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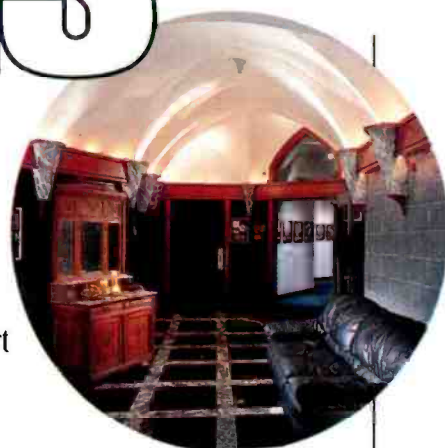
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VIG INTERVIEW

Immortalised through his work with Nirvana, Butch Vig's production credits are long and impressive. In a rare interview he shares his secrets exclusively with **Studio Sound**



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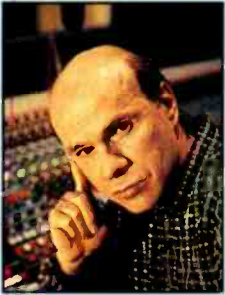
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THIS EDITION'S CONTRIBUTORS



PATRICK STAPLEY began in pro audio in 1972 at London's Abbey Road Studios and has worked with artists as diverse as Paul McCartney, The Damned, Sting, and Kraftwerk. Recently shortlisted for a Press Association award, Patrick has been writing for *Studio Sound* for over a decade.



JONATHAN KETTLE contributes a monthly audio column to *BBC Music Magazine*, and edits *CYBERFI*, the world's first hi-fi magazine published on the Internet. Formerly managing editor of *Audiophile*, he has worked extensively in consumer audio journalism since 1977.



GEORGE SHILLING is a freelance engineer-producer with extensive experience of dance, pop and rock recording. Recent credits include The Wannadies, Blur, Boy George, Etemal, and Marc Almond. He operates a programming-preproduction room at his home in the Cotswolds.

Chance encounter

IT IS SOME 20 YEARS since I first read Luke Rhinehart's *The Dice Man*. Intrigued now, as then, by the concept of a 'random man', my recent rereading left me pondering its relevance not just to society at large but to life within the recording studio.

For those of you not familiar with the novel, it relates the supposedly autobiographical story of a wayward psychiatrist who experiments with 'dice therapy'—the substitution of a random pattern of living for the structured one most commonly practiced throughout the civilised world. Reasoning against the line that a socially successful individual is one who, despite being subject to a variety of inclinations and interests, adopts consistent themes in the interests of consistency and conformity, Rhinehart cultivates a style of behaviour in which all aspects of a personality are expressed. He does this by increasingly surrendering his free will to the direction of chance—specifically, he uses dice to determine aspects of his personality and behaviour. The parameters of his random living are set wide and have him committing rape and murder among a wealth of lesser misdeeds.

Inevitably it is a story of an unacceptable lifestyle since the rules by which the random man lives are fundamentally at odds with those of the rest of society—even when his behaviour appears normal, it is determined by a method that is not. The reasoning behind the ethic, however, remains plausible even in the face of its outrageousness.

Inside the recording studio, chance is a relatively welcome performer. Probably the best-known exponent of chance working is Brian Eno, whose *Oblique Strategies* and chance composition appear to be at least as successful as they are well known. But there are plenty of other high profile artists who have been in on the act—like David Bowie, who has been known to employ chance in writing lyrics. When compared to the experiments of Dr Rhinehart, these uses of chance are harmless at worst, and tame at best. While they defy the more rational aspects of composition, they are invisible to the listener.

In part at least, chance working in any artistic field (and I'm including the producer's and engineer's roles here) offers those involved something that determinism denies them; something that is an integral part of the enjoyment of most detached listeners. That element is a lack of comprehensive understanding of how the finished work hangs together—the opportunity to listen repeatedly to a piece of music, study a painting, or read a novel and still find that it offers ground for further exploration.

That quality is a readily available ingredient to anyone prepared to submit to the guidance of chance.

The question raised by *The Dice Man* is not one of whether or not to accept chance as a valid working tactic but the extent to which it should be adopted. The lessons demonstrated in the novel would surely follow the unconditional adoption of random recording practices. But popular acceptance has rarely accompanied innovation in art. Let's take Stravinsky's *The Rite of Spring* and John Cage's *4' 33"* as well-known examples of works that have offended. Yet *4' 33"* has secured its place in musical exploration, and *The Rite of Spring* is now universally accepted as a seminal work.

So who among us is brave enough to eschew commerciality, and let the die dictate whether the musicians should hear the backing track, the mic choice and position, and the signal process?

Tim Goodyer **EDITOR**

THE CHANGES that *Studio Sound* has gone through in the last year, and a few have been dramatic by its own standards, yet almost minor in comparison to some of the things that have impacted on the business in the same time. I know I'm not the first, and I certainly won't be last to feel smug and profound with the clichéd observation that the industry is in a period of remarkable change. When has it never been so? The nature of audio, and its hard-wired links to the technology on which it depends, is constantly evolving alongside commensurate adaptations in technique by its operators. Each side incites the other, it has to move, and it's our function to maintain the depth of focus. What we have is a microcosm united by its passion, and dependence on gear, and is populated by people that actually choose to work in it. Professional audio is curious in this respect as nobody falls into a job in a studio with no interest for it and lasts; nobody can cut it in a high pressure post unless they lose the 'just-a-job' mentality; and nobody lasts the course in broadcast unless they really want to be there. This attitude is priceless, and lethargy its greatest enemy. I see an important role for *Studio Sound* in this microcosm as there is no better medium for communicating the information and the enthusiasm. *Studio Sound* is the oldest publication serving this realm, and the only one that has grown up with the industry. Even so it has only just cut its teeth. I'm delighted to take the helm as executive editor. It's going to be great.

Zenon Schoepe **EXECUTIVE EDITOR**

Sound

Yamaha launches 03D

AES: The LA AES Convention will provide the platform for the launch of the third stage of Yamaha's 0-series digital mixing console development—targetted at audio recording, video postproduction, project rooms and limited sound reinforcement applications. Billed as a 'smaller but extremely powerful derivative of the company's market breaking 02R digital console', the 03D is configured to interface with DAWs and MDMs such as Tascam's DA-88 and Alesis' ADAT complete with all of the 02R's dynamics processing and mix automation facilities.

Yamaha's new baby uses an enhanced version of the 02R LCD display which incorporates mouse operation. It also offers 26 inputs and up to 18 outputs (both analogue and digital stereo outs are supported along with 8 assignable digital outputs) and six aux sends. Console automation covers full moving-fader implementation,

dynamics processing, and access to two ProR3-Rev500 digital signal processors. Digital I-O is via one 02R card which offers 8 channels of AES-EBU, TDIF or ADAT format audio.

The 03D supports direct interfacing with video edit controllers through the Graham Patten ESAM-II protocol and further accommodates postpro functions through onboard multichannel mixing and automation.

Other late-breaking product launches for AES include Anthony Demaria Labs' ADL 300+G valve DI box, Whirlwind's MD-1 and Snakeskin, the Pro Tools version of CEDAR's DeClick process and Pyramix' Virtual Studio v1.1.

Whirlwind's MD-1 is a battery-powered mic preamp-headphone amp, while Snakeskin is a colour-coded sheath offering ready identification at the same time as protecting it from a variety of adverse materials and conditions—heat, flame, water, solvent and UV light.

Updates to Virtual Studio include audio scrubbing, reverse playback, editable text view fields, user control of autocrossfades and



nudges, options on 16/18/20/24-bit recording and the same mixdown options with the addition of 32-bit resolution.

CEDAR's DeClick is the first in a range of CEDAR for Pro Tools products and runs on CEDAR's dedicated MacDSP/C board. The process is capable of removing up to 2,500 clicks and ticks per channel per second, restoring 78s and vinyl discs, cleaning up film and TV soundtracks, and removing degradations from all forms of digital media.

AES: The LA AES has given the British-based RePro record producers' organisation the ideal opportunity to

establish itself in America. The initiative will take the form of two events spread over the weekend of the Convention; the first is an open forum entitled *Name, Rank & Serial No.*, taking place in the Westin Bonaventure Hotel at which the issue of ISRC (International Standard Recording Code) and encryption of recording. The second is a joint party with BASF at the nearby Petersen Automotive Museum where mechanical and imbibition issues will top the bill.

RePro's Peter Filleul commented: 'The theme of these meetings—*Name, Rank & Serial No.*—was chosen because, in different ways, it applies to all the functions RePro is organising. The theme of the forum meeting is the importance of the implementation of ISRC and how it could significantly change the responsibilities of every record producer. The AES party gives producers and engineers a chance to have fun while meeting each other and to sign up to show an interest in establishing a US organisation that can start to address how the profession should respond to the extensive changes that digitalisation will bring.'

US: New York's Right Track was the location for what is being claimed as the first '24-bit album'. Entitled *The Quartet*, the album comes from the group lead by American jazz guitarist Pat Metheny and was produced by Metheny, keyboard player Lyle Mays, Steve Rodby and David Oaks. The recording was mastered to Sony PCM-9000, beginning on the AMS Neve Capricorn console in Studio A and completed on Studio B's Capricorn. In addition to the obvious quality considerations of 24-bit working, Right Track's Barry Bongiovi identifies future high-bit release media as a justification for the move.



US: Babyface's new studio—Brandon's Way—has recently opened in California. Featuring a new SSL 4080 G+ console, Augspurger surround monitoring, and outboard including: Pultech, Focusrite, API, Avalon and Summit. The studio has already completed the recording of Babyface's solo album, *The Day*, and projects including Boyz II Men and Madonna. In addition to music tracking, Brandon's Way is expected to handle film work—along the lines of the mix of *The Waiting to Exhale* movie soundtrack recently completed by Chief Engineer Brad Gilderman. Brandon's Way, US. Tel: +1 213 931 5000. SSL, UK. Tel: +44 865 842300.



US: BASF's first Master Award has been presented to producer Bob Rock (pictured on the right with BASF's Terry O'Kelly and Mark Huisman) for his work on Metallica's *Load* album which has sold in excess of 6m copies to date. Tracked at Sausalito's *The Plant* and mixed at New York's *Right Track*. The presentation was made in Chicago and accompanies a donation of \$1,000 to UNESCO for preservation of 'culturally significant sites around the world'. BASF, US. Tel: +1 415 227 0894

NEW WEBSITES: Pro-audio is taking to the Internet in a big way, with increasing numbers of manufacturers seizing the opportunity presented by the Web to showcase their equipment. Among more recently established sites are: Amek (www.amek.com); Harrison (<http://www.glw.com>); SSL (<http://www.solid-state-logic.com>); Genelec (<http://www.firhost.fi/genelec>); Aardvark (www.aardvark-pro.com); Rane Corporation (<http://www.rane.com>); BSS (<http://www.bssaudio.co.uk>); Drawmer (<http://www.proaudio.co.uk/drawmer.htm>); Quantegy (<http://www.quantegy.com/>); Tannoy (<http://tannoy.com>); DK-Audio (<http://www2.dk-online.dk/users/DK-Audio/>); Optifile (<http://optifile.com>); Soundcraft (<http://www.soundcraft.com>); Z-Systems (<http://www.z-sys.com>); Turbosound (<http://www.turbosound.com>); and Garwood (www.garwood-radio.com).

Websites are also being used to promote other aspects of the audio business, such as that of Livingston Rental (<http://www.livingston.co.uk>) and Axis Audio Systems (<http://axisasl.demon.co.uk>), to distribute software updates like tcelectronic's v2.0 M5000 reverb (www.tcelectronic.com) and QSound's plug-in demos (www.qsound.ca). More adventurous Web projects include: The School of Audio Engineering is encouraging its students to use its 'virtual workbench' (www.saecollege.edu.au); the British APRS' Recording Register (<http://www.aprs.co.uk/repro/>); Network Music's sound effects and production library (www.networkmusic.com); and Studio Wizard's studio design, training and troubleshooting service (<http://www.paston.co.uk/studio.wizard/homepage>).

The British Surrey Sound Studios has joined Webbed-up studios at (<http://www.demon.co.uk/studiobase/studios/surrey>) while New York-based JeepJazz Music has taken music to the Web at (<http://www.jeeppjazz.com>).

Contracts

- ◆ Australia's Foxtel pay-TV system now uses 31 Orban Optimod TV8282 processors at its Sydney playout centre. The centre operates in 'total digital mode', feeding Sydney, Brisbane, Adelaide and Gold Coast head ends with 31 channels of programming. Perth is expected to follow the Optimod setup shortly. Foxtel, Australia. Tel: +61 2 200 1690. Orban, US. Tel: +1 510 351 3500.
- ◆ Denmark's premier Puk studio has purchased a tcelectronic Finalizer digital dynamics processor as the first of a series designed to support its use of tcelectronic M5000 audio mainframes. tcelectronic, Denmark. Tel: +45 86 21 7599.
- ◆ Hollywood-based Todd AO/Glen Glenn postproduction studios has installed a further Bag End ELF system. The installation brings the investment of the world's largest post facility in ELF to over 12 systems, and its overall Bag End systems to more than 100. Todd AO/Glen Glenn, US. Tel: +1 213 962 4000. Bag End, US. Tel: +1 847 382 4550.
- ◆ London's theatre and conference sound company, Orbital, has taken delivery of six XTA DP200 digital signal processors and a number of XTA GQ600 graphic equalisers. First use of the XTA units was on the 1996 Lindsay Kemp tour and the Birmingham Motor Show where XTA's Audlocore control software was also in use. beyerdynamic, UK. Tel: +44 1444 258258.
- ◆ Holland accepted the first two Soundtracs Virtua digital consoles immediately following the Dutch ProAudlocom show held in Utrecht. Dordrecht's TFX Productions and Weesp's Maarten's Sound & Vision accepted the digital challenge to film soundtracks and music tracking respectively. Soundtracs, UK. Tel: +44 181 388 5000.
- ◆ China's Shanghai Radio has ordered four pairs of Genelec 1030A, 10 pairs of 1031A, 21 pairs of 1032A and seven pairs of 1037A monitors. The order coincides with China Central TV's order for five pairs of 1030A, 40 pairs of 1031A, 4 pairs of S30C and 1 pair of 1038A systems, and Radio Beijing 10 pairs of 1030A, and 4 pairs of 1034As. Genelec, Finland. Tel: +358 77 13311.
- ◆ New York's Howard Schwartz Recording has installed an L-C-R array of KRK M15A-3s as part of a control room renovation. Following completion of its refurbishment, the studio is to see service on postproduction projects. KRK Monitoring Systems, US. Tel: +1 714 841 1600. UK: The UK Office. Tel: +44 1442 870103.
- ◆ Birmingham (England) recently stages the third of its Party In The Park festivals at Cotton Park. Organised by local broadcaster BRMB, the Party provided a showcase for Raycom's Sony mic and Audix OM7 capsule hybrids. Two similar mic setups have also been sold to British equipment suppliers, Wigwam. Raycom, UK. Tel: +44 1789 400600.
- ◆ Switzerland's Berne-based Sound Design Studios has installed an SSL Axlom console as part of the refurbishment of its THX-equipped Studio A. As the only Swiss studio with a Dolby stereo license, Studio Design expects the investment to further consolidate its position in film work. SDS AG, Switzerland. Tel: +41 31 9321111. SSL, UK. Tel: +44 1865 842300.
- ◆ Burbank's Front Page Studios has just installed the largest Euphonix CS2000M console on America's West Coast. The 96-fader desk graces the Paul Yancher-redesigned Front Page following the Kent Duncan-Tom Hidley original design of 20 years ago. Front Page Studios, US. Tel: +1 818 556 5095. Euphonix, US. Tel: +1 415 855 0400. Euphonix, Europe. Tel: +44 171 602 4575.
- ◆ Korea's largest broadcaster has bought two 48-fader AMS Neve Capricorn digital desks and two 32-fader 55-series analogue desks for its Seoul facility. The Capricorns will serve KBS' new satellite TV station which was established earlier this year while the 55-series will be installed in KBS' radio station early next year where they will be used for live music and talk programme production. AMS Neve, UK. Tel: +44 1282 417282. ACCL, Kowloon. Tel: +852 351 3628.
- ◆ London-based mobile recording operation BMP Productions has purchased a 24-channel DDA CS3 desk. BMP specialise in classical recordings for London record labels, and has recently completed a recording of Prokofiev's piano concertos by the London Philharmonic. BMP, UK. Tel: +44 258 3979. Mark IV Audio, UK. Tel: +44 1562 741515.

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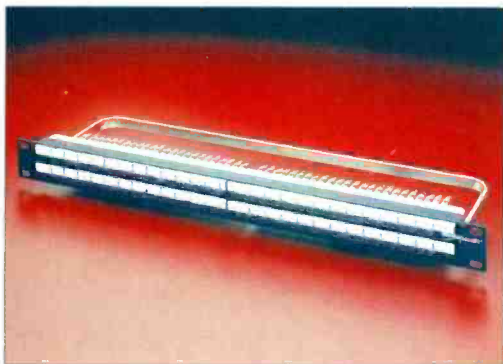
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When digital is analogue

Not every implementation of digital technology delivers what we expect from a 'digital' performance. But how can analogue performance be given by a digital system, and what can we do to keep our digital systems digital?

As an industry, we have been using digital audio techniques for a long time. When digital audio was first introduced there was excusable confusion caused by the quantum leap in technology. Essentially, digital principles were quite new to those with analogue experience, and it was inevitable that it would take time for the new ideas to be assimilated. However, the digital-audio quantum leap was long enough ago for the serious designer to have learned something about the principles by now.

The rule that we must never break is to ensure that digital really is digital. Digital audio is data, and data are discrete. Discrete data can be recovered perfectly in the presence of controlled amounts of noise and jitter. This is just as well otherwise CD, ADAT, RDATE and DASH wouldn't work, to say nothing of time code. In the case of the AES-EBU interface, the channel bit period is about 150ns, so peak-to-peak jitter of a little less than this will not impede data recovery. As AES-EBU has parity checking on every sample, it is easy to show that the data received are identical to that sent.

With correct data, it is only necessary accurately to produce analogue voltages from each sample, and to space these voltages apart by exactly the same time interval to have an accurate conversion. The criterion for sample spacing has been known to me for around 15 years, and as I discovered it within weeks of my joining Sony from the computer industry it must have been known elsewhere for longer than that. The convertor clock must have time stability measured in tens of picoseconds if the resulting analogue waveform is to be undisturbed.

A well engineered D-A convertor must buffer the jittery AES-EBU data and create a jitter-free clock that transfers the data to the D-A proper. Then jitter on the data interface cannot reach the convertor clock, and the interface will be truly digital in that only the discrete values it carries will affect the analogue output waveform.

If this is not done and interface jitter, an analogue variable quantity, can affect the output analogue waveform, the convertor is an Analogue plus Digital to Analogue convertor. The corollary of this statement is that the sound of a true D-A is unaffected by the type of cable, or the noise experienced by that cable until the onset of parity errors indicates that the data are incorrect. We can also conclude that a good D-A convertor should display received parity errors prominently.

This allows a very simple test to see if a D-A is really digital—you simply try different lengths and types of input cable to see if the sound quality changes. If it does, yet there are no parity errors, the D-A is not digital. Another easy test is to fit an AES-EBU repeater or reframer directly before the D-A convertor under test. These devices will clean up the digital signal waveform without changing the data and should have no audible effect on a true D-A, but I can assure you that many commercially available D-As fail this test because I've tried it. Another definition of a non-digital D-A is that the SPDIF and AES-EBU inputs sound different with the same data.

NONE OF THE ABOVE is new, and very little research is needed to find it out. Books by Ken Pohlmann, Francis Rumsey and myself all spell it out, to say nothing of various learned journals. Consequently, I was dismayed to read Ben Duncan's high-end speak contribution to 'Open Mic' in September's *Studio Sound*. This alarmist piece is good entertainment provided you realise how flawed it is. I genuinely fear for the reader who acts upon it in good faith, hence my observations.

Duncan tells us that the high-end audio community have recently discovered jitter as a potential problem in digital audio and cites papers after October 1993. I have long suspected that one of the tenets of high-end audio is to avoid doing research, because this causes painful exposure to the laws of physics. This explains why Duncan has published outboard D-A designs which run the convertor from the interface clock on

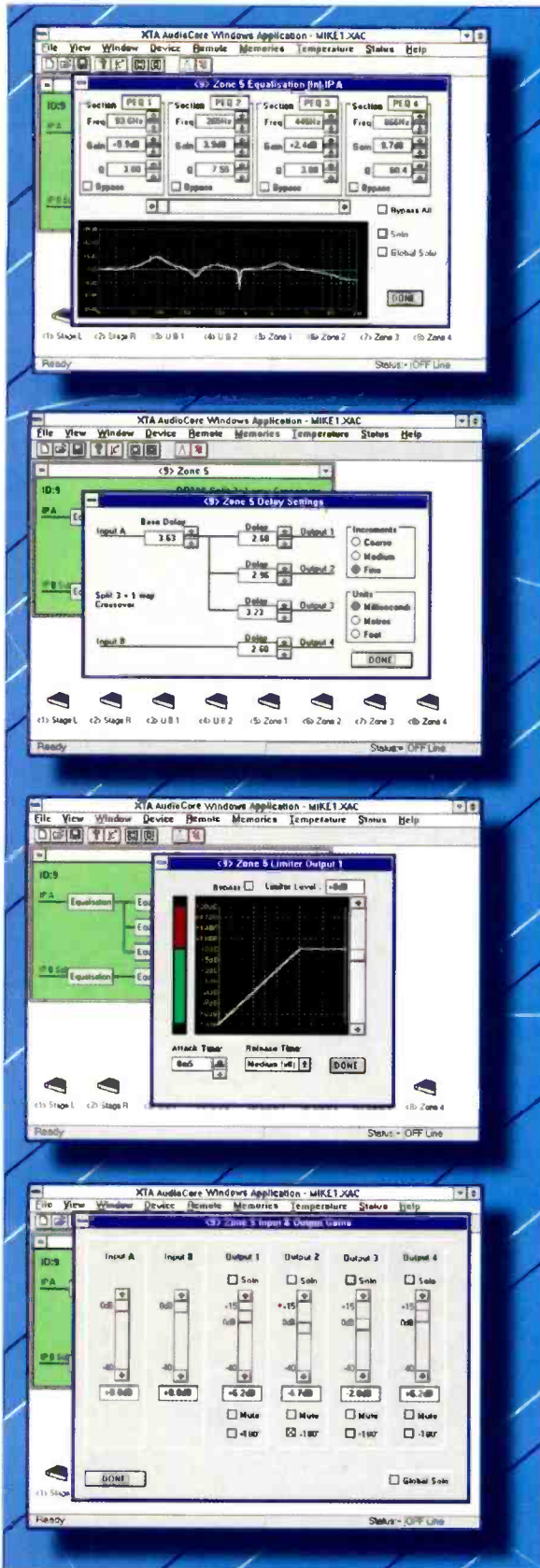
which he can certainly hear the effects of different cables.

