitious, both in the multi-faceted physical plant and in its marketing strategies. But Romeo maintains that starkly new and even radical approaches are necessary to service the New World Order of the entertainment and media industries. And he also stresses that studios have to be flexible enough in their approach to clients to be able to deal with guiding a novice on a shoestring budget through a record at the same time it services a major record label's needs. 'It's more complex than ever to make a project these days, and at the same time there are more people out there who don't have a major record label guiding them through the process or paying for it,' he observes.

As complicated as it all is, Romeo steadfastly also maintains that the technical and business models evolving at Emerald will not overextend the facility's ability to support them. The models are still evolving and being fine-tuned, he explains, using a metaphor that cites the fact that an entire alphabet soup of automobiles preceded Henry Ford's Model T. 'It took a lot of trying with various models to get things right before it was the Model T,' he says. And Romeo is candid that certain fundamental issues will take time to resolve, from the obvious ones like finding the right people to head up divisions and integrating their day to day workings, to the less tangible ones such as gently but firmly educating an entire regional industry on reacting to change.

But it's a mission he seems to relish and believes is attainable. To buttress that, he often relies on vision-speak. But at a time when vision is in short supply as the entire music recording industry morphs rapidly and globally, even aphorisms take on new significance.

'It will work as long as the focal point is on the client,' he says. 'If we started making bottled water, I'd say we were moving away from the core competency. But the function of this entire enterprise is to ensure the success of Emerald's clients. Anything that will help them attain that success—be it demos or DVD—as long as we don't lose the focus on the Emerald Advantage, we'll do well.' □

Contact:

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TV2 OSTJYLLAND

The pioneering moves being made in digital television operation in Scandinavia have attracted close co-operation from manufacturers. **Tim Goodyer** visits the new studios of TV2 Ostjylland

WHEN A SCANDINAVIAN television network and a major Japanese manufacturer start talking behind closed doors, you know both are doing something right. In the case of Danish TV2, it's probably the fact that it provides 5.5m Danes with the majority of their viewing through its main station and eight regional stations that provide extensive news coverage. More, that its Ostjylland site has been re-equipping for fully digital operation since it moved to a purpose-built studio complex a year-and-a-half ago. On Yamaha's part, it's because it wanted to make it's new digital console an inescapable choice for broadcast applications world-wide.

Backtracking around three years, the Ostjylland staff were preparing to strike camp and had employed Danish architects Schmidt, Hammer & Lassen to provide them with a new 34m kroner (£3.5m) home in Aarhus. 'We had to decide whether to move the old equipment to a new facility or whether to get rid of the old equipment and go digital,' explains Alice Bunde, the station's technical manager. 'So we made a company-wide decision that the whole of the TV2 system was going to go digital within the next two to five years,' continues sound engineer, editor and project manager for the relocation, John Vester.

The planned move to digital operation was split into three phases: Phase 1 covered studio cameras, continuity, communications and should have included the sound room. Phase 2 was to take care of editing and server systems, ENG cameras and the news system. Phase 3 was to tie in all the intercommunication between the stations and distribution of programme.

Following the digital option put the technical team in the market for a suitable digital console and into consultation with Yamaha over the proposed PM1D.

'The audio mixing was originally part of Phase 1 but there wasn't a digital desk to suit us at that time,' Vester elaborates. 'We only looked at one seriously, the AMS Neve Libra Live. It was too expensive, to be honest, and if you wanted to assign an equaliser to a channel, for example, it would take half a minute and you can't have that live in a TV station. So the audio desk part was taken out of Phase 1 and everybody agreed to wait and see what was going to happen. We had to have agreement because everybody was going to be affected by what we did.'

Another Yamaha console—the analogue PM3000—provided temporary cover while the search for an appropriated digital desk went on. Meanwhile a Sony DNE-2000 editing system and Danish NTP 180 x 180 point audio router provided the heart of the system with Genelec 1031A monitors and B&K mics supporting the audio which is acquired along with video on Betacam SX by the ENG teams. The stories are fed onto the Daily Server at 4x normal speed, edited on the Sony DNE2000, and filed to the on-air server ready for transmission. Master synchronisation is derived from a GPS satellite signal to allow tight sync with the other TV2 stations.

Although the Aarhus station is in the forefront of the migration to digital operation it is, Vester asserts, not a test site. The choice of Sony editor, being a future part of the program, is therefore outside the brief and may have to be scrapped if the consensus favours an alternative system.

'At that time, the Sony was the only system that could meet our needs,' Vester counters. 'Only Sony could offer the whole system—with editing, the server, with the browser, with playout...' Reasonably, however, Ostjylland's experiences will count towards TV2's decisions.

The solution to the console crisis began with rumours of a new digital desk leaking from Yamaha.

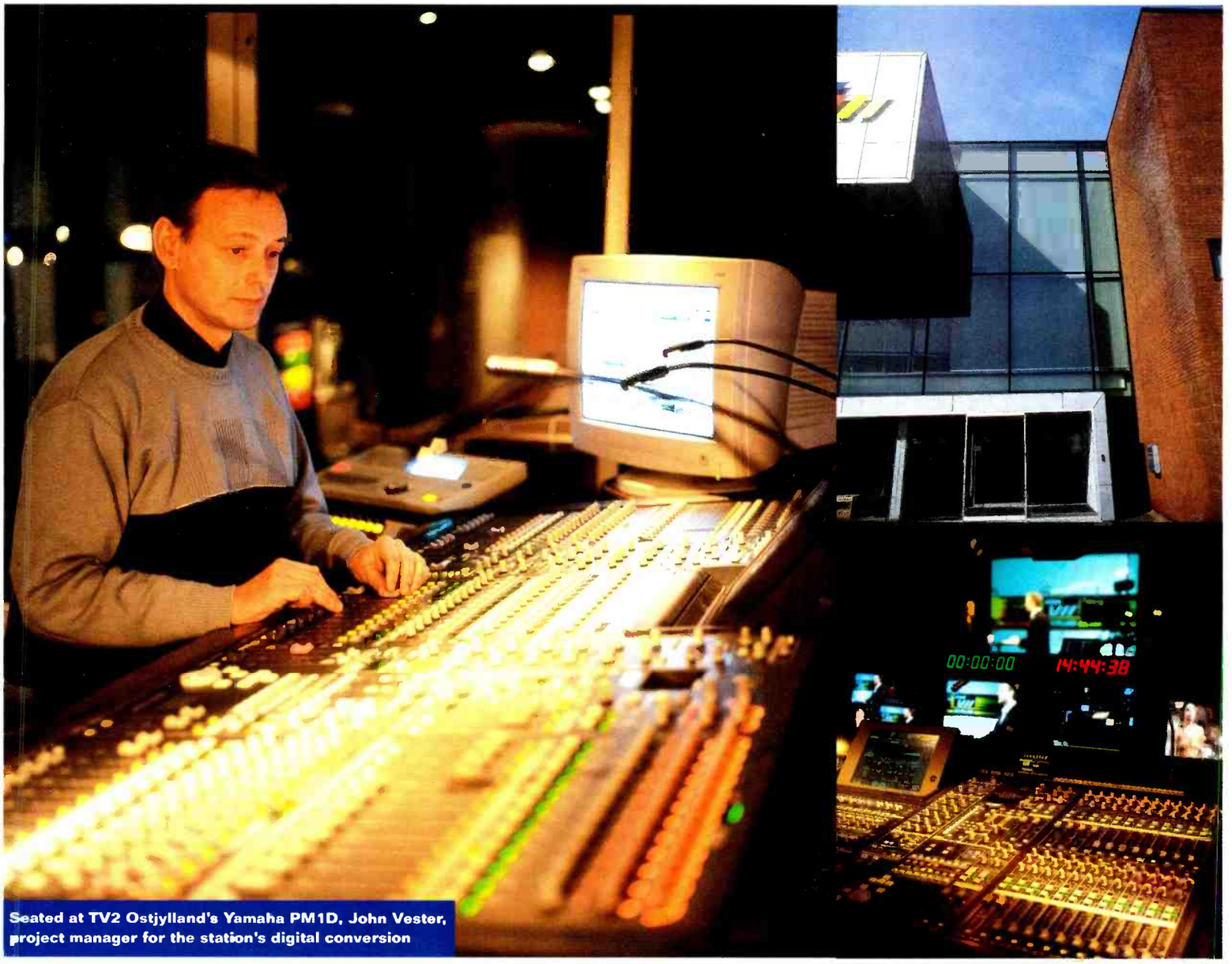
'To begin with it didn't seem that the PM1D was a broadcast desk,' says Vester, 'it was a PA desk or a theatre desk. But we suggested a number of things that would make it more suitable for us.'

'It was aimed at any live mixing application where a lot of the requirements are common anywhere and you have to be able to instantly access control,' explains Yamaha's Terry Holton. 'Whether you're doing a live concert or theatre show, or a live TV broadcast where you have to grab a channel at any moment and adjust the EQ, that was the primary focus behind the development. As we went through the evaluation stages of the console, we brought in people from different disciplines including broadcast.

'We couldn't get people in from every broadcaster, but we thought Scandinavian broadcasters were moving rapidly towards digital operation so we thought that getting some people from Denmark would give us a good indication of what the broadcast market would need in the future. So from the very beginning we were bringing people into the evaluation process from TV broadcasting to cover their requirements if we could.'

A preproduction console arrived in Aarhus for evaluation and training but ended up on-air the same day. 'We took some risks here,' comments sound engineer and cameraman Jesper Brinck casually. 'But you have to take risks.'

'We worked out all our settings the day it arrived,' Vester begins. We had cabling ready and it read word-clock from our system okay. It seemed stable although Jesper was able to bring it down by doing something



Seated at TV2 Ostjylland's Yamaha PM1D, John Vester, project manager for the station's digital conversion

too quickly. But that was pre-release software and all the normal functions seemed stable, so we went on-air and it worked through the two weeks.'

'During one of the off-air rehearsals I switched the console off during an announcement...' says Brinck.

'Did you do that?' demands Vester, incredulous.

'Yes, and I could see on the meters that the audio was still going through.'

Brinck's early confidence in the PM1D has been repaid by Yamaha's eagerness to accommodate broadcasters' needs in the console. In fact, TV2's influence over the broadcast aspects of the PM1D was to prove critical in its development and continue into the latest software release. But its adoption into TV2 required a further tender, in line with EU regulations.

'By the time we were ready to buy a console, we had begun to think that the PM1D was going to be the only choice but it wasn't, we actually got a lot of offers,' Vester recounts 'We had a lot of internal discussions and decided on the PM1D. It wasn't a unanimous decision but most of us wanted it, and it offered the best value for money.'

With all regional centres having completed Phase 1 of the modernisation program, TV2 has ordered eleven consoles—one for each station's sound room and three for the main station to cover news, sports and talk shows.

The PM1D installed at TV2 Ostjylland uses no patchbay and provides all the audio processing the station requires.

'When this was a hole in the ground we decided that we would get rid of everything we didn't need, so we have no multiband compressors, no patchbays...' Brinck confirms. 'Everybody said we were crazy. But you have to learn to trust the digital equipment. If you don't trust it, you have to have a back-up all the time.

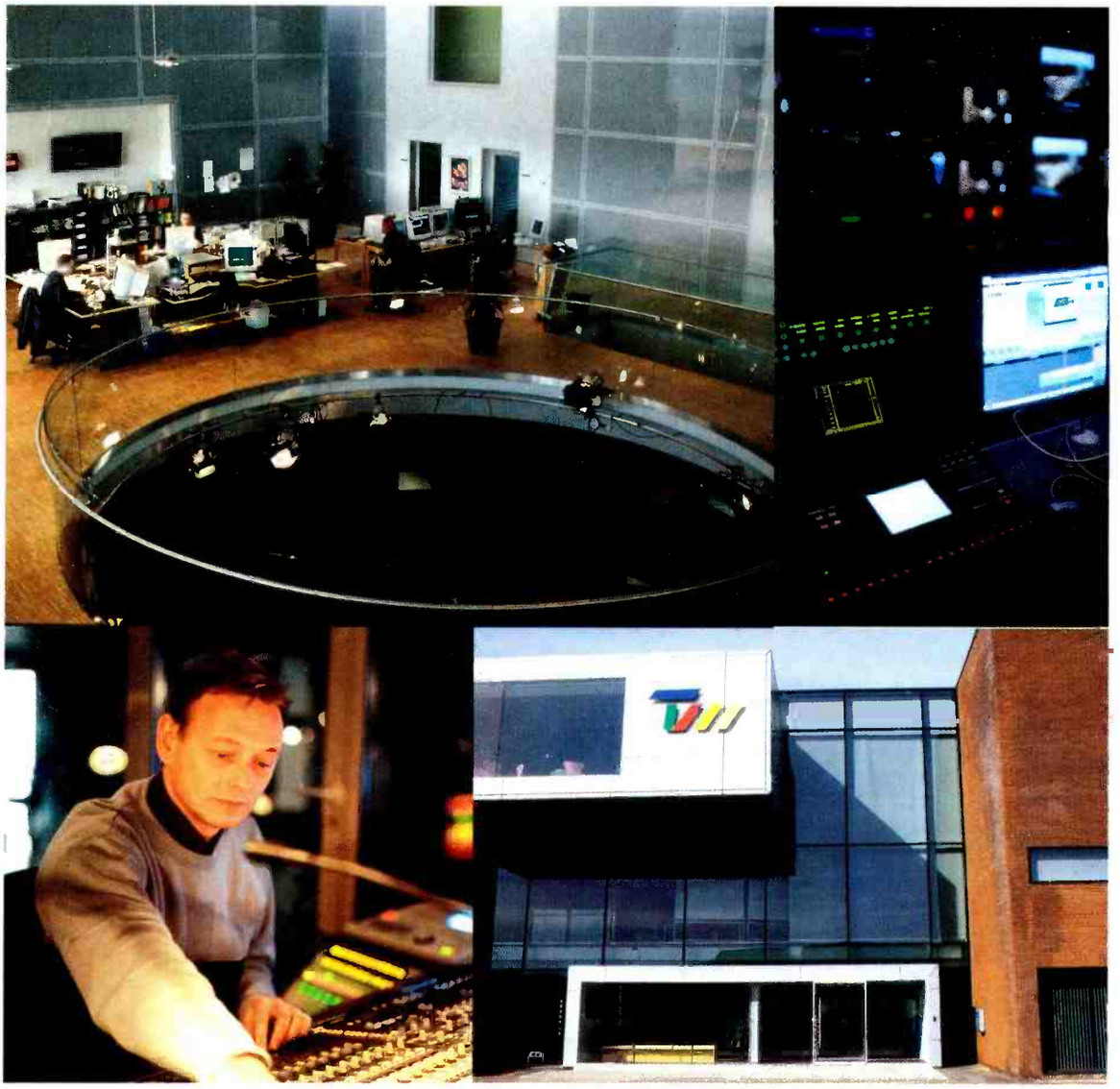
'We had one patchbay to begin with, and the one evening I had no audio it was because someone had left something plugged into the patchbay. All the other stations have a patchbay—just to be sure—but we don't. Of course, we still need a cassette player, a CD player, a DAT and a preamplifier for a gramophone—it's what we call the Museum Rack. And we were going to put a patchbay in a fish tank like a museum exhibit but we haven't got around to it yet.'

The only analogue connections to the console are

Yamaha PM1D Broadcast Upgrade

AFTER CONSULTATION WITH TV2 Denmark and other broadcasters, Yamaha is releasing new software for the PM1D to meet specific broadcast requirements. Among the new features and enhancements will be the following:

- Digital Input Gain—up to 18dB of gain will be available at the input stage of any channel which has a digital source.
- Stereo Balance—a new Balance mode will be provided for stereo inputs and stereo pairs of channels.
- Left Mono/Right Mono—allows any stereo input or pair to be quickly assigned to function as a Left Mono or Right Mono channel. For example, this function allows the Left channel to be instantly positioned in the centre pan position while the right channel is muted.
- M-S Matrix—will be available to be inserted across any stereo or pair of input channels.
- Mix Minus—a new menu provides a fast and simple method for setting up mix minus assignments.



for the studio monitors. All other connections are made via the NTP router giving 24-bit, 48kHz audio throughout the system. The router is also linked in software to follow the Sony server and editing system although they can operate independently if required.

This station is really built in two parts: the audio and the video,' Vester explains. 'They don't follow each other outside of the Sony system. Once you get outside of the Sony system it's video and audio because you need the audio to go through the sound room.'

With this setup, TV2 Ostjylland contributes three regular live news spots to its audience of 600,000–700,000 viewers.

'We are a small region with quite a lot of people, so we only use one transmitter but some regions have three transmitters,' Vester explains. 'All the transmitters are connected to the main station. Then the main station has a big switch that it uses at 6.10pm, 7.30pm and 10.15pm to put control over to us and it's up to us to be ready. So we have to fill in that window each time. During transmission, the PM1D is taking care of the sound—and the host presenter, and the guests, and the satellite news coming in, and OB news coming in, and feeds from the TV2 main station, telephone interviews, jingles...'

The brief is soon to be extended to include an important weekday programme that will further test the new setup.

'In the Summer we will be doing a national 1-hour programme at 8pm on Monday to Thursday (mid June to mid August) just after our own main news,' Vester confirms. 'There will be a lot of signals coming in and out of the studio and a lot of mix minuses. That's going to be very interesting although we don't know too much about it yet.'

While talk of Phase 3 revolves around 2005-2008, the decisions to be made on Phase 2 are due imminently. In the meantime, the Aarhus team waits to learn whether or not to replace the Sony system and whether it has paved the way for the remainder of the TV2 operation once again.

'They're going to make a decision this Spring about Phase 2,' Vester confirms, 'but it's the same thing again—are any of the manufacturers ready to supply equipment?

'I don't know if it's true, but it seems like Scandinavia is ahead of the world in the move towards digital broadcasting,' he muses. His suspicion is apparently born out by Yamaha's choice of development partner—and by the constant frustration of having to wait for the broadcast manufacturers to catch up with TV2's needs. Time for another closed-doors session? □

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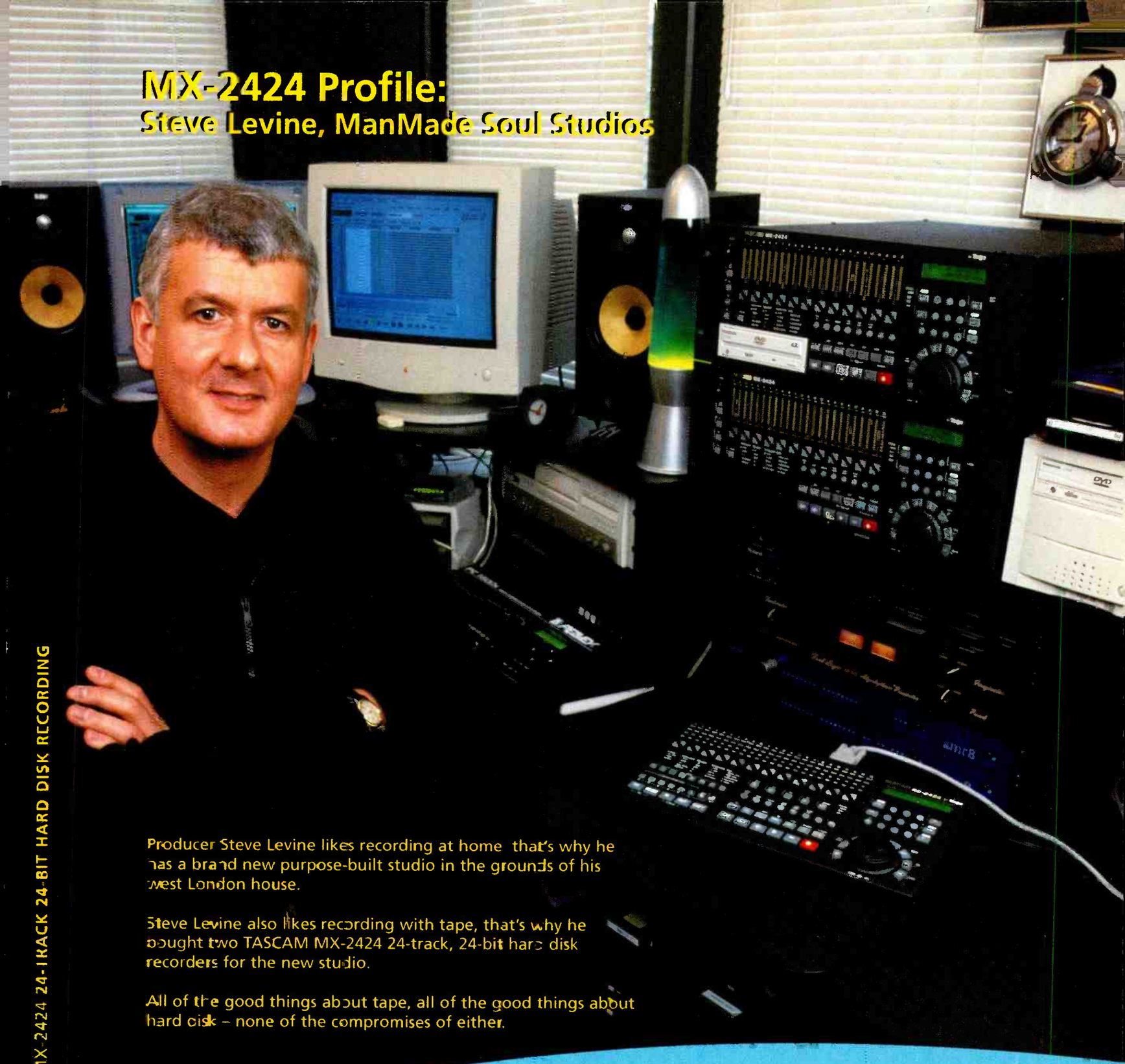
MX-2424 Profile:
Steve Levine, ManMade Soul Studios



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.

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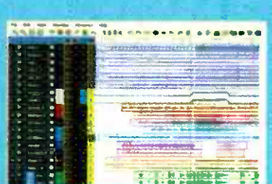

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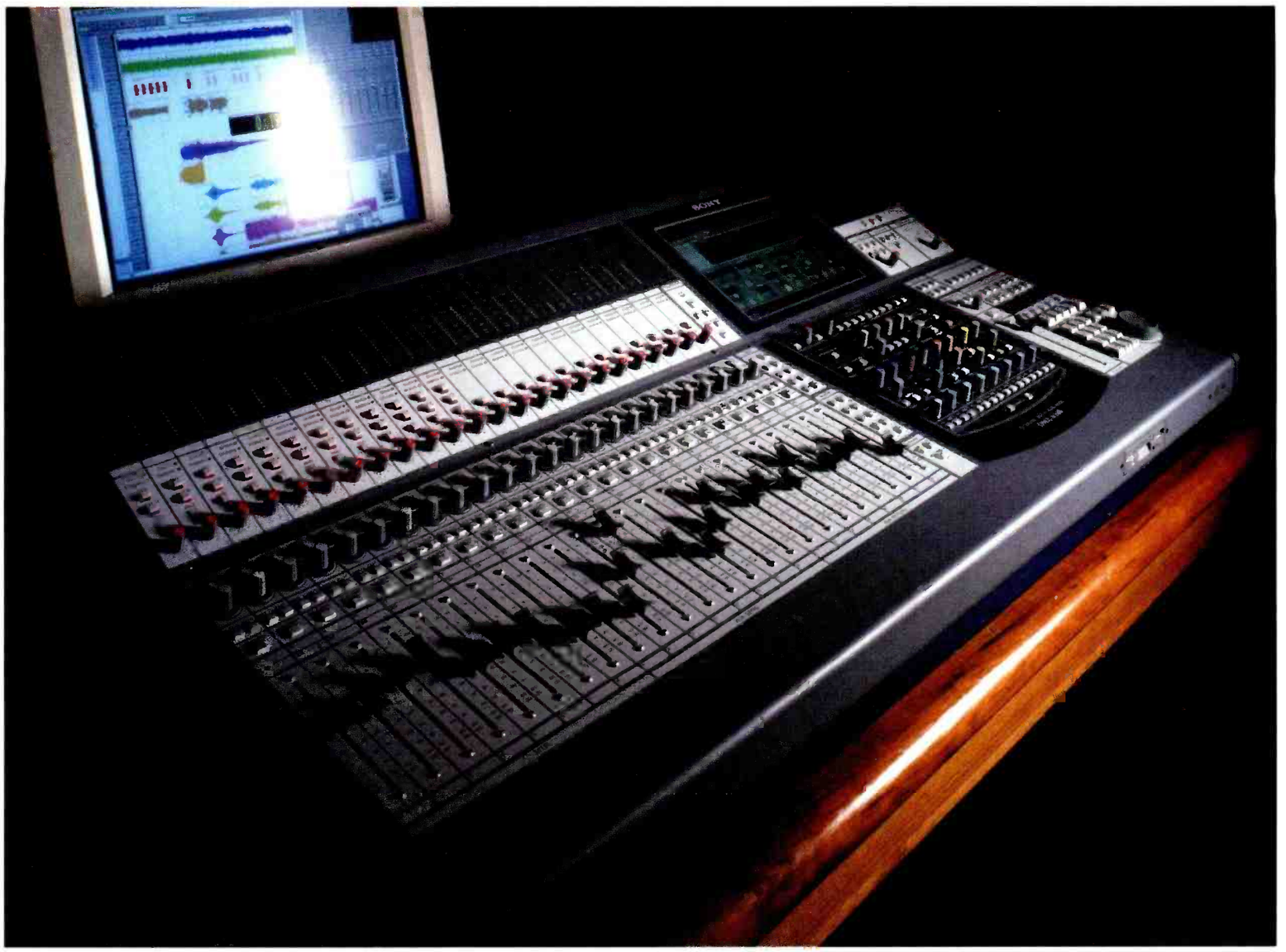


Sony DMX-R100

Aimed concurrently at the recording, broadcast and theatre markets, Sony's latest digital mixer is a contender in all areas. **Rob James** debates flexibility and dedication

ARGUABLY THE STAR of last year's Paris AES, the Sony DMX-R100 has already attracted a good deal of comment and sales. Now the fuss has died down a bit, a production unit (v1.16 software) was available for an in-depth investigation.

Consoles are personal things. At some time or other most of us will have doodled designs for the 'perfect console'. I would be prepared to bet no two are the same. Comparisons are odorous—or so Shakespeare has it—in this case they are certainly not easy to make. Pricewise, the DMX-R100 is in an almost unique position in the digital console market, sitting between the rash of 8-bus assignables (at a fraction of its price) and the lower-end heavyweights.

The overall design follows the familiar 8-bus assignable paradigm with layered faders. Other similarities are the inclusion of a generous number of analogue inputs (24, 12 with mic level preamps) and the usual assortment of monitoring outputs, aux sends and so on. There are four slots for expansion and digital I-O but the large cards are rather fiddly to fit in my experience.

The Sony begins to show its mettle with 96kHz options, solid construction, touch-sensitive faders and screen, 9-pin machine control and a large assignable parameters section. Although high-sample-rate working is already proving useful, the number of inputs is halved to 24, aux sends are reduced from eight to two, Returns to four, inserts to four and monitoring to two channels.

A cold boot takes around a minute. For peace of mind I would use a UPS (un-interruptible power supply) for live work. With the start-up sequence complete the only thing you hear is blissful silence. There are no cooling fans or whirring hard drives in the console and even the touch-screen is quiet.

I am no great fan of touch screens but this is an unusually good example, clear and positive and there's

a VCA output. The whole surface is inviting and satisfying to the touch. Faders are smooth and light, not perhaps up to the standards of an AMS Neve DFC or an SSL Avant, but good for the price point. Knobs and keys maintain the impression. This board makes you want to use it.

At first glance the equaliser and dynamics controls seem haphazardly arranged. In use this impression is swiftly dissipated. The controls fall naturally to hand and interaction with the screen quickly becomes instinctive. The layout owes much to John East from the Sony Oxford design team. However, I also recognise several features from other, pre-Oxford, Sony consoles.

The first opportunity for criticism comes when you first switch one of the 12 mic inputs from A to B input with the fader open... A small splat is evident. It's nothing serious but it's not desirable. Each analogue input has signal present and overload LEDs, a nice touch. Another thing which caught my eye is the LED halos around the pan knobs. From a normal operating position the knobs neatly hide the LEDs around the zero position. If the LED halos had been mounted the other way up, with zero at the bottom, this wouldn't be a problem and while we're at it, why don't the rest of the rotary controls have LED halos?

Another strange omission swiftly comes to light: there is no linking between pan controls when channels are paired for stereo. Welcome though, is the inclusion of M-S decoding although this is somewhat rudimentary with no real provision for varying the S signal and thus the width.

Getting audio through the board and setting up a simple stereo mix is child's play. I would hazard anyone even vaguely familiar with assignable consoles could do a simple recording session without tuition or even opening the manual. However, digging deeper is more rewarding. I-O options are already pretty comprehensive with ADAT, TDIF, AES-EBU with or without SRCs and analogue boards but there are further opportunities for expansion since one slot has the potential to add far more than the usual eight way I-O options. This makes a lot of sense in conjunction with the onboard matrices which allow any physical input or output to be patched to any logical input or output. All this adds up to a considerable saving on external patch-fields and installation costs.

In the DMX-R100 sonic integrity is clearly high on the priority list.

Quiet analogue inputs, lovely long, smooth, fades to black with no hint of zipper noise. Musical EQs combining sufficient Q (16) with 20dB of boost and cut allow for drastic alteration of tonal quality without sounding unpleasant. On the other hand, in sound for picture work, something more clinical, with an even higher Q would be preferable. I am used to full frequency range in every band and found the limited bands a little irritating. The separate high-pass and low-pass filters are welcome but again, for post work, 24dB/octave would be more use than the current 12dB although the high-pass has a useful option notch. At the other end the gentle roll-off is mitigated by a maximum frequency setting of 22.35kHz or 42.2kHz at 96kHz sampling. The HF equaliser band is similarly affected with maxima of 19.9kHz and 39.8kHz. Dynamics are a joy—transparent brick-wall limiting if that's your thing or opaque compression when you feel the need and there is gating or expansion at the same time. The limiting in particular does exactly what I want. Even with already highly-compressed material you can apply around 12dB of limiting and the music just gets louder without obvious artefacts. Internal processing is 32-bit floating-point with 40 bits where they count—and it shows. You have to seriously abuse it before anything gets unpleasantly crunchy.

Monitoring control gives more than a nod in the direction of 5.1 surround. Setup is accessed via keys on the surface or a screen menu. Mono, stereo and surround setups are available for the control room with mono or stereo for the studio. This may well be used for alternative control room speakers since there is no other provision. Six keys on the surface select control room sources. STEREO PROGRAM, AUX, MULTITRACK,

EXT, 2 TRACK 1 and 2 TRACK 2. The MULTITRACK and EXT keys access single or adjacent pairs of inputs unless Surround mode is selected. In this mode there are, in effect, two 5.1 sources plus the stereo programme, aux and the 2-tracks.

Sensibly, there are separate outputs for surround and stereo programme although no provision for down-mixing, bass management or any other format *apart from 5.1* so, if any of these are a requirement, an external monitoring controller will still be required. Surround panning is 'finger on screen' or you could use a mouse. Panning a stereo source is almost impossible since you can only move one channel at a time and there is no direct way to control the LFE level.

Machine control options allow up to six machines to be defined and selected via keys on the surface. The DMX-R100 will chase LTC or MTC and generate LTC but annoyingly not MTC at the same time. It will respond to MMC commands and generate them. Alternatively it functions effectively as a 9-pin master controller. Only one of the two 9-pin master sockets is active at a time and, while there is a slave socket, it will not currently work as a 9-pin slave.

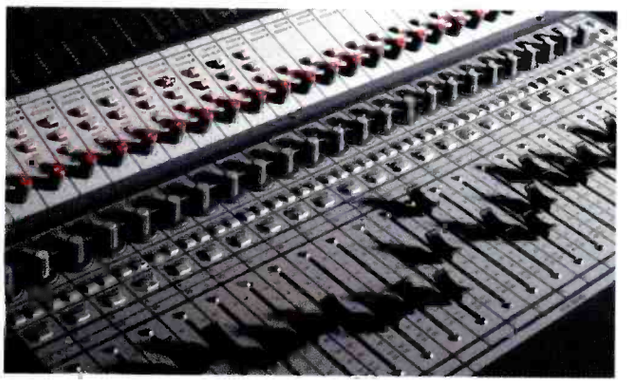
The internal generator does not rewind or fast forward, only Play, Stop or Locate. Another irritation is the time code reader and generator settings are not stored with the machine setups. This frequently necessitates going into the menu and changing things rather than simply selecting a machine on a single key.

The first level of automation is snapshots and cues. Channels or functions may be isolated from snapshots or dynamic automation. Snapshots may be recalled manually or via MIDI or by time code cues so one snapshot may be employed many times in a project.

The accuracy of both snapshot and dynamic automation is quoted at ±2 frames which is very loose. In practice I found it tighter so maybe this is worst case.

The point at which all the other 8-bus designs really come unstuck is dynamic automation. Proper touch-sensitive faders alone would almost justify the DMX-R100's price premium over the rest. These do not disappoint: plenty of power translates into rapid movements although there is still room for improvement in the speed at which the movements of one fader is mimicked another—where six faders are controlled by one, the six move in virtual unison but perceptibly after the master. Of course, none of this affects the audio which follows the controlling fader exactly. Up to eight fader-cut groups may be created and activated individually or in combination.

Dynamic automation passes are saved in A and B RAM buffers. These may be switched automatically after each pass or manually when desired. The memory



provided appears adequate to cope with lengthy projects and mixes may be saved to the built-in floppy drive.

A menu selection decides what will occur when controls are dropped out of record. Butt reverts to the previous value immediately, Hold to End and Hold to Next event do what they say and Ramp ramps back to the previous value over a time period set in the automation page. Individual controls are armed for automation via the READY/SETUP screen key and touching the individual controls on screen or rotating knobs-touching faders pressing keys. Alternatively, the entire 'strip' is armed with the WRITE key. This drops in and out all armed parameters on the strip. Otherwise faders are dropped into write by touching them and out by releasing them. Keys drop in when pressed but annoyingly, rotary controls require a screen touch. Individual keys and rotary controls can only be dropped out by touching them on screen. I accidentally discovered if you move a fader with a fingernail and later touch it, the actual value does not reflect its position until you move it again.

For music recording, some broadcast work (especially outside broadcasts) and live theatre work, this machine is already a strong contender. For sound for picture post, I am less convinced. The quoted automation accuracy is inadequate and the surround implementation and dynamic automation feel incomplete. The lack of pan linking of stereo sources a pain in stereo and almost impossible in surround. Screen re-draws are often slow. This would be fine if there were not other signs that the controlling computer may be struggling to keep up. On a few occasions I found values continuing to update after I had released the controls and the lag between faders may well be another symptom.

Apart from all this there is a wish list. EQ and dynamics libraries would be good and so would onboard reverb, perhaps as a third-party plug-in.

Many people I meet have been waiting impatiently for a manufacturer to develop a console which really improves on the first generation digital 8-bus machines without breaking the bank. Amazingly, the DMX-R100 is the first serious contender to emerge.

If this review sounds harsh in places, my apologies are due to Sony. Obviously, any console intended to sell in numbers is going to show areas of compromise, the acid test being whether the balance is tilted in favour of your particular requirements and prejudices. Some measure of Sony's achievement with this design, then, is the difficulty I found in making such allowances. My criticism arises from my feeling that although the DMX-R100 is a good console at the price, it could so easily be a great one with these points addressed.

It may be a cliche, but the bottom line is that if you need a digital console at reasonable cost which sounds great and looks and feels like a professional tool, then this is the only game in town. I want one. □

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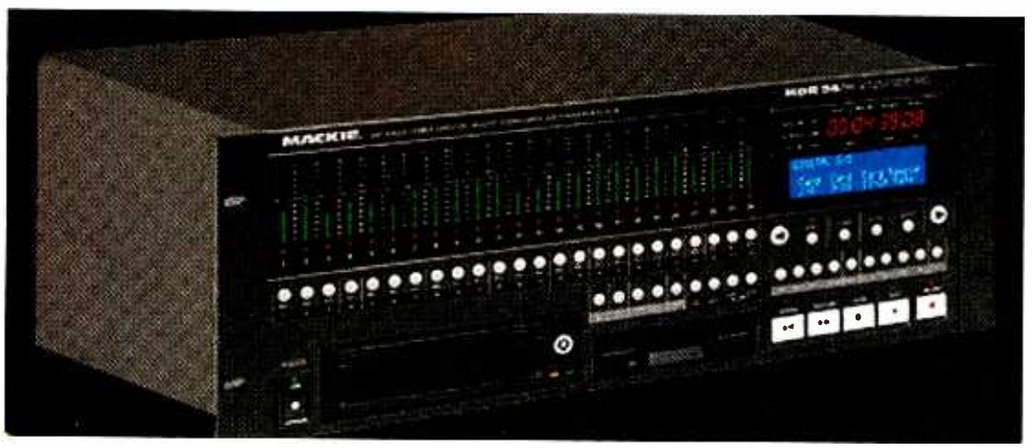
Mackie HDR 24/96

Carrying Mackie's trade-mark accessibility, the HDR24/96 hard disk recorder-editor makes a welcome entrance on to the pro-audio stage. **Rob James** watches its audition



IT'S BEEN A LONG WAIT but Mackie's HDR24/96 recorder has finally arrived. And it's as close to plug-and-play as it gets—just add audio interface cards, connect audio and sync, switch on and press PLAY.

Mackie ships the machine with demo projects on the internal drive which is a better way of helping you finding your way around than you would first assume. The last project you worked on is always loaded at switch on. Plugging in a PC monitor reveals the track sheet, meters, transport controls and counter. Autoscroll puts the play line in the centre of the screen and scrolls the tracks at all useful zoom levels. Scrolling is among the smoothest I've seen. The on-screen meter ballistics may be vu or peak with the interesting option of both together. I found myself using this mode much of the time.

Transport dynamics are also impressive. Play starts from any mode in less than a second. Rewind and fast forward behave like a mechanical recorder—single press ramps up fairly slowly to 20x speed, second and third presses drastically increase the speed. The values are well chosen to make it easy to end up where you want to be without overshooting. Judicious use of the locates, loop and autopunch make the process of tracking almost painless. Eight easily accessible takes per track are the icing on the cake. Multiple successive punch-in, punch-outs without stopping are okay. There is a brief delay after dropping out before you can punch-in again but this is unlikely to be a problem in normal operation. More to the point, when punching out, even on 24 tracks, the monitoring switches almost instantly back to the previous take(s).

For editing, the meters can be replaced with a tool palette and the right-hand-side of the track sheet with a cue list (locates) or region list (raw audio files). At the simplest level, editing begins with selecting a region or regions with the Hand tool. Selected regions change colour. The selection can be moved in time or across tracks. Placing the tool on the lower part of a boundary enables trimming and on the upper half, fading. An autocrossfade function produces instant results when one region is moved over another.

You only get a choice of three fade shapes, or nine permutations on a crossfade but hold on a minute, some of the most expensive hardware editors only give you one. I have no doubt that if there is sufficient clamour, Mackie will provide more. This will not necessarily be a good thing. Less is more, the KISS principle, call it what you like, the point is, if the basic tools do the job quickly and effectively, the battle is half won. A choice of 50 fade curves isn't going to help and a lengthy list of glitzy features which get used once in a blue moon are no substitute. If the fundamental operation is right then by all means add all the features you want, but keep the interface clean and uncluttered.

Mackie has managed the trick pretty well. It is easy to get into editing on this machine, but as you become more proficient there are sufficient further tools to keep you happy for some time. Hitting the

Interfacing

THREE SLOTS TAKE optional audio interfaces. These are the same as those used with the D8b console. At present these come in four flavours;

- AIO-8 provides eight channels of 24-bit analogue I-O at 44.1kHz or 48kHz. Connectors are 25-pin sub-Ds and use 'Tascam' pinouts. 0dBFS equates to +22dBu
- DIO-8 gives eight channels of Digital I-O in two formats, Tascam TDIF on 25-pin sub-D plus sync BNC or ADAT Optical.
- OPT-8 is a highly cost-effective ADAT optical only version of the DIO-8.
- PDI-8 carries eight channels of AES-EBU digital I-O on a single 25-pin sub-D. This card allows sample rate conversion on individual pairs of inputs. Mackie sensibly makes the point that conversion is undesirable unless absolutely necessary. This is also the card to use in two-wire mode for 96kHz.

Two of the six other slots are empty. The rest are occupied by a standard 15-pin VGA connector for an external screen, a RJ-45 100Mbit Ethernet connector and a 9-pin sub-D for MIDI (breakout lead to two DINS is supplied). The remaining populated slot carries the sync connections. Two BNCs deal with in and out and the unit will sync to either wordclock or video. When syncing to video the wordclock output remains active, increasing the options. A push switch applies 75Ω termination if required. SMPTE time code input-output is a single ¼-inch jack. The function changes depending on mode.

On the unit body a further RJ-45 socket connects one of the optional remote controls. Footswitch is a jack. The mouse connection is a PS-2 mini-DIN but the keyboard is the older AT style full-size DIN. This is a great way of using one of those keyboards you've had lying around for years. If you need to use a PS-2, convertors are readily available.

Front Panel

THE HDR24/96 PANEL is dominated by the 24 meter displays and record arming keys. Right of the meters are two further displays. The time counter uses bright red alphanumeric LEDs with indicators for sampling rate, varispeed, error, time code and clock. The remaining display is a backlit LCD used for housekeeping and menu selections. This blanks after several minutes of inactivity. Pressing any relevant key lights it up again. Menu navigation is by four select keys, increment-decrement keys and two, larger, Left and Right cursor keys. Eight dedicated keys take you straight to the main menus. The other new keys access two locator memories, store and loop, monitor switching, auto take and time code chase. The only problem is, until you are familiar with the layout, the legends are white on grey and difficult to read in studio lighting.

Transport controls are big and positive with a click. Tallies are separate LEDs. The power switch is momentary and a little too easy to inadvertently trip. Software updates and tempo maps are loaded via the floppy drive. The single, removable storage slot (Mackie Media Receptacle) accepts EIDE hard drives in Mackie Media Trays or a 'project' drive which uses the popular Orb 2.2Gb device. Mackie supply pre-formatted UDMA drives ready mounted in trays. These come in padded plastic library cases with track sheets and so on. Very convenient and relatively safe. Alternatively, empty trays are available.

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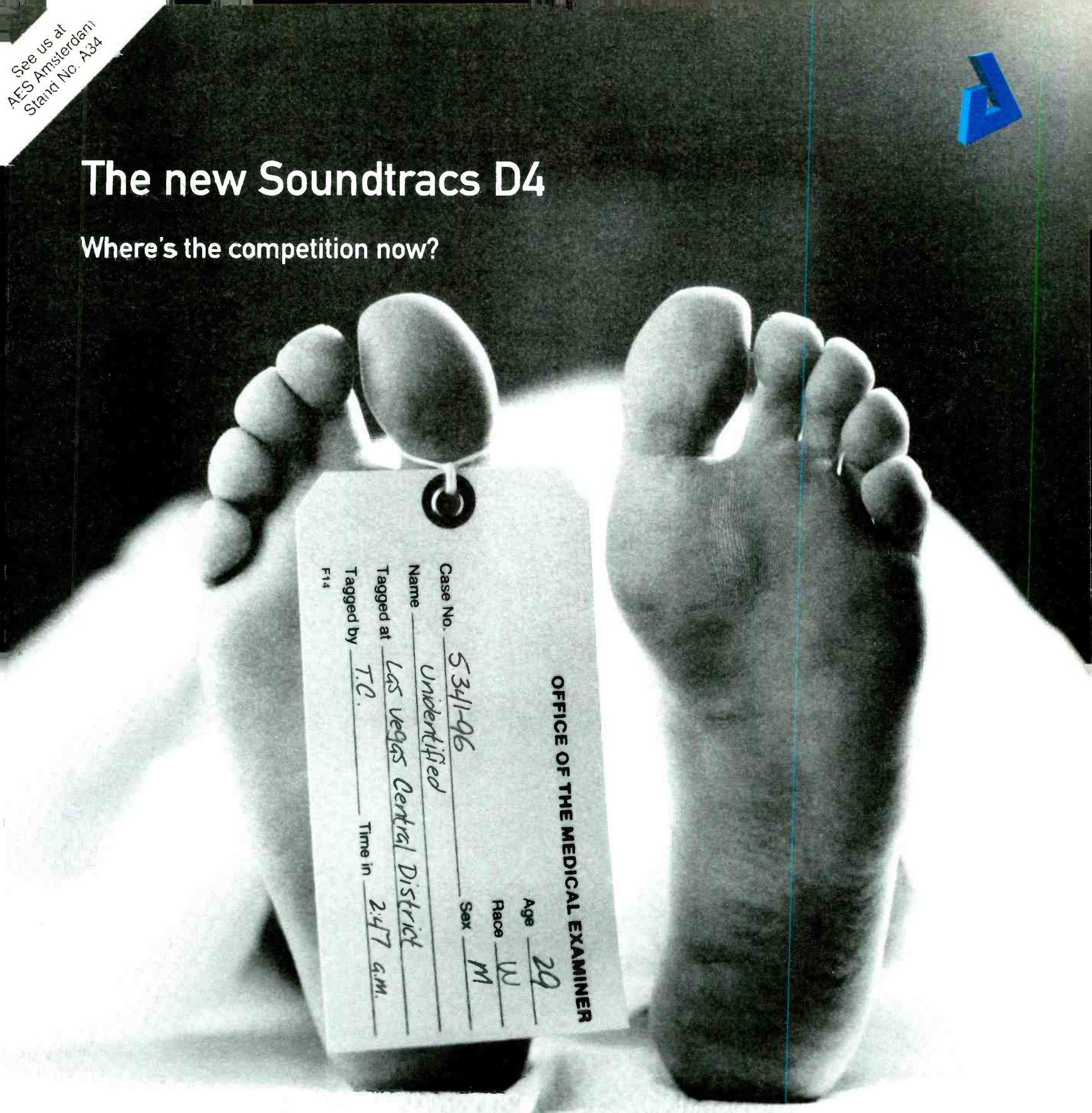

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Z key momentarily zooms in to the mouse cursor position. Counters indicate the start and end of selection range and loop-punch ranges. Another counter tracks the cursor position in time. All but the last accept directly entered values, grabs or reflect on screen selections.

Nudge tools are one welcome addition. Nudge resolution may be set to values from one sample to one frame. In units of samples, milliseconds or SPMTE frames. Three selection boxes determine what the nudge arrows surrounding them affect. Left boundary, right boundary or the whole selection. If the Hand tool is in use the boxes show a waveform to indicate a region will be nudged. With the I-beam they show a divided block which means the selection will be nudged. The Scrub Wheel tool can work in conjunction with the I-beam so you can set a point while scrubbing. Scrub quality is very good, although the maximum speed of one times play is a bit limiting. Cut, copy and paste are analogous to the standard word processor operations. Clipboard contents is replaced with the last item cut or copied. Multiple undo and redo are allowed and there is an edit history list which is only lost when the project is closed. Other edit operations include cut or splice, insert time, split and crop. As with any editor, there are things to watch for. If you drag a region so it completely covers another with autocrossfade off, the underlying region is removed from the playlist. However, the audio isn't erased, there is always undo or you can simply replace it from the region list.

The Node tool introduces volume automation. The pencil cursor is used to add points on the volume envelope line which can be dragged to change level at specific points. Familiar from various workstations and sequencers but unusual on a recorder.

Remote 24

THE OPTIONAL REMOTE 24 connects via a Cat5 Ethernet cable over distances up to around 10m. This neat little unit can either sit on the desk or screw holes are provided to attach a standard 'top hat' mic stand adaptor or custom mounting. The main transport controls and all the keys are of the same type as those on the machine. Apart from the transport controls there are 24 track arming keys, a Record Safe, ALL INPUT and AUTO INPUT monitor switching. Four locate keys are used with STORE. LOCATE 1 and LOCATE 2 also double as in and out points for the loop function, invoked by the LOOP key. Similarly, LOCATE 3 and LOCATE 4 double as punch in and out points when used with the PUNCH and REHEARSE keys. PREROLL adds whatever pre-roll has been set on the HDR24/96. The Take Select section sets the active take for the selected track with increment-decrement keys. The selected take number is displayed on a single bright red alpha LED. AUTO TAKE increments the take number automatically on each successive pass up to the maximum of eight. Pressing DELETE LAST twice deletes the last take. In the Track Number section Tracks are selected by using increment-decrement keys and displayed on two alpha LEDs. The single meter follows the track selection. When PLAY is held or the transport is in FF or REW the three alpha LEDs display minutes and seconds.

The whole thing is well thought out and immediately instinctive in use.

Of course, everyone's requirements are different and not all are met by the HDR Locking of stereo and multichannel regions for edit operations and audible cue and review at up to, say, 4x play speed would be good. And since the HDR24/96 scrubs backwards and forwards perfectly happily, a direct method of accessing reverse play would be welcome. There are many more. However, this is not a criticism, rather an indication that Mackie is doing rather well for version one of a new venture.

If the HDR24/96 had appeared when it was first advertised, it would probably have cleaned up. As it is, there is now a considerable choice of 24-track hard-disk recorders available at reasonable cost. Tascam and Fostex both have recorders on the streets and Alesis is not far behind, not forgetting the more costly Radar, Fairlight Merlin and Euphonix R-1. However, there is quite sufficient variation in approach and implementation to clearly differentiate these superficially similar machines. Mackie has said it set out primarily to make an analogue multitrack substitute without requiring you to metamorphose into a computer geek or to sacrifice anything. In this it has admirably succeeded. Ironically, it has also done an excellent job in laying the foundations for a thoroughly serious editor as well. While it is perfectly possible to use the HDR24/96 simply as a recorder without bothering to get into any of the other features it would be a shocking waste. The basic editing is quick to learn and intuitive. More complex editing has some extremely powerful features. The 96kHz option is here and working although the track count is, predictably, halved. Connectivity is excellent with a 'built in' FTP server and TC/IP networking protocols. Audio is recorded in WAV format and WAV or AIFF may be imported.

Manual writing is an art and Mackie's are among the best, but would benefit from a proper index.

The great virtue of the HDR24/96 lies in retaining all the advantages of an industry standard computing platform whilst managing to avoid the baggage of unreliability and complexity by using their own operating system. The potential for synergy with the D8b and its successors opens up new vistas of possibility.

Just when it was beginning to look as if there was only one answer to the workstation question, with dedicated hardware an endangered species, things are getting interesting again. □

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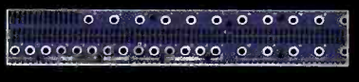

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Emagic Logic Audio Platinum

It's evolution from MIDI sequencer to heavyweight integrated recorder is over. **Rob James** finds Logic Audio Platinum v4.7 a match for dedicated audio recorders

I MUST CONFESS that I am not a regular user of sequencers. Many of the MIDI subtleties of a package like Emagic's Logic Audio are somewhat wasted on me and require a sequencing expert to do them justice. However, using PC audio packages on a regular and frequent basis, I can assure that Logic has arrived at a point where it now bears comparison with heavyweight audio-only systems.

Logic: the word alone conjures images of precision and irrefutable good sense and v4.7 is only the latest incarnation of the well-respected German audio and MIDI recorder. The Platinum version is the top of the range, offering a maximum of 128 audio tracks and a plethora of bells and whistles. Make no mistake, this is a huge suite of software.

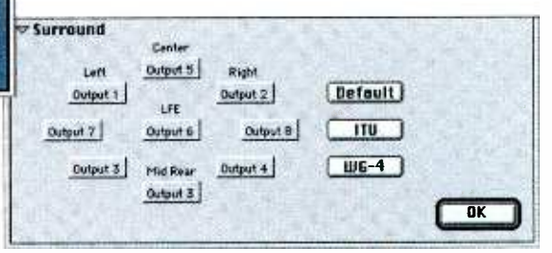
The main user manual is 50mm thick and still doesn't contain everything you need to know. In fact there is a thriving industry in 'How To' books and videos related to this and other comparable packages. Such breadth and depth can be more than a little daunting to a newcomer, and extracting the maximum benefits and performance requires some serious study and practice. But the potential rewards are many. The degree of control over a vast number of parameters is quite remarkable and Logic offers a unique perspective on several aspects of the user interface. Other, less complex alternatives may well be easier to learn but for power users, their limitations rapidly become apparent. Of course, there are restrictions to Logic's capabilities but successive revisions of Logic have added ever more audio functionality to what was already a heavyweight sequencer package.

Hardware support is, as might be expected, comprehensive. The proprietary EASI (Emagic Audio Streaming Interface) drivers are probably favourite if your card or cards support them. Otherwise there is ASIO support and Windows MME. Emagic's own Audiowerk, SoundScape's SSHDR hardware, the Yamaha DS 2416 DSP Factory and various Digidesign hardware are directly supported, depending on platform, as is Roland's VS-series and Korg. Specific configuration obviously depends on the hardware. I used a Creamware Luna card with the PCAV EASI driver that proved straightforward and effective.

Logic Platinum can be relatively simple, used on a superficial level, or extremely complex if you want to play that way. The default configurations are fine to get you started but once you delve deeper, the learning curve is long and steep. A friend of mine, a university professor and composer of music for films and TV, reckons he was only just beginning to get into it after six months of heavy use.

At the heart of Logic is the Environment. This is where all the connections between virtual and actual devices can be examined and modified and where the serious customisation takes place. Thanks to the many automatic features it is possible to use Logic without really getting to know the Environment. If you take the time and trouble to understand it, the power becomes apparent. Environments can be designed for specific tasks and when combined with other features such as 'screen sets', can considerably improve productivity. Environments can be simple to deal with common tasks or extremely complicated for more esoteric purposes.

Recording and editing can both be undertaken in the Arranger window that, as the name implies, is the track sheet. One major annoyance concerns recording—Emagic strongly recommends setting a maximum record time before recording. For some applications this is very inconvenient. According to the manual, failure to follow this advice can result in a heavily fragmented drive due to the way Logic operates. If a maximum time is not set Logic creates a file or files using the entire free space on the drive, releasing the surplus when recording is stopped.



Recordings made in Logic are time-stamped and can be returned to their original locations if you get in a mess.

Audio editing can be undertaken in several windows. The Audio window, which is also the place to audition and manage audio files, the Sample Edit window, which is good for delicate work, or the Arranger. Ultimately, if you can think of it, there is probably a way to do it. Many of the functions make considerable use of mouse clicks and dragging in conjunction with modifier keys. Fades and crossfades in the Arranger are non-destructive but are rendered to disk as separate files that can take some time with longer fades. There is also a destructive crossfade option. The advantage with rendering is the lack of processing and disk overhead when replaying the result. The downside is there's no preview and if you don't like the results you have to re-render to change the fade. That said, curve shape and length are flexible enough. Useful additional features include 'strip silence' which automatically creates regions from a recording with gaps in the audio.

The mixers are visually stylish; graphics are art deco crossed with Star Trek. Once acclimatised the controls are no more or less difficult to use than any other mouse-and-screen based interface and there are some very nice touches. MIDI has always only been barely adequate for fader control—128 steps really aren't enough. Logic provides an adjustable volume smoothing parameter which interpolates between steps thus avoiding zipper noise when moving audio faders quickly. I also like the numeric display of level in the fader 'knobs'.

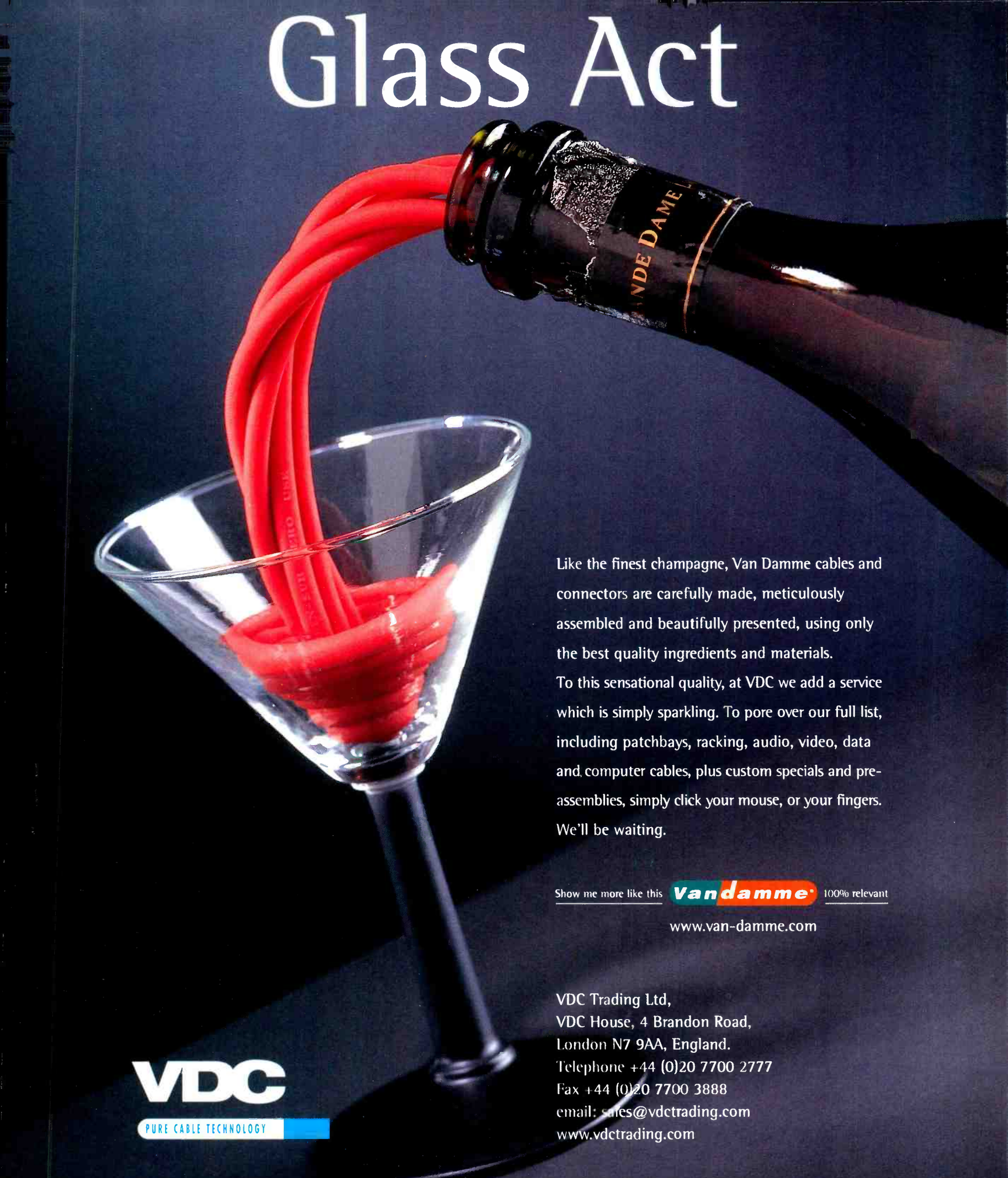
One decision worth considering is whether to use the Track Mixer or Audio Mixer since the presentation of automation data differs.

The Track Mixer is the simplest for mixing audio and MIDI tracks. The software automatically creates a mixer from all the currently assigned tracks in the Arranger, MIDI, Audio. The Audio Mixer may be a better choice for audio only projects with relatively few tracks. Automation files are written to separate tracks in the Arrange window that arguably makes for better clarity. The Audio Mixer is actually a layer (view) of the Environment.

The supplied plug-ins lift Logic's game to greater heights. Not only are there plenty of them but some are unique and most are of uniformly high quality. Unless you get really carried away with the number of effects inserted into a channel or bus every parameter can be automated. As a bonus, plug-ins can also be used with live inputs without the 'transport' running. Plug-ins have two views: Editor has the prettier skin while Controls sometimes allows access to more parameters.

For me there are several highlights to Logic; Fat EQ is a 5-band fully-parametric EQ which sounds great. Although for some purposes I would have appreciated a higher Q to go with the ±18dB of boost and cut. Distortion and Overdrive are far more usable than many other examples. Autofilter offers many intriguing creative avenues for sound designers as well as composers. It will even produce instant 'Clanger' voices from a dialogue track, which may give some flavour of what it's about. Reverb is always

Glass Act



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a tricky compromise with native processing since really convincing reverb takes a lot of processing. The Platinum reverb is a lot more than just usable and will give many a dedicated unit a run for its money. The Spectral gate is, so far as I am aware, unique. This complex dynamic filter effect is hard to describe but highly engaging.

It is also nice to see and hear Logic's famous Bit Crusher and the Direction Mixer. The latter takes either an XY or M-S stereo signal and gives direction and width control. VST and DirectShow plug-ins are also supported.

Apart from real-time effects, there is a collection of mostly destructive off-line processes dubbed, The Digital Factory. Here you will find pitch shifting-time stretching, both are conventional and in the form of The Quantise Engine and Groove Machine use rhythmic-dynamic parameters to vary the stretch. There is also the Energizer, sample-rate conversion and the Silencer which offers de-noising and de-clicking. The other two processes generate MIDI data from audio. Audio to MIDI Groove Template creates a quantisation grid from suitably rhythmic material and Audio to Score attempts the difficult feat of generating MIDI data from mono audio.

For multichannel surround work, Logic now has a number of useful attributes. Formats up to 7.1 are possible including the recent 6.1 variants. Surround panning is dealt with using the now familiar ball in a square with a separate LFE slider. Drag the ball to position the sound. There is no direct control over divergence. Because Logic is so configurable, anyone requiring more sophisticated surround tricks such as HP filters to bleed bass to the LFE, can design their own solution.

Synchronisation is another of the software's fortés. MMC master or slave, time code chase and generation with extremely flexible display options are backed up by a reputation for the tightest timing in the business. Picture has not been forgotten either. Logic can handle AVI, Quick Time and MPEG2 files.

All of this doesn't begin to cover the totality. Sequencing, scoring, virtual instruments and control over a vast range of MIDI equipped hardware have recently been joined by Rocket Network connectivity.

I found Logic both infuriating and seductive. Infuriating, because there is so much in it I often couldn't see the wood for the trees, seductive for the same reason and the level of control, the effects and the sound—32-bit internal processing pays off. My only fundamental criticism is of the recording operation. In my kind of work I often have no idea how long a recording will be in advance and I certainly don't want to have to think about it. Apart from this, the editing could be slicker, especially the fades. But the same could be said of every other PC or Mac-based product I've seen which uses rendered fades. Longer acquaintance will generate the inevitable 'wish list' but for the moment I'll let this pass.

As the nexus of a MIDI-based studio, There are compelling arguments for Logic.

It is probably the most extreme illustration of the integrated sequencer-audio approach to system design. The audio tools now rival dedicated DAWs and even taking into account the need for a powerful computer, the cost is reasonable. Emagic has also had the sense to support third-party DSP for those who want it. This largely avoids the usual native processing arguments. But, despite the advances, there is still a trade off. There is a stark contrast between this methodology and a system built using stand-alone hardware. Dedicated hardware will be far more expensive but in many applications it is still a better solution. Speed, both of learning and operation is easier to achieve and simplicity is still a great virtue. Most manufacturers now tacitly acknowledge real tactile control is preferable to mouse and keyboard shortcuts. Emagic is not ignoring this. Mackie is working on a control surface designed specifically for Logic. When this arrives the equation will become even more complex.

Logic would be a quite remarkable achievement at any price. As it is, it's a steal and once hooked, highly addictive. □

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Pastega RMD 34, TMU 20, TMU 200

A new radio mic package from Italy is set to take advantage of changes in international radio licensing. **Neil Hillman** takes the Italian job

SOMEWHERE IN THE DARK and distant past of my ancestors, must lie more than a splash of Italian blood. I know for certain of a maternal Saxon heritage, and also of a paternal infusion of Celt. But how else—now that I come to examine it closely—can I explain away my predilection for Italy's finest offerings? Obviously, in that British somewhere that was an edge-of-the-empire garrison town, on a cold, wet, winters night in Northumberland, a Roman soldier entered my gene pool.

My first foreign holiday was in *bella* Riccione as a child. The finest car I've ever driven was a Ferrari 360, new and fresh, and collected from the factory car park in Modena. The motorcycle have I promised my inner-hooligan to trade up to is a Ducati 900 V-twin. In an ideal world, Gucci loafers would adorn my feet, Armani suits would adorn my body and Ciccolina would regularly adorn my, er, arm as she gracefully accompanied me each week to watch the finest football league in the world, Serie-A. I would holiday in Tuscany, but have my studio complex in the North, where the lakes would become a weekend playground for my Riva Aquarama mahogany launch. We are talking is style; and in bucketfulls. Not that much in evidence if you met me in person I hasten to add—before those who know me do—but at least I can offer a more rounded appreciation of La Dolce Vita than a pizza, some lager, a houseful of mates and *The Italian Job* on the DVD.

I can, therefore, appreciate the new range of Pastega wireless products introduced into Britain by the Emperor of recordable radio mics, Raycom. And this is not just a case of Anglo-Italian Emperor's new clothes. It is no great secret that the professional radio mic market is about to undergo an enormous change. That much is clear. What as yet is less well-known is that the proposed and necessary tighter regulation has more than one propriety brand manufacturer running scared of future professional-quality compliance. Indeed, the next two years could bring about an interesting result as to which of the established manufacturers may be allowed to claim to be offering a truly 'professional' product—defined by the industry's own set of standards —and not some semi-pro, re-packaged-for-UHF, how-do-we-do-it-for-the-money offering. Pastega clearly feels ready for the challenge with their latest offerings for location use.

The Pastega RMD 34 is a true diversity, UHF receiver that also easily adapts to slot into the back of any proprietary professional camera, such as those made by Sony, Philips or Ikegami. And what it is receiving may be sent either from a belt pack transmitter—the TMU 20, or a hand-held radio stick mic—the TMU 200.

The TMU 20 belt-pack transmitter bears an uncanny resemblance to the Sennheiser UHF belt pack, even to the drop-down, squeeze-and-pull front-flap battery compartment, housing two 1.5V AA dry cells, and the spring-steel belt clip, but an Olympic-medal-winners-podium top profile cuts a distinctive line. In the gold medal position, extending the analogy to mean the central top face, is the ON-OFF toggle-switch with accompanying green and red LEDs (respectively) to signify power and limiter 'on' or 'off'. These LEDs show red for limiter in-circuit, steady green for full battery with power on, or a flashing green state when the battery life is below 25%. A 6-position, 8dB per click gain selector-switch, adjusted by means of a small 'tweaker' screwdriver slot sits alongside. On either shoulder of the top face—in bronze and silver positions—

sit the signal route's connectors. To the left is a miniature 3-pin microphone socket that is married to the beautifully engineered Fischer connector (on the test model attached to the recordists' friend, a Sanken COS-11 lavalier mic). And to its credit, the transmitter only weighs 160g all-up, so even the smallest Tutti Frutti contestant would not be greatly inconvenienced.

Setting the transmitter up is a simple enough job, using the red limiter-on LED as a guide; it should just register under the heaviest peaks a voice is likely to deliver in the course of an individual recording. The right-hand shoulder houses the socket for the antenna connector, again secured by a Fischer colleted-sleeve arrangement. The two most fragile parts of the transmission end, the mic connector and the aerial connector, are as well protected as they may be by virtue of these robust plugs. The transmitter's front face houses four recessed adjuster switches in a row down the left-hand side. From the top these are: AUDIO a selection between a 100Hz high-pass filter or flat; MICRO, for powering the microphone between a 2-pin or 3-pin configuration (2 or 3-pin for electret mics, 3-pin for dynamic microphones); PHASE, and GROUP to select the operating bands

between, in the case of UK models, CH67 or CH69. A larger, hexadecimal-style rotary frequency selector for individual channel selection sits below the four smaller windows. Through a cut-out in the battery flap, a row of four LEDs are visible as a clearer indicator of battery status, set at 100%, 75%, 50% and 25% steps of useful battery life; said to be about 5.5 hours in continuous transmission.

Transmitter power is stated as 50mW ERP, with a bandwidth 30Hz—20kHz, and a nominal deviation of ±40kHz. The all-so-important compander system is very effective and available in the older style NR (Pastega Standard noise reduction) to remain compatible with older existing systems, or the newer, tighter XNR (Pastega Extended noise reduction). Subjected to the notorious 'jangling keys' treatment to test HF transient response, it brought about a pleasing result. Presumably, the 'ultimate' noise reduction is the option facing you when you realise that you do not have replacement transmitter batteries with you and are six hours into a day's filming; the new ones are half a mile away in the car, and in any case the assistant's got both sets of car keys and he's gone off shooting second unit with the DV Cam.

The TMU 200 hand-held radio microphone carries

a similarly impressive overall specification to the TMU 20 belt-pack transmitter. It has sufficient weight (270g) and robust feel, to inspire confidence in its ability to withstand the rough and tumbles likely to come its way in the course of its operational life. Powered by a 9V MN1604 battery, concealed within the body of the microphone and accessed by unscrewing the barrel outer, the 16-position rotary channel selector switch is available for screwdriver setting. The bottom of the mic carries the stub aerial connector, an ON-OFF power toggle switch and a similar arrangement of red and green LEDs for the limiter and battery warning as the belt pack. The 6-position, 8dB steps gain control is positioned on the bottom face too, and again like the belt-pack, it is set so that the red limiter LED twinkles on peaks. The standard omni microphone head itself may be interchanged with a Milab LR2000 supercardioid condenser capsule.

The Pastega RMD 34 receiver is similarly shouldered, albeit this time equally, at its business end. *Nil pointo* for guessing that the sloping top-sides are home to the two ¼-wave receiving antennas, but take a look at the rest of the device and you see the true beauty of this device: its slim simplicity. A 16-click rotary selector on the top allows for channel selection, two yellow LEDs indicate which antenna is active and then a power toggle switch and associated green LED complete the compliment. Four recessed, preset type switches at the top of the front face select the output to be 'mic' or 'line' level; select between channel groups 1 or 2; adjust the output level and adjust the squelch. The bottom face houses the 4-pin Hirose lookalike connector to take power in from an external 1.8V-18V source in camera mode or two 1.5V AA cells in self-contained mode. The final connector is of course the one carrying the audio: a 3-pin Fischer socket. But it would be so much more convenient operationally if connectors didn't live on the bottom of such devices.

Its easy to see how the two types of transmitter—the TMU-200 hand-held and the TMU-20 belt-pack—with a camera-mounted receiver and kept together as a kit, provide work-horse service for single news cameraman and reporter teams elsewhere in Europe. Not that the system however is limited to news either. This is a seriously effective, yet operationally simple, piece of kit that might just cut a swathe into the more established manufacturers selling into the UK market, and rightly so.

Priced very carefully to match its quality competitors, the Pastega systems may also be PC reprogrammed to suit overseas licensing conditions for the journeyman recordist—another huge plus in Pastega's favour. Travelling abroad at short notice brings about all kinds of extra problems for recordists if they have to consider working with radio mics anywhere else apart from home-licensed territory. Its not just the legality either, it's the frustration of being with ineffective kit a long way from home.

So when, as all good sound men are, I am called to cry *arrivederci* to this life and I prepare for the long, dark remix of the soul, St Peter will ask what meal I shall eat in perpetuity. And as a man of simple yet perfect taste, I will choose a repast that starts with *melone et procuttio*, is followed by *spaghetti alla carbonara* and culminates in *tiramasu*. And do you know what—with their reliability being greater than a Ferrari, whilst costing a fraction of the price, there is a chance that the readiness of my last supper will be conveyed to me on a Pastega system. So why don't they paint them Testarossa red? □

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Raycom, UK.
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AVI Pro-Nine

Studio Sound's 'bench test' loudspeaker reviews continue with the AVI Pro-Nine. **Keith Holland** reports

THE AVI PRO-NINE is a compact, two-way, passive loudspeaker comprising a 165mm woofer with a curvilinear doped paper cone and a 28mm fabric-domed tweeter. The drivers are mounted in a 9-litre ported enclosure with the tweeter offset from the vertical axis of the woofer. Overall cabinet dimensions are 310mm high by 195mm wide by 250mm deep. AVI recommends use with amplifiers of 50W-250W and

specify a sensitivity of 89dB for 1W at 1m giving a maximum sound pressure level of 111dB at 1m per loudspeaker.

Fig. 1 shows the on-axis frequency response and harmonic distortion performance for the Pro-Nine. The response fails to keep within ±3dB limits due to a broad peak between 500Hz and 4kHz, and the low-frequency roll-off is seen to be approximately 2nd-order with -10dB at around 70Hz. This 2nd-order roll-off suggests that the bass reflex port has been very heavily damped and thus contributes very little to the output of the loudspeaker. The harmonic distortion performance, which, in common with all the tests in this series, is measured at a level of 90dB SPL at 1m, is commendable for a loudspeaker of this size with both 2nd and 3rd harmonics lying below -40dB (1%) at all frequencies above 90Hz. The horizontal and vertical off-axis responses are shown in Figs. 5 and 6 respectively. The horizontal directivity is seen to be well controlled with little evidence of mid-frequency narrowing, and the vertical responses demonstrate the usual notch at the crossover frequency which is characteristic of most non-concentric loudspeaker designs. Fig. 3 shows the step response for the Pro-Nine, which demonstrates accurate driver time-alignment, and Fig.2 shows that the acoustic source position moves a mere 1m behind the loudspeaker at low frequencies; these two results suggest that the Pro-Nine should reproduce transient signals accurately. The waterfall plot (Fig. 7) reinforces this conclusion with a rapid decay at all frequencies except for some minor ringing at about 700Hz. The power cepstrum suggests the presence of a fairly strong echo at about 400 µs which may be due to cabinet edge diffraction. A comparison between the on-axis response and the horizontal off-axis responses (Fig. 5) shows that some of the response irregularities only occur on-axis which further suggests the presence of edge diffraction effects.

Overall, the AVI Pro-Nine is a good performer. The accurate time-domain performance, low harmonic distortion and controlled directivity are let down by a disappointingly uneven frequency response. There is some debate as to the importance or otherwise of a flat frequency response, as many listeners can adjust quite quickly to changes in frequency response, especially broad ones. Nevertheless, it is possible that for monitoring purposes, a non-flat response may give rise to mixes which have the opposite characteristic, and which may then not travel well to other systems. All of the measurements show that the loudspeaker operates as a 2nd-order system which suggests that the bass reflex port is actually doing little, although the designers probably have a good reason for including it! This over-damped low-frequency response suggests that the Pro-Nine would probably be well suited to flush-mounting, and that it may also be useful in less than ideal acoustic environments. □

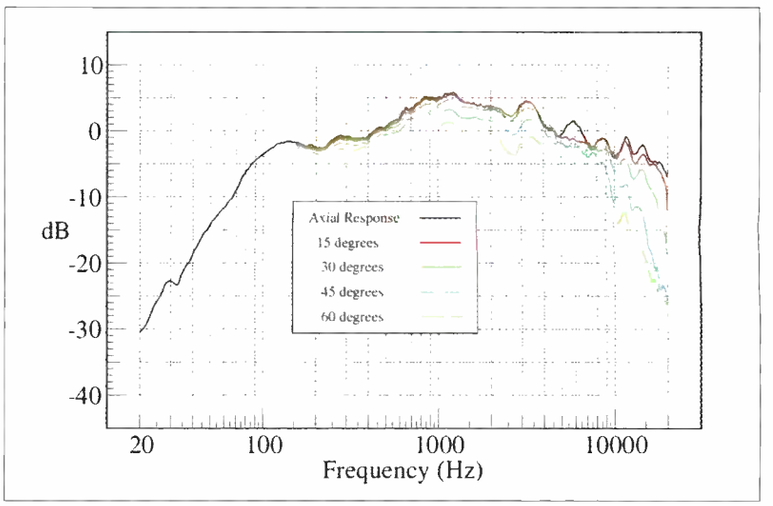

Fig.5: Horizontal Directivity

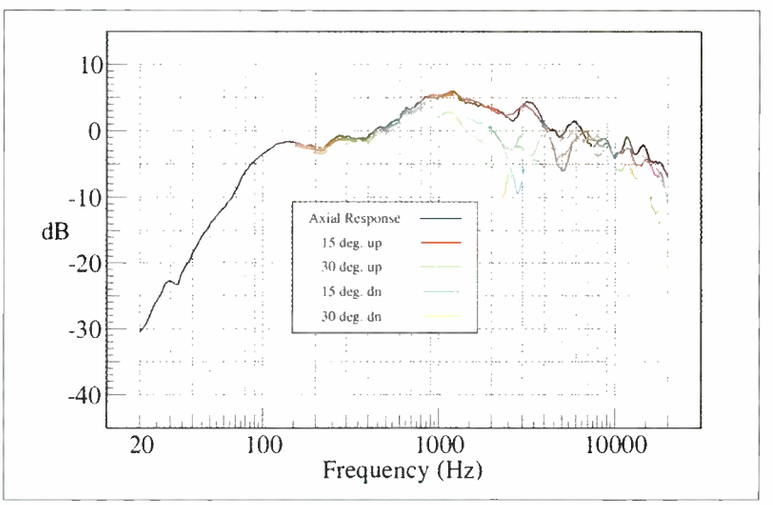

Fig.6: Vertical Directivity

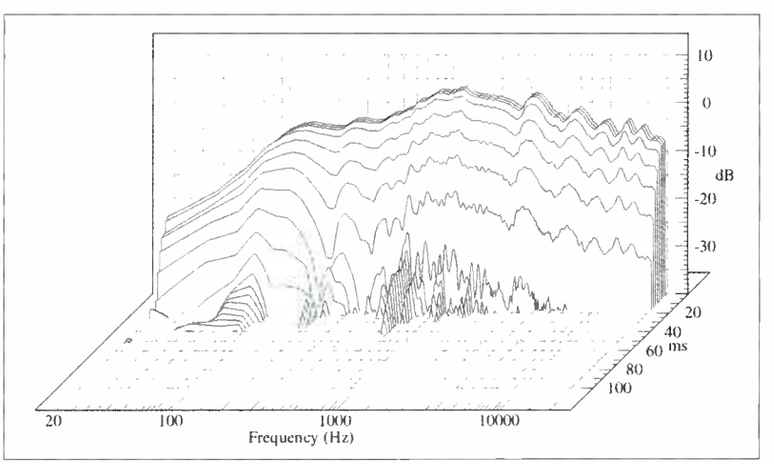

Fig.7: Waterfall

Contact

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Methodology

Studio Sound, April, page 14
Net: www.prostudio.com/studiosound/apr98/t-tannoy.html

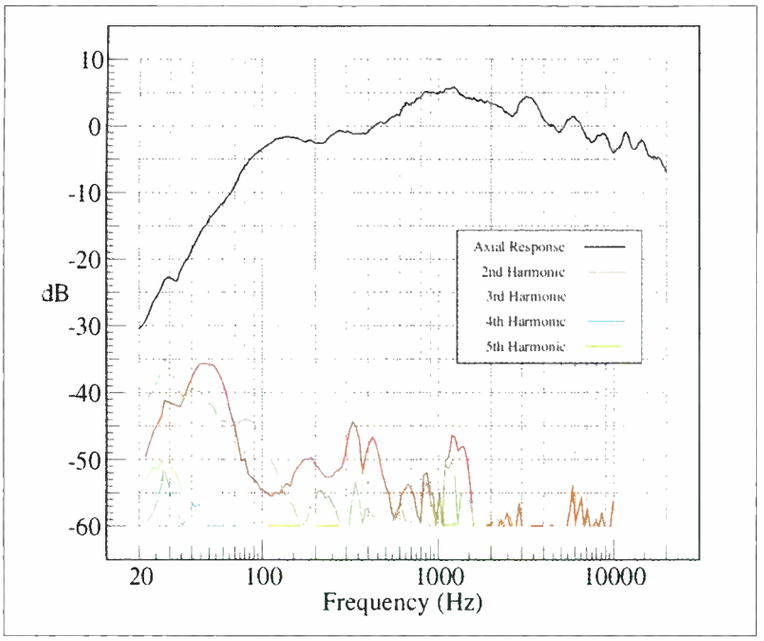


Fig.1: On-axis Frequency Response and Distortion

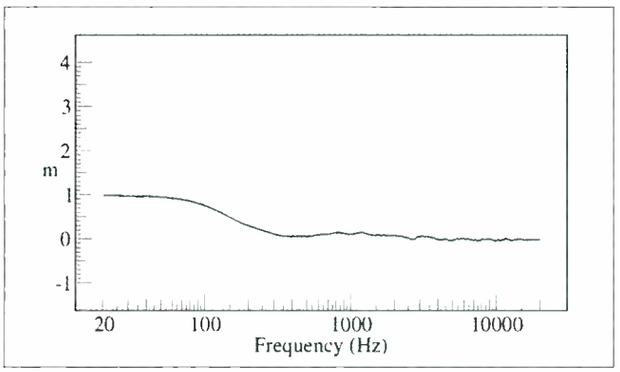


Fig.2: Acoustic Source

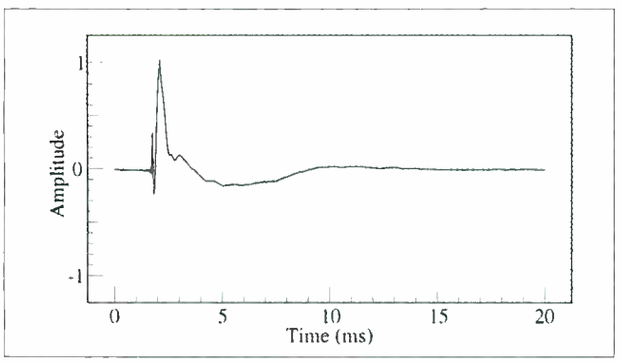


Fig.3: Step Response

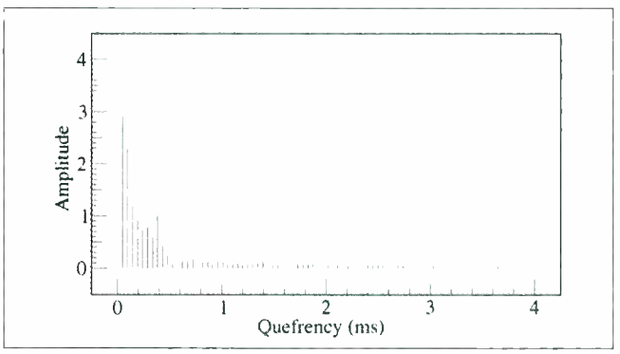


Fig.4: Power Cepstrum

Neva Audio PA-2000AG

Studio Sound's 'bench test' amplifier reviews continue with the Neva Audio PA-2000AG power amplifier. **Paul Miller** reports

DURING MY TIME compiling *Studio Sound*'s amplifier benchtests, I have become accustomed to dealing with products that are provided with scant technical literature, if not a manual or basic specification sheet. However, the Neva Audio PA-2000AG sets new standards as regards technical anonymity. Not only was the unit bereft of any information, but it was packaged in someone else's cardboard box. On first acquaintance, all you may learn is that the PA-2000AG hails from St Petersburg, Russia.