As the solution to convertor jitter resides in the convertor, there is no cause to over-engineer the data interface in an attempt to fix a non-digital D-A convertor. Consequently, Duncan's suggestion that a digital-audio interface requires 50MHz of bandwidth is sadly misguided. It is well known that the AES-EBU interface uses a DC-free channel code and that when the bandwidth of such a signal is reduced the zero crossings in the waveform which carry the information do not move.

It is unnecessary to use exotic cables or connectors or to have fanatical impedance matching. The unbalanced SPDIF interface, and the TOS-link are not inferior to the balanced AES-EBU interface, but are simply not capable of sending error-free data so far. Provided there are no parity errors, AES-EBU, SPDIF and TOS-link interfaces are all transparent with a true D-A convertor irrespective of the grade of cable and the connectors, which only affect the distance that the signal can go and the noise margin.

Ben's opinions on RF interference are simply scary. There is no such thing as an RF earth. Any piece of wire connected to a technical earth will develop voltages at the other end in an RF field. Leaving one end of a cable screen disconnected is suicide as it turns the screen into an antenna and allows the building wiring to define the relative potential between the equipment housings. Duncan is wrong when he says that differential signalling is only RF immune if the shielding works. In fact differential signalling will work without any screen, provided that the two legs of the differential signal exhibit identical impedance-frequency characteristics and the common mode rejection is maintained right up to the frequency of the interference. Muncy rightly says this in Duncan's third reference.

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We can work it out



In the dynamic world of recording technology and studio ownership, it is prudent to be aware of the rising stars and waning comets. Should the audio industry cultivate its own astrologers asks **DAN DALEY**

Consider the lowly assistant engineer: he or she has endured much over the years, including numerous, and often less than complimentary sobriquets, ranging from the UK's 'tea boy', to the American 'hey, you!' As studio owners sit there trying to figure out how to pay for this week's client-demanded upgrade, the assistant is the one sitting behind the console trying to figure out how to run it, putting it through its paces, playing with parameters, then showing three visiting engineers a day how it works, and in the process building his or her own prowess on yet another device. Makes you kind of want to switch places for a moment or two, doesn't it?

You might not want to, however, as on average, US second engineers—to use the proper and more dignified appellation—are working between 60 and 80 hours per week on what have to be considered subsistence wages. These start at goose eggs for interns, to around \$5 per hour (a little over £3) for 'runners', and maybe up to \$12 to \$15 per hour for staff seconds who have shown some talent—or at least perseverance, and have been at the place for more than the usual six months before many go off to set up a Mackie and ADAT in their bedroom and call themselves a studio.

That's really the issue in this matter: assistant engineers are increasingly critical in the operation of recording studios at a time when profitability is down and the amount and complexity of equipment is spiralling upwards on a daily basis. Yet the range of opportunities for those at the entry level of the industry has never been greater: for less than \$5,000 anyone can pick up some relatively sophisticated gear, and essentially put themselves into business—and into competition with other recording studios. The former Gunga Dins of audio are fast becoming the Sahibs. It is a typically American sequence of events; the notion of working for one's self has always held more allure than having the status of employee, and never before has there been so large a window through which to exit the wage-slave scenario than now.

THE OUTCOME of the scenario, however, is far from clear. On one hand, professional studios need their assistant engineers like never before. Aside from their *de facto* task of mastering every piece of gear in a facility in order to lead the vast majority of itinerant engineers through each individual studio's arsenal, they also serve a social function.

As Joel Levy, owner of Criteria Recording in Miami puts it, 'Often an assistant establishes a relationship with a client, and the client asks for them specifically. That helps cement the bonds between a client and the studio.'

And Howard Schwartz, owner of postproduction facility HSR in Manhattan, says that in the audio post business, engineers function as much as salespeople as they do technicians, assembling followings within the industry that enhance their value to studios. Assistants are, in effect, salesman-trainees. 'We rarely have outside engineers in post,' he says. 'Our top mixers have come from within from the ranks of assistants, and we encourage assistants to become clones of the "A" guys,' he says. 'They're going to inherit the business.'

This puts pressure on studios to pay assistants more to retain

good ones, a pressure counterbalanced by the fact that there are more and more young people looking to enter the professional audio field.

Garry Jones, senior vice president at Full Sail Centre For The Recording Arts in Orlando, Florida, says that both his school enrolments and graduating classes have been getting larger with each successive years, and that he expects that that's true for audio academia in general. Full Sail's 1995 enrolment was 750; the 1996 school year is expected to host 1,025 students, based on already processed applications, he says.

Don't look for unionisation among assistants anytime soon. On the other hand, those same swelling ranks are making the notion of going it solo seem a bit more daunting. Unless you're shooting for—and have substantial talents in—a niche like dance remixes, the minute you buy some equipment and set up shop, you're subject to the same vicious vicissitudes of business that commercial studios face: getting enough people in the door at a high enough rate to make a profit at the end of the month.

Both commercial recording studios and assistant engineers are treading deeper into the waters of ancillary businesses, and both are doing so because it's harder and harder to make a living off their respective chosen fields of endeavour. Studios are adding anything from post suites to their own record labels to bring in additional revenues; assistant engineers are also eyeing variations on a theme, such as Nashville assistant Nick Sparks, who has started a side business renting ADAT decks for transfers, which he says compensates for the competitiveness among freelance seconds in that single-genre-driven town. That is to say, as fast as new opportunities arise for studio assistants, there are boundaries appearing just as fast on those same opportunities, in the form of the increasing competitiveness of a saturated market.

WHAT WE'RE LOOKING AT over here is a dramatic change in the dynamics of the relationship between studio assistants and the studios themselves. Both parties have more options than ever before, yet both parties need each other as much—if not more—than ever before. Just as studios require staff assistants to negotiate the deepening maze of wires in the control rooms, the assistants also need the career legitimacy and network of contacts that a studio environment has to offer, not to mention the real-world experience of getting to play with a range of gear that they can only dream about affording.

As with the brave new worlds of digital distribution and content ownership, the relationship is at a critical juncture of equilibrium, with as many forces pushing to keep the relationships in their original form as there are pulling them apart. Telephone companies in the States are entering the Internet access business, but they still routinely connect calls between people in New York and Albuquerque even as they explore the possibility of making feature films next year. Will the telco of tomorrow make more money from facilitating family chit-chat, or from funding *Batman VII*? Will the assistant engineer of five years' hence go right from his bedroom to the boardroom, or will he or she still prefer to run for tea and coffee as a trade-off to more comprehensively learning the business as an apprentice? One thing's for sure: the next time you ask for that tea, you probably should do so politely, since it's entirely possible the roles may someday be reversed. ☺

A secret history



As the DVD story unfolds, it embraces ever-increasing intrigues. Latest to join the cast are American encryption legislation, and political tension between Pioneer's audio and video businesses writes **BARRY FOX**

Two recent events identify the foundation for a new-generation entertainment carrier based on the 'one disc does it all' principle. These events both took place in Europe: the first was a 2-day forum held mid-September in Brussels to announce the v1.0 standard for DVD, and the second was a demonstration given by Pioneer at a London hi-fi show. But the events also expose the chaotic way in which the so-called DVD Alliance or Consortium is counting down to the most important consumer launch since CD.

Version 1.0 of the DVD specification describes a disc that can carry either a movie or a video, and compressed surround, or studio-quality linear PCM, with the option of an Ambionics soundfield and still pictures. A DVD player will decode either type of disc, for playback through a television set equipped with movie surround, or through a hi-fi system. A dual-layer disc will carry a conventional (Red Book) audio recording in the lower track, for playback on an ordinary CD player. The high-density recording will be on the upper track, for read-out by a player with DVD optics.

The v1.0 standard, set by the ten member companies of the Consortium, follows v0.9 which had been circulated for comment. The document runs to 800 pages and costs \$5,000 (from Toshiba).

Version 1.0 allays the worst fears of the Acoustic Renaissance for Audio movement, which had seen early versions of the DVD standard, locking future audio to compression. The ARA's Bob Stuart said at Brussels, 'I am very happy with v1.0. There has

been a huge shift to high audio quality. The standard is now very flexible and leaves room for a wide range of options, right up to 96kHz, 24-bit linear PCM, either on its own or with still pictures or lower quality video'.

The standard refers to Super Audio and multichannel Super Sound. There is even a karaoke option. 'There may now be no need for a separate audio standard,' said Stuart.

John Dawson, MD of A and R Cambridge: 'This is very encouraging. It's a real bonus and very exciting. If it can be done it will be done. It must make DVD interesting for specialist record companies'.

On one vital count, however, Version 1.0 is still incomplete.

EARLY IN 1996, the Hollywood studios said they would not release movies on DVD unless the format used digital encryption to control copying and make discs pressed for one market—say, the US—unplayable in other markets such as Europe. The Consortium agreed on an encryption system developed by Matsushita but by the time of the Brussels Forum, Hollywood had not yet approved it. We were repeatedly told that agreement was 'very close'. But a month later it was still 'very close'.

The disc contains scrambled video and audio. It also stores a digital key, in a 'secret part of the disc'. If the disc is digitally copied, this key is corrupted. When an original disc is played on a player with the correct regional decoder, the user 'just pushes the button and the disc plays'—after a brief pause while the player checks copy protection). If the player does not

contain the correct circuitry (if, for example, it is for wrong region) 'it rejects the disc'. The same thing happens if the disc is a copy.

At Brussels, members of the DVD Consortium admitted that the key codes were strong enough only to resist 'casual copying' and more dedicated computer hackers could crack the codes. By then IBM was already tinkering with the encryption system, after Intel had complained that it consumed too much processing power if a computer is used to play a DVD disc. IBM's improvements should make DVD more secure. But a more powerful system will increase the cost of the consumer player and risks falling foul of US law that classifies tough encryption as a weapon of war, and bans import and export.

Typifying the muddled way the Forum was run, and members or the DVD Consortium sing from different hymn sheets, the Brussels organisers cancelled the press conference they had arranged. The press then called their own informal conferences, where we heard a string of contradictory policy statements. The contradictions continued even after the event had ended.

In Brussels, Warner Home Video said what seemed like common sense; encryption might not be used on back catalogue movies. Other Hollywood studios, in the process of lobbying for laws to make DVD hacking a very serious criminal offence, feared that Warner's pragmatic approach might undermine their legal case. Warner then accused the press of misquoting, and said that all movies will be encrypted, even those already shown on TV.

If that's what they want to say, let them. But Rick Marquardt, VP of Warner Advanced Media, had earlier told the audience that the Warner plant was already 'running large orders' and these discs were 'not encrypted' because there was no agreed standard for encryption. So by Warner's own admission, none of the discs its factory has so far pressed can ever be sold.

OVER THE WATER, in England, Pioneer was putting more cats among the pigeons.

Every autumn British magazine *Hi-Fi News & Record Review* stages a specialist hi-fi show at the Ramada Hotel near Heathrow airport. This year one of the high spots was the first public demonstration of a DVD player running audio from an 8cm DVD disc coded with 24-bit, 96kHz stereo. At that data rate there is no room for MPEG-2 video so the disc carried still pictures (a bit like the old AHD audio disc developed by JVC in pre-CD days).

Pioneer's prototype player was delivering around 21-bit accuracy. The industry buzz is that even early DVD consumer players, such as those from Panasonic and Pioneer, will have 20-bit D-A converters on board. The news upset the record companies, who fear that talk of a new audio disc will stall CD sales. Within days, Pioneer in the US was rubbishing the UK demonstration, even though it had been staged by engineers from Pioneer's head office in Japan. The London demo, said Pioneer in California, used a 'video disc—in line with the DVD video specification... not a special audio disc'.

So as far as Pioneer is concerned, the new v1.0 DVD video standard stretches even to include an 8cm disc with still pictures to accompany 24-bit, 96kHz audio. This should make DVD a single platform for video and hi-fi. The only fly in the ointment is that Philips has now backed Sony on the use of DSD bitstream, instead of PCM. **S**

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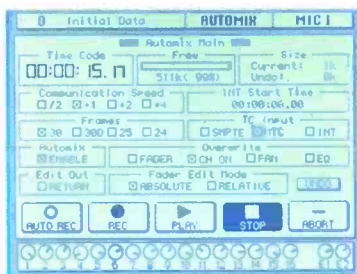
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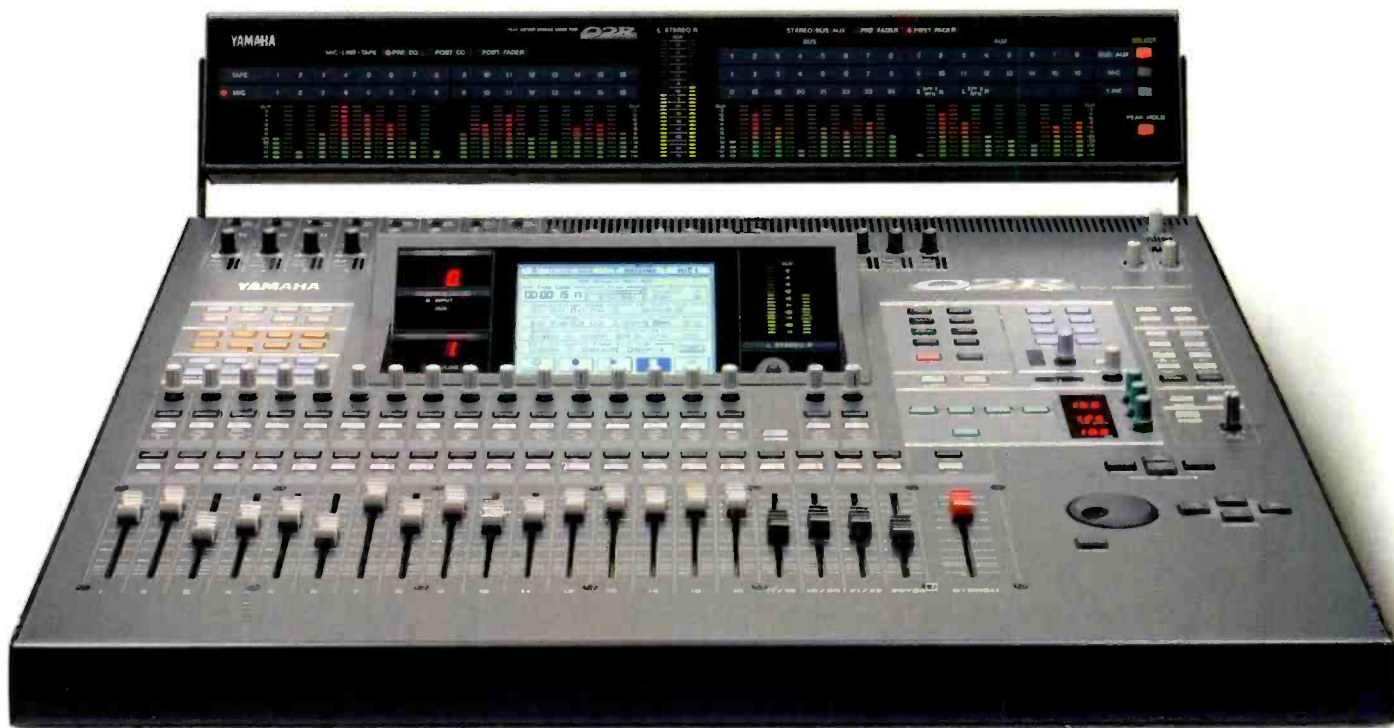
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Stepping into Asia



The Philippines: the locals are preparing to take on the rest of the Asian region for status in the post market writes **STEFANIE GOH**

The sound of tooting horns from cars and Jeepneys (locally made jeep-like cars that also come in bus-sized versions), welcome you as you pull out of Ninoy Aquino airport in Manila. The air is heavy with bustle and pollution from vehicles, yet there is an air of calmness about the people as they go about their daily lives. I'd been told that the Filipinos are very creative and talented people, and since I'd had limited contact with them, I took a 'we'll see' attitude about the people and their work in broadcasting. My mission in Manila was to find out about the state of the Filipino audio and video postproduction industry—I was to be pleasantly surprised.

My first stop was at Audio Post, the leading audio postproduction house which caters to the various aspects of radio, television and film audio production in the Philippines. My host, Arnedo 'Dodie' Lucas, showed me around the facility which probably boasts the largest collection of AMS Neve AudioFiles, and is able to provide the client with a television commercial with a total audio solution. It transpires that Audio Post not only has some of the best engineers in town, but also composers as well who are able to score a commercial and mix the audio.

'Our setup allows the client to come in with an idea and we can arrange for the production of the commercial. We can take care of everything from the casting to the location scouting because of our network of contacts,' says Lucas.

Audio Post is part of the Roadrunner Network of media companies that includes Video Post, Star Labs, Star Animation, Cine Video, The Music and Sound Gallery, and Pre Post. ABS-CBN, one of Philippines largest broadcasters, has recently become a shareholder in the Roadrunner Network, injecting funds, and creating a partnership that will see both organisations take an aggressive step into the film-making industry.

'We feel that the move is a prudent one in a sense that there is a large domestic market for locally produced films,' offers Reuben 'Bon Bon' Jimenez, president of Video Post. 'However having said that, we would also like to handle the postproduction for overseas clients, including the ones who shoot on location here in the Philippines.'

A VISIT TO JIMENEZ at Video Post showed the facility to have recently taken delivery of an Ursa Gold, which was waiting to be installed in its new studio. The facilities include two Quantel Henrys, and eight SGI workstations that produce animation and graphics for their television commercial productions.

The Filipinos seem to have a great potential for playing in the big leagues. This is because they have a knack for creativity that is almost unsurpassed in the region, and the passion for the work they do comes through in some spectacular products that, once seen, beg the question: why hasn't anyone done this before?

'It is not the talent that we lack, but the infrastructure,' Lucas reveals. 'What we need to have is more stable public utilities and telecommunications system because they are quite vital to the success of our businesses internationally. Having all the human resources in the world is not enough.'

This obstacle is evident as Lucas and I tried to make our way to ABS-CBN in Quezon City which is normally a 20-minute ride that eventually took us an hour and a half because an early afternoon storm had knocked out the traffic lights at a major intersection between Makati and Quezon City, creating a massive traffic jam.

Once we arrived at ABS-CBN, I noticed a marked lack of security at the gates even though there were a few armed guards who gave us the once over. Lucas is a familiar face around here as he has acted as consultant for the design and acoustics for a couple of their theatres. The ABS-CBN facility is relatively new, but an additional 18-storey building is under construction next door in anticipation of future growth. The Roadrunner Network already has space booked in the new building.

THE MAIN ATTRACTION is the broadcast centre and the postproduction facilities located in the basement of the building.

'This is where the engineers hide out, in the dungeons,' smiles Patrick de Leon, manager of On Air Design who is our guide.

A dungeon it certainly is not; the corridors are brightly lit, and behind each door were editing suites occupied with enthusiastic young producers. The equipment is by no means antiquated, nor the youthful hands that operated them amateurish. According to the senior vice president of corporate services, Felipe Yalong: 'They are our future and we believe in providing them with an environment in which they can utilise their full potential.'

Another video postproduction facility I saw was Omni Post which is about a year old. Also located in Makati, Omni Post has a Hal Express and an Editbox on which they have produced some rather outstanding commercials for San Miguel beer and Mister Donut. As engineer Karlo David played the show-reel, and eagerly explained the intricacies of each commercial it was easy to understand how such quality can emerge from such a young company.

'I guess you can say that there aren't enough hours in the day for me to be here. I truly love what I do,' declares David.

That kind of spirit carried me through the traffic of one way streets of Makati to Optima Digital. Walking through the door is like walking onto the set of *The Flintstones* meets *The Jetsons*. Peter Jimenez, Optima's creative director, took me around the facility that has an equipment list that outputs a quality of work as impressive as its decor.

General manager Armando 'TTA' Francisco has the same vision as his counterparts at Roadrunner, 'We have the capabilities, but we do not have much recognition outside the country because we produce mostly for the local market,' he says. 'We feel very ready to handle more international work that we know is out there.'

There is no doubt that as the Filipino economy and political climate strengthens, their media and broadcast industry will get a huge boost. Talent-wise, they are remarkably self-sufficient, and the standard of work produced is world class. Once the rest of the world sees beyond the decades of political turmoil, soot covered facades, and the odd beggar on the street, they will find a competitor worthy of respect. From the unspoiled beaches to the crowded streets of Manila, you will always be greeted with 'Mabuhay!' 🇵🇭

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Dave Foister, voted
technical journalist of the year 1995.