Nevertheless, the editor informs me that Neva Audio is an up-and-coming player, recently winning contracts as one half of a duet with Reflexion Arts. In a nutshell the PA-2000AG is an extremely weighty amplifier shoe-horned into a 2U high, 19-inch rackmountable case, equipped with analogue input attenuators and offering stereo, mono and bridged operating modes. Balanced (XLR) and single-ended (jack) inputs are provided along with 4mm speaker binding posts and Neutrik Speakon twist-to-lock sockets. You'll never wont for power with the PA-2000AG and neither, frankly, are you likely to need a forced-air cabinet as the amplifier runs very cool indeed.

The amplifier is essentially dual-mono in configuration, right down to separate power on switches for the A and B channels. There is evidently some capacitive coupling, however, as inter-channel crosstalk typically rises from <-100dB through the midband to <-75dB at 20kHz. Though the two channels are essentially identical in design, they are apparently configured to drive the upper and lower frequency drivers of a multiway stack in a cinema mixing room, for example. Teamed with either Reflexion or JBL monitors, the amplifier will run very loud, near or far-field!

Otherwise, both channels are independently protected and include a form of 'soft-clip' compression that limits output power to ~520W/8Ω at ~0.5% distortion. Beyond this point there is no increase in output or distortion for any increase in the input level. Fig. 1 indicates that this prodigious power output holds true across a 20Hz-20kHz bandwidth and increases to ~780W/4Ω.

Despite its high output capability

	20Hz	1kHz	20kHz
Max Continuous Power Output,			
0.5% THD into 8Ω (2-channel)	510W	520W	500W
0.5% THD into 4Ω (2-channel)	770W	780W	760W
Frequency Response @ 0dBW	+0.1dB	0.0dB	-1.25dB
Dynamic Headroom (IHF)		+1.5dB (730W)	
Maximum Current (10msec, 1% THD)		32A	
Output Impedance	0.018Ω	0.017Ω	0.03Ω
Damping Factor	444	470	266
	Balanced Input (Driven Unbalanced)		
Total Harmonic Distortion, 10W/8Ω	0.003%	0.008%	0.4%
Total Harmonic Distortion, 1W/8Ω		0.01%	
Total Harmonic Distortion, 50W/8Ω		0.05%	
Total Harmonic Distortion, 400W/8Ω		0.01%	
Noise (A wtd, re. 0dBW)	-83.9dB/-86.0dB		
(re. 2/3 power)	-99.5dB/-107.0dB		
Residual noise (unwtd)	-73.4dBV		
Input Sensitivity (for 0dBW)	75mV		
(for full output)	1680mV		
Input loading	20kΩ		
DC offset	-1mV / -1mV		
Serial Number	2099188		
Retail Price	(Ex-VAT)		

Neva Audio PA-2000AG Specifications

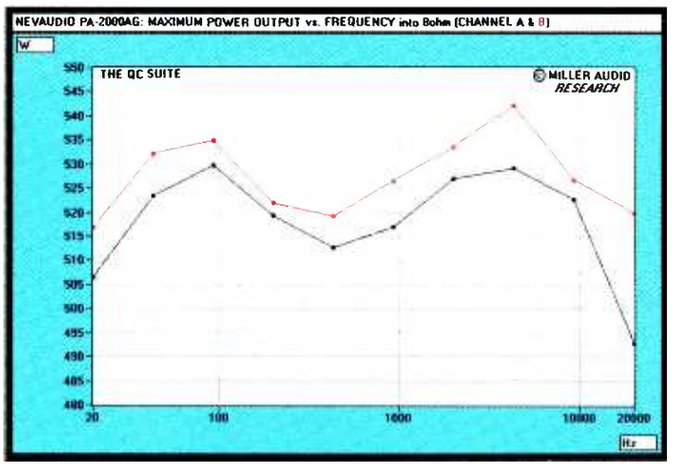


Fig.1: Maximum power output vs frequency

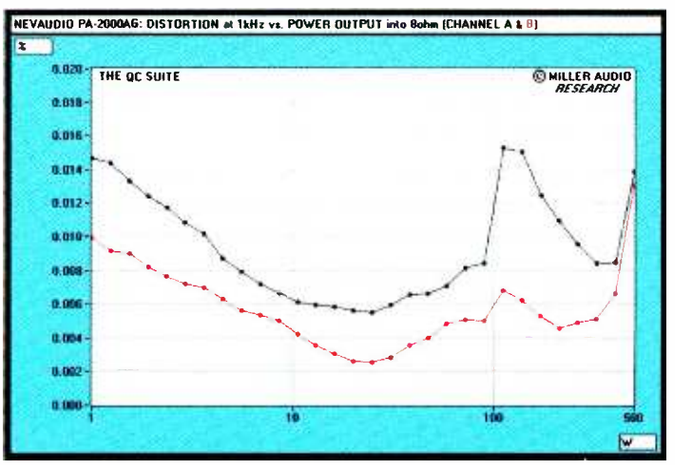


Fig.2: Distortion at 1kHz vs power output

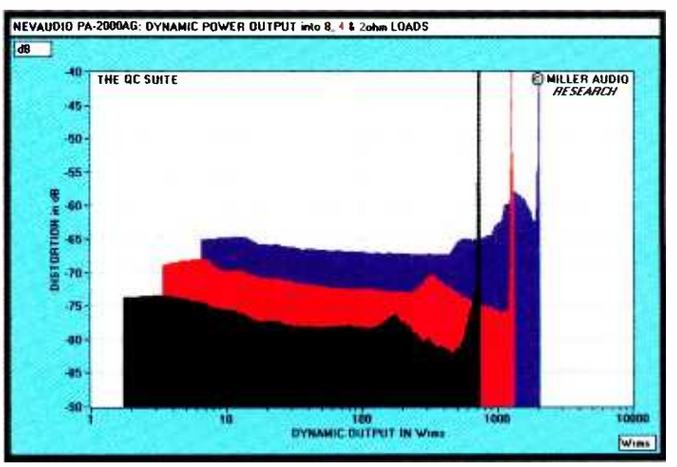
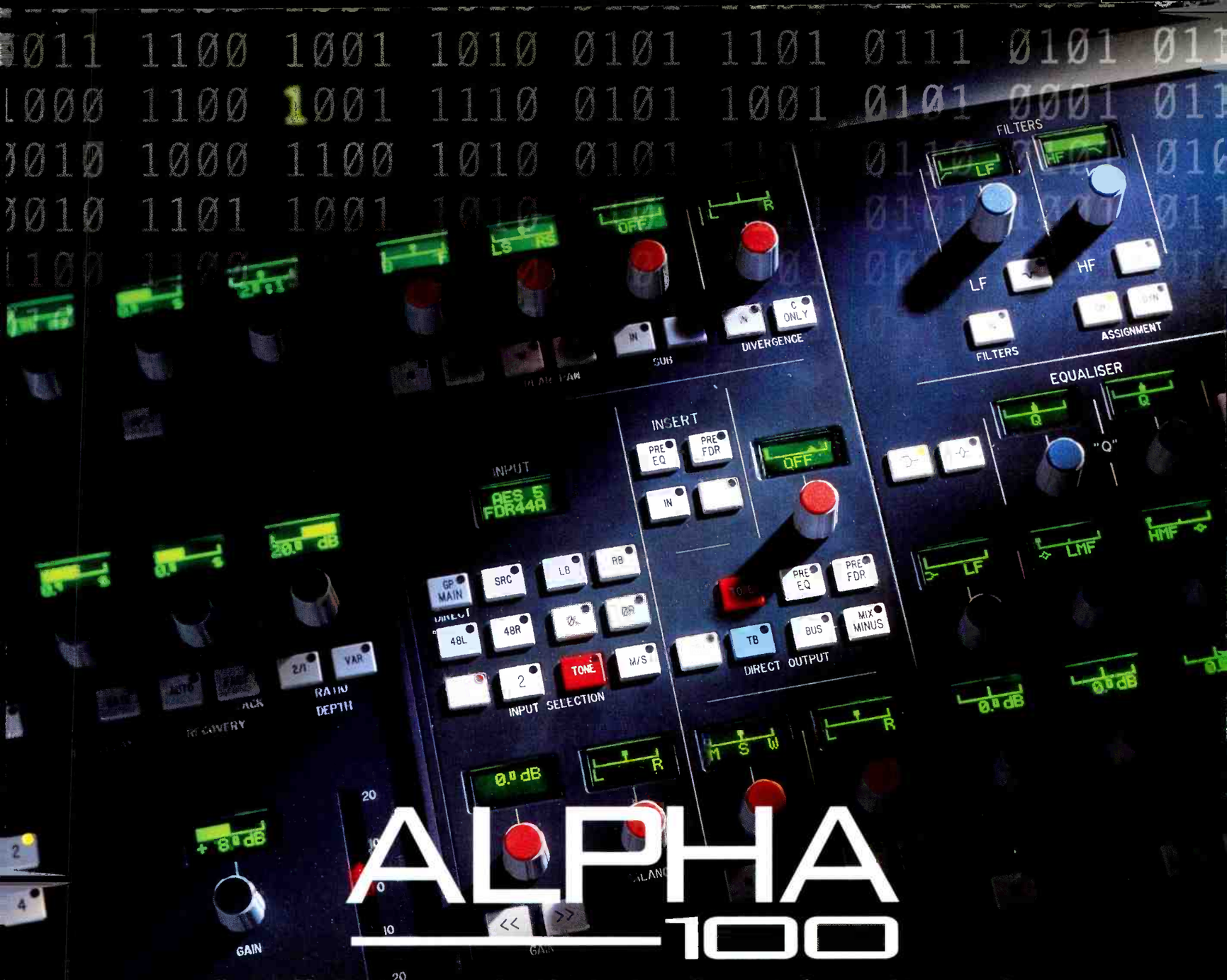


Fig.3: Dynamic power output



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and low operating temperature, the PA-2000AG does not use a switch-mode supply nor does it appear to employ a class-D, or variant, output topology. Instead, much of its bulk is occupied by a huge linear supply and fluted heatsinking for its nine pairs of output devices (per channel). The trend of steadily reducing distortion from typically 0.012% at 1W/8Ω to 0.005% at 10W/8Ω, as depicted on Fig. 2, suggests the PA-2000AG is simply under-biased (I'll return to this theme in a moment). Meanwhile, the 'kick' in THD at ~130W might indicate a switched PSU rail technique championed by NAD and Carver or, alternatively, the use of switched banks of output transistors in a similar vein to Yamaha.

The dynamic profile Fig. 3 is equally impressive with 730W, 1290W (18.0A) and 2040W (32.0A) being realised into 8Ω, 4Ω and 2Ω while the limiter virtually shuts down <any> useable output into loads as low as 1Ω. Short-circuit protection is thus assured. You may also notice the same 'kick' in THD occurring at ~32V in all profiles (8Ω = black, 4Ω = red, 2Ω = blue) which is equivalent to ~130W/8Ω.

As if to reinforce the point that the PA-2000AG was never conceived for critical, nearfield monitoring, Fig. 4 indicates just how dramatically its high frequency distortion is influenced by output level. In this instance, Channel A's distortion was uniformly higher than Channel B, though the trend was comparable with THD falling from 1.2% at 1W, to 0.8W at 10W and 0.1% at 100W/8Ω, all at 20kHz. This is possible evidence of substantive crossover distortion due to under-biasing and though many valve amplifiers typically suffer similar levels of THD, those levels are at least consistent with output and frequency. In Neva Audio's case, it's the dramatic increase in THD from 0.01% at 1kHz to 1.2% at 20kHz that will exert the greater subjective penalty. Because of this disparity in THD vs frequency, I have plotted the trends up to ~1kHz on the same graph but magnified by x100 (see outside Y scaling).

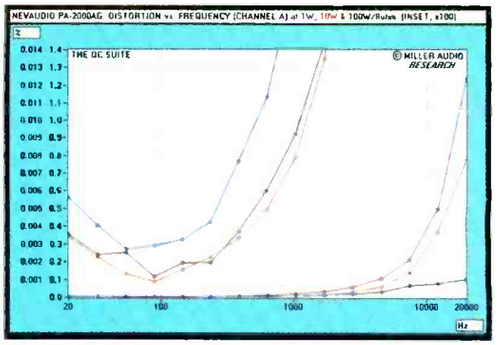

Fig. 4: Distortion vs frequency

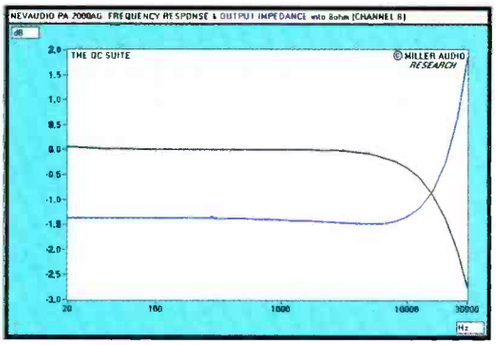

Fig. 5: Frequency and output impedance

The response of both channels falls by about 1.3dB at 20kHz and 2.6dB at 30kHz, though their respective output impedances are very different. Fig. 5 shows the response-output impedance curves for Channel B where the latter rises to a not atypical 0.03Ω at 20kHz. Channel A, by contrast, dips close to 0Ω at 20kHz before rallying slightly to 0.010Ω at 30kHz. Of course, it's perfectly possible to invoke a 'negative' output impedance at certain frequencies as a function of output compensation (feedback). In this instance, it's difficult to judge whether the difference is intentional....

There are other, slight variations in performance between Channels A and B. Both offer a maximum +31.5dB gain but as this is approached (or, more correctly, input attenuation reduced), noise would increase on the 'A' channel over the 'B' channel to the tune of -84dB/-86dB and -100dB/-107dB re. 0dBW and two-thirds power, respectively. Residual noise and DC offsets are consistently low on both channels, however.

All told, the PA-2000AG is evidently no shrinking violet and more than capable of robustly grappling with the hardiest of rigs. It's the kind of amplifier that relishes rough treatment. Just plug-in, wind-up the level and the PA-2000AG will respond in kind. □

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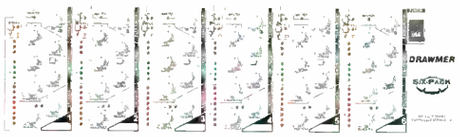
AES New technologies

As Amsterdam's RAI centre opens its doors for the European AES Convention, new product news floods out. Here are the early highlights



Drawmer shows-off new Six-Pack

Drawmer's Six-Pack Surround Dynamics Processor is a 3U, 6-channel multidynamics processor featuring universal linking technology designed for surround sound. The unit can be configured so that any combination of channels can be linked to track each other's levels, preventing image shift. Channel six offers the option of a switchable 120Hz low-pass filter so that a sub-bass (LFE) channel can be derived from a five channel surround mix. Each channel comprises a soft knee compressor, with switchable auto or manual attack and release; a variable threshold limiter, and a programme adaptive expander-gate with a variable release time of up to five seconds, to retain reverberant tails where necessary. LEDs show link status and bargraph metering displays all dynamic functions.

Nagra shows new digital recorder

Nagra's Nagra V 2-channel audio recorder is described as the successor to the Nagra IV-STC. The Nagra V is a removable hard disk-based digital recorder intended to offer a flexible and convenient alternative to portable recorders based on the R-DAT format. Designed for film, television and video location recording applications, the recorder uses linear 24-bit recording technology at 44.1kHz or 48kHz sampling rates to deliver over two hours of stereo recording per 2Gb of hard disk space. Rather than use a proprietary storage format, the product stores audio in broadcast WAV format, thus simplifying the transfer of recorded material. Based upon the rugged, proven chassis of the Nagra ARES-C solid-state recorder and weighing just 3kg, the compact Nagra V has been designed to offer comfortable on-the-shoulder operation.

Eela gets to work with Logos

Eela Audio's Logos interfaces with audio workstations in a broadcast environment. The Logos is geared towards news and programme preparation in the radio preproduction area. As most workstations provide just an input and an output, they usually require the addition of equipment such as microphone preamps, signalling functions, input selectors, monitoring facilities, telephone hybrids and ISDN codecs. The Logos offers an all-in-one solution to turn a computer into a complete workstation with an audio card. It provides mic preamp, monitoring with separate volume control for headphones and speakers, source selecting and mixing, interfacing telephone hybrids and codecs, red light signalling and broadcast functions, remote control for editing software from Dalet, Digigram and Netia and Windows configurability. Logos can also be used to load program material onto hard disk. The source selector offers the possibility to connect all common source equipment, and it is also possible to switch and cross-fade to another source. Logos is also suitable for voice-tracking applications. It can easily be operated by non-technical users. Logos is already in use with broadcasters such as CBC in Canada, Radio France and the BBC.

Universal Compressor

SPL has launched a new stereo compressor-limiter optimised for processing complete mixes and single tracks in stereo and multichannel-surround applications. The Kultube features a tube harmonics stage with an infinitely variable tube harmonics control enabling the user to apply precise amounts of natural-sounding tube enhancement. The use of discrete gain cells (instead of VCAs) and high-quality tube circuitry delivers control and high specifications combined with the best sonic aspects of classic tube equipment. The Kultube incorporates master-slave linking facilities for stereo and multichannel applications or for processing various subgroups under the control of one master unit. There is also a new Advanced Time control for the manual adjustment of the attack and release parameters, which interacts with the auto time constant circuitry to combine the best aspects of manual and automatic control at the same time. The Kultube can control time constants in less than 20µs (claimed to be about 10 times faster than plug-ins) and also features a side-chain with prelistening plus a de-compression function that can be used to help compensate for material that has already been subjected to excessive compression. As an option, the unit can be fitted with Lundahl I-O transformers and a 24-96 A-D/D-A convertor.

New SPL recording channel

The Track One, SPL's new channel strip, is based around high specification amplifiers optimised for microphone, line and instrument signals. These are followed by SPL's effective de-esser, a compressor-limiter with programme-sensitive automation, a 3-band EQ section and an output stage with PPM metering for output level and gain reduction. Two units can be linked for stereo operation of the compressors. All the sections have been designed to combine a simple control interface with unprecedented musicality. The channel strip can optionally be fitted with an A-D convertor and a Lundahl input transformer

NEW TECHNOLOGIES

HHB addresses DVD-R with own media

Anticipating the widespread adoption by audio and video professionals of the DVD-R format, particularly in view of Apple's decision to include a writer in the G4, HHb has introduced the DVD-R4.7Gb to its recording media range. Developed for general v2.0 recording, the new disc uses a specially formulated recording dye to achieve exceptional levels of performance, compatibility and archival security, and joins a range of HHb recording media that already encompasses DAT, CD-R, ADAT, DTRS, MD, MO and DVD-RAM formats. The LynxTWO is a multichannel PCI sound card that brings the performance of high-end, standalone convertors to any Windows or Mac-based audio or video workstation. Building on the success of the 2-channel LynxONE card, the new LynxTWO delivers a choice of 4 in-4 out, 2 in-6 out and 6 in-2 out analogue I-O with 16 to 24-bit conversion at up to 192kHz. Digital I-Os are AES-EBU and SPDIF formats at 16-, 20- and 24-bit depths, and sample rates up to 96kHz, with high-quality sample rate conversion at up to 3:1 on digital input signals. In addition, the LynxTWO also includes digital I-O support for Dolby Digital and HDCD encoded bitstreams. The Portadisc Reporter's Kit partners HHb's professional portable MD recorder with the Sennheiser MD46 interviewer's mic, plus a full complement of accessories, including a USB cable for transferring audio to laptops for editing and delivery of finished news pieces, in an air and water tight Pelican case.

Digidesign introduces most powerful MIX system

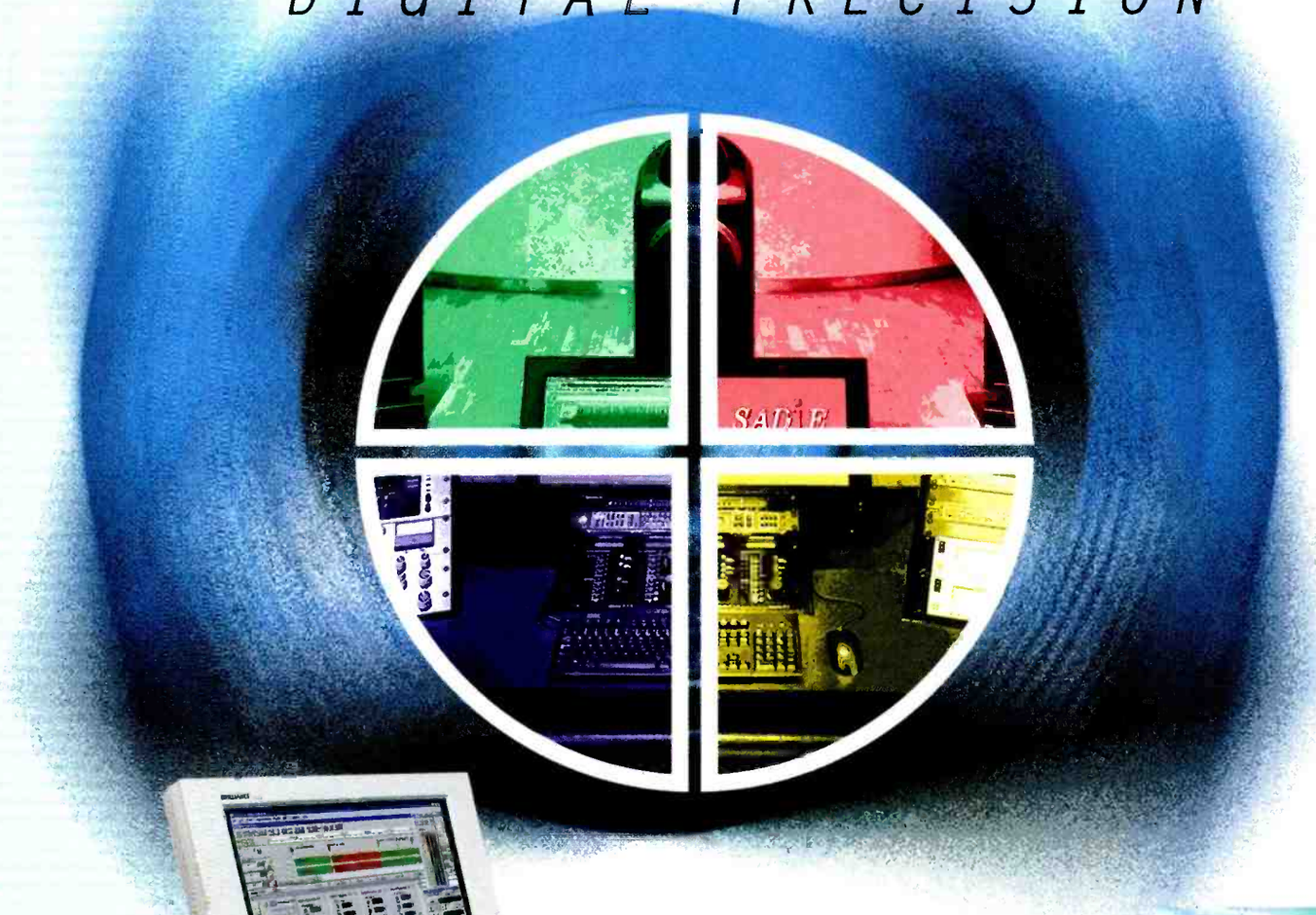
Digidesign has introduced Pro Tools 24 MIX3 (pronounced MIX Cubed). Comprised of MIX Core and two MIX Farm cards, this latest addition to the company's Pro Tools 24MIX range offers increased audio processing power and support for 48 channels of I-O. Digidesign describes the new system as 'easily the most powerful core digital audio workstation ever available.' Pro Tools|24 MIX3 is now shipping with Pro Tools 5.1.1 software for Macintosh and Windows 2000, described by Digidesign as a feature-rich upgrade to the Pro Tools software which introduces integrated surround mixing, enhanced MIDI functionality, and major enhancements to editing, navigation, session interchange and system integration. The MultiShell II technology of Pro Tools 5.1.1 allows DSP sharing of various plug-ins and maximises use of Pro Tools|24 MIX3's extra DSP capacity. The 5.1.1 software also adds surround-multichannel functionality to Control|24, the new 24-channel mixing control surface developed by Digidesign and Focusrite which offers hands-on control of nearly every recording, routeing, mixing, and editing function in Pro Tools. Also new from Digidesign is the Control|24 Cable Kit, which consists of seven 25-foot, 8-channel cable snakes for connecting Control|24 to Pro Tools interfaces or external audio gear.

Pearl stereo condenser

Swedish microphone manufacturer Pearl Labs has released the MSH 20 stereo condenser mic which has ben designed specially for use in recording TV, video and film production in M-S stereo. It is a short, shotgun, figure-eight capsule system. However, the MSH 20 departs from the use of the M-S format in the fact that the middle and side signals are combined by an internal matrix to produce a left and right output allowing the microphone to be used

THE WHOLE PICTURE

DIGITAL PRECISION



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without external M-S processing. According to the company, compared to a traditional A&B microphone patent the MS system is better at keeping noise as low as possible. The MSH 20 requires phantom power and is designed to withstand adverse environmental conditions such as moisture, dust, and extreme temperature fluctuations. A Rycote suspension-windshield is available and recommended for outdoor recording. The MSH 20 weighs 180g. Pearl has also introduced a the BA 48uP 48V phantom power supply unit powered by a 9V battery or by mains adaptor 8-24VDC. No fixed polarity is required. A green LED blinks slowly when the battery has sufficient charge, and rapidly when it is time to replace it.

Fairlight enhances Prodigy and Fame

Fairlight is introducing VST plug-ins for the Prodigy2 and FAME2 and can deliver 48 tracks on a single hard drive at 96kHz. Using the power of QDC technology, this is believed to be a unique achievement. Fairlight's new plug-ins address the twin issues of propagation delays and limited real time plug-in choice. The Plug-ins Manager provides access to VST software, giving users the choice from a large library of third-party plug-ins. The company has also included a large number of on-board low-latency, real-time plug-ins, which are driven by dedicated DSP. These include high-quality 32-bit reverbs, delay lines, dynamics processing, equalisation, chorus, flanging, distortion and pitch shifting effects. Plug-ins Manager runs

DW Fearn VT-4

Cherry-picking the best aspects of vintage outboard and marrying them with modern refinements is Doug Fearn's speciality. **Dave Foister** explores his new valve EQ

THE CONCEPT IS FAMILIAR, although the name may not be; the idea is an old one, but this is a brand new implementation of it. This is the approach brought to the other product bearing the DW Fearn name to have appeared in these pages, the VT-1 microphone preamplifier. The VT-1 is a massive 3U-high red box containing just one valve preamp with the bare minimum of facilities, and represents Doug Fearn's ability to rethink valve designs using modern technology. This time the Fearn touch has been applied to the vintage style of equaliser, producing an EQ that may be the first product of its type for some time that is not a conscious clone of an old favourite.

The VT-4 is so obviously in the style of Pultec that it could be taken for a replica, but the resemblance is superficial. Apart from the Fearn blood red colour, the facilities and control ranges are different and the unit sets out to be very much its own EQ. Having said that, the whole operating principle is that old approach so rarely seen today: completely passive LC filter circuits (with custom Jensen inductors) set between valve input and output amplifiers. Those in the know will appreciate that any reduction in detailed adjustability is more than compensated for by a sound that is very different from that offered by active EQ.

There are five 'bands' on the VT-4, but the term is not quite apt because each band can apply either boost or cut—none can do both. Thus there are separate sets of controls for LF boost, LF cut, HF boost and HF cut, and this is not as daft as it sounds because the frequencies and characteristics are different for the boost and cut circuits. It's not possible to set either pair of boost and cut filters so that their actions cancel each other out. Instead the cuts appear to be optimised for gentle corrective filtering while the boosts are for more creative tonal alterations, and the possibilities presented by being able to do both simultaneously are interesting and unfamiliar to those used to modern mirror-image EQ filters.

We often don't do the numbers when looking at equipment like this but in this case an idea of what's on offer is perhaps a bit more pertinent to what it does than with some devices. The Low Cut gives up to 18dB of shelving filter at 30Hz, 40Hz, 100Hz and 400Hz, making its use for removing unwanted low end artefacts apparent. Few other EQs have settings as close together as 30Hz and 40Hz, but the difference when you need to get rid of an LF problem without eating into wanted signal is worth having. The Low Boost

gives up to 12dB of lift at 20Hz, 40Hz, 60Hz and 140Hz; the difference in the ranges is immediately obvious and suggests all kinds of combinations where the boost can put in some bottom-end punch when the cut has removed a problem.

Similarly the High Cut operates at 1.7KHz, 4kHz, 10kHz and 28kHz (sic), up to a maximum of 14dB of cut, while the High Boost goes up 14dB at 2kHz, 3kHz, 4kHz, 5kHz, 8kHz, 10kHz, 12kHz and 16kHz. Once again the frequency settings are very close together on the Boost circuit, allowing much more subtle adjustment than the switched design might suggest. The Cut on the other hand covers a very wide range in very big steps, with a broad smooth curve that means the 28kHz setting does occasionally have some audible effect (although it's perhaps one of those settings that you so much want to be able to hear that you start to fool yourself). The High Boost even has variable bandwidth, with five switched Q values from 0.6 to 1.7—not a huge range but a useful variation.

The filter complement is rounded off by a Mid Cut filter, operating from 200Hz to 700Hz in 100Hz steps, with a maximum cut of 16dB. All the filters' gain settings are adjusted in increments of 2dB, which is a fine enough difference for most purposes. In fact the first surprise with the VT-4 is just how subtly variable it is; you expect a slightly clumsy stepwise adjustment, with the finished setting being close to what you want but not quite on the button, but in practice it's not like that at all. It seems the only way you'd know you're operating switches is the mechanical noise of the switches themselves—the sonic changes are smooth and allow detailed adjustment. At the same time the advantages of repeatable switch settings are obvious, and the VT-4 is precisely calibrated with the intention of allowing two to be used for stereo—this would be an ideal mastering EQ, with just the right kind of subtle overall contouring, repeatable settings and accurate channel matching. Five for surround anyone?

Many of you won't need me to tell them just what an EQ like this can do for you. It may not be what you want for the really extreme stuff, but for gentle to medium EQ it's a whole different palette of possibilities from the usual fare. And because the Fearn philosophy is Valves Revisited, the circuit design is tube state of the art, removing the worries that accompany the use of genuine vintage gear. The VT-4 could sell itself to those in the know without them even hearing it; the rest should hear and be converted. □

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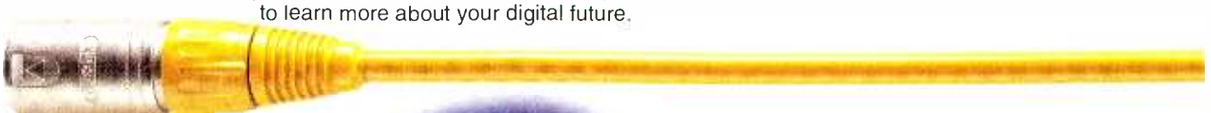
NEW TECHNOLOGIES

on an external PC, but apparently communicates seamlessly with the Fairlight audio engine. The intention is to make plug-ins freely available without interfering with the operational reliability or speed of the Fairlight core operating software. The enhanced 48-track Prodigy2 is said to be 'the world's fastest integrated digital recording, editing and mixing system'. It now provides 32 buses, 48 tracks, 24 live feeds and up to 64 independent I-Os (32 analogue and 32 digital). The QDC technology engine is said to deliver through-noise less than -110dB (A-weighted) and THD +N less than 0.0008%. The implementation of the FAT 32 drive format allows Fairlight products to read and write to Mac, MediaLink and PC drives.

D&R is Sirius and Scorpius for On-Air digital

D&R has presented it's first all-digital console. The Sirius is a modular broadcast on-air/production console that uses DSP technology from Texas Instruments. The system can be built up to customer requirements and has a control surface, screen, rackmount I-O units, digital router and an optional 'direct access' super module. The control surface can hold a maximum of two fader-panels containing four faders each and a system can be built up with a maximum of 16 faders. The control

BYTES



TL Audio Fat Two

Aiming low but hitting high, the Fat family's new baby offers quick-and-easy mono preamplification and compression to anyone who will listen. **George Shilling** weighs it up

THE FAT TWO—unsurprisingly—follows up on TL Audio's fast-selling Fat One stereo compressor. This time the new Fatty on the British block is a mono front end featuring a similar compressor to the Fat One. At first glance you'd be hard pressed to tell the difference, such is the similarity of construction and front panel layout.

The well-built box includes a slanted mesh top which prevents you from resting your tea there, a 3U-high half-rack front panel, and similarly placed

controls to the Fat One. It has the familiar deep red painted front panel, similar stylised white legending and the same little round illuminated vu meter. As this is a mono unit, the dual-triode's duties are split differently: this time one half is wired to the mic preamp stage, and the other is in the compressor gain circuit.

The rear of this box is slightly more sparse. Alongside the single XLR microphone input are TRS balanced jacks for Line Input and Output. I would have liked an XLR output too, but then again, I would have liked free cream cakes and a tub of lard with it—at this price a TRS jack will do the job just fine. However, with all that spare room on the back panel, it's a shame that there is no sidechain link jack for stereo or externally-triggered compression.

The front features the same rotary controls as its sibling: the centre detented INPUT GAIN has a range of ±20dB in Line mode, which on this unit also allows +16 to +60dB for mic gain. The OUTPUT GAIN can be used in place of a fader, ranging from infinity (off) to zero at the top, to +15dB at full tilt. Perhaps a trifle extravagantly, there is a separate GAIN MAKE-UP knob, which adds up to another 20dB, post compression. The PROGRAM knob is a 16-way rotary switch, offering 15 presets and a Manual setting. As this is an input recording device, the presets have been assigned slightly different labels from those of the Fat One. Before describing them, I should explain that all these presets contain settings which can be achieved by selecting manual and placing the knobs and buttons in the positions described by a handy chart in the excellent and informative manual. In Manual mode, you have THRESHOLD, which has a good range from +10 to -20dB (and sensibly, more compression is clockwise); RATIO, which goes all the way from 1:1.5 to 1:30 (although the presets never go near either extreme); separate ATTACK and RELEASE FAST/SLOW pushbuttons; and a HARD/SOFT KNEE button. Also on the front panel is a useful and great-sounding instrument input jack, which when used works in addition to the selected input. Line or mic inputs are selected with a pushbutton, which handily doubles as a gain range switch in the case of Instrument Input. There is a switch for 48V phantom power for the mic input, and a 90Hz high-pass filter is also featured for removal of those unwanted rumbly noises or to reduce proximity effect. A COMPRESSOR ON button puts the compressor in circuit, its accompanying LED situated nowhere near the button (it's next to the meter). The meter OUTPUT/GAIN REDUCTION button is nowhere near the meter, but this keeps the front panel tidy. A neat POWER rocker switch enables the valve's life to be preserved when the unit is not in use.

My overall impression of the mic amp was that although it was perhaps slightly noisier than the very best, it acquitted itself respectably, with an overall big, warm sound, not quite as detailed as a modern Rupert Neve design, but somehow more friendly, perhaps more like an API, if not quite so refined.

The compressor presets include four varying vocal settings plus settings for Rap Vox, assorted electric and acoustic guitar, bass, keyboards, and Loop, Kick and Snare settings. These are all a matter of personal taste but I thought they were wisely chosen, and in any case, you can always do your own thing. They seem a bit harder than I remember the Fat One settings, which is no bad thing—the compression is always enjoyable, and settings can be tweaked with the input gain, or by reference to the manual and setting up the knobs and switches yourself. Without a rapper 'in da house', I had a go at my own rant in order to test the Rap Vox setting, and it was inspiring enough through the headphones for me to shout freestyle nonsense for several minutes.

For any recordists—professional or amateur—this is a useful unit and due to its ease of use, it will also be ideal for live and broadcast applications. For the novice, this would make an ideal first time purchase: excellent sound quality, and ease of use without denying the user knowledge of what goes on 'under the bonnet'. The manual is informative without being patronising, and a hand-written spec-test sheet is included, just like a proper top-end bit of gear. It's the bees' knees, or perhaps, to coin a phrase, the builder's bum. □

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surface has a clear layout and is equipped with on-off, cue and select buttons. By selecting a module the operator has access to its EQ, routeing and dynamics on the system's screen. For those who prefer the 'analogue feel' of real potentiometers and switches, the optional super module has a complete channel-strip with EQ, auxiliary, dynamics and routing sections. All pots in the super module are motorised and settings of all pots and switches can be stored in presets. The Sirius contains 32 digital audio processing channels with 4-band parametric EQ and compressor-limiter and gate. The desk has 2 stereo programme buses, 8 group output buses, 8 clean feed buses and 3 stereo aux buses. The system's internal routeing matrix can connect up to 64 I-Os. For communication with the digital and analogue outside world the Sirius' audio interfacing is also modular allowing the system to be adapted to the studio environment. All digital inputs have their own sample-rate convertors. The Scorpius is a smaller version of the Sirius but with the same amount of power in its processing.

Ultrasone 3D sound in the can

The HFI-2000 from Ultrasone is the successor to the HFI-200 headphone model. Based on the company's patented FPS Sound System, the HFI-2000 offers natural frontal sound perception without additional technical audio equipment. This is achieved by a decentralised driver positioning which converts the headphones' conventional 'in-head localisation' into an 'out of the head in-front locationalisation'. An additional result of this development is that the same volume perception comes from a lower dB output, reducing the risk of hearing damage. The HFI-2000 offers improvements over its predecessor: a more brilliant sound in the upper frequency range, a lighter weight, and a reduction in electromagnetic emissions. The new headphones are available in a LE (Low Emission) model offering a reduction of at least 60%, compared to the average of conventional headphones, and a ULE (Ultra Low Emission) model promising a reduction of at least 95%. The HFI-2000 has been developed for professional users who are working all day long and therefore need a lightweight, comfortable headphone with excellent sound qualities and health protection features.

Steinberg convertor

Steinberg's Nuendo DD8 reference-quality 8-channel format convertor is a 1U rackmount featuring conversion between digital signals in ADAT, TDIF, SPDIF and AES-EBU formats. Switchable 24-bit sample rate convertors allow for both highest-quality conversion and clock unlinking of all AES-EBU inputs. All of the DD8's digital I-Os support 24-bit/96kHz resolution. As ADAT optical and TDIF are usually restricted to 48kHz, the DD8's unique DS (Double Speed) mode allows two channels to be used for the transmission of one channel's data. Steinberg comments that the DD8 is an ideal addition for Nuendo 96/52 owners in need of digital conversion. Among the many features offered by the DD8 are Intelligent Clock Control are SyncCheck, SyncAlign, Bitclock PLL, digital patchbay functions, and active jitter reduction through SD-PLL and 24-96 sample rate conversion. Steinberg has also announced the Nuendo Dolby Digital Encoder, a software plug-in which allows Nuendo projects to be encoded into Dolby Digital format, with support for encoded bit rates from

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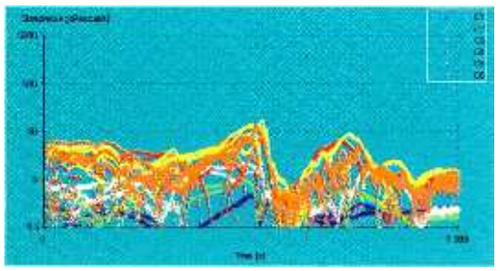
56 up to 640kbs and channel configurations from mono to 5.1 surround. The Encoder is licensed by Dolby Laboratories, and comprises the full functionality of the original Dolby hardware. In also adds a built-in batch processing function, enabling overnight compiling of work to various versions.

Leonard mimics human ear

Leonard Research's Harmoni Lab transient analyser software recreates characteristics of human hearing to perform



evaluations that would otherwise require listening tests. These include 'rub and buzz' noise in loudspeakers and clicks in transmission lines. Not surprisingly, such an ambitious achievement has a heavily theoretical basis. The Harmoni transient analyser uses the latest research on how acoustic energy transients are detected in the human ear and brain. This combines the well-known filtering nature of cochlea presented by Dr Zwicker with the new acoustic energy transient detection theories developed by PhD Frank Leonhard, founder of the company. The result is a system said to 'give a perfect correlation between the perceived quality of sound and the reading of graphs'. According to the

Rode NT1000

Latest from the Rode microphone stable, this solid cardioid condenser is a worthy addition. **Dave Foister** feels its presence

WHEN RODE STARTED OUT it looked as though the company had every intention of sticking with the one idea for as long as possible, enjoying its deserved success. More recently we've seen a sharp upturn in the new products curve from Rode, with specialised models of various kinds and significant upgrades on established models. Now we have two new models alongside each other, cosmetically similar but technically very different. One is a new twist on the valve theme; here we're looking at a much simpler straightforward solid-state condenser model, the NT1000. Bad luck Microsoft, you'll have to think of a new name when the fixes, sorry upgrades, get that far.

Rode has apparently employed an image consultant. Gone are the plain functional boxes that the microphones used to be supplied in; in their place are fancy colour printed boxes announcing the microphones to be Recording Artistes and depicting them mounted in a picture frame against a painted backdrop. I only hope we're not paying too much for them, as they're almost certainly going to find themselves in the bin within minutes of the microphone being unpacked. Inside, in the case of the NT1000, is the microphone, a stand mount and a soft carrying pouch, complete with a little bag of silica gel for drying—always worth keeping with the microphone in my view.

Rode has cleverly decided to settle on a standard system for mounting its microphones on to stands, so that the same mounts can be supplied with every model. Part of what constitutes the difference between the expensive models and the less expensive ones is whether or not you get both types supplied as standard. The NT1000 comes with just the simple one, a ring that attaches to the base of the microphone body by means of a big knurled nut, with a swivel locked with a substantial handle. And there's a thread adaptor—why can't they all give you one? The SM2 suspension mount, supplied as part of the package with the big valve microphones, is an optional extra here, and if it's man enough to support the Classic II it clearly won't have any problems with the NT1000, even at nearly 700g in weight. On the other hand, the capsule already has shock mounting fitted internally so should be reasonably immune to being knocked about without having to buy the SM2. There's no windshield, not even as an optional extra.

The specifications make interesting reading. Although the instructions don't trumpet it, Rode is proud of the

noise figure, which is an impressive 6dB SPL. At the other end it can handle over 140dB SPL at 1% THD, giving a dynamic range of 134dB. Its frequency response is clearly intended to have a character rather than to make the NT1000 a neutral all-purpose unit; a smooth low and mid spectrum gives way to all kinds of lumps and bumps at the top end from 2kHz upwards, with a peak at 12kHz no less than 6dB up. It's 4dB up at 5k, so it's clearly meant to have a strong presence, although the drop off back to 0dB at 20kHz should avoid harshness.

Operationally it's the simplest configuration possible: a fixed cardioid polar pattern, and no filters or pads at all. Cosmetically this results in a very sleek appearance, with the make and model quite modestly displayed on a black band around the bottom of a satin nickel body. The front is identified in traditional Rode fashion by a gold dot below the grille, and the grille itself is clearly pretty heavy duty. On some Rodes the grille is a bit coarse, but here it's smooth and close-woven—the spec says it's welded and heat-treated. Overall the impression is of a solidly-built, elegant microphone in the classic tradition.

The sound the NT1000 produces bears out what both its appearance and the specifications would suggest. This is a highly capable and versatile sound, which is smooth enough to be used for a wide range of applications but with the kind of presence emphasis that seems to be Rode's trademark. It's not hard and it's not extreme, but it definitely favours certain instruments, and makes the NT1000 a very appealing vocal microphone. It has that lift around the vocal presence region that pushes a voice forward in the mix without EQ, but it stops short of emphasising sibilance or excessive edge. This same characteristic makes it worth trying on acoustic guitar, where its other attribute, the very low noise, comes into play. This is indeed a quiet microphone, with a noise floor that lies well below 16-bit dither levels even at high gain, unlike the standard model I was using as a comparison.

The flip side of the presence coin is often an apparent loss of depth, and on some sounds this starts to manifest itself here. You wouldn't want to put a pair of NT1000s up on an orchestra, but then it probably wouldn't occur to you anyway. But on most things the impression is of a very complete sound, with nothing lacking anywhere and this distinctive forwardness that can be so useful.

Priced just under the original NT2, this is not a cheap microphone by today's standards, but there's nothing cheap about the way it's put together or the way it sounds. There's real quality here, coupled with a useful sonic contour that is rarely restricting and subtle enough to allow the NT1000 to become a popular all-rounder. □

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company, the Harmoni Lab transient analyser calculates the transient steepness and amplitude in six parallel fixed-frequency channels. Each channel apparently includes a band-pass filter and detection, consisting of a rectifier, a low-pass filter and a transient detector. The transient analyser viewer uses a new way of displaying the results. Each filter in the bank is represented by an individual colour and the calculated steepness or amplitude of the detected transient is marked with a coloured dot at the moment it appears during the sweep or test signal. High readings on the graphs mean high or steep transients, which will be perceived as being annoying to the human ear. The Harmoni Lab is impervious to background noise, an important factor when the system is to be used on an assembly line. A PC running Windows NT or 2000 and a standard sound card are all that is required as a host platform. Harmoni stands for Human.

RTW

RTW has introduced software version 4.0 for the Surround Monitor 10800 which allows the 10800 to be used as an analysing tool for surround sound audio programmes. According to the company, the new software takes into account that there are different applications, such as DVD mastering or surround sound music recording, that have different demands with regard to metering and programme

Audio-Technica AT3035

A change in styling has not distracted A-T from its mission of making mics that perform beyond their price point. **Dave Foister** takes on a new electret condenser

AUDIO-TECHNICA IS FULL of surprises. It's still not that long ago that the company burst out of the shadows of the semi-pro microphone market with the 40-series of studio condensers, a range that in an incredibly short space of time established itself as a major contender among the venerable establishment manufacturers. As if the price point of the 40s was not competition enough for the big boys, there's now the 30-series, coming in around half the price of the 40 equivalents but still looking like serious studio microphones. The first on offer is the AT3035, a side-fire cardioid condenser that takes itself seriously enough to come with a suspension mount as standard but is priced to worry the Eastern Europeans.

The styling is something of a departure for Audio-Technica. Gone is the familiar black; in its place is a silver-grey satin nickel finish similar to that seen on the 'vintage FET' 4047. Like the 40s, the design does not appear to consciously imitate anybody else, although I've seen some funny old ribbons from the fifties that look a bit like it. It appears to be a sturdy, solid frame, supporting a tough wrap-around grille through which the big 1-inch capsule can easily be seen. The grille extends to the top of the microphone, making for an unusually open enclosure, and the attention to detail extends to the hemispherical support for the capsule, presumably designed to minimise reflections into the diaphragm. The weight of the whole thing is quite surprising for its size, and everything reinforces the impression that this is a solidly-built little microphone that should stand up to life's knocks very well.

The big difference between this and the more expensive A-Ts is, of course, that this is an electret capsule (fixed-charge back plate permanently polarised condenser it says in the instructions). There still seems to be a view that electrets are second-class citizens, despite their use in some pretty grown-up microphones, and this is perhaps explained by the fact that there are a lot of Mickey-Mouse wannabe designs out there built around such capsules that should never find their way into a studio. There is however an increasing number of models that are coming out of the closet and openly admitting to being electret designs, and holding their own against more expensive competition.

There are just two switches on the 3035, as the polar pattern is (obviously) fixed at cardioid. One introduces a 10dB pad, while the other is for low frequency roll-off, a 12dB per octave filter turning over at 80Hz—a usefully chosen figure if you're just going to have the one. The specifications claim a high SPL handling of 148dB at 1% distortion (158dB with the pad); this is coupled with a good equivalent noise figure of 12dB SPL, giving a claimed dynamic range of 136dB. The published curve shows its response to be about 3dB down at 20kHz, with only slight deviations from flat around the upper mid and a smooth bottom end down to about -2dB at 20Hz. Its electret design allows it to be happy with phantom voltages from 11V to 52V.

The aforementioned suspension mount is in fact the only stand attachment available for the 3035, and a commendably compact and sturdy design it is. There's plenty of stiffness and tension in the elastic bands, and the location of the microphone into it is determined by the bands slotting into a groove just below the Audio-Technica logo. The rear-mounted switches are still easily accessible with the microphone in its mount, which is more than can be said for some. Unfortunately there's no thread adaptor, so as supplied it only fits US-style stands. Adaptors are so cheap—why should we have to buy them separately? Rotating the body within the mount is easy, which in conjunction with the small size makes it very straightforward to adjust the microphone's position.

Basing my pre-judgements on the low price and unassuming appearance of the 3035, I was quite unprepared for the quality of the sound that emerged when I put it up to audition it. I was using a standard all-rounder for comparison, and was surprised to find that there was very little difference between them. One obvious difference was the noise floor, which was substantially lower in the Audio-Technica, bearing out the specification admirably. But in terms of its frequency response and spectral balance, I really didn't expect the flat graph in the instructions to be so well represented in what I heard. This is an amazingly neutral and accurate microphone at this or any other price, with the transparency to make it useable on anything you care to name. It's a big full sound all the way down to the bottom, with remarkable detail and openness at the top without any intentional or unintentional enhancement.

Audio-Technica snuck up on us before with the 4033 and the ensuing 4035; it looks as though they've done it again with the 3035. No doubt they'll pay some industry 'worthy' with more clout than me to endorse it in the ads, but whoever it is you may as well believe them—however much they puff it they won't be lying. □

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analysing. Several new display modes have been added which show the balance of front-surround channels as well as distribution of the sound energy in the surround sound listening field using a SPL-calibrated grid. Different vectorscope modes allow the comparison of all channel pairs. The phase relations between all channels can be seen on the new multiphase meter display. The unit may be calibrated using a reference monitoring level and can also display the correlation between LSRS channels for low frequencies which gives an idea of the enveloping of the surround sound. An indicator that helps to estimate if a pseudo 3/2 type surround sound has been derived using delays from a 3/1 has been added too. The new protocol mode for average and overall loudness uses an external time code or internal time reference for mastering applications.

Main monitor with FIR controller

Klein & Hummel believes it has introduced a new concept in active main monitors. The 3-way O 500 C has a built-in digital controller based on FIR filter technology for the independent control of frequency curve and phase alignment. The bass, mid, and treble ranges can be completely equalised without misaligning the phase which the company believes will result in important advantages for the concept and design of an active monitor. A further feature of the monitor's FIR controller technology is the possibility to improve the studio acoustics at the listening position. The FIR filters can be adjusted regarding frequency and phase to equalise disadvantageous acoustic modes in a studio. This can be performed with special measurement to create the 'best' acoustic conditions for the engineer, and the manufacturer claims this is approach is more economical than modifying studio architecture.

DAIS PLUS for Audio-Service

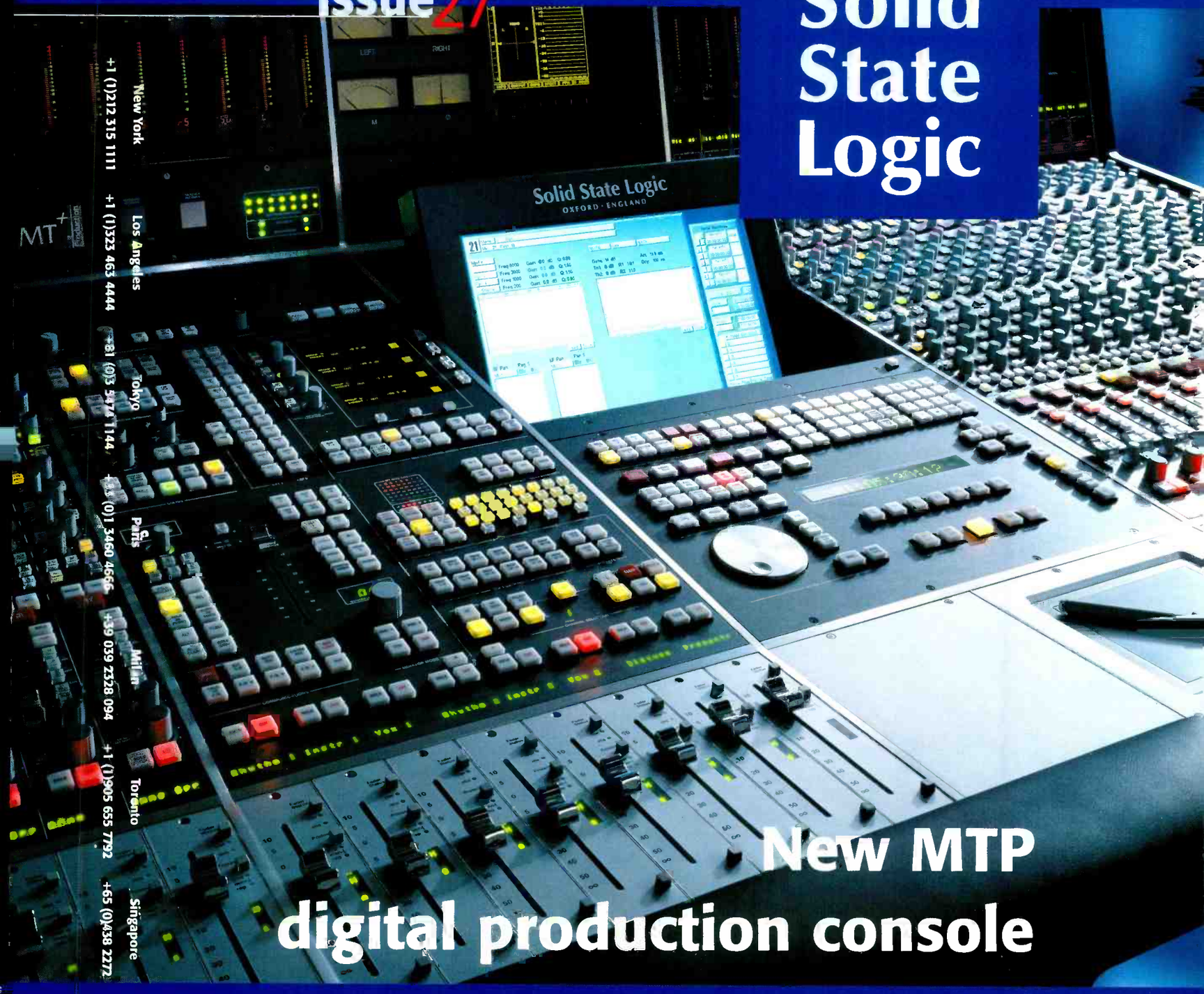
Following customer demands, Audio-Service has designed DAIS PLUS, a double frame 8HE router enabling 80 x 80 stereo (160 audio channel) synchronous digital audio routeing, covering the most popular digital audio formats including AES-EBU, ADAT, SDIF-2,TDIF, Yamaha Y2 and analogue. Three DAIS PLUS routers are already installed in Germany, with two further units being sold through Audio-Service's UK distributor Aspen Media. Finally DAIS DSP is an integrated, compact matrix and DSP system. The basic system is equipped with the DAIS Router, a complete PC and one DSP Card, currently the Yamaha DSP Factory and Studio-Audio 2496. Other brands of DSP cards can be implemented. DAIS DSP offers a hardware solution for a variety of hard disk, mixing and signal processing software from leading manufacturers. The DAIS DSP is a compact, 19-inch rack unit.

Neumann improves on a classic

Neumann claims its M 150 Tube mic exploits the heritage of a revered classic design, while exhibiting a performance capability that is said to be at the very limits of modern engineering. The headgrill recalls the famous M 50 from which the M 150 derives its distinctive acoustic characteristics and operating principle. First introduced some 50 years ago, the M 50 earned a place in recording history as an orchestral microphone of choice. The omnidirectional, pressure gradient transducer provides

issue 27

Solid State Logic



New MTP digital production console

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New MTP

large-scale mixing for television and music!

The MT Production digital console provides the power of SSL's MT Plus in a configuration optimised for general multitrack applications such as large scale television production and music.

The console's in-line multitrack mixing architecture with simultaneous multi-channel surround outputs ensures maximum format flexibility for programme material. In broadcast applications, MTP provides 48 clean feeds/mix minus outputs and full multitrack back-up.

MTP uses an ergonomically optimised and lightweight frame, with a depth 20% smaller than its sister, and is available in both Studio and Mobile versions. Both versions retain the SSL discrete control approach to realtime mixing and present a full set of controls for all channels in each layer simultaneously, complete with parameter displays across the board. Comprehensive project management and full reset capabilities are standard, as are snapshot and dynamic mix automation.

An even more compact version of MTP is also available for mobile production applications in music and television, packing large-scale audio mixing capability within a narrower frame size without compromising functionality. A slender new master section, optimised for realtime mixing, allows 96 dual-path in-line channel strips in two layers to be accommodated in the width of a conventional non-expanding truck, for example. The new-look, high resolution control graphics will drive an SVGA screen integrated within the installation. The master section can be specified centrally or to one side to suit different operating needs.

The 96 channels can control up to 192 simultaneous inputs that can be fed from remote-controlled microphone preamplifiers, or from analogue or digital line inputs, without restriction; a truly remarkable degree of mixing capacity. Stereo channels may be configured anywhere in the console to suit each project. Any bay of channels on either layer may be switched instantly to a 'sweet-spot' bay convenient to the operator for consistent monitoring even in a small space.

MTP extends the superb sonic quality of the SSL A-series range and inherits the A-series range of I/O options and accessories. The SSL NiTech Super-Pre™ provides the ultimate quality with remote-controlled preamplifiers and the option for analogue processor insertion prior to digital conversion. Analogue return feeds are provided for artist foldback capable of the lowest round-trip delay in a digital console. Forty-eight multitrack buses, accessible to both large and small fader paths, may be used for recording or to provide mix minus feeds. Multitrack machines may be connected via SDIF-2, MADI or AES/EBU protocols.

Abbey Road surrounded

Studio Three, Abbey Road

London's famed Abbey Road Studios recently installed an SL 9096 J Series SuperAnalogue™ console in Studio Three. The 96-channel console, the largest J Series in the capital, is fully equipped for 5.1 surround mixing with a custom panel, and replaces a 72-channel SL 8000 G Series console installed six years ago. The newly equipped Studio Three will be open for business in the spring of 2001.

Abbey Road Studios' new SL 9000 J Series console has an 8-channel surround sound master control panel fitted in the centre section, incorporating full 5.1 compression on all outputs. Additionally, a recently introduced optional feature enables the console to be easily switched between stereo and 5.1 modes at the touch of a button.

As Peter Cobbin, Senior Recording Engineer at Abbey Road Studios, explains, "We have traditionally had SSL consoles here since 1984. The SL 9000 J Series delivers outstanding sonic quality and incorporates technologies that make it particularly suitable for surround sound mixing. Having a greater number of channels will give us increased flexibility in the way in which we derive the surround mix. Also, a key advantage of this customised desk is that Studio Three will be able to adapt easily between stereo and surround sound DVD projects."

Digital consoles are now 'A Plus'!

SSL has announced new advanced specifications for its digital console family with effect from June, creating the A Plus versions of the company's A Series digital consoles – Axiom MT, Avant and Aysis Air.

A Plus specification consoles benefit from a range of improved hardware and hardware options which include:

New HS Automation Computer

The new HS Automation Computer improves the speed of operation of all A Plus digital consoles in everything from boot time to complex actions such as automation editing.

High resolution graphics

The new HS Computer provides an improved graphical environment, whilst maintaining the familiar operational mode already praised by existing users.

TFT monitor

A modern flat-screen TFT monitor provides the display for all of the new HS Computer control screens.

Flexible I/O resource (RIO Grande)

RIO Grande provides greater flexibility in mixing analogue and digital inputs and outputs, together with a simple and economical expansion path.

INFO faders (option)

SSL's INFO (Intelligent Null Feedback Operation) Digital Linear Motor Faders provide increased accuracy and tactile feedback at null points and level matches for a greater degree of control. Individually hot swappable, the new faders also feature a four-character LED display.

NiTech mic amps (option for MT only)

A new Super-Pre mic amp, from the designer of the celebrated input stage of the SL 9000 J Series, combined with SSL's NiTech (Nearly Instantaneous Technology) digital audio converters enables very fast, high quality transition between analogue and digital domains, plus negligible latency in record and monitoring paths.

Conservatoire de Paris

▲ Conservatoire de Paris, Studio 1

The Conservatoire de Paris has installed two MT digital multitrack consoles and an SL 4000 G+ analogue console for the re-equipping and expansion of its Audiovisual Department.

Established more than 200 years ago, The Conservatoire de Paris is one of the world's most highly regarded schools of music and dance. The Audiovisual Department plays an important and multi-faceted role in the life of the Conservatoire, providing a full range of services from the teaching of sound recording and mixing principles, to the professional recording of individual performances.

According to Catherine de Boishéraud, Director of the Audiovisual Department, the choice of consoles was not an easy one. "Due to the diversity of the subjects taught at the Conservatoire, the recording studios are available to a wide range of users and different types of production. We had a requirement for powerful tools which would cope with such diverse applications, whilst offering a fully featured control surface where all functions are immediately and easily accessible. We also had to consider an 'architecture' which could easily be taught to students and we needed flexibility in console set up and operation. Reliability and track record were also important.

Our quest led us to SSL. We liked the in-line structure of the MT, making its operation by far the best, while its 'knob per function' approach is unarguably an asset in an educational application."

JC Studios

JC Studios,
Brooklyn, New York

Two 32-channel Solid State Logic Aysis Air Digital Broadcast Consoles grace the newly rejuvenated JC Studios in Brooklyn, New York. Purchased by NBC in the 1950's, the facility was host to a parade of landmark TV shows from the more recent 'The Cosby Show' to the legendary 'Sing Along with Mitch' and Mary Martin's 'Peter Pan.' And like the title character of that famous production, the new owners are keeping the facility forever young with the addition of the Aysis Air consoles.

"JC Studios, in its different incarnations, has made so much of film and NBC-TV history," says Paul Stiegelbauer, Director of Technical Operations for JC Studios. "We acquired the facility last year to produce the daytime drama 'As the World Turns.' We took occupancy in November 1999 and went on air on January 3, 2000 with the two SL 6000's that NBC had used. Once up and running, we decided to go with the new Aysis Air systems as the first step in taking the entire production chain digital."

'As the World Turns' is set up on both stages of the Brooklyn complex so that when one stage is shooting in the morning, the other is being prepped for the afternoon scenes. "There are several situations that led us to the Aysis Air, with networking capabilities at the top of the list," says Stiegelbauer. "There are times when we will use both studios at the same time to complete a segment, so we needed two consoles that would seamlessly and effortlessly work together."

Success for Avant in Japan

Sony PCL

Sony PCL has installed a 112-channel Avant digital film and post-production console at the heart of its new THX-approved mixing theatre in Tokyo. Studio operation commenced in August 2000 and since that time the console has been fully employed by the Sony subsidiary, mixing and sweetening audio for high-profile surround sound projects.

According to Takeo Asano, Managing Director of SSL Japan, "Many of the projects already completed were mixed in 5.1 - including one of the first to be broadcast in HDTV. Everyone has been amazed by the outstanding quality of the sound." The 112-channel Avant console is the largest to have been installed in Japan to date.

Leading Japanese post-production facility Imagica has recently ordered its second 64-channel Avant. Imagica has four facilities in different locations in Tokyo; the Avant-based studios and a second studio complex equipped with two MT digital multitrack consoles. A third studio now has eleven SL 4000 series consoles - following a recent order for an SL 4040 G+.

In addition, NHK, the Japanese national broadcaster, has ordered a third Avant for video post-production. With more than 150 audio engineers, the ease of operation and familiarity of Avant's control surface was a key factor in NHK's decision.

Avant revolutionises BBC drama production

Dubbing Mixer David Mason works on the Avant at BBC Resources

An Avant digital film & post-production console is now installed in Dubbing 1 at Pebble Mill in Birmingham for BBC Resources, part of the largest television facilities company in Europe.

The 24-fader Avant, with 96 inputs, is operational in a completely refurbished studio equipped for Dolby 5.1 mixing. The console is currently employed on a variety of high-end television drama projects, the first of which was the latest series of 'Dalziel & Pascoe' - a BBC Birmingham production for BBC1.

Dubbing 1 will also extend surround-sound mixing and remixing capability - for DVD and other applications. The room has already been used to create the Dolby 5.1 remix for "Doctor Who: Five Doctors," a DVD for the BBC that features extended scenes and untransmitted sequences from the original production broadcast in 1983.

"Our Avant has revolutionised the way in which we produce drama," maintains Dubbing Mixer David Mason. "Increasingly, sound mixing for high quality television productions is resembling the feature film process with ever more tracks to mix. Consequently, the ability to perform virtual pre-mixes - and change setups quickly in front of our clients without the time-consuming constraints of committing to tape - is a great benefit."

BBC Resources in Birmingham offers programme makers a 'one -stop' facility encompassing every aspect of television and radio production through a combination of the latest innovative technologies and a highly skilled and experienced workforce. In addition to its BBC clients, the facility has worked with a growing number of leading production companies and broadcasters including Carlton Television, Bazal, Ecosse Films, GMG Endemol and LWT.

The Ocean Room at Oasis Studios

Oasis in Beijing

Oasis Studios of Beijing, equipped with its SL 9080 J Series SuperAnalogue™ console, opened for business in October 2000. A subsidiary of YYYD Productions Co. Ltd, Oasis is an all-new studio complex, set in a lakeside location in the centre of the Chinese capital. With an impressive range of equipment and extensive facilities, Oasis Studios is the premier recording and mixing facility in the country.

Dindae Sheena, Chief Operating Officer of YYYD Productions, explains the reasoning behind the decision to equip the new facility with an SSL console. "We did a market study on the standard that was currently available in other private facilities in China - as we wanted to improve on what was available. We decided that the 9K was the way to go and Oasis will be the first private facility in China to own one."

Oasis has two control rooms, one large live room, and five isolation booths. Control room A (The Ocean Room) will house the SL 9080 J console with monitoring by Genelec 1036As. The main 4,000 square-foot studio - with stunning lakeside views - is large enough to house a 60-piece orchestra comfortably. Considerable attention has been paid to acoustics throughout, with design by Sam Toyoshima.

Sheena concludes, "The first large-scale commercial recording facility in China, Oasis Studios will concentrate mostly on working with artists in the Asia-Pacific region, with most of the focus on artists from Mainland China, Hong Kong, Korea, Japan and Taiwan. But, as a 9K equipped facility, our ambition is to join the global club of premier international studios and we look forward to working with artists from all corners of the world."

MT for Rodgers Studios

Pictured with their recently installed 96-channel MT digital multitrack console are Dave Rodgers and Domino, a partnership that has enjoyed outstanding success in the Japanese Eurobeat music scene. Installed in Rodgers Studios, a private residential facility on the outskirts of Mantua, the MT will help to consolidate the studio's position as one of the most technically advanced in the country.

SWTV migrates

to digital broadcasting

SWTV's Sundance mobile

Sundance, the newest addition to the five-truck hybrid digital fleet of live broadcast expandable production trucks owned by Core Digital Technologies-SWTV (Southwest Television) in Tempe, Arizona, sports a 96-channel Solid State Logic Aysis Air Mobile digital broadcast console, making the entire production chain digital. Servicing mostly live high-end sports and entertainment events, the rock-solid reputation of the Aysis Air convinced SWTV to include the console in this very advanced digital environment.

"We are a production services company, a one-stop shop for remote live television broadcasting," says Shawn O'Shea, director of engineering and operations for SWTV, a division of Core Digital Technologies. "When we were building this new remote truck, we chose the Aysis Air Mobile based on the wonderful experiences that other customers have had with their consoles. We strongly believe that the remote market should quickly migrate to digital audio, and with the Aysis Air, we have a proven, great-sounding and powerful platform to accomplish this changeover."

SWTV sends its remote fleet out to cover events throughout the continental United States, Canada and the Caribbean basin. According to O'Shea, about 75% of the company's business is live network sports for CBS, NBC, FOX, ESPN, Turner and the like.

Sundance is a production truck with digital wiring for 20 cameras, 24 tape machines and the Aysis Air Mobile, all routed through a Kalypso switcher.

"It is very important to build a truck that can handle today's business, while also keeping an eye on the future," explains O'Shea, "The Aysis Air keeps us prepared for any eventuality that may come along, and that is another great benefit of the console."

Recently, SWTV used Sundance with its new console at the NBA All-Star Game, held at the MCI Center in Washington, D.C. SWTV broadcast the live feed for Turner Sports Network.

Sphere chooses SL 9000 J

Sphere Studios, the first large multi-room recording facility to be built in London for many years, is to install a surround sound equipped SL 9000 J Series SuperAnalogue™ console.

Due for completion in the spring of this year, Sphere is located near the Thames by Battersea Bridge and is the joint brainchild of Francesco Cameli and Malcolm Atkin. Malcolm was also involved with the last major such project to be undertaken in the capital, the construction of Sir George Martin's Air Lyndhurst.

Occupying 10,000 square feet with acoustic design from Munro Associates, Sphere Studios will have three main rooms - one for live recording and two mix rooms - built around a centralised machine area for facility-wide resource sharing. Shared access also extends to the six "white rooms," designed to accommodate a broad range of pre-production activities. All three control rooms are to be equipped with 5.1 monitoring from Dynaudio Acoustics.

Connectivity, both within the facility and globally, is recognised as a key factor in the commercial success of the new venture and, consequently, the facility has been wired internally to accommodate both existing and future technologies with extensive use of fibre optics. Sphere will also provide its clients with broadband connectivity to the outside world.

(l-r) SSL's Stuart DeMarais and Mike Banks with Malcolm Atkin and Francesco Cameli

Soundtrack's a favourite for Andy Wallace

When mixer/producer Andy Wallace (Limp Bizkit, Foo Fighters, Everclear) was contacted by Metallica drummer Lars Ulrich about working on an upcoming project together, he knew exactly where he wanted to work-Soundtrack in New York City.

For this project, Wallace and Ulrich teamed up to mix Systematic, an up and coming band on Ulrich's Elektra label due to have their debut album released in May this year.

Wallace has worked at Soundtrack since the 1980's and prefers it as his studio of choice when working in The Big Apple. "I've mixed quite a few albums at Soundtrack and without a doubt it's the place I want to work when I'm in New York," says Wallace.

Since Wallace is used to working with bands such as Limp Bizkit and Foo Fighters, he felt right at home mixing Systematic's heavy guitars and melodic vocals. "Systematic is a new band out of San Francisco and this is their first album," explains Wallace. "Their sound is fairly heavy but they are very song oriented and have very strong performances. Tim is an excellent vocalist and that should allow the group to be radio accessible."

Wallace, now based in New York, began his career as a musician in the 70's in Los Angeles and from those experiences he was able to break into mixing and producing. He has primarily worked with rock artists and prior to working with Systematic he mixed Limp Bizkit's latest multi-platinum release, 'Chocolate Starfish and The Hot Dog Flavored Water,' also in Studio G.

(r-l) Engineer Andy Wallace, Metallica drummer Lars Ulrich and Systematic guitarist Adam Ruppel of Systematic, at Soundtrack, New York City

According to Wallace, Studio G is where he feels most comfortable. "I've mixed a lot of albums in Studio G and I love the sound in there. Studio G has a Solid State Logic 4072 G+ Series console with Ultimation™ – which I really like. Specifically, I like the sound and method of automation because I'm able to move quickly on the console. There are no obstacles with the G+ Series because I have so much experience with it."

technofile

AudioBridge

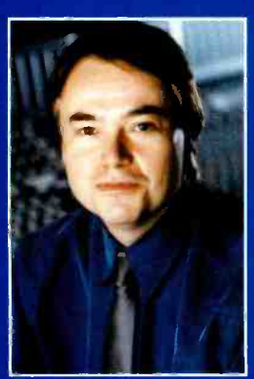
SSL's new AudioBridge interface extends the company's HiWay™ and Freeway™ multi-channel networking technologies by providing full bandwidth digital audio distribution, both locally and globally, without reliance on low quality, unpredictable Internet delivery systems. AudioBridge connectivity is characterised by its dependable, continuous service and low coding delay, making it most appropriate for professional audio applications.

Using standard (Cat 5) computer wiring and wide-area network data protocols to route full bandwidth digital audio over both hardwired and virtual circuits, AudioBridge data is compatible with standard ATM switches and telecoms interfaces, opening up a world of audio distribution possibilities.

Each AudioBridge 1U rackmounted unit provides an 8-channel, two-way audio connection within a standard 25Mb/s data interface. Where more than 8 channels of audio are needed, multiple AudioBridge units may be aggregated via an ATM switch to increase capacity.

Mark Yonge, Market Manager, Broadcast & Post, Solid State Logic

AudioBridge



New MD for SSL

Colin Pringle was appointed as Managing Director of Solid State Logic Group Ltd on 1 January this year, taking over from John Jeffery, who as Managing Director since 1991, had led the company to its current pre-eminent position.

Colin originally joined SSL in 1988 as Marketing Director in which capacity he served for seven years. He rejoined SSL last year after a period as Development Director of the Entertainment Division of United News & Media.

Bob Pridden

DVD 5.1 mix captures The Who

Classic for SoundCastle

SoundCastle, a leading recording facility specializing in pop, hip-hop, rap and R&B located in Los Angeles, was the first studio to install an 80-channel Solid State Logic SL 4000 G+ Classic console.

The "Classic" designation of the console indicates the latest sonic improvements of the G+ combined with a return to the original appearance of the E Series, with its black 'Raven' finish. The installation reflects SoundCastle's desire to service its long list of clients interested in the classic SSL sound.

"The sonic attributes that our clients have come to expect from the single most successful mixing console in modern recording history, the SL 4000, cannot be achieved by any other console," says Buddy King, owner of SoundCastle. "The G+ Classic we have purchased still offers that great sound quality, while addressing the mixing needs of the future."

Because of the recognised industry-standard sound of the SL 4000 G Series, SoundCastle engineers specified the new SL 4000 G+ Classic in response to client demand. They already have an SL 9000 J Series in Studio A and felt the G+ Classic purchase would balance their sonic offerings.

"Studio 2 was most recently home to an SL 4072 G Series, installed in 1989. A number of our clients like to use both our SL 9000 and SL 4000 consoles at different stages of their production," states King, "and the installation of the new SL 4000 G+ Classic allows us to service all situations."

The first client to use the new G+ Classic console was producer Battlecat who worked with engineer Tim Nitz to mix the soundtrack for John

Following their all-star concert at London's Royal Albert Hall last November in aid of the Teenage Cancer Trust, The Who are to release a DVD of the performance in the Spring of 2001. The concert was mixed in 5.1 surround by The Who's producer/engineer Bob Pridden ably assisted by Will Shapland of Sanctuary Mobiles - known as Manor Mobiles prior to its acquisition by the Sanctuary Group last year.

The three-and-a-half-hour concert, which featured contributions from Bryan Adams, Eddie Vedder, Kennedy, Paul Weller, Noel Gallagher and Kelly Jones was recorded on Sanctuary's SL 4048 E Series console and mixed in 5.1 on their 62-channel MT. For this purpose, the truck was fitted with Quested monitoring.

Sanctuary's recording engineer, Will Shapland, is no stranger to digital mixing as Manor was one of the first to take delivery of SSL's MT digital multitrack console two years ago. In that time he's worked the console hard on a variety of demanding projects including 50 weeks of TFI Friday for Channel 4, a near-live show where he came to appreciate the instant reset capabilities of the console as he was mixing at least four different bands on each programme.

For producer/engineer Bob Pridden though, who has worked with The Who for 34 years, and was an early pioneer in the field of on-stage monitoring, this was to be an introduction to digital mixing and he freely admits to approaching the session to mix 48-tracks for the DVD with a degree of trepidation.

"You could say I'm a bit of a Luddite. This was my first session with 5.1 and we had nearly 50 tracks to mix, so I was naturally apprehensive. Frankly, I've not been too impressed with the sound of some digital boards I've listened to, as I thought they sounded brittle. But I have to say that the MT's been absolutely fantastic. I'm a complete convert - I love it, and I love the sound. The repeatability, where you can just go back and recall all your channel settings is such a timesaver - this job would have taken forever on an analogue console. Also, I really like being able to pull channels across to my listening position - I don't want to move around when I'm mixing - you can lose the plot too easily."

Will Shapland, who also mixed the concert with Bob Pridden in stereo for pay-per-view TV transmission, believes that 5.1 is a great medium for capturing live performances. "You don't move stuff around for the sake of it," he argues," I like to keep the band in front of me and use the rear speakers to spread the room around rather than the band. We'll also use the rear speakers to fill in on the sing-along and clap-along numbers. The Albert Hall has a definite acoustic shape and 5.1 captures the reflection well – it's a lot more difficult with outside events where there's no natural reflection."