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Uli Jon Roth, 'Scorpions' and Symphonic
Musical Director. BEQ 32 Owner, BEQ 56 ordered.



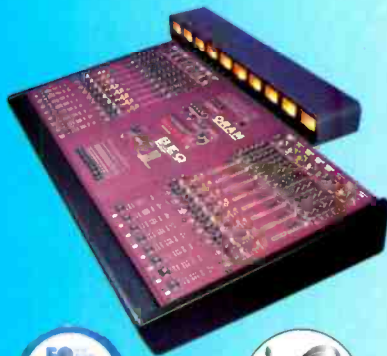
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B&K 4000-SERIES COMPACTS

Brüel & Kjær's omni microphones established the kind of reputation that makes or breaks companies.

DAVE FOISTER puts the Danes to the test with a comprehensive selection of their compact 4000-series

BRÜEL & KJÆR is not a company known for style gestures. Its roots in test and measurement equipment have provided the foundation for a reputation for precision and quality, making cosmetics and aesthetic image relatively unimportant. Not that B&K microphones are unattractive; the 4000-series combines functionality with a sleek elegance, and the spectacular 4040 stands out in any crowd, but in both cases the design serves the technical needs.

It can be safely assumed, therefore, that the remarkable compact microphones that have recently joined the 4000-series have been given their small size for purely practical reasons, with as little compromise in quality as possible, rather than to fill a gap in the market or merely to get themselves noticed. They were, in fact, conceived in direct response to a request from a customer, a whole range growing from one man's wish to attach a B&K to his violin.

They also represent a step forward for Danish Pro Audio, the company that took over the studio microphone range from Brüel & Kjær when that company decided it no longer wished to continue making them. Several B&K employees found themselves out of a job, only to be re-employed over the next couple of years by Danish Pro Audio. DPA had been quickly set up by former senior B&K Pro Audio Group people Morten Støve and Ole Brøsted Sørensen to ensure the continuity

of the 4000-series, and the irony was that Danish Pro Audio immediately became a major B&K customer, as B&K continued to manufacture the microphones themselves under contract to DPA. All this happened so seamlessly that I suspect few people in the industry even noticed; the microphones remained the same, the designers and R&D people in time became the same, and the Brüel & Kjær name was retained, even though the entire commercial basis for the operation had changed. The arrangement is still in place, with the microphones and capsules made in the same small section of the vast B&K complex using machinery, manufacturing techniques and quality control of an extraordinary precision as befits a company making reference measuring equipment. This is still the core business of B&K itself, as it always was, the studio microphones being an almost reluctant spin-off from the reference models. Note that the entire range of B&K studio microphones, including the new ones, is designated the 4000-series; there have never been any others.

THE COMPACT MICS move things on still further because they are the first new product, developed by DPA since the separation, albeit designed by the same people responsible for the original range. Besides this, the only components of the new models that are manufactured by Brüel & Kjær are the microphone capsules, the same pre-polarised condenser cartridges that have formed the basis for the 4000-series all along. The principal new element in the compact range is the preamplifier, and that is now made by Danish Pro Audio in-house.

The story of the compact goes back to before the DPA move, when

Semmy Lazaroff, a violinist with the Stockholm Symphony Orchestra, asked if it was possible to

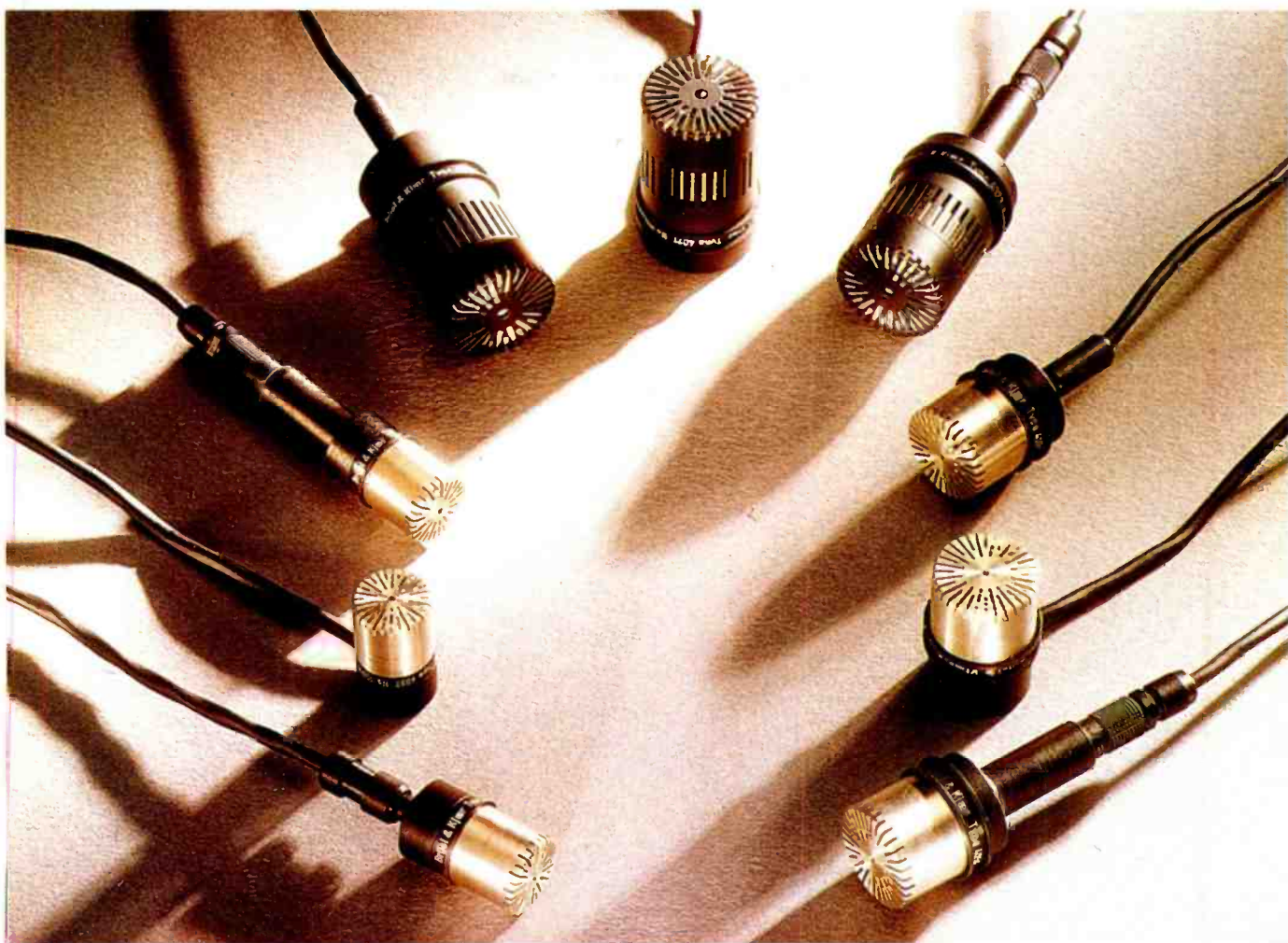
have a scaled-down version of a B&K microphone to mount directly on his Stradivarius as he was so pleased with the results he was getting with a 4011. Intrigued, B&K developed a prototype in 1989, based on the high-voltage cardioid and mounting on the violin's tail piece. It was held in place off the instrument by a small right-angled rod, which made it look more like a small street lamp than a microphone. This was a little clumsy, so a foam mounting fitting on to the strings behind the bridge was tried; this was not satisfactory pointing at the bridge, and picked up too much violinist-breathing and grunting—the other way round. Eventually an adjustable yet discreet mounting was designed which allowed better microphone placement without drawing too much attention to itself. The results were so good that the possibilities of a whole range of compact microphones with high performance but low visibility began to present themselves.

The first of these, launched about three years ago, were cardioid microphones like the violin prototype. What made them possible was a completely new preamplifier module, replacing most of what lives inside the body of a 4011 with a thick film circuit on a disc not much more than a centimetre across. The electronics are completed by a small PCB in the XLR at the other end of the cable, which provides impedance matching and power supply conversion—everything else, hard to believe as it is, lives inside the microphone body behind the capsule. Three versions of the compact cardioid comprise the range: the 4021 with its cable exit at 90° like the original violin prototype, the 4022 with its cable exit at the rear, and the 4023 with a miniature Lemo connector on the back. This is a tri-axial connector providing balanced operation without the risk of damage from accidental twisting, and makes an easy yet secure connection allowing the head to be exchanged for one of the other types of microphone if required. All use the same capsule and electronics, the capsule being the MM0056 cartridge exactly as used in the 4011 and 4012.

The consequence of this is that the performance of these compact microphones is in most respects identical to the familiar larger equivalents. The only significant derating is the SPL handling, reduced by 13dB compared with the full-size 4011 purely because of the reduced

**Model 4021
Cardioid
compact mic on a
violin bridge**





signal handling capabilities of the thick film preamp. Despite this it remains perfectly respectable at 145dB, only suffering by comparison with the 4011's remarkable headroom.

SINCE B&K'S reputation was founded on omnidirectional microphones—the only kind the company made for quite some time—it was inevitable that these little cardioids would soon be joined by omni models, and these appeared earlier this year. Two distinct types are available, and each comes in the same set of three cable exit versions as the cardioid, giving a range of nine models altogether in the series. The 16mm MM0042 cartridge used in the 4006 forms the basis for the 4051, 4052 and 4053, while the 12mm MM0043 cartridge from the high-SPL 4007 produces the very smallest of the new microphones, the 4033, 4036 and 4037. These are the same kind of size as most traditional tie-clip models, which is an extraordinary achievement given that the performance is again almost identical to the 4007; for example, the frequency response remains within ± 2 dB from 20Hz to 40kHz and the omni pattern shows little deviation from the ideal right across the spectrum. All three come with a tiny foam windscreens, and the axial cable version has a lavalier clip supplied as standard.


The slightly larger models, distinguished from the very small ones by being called Versatile in the catalogue,

bring the same benefits over the 12mm microphones as the 4006 has over the 4007. They have the lower self-noise implicit in the physics of the larger diaphragm, at the expense of the SPL handling and extended frequency response—these only (!) go to 20kHz within ± 2 dB—and they accept some of the special accessories designed for the 4006. The 4006 grid over the diaphragm can be removed and replaced with a special black grid, whose slightly longer dimensions create a linear diffuse-field response which translates into a 6dB boost at 15kHz when used near to the source. Because the capsule is the same, the compact versions can also have this grid fitted with the same result, and the same applies to the 4006 nose cone, which counteracts the directional characteristics that omnis exhibit at high frequencies. This gives the microphones a virtually perfect omni response over the whole audio range, giving particular benefits where uncoloured ambient pickup is required. The only 4006 accessories not suitable for the compacts are the remarkable Acoustic Pressure Equalisers, the bizarre spherical and cylindrical objects that provide acoustic tonal equalisation to the microphones when slid over the body behind the capsule grid. The compacts are simply too small for them to fit.

But the very nature of the compact range means that more accessories than these are required. DPA feels that

From left to right: Omnis 4036, 4037, and 4033. Cardioids 4022, 4021 and 4023. Omnis 4052, 4051 and 4053

accessories have never been a strength of the B&K range, and is determined that these new microphones should have all the support, literally as well as metaphorically, that they need. The small size is tailor made for applications where they must be hidden, such as theatre and TV, but this can only be done effectively if there is a variety of means of mounting them. So a system has been evolved which allows all three sizes to be shock-mounted on a selection of holders using a simple rubber spider's web which slips easily on and off the three pins on each mount. This element, in the appropriate size, can be fitted to a simple stand-mounting ring, or to special clamps for saxophone, cello and violin. This last resembles the final version of the prototype violin mount and also attaches to two strings on a double bass, while the sax mount works equally well on the bells of several brass instruments. There is also a small yet very heavy table stand, and a magnetic base for attaching to a piano frame to save its finish from the ravages of gaffer tape. The cardioids have their own special accessory, in the form of an X-Y stereo mount holding them vertically above each other at the appropriate angle.

All these are optional extras; supplied as standard are simple suspension mounts which allow the microphones to be hung from their cables. One end clips round the microphone body while the other ends in a helical spiral which wraps round the cable like the hangers used for telephone wires. 

REVIEW

They are made of wire which is flexible enough to be bent into shape, holding the microphones at the desired angle.

A recent addition to the range is the Flamingo series of stands, slender floor stands that resemble familiar extension tubes except that there is no detachable preamp to extend. Instead, the Lemo versions of all the microphones can be plugged straight into the top of the stand on a flexible gooseneck, with an output appearing on an XLR in the other end of the tube. Options for the Flamingo stands include twin tubes for double rigging and extension sections for the adjustable base.


Armed with at least one of each model of microphone and a representative selection of mounting hardware, I set about throwing the whole system at any job it might possibly be good at, which covers pretty much everything. I use the term throwing loosely, as the tiny size of the

microphones belies their actual robustness and inspires an unusual amount of respect. The cables too are unusually thin, creating fears for their safety which are probably quite unwarranted, but I felt the need several times during sessions to point out to musicians that the little black and silver cylinders dotted around the studio were actually rather expensive delicate microphones and not to treat them as if they were throwaway bugs; some had not even noticed they were there. All this of course is not a reservation but a compliment to the design, as they were not intended to be stuck in a conventional recording studio but hidden away where they will avoid intruding on pictures.

The straightforward stand mounts make these microphones ideal for drums, as they can be poked in anywhere without getting in the way or fouling the movement of a cymbal. It was also easy to hang a pair of omnis over a kit on their

wire suspensions, or to use a pair of cardioids on their X-Y mount as alternative overheads. The same mount is ideal for piano recording, creating a pair which can be moved around at will to find the best site without disturbing the carefully-set angle or coincident configuration—the assembly is as easy to use as a single-point stereo microphone. The point is that although the system was designed to be unobtrusive in the context of pictures, it has many advantages in straight sound recording as well. Even the mounts for individual instruments, which I approached sceptically as I assumed the microphones would be far too close, gave excellent results, the players on every occasion being particularly impressed with the resulting sound.

AND THE SOUND is the most remarkable aspect of all. I began by saying that it would be surprising if much of the sonic quality of the B&K capsules had been sacrificed in the interests of reducing the microphones' size, but even so it was a revelation to hear just how good they are. The utter openness for which the 4000-series is renowned is retained in these microphones, with a breadth, a dynamic transparency and a sheer quality which few full-size microphones can approach. These are microphones I would find myself reaching for even when there was absolutely no need to use a small model, just because of their sound. This is perhaps what makes the results when mounted directly on the instruments so surprisingly useable, especially when using the omnis with their inherent lack of proximity effect. A particular surprise was an experiment with bass drum, tried simply because I have been bombarded with papers showing why the assumption that only large microphones can properly deal with large amounts of low frequency energy is false. Sure enough, the sound produced by one of these tiny cardioids in front of the kick was bigger, fatter and more physical than that from my usual industry-standard dynamic, the only problem coming when I placed it too close to a small hole in the front skin—predictably, it didn't like the blast of air.

That aside, everything else worked amazingly well, making me yearn for a studio full of full-size B&Ks. The further twist is that these compact microphones, despite their clever technology and specialised applications, are actually less expensive than their full-size counterparts, bringing a complement of B&Ks—never the world's most expensive microphones to begin with—even more within reach. Any thoughts that the only reason for using these is their size, as would undoubtedly be the case with some other miniature microphones, should be completely dismissed. These are world class sonically desirable microphones which happen to be very small, rather than very small microphones which happen to sound all right. They are a remarkable achievement. 

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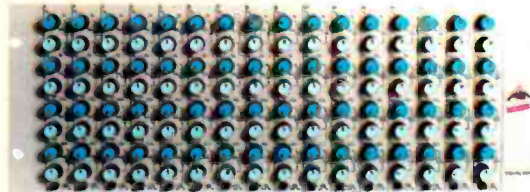


The versatile 2U rack mounting unit provides 16 independent channels of balanced mic/line amplification. Each channel is provided with: Balanced mic input, balanced line input, bal-

anced 1/4" jack output, +48 volt phantom power with individual led indication, a phase reverse switch (operating on both mic and line) and a 20dB pad on mic input. £899

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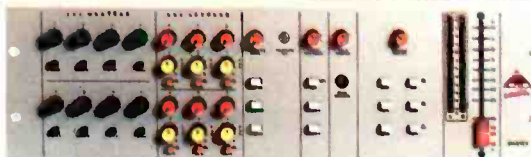


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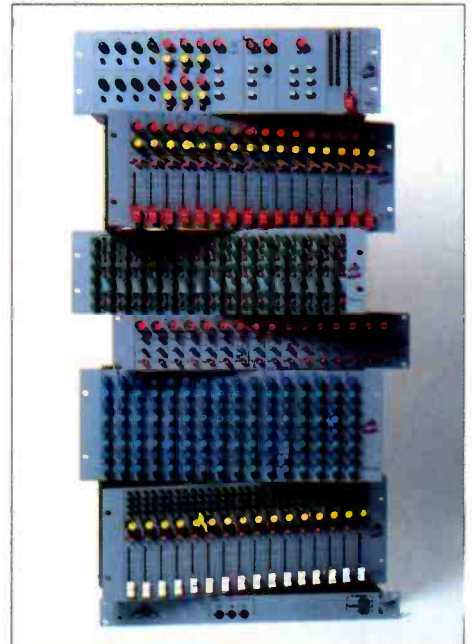
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Photograph by Jack Bradley, Peoria Journal-Star, Peoria, Illinois, 1963.

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Focusrite GREEN RANGE

The Dual Mic Preamp, Focus EQ and Voicebox are the first of the Greens—a range of affordable Focusrite outboard processors. **ZENON SCHOEPE** evaluates their nutritional value



with three other new units a little later on, and with as many as another six rumoured to be in the pipeline. Exactly what form these units will take is not clear, but clues can be gleaned from the units being looked at here, which introduce the concept of single-chain multiple processing, and the inclusion of, of all things, an instrument-level input. Other pointers must come from the obvious type of analogue processing that is currently not represented in the range as a stand-alone box, such as dynamics and gating. It's interesting stuff and it's likely to be pretty good.

Focusrite has clearly turned on to the observation that the look of a unit can contribute significantly to its perceived value as demonstrated by the classy looking Red series

ONE OF THE THINGS you have to bear in mind when approaching the Greens is that these are no Red or Blue range Focusrites. Everybody would want to believe that by some strange fluke of nature the company that made its home in definitive, and not inexpensive outboard processing could create something just as good for a lot less.

Well, while it's true that the Greens do represent all the traditional values associated with the high-ranking brand they are not just repackaged low cost versions of existing units, they are in fact significant departures in terms of direction and application and don't necessarily have immediate and direct equivalents in the Red and Blue ranges. The Greens represent new territory for Focusrite, veritable mass-market territory in comparison to its established ranges, but a very valid adjunct that spreads the company word and appeal to more than could ever have hoped to respond.

Savings have been made through the design and manufacturing process of

these new units (see *Studio Sound*, May 1996, page 95) but the company took the opportunity to retarget this new breed of processor at a new breed of Focusrite buyer having recognised that going down the more obvious stripped-down route might not, on its own, be enough to sway a new buyer.

What we have is the beginnings of a well planned range of 1U-high outboard processors that will appeal immediately to project studios and musician self-ops working, perhaps predominantly, with digital DAWs who have a real need and appreciation of a couple of channels of very good analogue gear. However, the panache with which this has been achieved means that these boxes will find friends further up the commercial chain to studios and post outfits that have similar requirements, and to whom the Focusrite name at this cost represents outstanding value for money.

The Voicebox, Focus EQ and Dual Mic Preamp are the first three units in a range of Greens that promises to be followed up

Three of a kind. Many more in the pipeline?

Focus EQ: with an instrument input

Cosmetically, you're either going to love or hate the Greens as they're highly design led. There's an argument that states that outboard ought to be black and dull, but Focusrite has clearly turned on to the observation that the look of a unit can contribute significantly to its perceived value as demonstrated by the classy looking Red series. Greens don't look classy in the same way in my book, but they do look different, fun and a bit funky. They catch the eye, and suggest that they promise something a little special which is presumably the intention. You can't miss them. They even stand proud from a 19-inch rack case by virtue of having a thicker than usual front panel, and are fixed in place by only two rack screws—something that is possible because of the torsional rigidity of the aforementioned front panel.

I find the crazy cut-outs surrounding processing sections a little obstructive if you insist on trying to read the pot legending. But more significantly I was disappointed that none of the knob cap





Dual Mic Preamp

pointers actually pointed due north at centre detents.

All the units share similar front-end blocks and it's perhaps apt to concentrate a little in the first instance on the similarities of these three units.

All have XLR connectors for inputs, and output with jack sockets used only for a rear-panel instrument input on the Focus EQ, for stereo linking the compressor and de-esser sections in the Voicebox, and for remote muting on the Dual Preamp and Voicebox.

All these units have similar mic preamp sections to that found on the Dual Mic Preamp which has a gain pot (around 60dB) and switchable phantom power, phase reverse and a 75Hz high pass filter all with LED indicators. There's also an overload LED on the Dual Preamp and Voicebox, and LEDs that indicate external muting and manual mute buttons.

Voicebox is designed as a single-channel mic recording path with an output-level pot and overload LED. It combines an expander, compressor, de-esser and EQ in a very attractive and useful package. The expander works on a single threshold pot while the compressor has fully variable threshold, ratio and make-up gain pots plus an auto-release switch that takes over from the default setting, which we are told has

been optimised for vocals. The section can be bypassed and switched to read gain reduction on the Vu reading input level bar-graph-style meter by a novel single dot display.