Will Shapland identifies an issue with surround mixing in that the final result is heavily reliant on the studio monitoring system. "There's simply not enough reference points at the moment - you need to be able to play your mix at a dozen different places - unlike stereo where you can put it on a cassette and listen in your car!"

Bob Pridden, whose credits include recording and mixing Eric Clapton - as well as bands The LA's and Streetwalkers concludes, "When I started working with The Who we recorded on four tracks, even 'Quadraphenia' got started on an eight-track. It's incredible how far the technology has progressed. It's been a great experience mixing in 5.1 on this console and I'm sure we've managed to capture the excitement and energy of the original performance. I can't overestimate how great a help Will has been."

▲ Pictured at SoundCastle are (l-r) Tim Nitz, Battlecat and Buddy King, studio owner

Singleton's next feature film 'Baby Boy,' scheduled for release in June 2001. The pair also worked together at SoundCastle on other recent projects including: Battlecat's upcoming album, the soundtrack for Road Dogs and Dr. Dre's Aftermath artist, Hit Man.

The 80-channel SL 4000 G+ Classic for SoundCastle, in classic 'Raven' black with 48 E Series '242' equalizers, is built with a G Series centre section with G+ modifications. Special-edition features of the Classic include Stereo AFL, True Group Solo, custom 8-way cues modification and extended panning to accommodate today's market requirements.

Aysis Air Mobile gives 100%

Turner Studios' Solid State Logic Aysis Air Mobile digital broadcast console is at the top of the league, following its first months of service for the Atlanta Braves, NBA and NHL games on TBS. Installed in a network production truck, Turner's engineers have grown to appreciate the rock-solid reliability and ease of use offered by the Aysis Air.

"Live remote broadcast situations are always taxing as your systems need to be at 100 percent all the time," says Bob McGee, director of technical operations at Turner Studios Field Operations. "The operation of the Aysis Air Mobile has been perfect. We had absolutely no issues—operational or technical. The engineers turn it on, load a file, successfully mix and it's off to the next event. You can't ask more of a console. All this and it sounds great. We're very happy."

The Turner system's current configuration allows 152 sources to be routed through 96 processing channels to 80 outputs. While it may seem like a daunting task to master a digital console of this size, Turner's experience has been exactly the opposite. "The Aysis Air Mobile is very easy to use," states David O'Connell, audio engineer. "While it is a digital console, it really looks and feels like the very familiar SSL analogue consoles. For us, the Aysis Air sets the standard for digital consoles in the way SSL set the standard for the analogue generation."

The console's total resetability was cited by O'Connell as a key feature for Turner's type of television production. Once the outboard gear, microphones and tape machines are normalled into the console's router, set-up becomes extremely easy. "You just hit a couple of buttons and you have your source. All the source routing is easily attainable, and the destination routing is very flexible. We essentially have a patchless system right now. We can pre-set a show, set all the EQs, compression ratios and all the routing, save it to disk and instantly recall all our settings. We can quickly move from a small-format production to a large production. The Aysis Air saves us time and, in our business, time is money."

The final test of an audio console is its clarity and quality of sound, another area where the Aysis Air Mobile shines for Turner. "The Aysis Air is a high-level digital console and the clarity is outstanding. I can now hear things I wasn't able to hear with an analogue system. The richness of sound is more defined, allowing us to produce a superior television experience for our audience."

▲ Aysis Air Mobile in Turner Studios' network production truck

news bytes

Guillaume Tell hits the mark

Studios Guillaume Tell, one of the most revered recording facilities in Paris, is to replace its existing SL 9080 J Series console with a new 96-channel version, equipped with monitoring for 5.1 surround mixing.

As before, the SL 9000 J Series will be installed in the spacious Tom Hidley designed control room in Studio A, the largest in the complex, with 300 square metres of floor space and a ceiling height of more than 13 metres. With such considerable volume, Studio A can comfortably accommodate 80 musicians. The SL 9096 J is the fourth SSL console to have been installed in the control room since Studios Guillaume Tell opened for business in a converted cinema in 1986.

MT for Germany's first digital surround mobile

B&R Medientechnik of Kürten on the outskirts of Cologne, Germany, has expanded its mobile fleet, equipping an 18-metre remote recording vehicle with a 48-fader, 96-channel MT digital multitrack console, supplied through SSL's alliance partner in Germany, Digital Audio.

The new vehicle cut its teeth when it was used for the surround sound recording of an orchestral concert in Berlin last year, featuring the internationally acclaimed violinist, André Rieu and Orchestra.

According to B&R's owner, Bernd Kugler, "For us, the installation of the MT was a dream come true. We have a very successful mobile recording business but we wanted to be the first in Germany to offer digital surround sound - both for recording and broadcast - to extend our client base. We were extremely impressed with the powerful automation on the console and with the fact that it's readily familiar to our freelance operators."

Two SL 9000 J Series for The Netherlands

This year started well for the Dutch recording industry with two SL 9000 J Series consoles being installed in The Netherlands.

The first, an SL 9048 J Series, went to Zeezicht for their rurally located studios on the outskirts of Haarlem. Zeezicht is located in a refurbished school with the assembly hall, complete with original stage, serving as the recording area. A number of leading Dutch artists record regularly at Zeezicht, including leading Dutch pop group Abel and Candy Dulfer, the internationally acclaimed jazz tenor saxophonist.

Studio Down Under, so called because of its basement location in a large villa in Hilversum, is the recipient of the second SL 9000 J Series console. This prominent Dutch studio, owned by highly successful producer/songwriter John Ewbank, is replacing its 14-year-old SL 4000 console with an SL 9048 J Series.

"Mama's Gun" at Electric Lady Studios

Top R&B artist and Grammy nominee Erykah Badu's, new hit record, "Mama's Gun" was mixed at Electric Lady Studios in New York on a Solid State Logic SL 9000 J Series SuperAnalogueTM Console.

With such diverse-sounding material - covering everything from R&B to Adult Alternative Pop/Rock to Alternative Rap - Badu and her associate producer, James Poyser, chose three different engineers to mix the album, Russell Elevado, Leslie Brathwaite and Tom Soares.

All three engineers have prior experience, both with the console and with working in the legendary Electric Lady environment. Brathwaite explains, "I normally work on other SSL consoles including the G and E series, but it's always a pleasure to mix at Electric Lady because I have the opportunity to work on the SL 9000. The console is the most user-friendly around."

Delphine extends range of services with MT

Delphine Studios, at the heart of the Parisian music recording and video post-production scene for more than 20 years, is to re-equip its Studio B, installing a 40-fader, 80-channel MT digital multitrack console. In so doing, the studio will extend its range of client services to encompass multi-format surround-sound mixing for post-production, including DVD.

The new digital room will be equipped for 5.1 monitoring and will complement Delphine Studio's analogue suite which houses an SL 4064 G Series console.

The MT for Delphine Studios is the 10th to be installed in France since the console's launch two years ago. SSL Regional Manager, Philippe Guerinet attributes the success of the MT in his region as being due to the French market's readiness to adopt digital technology, the sonic performance of the MT and SSL's strong regional presence to deliver service and support.

New appointments

Solid State Logic has appointed two new product specialists: John Pastore for the East Coast, based in SSL's New York office, and Ryan Hewitt for the West Coast, based in SSL's Los Angeles office. Both will be responsible for product training and demonstration for all SSL consoles.

Prior to joining SSL, Pastore spent two years with Otari's console development group as the lead quality assurance engineer and has an excellent understanding of digital consoles.

Hewitt's background includes several years of experience as a live sound and studio engineer. He has recorded live projects for the Family Values Tour '99, Kenny Loggins and Jimmy Buffett, and he has mixed projects for Ringo Starr, Kenli Mattus and Burt Bacharach.

"We're extremely pleased to have John and Ryan join SSL," says Rick Plushner, president of SSL Inc. "Both have a great deal of expertise with large-format consoles, and each brings a passion for their work to the company."

Historic studios re-equip

Two large Avant digital film consoles are to play an important role in the regeneration of the film industry in Russia. The two 48-fader consoles, each with 192 processing channels are now located in the legendary state-owned studios, Lenfilm and Mosfilm.

Mosfilm has produced more than 3000 films in its 70-year history and the studio's output has garnered more than 400 major international awards. Eisenstein's "Battleship Potemkin," Kurosawa's "Dersu Usula" and Bondarchuk's "War and Peace" are just a few of the classic films from this historically important studio.

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TL Audio M3 TubeTracker

Sitting between the high-end VTC console and the discontinued M2, TL Audio's new 8-channel valve desk promises plenty. **George Shilling** takes an exclusive look

SINCE THE INTRODUCTION of the VTC (Valve Technology Console) nearly two years ago, it has won a steadily increasing stream of converts. However, such quality comes at a price, and takes up a fair amount of space. TL Audio previously made two 8-channel valve mixers, the M1 and M2 and, after receiving requests for used examples of these models, did the decent thing and designed a new one. Not only does this benefit from the VTC's development, but TL is planning to price it even more aggressively than its predecessor the M2. Step forwards then, the M3 TubeTracker, a surprisingly affordable 8:2 valve mixing console.

The main unit is rackmountable: 10U-high and only 5 inches deep. Table-top mounting can be slightly precarious, as it balances on two metal endcheeks: the base is partly recessed. I was lent a preproduction prototype: customer models will feature a wooden surround, making the whole thing look as elegant as its big brother the VTC. The power supply is housed in a separate 7.5kg 2U-high box connected with a 3m cable. This includes a fan, so some consideration must be made as to its positioning. Although the mixer includes a number of valves, it runs relatively cool and weighs in at around 13kg. Valve topology is similar to the VTC, with half an ECC83-12AX7 dual triode used by each channel preamp, and one in the mix bus.

The rear features vertical rows of connections mirroring the channel strips of the control surface. An XLR socket is provided for each mic channel. Below these are jack sockets for Line input, then TRS insert jacks. All jack sockets other than the inserts are balanced. Jacks are provided for individual (post-fade) channel output, enabling easy multitrack recording. A push-button for each channel switches levels between +4dB and -10dB. All the push-buttons on the rear of this prototype protruded considerably but I am assured this depth will be reduced. There are separate calibration trim pots for each level setting on each channel. The master section includes stereo monitor output jack sockets, XLR main outputs, along with two aux Send outputs, accompanied by a +4/-10dB switch. Two stereo pairs of Effects Return inputs are provided, each pair having its own +4/10dB switch. There is also a 2-track monitor input: selecting this on the front mutes the main stereo bus from the monitor output. Further level and meter trim pots are provided, along with a pair of 15-pin D-type connectors which usefully enable multiple M3s to be daisy-chained together, linking PFL, stereo and aux buses: the M3 at the end of the chain becomes the master output controller. A blanking panel covers the slot for an optional stereo digital output, although the front panel already includes controls for this.

On each channel the line and mic inputs share the same gain knob with centre detent for zero setting in line. There is a switch to select between line and mic inputs, so microphone and multitrack connections could be made simultaneously, then flipped as required for recording or playback. A phase reverse button is provided on each channel—it is astonishing how many budget consoles omit this vital feature. A high-pass filter is also included, near the top of the EQ section, which is headed up by a useful EQ ON button and associated LED—another button often omitted by cost-cutting designers, although I would have placed it near the bottom of the EQ. The high and low bands are fixed at 12kHz and 80Hz respectively, with wide-ranging sweepable mids. These are similar to those on the VTC, with average bandwidth settings. Both aux sends operate post-fade, with Aux 1 switchable prefade. The pan pot is accompanied by MUTE and PFL buttons, both accompanied by LEDs, and near the top of the fader are useful Peak and Drive LEDs. The yellow Drive LED monitors the input stage valve, starting to flicker at +6dBu and intense at +16dBu, while the red Peak LED comes on at +21dBu, where there is still 6dB headroom and additionally monitors post fader.

The master section features a pair of illuminated vu meters, master phantom power switch, and master controls for aux sends and returns, all including PFL listen switches.

All the knobs are nicely damped, the buttons have a positive feel, although the 100mm faders are fairly light to the touch. It feels and sounds like a professional mixer: all the controls are well spaced, and it is in no way fiddly to use. Legending is clear and there is room to scribble channel names with a white chinagraph. This is a serious tool with useful features for many applications, from location recording to studio mixdown. The EQ and mic amplifier sections are excellent, suiting a wide range of inputs. It handled everything I threw at it with ease, always sounding responsive, exciting and dynamic. All connections and controls have been well chosen and positioned to enable great flexibility, with levels and gain structures set sensibly. It is a joy to use, and those familiar with the TL Audio range know what to expect—I loved its chunky feel and chunky sound. □

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Sabra offers noise protection

Brazilian manufacturer Sabra Microphone Tools has a universal mic mounting system, described as a 'noise protection system for microphones'. It is a combination of products that form a versatile universal erector set to deal

with mic placement, shock mounting and pop filtering issues in studios and live performances on stage. The system includes ST2 universal T-bar double support with 3/8 and 5/8-inch thread, an SSM-1 mechanical noise suppressor support and the SPF pop filter. Elements can be adjusted to create customised set-ups, and a second mic can be added for M-S or conventional stereo set-up. The unit is effective in isolating mics from noise, rumble and vibrations. By mounting a second SSM-1 (optional) to the ST2 T-bar, the system can accommodate the longest shotgun mic. Additionally, the T-bar can be used alone as a stereo mic mount with a maximum 8-inch spread, suitable for X/Y arrays. All components attach to (non-rotating) hex rods for a solid lock. The SPF (Sabra Pop Filter) is a dual-layer screen design that removes breath pops and plosives. The SPF mounts on an articulated arm that swivels and locks into position, unlike pop filters that use gooseneck-type mounts.

FAR monitors

FAR is launching two new active monitors, the AV 8 and LBE 11A. AV 8 is a high power 2-way medium-sized monitor. The 40-litre enclosure houses a 25cm woofer and a tweeter featuring FAR's waveguide. This approach ensures high-frequency coverage in both vertical and horizontal planes. The amplifier delivers in excess of 300W, producing sound levels of more than 120dB. The FAR LBE 11A, is a sub-woofer specifically designed for medium-sized 5.1 surround systems. The 250W amplifier drives two 25cm long throw woofers, capable of generating sound pressure levels of up to 117dB, at frequencies down to 30Hz, for extended periods. The LBE 11A is suitable for extending the LF response of systems deploying FAR's AV2 and AV6 full range monitors.

Audio Service puts cards on table

The SDIF2 Interface, from Audio Service, supports the Sony Digital Interface and the size of the card is the same as Yamaha CD8 cards, allowing it to fit into the DAIS (Digital Audio Interconnection System), 02R and 03D mixers. Input and output connections are made with two 25-pin Sub-D jacks. The CD8MYAT enables the use of 24-bit wordlength in Alesis ADAT format for the Yamaha 02R, 03D and the Audio-Service DAIS. The card uses the Yamaha MYAT interfacecard as its front end, which is installed on the Audio-Service CD8 extenderboard.

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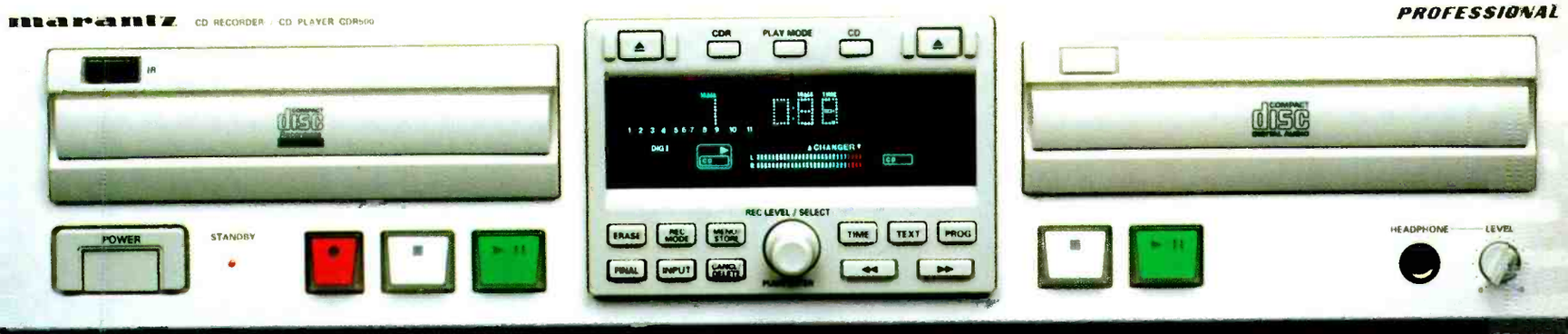

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Leanne Ungar

LIFE IN THE FIELD

With live and studio album projects on the go, Leonard Cohen's engineer-producer Leanne Ungar is in demand. **Mel Lambert** talks about production, poetry and sex

LEONARD COHEN IS UNIQUE: a combination of seer and sage; his poetry, song lyrics and prose writing have inspired audiences for three decades. Cohen's debut album, *The Songs Of Leonard Cohen*, was released at the end of 1967, since which time he has recorded eight additional studio albums, a pair of live albums and released two hits collections. In addition to recordings, Cohen has published 11 books, including the 1963 novel *The Favorite Game* and the 1966 classic, *Beautiful Losers*.

His most recent album, *Field Commander Cohen* was produced by Leanne Ungar whose association with Cohen dates back to the early seventies when she was working at Sound Ideas in New York. Here she also assisted on sessions with James Brown, The Brecker Brothers and Manhattan Transfer. After working at Le Studio, Canada, in 1975, Ungar returned to New York and secured a job at A&R Recording, working on sessions with Cat Stevens, Loudon Wainwright and Janis Ian. Going freelance in 1977, she worked on more Janis Ian sessions plus film scores with Mason Daring, and a series of records and a movie with Laurie Anderson.

Ungar started working again with Leonard Cohen in 1984. The live *Field Commander Cohen* album is the fifth she has engineered for the artist: Various Positions, in 1984, which she recorded and mixed; 1987's *I'm Your Man*, recorded by Ungar and others, but mixed by her; 1993's *The Future*, recorded and mixed by Leanne (the single, 'Closing Time' was co-produced by Leanne and Leonard Cohen); 1995's *Cohen Live*, recorded by Ungar and mixed by Bill Schnee, co-produced by Ungar and Bob Metzger. Cohen's new, currently untitled, studio album is also being co-produced by Leanne Ungar with Sharon Robinson.

These two albums represent an unique juxtaposition. Field Commander Cohen *was recorded at the former Hammersmith Odeon, West London, and the Brighton Dome during the late seventies, while the unreleased album is coming together as we speak. Why go back to these older tapes?*

Yes, *Field Commander Cohen* has an interesting pedigree. Every few years Leonard looks through these archive tapes to see if there is any live material that might be appropriate for release. And also we make sure that the tapes are still playable—and maybe think about archiving the analogue material to a more permanent digital medium. When we came to audition the multitrack tapes from those English dates, we weren't sure what condition they were in. It turned out that they were in excellent shape.

What we found was a collection of 24-track reels of Scotch 250—thank God, because other brands of tape would have broken down by now—that were recorded by Henry Lewy at the Hammersmith Odeon and Brighton Dome Theatre. The tapes were Dolby A encoded—we had to look around to find that many channels for rental, which got me thinking seriously about archiving.

While listening to these tapes the arrangements seemed to line up with the current interest in world music. The tracks still sounded so fresh and interesting to us, that we thought they were asking to be released and the project pretty much followed on from there. We had about three hours of material from each night; most songs repeated at all of the concerts, but with slightly different set orders. The tracks were beautifully recorded by Henry Lewy, who had recorded and co-produced *Recent Songs* with Leonard Cohen and is well-known for his work on several Joni Mitchell albums. The Odeon and Dome sessions involved two different recording setups and two different track arrangements.

Where did you transfer the material from 24-track analogue?

At Westlake Studios [West Hollywood] to Pro Tools format. I started with a just couple of songs, so that I could work out my Pro Tools templates, test the quality of the conversion, and make sure it was all compatible when I got it back to Still Life Studio [Cohen's private LA facility]. I transferred everything across flat at unity gain because I didn't know what was coming along, and could make all the adjustments in the Mac G4. I used Pro Tools 888 convertors, which sounded okay; I didn't think Apogee Model

8000 convertors, for example, would represent a tremendous jump in quality, given the additional rental cost. I was happy with the quality; the Pro Tools recordings sounded big, silky and clean. I only transferred versions of songs that I knew we would need—probably 16 in all, of which we used 12 on the album. On some songs I transferred several versions from different nights, thinking that I might come across more details when I got to work on the tracks.

I pretty much put up the faders and didn't bother with differences between drums and keyboard mikings. When I got [the drives] back to Still Life for editing and mixing on our 64-voice MixPlus Pro Tools I had some sorting out to do to make the track layouts consistent from song to song. As I said, these were beautifully recorded tracks but, over the course of an evening—from quiet ballads to strong rockers—there were major level differences. I was concerned on some songs about dynamic range and had to normalise them and then digitally bring up the levels.

Before I transferred we were listening to rough mixes made straight off the board the night of the concerts. Some rough mixes were heavy in bass and drums and I couldn't hear everything, so I transferred several insurance versions of those songs. The first four songs from the first night of recording didn't make it to tape due to technical difficulties—and song #5 was 'Field Commander Cohen', which opens the album.

What fixes needed to be made to these tracks?

Where we could, I took an entire track, and did only minor touch ups. My philosophy was to pick the brilliant performance, and then sift through the track listening for parts that were keeping my ear from focusing on that brilliance. If I came across anything that startled me, or annoyed me—took me out of the 'moment'—then I would look for ways to remedy it. Maybe go to a different night or another concert for a note or a phrase. There was surprising little to do, however.

The vocal tracks were very good. I didn't want to just put an Antares Auto-Tune across the whole vocal track, because as a note changes pitch and AT pulls it back, you lose inflection. I used PitchDoctor for Pro Tools on selected notes. It allowed me to place the centre of a moving note wherever I want it and then it tracks the curve as it rises and lower; in other words, it lets a bend be slid into place. It sounds very subtle.

Each concert was pretty consistent. On a given night, a given mood prevailed. On a quiet night the tempos were a little slower and everything was a little more subdued; people were not as 'present' in their microphones. On a loud night it was the reverse. I faded to silence between tracks so as not to give the illusion that this was a single concert from beginning to end. After all, the album took place over four nights at two different venues. It would have been too contrived to let the tracks run continuously into one another.

The band [Passenger, comprising bassist Roscoe Beck, keyboardist Bill Ginn, drummer Steve Meador, saxophonist, flutist Paul Ostermayer and electric guitarist Mitch Watkins, plus vocals by Jennifer Warnes and Sharon Robinson, with John Bilezikjian with oud and mandolin, and violist Raffi Hakopian] was brilliant! Passenger had played together in Austin, Texas, and were introduced to Leonard by Henry Lewy. Leonard isn't much of a 'time-guy'—his style is fluid and moving—and the band was able to flow with him as a single entity.

One of the reasons that the album sounds so great is because Leonard uses low stage volumes. The monitors are extremely quiet, so there is little bleed through into the stage mics. We didn't have that hollow sound that results when the monitors leak into everything.

All the editing, comping and trial mixing was done in Pro Tools. Do you use Pro Control?

No, just a mouse. I have worked with a control surface on past projects, but was surprised how little I used it. I prefer a mouse. You can draw [level] profiles over the track, which seems very intuitive. With Pro Tools, I love being able to see things as well as hear them—to draw a level changes and make those impossible edits and crossfades. Comping elements together, automating EQ, and so on. It used to be that if you wanted a different EQ or effect on a chorus, for example, then you needed to split the vocal track and bring it up on two faders. And then whip the faders up and down at the appropriate points. Now it is all in Pro Tools. I don't miss those old analogue days for those types of problems.

The live album was mixed by Bill Schnee at Schnee Studios, North Hollywood. Why didn't you mix it yourself?

Certainly, I was capable of mixing it myself but Bill is a genius. We first used a remix engineer on *Cohen Live* and it worked out very well to have an extra pair of ears

A selection from the considerable body of Ungar's work with Leonard Cohen

at that point. Basically, producing and then mixing an album is a lot to handle. I'd worked with Bill on *Cohen Live*—he will probably mix this new album—so, 'Why not?' We could afford it, so it let me sit back and listen objectively, rather than being too close to the mix.

I had made EQ, compression, reverb and panning effects in Pro Tools the way I heard it, and handed the tracks to Bill Schnee. Who promptly took all the effects off [laughs] and brought each track up individually through his analogue console. Bill added some audience tracks, and after he had the vocal EQ'd the way he liked it, hand de-essed it inside Pro Tools, by riding level on the consonants.

Could Bill monitor what you had done Pro Tools, as a guide?

Yes, there were a couple of things that I had done in the Pro Tools Session. Firstly, there were 'mix niceties' that he was able to do better in analogue. And then there were certain automated EQs and rides that had to do with tricky edits—for example, a saxophone solo with a phrase from a different night that had to be blended using EQ and level changes. We left the Pro Tools automation on that track so that levels and EQ could be implemented. I gave it to Bill as a composite track.

Let's move to the new album, which you are currently completing. What is the focus?

Leonard is always working in several mediums: books, poems, songs, and so on. He put out a book of poetry two years ago, and turned his attention to a new album project. Originally he was thinking of reading some of his poems, and it mushroomed into the current project.

This new album in a collaborate effort with Sharon Robinson, who in 1979 was a singer in his band, along with Jennifer Warnes. Sharon is a well-known songwriter, and a Grammy winner for 'New Attitude'. In 1987, Sharon wrote a song with Leonard, 'Everybody Knows', which went on to be covered fairly heavily by many artists. In 1993 they co-wrote 'Waiting for the Miracle' which ended up in a few movies. Sharon and Leonard collaborated on all 10 songs we are working on for the album; Sharon is also handling the arrangements.

What we are getting on these tracks is a very intimate and beautiful sound. The tracks are mainly sequenced samples; there's a little bit of guitar. Sharon creates the tone and feel while she writes the chords, taking cues from the lyrics. They pass the tracks back and forth a lot, adjusting the key, tempo, and musical elements in the song. Leonard has a Technics SX-KN6000 synth with a built-in

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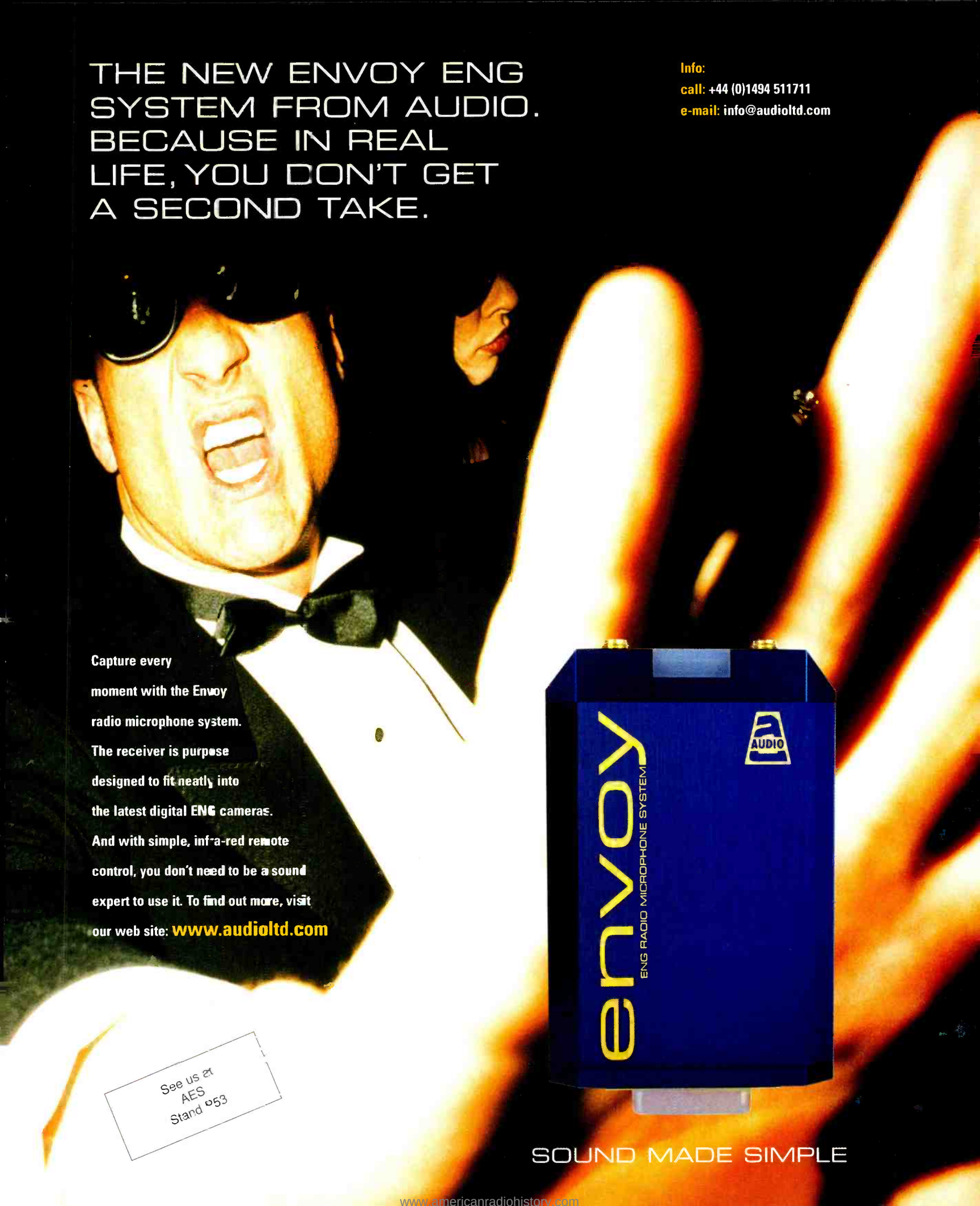

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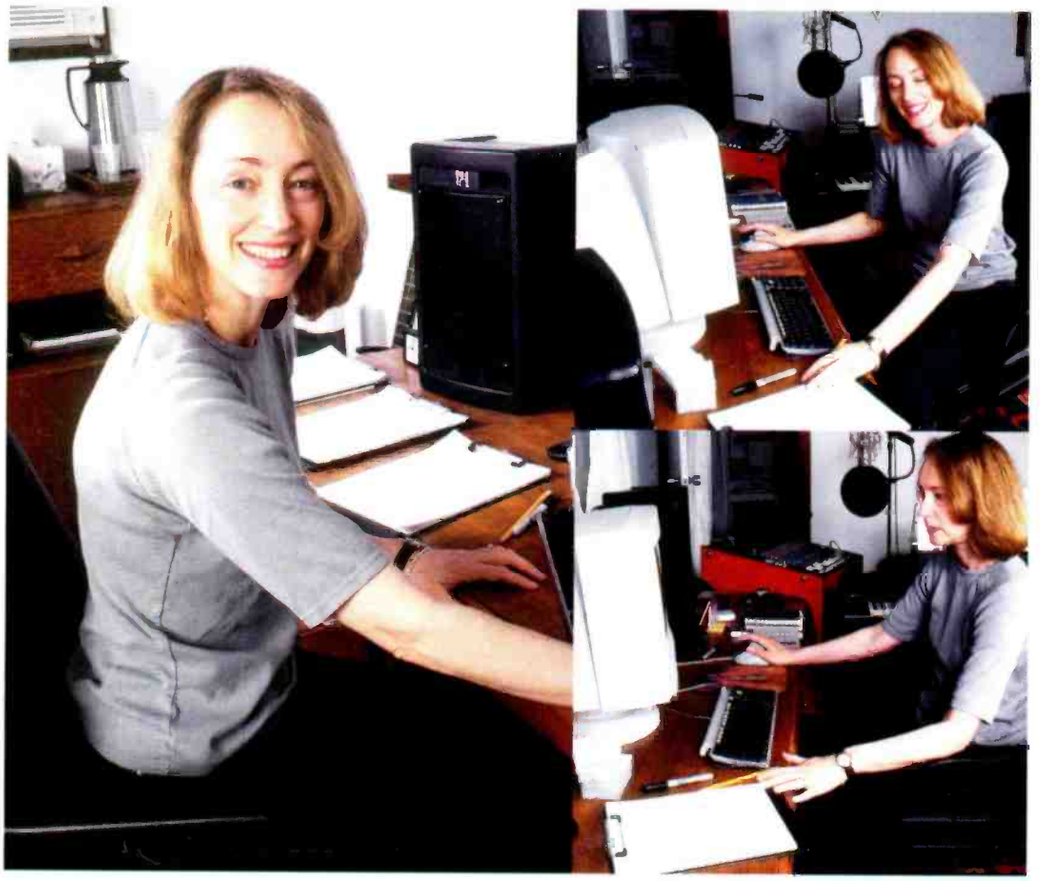
sequencer, which contains a tremendous library of ethnic instrument sounds that he uses for experimentation.

The basic tracks are sequenced at Sharon's home studio. The next thing recorded is the vocal, which dictates the direction the song will go after that. Later, we will go out to Westlake or Capitol, and overdub as required. The songs seem to be hanging together as a collection, with different moods and textures. Leonard is meticulous about the emotional and poetic aspects of a song. Often the song changes as we develop, as he maybe 'discovers' the song. Leonard constantly tinkers with the lyric as he finishes a vocal, maybe changing the words and re-recording all or part of the track. He might even complete a song—it happened the other day—and then reject it because it doesn't work for him.



I see that you have set up a microphone here for Leonard. He records his own vocals?

On this album, yes. He likes to wake up at 3 o'clock in the morning, wander out into the studio and murmur into the microphone. But he is quite adept with recording hardware. We have set up a Mackie [CR104] mixer with returns from a Tascam DA-78HR so that Leonard can record different vocal takes. We premix his headphone mix and preset his levels. Normally, he records against a simple backing track—bass, drums, synth chords—using a U67 plugged into a Neve 1272 mic pre-amplifier and then patched directly into spare tracks on the DA-78. He is extremely computer literate, but doesn't want to learn the Pro Tools program; he prefers to stay with his familiar tape setup. We record everything at 24-bit on the DA-78, and then bounce it over digitally to Pro Tools against time code for comping.

Do you think that you have a specific production style?

I don't think I have a philosophy—simply to facilitate the creative process and capture the best tracks I can. Call it what you will, I basically take care of the technical details, and am available for consultation on creative areas. I sit behind the console and offer advice on what sounds good and what doesn't, if asked. If there is another producer in the room, then I would keep quiet and let that person give direction. Leonard has his own vision of what he wants. During the mix he is extremely involved; he knows in great detail what is going to work to create the mood. When the mood is not working he knows instantly. Sometimes he'll know what he is after specifically—like more bass—but sometimes he doesn't know what needs to be done; just that he doesn't like the current mix.

For example, on the song 'Closing Time,' from *The Future*, we had a gorgeous track that we worked on for quite a while. We brought in new musicians and did overdubs; a great arrangement that I was absolutely in love with. And Leonard said: 'Darling it's not working'. So he disappeared for a week, played into his synthesiser at a much brighter tempo with new lyrics—it was almost another song. The 'new' version on the song was great hit for him in Canada. So what do I know?

Do you think that your gender impacts the way you work?

I have never been a man, so it's difficult to know what the difference would be. And it's hard to separate my own individuality from the sex within my own individuality. In other words, I am a quiet, intense listener, as opposed to an auteur who comes in and says it is going to be the same way as my last hit. Looking into my character, I do have a certain empathy and sensitivity and willingness to understand what needs to be done—and maybe compromise when it is necessary. If you are going to spend time locked in a small room with someone, you had better get along with them.

I know men that have these qualities, too. In this industry there have been people who have wanted to work with me because I am a woman, and there have been people who didn't want to work with me because I was a woman. People who remembered me because I was different. I think it works both ways; it is an aspect of individually, like anything else. And it's not necessarily a harder job for a woman than a man—producing is just a plain old hard job!

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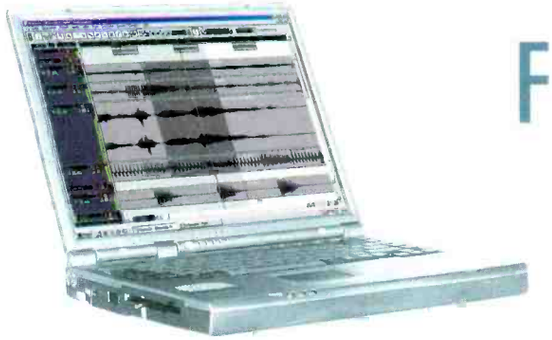

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DOWN UNDER

It's a smart idea and one that many would like to try, but Dutch studio Down Under is the first to incorporate a Digidesign Pro Control into an SSL 9000 J Series. **Zenon Schoepe** reports from the hot seat

THE SUGGESTION WAS made some time ago and was precipitated finally by a combination of forces all working towards the same goal. Down Under studios in Hilversum, the Netherlands started off in traditional fashion as the private studio of producer and song writer John Ewbank for his work with Dutch language singing phenomenon Marco Borsato. A second-hand SSL 4000 went in to the room, which was built in the basement and back garden of Ewbank's home, some six years ago. The introduction of engineer Holger Schwedt to the proceedings a couple of years ago and his move to managing and running the Down Under studio more recently stepped things up with Ewbank and Schwedt both looking for new and more efficient ways of working. A 48-channel 9000 J Series with a Pro Control, connected to a monster Pro Tools system, mounted in its centre section went in at the beginning of this year. The installation posed major problems as the original SSL had gone in to the studio when the lid was still off it and the 9000 had to be taken down the stairs in pieces after removing the 4000 in bits.

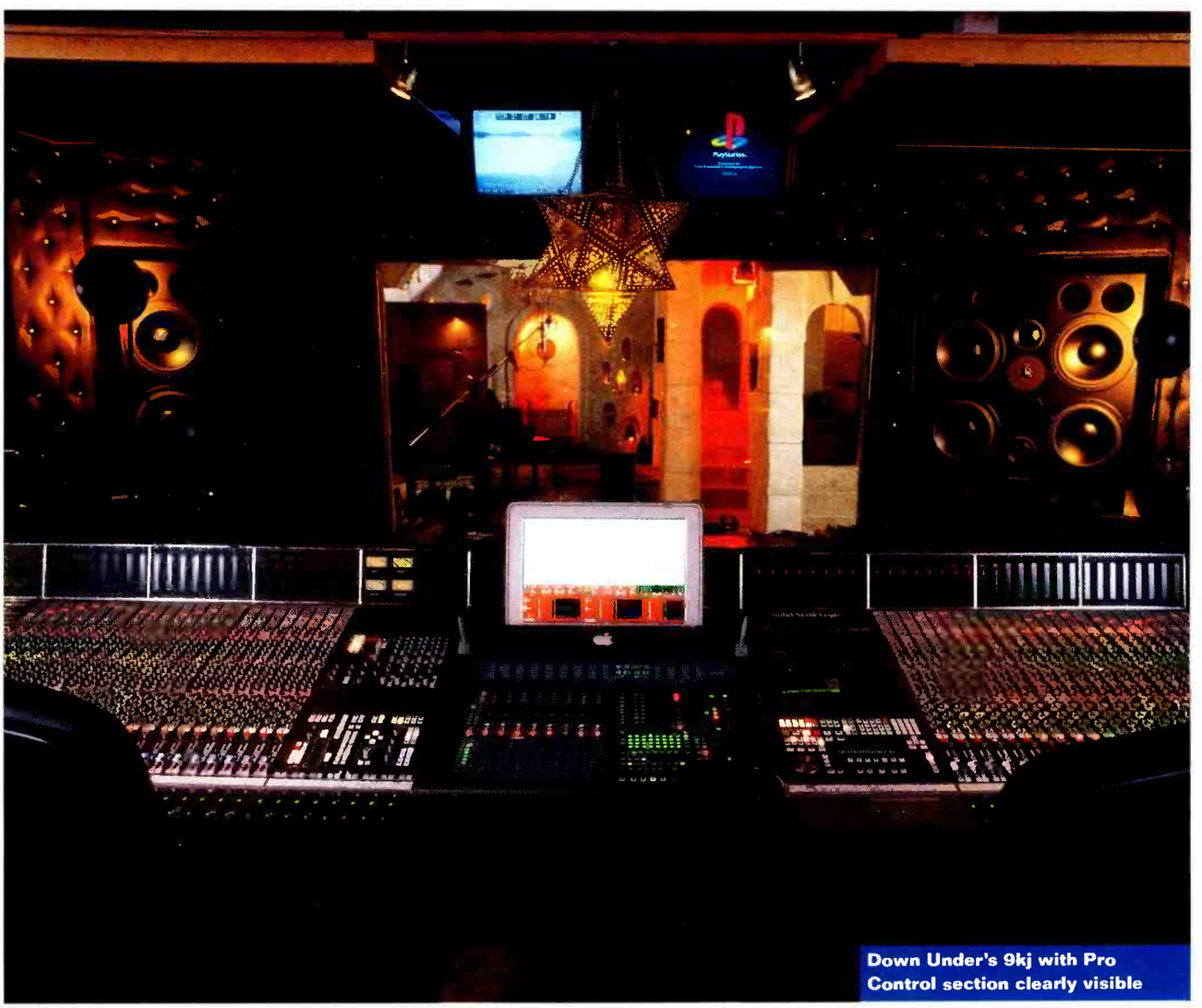
Schwedt admits that he's been in love with the sound of the 9000 console since he first started using it. 'There is nothing else that sounds as good even without the EQs and dynamics in,' he says. 'The only desk that maybe comes close is the Amek 9098. It was still a hard decision to make though as it was difficult to find independent advice from anyone who didn't have a vested financial interest. John was supplying the commercial input and SSL was the desk he knew as the world leader in analogue desk technology and we were talking about an analogue desk.'