A bypassable de-esser section has continuously variable threshold, and frequency range pots, and is followed by three bands of bypassable ± 18 dB EQ with sweepable LF (100Hz-1kHz) and HF (1kHz-10kHz) shelves and a switchable broad or notch peaked, swept mid operating over 600Hz-6kHz.

Moving on, the three-band arrangement of the Voicebox is restrictive by comparison, but there's still enough to make a cheap mic sound more substantial, and to lift the character out of an expensive one

EQ IS ARGUABLY what Focusrite is most famous for, so it is with some serious expectation that we greet this single channel 4-band unit with high-pass and low-pass filters. The Focus EQ has the added distinction of catering for mic, line and instrument inputs selected by switch with an associated ± 12 dB input trim pot.

The EQ and filters can be switched into circuit separately the latter sweeping 10Hz-320Hz and 4.7kHz-30kHz. You're then into four ± 18 dB bands with sweepable 30kHz-470Hz LF and 3-18kHz HF shelves which can also be switched individually to peaking response. The two mids are fully parametric—Qs variable from 0.3 to 1.8—and feature x3 multiplier switches to cover 40Hz-1.2kHz and 600Hz-18kHz as a result. The whole strip is wrapped up by an output-level pot and overload LED.

You start off with beautifully clean and quiet mic preamps, and while things end here for the Dual Preamp, for the other two units it just gets better.

Many will no doubt be wondering what a Focusrite instrument level input sounds like and with the Focus EQ you can find out. It's nice and open, true to guitar tone, and good on bass. However, you've really got to wind back on the input level if you're looking to whack on a lot of EQ as you'll get the unit running very hot without too

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- Selectable 44.1 and 48kHz sampling rates – so you can master at the CD standard.
- Setups easily selectable from the front panel for digital I/O terminals, digital output format, analogue output level, single program play on/off, blank skip on/off for program play and ID-6 status for SCMS.

- Precision engineered for professional use. Beware of "uprated" consumer machines, the SV3800 is a pro machine from the ground up.
- Single Program Play mode – vital in broadcast, post-production and live sound applications.
- Shuttle wheel with dual speed range.
- Skip Search and Program Number search for convenient cueing.
- Adjustable analogue output level.
- 50 function parallel remote control.
- Professional 'Error Rate' and 'Hours In Use' displays.

The Panasonic SV3800 represents incredible value in professional DAT. Contact HHB Communications today for details of your nearest HHB DAT Centre.

Panasonic sv-3800 **DAT**
Digital Audio Tape

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REVIEW



Voicebox—preamp expander, compressor, de-esser and EQ

much provocation.

The filters are excellent and truly useful, and transparent beyond the knee as they should be, and then you're into the 4-band. Bottom end control is exquisite with a discernable difference between shelf and peaking curves at ultra-low settings. The mids can be subtle with a just a twist either side of zero over what are wide, but sensibly divided frequency ranges, but there's still enough overlap to stack a broad band on a notch if you need to.

Moving on, the three-band arrangement of the Voicebox is restrictive by comparison, but there's still enough to make a cheap mic sound more substantial, and to lift the character out of an expensive one. The compressor is great, and the two release settings are different enough to be useful. In fact it's a classic-sounding section, and probably the best feature of the Voicebox. It's a shame that an instrument input isn't provided for this unit because it would do nicely. The expander is simple in the extreme, but click free, and very hard to fool, so it can be used without fear of stealing unexpectedly. A de-esser is a de-esser in my book, and this one works fine.

I have criticisms—a front-panel instrument socket would be handy on the Focus EQ, and mic-and-line inputs on the Voicebox—but most

tend to be of the 'what if...' nature, and are concerned with different combinations and permutations of the blocks of processing, but who is to say that Focusrite aren't working on the development of just such boxes at the moment. These units set out to offer a dual mic preamp, a slick voice recording channel, and a powerful channel of excellent EQ, and that's just what they do.

These boxes are really quite excellent. I'll admit

that I expected them to be ever so slightly less than spectacular lest they steal the glory from Focusrites more haughty brethren, yet sonically they're spot on. They lose out most perceptibly to other coloured Focusrite units in terms of being only single channel, and in operational ease—they're a little fiddly by comparison to the blatant ergonomics of something like the Reds, but then they are not direct counterparts.

They should really be judged against what is available anywhere else for the money, and that's where they score so highly. It's almost incredible that Focusrite can build these boxes at these prices. Solid, reliable and classy performance. They will sell like hot cakes. If you don't like the look, then close your eyes because you can't afford to close your ears. **S**

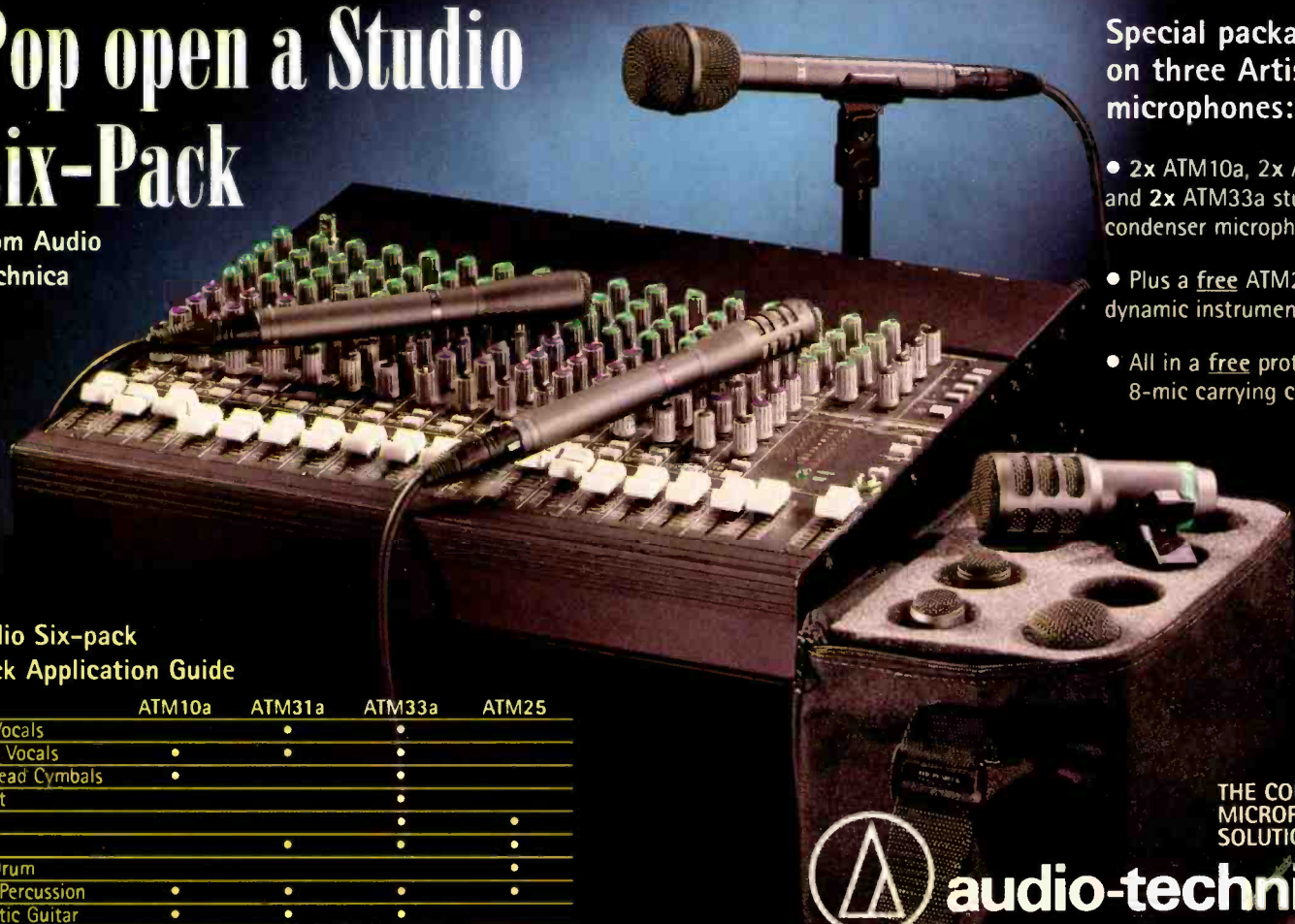
They should really be judged against what is available anywhere else for the money, and that's where they score so highly. It's almost incredible that Focusrite can build these boxes at these prices

CONTACT

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Studio Six-pack Quick Application Guide

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Hi-Hat			•	
Snare				•
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MDD140

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CDR74

680 MB/74 MINUTE RECORDABLE CD
FOR PROFESSIONAL USE



CDR74P

680 MB/74 MINUTE RECORDABLE CD
FOR PROFESSIONAL USE



MDD140

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WRITE PROTECT



CDR74

680 MB/74 MINUTE
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dependable and cost effective range of high quality tape and disc-based digital recording media, to provide the discerning professional user with unparalleled standards of performance and long term security.

HHB DAT Tape has already proved its superiority by outperforming all other brands in independent tests. HHB DAT, CD-R, MiniDisc, MO and ADAT media is recommended for use by all of the world's leading manufacturers, including Sony, Panasonic, Pioneer, Denon, Genex and Yamaha. The HHB reputation for absolute dependability is so strong that many leading recording artists, broadcast organisations, industrial users, government agencies and utilities worldwide simply

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PLAYER / RECORDER**



DIGITAL RECORDING MEDIA



ALESIS ADAT XT 8-TRACK DIGITAL TAPE RECORDER



GENEX GX8000 8-TRACK MD DISK RECORDER



MARANTZ CDR620 COMPACT DISC RECORDER



PANASONIC SV3800 DAT RECORDER

HHB's involvement in establishing the professional acceptance of many of the formats in question is well documented. HHB is the world's largest independent supplier of DAT technology, and a major international distributor of CD-R, MiniDisc and Magneto Optical Disk recording hardware. As such, we are perfectly placed to assess the media requirements of our professional customers working in a wide variety of industry sectors. From music recording to video post-production, film dubbing to broadcast, HHB plays a pivotal role. So while laboratory testing is an essential element in the development and quality assurance of the Advanced Media Products range, HHB is uniquely placed to undertake ongoing tests in 'real world' conditions, ensuring that HHB recording media products continue to be manufactured and packaged to our exacting specifications, and continue to deliver the performance and reliability that our professional customers demand.

HHB Advanced Media Products are available from more than 500 professional audio and media dealers worldwide, supplied by a network of over 40 international distributors. For details of availability in your country, please call HHB Communications Ltd in the UK on +44 181 962 5000, or in the USA call HHB Communications Inc on 207 773 2424. Alternatively, for full information on all HHB products and a full listing of international distributors, visit the HHB web site at <http://www.hhb.co.uk>.



ADVANCED MEDIA PRODUCTS

THE FUTURE IS SECURE



MiniDisc



MD74

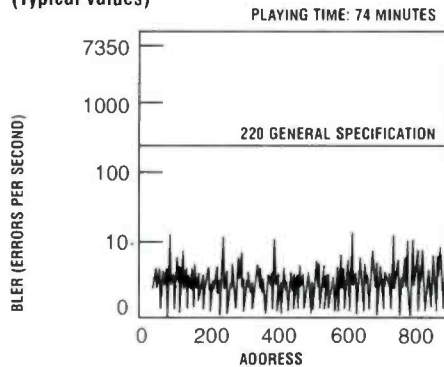
Professional Audio MiniDisc

High sound quality, low media costs and the virtually instantaneous playback of 255 tracks have quickly established MiniDisc as the medium of choice in a variety of broadcast and live sound applications. To ensure security and dependability in such demanding environments, HHB has developed the HHB MD74 Professional Recordable MiniDisc – the most advanced MiniDisc media currently available.

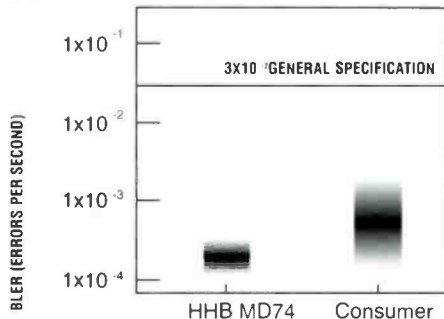
Precision manufactured and tested to exacting tolerances, the HHB MD74 achieves block error rates more than 10 times lower than conventional consumer MiniDiscs and can be reliably used for more than 1 million read / write cycles. The sputter coated recording layer achieves precision length and position of recording pits and delivers a high carrier to noise ratio. Protection against physical damage and the harmful effects of extreme environmental conditions is provided by a tough UV coating. A special lubricating agent ensures optimum contact with the recording head, while a unique foil shutter protects the disc from dust contamination and is far less susceptible to breaking after repeated handling than inferior metal shutters.

Quick access to the MD74 in a hectic environment such as a busy broadcast studio is enhanced yet further by packaging the disc in a slip case with a quick release security lock.

BLOCK ERROR RATE CHARACTERISTICS (Typical values)



COMPARISON OF AVERAGE BLOCK ERROR RATES (Typical values, averaged over disc)



MDD140

Data MiniDisc



Originally designed for data back-up, the MiniDisc Data format has now been embraced by a number of professional audio manufacturers for use in an exciting new breed of portable, random access digital multitrack recording products. HHB's position as a pioneering supplier of this new generation of personal multitrack recorders places us uniquely to specify, develop and test a dedicated version of the MD Data format specifically for professional audio use, and to ensure its compatibility with all existing and future hardware. Manufacturing specifications for MD Data are even more exacting than those defined for its audio counterpart and typically the new HHB MDD140 excels in the critical areas of high carrier to noise ratio, low block error rates and extended long term security to provide professional audio users with a dependable, cost-effective disc.



MO & ADAT



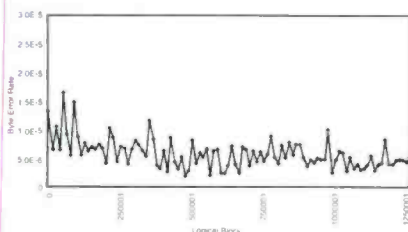
MO 1.3GB & 2.6GB

5.25" Rewritable Magneto Optical Disks
1024 Bytes Per Sector

Random access, high capacity and excellent long term security make MO the natural successor to tape in a new generation of high-bit digital multitrack recorders. For the demanding professional user, HNB provides ISO standard 1.3 and 2.6 GB disks of such quality and reliability, that we are confident to back them with a lifetime (100 years) warranty.

The stable recording layer delivers a carrier to noise ratio of greater than 45dB while the meticulous elimination of physical defects during the manufacturing process results in consistently low block error rates. A specially compounded polycarbonate substrate functions dependably under extreme variations in temperature and humidity, while an anti-static hard coating repels dust and minimises scratching, ensuring an extraordinary secure archival period of more than 100 years.

BYTE ERROR RATE



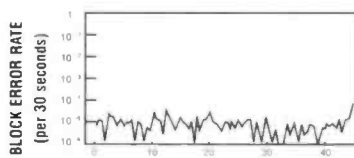
ADAT 45

S-VHS Tape For Use With Alesis ADAT Digital Multitrack Recorders

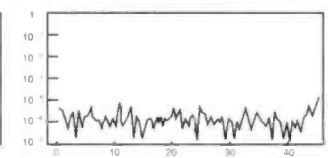
Constant high speed shuttling and re-recording during the multitrack recording process places considerable physical strain on the tape. The HNB ADAT45 is designed to provide users of the ADAT 8-track digital recorder with dependable, high performance recording media, manufactured and tested specifically to withstand the rigours of a professional recording environment.

Ultrafine cobalt ferric oxide particles are distributed with exceptional uniformity to produce an extremely smooth magnetic surface, delivering enhanced high frequency response, consistently low block error rates and an unusually high output generally. A special high density binder ensures that the error rate stays low even after 100 passes, and a rigid, precision engineered cassette ensures the accurate handling of the tape and minimises tape pack slack, further enhancing reliability.

BLOCK ERROR RATES (Initial use)



BLOCK ERROR RATES (After 100 passes repeat running)



DAT



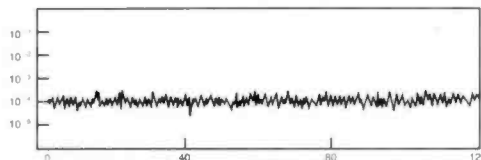
DAT15-125

Audio DAT Tape

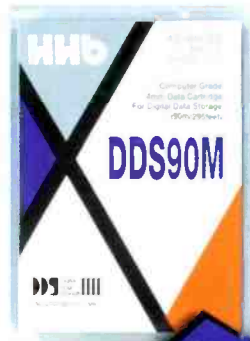
If you value the security of your masters, there's really only one DAT tape you should use. In independent testing of seven leading DAT tape brands by the respected professional audio journal 'Studio Sound', HHB DAT Tape emerged a clear winner with consistently low block error rates and superior long term security. So perhaps it's no surprise that HHB DAT Tape is recommended by most leading hardware manufacturers including Sony, Panasonic and Pioneer for use in their recorders. A choice of 6 tape lengths, 15, 35, 50, 65, 95 and 125 minutes, enables the user to match the running time with the project, minimising costly wastage. In fact, the HHB DAT125 is the

longest full-thickness DAT tape available, allowing uninterrupted recording of 4 hours and 10 minutes in long play mode. An enhanced magnetic recording layer combining ultrafine magnetic particles with a unique surface treatment results in block error rates of less than 5×10^{-4} . Equally importantly, a specially formulated binder system, bonding the recording layer to the base film, ensures that error rates stay low, even after 100 passes, while a new, more flexible, base film enables the tape to mould better to the head, reducing head wear and further reducing error rates. Integral to the high performance specifications

BLOCK ERROR RATES AFTER 100 PLAY / REWIND CYCLES



of HHB DAT Tape, the cassette shell is capable of withstanding a temperature of 107°C (224.6°F) without warping, equipping it ideally for use in extreme conditions. A new anti-static lid discharges at twice the conventional rate, actively resisting the dust build up that can lead to increased block error rates or even muting. HHB DAT Tape is packaged in reusable, shatterproof Polypropylene (PP) cases, replacing the brittle, plastic case. A 'freshness seal' is used instead of the environmentally damaging shrink-wrapping process, and the J-card has been designed in consultation with leading audio facilities to ensure that it is appropriate across a range of professional audio applications.



DDS90M

4mm DAT Data Cartridge

Users of DAT for bulk data back-up can now enjoy similarly high levels of performance and security as users of HHB's award winning audio DAT Tape. The high concentration of evenly distributed, non-corroding metal particles on the tape surface decreases quickly immediately beneath the recording layer to allow an increased density of advanced binding polymers. Combined

with the controlled distribution of a special lubricant, the result is low error rates, high output, long term data security and reduced head wear. The heat resistant shell features positive locking hubs to reduce tape pack slack, an embossed friction sheet to eliminate vibration during high speed search and an improved slider design that reduces loading and jamming problems to negligible levels.

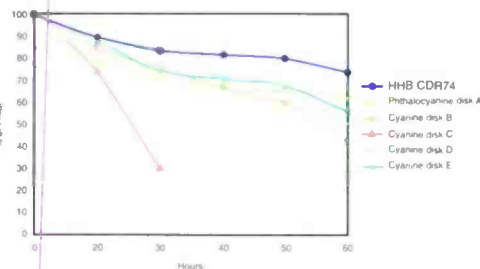
CDR74

Phthalocyanine CD-R Disc

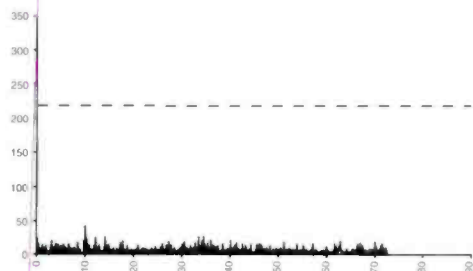


The new, improved 74 minute / 380 MB HNB CDR74 is the most advanced, and the most secure, CD-R disc currently available. In accelerated UV exposure tests, the specially formulated Phthalocyanine recording dye, developed in partnership with the world's largest Phthalocyanine manufacturer, proved more stable than the dyes used in all other discs, leading us to confidently predict a secure archival life for your valuable recordings in excess of 50 years. Uniquely in the case of the HNB CDR74, all critical elements of the production process are under direct control; the production of the masters, the formulation of the dye and the disc pressing. Manufacturing tolerances are unusually exacting, including the viewing of the disc at both the dye coating and lacquering stages with

ACCELERATED UV EXPOSURE TEST DATA

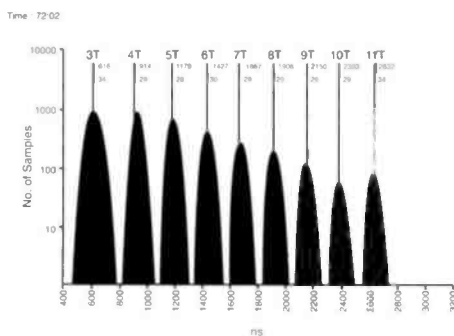


BLOCK ERROR RATE



a 2000 element CCD camera system. Such attention to detail ensures extremely accurate pit position and length, leading to an average block error rate of less than ten. A unique matt UV coating protects the disc from scratches and fingerprints, and from the delamination that can occur when gloss coated discs become 'stuck together'. The HNB CDR74 is optimised for use with writers up to 4x speed, and is tested for complete compatibility with all commercially available hardware. Furthermore, the disc is already T-coded in anticipation of the Orange Study Group of Japan's proposals to make CD-R disc brands recognisable by hardware.

PIT HISTOGRAM



CDR74P

Printable CD-R Disc



HB's answer to the continued shortage of CD-R media, particularly of the 'printable' type, is the HNB CDR74P, a high performance, low cost recordable CD that features a special matt coating to enable users to print their own graphics directly onto the disc using either laser or inkjet printers. The 74 minute / 650 MB disc is precision manufactured for low block error rates and full compatibility with 1x, 2x and 4x speed writers. Long term data security is ensured by a tough UV coating which protects the gold reflective layer against scratches and fingerprints, and the harmful affects of extreme temperature, humidity and light.

HHB ADVANCED MEDIA PRODUCTS: TECHNICAL DATA

DAT 15, 35, 50, 65, 95 & 125



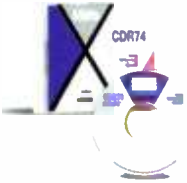
Recording times 15, 35, 50, 65, 95 and 125 mins
 Block error rate (average) Under 5×10^{-4}
 Retentivity 2500 gauss
 Coercivity 1520 Oe
 Surface resistance Mag layer $2 \times 10^9 \Omega/\text{sq}$
 Back coating $2 \times 10^9 \Omega/\text{sq}$
 Tape thickness (total) 13µm
 Long term stability > 30 years
 Recommended storage conditions 15°C (59°F) 30% RH
 Recommended operating conditions 20°C (68°F) 50% RH

DDS90M



Tape length 91.5m (300.2 ft)
 Block error rate (average) Under 5×10^{-7}
 Signal to noise ratio 0.1dB
 Surface resistance Mag layer $1 \times 10^9 \Omega/\text{sq}$
 Back coating $1 \times 10^9 \Omega/\text{sq}$
 Tape thickness (total) 13µm
 Long term stability > 30 years
 Recommended storage conditions 20°C (68°F) 50% RH

CDR74



Recording time 74 minutes
 Capacity 680 MB
 Recording material Phthalocyanine stable organic dye
 Protecting material UV cured resin
 Block error rate (average) 3.4 cps
 Reflection ratio > 65%
 Refraction < +/- 40nm (double pass)
 Dynamic radiant runout < 70 µm
 Long term stability > 50 years
 Recommended storage temperature 15 - 20°C (59 - 68°F)
 Recommended storage humidity 30% RH

CDR74P



Recording time 74 minutes
 Capacity 650 MB
 Recording material Cyanine stable organic dye
 Protecting material UV coating
 Block error rate C1 error < 50 cps
 Reflection ratio > 65%
 Refraction < +/- 70nm (double pass)
 Dynamic radiant runout < 100 µm
 Long term stability > 10 years
 Recommended storage temperature 15 - 20°C (59 - 68°F)
 Recommended storage humidity 30% RH

MD74



Recording time 74 minutes
 Frequency bandwidth 5 - 20,000Hz
 Dynamic range 105dB
 Block error rate (average) 1.3×10^{-4}
 Disc diameter 64mm (0.25 ins)
 Disc thickness 1.2mm (0.004 ins)
 Write / read cycles > 10^6
 Long term security > 10 years
 Operating temperature 5 - 55°C (41 - 131°F)
 Operating humidity 3 - 95% RH

MDD140



Capacity 140 MB
 Carrier to noise > 46dB
 Block error rate (average) < 3×10^{-3}
 Disc diameter 64mm (0.25 ins)
 Disc thickness 1.2mm (0.004 ins)
 Write / read cycles > 10^7
 Long term security > 10 years
 Operating temperature 5 - 55°C (41 - 131°F)
 Operating humidity 3 - 95% RH

MO 1.3 / 2.6GB



Capacity MO1.3GB 1.3 GB
 MO2.6GB 2.6 GB
 Bytes / sector MO1.3GB 1,024
 MO2.6GB 1,024
 Format ECMA 184 (ISO/IEC DIS 13549)
 Write / read cycles > 10^7
 Carrier to noise > 45dB
 Error rate > 10^{12} (after correction)
 Long term stability > 100 years
 Operating temperature 5 - 55°C (41 - 131°F)
 Operating humidity 3 - 85% RH

ADAT45



Recording time 45 minutes
 Frequency response 20 - 20,000Hz
 Dynamic range > 90dB
 Coercivity 900 Oe
 Retentivity 1800 gauss
 Block error rate (average) < 1×10^{-5}
 Tape thickness 19 µm
 Yield strength 26 N
 Long term security > 30 years
 Operating temperature 15 - 25°C (59 - 77°F)
 Operating humidity 40 - 60% RH



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Soundcraft GHOST

Mixing a keen price point with versatility and a careful selection of features, Soundcraft's Ghost will be of immediate appeal to project studio owners. **PATRICK STAPLEY** investigates the substance behind the apparition

IS IT ME or are console names becoming more peculiar? It used to be sufficient to lash a few letters and numbers together with the occasional 'Series' or 'Type', but this undeniably prosaic approach appears to have given way to the theory that names are more memorable than numbers. And, of course, the more unusual the name, the more memorable it becomes.

Consequently, it appears that manufacturers are coming up with stranger and stranger names for their creations. Amek is a past master with a string of desks dedicated to famous dead people from Hendrix to Einstein; Soundcraft, has followed the incongruous Spirit with the wholly implausible Ghost.

When asked why, R&D director John Oakley appeared to have little explanation other than Ghost began as an in-house R&D joke, and stuck. What exactly the joke was he's not saying. Regardless, Ghost offers excellent value, high quality, and plenty of features.

Fitting into Soundcraft's range between Spirit and the DC2000, the 8-bus Ghost is aimed at the project-programming room, although it is also suited to straightforward live sound applications. Additionally, by including Sony 9-pin machine control, the console will appeal to sound-for-picture composers working with VTR.

Ghost is available in two versions: either with CPU facilities which offer built-in

machine control, automated mutes, MIDI control and so on, or without the CPU.

The console comes in three frame sizes—16, 24 and 32-channel—which can all be increased by adding a 24-channel expansion module (available December 1996). The design is compact, although not cramped, with a 24-channel version measuring 1059mm wide x 780mm deep. One thing that is immediately noticeable when installing the desk is that its heavy for its size (24-channel weighs 44kg), and this is due mainly to its sturdy steel frame construction. To support this an equally strong Z Stand is provided as an option.

Power is from an external PSU and the review unit was unusually noisy. Soundcraft says it is in the process of changing to a quieter fan mechanism.

The control surface is a one-piece panel, although channels are arranged in a modular format in vertically mounted circuit boards beneath. This facilitates easier servicing and according to Soundcraft enables a greater density of components to used per channel. Another feature is that all control pots are firmly bolted to the top panel to prevent external shocks from damaging the boards below.

The console can be fitted with an optional meter bridge providing 15-segment bar graphs for the channels and 20-segment bar graphs for the main stereo mix output. Channel meters can be internally set to read either tape return

(factory preset) or channel input. The desk also includes channel input indicators, and additional 12-segment bar graphs for group outputs, and the main stereo mix output. All metering is peak.

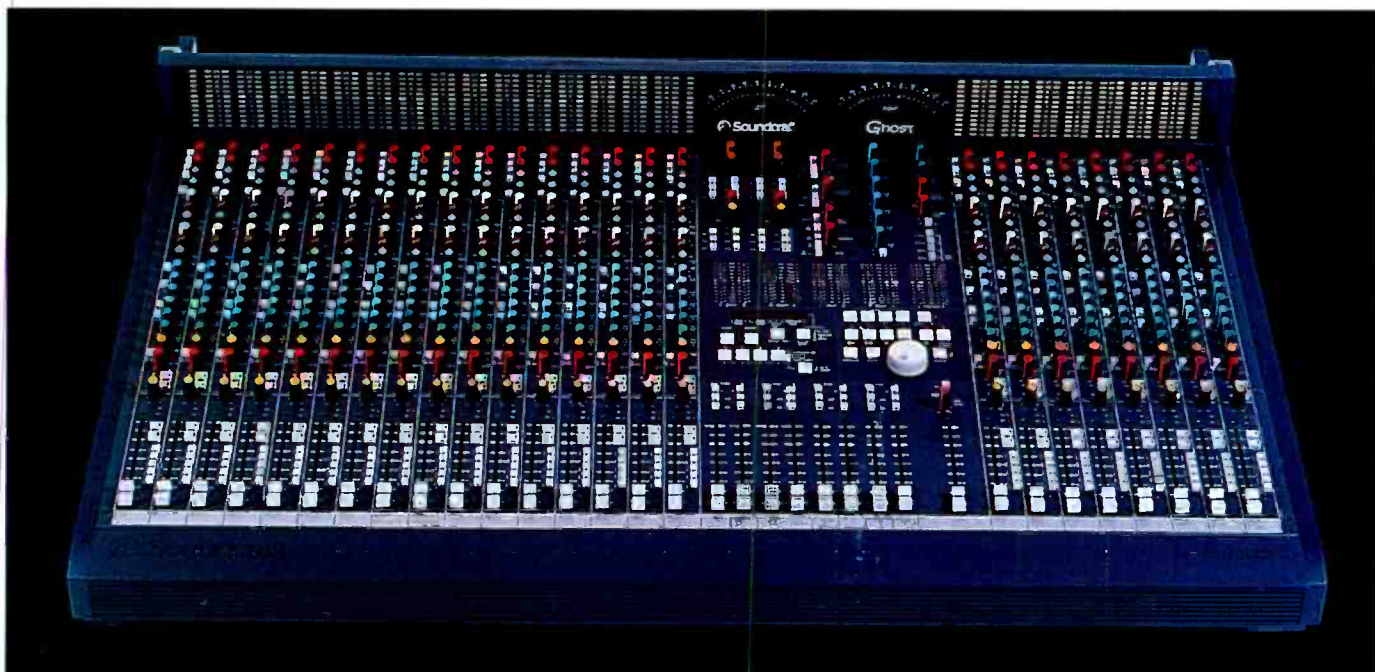
The meter bridge conceals the recessed connector panel situated directly behind. However, it has the added effect of hindering access to this area from the front of the console, which is particularly relevant as apart from the audio connectors this panel also includes control switching for phantom power and direct output. All connections for machine control, time code, MIDI, console expansion and power are made to a separate rear connector panel.

The channel strip has been designed with simplicity in mind, but includes some surprising features for a console in this price range. It uses in-line architecture, although a slightly different approach has been taken to make the secondary signal path more versatile. Named Mix B, rather than monitor, this secondary path can behave like a conventional in-line monitor, or can be disconnected from the main stereo bus and used as an independent stereo group, auxiliary, and so on.

One of Ghost's key features is its newly designed mic preamp. Called ProMic, Soundcraft claims it is the best design it has made to date.

The 4-band equaliser is another example of value for money. Sectioned into

Keenly priced and available either with or without machine control and mutes —the Ghost



parametric low-mid and high-mid bands, and fixed frequency (60Hz and 12kHz) low and high bands, the EQ provides flexibility, functionality and quality.

The parametric mid bands offer a wide frequency range with plenty of useful overlap (25Hz–1.5kHz and 400Hz–20kHz). The ultra low frequency range is unusual, and is presumably a response to the increasing appetite for 'subsonics' in a lot of today's record production. A Q of 0.7–6 enables control flexibility between pinpoint operation and broadband enhancement. Flexibility is also offered for the HF and LF bands which can be switched independently of the mid bands into the Mix B path enabling split EQ operation.

Between the channel pan and fader, a green Signal Present LED monitors the signal from the output of the high-pass filter (pre EQ) intensifying as signal increases, while a red Peak LED switches on if a level of 6dB below clipping is detected at any one of four points through the channel.

The master section is divided into four distinct areas. At the bottom are the group and master faders; above this is the CPU control panel for the automated functions and machine control; above this is metering; and at the top are the auxiliary masters, effects returns, communications, and so on.

As with channel faders the group and main mix faders are all 100mm Panasonic. The 8 group faders also include routing buttons enabling them to be individually sent to the stereo bus. The system works in such a way that groups can be routed as stereo pairs; individually summed to left and right buses; or individually such that odd groups route to the left while even go to the right.

Twelve-segment LED meters are provided for all eight groups, and the main mix output. The main mix meters follow control room source selection, and any AFL, PFL Solo selection. If the optional meter bridge is installed, it will duplicate the stereo mix meters, although with a much higher resolution. An idea here might have been to further distinguish the meter bridge stereo meters, by making them 'VU' rather than peak. The Mix B signal can be added or removed from the main mix via a button press enabling it to be used as an independent signal path. A rotary level pot is also provided controlling the level to the rear Mix B outputs and to the main mix bus adding to the versatility of the facility.

The desk also includes four stereo effects returns each with rotary level control, balance control, PFL, and routing to the four pairs of groups and main mix bus. Inputs have been sensibly arranged so that if a single mono signal is connected to a left input it will also be paralleled to the right with the balance control effectively acting as a pan.

THE CPU CONTROL area is a compact panel divided into four key areas: machine control, snapshot control, multifunction switches, and display window. This acts as the central controller for all mute automation, MIDI functions, time code and machine control, packing a lot of functionality into a confined space.

Ghost offers two types of machine control: MMC and Sony 9-pin. To cater for different machine protocols and whether MIDI time code or LTC are being used, a setup page including a comprehensive list of popular machines is provided to allow correct matching. Ghost will read, generate and display time code.

Full transport controls plus a jog-shuttle wheel

are included. Also four autolocate keys with the first and last providing start and stop points for an automatic cycle facility—this can be programmed for continuous cycling or single cycle.

Track arming for up to 48 tracks is provided using the console's four multifunction keys. These are used in conjunction with the display window above that indicates the track each button currently relates to. By using UP-DOWN controls, banks of four tracks are scrolled through allowing specific tracks to be located and record enabled. Alternatively, all tracks can be deselected using a 2-finger operation.

On the face of it, the ability to arm tracks in this way is dangerous. You may think, as I did, that it would be very easy to put a track or tracks into record, turn to another function and forget about the selection. However, the console tries hard not to let you forget, and as soon as any track has been readied, a Track Enable LED flashes until all record selections have been cancelled.

Up to four mute groups can be set up on the console, and these include mutes for the channel and Mix B paths. Again the four multifunction keys provide control, and with the Mute Group button selected, will instantly set user programmed mute configurations. Mute groups can be activated simultaneously and nested (contain duplicate mutes).

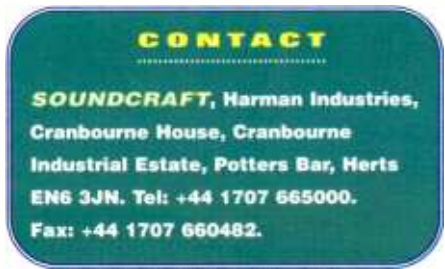
Mutes may also be stored in one of Ghost's 128 snapshot memories. This allows configurations to be reset manually, automatically by allocating a time-code value to a snapshot, or remotely via MIDI program change—the same snapshot number directly corresponding to the program change number. Using a MIDI sequencer, mutes can thus be automated externally.

Ghost will also transmit MIDI control data, and group faders 1–4 (which include audio and data tracks) can be individually set up to have their own MIDI channel and controller number (this information may also be stored in any of the 128 snapshots). Although not automated themselves, the control data from the faders can be recorded to a sequencer—enabling level information to be programmed with a real fader rather than having to use a mouse.

The system can also be useful for making real-time adjustments to effects units. Of course if this information is also recorded to a sequencer, the whole process may then become automated.

At the present time the console does not include facilities for fader automation. However, Soundcraft says it is currently investigating retrofit options, with particular interest being focused on the Optifile Drax system.

Ghost offers a frightening amount of console for the money. For the project studio user looking for a versatile, fine-sounding desk with professional spec and plenty of features, Ghost (at £4,000, UK) has to be a hot contender. **S**



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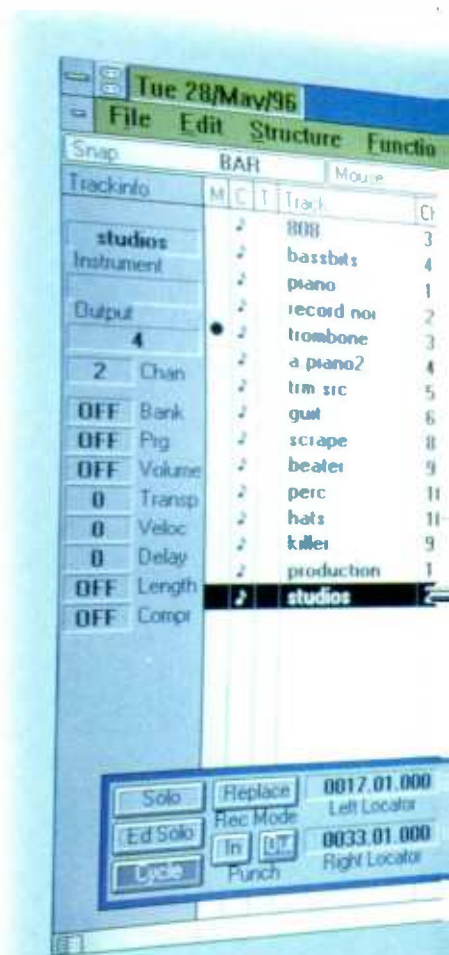
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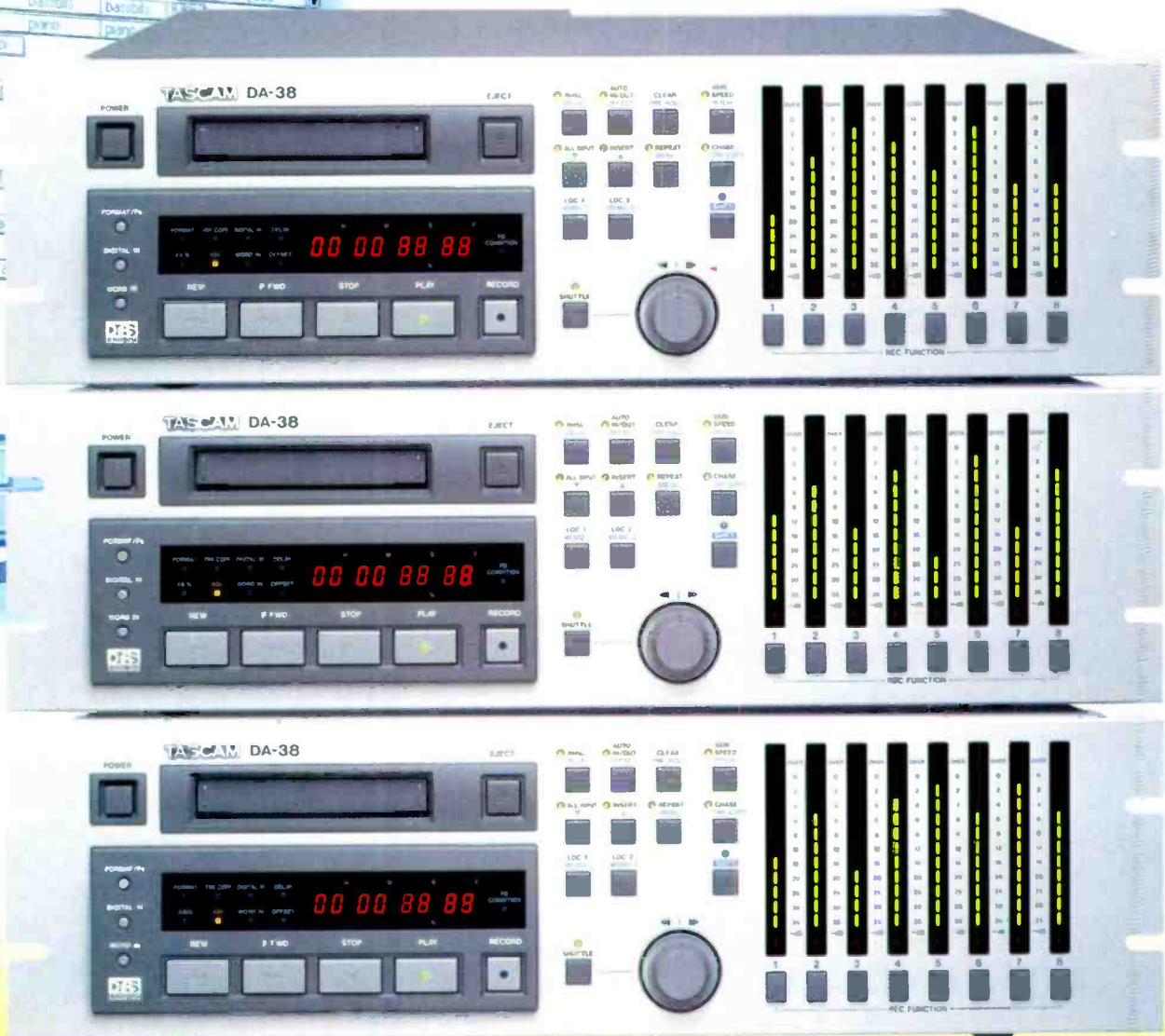
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CRL SENSaura SPU-800

Presenting its Sensaura processing technology as a workstation is the latest development in CRL's efforts to bring 360° sound-stage to audio recording. **DAVE FOISTER** evaluates its ease of operation and assesses its performance



THREE YEARS AGO I was invited to CRL, the Central Research Laboratory associated with EMI, to see and hear the prototype Sensaura system. Sensaura is a technology for creating a 360° sound stage, including height, from a conventionally-placed pair of loudspeakers, based on CRL's extensive research into how the ear-brain system locates sound. No special electronics is required for playback, the Sensaura output being a 2-channel signal with all the necessary psychoacoustic processing inherent in it. The prototype I saw was running on a PC attached to an electronics rack, but even then a dedicated hardware package allowing up to 24-channel Sensaura mixing was under development; this is now available in the form of the SPU-800, which I returned to CRL to investigate.