The built-in Pro Control custom section was an essential condition and occupies what amounts to a modified producer's bay and an 8-channel bay combined. 'I was in Begbroke and told them that I wanted a Pro Control built in to the centre section,' explains Schwedt. 'They went away and 10 minutes later came back with a drawing of a 9k with a Pro Control in it. I told them that they were either very fast or that I wasn't the first to ask for this! As it is we are the first although I discovered that there was a studio in New York that had a similar idea but never went through with it, maybe because of the cost of the metal work!'

Schwedt's route to Pro Tools is an interesting one for a self-confessed analogue man. 'Two years ago I never dreamt that I would have described myself as a Pro Tools engineer and that I wouldn't show up on a session if there wasn't Pro Tools on it. The truth is that I now can't be hired without a Pro Tools system on the project.

'Two and half years ago Pro Tools was just another system to me like a 3348 and I'd record a few vocal tracks in to it, edit them and send them back to the DASH. I regarded it in the same way as I did the Akai DD1000 which I'd used until then. It was handy,' he continues. 'The Pro Tools was always tucked away at the back of the studio but I started to record more in to it, I got fast on it, and the plug-ins showed up, more processing, I was getting used to it and I started getting annoyed with the 3348, which, while it was reliable, started to look like ancient technology. The advantages of a tape transport were fading away for me.'

By the time he started at Down Under he had a Pro Control, a large screen, a G4 and he was looking to sell the studio's Mitsubishi ProDigi and Sony DASH. 'This is the first 9k studio in the world without a tape deck and I don't have any hard feelings about it,' he laughs. 'Hard disk storage is reliable, available and cheap. All the people I know in Holland work



Down Under's 9kj with Pro Control section clearly visible

on Pro Tools and they'll only use tape decks if their system isn't big enough to do it all on Pro Tools. Even those who want to record in analogue on an old Studer, somewhere along the session it will end up in Pro Tools.

'I'd been working for six months with the Pro Control next to me on the left with the screen which is crazy because on a recording session 95% of my time is spent working on Pro Tools and the speakers were over there to my right which isn't much good for the panning. The idea of putting a Pro Control in to a 9k started off as a bit o' a joke, a what if... We looked at digital desks and for the money we spent we could have bought a very nice digital desk. When it comes to digital dynamics and digital EQ there's no reason for me to look to a digital desk because I can do that in Pro Tools.'

Schwedt doesn't understand those who criticise the system on reliability grounds. 'That has more to do with the people who use it,' he retorts. 'If you have a lot of different engineers using the system with their own preferences and extensions, that can screw it up and the maintenance people in studios generally don't know enough about Apple and Pro Tools to keep them functioning and stable. We don't have any of those problems here because I understand the system well.'

Some 60% of Down Under's work is taken by internal projects but the uniqueness of the 9000 with a Pro Control parked seamlessly in the middle has not been wasted on outside commercial work. There's Dynaudio M4 monitoring and an interesting good-sized live room with stacks of mics and outboard plus the Pro Tools system with Magma expansion chassis fitted with one Core card and six Mix Farms, Avid AV option XL, Apogee, 888 and 1622 interfaces, and USD among other choice bits.

'For engineers who do not know Pro Tools I have defaults called things like 48 DASH,' says Schwedt. 'You can cover over most of the centre section and pretend that the system is just a multitrack tape recorder using the SSL transport, locate and track arming. So there's no difference to using a tape machine apart from the rewind times and I could probably program in some delays and ramp up times for that as well.'

How do you use the Pro Tools, is it just hung on the end of the desk like a multitrack?

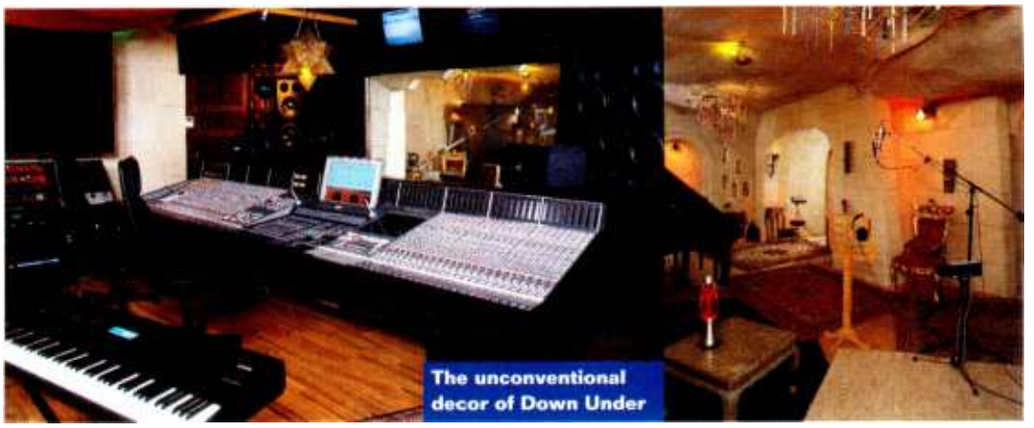
'That depends. I can run 64 tracks in it easily and I often do. If I have 20 tracks of real violins, a few years ago I would be mixing them to a few tracks on the DASH but now I mix them on Pro Control to two analogue outputs to the 9k and I put those 20 tracks in the background in Pro Tools because I don't have to see them anymore. If the producer then says he wants to hear more of a certain part of the violins I make the relevant move in the automation on the Pro Control.'

So the pro Control serves as a submixer?

'I use my 128 Pro Tools channels mixed to 48 outputs in to the SSL which is where I do my real mixing. It's controllable because you don't end up with 100 tracks on screen, 48 tracks is intuitive on a 48-channel system. But any option is still open to me and at the last stage of the mix I can still go back to my vocal comp and find another word because everything is still there. I can't go back from this way of working now and there's no way I could do it with tape.'

So you're premixing on the Pro Control and final mixing on the SSL.

'If I want small, fast moves then I'll draw them in the grid editor of Pro Tools and then I close my eyes and use the Ultimation and I try to come out on Apogee convertors where ever possible. I will have a



The unconventional decor of Down Under

Holger Schwedt at the SSL Digidesign interface

total of six AD8000s which is quite an investment.

'When you get to this point you can start to talk about digital timing. It doesn't slip because I don't use that much DSP as most of my EQing is in the analogue domain and I don't use many plug-ins. The only DSP involved is the fader from the Pro Control. If I go in to the system on an Apogee convertor then I come out on an Apogee convertor and I do my EQ and dynamics on the 9k. The signal path is cleaner than on a digital desk. The warmth that I get out of this system and the creativity within Pro Tools is amazing, it's the best of both worlds.'

Are you saying that you don't use plug-ins at all?

'If I want to I have a large list of plug-ins that I can use. If I want to do weird stuff like automated EQ I can do it off line and automate it to bars and beats but then I could also switch the signal to two different tracks on the 9k. I have all my aux sends merged so I can get to my Lexicon 480 from Pro Tools or from the desk and that means I can choose where to automate whether prefader, precompressor, or preEQ. I can also automate all my auxiliary stuff by bars and beats. There's still no advantage to having a digital desk. The only disadvantage is that I don't have total reset, I have to use Total Recall.

'During track laying I hardly use the 9k at all aside from its mic preamps. I use the Pro Tools mixer because that's where I'm working. It's only when I start mixing that I spread it out on the desk.'

The work process you describe has analogies to film mixing but what has this arrangement of gear done to your productivity?

'The best thing is that my Pro Tools screen and Pro Control are now between my nearfield monitors. I've been working sidewards on to them for a long time and this makes a big difference. It feels as if I can work a lot faster now but then I am probably doing more and trying more things as a result. Creatively I'm very inspired by it. Mixing is fast because the sonic quality of the system is that good that you will finish quickly. I'm a very experienced 9k user and an experienced Pro Tools user and it suits me well. The record companies have been knocked out by the results and I'm very pleased.'

Do you edit on Pro Tools during the session, after it or leave everything intact and take care of it at the mix?

'The track laying and the mixing melds together because I use a lot of automation, I draw faders moves during the track laying which take the track in a direction that is reflected in the mix. You can do stuff because it's non-destructive and you're not frightened of trying things. It's creative but you have to be disciplined because the sky is very much the limit. The first year I worked with Pro Tools this was a problem for me, listening to that track from a week ago which was one of 100 vocal takes. Now I make decisions, and sometimes I even throw things away, but they're the same kind of decisions I was making with tape except that they're non-destructive decisions. That's great for producers that can't make up their minds but it's also good for me because the decisions you make with tape to free up tracks, for example, are often premature because you're not making them within the context of a complete mix. This method is an enormous advantage in pop music where you want to create a really fine and well tuned balance.' □

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EXPOTUS

EASTERN PROMISE

Early eastern initiatives in digital radio may not come from the obvious players. **Martyn Green** surveys key players on the Philippines airwaves

LONG REGARDED THE poor relation of other Asian countries, the Philippines is starting to contemplate a move to digital television. Yet a decision on what system is to be used could still be almost two years away, and actual implementation is likely to be even longer. Not surprisingly, the situation regarding digital audio broadcasting—DAB—is much the same. Despite consumer interest, mainly among the elite and higher income-earners, currently little is seen to be happening to advance the cause of DAB. The major reason, of course, is cost.

Ernie Claudio is VP of engineering at Manila's GMA-7 television station. Even with regard to television, he doesn't see digitalisation coming to the Philippines for at least another four years, 'because it is going to be extremely expensive,' he points out. Digital audio broadcasting, he feels, is likely to be even further behind digital television.

Nevertheless, Gibson M Villanueva II—a sales support engineer for satellite communications at Makati-based Nera Telecommunications—is sanguine. 'With its vast manpower, I believe the Philippines is more than ready for the transition to digital audio broadcasting,' he asserts. 'Most Filipinos speak fluent English and are very eager to learn more about technology. Given proper training, Filipinos are generally fast learners, especially in the field of technology. So as I see it, the only hindrance to the introduction of digital broadcasting now is the continued reluctance of investors to invest in the technology for the country.'

Jose Gutierrez is General Manager of Manila's FBS Radio Network, and his view may well be felt by other radio stations, as they face the inevitable switchover—whenever it may come. 'At Mellow Touch, our station here in Manila,' he says, 'we have already started some moves towards going digital. In fact, in our recording studio, we record directly onto a computer hard disk. But when we go to actual digital broadcasting, we will have to go out and get replacements for all our equipment. And that's going to be pretty expensive.

'Anyway, our existing transmitter is still fairly new—only about five years old. So it will probably take another four or five years before our station really gets going with digitalisation. Another inhibiting factor is that our engineers are not familiar with how digital equipment operates, and is serviced—so if we have a breakdown, it could be traumatic, as we could be off the air. We daren't even think of that.'

For her part, Dr Rosula San Jose Reyes, an Associate Professor and the Engineering Programme Director in the Physics & Engineering Department in Ateneo de Manila University is eagerly looking forward to the introduction of DAB.

'As the successor to AM and FM broadcasting, DAB is the system of the 21st Century,' she says. 'It uses advances in digital encoding to derive a number of benefits. For instance, it will give us interference-free CD-quality sound. FM sound, while better than AM, has substantial disadvantages, like signal fading. Whenever you are driving and there are obstructions, you get fading. Also, as you move across the country, you have to change channels. These kinds of problem are overcome by DAB.'

Noting that the FM band is congested, Dr Reyes, the Electronics, Computer and Communications Director at her university, says that DAB offers more efficient use of the frequency spectrum. She comments, 'Digital compression technology has found application in recording, transmission, music and computer industries. The future technology for programme production, editing and transmission will be all digital. Digital broadcasting systems using advanced modulation techniques, may be introduced into the terrestrial frequency bands currently allocated to broadcasting, without disturbing existing radio transmissions.' She says the introduction of DAB does not mean that existing radio stations will be phased out. 'They will still be there,' she maintains. 'In areas where they cannot build up the DAB system so soon, AM and FM transmissions would still have to be provided.'

Dr Reyes believes that even though the Philippines is a developing country, nowadays there is an increasing demand in the country for better sound quality, and continuity. 'And if broadcast stations do not improve their facilities they will lose business,' she declares. 'Because, instead of trying to tune in to fading signals, listeners will just switch over to their CDs.'

'With DAB,' she continues, 'you have virtually perfect mobile and stationary reception. It has high programme transmission capacity—you can do simultaneous or multiplex transmission of signals on a single carrier.'

Pointing out that DAB can involve both terrestrial or satellite transmission, or a combination of both, Dr Reyes says, 'Since the Philippines is a country of many islands, the best sort of transmission is often by satellite.'

DAB offers the prospect of early services by terrestrial networks, and later by satellite systems. DAB technology would also be applicable in satellite-delivered trans-national broadcasting and international broadcasting.

'While the United States and Japan both have their own digital audio broadcasting systems,' says Dr Reyes, 'the European Broadcasting Union or EBU has recommended the Eureka-147 DAB system,' which is currently being considered by the Philippines. 'The advantage of the Eureka-147 DAB system,' she continues, 'is that it is also capable of carrying independent data services, compatible with radio data systems. So not only can audio be transmitted, but so also could text messages.'

The Eureka DAB project is a consortium of European partners, with Germany, France, Holland

John Dela Pena, of MBC's DZMB radio station

Johnny Ace, DJ on "DWRR 101.9 for Life" Radio, Manila, at ABS-CBN

Joe Fandango, of MBC's Love Radio, Manila

ABS-CBN's anchor Atty. Francis Pangilan, technician Ray Aganon, on DZMM 630Mhz

and the United Kingdom launching the project in 1986. 'They started off by looking at the problems with FM, and investigating the kind of technologies that could overcome these problems. It was initially planned to last only from 1988 to 1991. However, when they saw the benefits that could be derived from DAB, the project was extended. Phase Three of Eureka, known as Eureka-147, continued with individual companies, like the BBC, getting involved, along with manufacturers. Because one of the other benefits would be to manufacturers—as everyone will have to change their radio receivers.'

Dr Reyes says digital audio tests have already been conducted in Asia, with Singapore participating, 'and a study group in Taiwan has been looking at the idea of producing digital radio receivers.'

When asked how she felt things are going in the move over to digital audio transmissions in the Philippines, Dr Reyes indicates that despite consumer interest, currently little is happening to advance DAB.

'Actually, I don't see any strong initiatives at this time. For instance, I haven't heard of any conference, seminar or training sessions on the matter. When I first made a presentation on DAB to a local forum, I don't think it included anyone from the broadcast industry. But I'm not sure if they were not informed about it or simply did not receive an invitation.' She adds, 'Although of course there is a lot being done with digital recording, in terms of transmission, I don't think there have been any positive moves by any sector of the industry here towards digital audio broadcasting.'

What may be holding things back, in Dr Reyes' opinion is that attention is currently focussed on expanding the Internet, along with mobile cellular networks and their applications. 'All efforts and resources are given over to these areas,' she explains, 'so I don't think digital audio broadcasting can simultaneously have a similar impact, or parallel the efforts in those areas at this time.'

Manila Broadcasting Company's rooftop satellite dish

Asked how long she envisages it might be before the Philippines starts full transmission of DAB, Dr Reyes answers, 'Probably a long time from now. Not until several other countries in the region, or a number of the first world countries, have successfully implemented the system.' However, Dr Reyes sees the moves towards convergence progressing, 'Relatively fast for a third world country like the Philippines. It could even be made faster if helpful policies were in place.'

Commenting on Eureka 147, and its introduction in the Philippines, Dr Reyes says, 'Since most of our systems use the American standard and Japanese designed appliances, in my opinion it might be difficult to implement the European standard.'

Whatever choice is made, Alexander Saragpon, an engineer at Mabuhay Satellite, feels his country is well equipped for both digital audio and digital video broadcasting, because it has the Agila-2 satellite. 'This is already being used by many major cable TV operators and broadcast channels as the medium for their digital technology,' he says. 'However,' he adds, 'I must admit that the high cost of equipment is a major stumbling block to going fully digital for the operators—and even more so for the poor consumers, as even digital radios cost around US$300 each.'

But, according to Saragpon, Direct-to-Home services, and the convergence of audio, video, and the Internet, has great potential in the Philippines. 'PLDT [the Philippines Long Distance Telephone company] already has the equipment in place,' he points out. 'It has its own cable company, Home Cable, its own Internet company, Infocom, and its own satellite company, Mabuhay. So, from our point of view, we can't wait for DAB to take off.' □

WINNING WAYS

Pushing the boundaries of betting along the trail of technology, William Hill has a new Net operation built around Fairlight's Co-Star. **Kevin Hilton** goes to the track

IT'S NOT UNUSUAL to be stopped in the street and asked for directions. It is a little more unusual to be stopped, as I was recently, and asked specifically where the nearest betting shop is. Conjuring up an image of someone who was in an unfamiliar area and just had to get a bet on, this experience sums up the power and pull of gambling, that need to be involved because it could make you that fortune.

Horses are one of the most popular bets: globally, $40bn (£24bn) is wagered on flat racing, $17.2bn (£10.3bn) of it placed in Japan, home of the Japan Cup, the biggest flat race in the world. This meeting pulls in bets of around $206.3m (£200m), while such races as the Kentucky Derby and the English Derby attract massive attention from serious and casual gamblers alike.

William Hill is one of the world's leading bookmakers and specialises in legal off-track wagering. Founded in 1934, the company operates over 1,500 licensed betting offices in the UK, with in excess of 300,000 telephone clients world-wide. This makes William Hill the world's largest telephone betting organisation and its Internet gambling site is growing fast. Employing over 9,000 staff, the company has a yearly turnover in excess of US$2.5bn, with an international division based in St John's, Antigua. This service is operated by Betwilliamhill.com Limited, which offers world-wide on-line betting that is completely free of any tax or deduction and is licensed by, and subject to, the laws of the Government of Antigua and Barbuda.

TV and radio is not the only outlet for 'broadcast' coverage of sports events. The punters sweatily grasping their betting slips in a bookmaker's shop need to know whether to leap in the air with joy or tear the slip into pieces in frustration. The primary supplier of TV pictures for bookmakers is specialist broadcaster SIS and while William Hill takes TV pictures from this source, it produces its own audio feed, Shop FM, from radio studios where presenters and commentators keep the faithful up-to-date with the latest prices and results.

The Internet is seen as a new outlet and so it was decided to create a specialist service for the web. A basic service that re-broadcast Shop FM began in late 1999. A specific Internet service was launched in June 2000 and is available through williamhillradio.com. A team of producers and editors assemble material on a daily basis and prepare it in the broadcastable packages, that form the basis of the following morning's transmissions. During the day, as the race meetings commence, live commentary and interviews are received and either relayed or pre-recorded for later broadcast.

William Hill Radio is produced from two dedicated studios in William Hill's offices in the northern England city of Leeds, while Shop FM continues from its own studio centre. William Hill Radio Studio 1 is the main live room while Studio 2 is primarily a production suite, although it is also used for a dedicated service for the Greyhound Racing Association. As this sport is solely an evening activity, Studio 2 is able to fulfil its primary function during the day without any conflict. There is also a production area for the preparation of material.

Material such as interviews comes into the complex on either standard telephone lines or ISDN connections. Each of the three technical areas houses a Fairlight OnAir Co-Star radio automation workstation, which were installed in December last year when the service was relaunched. These are connected to a background server so the packages for broadcast—which are recorded and then edited on the workstations—can be easily accessed. Studio 1 additionally features computer monitors and TV screens; MiniDisc, DAT and CD players; three telephone balance units; two ISDN lines; and a cassette machine. There is a simple mixing desk but the core of the setup is the Co-Star.

The service broadcasts live for 18 hours a day but is effectively a 24-hour operation: live programming runs from 8am to midnight with a mix of commentary and interviews. The Co-Star is used in its live assist mode during these hours; after midnight and until the beginning of the next day's live programming, there is an automated overnight sustaining feed of interview packages, reviews of the day and a preview of the upcoming day's events.

This material is prepared by three producers and a production assistant. The presentation is intended to be short and snappy, with up to three presenters either linking interviews, giving their views on upcoming events and providing commentary on the races (TV monitors in the studio relaying SIS pictures). Explains project

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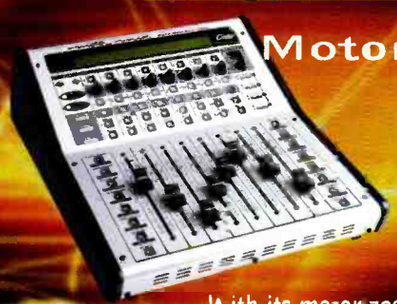

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manager Mike Whitehead: 'We get the information from the traps and re-transmit it. The idea is not to try to tip—we don't want to influence the betting but there is the nap of the day [when a horse or greyhound is named as a probable winner of a race]—so we use independent journalists and broadcasters.'

Coverage is intensive, particularly as even an average race day can offer up numerous races. 'We jump from one meeting to another,' explains channel manager Jeff Graham. 'There can be 10–12 races in each meeting and up to five meetings a day. And on top of that there are the greyhounds.' This high turnover of potential material demanded an efficient infrastructure and it was decided to use the Co-Star for editing and play-out.

Programme material is fed into the workstations, scheduled and played out in sequence. Co-Star can be fitted with specific modules for different functions. At William Hill, the Acquisition package is employed, which includes the Item Manager, enabling the creation and management of groups and items, including intros, names and descriptions; Quick Record for recording audio into the Co-Star audio library; the Multi Channel Recorder, used in conjunction with several digital audio cards; the Looping Recorder, a single track version of the Multi Channel Recorder; the Single Track Editor for topping, tailing, cutting, pasting and inserting material; a Wide Area Network environment In-Out box for distributing audio files to remotely located audio libraries; and a News Wire Reader for use in capturing news text from news service providers.

The William Hill Radio team wanted to be able to automatically deposit a story into the system and then drag the saved audio file into a cart machine-style player, enabling it to be played-out quickly. Two of the three Co-Star workstations are used for acquisition and production; the third, located in Studio 1, is primarily a play-out unit for material that has already been edited and compiled into broadcastable packages.

While the studio setup itself is pretty much a traditional radio model, Jeff Graham is convinced of the fact that the service as it is now would not be able to run with an automation system. 'Automation makes this possible,' he says. 'What it provides is the beauty of putting things in an order and being able to rotate and re-rotate the material, which would be difficult otherwise because we are dealing with 30- to 40-minute rolling information.'

Co-Star is a Windows NT-based system, providing users with a database that operates in conjunction with a central server. Tim Cuthbertson, CEO of Fairlight OnAir, describes Co-Star as 'an operational shell run by software that creates a working environment for audio and content management purposes'. He explains that the manufacturer became involved in the William Hill Internet Radio project after the project team saw the Co-Star system demonstrated at the Sound Equipment Broadcasting Show in Birmingham last year.

In addition to the standard radio broadcasting automation functions, the system was being shown with a preliminary version of Co-Star's Internet publishing software. This feature has now become an important factor; during March a new web site was due to go live, giving access to specially prepared contemporary material and the service's archive. 'What we're looking to do is supply audio straight from the web site,' explains Mike Whitehead. He added that the infrastructure was in place and, at the time of writing, it was a matter of buying the right modules from Fairlight OnAir.

Co-Star's Internet module includes automatic web publishing, multimedia management (of audio, text, video and other images), audio-on-demand with format conversion and full XML interface. The intention appears to be to broaden William Hill's services and, by extension, broaden the bookmaker's audience. 'There are a lot of people who know about William Hill and they are our target audience, through the existing channel,' Whitehead outlines. 'In the future we want to target a new set of people who want sports information and have access to computers or other multimedia equipment.'

The extended service will include hourly and half-hourly news in its schedules, covering all sports, not just the obvious ones people tend to bet on. 'It's not just pushing betting but William Hill is a strong brand name that we can build on for more general services. We see this new web site as an added value,' says Whitehead. However, he concedes that there will still be plenty of people accessing the site whom do want to bet.

Jeff Graham observes that the new audio service will be completely different to the present rolling information sequence. He explains that material will be sourced from Co-Star and saved to hard disk on the main server. 'A lot more archive material will be available to the user,' he says, 'including races from the previous week, links to interviews and so on. The radio service offers what comes along on; the web site is more specific.'

The radio service is streamed in the Windows Media Player format, although it can be read by other players, with each studio having its own feed. Within the studios a dedicated streaming media encoder, the Pro-Bel Clari.net, converts the audio into an IP bitstream. From the Leeds studio the feeds are piped to telecommunications infrastructure company Energis along a kilostream line rented from British Telecom. This links into a private circuit within Energis and thence to a streaming server that is connected to the Internet.

Chyron Streaming Services, a division of Chyron Corporation, which is also the parent company of Pro-Bel, provides the streaming expertise for William Hill. There are currently two streams: one for horse racing, the other for dog racing. As well as providing the connectivity, Chyron also supplies the logging tools that enable Jeff Graham to measure how many people access the site and how they use the service. 'The busiest time is Saturday during 3pm and 6pm,' says Nick Pywell, head of technical services for Chyron Streaming Services. 'We can tell how long people are logged on for and at what time.' He acknowledges that users may have a slight wait before the streaming starts but that this depends on the quality of connection.

Williamhillradio.com may be a very specific service with a defined audience but it is clear that the bookmaker is keen to become a more general sports information broadcaster. Its use of streaming technology may even influence other, more established radio operations. Don't bet against it... □

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FIRST WE LISTEN

EXTENDING THE 'CAST

Much talk but rather less understanding surrounds use of the Internet for radio broadcast. **Herbert Sedation** of RCS explains the 'why's and 'how's of webcasting

WHY WOULD YOU WANT to put a radio station on the web? It might be the only output medium available or you may want to provide a service to listeners outside your transmission area. Either way, industry feeling is that only niche formats are truly commercially viable because—as we all know—someone has to pay for the provision of the service, and currently, that is the broadcaster. Alternatively, non-niche broadcasters use the web only as a value-added service to complement their day-to-day broadcasting—London-based Classic FM, for example, has many listeners in North America courtesy of the web.

You would think that getting on-line is easy, but it usually involves a complicated route through the Internet minefield. An average radio station that broadcasts on FM or AM will either have an analogue 'land line' to the transmitter site or, if it's more modern, it will have a digital link—normally on a either BT MusicLine or a kilostream with an audio codec. The approach to getting the station on the Internet is much the same. Fig. 1 shows the similarity between webcasting and conventional broadcasting.

Taking the output from the station studio switcher, the audio may be processed by an audio processor. This is mostly for AGC (automatic gain control) and peak level protection purposes, and a basic compressor-limiter may perform this function quite satisfactorily. The next stage is audio encoding. This is performed essentially by a PC with a soundcard running encoding software. There are a number of different 'encoders' available—some free to use, some licensable. Popular encoders such as Windows Media Player, Real Audio and QuickTime require applications (or Players) to be downloaded onto the listener's PC and the radio station needs to take a commercial decision about which format or formats to support. There are also non-downloadable formats such as ClipStream.

Not only does the station need to decide on an encoding format, it also needs to determine the bandwidth of the feed and this often determines the type of connection between the station and the ISP (Internet service provider) where the audio stream is received and distributed. The ISP is effectively the transmission service provider in the same way that NTL or Crown Castle may provide FM or AM transmission facilities.

The most important consideration here is the speed of the link the listeners may have connecting their machine to the Internet (Bandwidth to Target). Factors such as distance can impact performance due to the number of nodes that the signal has to go through between the station and the user. At certain times of the day when Internet traffic becomes congested it can become difficult to achieve respectable performance from any connection! Not many regular home users currently have broadband access so most stations should assume that their listeners will be dialling up over low bandwidth connections, and choose 28.8kbps as the optimum speed.

Even so, it is still desirable to offer listeners a choice of connection speeds in order to accommo-

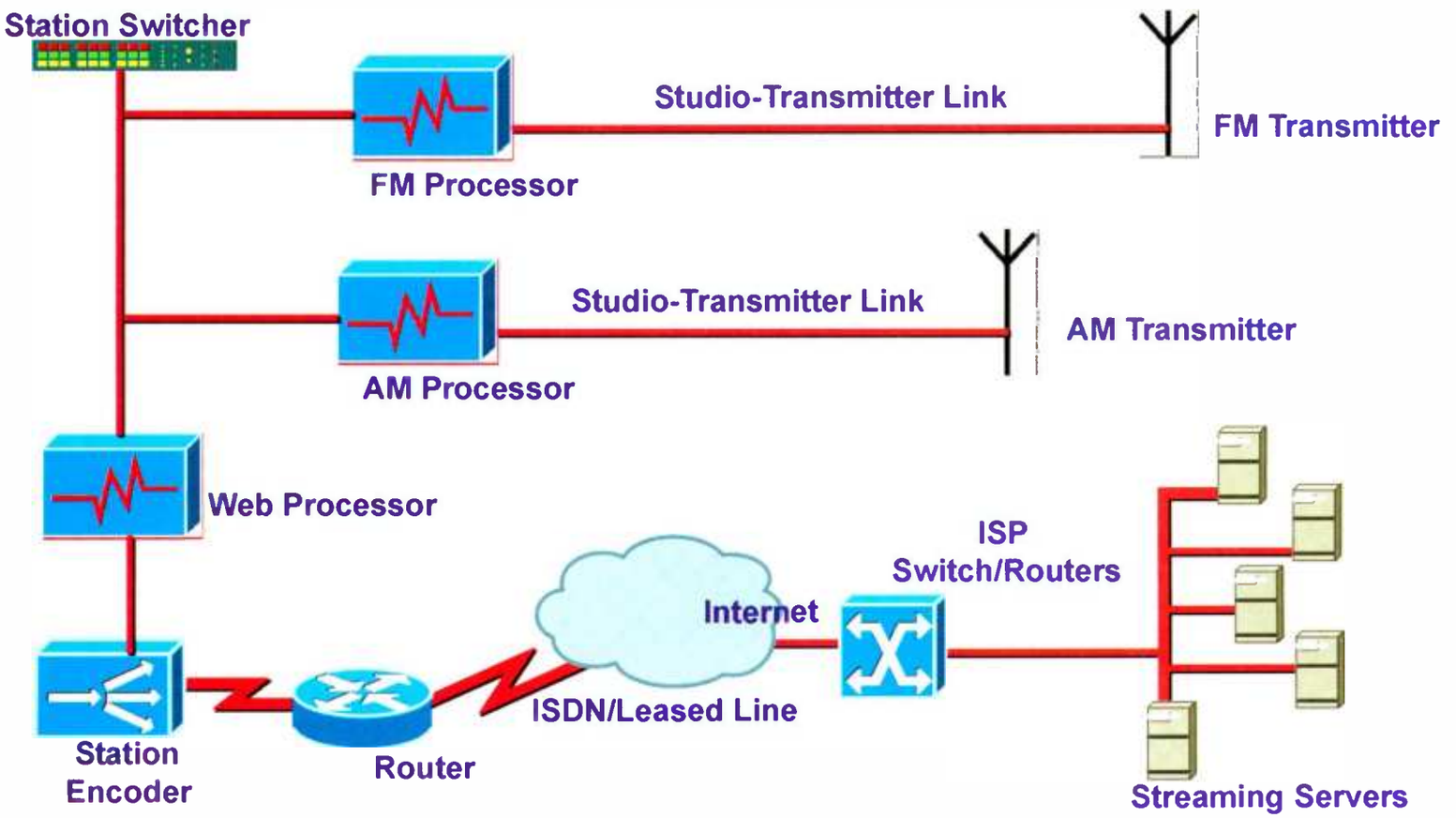


Fig.1: The similarity between webcasting and conventional broadcasting

date the differing speeds of their own connections, but an encoder and the relevant bandwidth will be required for each connection speed offered. One PC may be used to encode several streams at different speeds and formats (which may or may not contain the same audio) but one soundcard (or soundcard channel at least) is required for each stream. The latest generation of Real Audio can even multistream at different bit rates from one encoder, where the client software will choose the applicable bit rate depending upon a specific Bandwidth to Target.

Most listeners will not be listening to the station in 'hi-fi quality'. In fact, most will be using small multimedia speakers. This entire process uses high compression ratios throughout, and audio fidelity inevitably suffers. The compromise between bandwidth and audio quality will depend upon the Bandwidth to Target chosen by the listener and therefore the rate at which you choose to encode. The implication here is that the benefits of broadcasting in stereo are questionable especially when a mono stream delivers overall better quality for the same data bandwidth.

For a single 28.8kbps audio stream the best solution will typically be a single 64kbps kilostream from the station to the ISP. This link is then equivalent to the landline in the traditional radio broadcasting model. Some ISPs can even offer limited email capacity along the same link.

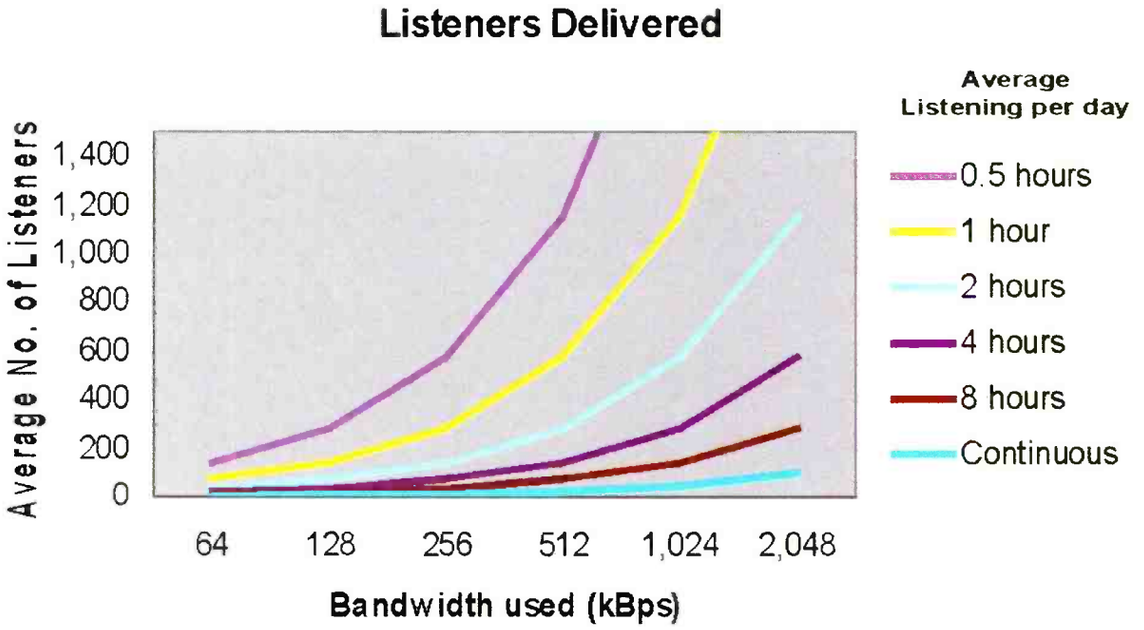


Fig.2: The average number of continuous concurrent listeners for a given bandwidth

The whole process can however be quite costly and for small stations, where web streaming brings in only limited revenue, is a cost that many will find hard to justify. Where a conventional station's ISP operates within its broadcast area, it may be possible to save the cost of the connection by locating a conventional radio receiver at the ISP. This has the added benefit of saving an audio processor (although there is a separate debate about whether processing for FM-AM suits the limitations of the Internet). Here, the audio encoder is sited at the ISP (you may have to pay rent for rack space) and connected directly across the ISP's LAN to the Media Server.

Table 1

BANDWIDTH USED (kb/s)	TOTAL LISTENING HOURS PER WEEK
64	504
128	1,008
256	2,016
512	4,032
1,024	8,064
2,048	16,128
20,480	161,280

This arrangement has disadvantages however when it comes to providing web-only audio content and-or interactive information such as artist and title information which can only come from the radio station directly.

Permanent connections are being slow to become truly cost-effective and so other solutions are worthy of consideration. In the UK at the time of writing, using ISDN dial-up lines and the BT Surfworld product is currently the most cost-effective route to getting your station on the web at an entry level. This has a number of disadvantages such as line drops* after a period of time, but the effect would not necessarily be heard by the listeners as the audio stream is 'buffered' into memory to minimise the effects of dropouts and delays associated with any Internet connection. (Automatic reconnection is enabled as part of the system). This option is not as silly as it may first appear since in any case, most Internet listeners are tolerant of the occasional audio glitch. You can of course use a normal ISDN dial-up connection but this tends to get expensive with a peak-rate telephone call for the duration of a broadcast but is nevertheless ideal for sports events and other web-only broadcasts.

It is very difficult to accurately estimate the number of concurrent users who will connect to the stream but this should not be an issue with any serious ISP who should be able to offer multiple media servers and sufficient Internet bandwidth. Each Media Server at the ISP will typically be able to handle about 500 concurrent connections. Each concurrent connection uses up bandwidth and inevitably someone has to pay for it, so it is an important consideration.

The total bandwidth required is calculated by multiplying the number of concurrent connections by the Bandwidth to Target. For example, 50 concurrent users at 28.8kbps uses equals 1.37Mbps total bandwidth (costing approximately £900 per month in the UK). This can become even more considerable if you have a large number of listeners and you are effectively paying per listener. The graph in Fig. 2 shows the average number of continuous concurrent listeners for a given bandwidth.

Sometimes, you may have an event that means that your number of concurrent listeners is very much higher than normal. This may be for a concert or perhaps a celebrity visit. In this case, ISPs sometimes have 'multi-peering' arrangements with other ISPs, to distribute the load so that more people can access your webcast—this would usually be for a cost. It is obviously essential that you ensure that your ISP has this facility available.

Until very recently, the most difficult part of getting on the web for a small station was to assess the likely costs of doing so. Few ISPs would service your requirement without charging metered usage. In effect, this meant that the more attractive and successful your webcasting operations, the more it cost you to deliver unless you could swing a clever deal with advertisers based on the 'number of hits'. It is hard to think of a greater disincentive for webcasting. More enlightened ISPs have recognised this fact and are now charging a fixed rate for 'unlimited' bandwidth. Of course there will be restrictions such as maximum concurrent listeners but this is a major step forward in the pricing of Internet audio streaming and makes budgeting for audio services possible without having to predict audience levels. What does all this mean to the radio station marketing men? The answer is in the number of listening hours generated, just as for conventional radio (Table 1).

We all know how important listening figures are for radio salespeople. A good ISP should be able to provide good quality audience profile statistics on a detailed basis. Like all statistics however they need to be read carefully, however data which is surprisingly usable (chronological and geographical audience profile) should be available from a quality ISP

to offer to your advertisers if you so wish.

Bandwidth used is calculated on an average per month and it is important to remember that nobody listens 24 hours per day. For this reason it is quite legitimate for your sales people to quote for more listeners (which can be based upon average listening hours) than the maximum number of connections serviceable by the capacity of the Media Server(s).

Assuming you have decided in principle to go down the webcasting route, how do you begin to deal with the issue of choosing an ISP? Here is a simple checklist to tick off:

- Can they guarantee enough Internet bandwidth?
- Does this include unlimited bandwidth?
- Proximity to station (in existing coverage area?)
- Leased lines are generally priced per km?
- Can you avoid a leased line altogether? Do you want to?
- Rental of rackspace available for a receiver—ie can receive the signal?
- Is it more expensive than a leased line from the studio to the ISP?
- How many users can the ISP handle concurrently before peering is required?
- Can the ISP handle your major event with significantly more concurrent connections than average?
- What happens when the server you are streaming to goes down?
- What happens when the IPS facility loses power and their UPS fails etc?
- What statistics does the ISP routinely provide?
- And, of course, what is the cost?

There are, however deals to be made—some will even provide encoding hardware and a router at your site. Shop around and take up references.

What else should you be thinking about? Some stations may have audio clips of news bulletins or promos but that involves very little interactivity. One of the problems with streaming is that all listeners are listening to a different part of the stream. Depending upon how many people are connected at anyone time and how much they buffer, the delay from a song starting in the radio studio to the time the listener hears it can be anything from a few seconds to at least a minute. If you are trying to display other information relating to the item that is playing then you want it displayed with the correct song at the appropriate time. Very little content (or metadata) can be streamed within the audio stream, but it is possible to encode a small amount of text that can be decoded by an appropriate Player.

RCS RadioShow does just this. Stations can display the artist and title information together with graphics, song notes and animated commercials and keeps them all in sync. RadioShow is an integrated product that works with the radio station's automation system and encodes 'cue' information into the audio stream together with other links for displaying graphics and animations. In fact RadioShow even 'looks-ahead' by looking at a scheduled playlist (or log) and encodes links into the audio stream before the item has been played. This means that the client application (on the listeners PC) will download graphics into memory a few seconds before they are due to be displayed according to the cue information which instructs the Player when to display any content.

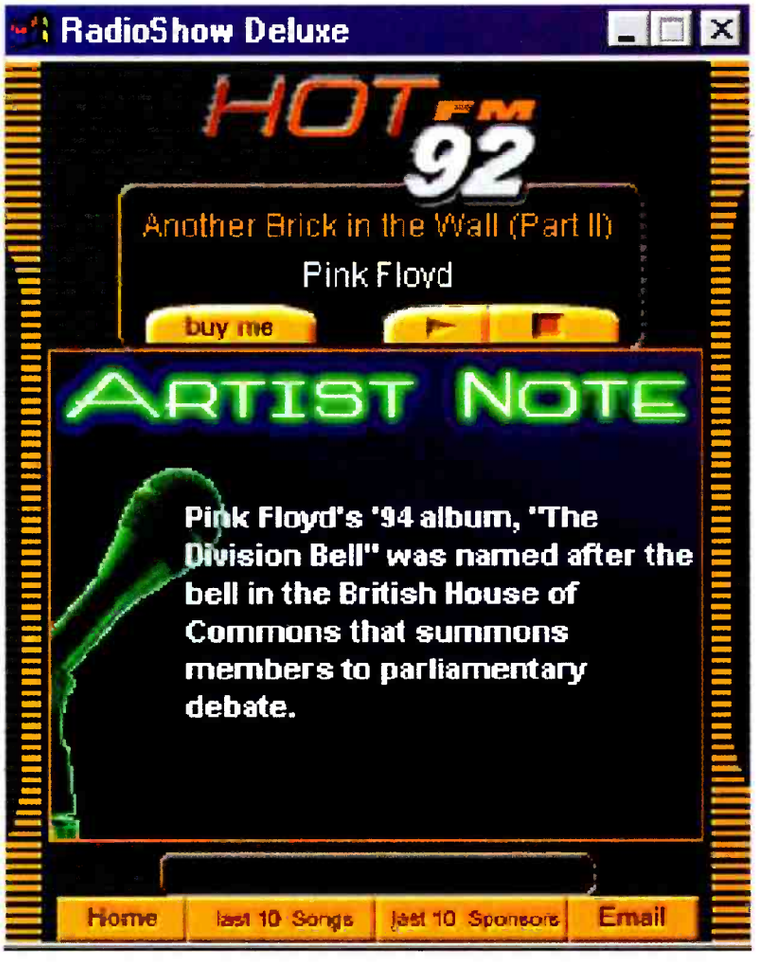


Fig.3: A typical player

The screen (Fig. 3) shows a typical player (using Windows Media Encoder). The artist and title information is displayed at the top complete with the ultimate value-added feature —the Buy Me button. In this case the radio station has an arrangement with Amazon and by pressing this button opens another window directly to the Amazon page with the relevant CD which has the song.

The display area can show pictures, logos, animations and, as illustrated, artist notes on a number of different backgrounds. Clickable links are provided not only with buttons within the player, but by simply clicking on the display area dedicated links to fan web site or advertisers can be encoded within the stream.

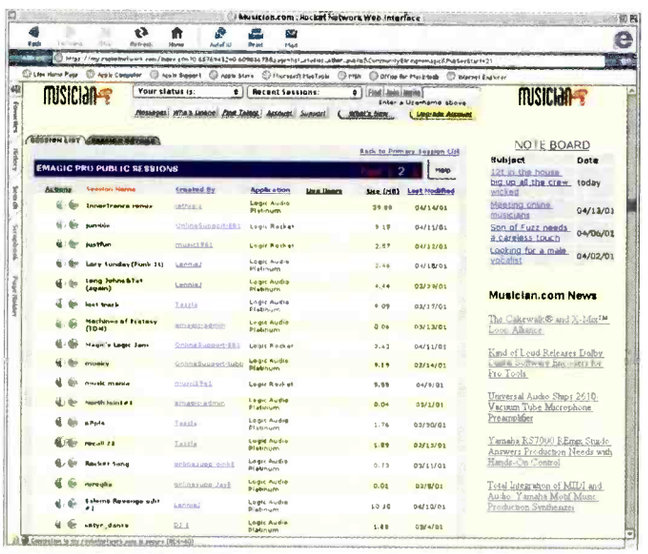
The next developments in webcasting will be governed by the costs of deploying them. The technology already exists to provide multiple channels, characterised by geography, by demographic, or even completely personalised. Several high profile providers offer these services but many have drastically scaled back their operations in the light of the recent dotcom downturn and the astronomical associated marketing costs. Remember when considering these technologies, that the telecom charging structure in the US where many of the companies and their technologies originate, is radically different to that in the UK and Europe—at least for the time being. □

SHOOTING FOR THE MOON

With Rocket Network's dream of globally networked music collaboration and production taking shape, is the 'studio without walls' an idea whose time has finally come? **Simon Trask** assesses the latest stage in Rocket's trajectory

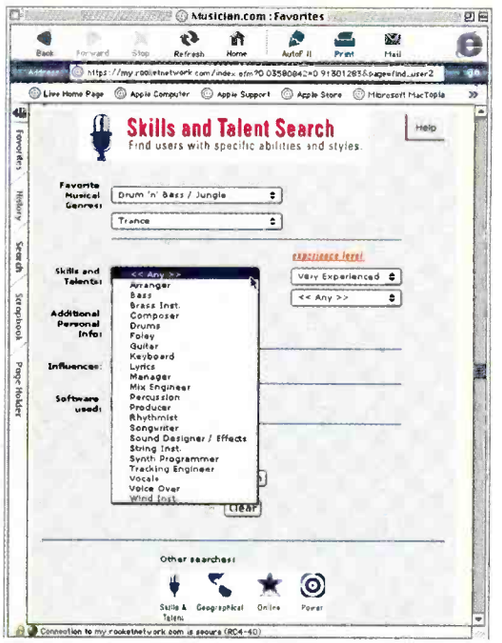
SINCE ITS INCEPTION in 1995 Rocket Network has grown from the initial four-strong team to become a corporation with $15m of financing (including a 19.7% equity stake from Digidesign parent Avid), and in excess of 40,000 users from around the world. Along the way it has wisely developed the Rocket Network SDK (Software Development Kit) which allows third parties to integrate Rocket networking functionality into their software and hardware products. Emagic and Steinberg have brought out RocketPowered versions of Logic Audio Platinum and Cubase VST, along with Logic Rocket (Mac and PC) and Cubasis InWired (PC), free programs which obviously have limitations built in (Logic Rocket is limited to a combined total of four online and offline tracks) but have the virtue of allowing people to explore the Rocket functionality without having to buy the full programs. Incidentally, Logic Audio Platinum users can also post and receive video files over Rocket, and with Avid as a shareholder in the company it's a fair bet that video will be given more attention in future Rocket Network releases.

Meanwhile, Digidesign and Mark of the Unicorn are working on RocketPowered versions of Pro Tools and Digital Performer respectively. As MotU marketing director Jim Cooper puts it: 'We view our collaboration with Rocket Network as an essential element of our ongoing commitment to Digital Performer users to support significant emerging audio industry technologies.'



Emagic Pro Public Sessions

High-end digital multitrack recorder and console manufacturer Euphonix is another company which has seen the potential of Rocket's technology for professional audio production. As well as working on RocketPowering its R-1 digital multitrack and System 5 digital console it has developed software called E-deck which enables remote online reviewing of mixes from stereo up to 24-96 5.1 surround sound utilising Rocket's technology. As Euphonix puts it, Rocket Network 'provides the infrastructure that enables a world-wide network for audio production and session management. Users of E-deck have around-the-clock access to their creative projects, accessed via Rocket's secure servers'.



RN Skill and Talent search

Two other high-end audio production technology companies that have announced they will RocketPower their products are DSP Media and WaveFrame—the Postation II Digital Audio Workstation in the case of DSP Media, the FrameWorks/DX and WaveFrame/7

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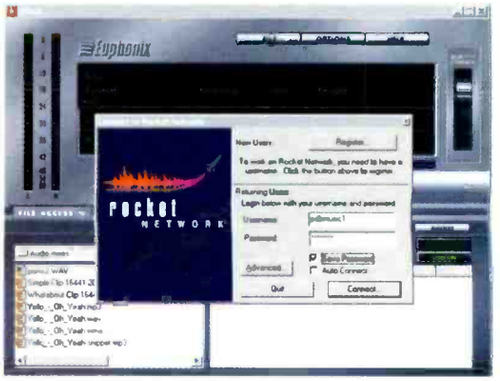
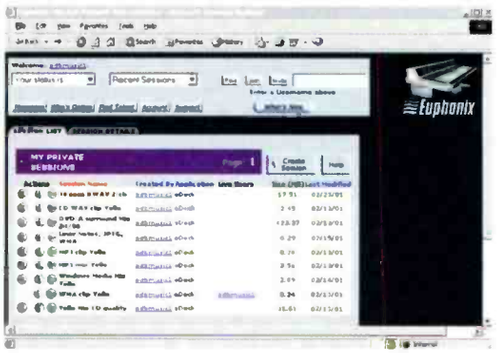
Digital Audio Workstations in the case of WaveFrame.

Rocket Network defines a RocketPowered application as 'any program that writes to the Rocket Network Application Program Interface, enabling it to communicate with other RocketPower applications via Rocket Network'. Users of RocketPowered applications can sign up online and join one of several branded Studio Centres currently hosted by Rocket on their central servers, where they can send and receive audio and MIDI parts within their familiar multitrack working environment. Studio Centres are available from Emagic, Steinberg, Musician.com, Sorinet and Futurehit.com, while additional Centres are planned from Digidesign (DigiProNet) and Rocket Network Charter Partner Strongroom Studios. Rocket defines a Studio Centre as 'a group of 10 or more online Sessions', and charges a $10,000 setup fee. Studio Centres can be public (reselling accounts to end users) or purchased purely for internal projects. Another possibility is mirroring content on local databases for clients and using the central servers just for the accompanying metadata and associated Session permissions.

Rocket Network isn't only about enabling Internet-based music collaboration. It also provides the enabling technology for structured, secure networked transfer and remote auditioning of audio around the world. All the work on a project could be done offline, and the Rocket functionality used just for posting mixdowns to a private Session within the online Rocket environment, from where they can be reviewed by the people who've been assigned the permissions to access the material.



Euphonix E-deck with Rocket



E-deck Rocket Studio

Until recently, Rocket Network had used the studio metaphor to structure the online server space. However with the introduction of v2.3 RocketControl software earlier this year the studios have given way to Sessions. Instead of 'navigating between studios', an account holder who logs into the Rocket Network web interface (http://my.rocketnetwork.com/) can view and manage of a list of public and private Sessions. Users can work in any Sessions for which they have suitable permissions, and can also create new Sessions of their own from within their RocketPowered software. For any given private Session there are four permission levels that provide access to the Session: Listen (new to 2.3), Contribute, Session Manager, and Session Owner. A Session Owner who assigns someone Session Manager permissions gives them create, delete and contribute powers for the Owner's Sessions, including the ability to set permissions for other users up to Contribute level. Users with no access permissions to a private Session can neither contribute nor listen to that Session. Six levels of account are available. At the base level, the free account allows you to enter and contribute to any public Sessions. Combined with Logic Rocker or Cubasis InWired, this enables people to explore the Rocket Network online collaborative system and web interface without having to make any upfront investment. To be enabled to enter and contribute to private Sessions (on invitation) and edit an expanded User Profile, you have to upgrade to an Access Private account, which costs $29.95. To go beyond this into creating your own private Sessions with online storage and the ability to set access permissions, you have to opt for one of four additional Private accounts: Basic, Standard, Premier or Enterprise, each with a choice of one-month, three-month or one-year billing cycles.

The Rocket approach has never been about enabling remotely connected users to play together live—hear and react to one another's playing in real-

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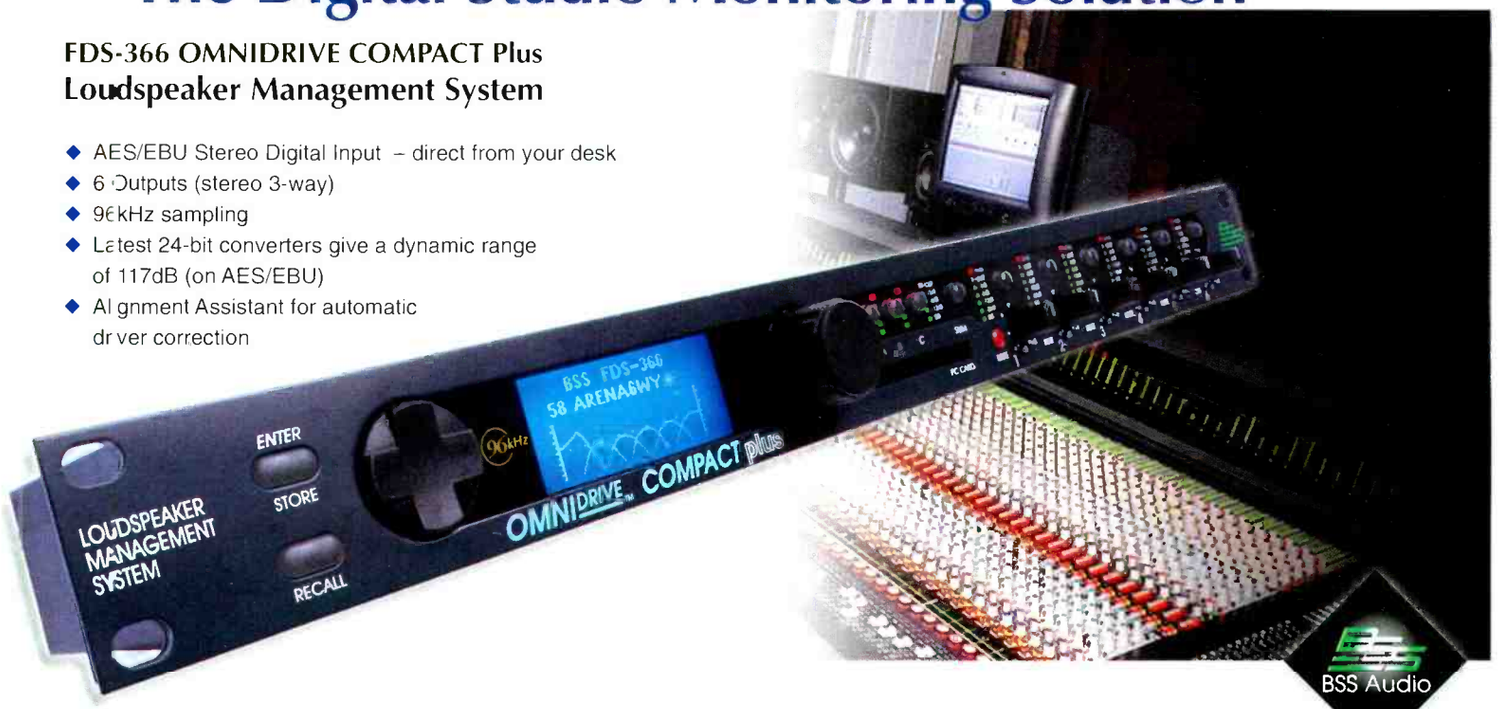

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RN Power Search

time. Consequently, there's no substitute for gathering two or more musicians in a single physical location if what you want is a live performance in which the musicians spontaneously 'inter-react' to one another's playing.

In the Rocket Network setup, a user works on a part locally, then posts it to the relevant Session on the Rocket server. The server's Session management software then handles sending the part out to all the other users who have permissions enabled for that Session. For each of these users the part will appear in a new track in their RocketPowered software, at the appropriate bar location. Another user with Contribute or Session Manager permissions for that Session can then add their own part and post it out via the Rocket server to all the other Session contributors, and the process can proceed in the same manner. There's also always the possibility for contributors to create parts independently of one another, which allows for 'happy accidents' (or complete chaos).

Because posted parts for a Session are stored on the Rocket server, the contributors to a Session needn't be online at the same time—something of an advantage, if not a necessity, given Rocket Network's multi-time-zone collaborative possibilities. When a contributor logs on to a Session, all the parts recorded since they were last logged on are available to them. Communication between Session collaborators within the Rocket environment is text-based, and can take the form of live multi-user Chat or persistent Messages and Session Notes.

Users of RocketPowered applications can set whether they want to post and receive audio parts as Source, Standard or Preview files. Source files are the uncompressed audio data, while the Standard and Preview options let you use compressed versions (currently lossy only), with user-definable quality; a codec from QDesign is available as standard. In this way you can work with smaller files right up until the final mixdown stage, thus saving on both time and money (the time angle being particularly pertinent if Session collaborators are working over dialup connections, though if the project is only a 30-second ad spot, or a track which makes much use of short repeated phrases, this needn't be such a problem). Of course, using MIDI data where possible is another way to save on time and money, but then there's an obvious requirement for collaborators to have the same MIDI instruments, which could give a boost to the softsynth market. In a similar vein, collaborators may want to have common plug-in audio effects where possible. In fact, Rocket Network is putting together a facility for users to buy or rent such software online within the Rocket environment.

While in some cases contractual relationships will already exist outside of the Rocket environment, Rocket Network is also putting in place a system of contract exchange and escrow-based payments that will enable commercial arrangements to be made on a project-by-project basis. In this way Rocket could enable talented but non-professional musicians to find a commercial outlet for their skills while working from home at times that suit them—and in turn the equipment manufacturers could benefit if extra money earned is ploughed back into buying more gear.

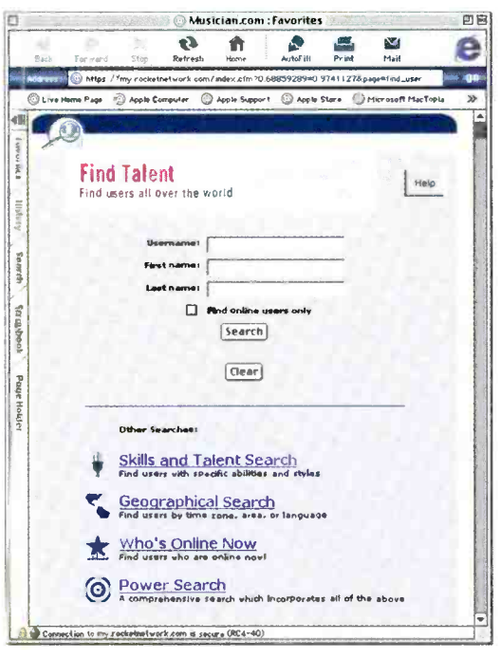
Deals with Licensemusic and Sounddogs are set to make over 50,000 precleared music tracks and 60,000 sound effects available for searching and purchase within the Rocket environment. Users will be able to audition music or sound effects online and then on purchase download them straight into their audio production software. Access to these libraries will be useful for what Rocket Network sees as a big growth area in the coming year, namely demand from increasingly media-rich web sites for audio content. In this scenario, a webmaster creates a Session within Rocket, finds and hires an audio producer as Session Manager through the Skill and Talent Search database, then delivers a brief and manages ongoing coordination through a combination of Chat, Messages and Session Notes. Depending on the brief, the producer can then pull together talent by searching the database, and/or buy in licensed music and sound effects. For instance, the brief may require a voice-over artist, or a composer to create a short original jingle, or a collection of sound effects. The webmaster as Session Owner can monitor progress and audition mixes as appropriate, and could bring in other company rep-

resentatives as Listeners. One advantage of Rocket's global nature is that an overnight project in one time-zone can be handled in someone else's daytime.

The ability for Rocket users to work with the system as an extension of their everyday, familiar recording environments such as Cubase VST and Logic Audio is, realistically, a necessary prerequisite for Rocket to achieve widespread adoption—though not a guarantee that it will be widely adopted. But the flip side to this benefit is that users with different applications may not be able to work together using Rocket. Near the end of the Rocket 2.3 User Guide, under Known Issues for All Platforms, is the following guidance: 'If you load a session that is not compatible with your particular audio application you will be notified with a dialogue that states just that. However, the applications available at this time do not handle this situation well. Unpredictable behaviour will ensue. We strongly recommend that you do not attempt to receive a session created by an application other than the one you are using.'

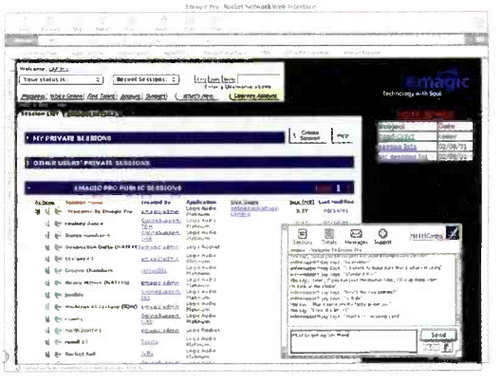
Rocket Network CEO Pam Miller points out that the company's technology has been designed to facilitate cross-application compatibility.

'Our API is a series of common objects,' she explains. 'Everybody writes their metadata to our objects, and when it goes to our central server it does a hand-off. If people have implemented our standard objects the way they're supposed to, it's completely seamless to go from one application to another. Now there's both strategic and technical reasons why some people might choose not to use all of our standard objects. We also have the facility for custom objects. So maybe one manufacturer decides that they don't want to hand off a certain type of data to another manufacturer's product, for strategic reasons. There could be reasons to not want to do that, to differentiate. However, the bigger global picture is that it's to everyone's advantage to be able to hand things off and take in other people's file formats. The reason it takes a while—anywhere from three months to a year—to implement Rocket's API is that companies have to go into their products and touch every part of what they do, to map it to what our objects are. That's what RocketPowering an application means.'



Radio Network Find Talent

Rocket Network has been slowly but steadily developing both the technology and the strategic relationships necessary to make its dream of a global networked production environment a reality. Ultimately though it will only be a workable and a sustainable reality if the technology and infrastructure are in place to enable it reliably, if the technology is supported to a sufficient standard by enough key production software and hardware companies, and of course if enough people find compelling enough reasons to use it (and bear the ongoing associated expenses of such use). But in a world in which global networked communication and interaction is becoming part of the fabric of daily business life, the signs are that the Rocket Network is an idea and a technology whose time has come. □



Emagic Pro screen

Love wars?

Destined not to learn history's lessons, the record companies are lining up a whole lotta trouble for DVD-A, writes **Barry Fox**

DO YOU REMEMBER the seventies? The mind-bending confusion over the SQ, QS, CD-4 and UD-4 'quad' surround formats, the near impossibility of finding anyone who understood what they were selling, the miserable lack of communication between the electronics hardware and music software industries and all those wince-making demonstrations that put listeners in the middle of the band or orchestra, where they never wanted to be? Well here we go again, this time with DVD-Audio.

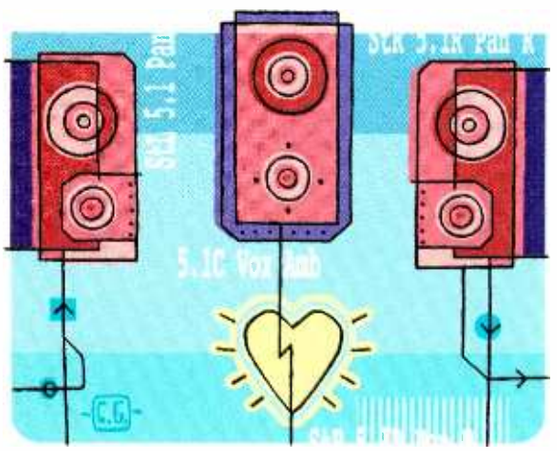
In early March the Music Producers Guild and DVD Association of Europe joined with Disctronics to stage a DVD-Audio seminar at Angel Studios in Islington. A few days earlier the APRS (Association of Professional Recording Services) had teamed up with the Audio Engineering Society at Olympic Studios in Barnes to talk about DVD-A and watermarking. Says Bill Foster, of Understanding and Solutions: 'So far Warner is the only major company backing DVD-A. There are already more than 350 SACD titles. SACD will benefit if DVD-A creates a void'.

The Angel event passed unannounced to most audio press. I heard of it by chance and while there discovered that Warner Music International was launching DVD outside the US, in 35 countries, on 6th April. Warner had done precious little to publicise the launch.

Says Warner's man in charge, Andy Murray: 'There will be in-store material, and we are liaising with the hardware companies. We wanted 50 titles but there should now be 28, including The Corrs, Alice Cooper, Fleetwood Mac, kd lang, Joni Mitchell, Neil Young and all nine Beethoven symphonies. Warner UK has not yet committed to UK artists. There ought to be some UK titles'.

Says Bill Foster: 'The major DVD-A bottle-neck is in authoring. There are tools available but using them is not for the faint-hearted'.

Rolf Hartley of Sonic Solutions says, 'We were sceptical about DVD-A but we realised there was a business when we got a call from someone saying they wanted to do that "9,6k audio thing..."'



'Surround is what's exciting,' says Hartley 'You can mine the vaults for old "quad" recordings.'

Warner's DVD-A demo disc was produced in Burbank, and compares the sound of Fleetwood Mac, *Carmina Burana*, Natalie Merchant and EL P in stereo and 5.1 surround. Andy Murray avoided ridicule by admitting and disclaiming responsibility for the blatant increase in surround-sound level which Warner Burbank had engineered to help make the stereo sound anaemic.

Andrew Walton of K&A Productions warned that clumsy use of the centre channel is, 'counter productive—it can make the front image collapse into mono'. Bob Stuart of Meridian Audio notes that some engineers are putting ambience in the centre channel to widen the image.

Walton's demonstration of an inventive *Four Seasons* surround recording met with general approval. But Simon Gibson and Rob Pinniger of Abbey Road Interactive then gave a surprising demonstration of what they call 'faux' surround for EMI Classics. Handel's *Music for the Royal Fireworks* was originally recorded in Abbey Road Studio One on analogue stereo tape. EMI Classics now plans a DVD-Audio surround reissue. The stereo tape was played through stereo loudspeakers in Abbey Road One and the reproduced sound re-recorded in DVD-A quality. The resulting sound is every bit as muddled as you would expect.

In happy contrast, a demonstration by Andrew Evans of The Pavement brought spontaneous applause. Live concerts by Underworld and David Gray put the audience right in the centre of the audience. But both were DVD-Video Dolby Digital discs.

The most impassioned response to the AC-3 demonstration came from engineer-musician-electronics wizard Malcolm Cecil who was in the audience. Thirty-odd years ago Cecil was playing standup string bass with the Dill Jones Trio, Ronnie Scott's group and the Jazz Couriers and then joined the BBC Radio Orchestra as principal bassist.

'Robert Farnon wrote a special arrangement of *Porgy and Bess* for the orchestra' he recalls. 'I was featured on bass. It was a very difficult part and I sweated blood to learn it. After we'd recorded it, we went up into the gallery at the studio theatre in Camden Town and listened to the playback. All I heard was plonk, plonk. That's when I knew that the recording industry needed musicians on the other side of the glass'.

Cecil upped sticks and emigrated to America where he designed and programmed synthesisers and worked with Stevie Wonder on this first four seminal albums. 'I loved it', said Cecil after hearing the Pavement DVD-Video recordings. 'That's the most exciting thing I've heard all day. I liked the *Four Seasons* but with those recordings I felt I was in the hall. It's not the quality that counts, it's the content. In the 1970s a lot of money went into putting 4-channel surround into the can. A lot of it never saw the light of day. It's now there to be used. But we need the major record labels to see the possibilities.

'The big five record companies now control the industry. I was at a surround-sound conference in Los Angeles recently and I asked BMG why they were not putting any surround material out on DVD. An executive got up and said, 'It's because of my sister and my brother-in-law. They said they just would not allow five loudspeakers into their living-room'.

'That's what we are up against. We've got to get round people like BMG's sister and brother-in-law.'

The kettle is boiling over

Exchanges in the American national press highlight the evolution of the recording business but miss its significance, writes **Dan Daley**

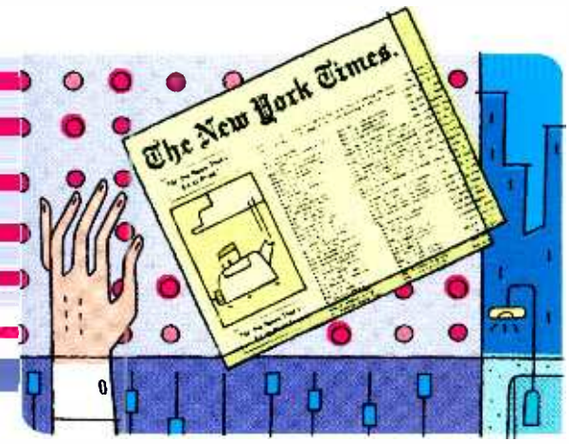
THE DISCUSSION OF the economic viability of the conventional recording studio has been pretty much an intramural one, something we kick around between ourselves between sessions, or when the guy from the leasing company calls. Again. But just as the Napster imbroglio has put the impact of downloadable music's effect on the music business into very public forums, it appears that the proliferation of personal recording technology is doing the same for the studio business.

Last February, writer-composer and adjunct professor of music composition Gregg Wager wrote an article for the *New York Times*, entitled 'Going the Way of the Victrola', predicting the obsolescence of the recording studio, through the ability of people—not necessarily musicians, engineers or producers—and their computers. The article elicited a response from Michael Tarsia, president of SPARS. Tarsia's response, which went out as an email to SPARS members, acknowledges some of the impact that project studios have had on the studio business but spends most of its energy stressing why the world needs professional recording studios and professional technical and musical humans in them.

Not uncharacteristically for a journalist, I feel strongly both ways. Tarsia's right when he makes a central point that, '...it would be very rare indeed for one person to have mastered all the skills that a trained group of musicians, producers and engineers routinely bring to a musical project'. However, he's on thin ice when he goes on to say, 'This one-man-band approach has proven feasible for some genres (techno, electronica) of music. But this small cross-section of the music community hasn't grown significantly enough in the 30-odd years of its existence to act as forecaster for global industry trends'.

Well, actually, it has. The percentage of recorded and commercially-released music made outside the conventional studio environment is huge and continues to grow. Which, I think, is why Tarsia felt the need to respond in the first place. (The way he responded could have been handled better—at over 1,000 words it would never fit on the *Times*' letters page. Also, he spells Wager's name in two different ways in the same article.) It's clear that the studio business isn't as robust as it was 20 years ago, and it's just as clear as to why it isn't. Recording's Rubicon was crossed back in the late 1980s, when a group of Los Angeles studios owners banded together to attempt to stem the tide of home studios and found that they had actually signed on to the equivalent of emptying the Mississippi with a soup ladle.

That said, however, Tarsia is right when he states,



in effect, that there will always be a need for professional, acoustically precise and technologically well-endowed recording studios, staffed by professionals for the use of professionals. Wager's presumption that the need for the professional studio is going to disappear is wrong. He writes, 'This type of easy production, distribution and even public relations is what should worry the recording industry. Soon it will have to fight back'. He is overlooking the crucial fact that major record labels have been actively encouraging their artists to record on their own equipment, and use their advances to pay for the gear, which acts as a brake on record production costs. Labels are more often in collusion, not opposition, to this phenomenon.

'What's missing in both articles is a sense of scale. Wager focuses on electronic music figures such as Carl Stone, Karlheinz Stockhausen and Morton Subotnick, and certain DJs, overlooking the fact that huge pop records, such as last year's 'Livin' La Vida Loca', were made virtually entirely on computer-based equipment. (Pro Tools, in that case.) On the other hand, Tarsia, understandably posturing for his constituency, ignores the economic consequences of a decade of intense home recording.

Napster is not going to end the commercial trafficking in music but it is killing the music business as we've known it for the last 40 years. And the digital audio revolution is not going to end the need for conventional studios, but it will reduce the need for them. It already has—I've written more commercial obituaries than I would have cared to.

What both Tarsia and Wager do agree on, from different perspectives, is that there is a change underway, and the implicit corollary that change offers as many opportunities as it does challenges. That's the central thread that has to be running though the mind of every studio owner, manager and engineer today: How do I adapt my facility, how do I adapt my skills, how do I adapt myself, to a New Order that's simply inevitable? There is more need for music now than there ever was—just to fill up the cable box requires more man-hours of music than Atlantic Records probably had to in 45 years. The Internet's need for better audio will only increase with broadband. Will we need as many studios to make rock 'n' roll records the way we used to? No. But the need for great audio isn't going to disappear. And synergies between personal and conventional studios already abound. To put it another way, sometimes when worlds collide, it can make for beautiful music.

... without a safety Net

Making a tangible asset out of the universe of possibilities contained within the Internet is proving more difficult than imagined, writes **Kevin Hilton**

THE INTERNET HAS many facets but until recently reality has not been one of them. While the technology is evolving at a fast pace and the potential grows, making people even more excited about the medium than they already are, it is as if the Internet and its associated technologies exist in a parallel universe where the hard truths of the real world do not apply.

This is patently untrue, of course, as the continuing collapse of 'dot.com' companies has now begun to affect longer established hi-tech operations. As an ISP and search engine Yahoo! would have appeared safe but even it has reported loses. Based on a poor 2000, Microsoft has already revised its revenue and earnings guidance for 2001, blaming the current weakness in the world-wide economy for a slowdown in PC sales, corporate IT spending and on-line advertising.

A general recession is expected in Europe, based on the principle that what happens in the US, where the economy has already slumped, will occur on the other side of the Atlantic not long afterwards. The recent announcement—albeit later retracted—by the Japanese finance minister that the country's once unassailable market was on the brink of collapse did not help matters.

With older markets now looking vulnerable, there are many theories as to why there has been such a sudden and devastating slow-down. Broadcasting is making money but suppliers are blaming greed for the recent spate of liquidations and bankruptcies, particularly in the equipment hire sector. The view is that the money being made by broadcasters from advertising revenue is not passed onto independent producers and, consequently, to service and equipment suppliers.

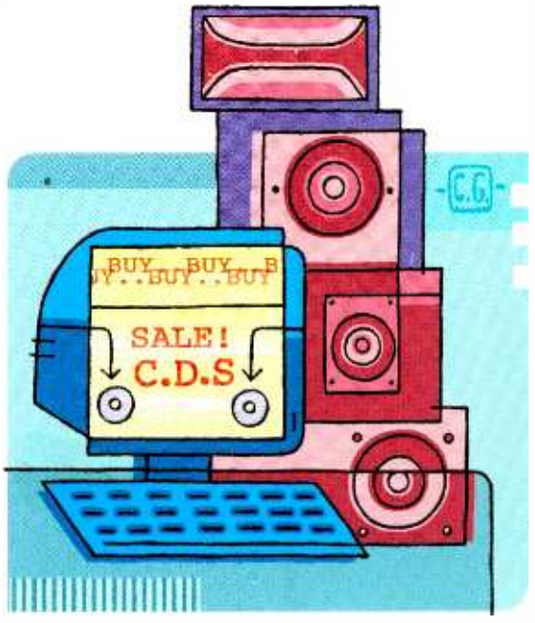
This analysis does not cross over to the new media. Advertising is still an issue but in terms of start-ups not being able to recoup their investment by either selling services or space for advertisements. The business model has been the foundation of the old economy but a clear one has not emerged for the new economy. People continue to hope, though. 'What everyone is trying to do at the moment is work out what the business model is. Once that's been done, a lot of people will be happy,' said Simon Bazalgette, chief executive officer of Music Choice Europe, last year.

Launched as a satellite music delivery service in the 1980s, MCE now offers 30 thematic channels on a number of different platforms, including digital television (SkyDigital), broadband communications and the Internet. The company is investing £10m in this cross-platform strategy, which will be spread out over the next two years. The Internet is the current focus, with 10 channels of continuous music, with access to the Music Choice web site, where browsers can buy a wide selection of music, music-related goods and memorabilia. Phase two will be a fuller move into e-commerce, with additional on-screen content and on-line shopping options.

The Internet has proved popular as a complement to conventional radio, enabling people to either listen to different stations from around the world or to their favourite home service when they are abroad. Just about every established broadcaster now has at least a simulcast presence on the Net but using it to bring in revenue is, again, problematic.

Storm Live, founded by former BBC Radio 1 disc jockey Bruno Brooks, was one of the first Internet-only services and has proved remarkably successful, although it also has cross-platform penetration on digital TV and other outlets. 'We've built up an audience and now the advertisers have seen that, they want to negotiate,' says marketing director James McDonald.

Banners are the best known and most widely used form of advertising on the Internet but as these are easy to ignore, they are regarded as virtually useless. A new rolling banner has been developed that incorporates audio and visual elements to make the advertisement more effective. 'People are now being far more creative in their use of banners and with cross-media opportunities, banners are only a part of the package,' McDonald observes.



Many dot.coms have trumpeted the number of 'hits' they get but research has shown that this is an unreliable way of measuring success: due to the banners a single hit can be counted several times, thereby artificially raising the strike rate. High Wire, which started out in the on-line travel field, believes it can specifically target advertisers by obliging listeners to register for services, stating gender, age and location. Using proprietary technology, High Wire can insert commercials into radio automation systems, with the output distributed either over Internet media streams or terrestrial networks.

As James McDonald at Storm observes, there is money to be made but companies must realise that the market is conditions-led rather than technology-led. The secret appears to be judging when the market is ready for a particular technology. One market analysts says the Internet is merely going through an 'ugly transition' and it a matter of waiting for everything to settle down. The problem is that not many people appear content to do that.