The roots of Sensaura lie in CRL's quest for one of audio's Holy Grails, the

successful transferral of binaural recordings to loudspeakers. Most of us have experienced the astonishing capabilities of good binaural recording when heard, as intended, on headphones, and have also heard how it clumps at the sides when played on loudspeakers, leaving a huge hole in the middle and no vestiges of the original all-encompassing sound stage. This is inevitable; binaural relies on the sound picked up by ear-spaced microphones being played directly into the listener's ears, and most of the localisation cues get completely lost with loudspeaker playback, primarily because each ear hears sound meant for the other. Part of CRL's task then was to feed cancellation signals from each channel into the opposite loudspeaker to reduce 'transaural crosstalk', and to apply tonal compensation for the fact that the sound had already passed through a pair of ear canals on the dummy head. CRL uses

The SPU-800 brings Sensaura processing out of the world of PCs and into the world of DAWs

B&K's Head and Torso Simulator (HATS), one of the most elaborate dummy head systems available, as its binaural microphone array.

CRL points out that this process was a typical example of ideas which had been around for some time—in this case since the 1960s and 1970s—only becoming practical with the recent leaps forward in DSP power. When the computing capabilities finally became available, the complex transformations required became possible in real time, and refinements began to create a bigger listening sweet spot—CRL now claims a better tolerance of listening position than conventional stereo—and to make the effect degrade outside that sweet spot in a pleasant and natural way. Mono compatibility and the robustness of the processed signal when reproduced on less-than-ideal media also had to be addressed.

The next stage was the introduction of additional microphones, which can so easily wreck any complex psychoacoustic recording system—at best the spot microphones will fail to blend with the main signals, and at worst they will cause the collapse of the principal effect. The task was to process signals from individual sound sources so that they took on the characteristics and localisation cues that they would have had if recorded binaurally, and add them to the sound stage produced by the HATS recording, or even use them like a conventional multi-mic pan-potted setup without a main pair. This is where further research paid dividends, allowing the DSP to simulate the interaural time, amplitude and spectral differences, caused by the spacing of the ears and the masking of the head, which help to localise sound. The nature of these cues, and their varying importance with frequency, is well documented; more contentious is the function of the pinna, the fleshy outer ear, that has long been a subject of debate, with many believing that in man it is merely vestigial, and of little or no practical use. CRL is confident it has identified specific effects of the pinna, showing that its main cavity produces different reflections and interference patterns depending on the direction of the source, leading to different coloration of the spectrum. This appears to help differentiate between front and back, and between up and down, traditionally, the most difficult distinctions to make with binaural recordings, and often thought to be so reliant on small subconscious head movements as to be impossible to

reproduce properly without them. So sure of this is CRL that the B&K dummy head in the Sensaura rig has had its rubber ears replaced with new ones of CRL's design. These subtle cues are also incorporated into the Sensaura algorithms, completing a complex web of interrelated processing which simulates almost all the effects produced at the ears by placing sound sources in different locations around them.

ALL THIS was in place on the experimental rig I saw originally, which had already seen service in many trial recordings and several commercial sessions, including some work on Frank Sinatra's *Duels* album. It had produced the Sensaura demo CD, with its marching band, traffic, and most memorably its recording of CRL's nearby Hayes and Harlington railway station, where Blumlein himself made his first experimental stereo recordings. These showed clearly what Sensaura was capable of; all that was needed was a real commercial product, and that is what the SPU-800 represents.

As with the prototype, the actual processing takes place in a fairly faceless rack, albeit with a large array of status LEDs on its panel. Inputs appear on the rack, in the form of AES-EBU and Yamaha format multichannel digital connections, which allows the use of Yamaha's digital multitracks or 8-channel A-D converters. Sources can be up to 24-bit, with 32-bit processing. Processing comes in blocks of 8 channels up to 24 in a full rack, and the final 2-channel output appears in analogue and digital form complete with tape monitor returns. For multitrack mixing, the idea is that console buses will be fed to the system, and its output either delivered directly to a 2-channel master or returned to the console to be mixed with non-Sensaura material. The SPU-800 does not take the place of a console as it has no EQ or auxes, or anything else other than level control and Sensaura processing.

This is carried out on the small controller, a neat blue console handling channels in groups of eight at a time. It contains a sizeable clear flat screen, but for many purposes it will be useful to attach a suitable computer monitor. The display covers various setup functions, but its principal purpose is to give a graphic picture of where the various sources are positioned in the sound stage.

One channel from the currently selected eight can be controlled at a time, and besides a level fader it has three modes of operation for placement of the sound. The first uses a combination of a linear fader and a continuous wheel to control the various parameters of horizontal position, height and distance; this is reasonably direct and intuitive, but it is hard to imagine anyone preferring it to the joystick alternative. The joystick is an elaborate affair, stubby and chunky, and with a knob on the end that rotates. In conjunction with the two conventional axes this gives three independent variable controls under one hand, providing everything that is needed for full spherical placement. Even so, the joystick can be operated in two different ways; one provides continuous horizontal movement round a circle when the stick is held to one side, vertical circling when it is held forward or backward, and alters the distance from centre with the rotary knob, but the method I preferred was straightforward X-Y horizontal placing with the

joystick, and height controlled by the knob. Whichever control system is used, the display shows the resulting position on a perspective view, with a grid representing the central horizontal plane, and signals appearing on it as flags with the length of the vertical lines representing the height above (or below) the horizontal. Flags for any number of the signals can be shown or hidden and move around the display in real time as the joystick is manipulated.

AND WHAT YOU SEE is pretty much what you hear. CRL makes no claims for pinpoint accuracy in the difficult areas of height and rear stage, but nonetheless the appearance of movement, and of placement in front of, behind, above and below the loudspeakers is impressive. As with any such system, a certain amount of suspension of disbelief is required for some of the more extreme settings, and it is possible to produce unpleasant side-effects if you really want to, but overall the resulting sound stage is more stable, more convincing and less prone to being irritating than any other I've heard. For classical recording a subtle approach will be required anyway, and for gentle expansion of the sound stage beyond the speakers and into the room Sensaura works extremely well, fulfilling its promise of making the speakers transparent. This underdemonstrative use gives good results on pop and rock material as well, producing a clearly larger, more 3-dimensional sound stage without drawing the ear away from the music to an obvious effect.

It is a testament to Sensaura's capabilities that it is as happy enhancing the spatial characteristics of such material as it is in another obvious application, whizz-bang games and simulator rides. For these it can produce spectacular effects of missiles and the like roaring over your shoulder, and the fact that the audience for such a soundtrack is effectively strapped into the best listening position helps considerably.

A surprising demonstration offered by CRL is the transferral of a decoded Dolby surround track on to conventional headphones, generating a full binaural out-of-head sound stage complete with front centre dialogue and impressive surround effects. This turned out to be a very comfortable way of listening to the soundtrack and suggests itself for in-flight entertainment, an area CRL is actively exploring.

CRL is not the first to attempt the apparently impossible and fill a room with surround sound from two loudspeakers, and neither will it be the last. It is clear, however, that its careful research and scientific background has produced an unusually effective, versatile system, combining the power to fly a helicopter round your head with the subtlety to bring an orchestra to life before your very ears. It's also easy to use and available, and very much worth a listen. **S**

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Mutronics MUTATOR

Packing a selection of analogue synth-style filtering and modulation into a box and calling it an outboard processor is a timely move. **GEORGE SHILLING** finds yesterday's technology aimed at today's high-end studio

IT IS NOT UNCOMMON these days for record producers to have ProTools systems with software plug-ins to digitally emulate analogue effects. There are also many studio units with digital gates, digital compressors and even digital EQ, all trying to treat signals with approximations of analogue effects. However, there are still some of us who appreciate the real thing—Fairchild limiters, Pultec EQs, Valley People Kepex gates: equipment from a bygone era that is still the preferred choice of many, because it does the job so well, and sounds so good.

So it was with great pleasure that I tell you that the Mutator retains those ancient units' tradition as a characterful yet no-nonsense, no-frills, piece of outboard. It uses tried and trusted technology, indeed technology that was at its most popular in the 1970s. There is nothing digital about this unit. And yet, it is something quite new and original for the recording engineer.

The Mutator is effectively the filter section of an analogue synth stuck inside a 2U-high, 19-inch rackmount box. To a synth player, the filtering is the source of major fun, and to the recording engineer a similar filter opens up possibilities rarely exploited in a professional unit.

The chunky black front panel features big black knobs for all variable controls, and cheap 'n' cheerful metal toggle switches. The unit runs in stereo and so has separate controls for each channel. There are three main sections, the first of which contains the envelope follower with selection of internal or external envelope source, gate or envelope operation and knobs for SENSITIVITY (threshold in gate mode), ATTACK and RELEASE. The second section hosts the LFO with knobs to control RATE, WAVEFORM and DEPTH, and switches for LINK and LINK INVERT, and also VCA, VCF or both. Finally there is the filter itself giving control over positive or negative envelope sweep, cut-off frequency and resonance. Each channel also has a BYPASS switch and a vca

IN-OUT switch.

At the back there are cheap plastic jack sockets for input, output, external envelope input, and CV input for each channel. These are all unbalanced mono jacks, and some might have preferred to see balanced connections for better interfacing with professional equipment. Here there are MIDI In and Thru connections and a notched rotary MIDI channel selector—I prefer all my controls on the front. In fact, the MIDI implementation appears to be something of an afterthought, but it is an option that most will nevertheless find useful.

There is certainly none of your tc or Lexicon sophistication here, but then who needs it? This box was built to do a job, not to bolster the looks of glossy magazines (I suspect a kind of inverted snobbery at work here). Possibly the only concession to modern studio equipment design is to make the legending front and back so small as to be unreadable in all but the most brightly lit studios, which may be acceptable in certain circles, but surely not to those with their sights on the Mutator—we're trying to create a vibe here. Making the knobs different colours (they are all black) would be a start. But you'll appreciate that these are minor quibbles when I tell you what Mutation is.

FIRST, I tried some envelope following. If you've ever used a Boss Touch-Wah pedal you'll know where I'm coming from—level-dependent wah-wah. Mutator helped me round out, and give a bouncy transient, to each note of a rather nasal synth bass part. The sound was transformed dramatically, the Mutator giving a superb warmth and character to the part. On keyboard lines I was able to add a resonant analogue twang to each note, although setting the sensitivity was difficult on some parts with varying volume levels. (This could be helped by adding compression to the signal before it reached the Mutator, or if using MIDI setting the note velocities all the same).

I should explain that the sensitivity-

threshold setting is made easy with a variable brightness LED for each channel. There are no rows of multicoloured lights here, but then they're really not necessary. The variable attack and release settings give a wide variety of effects. When modulating a stereo source, you can parallel the input of channel one to the EXT input of channel two to enable tracking of the two channels. However, there is no way, other than by using an external CV or MIDI, to synchronise the frequencies of the filters of each channel. With the resonance turned right up the filter goes into self-modulation where the cut-off frequency produces an audible note or tone.

The envelope sections ATTACK and RELEASE controls allow you to vary the speed of the filter sweeps from a subtle swoosh to an intense *wah-wah*. I obtained some great effects with long sounds such as pads, by sending a rhythmic pattern to the Mutators Ext input as a key. I keyed a voice pad with a hi-hat part to create a wonderful, bubbly, pulsating, new part. Sending drums through the main inputs gave some great effects, especially those Ultravox-style, filter-swept, explosive whooshes—now that's a sound that hasn't been used for a while.

Of course, you can twiddle the knobs in real time as you record a part, adding your own wah-wah as you go. I would love to have had one of these when I was recording the Soup Dragons 'I'm Free': all that guitar wah on the record is no wah-wah pedal, it's me twiddling the EQ. I remember the record company ringing up after hearing the rough mix, saying they wanted to hear 'more of the "wackawacka" sound—it's a hit sound!'. It was, sure enough, and if you are after that hit sound, then this is the box for you.

For yet more dramatic effect, you can switch the envelope filter key to Gate mode. Instead of the envelope smoothly following the key signal, the sensitivity becomes a threshold control. When the threshold level is reached the gate opens or closes the filter by the amount set with

Mutator
—ready to surprise engineers unfamiliar with analogue synths





the envelope \pm knob, at the speed set by the ATTACK control. As the signal drops below the threshold, the filter returns to its original setting at a speed determined by the release knob. The circuit includes a switchable VCA, so the choice is yours whether to have level affected as well as or instead of the filter. This gives you possibilities of all sorts of juicy pulsating sounds, which might bear little relation to the clean signal you fed in originally—but are great for dance remixes and the like. You can also use the unit as a straightforward stereo noise gate, of course, and it works well in this mode with fast attack times opening the VCA without any audible click.

With the appropriate patching you can use the filter of one channel to process the Ext key input of the other, for those difficult gating situations where you need to hone in on a particular frequency.

THE LFO SECTION is useful for autopanning and tremolo effects. Autopan is achieved by linking the two channels in Inverted mode. This means that as the filter and/or VCA opens up on one side, it closes on the other. There are four LFO sweep waveforms—sine, square, and saw-tooth ramped up and down—giving a wide range of effects. The LFO has a toggle switch to select whether it controls VCF, VCA, or both. This can lead to some unusual tremolo effects, or wonderfully swooshy autopanning if you use the filter appropriately. Unfortunately, there is no way of controlling the speed of the LFO externally, although MIDI Note On and Note Off commands retrigger the LFO when the unit is in Envelope (not Gate) mode.

MIDI clock might have offered one way of controlling LFO speed, but it would need additional hardware for selecting note length values which would clutter the straightforward design and push up the price.

As already noted, the MIDI implementation is something of an afterthought, but very useful nevertheless. The selector knob on the back gives you two adjacent MIDI channels—one corresponding to each audio channel.


When Gate (as opposed to Envelope) mode is selected a MIDI Note On command will open the gate, and the MIDI note value of the note played controls the cut-off frequency of the filter. Resonance and VCA volume are available via MIDI controllers: Resonance on MIDI Controller 1 (the modulation wheel on most synths) and VCA volume on MIDI Controller 7 which is,

logically enough, MIDI main volume. The front panel controls remain operative even when parameters are under MIDI control, so some hands-on control is still possible.

The external CV (Control Voltage) inputs allow a standard 1V-per-octave control to adjust filter cut-off frequency from your vintage synth, or more likely via MIDI through a MIDI-CV convertor. The manual frankly admits that it would generally be easier to sequence a part with varying velocity, and send the audio to the external input for this kind of operation. The choice is there if you are an analogue synth enthusiast, or if you have one of the new generation of synths, such as the Novation Bass Station, which features a CV output.

An engineer who has never used an analogue synth, or who is familiar with more subtle desk EQ will be pleasurably surprised by the intensity of effect available here. You can twiddle with the Mutator to get subtle movement, thickening or resonance, but it is easy to get carried away and make everything squidgy—which is probably what most engineers want. I suspect the main purchasers of this unit (undoubtedly the dance-orientated remixer, producer and musician) will love the exceptionally high knob-twiddle factor.

The manual is a slim but helpful and friendly booklet, with an engagingly humorous foreword by the enthusiastic designer—himself a recording engineer. Thankfully, there are none of those patronising connection diagrams with mixing desks and amplifiers so beloved of some manufacturers. Nor do you get one of those unfathomable MIDI implementation charts, just straightforward descriptions of features, and a few example settings to get you going.

In terms of signal quality, the Mutator is quiet and clean, despite the use of unbalanced connectors. Its straightforward conception reveals its designer as a professional user and obvious enthusiast. I loved it—its something different and useful, and already has a long list of professional endorsees. However, the rather steep asking price and lack of glamour might deter some of the bedroom ADAT brigade. 

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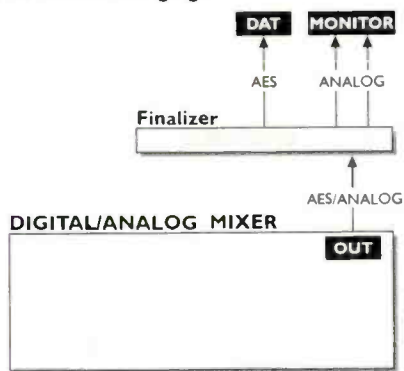
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Soundtracs VIRTUA

The modest heritage of the Soundtracs Virtua digital console belies its considerable power and flexibility.

ZENON SCHOEPE takes a closer look at the small British console that's squaring up to all comers

PART OF THE SURPRISE that surrounded the arrival of the Virtua digital desk concerned the fact that it was the relatively 'small' and British Soundtracs that was the first to reply to the thrown-down gauntlet of the mighty Japanese Yamaha. Launched at the beginning of this year, Virtua still stands alone, its shipping and its well sorted.

Designed to work out of the box as an easy self-drive, Virtua nevertheless contains a number of advanced twists that associate it more closely with some of the more costly digital desks than with the budget brigade.

On one level you can use Virtua as a pretty straightforward board; on another you can get pretty fancy and really stretch and tailor it to specific functions or installation size

The component parts are the control surface—which contains the DSP—and a monitor for displaying desk functions, status and controller movement and this is connected optically to an analogue I-O rack. Analogue connections are made at the remote rack while digital machines are connected directly to the worksurface back panel. ADATs plug in optically, you also get selectable AES-EBU and SPDIF I-Os with sample-rate conversion as standard, but other digital formats, most particularly TDIF, need optional digital interfaces to wire them up.

MIDI ports send out MMC and take in and send MTC, there's an RS422 port, SMPTE and wordclock I-Os. You can also connect a mouse if you're offended by the worksurface trackerball. Additional slots on the back panel promise video expansion capability for up to four additional different monitors for visualising all channels simultaneously.

Future plans may well include a fader start option, and some type of optical patchbay to route between numerous sources. Channels cannot be delayed individually, instead Soundtracs has opted for the short, but constant delay route with the worst case analogue-in to analogue-

out processing delay of under 2ms.

While the analogue I-O rack is fixed the worksurface can be expanded by the addition of extra 8-fader pods to a maximum of 32 faders with each pod duplicating the left half of the master worksurface with its channel controls. This allows more than one channel to be tweaked simultaneously—not something that you'd want to be able to do as a single operator, but the extra faders would undoubtedly be welcome.

In the UK, a standard Virtua with two lots of ADAT I-Os asks £18,500 + VAT with the aforementioned expander pods going out for £3,750 + VAT.

In terms of physical I-O on the standard system in analogue you get 32 mic-line inputs, 16 plain line inputs, which can be used as effects returns, plus 16 channels of ADAT digital. That equates to 48 channels of 4-band fully parametric EQ with a compressor, a gate and eight auxes. Add the aforementioned 16 effects returns with no processing for a total of 64 inputs to mixdown.

The order of processing in a channel is fixed, and enters in analogue via digitally controlled remote input gain, an analogue insert on mic-lines, the convertor, EQ, compressor, gate, prefade auxes, mute, fader and post-fade auxes. How the desk is arranged in terms of inputs is very much down to you, but perhaps the best way to regard it is as a type of 'all input' approach with the function of a channel dictated by its source input, routing and monitoring.

An input routing section on screen takes care of what signal is assigned to a channel, while output routing predictably takes care of outputting to the main mix or the eight groups, but describing Virtua in terms of

buses is difficult. While it is certainly 8-bus, you can direct out from a channel to any track of any connected machine you care to specify, relegating the groups purely to bused signals. However, groups can also be routed to digital tracks in the same manner, or even to aux outputs which draws attention to the important point that outputs on the back of the analogue rack are legended purely for convenience and need not necessarily perform that function.

On one level you can use Virtua as a pretty straightforward board; on another you can get pretty fancy and really stretch and tailor it to specific functions or installation size. If, for example, you buy extra interfaces and decide to send auxes to digital outputs then the analogue aux outputs become free for something else. This sort of flexibility may well be a culture shock for some.

Organisation of Virtua is by way of presets for channels, their input, output

While all analogue connections are made at the remote rack, digital connections for audio and control, are made via the worksurface

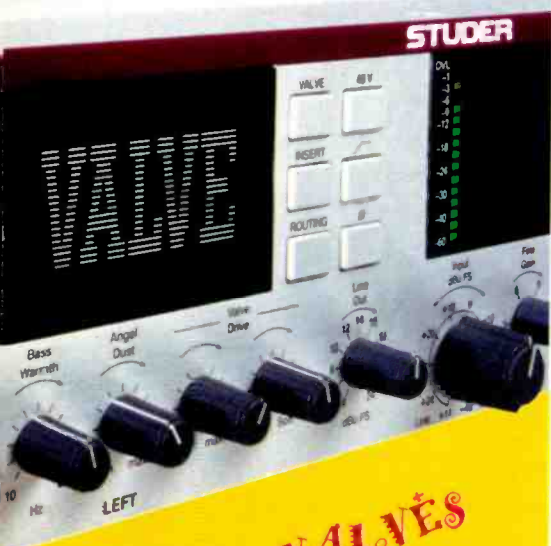


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Virtua's worksurface—'where all the action happens'

and aux routing, names and the function of certain programmable keys supplemented by presets for EQ, dynamics and gate settings. Presets also include information on whether the arrangement is for standard stereo or LCRS work, and contain the relevant routing. Sessions take in automation and total desk snapshots as well as the preset data information.

THE WORKSURFACE is where all the action happens, although it is closely linked to the monitor display which is neat and well presented, but predictably limited in the extent to which it can display a whole desk's worth of information. Any movement of the touch-sensitive faders, continuous rotary pots, and switches is reflected on the screen display and you can also alter values on screen if it's more convenient, or because you have to, as is the case with individual aux mutes, for example.

The worksurface is fairly steeply raked but comfortably populated with a lot of hard control surrounding LCDs that give alphanumeric read-outs of parameters and values.