MIC MECHANICS

Valve microphones can be a good investment in both value and sound quality but they need to be treated with respect. **Ashley Styles** explains that whether you own or just use a valve mic, there are guidelines to follow

AS WITH ALL MICROPHONES, the capsule is the heart of the unit, somewhat akin to the engine being the heart of a motor vehicle. Equally, it is likely to be the most expensive component within the microphone. Hence, if only for the value alone, it makes sound sense to keep the capsule in good condition, at the same time allowing the best performance to be obtained from the microphone.

In valve microphones, as in most other condenser (capacitor) types, the capsule is susceptible to damp due to the principle of operation of electrostatic items. Initially, problems in this area might show up as intermittent noise or 'frying' sound. With capsules of a similar construction used in part of an RF circuit, (such as the technique used in some microphones manufactured by Sennheiser for example), the problem is less apparent. However a capsule will suffer from the effects of corrosion and so on associated with dampness. To help reduce these problems, it is recommended that the mic is kept in a dry storage area. It also helps during storage if the microphone, together with a sachet of silica-gel crystals, is placed in an airtight bag such as the type available with a re-sealable strip across the end. This will ensure that little or no moisture can reach the capsule and the high impedance signal path to the grid input of the valve when the mic is not in use.

If the microphone is used for vocal or wind instrument use, there will inevitably be a build up of foreign matter on the capsule surface(s). A pop filter or screen (call it what you will) can help reduce this. However, the breath from a performer contains a considerable amount of moisture, and this turns the capsule into something akin to a sticky paper fly trap. If this layer of waste, which might well contain various corrosive properties, is allowed to build up on the capsule, it will eventually start to attack the capsule surface. In the same way that plaque grows on the surface of your teeth, the damaging decay takes place unseen, if allowed to go unchecked. Once this corrosion starts, the life of the capsule will have been significantly reduced. Microphones with nickel or aluminium capsules suffer somewhat more in this respect. Regular cleaning before the layer of waste reaches the critical stage when corrosion sets in, is highly recommended. For example, a microphone used for vocals on a daily basis, should have the capsule checked (cleaned if required), every 18 months. Cleaning of the capsule is a specialist job, if undertaken without the correct knowledge or approach, you can render the capsule useless is one brush stroke. This can be an expensive mistake to make as the average price for a capsule is around £250 (UK). In some circumstances, you cannot replace or re-skin the capsule, the mistake then becomes beyond costing.

Second to the capsule, the way you look after the valve(s) will determine the overall sound quality obtainable from a mic. With most microphones, the valve is housed within the body although there are some mics that make use of additional valve stages housed within the power supply unit or PSU. Some manufactures also use valves for rectification of the HT rail and-or HT voltage regulation. Again these are housed within the PSU. So what do you need to know about preventive maintenance in this aspect of valve microphones?

The following outlines the fragility of valves in general. Valves, through their internal construction, are fragile at the best of times. The envelope that holds and protects the electronic parts is normally made of glass. Again, fragile. Sometimes the glass envelope is housed within a metal case (as with the VF14). This is done for many reasons such as screening, however, the valve within is still very fragile. Should the envelope of the valve leak, then air will reach the heater-filament and allow it to burn away, destroying the valve and rendering it useless. This might be caused by a crack in the envelope, possibly because the valve, microphone or PSU had been dropped at sometime, or the problem of corrosion around the pins and-or wires, normally only found if the valve is old or has been allowed to become damp at some time, thus allowing the gas tight seal to be broken. It follows therefore, that any item using valves must be handled with considerable care even before any power is applied.

Having stated that, valves become far more fragile whilst in use—when powered up.

The heater-filament becomes soft and delicate when the valve is working. Therefore it is more prone to physical damage through vibration, shock or similar distress. If you do need to move the microphone or PSU when in use, take great care.

If, for some reason, a microphone PSU has been powered up, with the microphone disconnected, allow at least five minutes for the storage capacitors to discharge before reconnecting the microphone. Indeed, never disconnect and reconnect any valve microphone while the power is on. If this procedure is not fol-

A favourite of purist recording engineers, valve mics like the Neumann M50 regularly find themselves documenting classical and jazz performances

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Ad Index

lowed, there is a risk of 'fusing' the heater-filament of the valve. This is more likely to occur with microphones that use the excellent but fragile Telefunken AC701(k). I can vouch for this first hand as many years ago, when I knew no better, I had it happen to one of my own microphones. It proved to be an expensive mistake to make, and one never to repeat.

Most importantly, and often forgotten, allow the microphone-PSU to cool down after use—say 10 minutes—before moving or packing the units away. Again, this is to help prevent damaging the valves fragile heater-filament as it cools after use.

Some valve microphones use connectors that are either no longer available or, at least, are difficult to find. For this reason, take every measure to ensure that the connectors are not allowed to become damaged. When connecting the microphone to its lead, always hold the microphone and connector using both hands. This applies to the PSU end of the lead also. Take care in making sure that any screw-fit type connectors, do not get cross threaded. Some variants of connectors are made from soft alloys and will occasionally require the threads to be cleaned with a brush or similar. A trace of Vaseline or similar lubricant, run around the thread of the connectors, will help prevent the connector 'locking' on. Make sure that locating pins/key-ways are correctly aligned, before connecting the connectors. Many microphones have stand mount fittings, meaning that the microphone depends upon the locking system employed by the connector used as its only source of mounting. Therefore the connector needs to be fitted tightly and securely, thus avoiding the microphone placing too much stress on the pins of the connector rather then the connectors locking system. I receive many a stand mount socket, especially ones that are used with larger and heavier microphones, that has been damaged purely through incorrect use.

Loose fighting connectors can also lead to the burning of the pins that carry HT-LT feeds, and their respective return path pins. This can lead to noise problems and the possibility of premature failure, of the connector.

You should keep a regular check on the state of the cable clamping arrangements used on all the connectors. Don't forget the mains lead.

Maintaining your microphones' appearance is not so easy with some older examples. It is unfortunate that, over many years, the casework can suffer. Many microphones are constructed out of aluminium that is normally anodised or painted. As well as providing the required appearance, this helps to prevent premature ageing of the material. The majority of older valve microphones however, were constructed out of electroplated and, for example, satin chrome finished. In comparison to the aluminium types, electroplated brass models keep well but you will find occasional pitting on some surfaces. Again, it is our old enemy damp to blame, and the only way to slow down the ageing process is to keep the microphone(s) in a dry storage area. I recently received a Neumann U47 for examination. The owner, who obviously treasured his microphone, had the good sense to keep it in a safe dry environment. Allowing it to look as good as it must have done, back in 1955.

Now and then: latterday approaches to valve mics involve reissues such as Neumann's TLM 103 (R) and Rodes 'modern' valve mic, the Classic II

There are some capsules, that are no longer available or have the ability to be re-skinned. Unfortunately this applies to the availability of certain valves also. Sometimes you are in a no win situation. When this situation arises, there are really only two options available. Either use the microphone as an expensive paperweight or consider customising the microphone by fitting another type of capsule or valve, as the case maybe. When fitting another type of capsule-valve, it requires some fine tuning in the microphone preamp to allow the new combination to give the required frequency response and 'sensible' sensitivity level.

As with the problems arising with capsules and valves, microphones with connectors that are no longer available, can have their connectors modified, thus keeping the microphone in working order.

The main shortcoming of customising anything is that its value will fall but if you are pleased with the sound, it's not such a problem. Many of the modifications I am required to do are carried out it such a way that they can easily be reversed allowing the microphone, or whatever, to be returned to its 'standard' form. Indeed, you can finish up with some very pleasant results. I appreciate that the finished microphone would be non-standard, but the particular capsule-preamp combination may find numerous new uses.

Some microphones have specific problem areas to consider. I hope to follow up this article with another relating to these in detail. □

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INTERLACE

Interlace is as old as television and is a bandwidth saving device. However, as **John Watkinson** shows, there is a heavy price to pay

INTERLACED SCANNING is a crude compression technique developed empirically in the 1930s. It is a way of increasing the picture rate—to reduce flicker—without a matching increase in the video bandwidth. As showed in an earlier article, instead of transmitting entire frames, the lines of the frame are sorted into odd lines and even lines. Odd lines are transmitted in one field, even lines in the next. A pair of fields are supposed to interlace to produce a frame, but we will see that frequently this does not happen.

I have argued before that it should be possible to explain audio phenomena equally well in the time and frequency domains. In the case of video, the equivalence is between the time and spatial frequency domains. Images contain spatial frequencies, measured in cycles per unit of distance and are sampled by lines in analogue and by pixels in digital imaging systems. The spacing between the pixels is the reciprocal of the spatial sampling frequency.

Not surprisingly, sampled images have a sampled spectrum according to Shannon and Nyquist. Analogue television samples vertically using lines, and samples on the time axis using frames. Fig.1a shows the vertical spectrum of a raster scanned image. The baseband, due to image detail, is at the bottom. The vertical sampling rate due to the raster is shown, along with the upper and lower sampling sidebands. Fig.1b shows the temporal spectrum. The baseband frequencies are due to movement in the picture. If an object moves, its detail is scanned by a fixed point on the camera sensor resulting in brightness changing with time. Fig.1b also shows the temporal sampling rate that is the frame rate. Upper and lower sidebands around the frame rate replicate the baseband.

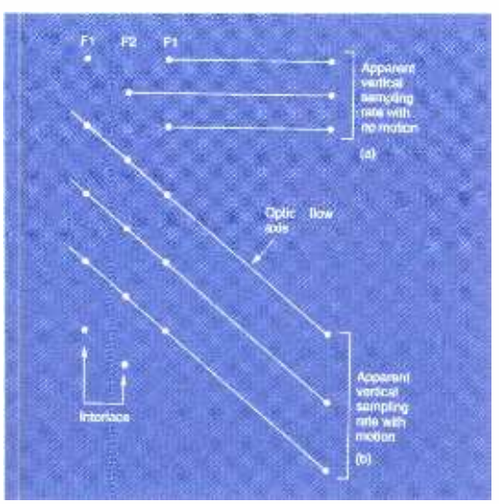

Fig.3: When an interlaced picture is stationary, viewing takes place along the time axis as shown in (a). When a vertical component of motion exists, viewing takes place along the optic flow axis. (b) The vertical sampling rate falls to one half its stationary value

In either case, if the sampling rate is less than twice the basebandwidth the result will be aliasing. This is readily seen in stagecoach or other spoked wheels which can have spoke-passing frequencies which are too high for most TV and film frame rates. In fact aliasing can also occur in the human eye because of the update rate of the nervous system.

Fig.1c shows that a two-dimensional spectrum results from combining Fig.1a and Fig.1b. Now one axis—the vertical axis—shows the spatial frequency spectrum, whereas the horizontal axis shows the temporal spectrum. The spectrum shown is idealised; with real images it wouldn't be so neat and tidy.

Fig.1c shows the case for a progressively-scanned picture such as on a computer monitor. In the case of interlace, the spectrum changes. Fig.2a shows the vertical-temporal arrangement of lines in an interlaced system forms a quincunx (five of dice) pattern. From transform duality it is to be expected that the vertical-temporal spectrum of an interlaced signal shows the same pattern.

Study of the vertical temporal spectrum allows many of the characteristics of interlace to be deduced. Theoretically, interlace has a triangular pass-band as Fig.2b shows. The highest vertical resolution is obtained at the point shown, and this is only obtained with a temporal frequency of zero—when there is no motion. This is suggesting that interlaced systems have poor dynamic resolution.

Although the theoretical pass-band is triangular, a suitable reconstruction filter cannot be implemented in any known display. Fig.2c shows that in, for example, a CRT display, there is no temporal filter, only a vertical filter due to the aperture effect of the electron beam. As a result there are two problems: first, fine vertical detail will be displayed at frame rate. The result is that although the field rate is above the CFF, a significant amount of frame rate energy is present to cause flicker. Secondly, in the presence of motion, there will be vertical aliasing.

Fig.2d shows that vertical detail such as an edge may only be present in one field of the pair and this results in frame rate flicker called 'interlace twitter'.

Fig.3a shows a dynamic resolution analysis of interlaced scanning. When there is no motion, the optic flow axis and the time axis are parallel and the apparent vertical sampling rate is the number of lines in a frame. However, when there is vertical motion, Fig.3b, the optic flow axis turns. In the case shown, the sampling structure due to interlace results in the vertical sampling rate falling to one half of its stationary value.

Consequently interlace does exactly what would be expected from a half-bandwidth filter. It halves the vertical resolution when any motion with a vertical component occurs. In a practical television system, there is no anti-aliasing filter in the vertical axis and so when the vertical sampling rate of an interlaced system is halved by motion, high spatial frequencies will alias or heterodyne causing annoying artefacts in the picture. This is easily demonstrated.

Fig.4a shows how a vertical spatial frequency well within the static resolution of the system aliases when motion occurs. In a progressive scan system this effect is absent and the dynamic resolution due to scanning can be the same as the static case.

Interlaced systems handle motion transverse to the scanning lines very poorly by aliasing, whereas motion

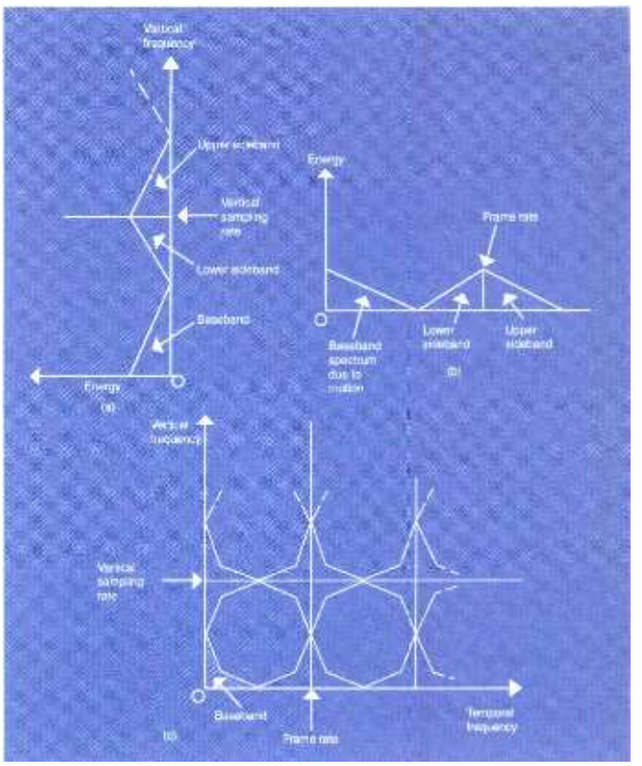

Fig.1: (a) Vertical image spectrum. (b) Temporal spectrum. (c) Vertical-temporal spectrum

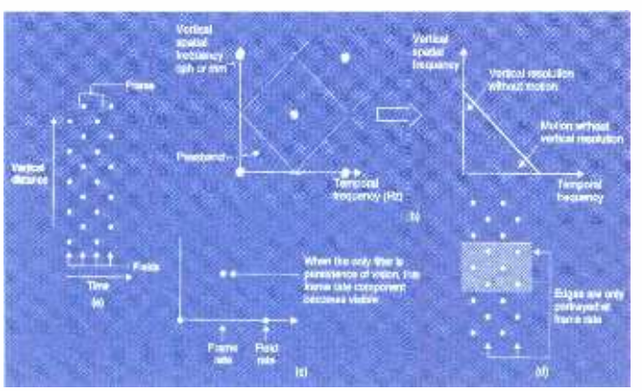

Fig.2: (a) Interlaced systems shift the lines in-between pictures. Two pictures, or fields, make a frame. (b) The vertical temporal spectrum of an interlaced system and its triangular passband, allowing motion or vertical resolution, but not both. (c) With the spectrum of (b) on a real display, the triangular filter is absent, allowing energy at the frame rate to be visible as flicker. (d) The flicker originates on horizontal edges which only appear in one field

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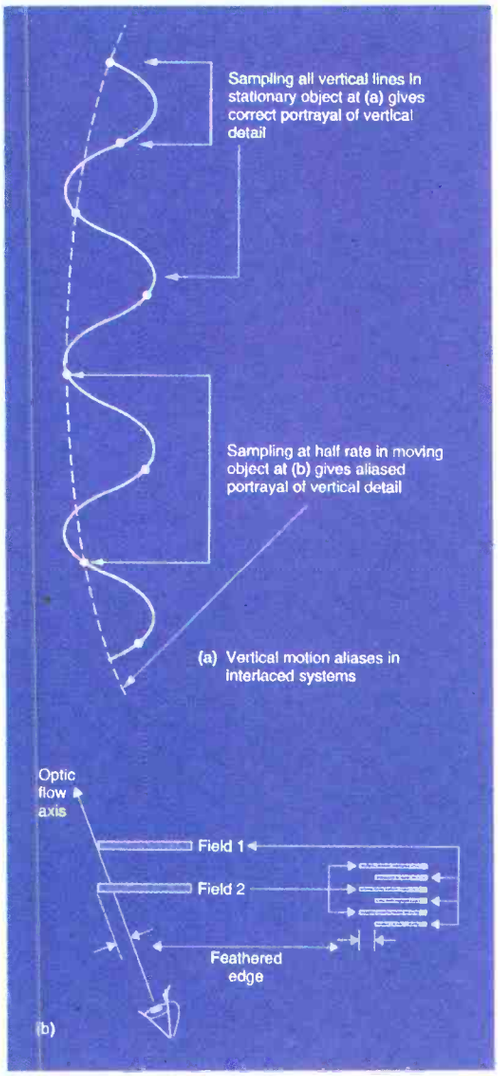

Fig.4: (a) The halving in sampling rate causes high spatial frequencies to alias. (b) To an eye following a horizontally moving object, vertical lines in the background will appear feathered because each field appears at a different place on the retina

parallel to the scanning lines results in a strange artefact. If the eye is tracking a horizontally moving object, the object itself will be portrayed quite well because the interlace mechanism will work. However, Fig.4b shows that the background strobing will appear feathered because only half of the lines are present in each version of the background. Vertical edges in the background appear as shown in the figure.

Feathering is less noticeable than vertical aliasing and for this reason interlaced television systems always have horizontal raster lines. In real life, horizontal motion is more common than vertical.

It is easy to calculate the vertical image motion velocity needed to obtain the half-bandwidth speed of interlace, because it amounts to one raster line per field. Fig.5 shows that in 525-60 (NTSC) there are about 500 active lines, so motion as slow as one picture height in 8s will halve the dynamic resolution. In 625-50 (PAL) there are about 600 lines, so the half-bandwidth speed falls to one picture height in 12s. This is why NTSC, with fewer lines and lower bandwidth, doesn't look as soft as it should compared to PAL, because it has better dynamic resolution.

Fig.5 also shows that the situation deteriorates rapidly if an attempt is made to use interlaced scanning in systems with a lot of lines. In 1250-50, the resolution is halved at a vertical speed of just one picture height in 24 seconds. In other words on real moving video a 1250-50 interlaced system has the same dynamic resolution as a 625-50 progressive system. By the same argument a 1080 I system has the same performance as a 480 P system.

Now that techniques such as digital compression and spatial oversampling are available, the format used for display need not be the same as the transmission format. Thus it is difficult to justify the use of interlace in a transmission format. In fact interlace causes difficulties which are absent in progressive systems. Progressive systems are separable. Vertical filtering need not affect the time axis and vice versa. Interlaced systems are not separable, and two-dimensional filtering is mandatory. A vertical process requires motion compensation in an interlaced system whereas in a progressive system it does not. Interlace, however, makes motion estimation more difficult. When compression is used, compression systems should not be cascaded. As digital compression techniques such as MPEG, compression factors way beyond 2:1 are readily achieved. At normal bit rates, it makes no sense to use an interlaced—compressed—video signal as an input. Better results will be obtained if a progressive scan signal is used.

Computer generated images and film are not interlaced, but consist of discrete frames spaced on a time axis. As digital technology is bringing computers and television closer the use of interlaced transmission is an embarrassing source of incompatibility. The future will bring image delivery systems based on computer technology and oversampling cameras and displays which can operate at resolutions much closer to the theoretical limits. With the technology of the day, interlace had a purpose whereas today the context in which interlace was an appropriate solution has disappeared.

Interlace causes difficulty in any process that requires image manipulation. This includes DVEs, standards convertors and display convertors. All of these devices give better results when working with progressively scanned data and if the source material is interlaced, a de-interlacing process will be necessary.

Why does interlace survive? Largely because the use of interlace allows an imaging system to be described as having more lines. Although its vertical resolution is only about 300 lines, PAL is described as 625-line video, and to the uneducated, this must be better than, say, a 480P system because more lines must be better. In reality 480P is obviously superior to the most casual viewer. □

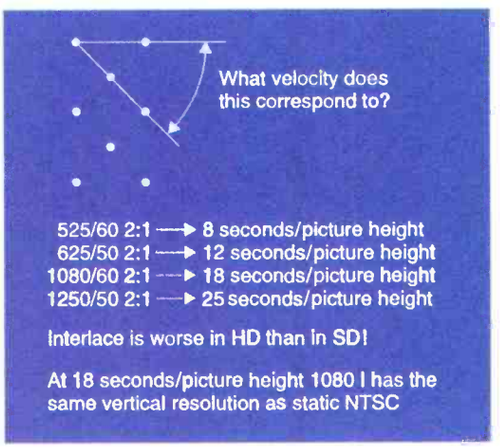

Fig.5: Interlace worked best in systems with few lines, for example NTSC. Increasing the number of lines reduces performance if the frame rate is also raised. Here the vertical velocities at which various interlaces standards fail are shown

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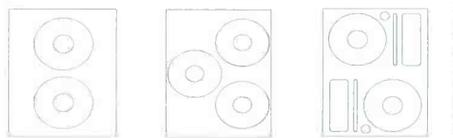

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Cinema sound off

IN THE FEBRUARY EDITION of *Studio Sound* the Barry Fox article, 'False starts and fine ideas' examined some aspects of multichannel audio. If I read him correctly Barry surmises that the main reason the likes of Steven Spielberg's DTS and Sony's SDDS systems are around today is that there had to be an alternative to Dolby. Methinks that is a rather sweeping statement and misses the point that as far as the DTS system is concerned, it is my view that for quality and reliability, it is the best system. Barry ignores the fact that Terry Beard and his DTS team had, for years, been looking for an economical and easily implemented method of presenting digital audio in cinemas. As long ago as 1994, Barry's article in *International Broadcasting* questioned the survival prospects of DTS. Seven years on I wonder what he thinks

Nevertheless the world of professional audio owes Ray Dolby a great deal of respect. He has hung in there through thick and thin, turning his ideas into practical applications, quite often with no reward.

For me, technically DTS-6 has a number of advantages over the Dolby SR-D and Sony SDDS systems. Firstly, in DTS the audio is stored on CD-ROM, not on the film strip. A synchronising time code is printed alongside each picture frame of the movie and when scanned at the projector drives a PC based dual CD-ROM player, identifying and outputting the associated sound bite, either in 5.1 surround or stereo formats. So, as far as audio is concerned there are no worries about the quality, or wear of the film print and the analogue audio optical tracks are in their usual place, not compromised in any way. Secondly, any reasonably modern cinema projector can accommodate a time-code reader, more or less just bolt it on, and there are now many thousands around the world that have already been modified.

And finally, storing enough audio data on CD-ROM to meet the demands of a full-length feature movie is achieved in the DTS cinema application by using the apt-X digital audio data compression algorithm. This superior prediction process (unlike the Dolby and Sony psychoacoustic processes) with 4:1 data reduction, enables up to 3hours 20mins of high-quality 20kHz bandwidth audio to be stored on CDs. DTS uses a combination of 2-channel apt-X chips to deliver multichannel, 16-bit 44.1kHz sampled audio with negligible processing delay cycle of around 3ms.

Like DTS with its continued enhancement of the cinema technology and its introduction of domestic systems, apt has not stood still. Advances in DSP technology have led to an enhanced version of apt-X that can operate at 16, 20 or 24-bit with four audio channels on each chip. A software release of the standard 16-bit algorithm can enable OEM's such as DTS, Leitch, Scott Studios, and Computer Concepts and other emerging OEMs to seamlessly integrate this popular algorithm into any of their audio software platforms.

Fred Wylie, apt

More bang, baa-room and harp

HOWARD YENTIS' SHORT list of recommended LPs (Letters, *Studio Sound*, March 2001) includes *Music for Bang, Baa-room and Harp* which has been my favourite demonstration disc for more than 40 years.

Inevitably it became badly worn although the quality of the recording shone through the wear and tear. Recently, to my delight, mint pressings—imports with the new number RCA LSP 1866—became available through the *Hi-fi News* CD service (+44 1234 741152). Howard Yentis does not exaggerate: it really does 'sound a lot better' and has 'better stereo spread than the majority of today's balances'.

Norman Wright, Group Sound Systems, London

Chocolate topping

THE MONDAY SCAN for presence of our lovingly prepared press releases in your August journal brought me to the letters page and Andrew O'Brien's enquiry

I had a suspicion I knew someone who knew the answer to the session singer question and the result is an uncertain but plausible Stevie Lange (I think that's as in Mutt). You would need further corroboration before this became fact, but it's a lead at least...

Pete Jones, KGA, UK

Back on ATRAC

WE JUST FOUND a mistake in the MDS-E10 MDS-E12 review taken off the web (*Studio Sound*, April 2001).

You've stated that the machines use ATRAC 3, when actually they are the first professional machines to use the latest ATRAC R and this does provide significant sonic improvements. The machines do switch to ATRAC 3 if you select the MD Long Play mode and this highlights another new feature—a new LP mode that allows the machine to record 320 minutes of mono audio on a single disk.

Andrew Hingley, Sony Broadcast & Professional

Bits from Brazil

I THINK YOU ALREADY KNOW what I'm going to say but... With reference to the April editorial, 'Listen Up'.

I have been in the remastering business in Brazil for more than five years. I know that when you put a master tape on a machine and play it, the sound you hear is not the same as what you hear on LPs or first edition CDs. Now I'm trying to pass master tape quality on to CDs and DVDs so that you will hear what is on the tape, not what the cutting engineers put onto CDs or the sound of a bad A–D convertor.

Now we can make quality discs with good equipment and more bits.

Marcos Abreu, Brazil

The Yamaha SREV1

Some of its best programs were written centuries ago

Nobody has more experience in DSP than Yamaha, as evidenced by our heritage of ground breaking digital reverbs, including the SPX90, REV1 and ProR3. The new SREV1, however, is a revelation.

With Convolution Sampling Technology the SREV1 uses impulse response samples of actual acoustic environments to produce reverb of staggering realism.

Comprising the 24-bit/48kHz mainframe, RC-SREV1 remote and optional expansion board, the system offers true surround reverb in 4 channel mode and can even operate as two fully independent stereo processors.

The SREV1 comes with a CD-ROM of sampled famous venues from around the world and includes bundled PC software allowing users to sample and create their own programs.

For more information call Richard Metcalfe on 01908 369243.

Σ-ENGINE

YAMAHA

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www.yamahacommercialaudio.com

THE WISH LIST

< Continued from page 98

are for drum kits; The Hebdens are what used to be the Calrec 1050s, which were incredibly reliable workhorse microphones; the 421s are essential for things like tom-toms, bass drums and bass guitars; the Schoeps Colettes are absolutely incredible, high-quality microphones for just about any stringed instruments, ranging from acoustic guitars to piano and harps; the Russian Mikrophons are tremendous in terms of their openness and transparency, so I wouldn't use them on the top kit of some drums because they don't reject things very well and there'd probably be too much overspill, whereas what they do pick up is really sweet and natural; the Beyer M88s are useful for drums and percussion; the M160s are tough, not fragile like most ribbon microphones, so you can have the benefit of a ribbon mic without worrying if it's going to let you down; the Pearl DC96s are superb microphones for classical voices.'

Stage boxes and cables

Active 96-way (fully split and isolated); Mogami

'There are so many possibilities with mobiles. You may use truck microphones or PA microphones, which means you'll be phantom powering things from the recording desk or the PA mixing desk, and then there's the question of who's got the priority, so you need real flexibility in the stage box.

'Mogami cable is a little more expensive to buy, but it's much cheaper to work with because you can work with it in half the time. It's rugged, It's excellent quality, very, very flexible, and very low loss. If cable is easy to use and easy to wire, it usually means that the joints are more reliable. They're not under any stress, and the wiring person isn't fiddling around with soldering. There again, the better the equipment, the cheaper the cost of cable.'

Power

'Some uninterruptable power supplies can cause as many problems as they solve. Usually, unstable sources of power are going to affect things in the concert hall as well, although maybe not on a classical recording. There again, on a classical recording you usually don't have huge lighting rigs that are drawing massive amounts of power and sending the voltages up and down. So, I think one of the most important things is an isolated transformer to help balance the power. Instead of nominally having 230V you'll have ±115V.'

Acoustics and monitors

Reflexion Arts 239; NS10s; Neva Audio amplifiers

'Of course, mobile trucks can be used for recording in people's houses, but live recordings are a major part of the job and you often don't get a second chance. You therefore need to be absolutely certain that if there's a problem you'll hear it, and so one of the things that most interests me in terms of monitoring in a mobile truck is the perception of detail and the resolution of the system itself. This means you've got to have reasonably good acoustics in the truck.

'The absolute flattest frequency response is not necessarily my overall priority, because in a relatively small truck this can be difficult to achieve. However, the transparency, the openness and the ability to hear detail are really important—You don't want a buzz or some noise masked by reverberation or whatever. I've therefore designed monitor systems from Reflexion Arts with that in mind, because that's my philosophy on the general studio design anyway. At the same time, I'll have a pair of NS10s because almost everybody in the industry knows what they sound like. So, if another engineer uses the truck and is not sure of the acoustics—even if they're as perfect as you can get, he's not going to believe this just because you tell him so—he's got these to rely on.

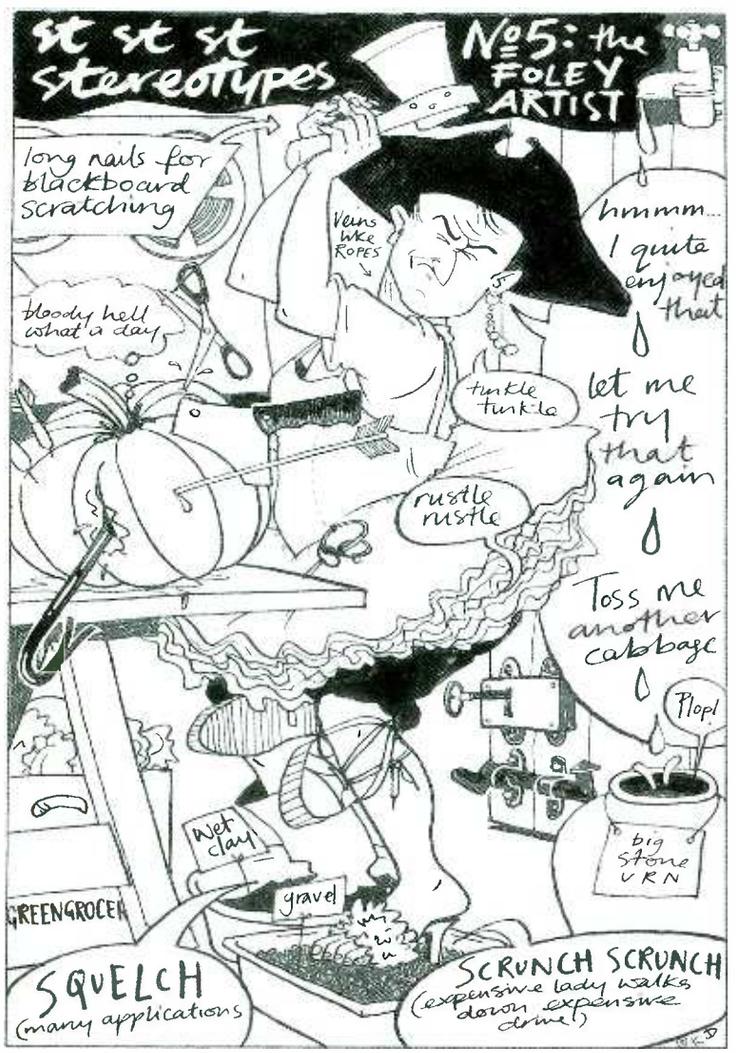
THE BALANCE SHEET

Total expenditure: <£2m

THE BALANCE SHEET

Not stinting in terms of opting for his choice selection of gear, Philip has benefitted from a somewhat generous (some might say indulgent) budget that made it almost impossible for him to exceed the spending limit. But if you want a top-flight facility...

'The amplifiers that I've been using for more than four years now are all from St Petersburg, Russia, made by a company named Neva Audio. They're absolutely stunning in terms of sound quality, with incredible resolution of fine detail.'



PRO AUDIO TOP 20

1	Sony Rock'n' Roll (But I Like It)	⇧	11	Soundtracs of My Tears	⇧
2	Akai See Clearly Now	⇦	12	How Can I Be Shure?	⇧
3	Digi Really Want You Hurt Me?	⇩	13	KT Lied	⇦
4	SSLing England by the Pound	⇧	14	P & G Baby	⇦
5	Hey Big Spendor	⇦	15	The Jünger Ones	⇩
6	DAR Prudence	⇧	16	Purple Rane	⇧
7	AMSage in a Bottle	⇦	17	Can't Beyer Me Love	⇧
8	Neva Mind the Bollocks	⇩	18	Lexicon Hat Dance	⇦
9	The Long and Winding Rode	⇧	19	The Pearl from Ipanema	⇦
10	Cedar Trouble with Me	⇦	20	Rorkesanne	⇩

FOSTEX

The performer is ready. Is your recorder?

Fostex's new, professionally specified 24 track is. Employing the latest 24bit A/D's and D/As, the D2424 offers sonically pure, no-compromise non-compressed multitrack recording in one of 6 audio formats, including the new 24bit / 96kHz and 24bit / 88.2kHz* standards. And let's face it, you should accept nothing less.

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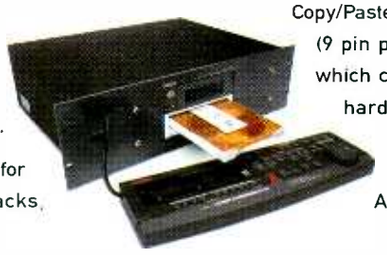
Recording to caddy-held standard E-IDE hard drives. (30GB supplied) and offering a removable 'remote' front-panel, additional 'ghost tracks' for multiple takes of one or more tracks,



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2ND BAY FOR EXTRA HARD DRIVE OR DVD RAM DRIVE

More in the shape of the unlimited multiple UNDOs, Copy/Paste editing across songs, RS422 ports (9 pin protocol), Word Sync, a second bay which can be fitted with a 2nd caddy-held hard drive or DVD RAM drive for easy archive and balanced analogue I/Os.

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PHILIP NEWELL'S MOBILE

With a wealth of experience behind him, it seemed appropriate to allow **Philip Newell** a no-holds budget to design and equip a high-end mobile recording facility. The results are impressive but not extravagant

BORN IN BLACKBURN in 1949, Philip Newell started out in 1966 working on live sound and lighting at the numerous venues of the Mecca leisure chain, taking care of mixes for acts such as The Who, Booker T and the MGs, Wilson Pickett, Sam & Dave, Family, and Junior Walker and the All Stars. Having also made private recordings of the resident bands, Newell left Mecca in 1969 to design and build a studio for a London bandleader, and the following year he then moved to Pye, where he divided his time between the company's 16-track recording facility and its mobile setup. This, in turn, led to an eclectic folio of work ranging from The Who, The Faces and Free, to brass bands, church organs, Welsh choirs, Scottish bagpipes, cabaret shows and classical piano recitals.

Joining the fledgling Virgin Records as its chief recording engineer in late 1971, three weeks before The Manor Studios opened its doors, Newell soon became a shareholder in the new company. Within a couple of years he was also responsible for building the Manor Mobile, the world's first permanent, fully-operational 24-track recording vehicle, while assuming the role of Virgin's managing director and then technical and special projects director of the company's entire recording division. During this time, Newell was not only responsible for rebuilding The Manor Studios, building The Townhouse, a second 2x 24-track mobile unit and many other facilities, but he continued to work as an engineer, general co-ordinator and producer, and by 1981 his credits included Captain Beefheart, Jack Bruce, The Duke Ellington Orchestra, Tony Bennett, The Small faces, Don McLean, Dizzy Gillespie and The Buzzcocks.

Thereafter, Newell sold his shares in Virgin to pursue his own sea plane business but in late 1984 he was invited to rebuild a studio for Jacobs in the South of England, and since then he has been involved in the design of more than 100 studios in 32 countries. Consequently, he is more than adequately qualified to assemble a mobile facility for the menial purposes of this article.

'My criteria are pretty straightforward,' says Newell. 'Extreme reliability; extreme flexibility without over-complication; economy of power; manoeuvrability; high headroom and low noise throughout the system; good monitoring for quality control; an uncluttered ergonomic layout, also designed for ease of maintenance; and sparseness—"If it's not fitted, it can't go wrong", as Bill Lear used to say.'

The truck

Air-sprung, 30-ft semi-trailer, acoustically treated and designed for monitoring.

Console

Raindirk Symphony LN3 56-channel, designed to fit a truck, with gates and limiters on all channels and outboard jackfield

'For me, this is one of the cleanest sounding consoles available. It's extremely reliable, with high headroom and low noise, and very flexible without being overly complicated. What's more, it doesn't take an enormous amount of power, which can be important in a mobile recording truck. Depending on where you're recording, you may have a limited amount of power available, and the more power that the desk consumes, the more air conditioning that is required in the truck, and the whole thing starts spiralling out of control.'

Multitrack machines

Sony 3348; Otari MTR100 with Dolby SR; Alesis M20 (3)

'I'd need analogue as well as digital capability. There again, while you can hire things in if you need them, it's always good to have backup, so the three ADATs can either be used to expand the number of tracks or, if you're recording a long piece that doesn't have any breaks, to cover when the tape is being changed. As for the Otari MTR100, it's a good, reliable machine, and it's got the self-aligning feature which is particularly useful. You don't always have too much time before the rehearsals or the setup, so if you've got a machine that can diagnose its own problems and check everything out, you can let it do that while you're getting on with other things. The Otari may not be the ultimate machine in terms of analogue sound, but unfortunately some of those which do have the ultimate analogue sound are not the most reliable, and in a mobile recording unit you can't take that risk.'

Outboard

Universal Audio 1176 limiters (4); LA3A limiters (2); Little Dippers (2); dbx 165 compressors (2); Alan Smart C2 compressors (2)

'The primary task is to capture the concert or whatever you're doing, and to that end the 1176s, LA3As and C2s all have minimum effect on the sound quality. They give you the ability to control things without imposing their own sound on the recording, whereas the idea of throwing in a couple of dbx compressors is that they do affect the sound quality. So, if somebody wants a compressed sound, you have something which can achieve that. The Little Dippers are the filter set that can notch things down to about 72dB/octave. If you must mix a couple of things together and you've got a bug or a noise on one of them, the Little Dippers are effective at getting rid of a hum, a whistle or whatever else. They're not very useful around a studio, but they are in terms of a mobile recording truck.'

Stereo machines

Fostex D25 time code DATs (2)

'I didn't see a lot of point in having analogue machines—they'd just take up space—but there are many times when somebody needs a monitor mix, a mix to television or a quick feed off something.'

Reverbs

Lexicon PCM81; PCM91; tc electronic M3000

'Basically, this is a selection of reasonably compact multi-effects processors. I don't see the point of taking Lexicon 480s and 960s on the road—again, more size, more weight, more heat, more everything else. The Lexicons and the tc doesn't produce an enormous amount of heat, and they have a very flexible range of choices.'

Mics

Neumann U87 (12); Neumann 147 (4); Sennheiser 421 (5); Beyerdynamic M88 (6); Beyerdynamic M160 (4); Shure SM57 (10); Shure SM58 (2); Schoeps Colette (8); Pearl DC96 (2); Hebden 1050 (6); Mikrophon (8)

'Variety is the name of the game here, covering everything from rock concerts to orchestral recordings, and a total of between 60 to 80 mics is necessary. The SM57s and 58s

Continued on page 96 >

"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!

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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
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- **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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