The eight faders are split into two sections of four with a thin vertical section between the two containing left and right buttons for scrolling the available channels across the eight faders—one press gives a one channel nudge, a double click jumps to the next bank of eight faders.

Faders have mute and solo, and dedicated continuous pots that are assigned via UP-DOWN keys to the eight auxes and pan control for all channels at once. These scroll left to right with

changes in the selected faders, and operate on the principle that it is handier to have control of eight pans or eight sends to a single aux bus than it is to have all auxes and the pan available simultaneously for just one channel.

Aux and pan values are displayed in the associated LCDs, and are accompanied by automation read and write buttons for the channel.

From here on in the remainder of the channel strip operate on the popular principle of striking an ACCESS key on a channel to assign it to the worksurface controls for input, EQ, dynamics and gate functions.

Four bands of three controls work in conjunction with the lower lines of the two top LCDs to alter EQ, while the top line reflects gain setting and phase reverse plus shared dynamics-gate control. There are bypass switches for EQ, dynamics and gating, while a MODE button switches the assignment of five continuous pots to gate and compressor parameters in a manner similar to that employed by Soundtracs in its digitally controlled analogue assignable dynamics processor featured on its top-end analogue boards.

You can work on these sections from the LCDs alone, but if you want a bigger picture of what is going on you'll need the monitor display. This does not follow worksurface changes in the way that the Yamaha O2R does, but relies instead on the user selecting what needs to be seen. The display can default to a condensed or 'folded' version of channel 'modules' that can be expanded for viewing via dedicated buttons for the EQ, dynamics, gate or auxes and matters are helped

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still further by eight layout buttons that can be programmed to show different combinations of parameters on screen, while calling up programmed combinations of channels. These channels don't have to be consecutive—channels can be locked into position regardless of any scrolling—and this serves as a quick way of jumping to particular layouts.

You can program layout keys to show only all input gains or just the auxes, if that's what you want, the only trouble is that there are only eight at present, but there are plans to extend this by banking.

A rather smart COMPARE key is provided for the EQ, dynamics and gate sections which allows any tweaks to be A-Bed against the last fixed setting. Another thoughtful inclusion is a SOLO CANCEL button which can be hit even when the PFLed channel has been scrolled off the worksurface.

Stereo channels are accommodated during the input-selection process, there are eight VCA-style control groups while the selection of LCRS mode changes on-screen side-to-side panning indication to a 2-dimensional panning box that can be grabbed, and written into automation by the trackerball. Alternatively LCRS panning can be administered by the panning pots for LCR and front-back positioning.

A meagre-looking centre section hides a lot of facilities. There are two sets of control room outputs, switching between a 2-track source and the main mix, mono (with left and right leg only options), presettable dim and talkback through a front-panel mic, level pot and latching or nonlatching switch. Talkback has its own mixer section that can control its level to each of the buses including auxes, groups and master, and can also dim the monitors.

As already mentioned, solo is PFL only at present, but is likely to go in-place stereo at a later date. The master stereo output has a switchable analogue insert and a limiter.

You also get a full complement of MMC transport controls with locates, and a 2-button trackerball with an extra continuous control knob that can adjust parameters that the trackerball cursor is resting on.

AUTOMATION is via snapshot and dynamic control. Snapshots cover everything right down to the input-gain levels, but there are currently only eight per session. Soundtracs is working to up this paltry number significantly using a similar method of banking to that proposed for increasing the number of layouts.

Dynamic automation is of faders, mutes, pans and aux send levels, and is therefore not total. The company has not ruled out looking at going dynamic on the EQ. Aux mutes can be activated on screen, or tied to channel mutes.

Soundtracs has kept the dynamic automation nice and plain with Write (destructive overwrite), Read (play, but because faders are touch sensitive you can move them on playback without altering the data that is displayed as a clear blue line alongside the fader on screen), and Trim in which the faders are used to update the recorded data. Programmable crossfades take care of transitions between before and after data. All other automated controls go immediately into overwrite as soon as they are touched. It's a clear and easy to understand system that uses an internal hard disk for storing mixes.

However, the system holds only one mix in memory at any one time meaning that if you

choose to keep a mix at the end of a pass you will not be able to get back to the previous pass unless you saw fit to save it first. This is the same sort of uncompromising approach to that employed on automation systems on Soundtracs analogue desks, and requires the 'keep it or chuck it' decision to be made before code is stopped. What you'd ideally want is the ability to store two consecutive mixes in memory simultaneously for comparison and auditioning purposes prior to committing.

Off-line editing of mix data has an Edit screen very similar to that on the Solitaire and Topaz systems through a scrolling display of fader movements and mute activity. There are processing tools for inserting and tying down mutes, moving, deleting, copying and pasting across multiple channels simultaneously plus ramping between sections and predefined fader movements and curves over time.

There is no editing of other automated parameter values, and, in honesty, that's just as well.


DO I LIKE IT? It's hard not to, even with far too few snapshots and the minor quirks of the automation. Above all it smacks of dependability. The lack of dynamic automation of the EQ is unlikely to be a practical limitation for anyone, its just that the expectation is now established in digital desks.

Besides the EQ is really rather good—only the mid two bands have 20Hz–20kHz spans, the other two are restricted to give an easy under the hand natural feel. It's also a definite bonus to have proper staggered pots for all the parametric controls in all of the bands just like you would have on an analogue board.

The same can be said of the dynamics (threshold, attack, release, ratio and gain make up), and the gate (threshold, attack, decay, hold, and range). They work really well and the compressor sounds very smooth even on extreme settings.

The thing that impresses me most is that the compromises, or rather the trade-offs, that have been made in the arrangement and planning of the worksurface are good ones. For example, the aux arrangement of one aux at a time across eight channels in practice has to be better than all auxes at once on only one channel. The combination of this with the access key EQ, dynamics and gate assignment is a natural once you accept Soundtracs' choice to limit the number of accessible channels to eight.

It's got a proper desk master section—one you could run a band session with comfortably—and a built-in level of flexibility that will make sense to the more adventurous post suite looking to customise and configure a digital desk precisely to its requirements. It's a natural accompaniment to DAWs.

Virtua appeals to a different set of senses to the O2R—both are equally valid, but they satisfy different wish lists. In its price range Virtua still stands alone. It does what it does extremely well. 

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Penny & Giles PP10

Following Studio Sound's exclusive review of the P&G PP10 signal processor, several of the planned advances have been delivered. Once again, **DAVE FOISTER** brings us up to date with the latest PP10 software and hardware



P&G'S PP10 digital signal-processing platform has now been seen at several trade shows, and the original prototypes have been replaced by finished production units. Both hardware and software that were still in the planning stage the first time we looked at it (*Studio Sound*, April 1996) are now in place, along with several additional improvements and refinements.

For the benefit of those who have missed it, the PP10 is a multichannel digital signal processor whose function is determined purely by the software installed in it, either in its internal flash memory or on diskette in its front panel drive. Penny & Giles' suite of software is called Pythagoras, and the first two packages were for equalisation and dynamics, each offering a wide selection of functions covering every familiar requirement with a few novel ideas thrown in besides. The 2U-high box can carry as many as eight audio channels in a variety of formats, and the thoughtful ergonomic front panel and its display are duplicated on an optional remote control.

Now the third software selection is available as promised. Known as the Studio package, it provides a selection from both the previous sets, allowing EQ and dynamics to be used together in a chain or on separate paths simultaneously. This is important because at present there is no means of mixing and matching across the packages, so the original two offered an either-or choice; the whole unit was either an elaborate multichannel equaliser or a flexible dynamics processor,

but not both at the same time.

This added flexibility is not the only change to the software. A feature of the PP10 is its informative display screen, invisibly divided into two sections whose functions are independently selectable. The left-hand third shows menus of adjustable parameters, while the right-hand two-thirds has a selection of graphic representations of signal activity, and it is this section that has seen significant additions. Metering options, spectrum analysis displays and EQ curves are now clearer, and extra functions include an X-Y stereo width and balance indication.


When I saw the prototype it only had digital inputs and outputs; now analogue cards are also available, using 20-bit conversion. Penny & Giles modestly admits that its converters are not competition for the specialised high-end units, but is confident they are an order of magnitude better than those in your average DAT machine or DAW. A card contains a single channel of I-O on XLRs, and a full machine can take eight cards. The digital cards offer two channels in the same space, with AES-EBU and SPDIF provided.

The demo unit I worked with had two of each, giving a total of six channels in and out of the unit. This is where a major part of the new software comes into its own, as it also includes functions for mixing, crossfading and panning of as many inputs as are fitted. This means the PP10 can be configured as a full-blown digital mixer, complete with EQ and dynamics on as many channels as it can manage until it runs out of DSP. Fortunately, the

demands being made on the unit's resources can be checked at any time on the display, although this can be misleading until you realise that the DSP use shown includes all the background processing, and even the display generation. This can mean that with one EQ module and one dynamics processor installed the unit looks half full, but then adding another block makes very little difference, indicating that there is still plenty of power available.

THE PP20R remote controller duplicates the keypad, the screen and the rotary controls exactly, but with a different layout to fit the convenient shape of the unit. It links to the PP10 with a long extendible DIN-terminated cable, and has its own power supply that can also be sited some distance away if required. It is chunky and rugged without being clumsy, and communication between it and the PP10 is fully 2-way, either set of controls being operative, and both screens tracking any changes.

Full MIDI real-time control is supported, which is significant in two ways. The first is that Penny & Giles' own MIDI hardware controller, the DC16, can be used with it, giving simultaneous control of several parameters on the familiar fader belts and switches, and the second is that the whole thing can be automated with any suitable sequencer. The implementation is extremely elaborate, with four MIDI channels required for full operation and permanent mapping of controllers to the complete front panel—keypad, rotaries and menus. One channel is reserved for the PP10 to send status and metering information, giving the possibility of getting it to control other devices.

So far the PP10 has delivered everything that was promised in the early stages and more besides. More still is already in the pipeline, with a mastering package not far off and further software ideas beyond that. This will all help to add to the growing list of enthusiastic users, and broaden the appeal of what is already a fascinating and powerful system. 

PP10 software now covers EQ and dynamics processing and will soon handle mastering

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Panasonic SV-3800

Assuming the mantle of the popular SV-3700, Panasonic's latest affordable professional DAT recorder has high standards of performance and reliability to maintain. **DAVE FOISTER** offers an exclusive review of the new model



PANASONIC committed early on to the DAT format. The Technics SV-360 (Panasonic SV-3500 in the US) was launched in the late 1980s as a consumer recorder, but had enough appropriate features to find a home in professional circles as well, where it became renowned for the quality of its convertors, and of its overall sound. This set the trend that later professional machines were to follow, culminating in the Panasonic SV-3700. This machine was hugely successful as a reasonably priced workhorse with a sound quality that raised it above its immediate competition. So popular was it that when it was withdrawn, distributors rushed to reassure potential buyers that the replacement was going to be every bit as good.

That replacement is the SV-3800, on the face of it a very similar machine, but with several changes and improvements. Like its predecessor it has none of the time code or synchronisation facilities DAT is now able to support, but neither does it have the price tag associated with that type of machine. What it does provide is a clear and simple implementation of everything else DAT has to offer, with a rugged transport and, once again, a strong commitment to high audio performance.

Not content to rest on its laurels, Panasonic has changed the convertors to improve still further on the acclaimed performance of the 3700. The new machine has 20-bit D-A convertors with a consequent improvement in transparency and resolution. The old SV-360 sounded so good there were stories of producers insisting on mixing to it rather than 1630, and I can imagine the same happening

with the 3800. You would be hard pressed to find a better-sounding digital recorder off the shelf.

Other changes are clearly intended to bring the machine in line with what the industry has come to expect from a professional machine. Gone are the old consumer-style record level controls, with one for level, and one for left-right balance, which seem to annoy people so much, to be replaced by straightforward left and right controls. Digital interfacing is expanded, with AES-EBU supported along with IEC (SPDIF) in both co-axial and optical formats. The implementation of the digital I-O has a couple of useful extensions to the norm. For one thing, it is possible to configure the ports independently as consumer or professional format, even as far as having AES-EBU coming out of the phonos and SPDIF out of the XLRs simultaneously, and secondly the machine both transmits and recognises start IDs in the AES-EBU data stream. It is a curious fact of life that this very useful feature, allowing tapes to be copied with the ID subcodes intact, is generally confined to SPDIF, and although adding it to the AES-EBU signal is currently only of any use with another compatible Panasonic machine, it is still a worthwhile move.

DIGITAL CONFIGURATION is one of several parameters that are set in the software, using a menu system accessed by pressing three keys simultaneously; while this set of keys is clearly marked, there is not room for a list of functions on the machine itself, although the manual includes a 'cut out 'n' keep' crib sheet. This is where analogue

output level is set, as well as copy protection and digital input selection. There are also display modes for error rates, peak levels and head hours hidden under here, and I must say I would prefer to have the first two more readily accessible.

Everything else, however, is perfectly accessible. The control panel is a model of clarity, with substantial controls logically grouped and clearly labelled. It is dominated by the shuttle search wheel, which has two sets of shuttle speeds depending on whether the machine is in play or pause when it is turned. Transport controls are large and colour coded, and like the ID controls need no double button pushes. Auto ID has a wide range of thresholds available, and there are buttons for automatically fading the signal in and out at the start and end of a recording. The only annoyance is the End Search function, which like previous Panasonic machines insists on winding the tape right back to the beginning before finding the end. This wastes so much time when you've just played a take back to the artist and want to get back to the end to carry on recording. Other machines manage to do this properly without all this long-winded messing about; I would be interested to know why Panasonic feels it has to be done this way.

Standard accessories include a complete rack kit—the ears are not integral to the construction making it neater as a table-top machine—and an infrared remote providing track-access facilities not available on the front panel. There is also provision for a parallel-wired remote on the back.

The SV-3800 appears in all respects to be a worthy successor to the SV-3700. It's a no-nonsense, flexible, professional machine, with more than the basic complement of features and, all-importantly, a highly impressive sound. It deserves to do every bit as well as its predecessor. **S**

The SV-3800's convertors offer improved resolution over its predecessors

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SSL CONSOLES

On the eve of the Los Angeles AES, SSL broke the news of the launch of the latest additions to its range of consoles.

ZENON SCHOEPE offers an exclusive preview of the G Plus Special Edition and the digital Aysis

THE LA AES

convention will see the unveiling by SSL of the G Plus Special Edition. The new desk is an analogue derivative of the SL4000 which also includes some tricks from the SL8000. Meanwhile later in the month the German Tonmeister show will mark the arrival of a more compact variant of the Axis digital system called the Aysis. Both desks are expected to be shipping by Christmas.

Director of commercial applications Chris Jenkins sees the G Plus Special Edition as a coming of age for

the SL4000, now in its 18th year, which builds on the electronic enhancements of the SL4000 G Plus.

'What we've done is put into a standard configuration a whole lot of options that have been available and developed over the last few years,' he explains. 'It gives the system as standard moving-fader automation, Dolby Surround and Stereo capabilities and other multichannel formats, we've added eight extra sends, the Bob Clear mountain true group stereo solo system—a whole package of little additions that people have had as specials on their consoles.'

Predictably it's an attractive price point package and substantially less than the circa 40% increase in cost that it would take to add these features as separate options. As standard are Ultimition, Total Recall, Motionworker interface with SSL synchroniser software, eight additional aux buses, full LCRS panning, simultaneous LCR and stereo mix outputs, Surround decoder monitor insert, stereo AFL, mono PFL, true group solo AFL, dual 24-48 routing with a new post-pan route switch, and LCD bar graph metering with switchable vu-digital 0dBfs scale.

'It gives a studio the possibility to easily work in formats other than just straight music recording, we want to make bringing in a video machine very straightforward,' he says.

Arguably the biggest departure on the board, which is available in 48, 56 and 64-channel frame sizes, is a veritable kaleidoscope of trim options to match studio decor or individuality.



A Christmas present from SSL: the G Plus Special Edition

The SL4000 G Plus remains current with its usual selection of custom options but the Special Edition should not be regarded as the last word in the development of the 4000 according to SSL commercial group director Hazell Simpson particularly as sales remain strong and prestigious. 'Last year we built more 4000 consoles than we have in any prior year,' she says. 'You don't give up on a product until the customers stop buying it. While we haven't determined the next evolution after the Special Edition we certainly haven't thought that we won't need to consider it again.'

She adds that with the notable exception of film dubbing stages, where the SL8000 holds a strong hand, SL4000 and SL8000 customers are merging and are requiring a combination of the two desk's assets.

Perceptions of quality have increased and studios also want to keep their options open to the type of work that they can handle through their desk's flexibility.

'The Special Edition module bears more resemblance to an 8000 module than a 4000 module except that the extra busing is used for aux sends instead of mix buses,' explains Jenkins, 'but there's nothing to stop you using those buses as eight additional mix buses. What we haven't done is put in the full-blown multiformat film monitor system.'

However, they're still holding off on a digital 4000-style music recording console. 'Digital music recording consoles are proving to be very slow to take off and that's down to the direction the market

wants to take,' says Jenkins. 'Broadcasters need digital because of the material they're dealing with—they're not just mixing stuff and often they just want to be able to move it around. They have a set of requirements that traditional music type consoles don't meet but the digital consoles do. If you want to send a signal 2 miles, digital does that very nicely and analogue doesn't—that's the attraction of the technology and the fewer conversions you make the cheaper it becomes.' Which brings us around to Aysis.

DESCRIBED as an Axiom but 'a little more assignable' it draws on the recent Axiom developments of the bi-level 'double banking' facility for doubling inputs and employs a similar 'sit up and beg' profile to the SL5000. Internally it's an Axiom but the control surface is much more compact and can be made more assignable by leaving out 'tiles'. 'On the Axiom we introduced banking and the bay swapping option which allows any bay to be moved to the one next to you and the obvious follow on from that is that if you can do that then you don't need to fit the controls in the remote bays—you need the fader but you don't need the controls,' continues Jenkins. 'Aysis lets you do that, its frame is more compact and you can arrange the tiles either in a conventional up and down fashion or put them sideways.'

At its most stripped down the minimum control surface an Aysis requires is one set of tiles for input, EQ and dynamics-auxes—effects processing can be controlled from the screen—for mono and stereo inputs. Banking doubles the number of channels to yield a very compact frame but with all the options of the Axiom available including its sophisticated routing.

It's cheaper too, with a 24-channel type configuration asking less than £200,000. Aysis is likely to appeal to existing power Axiom users but can be regarded as a response by the company to addressing the limited space available in OB vans and broadcasters operating in old buildings with smaller control rooms.



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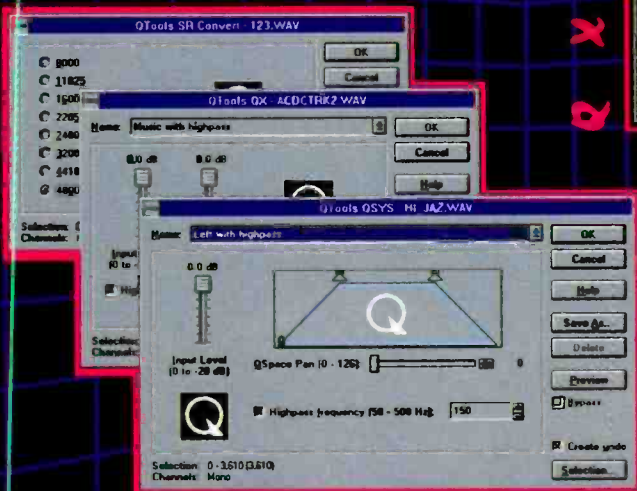
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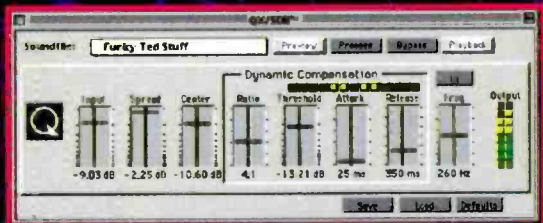
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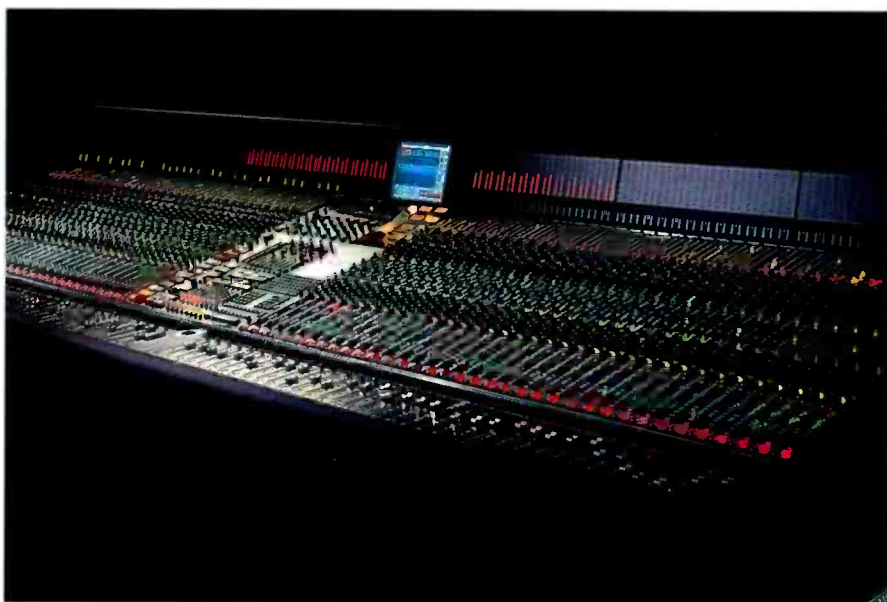
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AMS Neve CONSOLES

The LA AES will see two new analogue consoles and a digital film desk unveiled by AMS Neve. **ZENON SCHOEPE** offers an exclusive preview



THE LA AES will also see a major upgrade of AMS Neve's analogue console range with the introduction of the VX music recording and mixing console, and the VXS multiformat desk. The first VX, a 72-channel 'winged' version, has been bought by New York's Right Track Recording where it will replace an SSL SL9000 j Series.

The news coincides with the release of a film-optimised variant of the Logic digital desk called the DFC.

The VX continues a long tradition in analogue desks from the company, and combines Neve equalisation, filters and dynamics with the automation of channel switches, moving faders and recall. The two analogue desks are being billed as being 'as close to audio and operational perfection as technology allows' with Oxygen-free cable, acoustic profiling to minimise sonic shadow, and no VCAs in the channel path. The desk has a Formant Spectrum Equaliser in each channel with four overlapping frequency ranges, high and low EQ bands with variable gain and frequency, switchable Q and peaking-shelving characteristic, high-pass and low-pass filters plus two fully parametric mids and an expander-gate and compressor-limiter in each channel.

The board has 48 bus routing, mixed cues, eight auxes configurable as eight mono or four stereo, and patch-free subgrouping.

Master status switching is available on the VX and VXS desks allowing in-line or split desk monitoring to be selected centrally for the three operational modes of tracklaying, mixdown and broadcast. Broadcast mode sources primary and secondary signal paths from the mic inputs for setting up two completely independent mixes. In all cases, channel modes may be selected individually regardless of the master setting.

The VXS benefits from two additional modes

for scoring and multiformat work which are suitable for stereo, LCRS, Dolby Stereo, SR.D, DTS and HDTV, with the main output configurable to provide up to eight discrete channels or four stereo pairs.

Other features include support for three additional ATRs-dubbers or a second multitrack, plus an independent mono or stereo dialogue input.

The digital Logic DFC combines the Logic audio processing engine with a range of controls and features designed for film work.

Available in configurations of up to 256 audio paths, which may be a combination of mono-stereo channels or 4-, 6- or 8-wide predund inputs, key features include configurable mix buses, providing multiple format outputs plus a range of stem mix options; "one touch" routing assignments, optional integral hard disk multitrack, and the ability to play back from OMF compliant hard drives.

Other features include routing assignments as part of the dynamic automation data, automatic one-to-one assignment of predund inputs to output stems, and a 48 x 8 routing matrix with full PEC-Direct monitoring and recorder control for multiple stems. The DFC can have three operator positions with zone-dependent routing and automation functions controlled by Encore with independent save, undo and mix conform functions.

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New Technologies

On the eve of the 101st AES Convention in Los Angeles, news of new equipment launches is arriving thick and fast. DAVE FOISTER sifts through them to present a selection of hot product developments that will help to shape the show



Fairlight MF3plus

The LA AES Convention will see the launch of Fairlight's MF3plus. The enhanced workstation has an upgraded CPU giving 'up to 40 times' faster processing, and which runs new modular software, and incorporates support for the PCI bus. Networking facilities benefit from the combination of a proprietary comms protocol and the established 100BaseT topology, while the control surface has been redesigned to appear in four formats along with custom options.

Fairlight, Australia. Tel: +61 2 975 1230.

Fairlight, UK. Tel: +44 171 267 3323.

Fairlight, US. Tel: +1 213 460 4884.

ATC SCM20 SL

Monitor specialist ATC has launched a special version of the established SCM20 system in which new ATC driver technology is introduced for the first time. The advance comes in the form of a new non-conducting material for the pole piece and front plate that dramatically reduces the presence of eddy currents, identified by ATC as being the most significant remaining cause of distortion in moving-coil loudspeakers. This Super Linear Magnetic Material is difficult to work with, necessitating the design of a new pole tip geometry, and the published results show a decrease in third harmonic distortion of 10dB-15dB, giving an overall distortion claimed to be comparable to the specification of a power amplifier rather than an electromechanical transducer.

ATC, UK. Tel: +44 1285 760561.

Crookwood Rackpot and Mic Brick

Crookwood's idiosyncratically-named range has grown with the addition of two

rackmounting microphone preamp units, versions of the established Paintpot remote controlled preamp range. The Rackpot carries either two or four channels in a 1U-high case, while the Mic Brick takes up 3U with up to 32 channels. Both are completely modular and use technology from the Console Brick series of mixer building blocks. The Rackpot can have a variety of options fitted, including transformer input-output cards, stereo submixer cards, and high impedance inputs for instrument pickups, and is ready for a 4-channel 20-bit A-D card due early next year. Similar flexibility is available with the Mic Brick, with the addition of transformer splitter cards for multiple feeds and user-specified connectors. Both systems are compatible with Crookwood's Control Pot remote control, and can be mixed with existing units on the same Pot-Net control cable.

Crookwood, UK. Tel: +44 1628 528026.

Lexicon MPX1 and PCM cards

Lexicon's new multieffects processor is the latest addition to its Performance series, and features two independent microprocessors to achieve its combination of flexibility and Lexicon sound. The MPX1 incorporates the proprietary Lexichip for true Lexicon reverb, plus a second DSP chip for additional effects, allowing any chain of up to five effects to be built up without sacrificing the quality of the reverb. The illuminated front panel display is interactive using a simple drag and drop approach to routing and effect ordering. 56 preprogrammed effects and up to 200 editable factory programs are managed by a database sorting and searching

function. This is joined by a new PCM80 card, the Harmony FX card, providing four new algorithms for automatic harmonisation using straight parallel shifting, MIDI chord input, or Auto Chords which uses a table of different harmony chords for each of the 12 notes of the scale, as well as Pitch Correct, which will adjust off-pitch melody lines under the control of the front panel or a MIDI keyboard. The PCM90 also has its first expansion card, providing split control of the unit's reverb algorithms. It has ten new algorithms, 200 new presets, and space for further user edits of the new parameters. Presets are divided into four banks by application, with for example a Surround Sound group containing algorithms that produce surround reverbs when heard through a surround decoder.

Lexicon, US. Tel: +1 617 736 0300.

UK: Stirling Audio. Tel: +44 171 624 6000.

dbx Blue Series

A new range of products from dbx, the Blue Series, kicks off with three units, beginning with the 160S stereo compressor limiter. Built round the dbx V8 VCA, claimed to be the world's widest dynamic range VCA, the unit offers both hard-knee and dbx OverEasy compression, with either manual or programme-dependent time constants. Partnering this is the 786 mic preamp, a comprehensively-equipped unit complete with meters, subtle HF EQ and a 'super low Z' setting for very low source impedance microphones. Its output can either be analogue with two buffered outputs per channel, or digital using dbx's proprietary Type IV conversion system to deliver both AES-EBU and SPDIF outputs. This A-D conversion is available separately in the form of the 704, known for some reason as the Bad Boy. The patent-pending system claims a performance equivalent to 27 bits, and has a wide range of word length reduction and noise shaping options, including user-defined settings—dbx claims this is the only product

Lexicon's MPX1 uses two DSPs to allow primary and secondary effects processing

New driver technology from ATC incorporates a non-conduction pole piece and front plate



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Canford specials—Sennheiser HD4011s incorporating BBC level-limiting circuitry

on the market to offer this. Elaborate metering facilities include separate meters for analogue input and digital signal, phase monitoring, and a History function that allows the user to visually scroll back through several minutes of level and phase data. It offers sample-rate conversion and an extremely low-jitter clock, and its software can be updated via its serial port with upgrades downloaded from dbx's web site.
dbx, US. Tel: +1 801 568 7660.

Bag End Quartz

Drawing on the proprietary ELF technology that supports its range of high-spec close-field monitors, the Bag End has unveiled its Quartz subwoofer system. Aimed primarily at reinforcement applications, but also expected to serve cinema-style installations, Quartz incorporates four EL-18A 18-inch drivers, and claims a 'flat' response 20Hz-70Hz, and 102dB/1W at 1m sensitivity.
Bag End, US. Tel: +1 847 387 4550.

beyerdynamic Classics

Conscious of the high level of interest in classic microphones, beyerdynamic has introduced new production of two of its most famous models. The M88, designed in 1963 and regarded as one of its finest, is available in a limited edition, with only 999 units being made, each engraved with its serial number and presented in a wooden case. Joining it is the return of the M500 ribbon microphone, discontinued over two years ago, but relaunched because of interest in ribbons for digital recording. Both microphones are finished in satin chrome, and come with frequency response plots personally signed by Fred R Beyer.
Germany: beyerdynamic. Tel: +49 7131 6170.
UK: beyerdynamic. Tel: +44 1444 258258.
US: beyerdynamic. Tel: +1 516 293 3200.

RSP Technologies Project X

RSP's Project X Automated Digital Mixing System is now available, comprising a flexible range of consoles up to 64 channels with full dynamic automation and substantial processing

power. A full console has 56 Motorola DSP devices under the control of six microprocessors, allowing 7bn DSP operations per second. This gives a wide range of facilities on every channel including dynamics, 4-band parametric EQ, delay and stereo linking, while two of the eight auxes have time domain processing available on board such as chorus, reverb and pitch shifting. The X incorporates RSP's Circle Surround 5.2.5 encoding.
RSP, US. Tel: +1 810 853 3055.

Summit Audio MPC-100A

Summit's latest tube offering, to be introduced at AES, is a mic preamp and compressor-limiter designated the MPC-100A. The preamp and compressor stages are quite separate, each incorporating its own valve. Microphone, instrument and line inputs are accepted, and pass through the valve preamp stage before driving a new valve compressor-limiter section with fast attack times and vu metering of input, output and gain reduction. An overall output gain control allows levels to be adjusted without affecting the relationship between preamp and compressor, and therefore leaving the chosen degree of tube overdrive intact.
Summit, US. Tel: +1 408 464 7659.
UK: HHB. Tel: +44 181 962 5000.

Z-Systems detangler

Z-Systems newest and largest router-patchbay-DA is the z-64.64r Digital Detangler Pro. This has 64 AES-EBU stereo pairs in and out, and routes signals around in the digital domain without physical patching under automated control. Connections can be established and rearranged using either the z-rrc router remote control or a computer interface for Mac or Windows. Preset configurations can be saved for future instant recall. Z-Systems has also announced an upgrade to its two stereo digital parametric equalisers, the z-q1 and z-q1m adding 24-bit 96kHz capability in line with developments elsewhere.
Z-Systems, US. Tel: +1 352 371 0990.
UK: European Office. Tel: +44 1442 870103.

Solid State Logic

NEWSLETTER

ISSUE **18**



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DAVE BIANCO: WHY I LOVE THE SL 9000 J **PAGE 6/7**

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Training

SSL provides comprehensive training in the use and maintenance of all our products. For clients, operational training is carried out, either on-site or at SSL headquarters, by a team of dedicated product trainers. Purpose-built studios at Oxford provide a realistic training environment, and numbers are strictly limited to ensure personal attention. We also run courses specifically tailored to the needs of freelance operators. Maintenance training courses can also be provided, either at Oxford in a purpose built lecture room, or at the client's facility. Training is supported by comprehensive documentation and, where possible, augmented by interactive CD-ROMs (see below). Up-to-the-minute information is available 24 hrs a day through SSL's Internet Web Site (<http://www.solid-state-logic.com>). For further details contact the Training Department, tel +44 (0)1865 842300, or via e-mail on psd@solid-state-logic.com.

Tutorial CD-ROMs

Our latest user support initiative is interactive tutorial CD-ROMs (Mac/Windows) for Axiom and the SL 9000. Each offers a step-by-step guide to operating the console, with the ability to skip quickly back and forth to any section. Watch this space for news of more CD-ROMs covering other SSL products. Contact the marketing department for details.

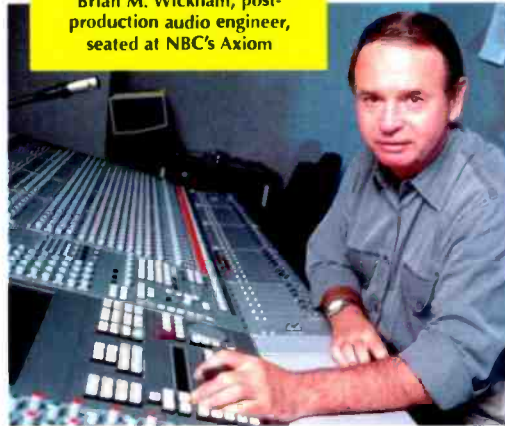
OmniMix Updates

OmniMix, the Digital Surround Sound Audio/Video System, now benefits from some important new features including extended surround sound spatial processing, with the addition of a 'centre size' function, and enhanced Hierarchical SubMix (HSM) displays with additional HSM presets.

2

Olympic Gold For Axiom

Brian M. Wickham, post-production audio engineer, seated at NBC's Axiom



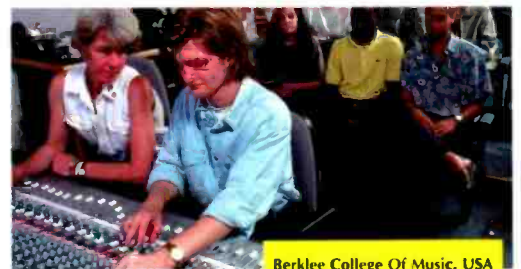
NBC in New York recently used its Solid State Logic Axiom Digital Production System for post-production and re-transmission of segments of the 1996 Summer Olympics in Atlanta, GA.

The Axiom was on-line for 17 days, 24 hours a day. NBC used fibre-optic links to shuttle pictures and audio between its production facilities in Atlanta and New York, and to link most of the Olympic venues to its facilities in the Georgia World Congress Centre. "This year's Olympics was different because we used this new technology [a digital console]," says Phil Paully, Director of Engineering, Broadcast Creative Services. "That made it easier for installation, control, and to mix down remote feeds." The Axiom was used extensively for voiceovers, attached to bumpers and animation, that were sent down the links to Atlanta. "The automation was done in pre-editing of what we were going to attach to visual animations," explained Paully. "We were able rapidly to trim down all the long forms of the music that we used into the time we needed. The Axiom was a very efficient way of doing it."

Music  Film

Prestige Recording Schools

More students on recording courses around the world can now expect to train on SSL consoles, providing valuable experience of the equipment they will use after qualifying. At Düsseldorf's Hochschule, Peter Nikolitsch says that installing a new 40-channel SL 4000 G Plus has given them, "a simple and straightforward studio, but with world class state-of-the-art professional equipment." An SL 4000 G Plus was also the choice of the Institute Of Sound Technics in Japan, enabling students to "train in a realistic environment to prepare them well for the many



Berklee College Of Music, USA

SSL-equipped studios in Japan," according to the Institute's head Mr. Kikita. In Sweden, meanwhile, the Royal College Of Music and the newer Pitia school have installed 48-channel SL 4000 G Plus consoles. Both institutions cited the status of the SL 4000 G Plus as the music studio standard as the main reason for their choice.

Broadcast & Post Production

Scenaria – The Cat's Whiskers

Atanta-based Cat's Paw, one of the US's leading radio broadcast post-production facilities, has placed a new Scenaria at the heart of a major recent expansion. The system will be used for radio broadcast editing, and sound design for TV. "We're a forward-looking company, which is why we chose the Scenaria – it represents a new

generation of technology," says Tom Race, Cat's Paw studio manager. "With the Scenaria, we are bringing something to the table in the South East that nobody else has," he adds. Besides work for Tribune Broadcasting and stations throughout the country, Cat's Paw has also created commercials for American Express, and produces the live alternative rock radio show 'Live X'.

Europe Unites Around SL 9000 J

Sarm West, London

Photo: Richard Davies

They may argue about federalism, football and single currencies, but when it comes to choosing the best music recording console Europeans are in total agreement. The latest studios to install SL 9000 J Series systems are London's Sarm West and Olympic, and Sound Studio N in Germany, bringing the number of installations of the ultimate analogue console to over 40.

Sarm West was the first London studio to install an SL 9000 – an 80-channel J Series Total Studio System in Studio One – and has already ordered a second. Studio One and the Control Room were expanded and totally redesigned to accommodate the new console.

Over at Olympic in West London, their third Solid State Logic console has taken its place in a refurbished Studio 1. "It needed a bit of smartening up and modernising, but the acoustics are perfect, so we've left those alone," says Ian Davidson, Director Of Operations for the Virgin Studios Group of which Olympic is a part. "It sounds fantastic, and the number of

studios to have installed them around the world proves that it is now an established international standard. Olympic is a world-class studio, and we therefore have to install equipment that world-class artists want to use." Recent projects range from tracks for Disney's 'Hunchback Of Notre Dame', through Shirley Bassey to ex-Gong luminary turned techno maestro Steve Hillage. "It's a very diverse mixture," notes Studio Manager Siobhan Paine,

"and any console we install has to be able to handle it. The SL 9000 is just the console to do that, and to do justice to a very special room."

In Köln, the 4-room Sound Studio N complex was refitted to accommodate a new SL 9072 J.

"It is the perfect addition to the

facilities offered by Sound Studio N, and an exciting development for us all," said studio owner Georgi Nedeltshev. With the installation complete, bookings have poured in from many of Germany's leading artists, including The Kelly Family, whose last album was Germany's biggest selling CD ever.



Olympic Studios, London

... IMPORTANT NEW CONSOLE NEWS ...



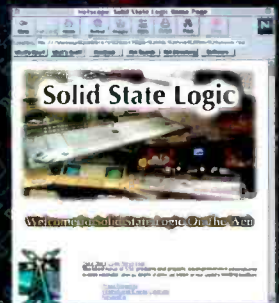
SSL has launched a Special Edition of the G+ console, with all the operational features that have made it the number one choice of producers and engineers, together with exciting new multi-format and extended features. Ultimation™, Total Recall™, LCR panning, plus a built-in 'motionworker' make this Special Edition console particularly flexible and able to mix for a wide variety of film sound formats. New features and special options fitted as standard include:

- Ultimation™ and Total Recall™.
- Surround Mixing – LCR panning and Decoder insert.
- High-definition Bargraphs – switchable VU/peak.
- Integrated 'motionworker' – comprehensive feature set complete with 'perfect machine'.
- 14 FX sends.
- Stereo AFL on Channels and Groups.
- Dual 24/48-track Bus Routing – new channel Route switching.
- Three flexible multi-format configurations.

High Definition Oberhausen

High Definition Oberhausen in Germany, Europe's first media production facility dedicated to high definition digital image processing for film and TV, has based its audio post-production facilities around an Axiom with DiskTrack. Production, training and research resources are combined under one roof in the ambitious project, in Oberhausen-Osterfeld, which currently employs around 200 staff. "The fact that Axiom is based on years of experience with analogue and digital production systems really shows through," commented project engineer Stoffer Gelling. "It offers a familiar interface to anyone who uses analogue mixers, so there's very little training required. It has highly flexible 8-channel monitor routing, which supports all common mixing formats and, because it's software-based, new technical developments can be implemented very easily. The high standard of SSL's service also influenced our decision."

Surfin' SSL



Solid State Logic now has an official web site, featuring all the latest news on our products, plus full details on our distributors and offices around the world, and personnel and departments at our headquarters in Oxford. You can even e-mail distributors, and members of staff, directly from the site, and request product literature. Come and visit at <http://www.solid-state-logic.com>.



The new G Plus console will be used mainly for orchestral recording at RTM

G Plus In Malaysia

Radio Television Malaysia (RTM), the national broadcaster of Malaysia, has upgraded its music studio with the installation of an SL 4000 G Plus console. The studio, with its large live

area, is used mainly for recording performances by the RTM Orchestra. RTM operates two national TV and six national radio stations, broadcasting to an audience of over 10 million.

Music & Film

SL 9000 J Goes Platinum

Platinum Studios, Taiwan's premier recording studio and a long-time SSL user, has opened a new 'sister' studio complex in Taipei based around a 48-channel SL 9000 J Total Studio System. The new facility, Premium, includes two control rooms with a separate live recording area. The SL 9000 J is installed in the ground floor mix room, linked to 48 channels of DiskTrack hard disk recording. Premium's Manager and Chief Engineer,

'Jerry' Lin, explained that the choice of the SL 9000 J Series with DiskTrack was made for financial as well as operational reasons: "Recording budgets in Taiwan mean that we are always trying to maximise productivity within each session. Replacing linear tape-based digital recorders with DiskTrack has had a dramatic impact in releasing more time for concentrating on the creative process, both in mix sessions and in vocal dubbing."

Music & Film

Avon - Fully booked in Hong Kong

Leading artistes from Taiwan and Japan are flocking to Hong Kong's Avon Studios. Formerly owned by CBS/Sony, and now in the hands of the Chiu family, Avon has just installed Hong Kong's first SL 9000 J Series Total Studio System. The SL 9000 J was chosen for its audio quality, level of automation, and "practically guaranteed full bookings after installing the console". The new console will be used for 48-track DASH recordings on Sony PCM3348s, in Avon's main Tom Hidley-designed room.

Broadcast & Post Production

Non-Linear Editing At Disney Asia

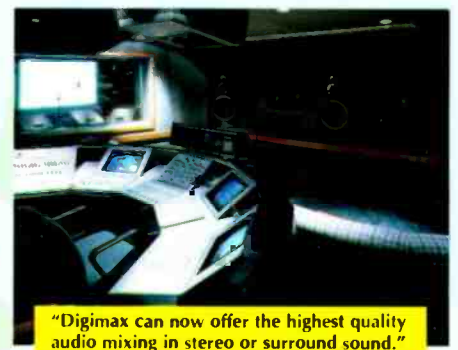
Following exhaustive competitive evaluation, Walt Disney Television in Singapore has purchased a ScreenSound digital recording and editing system, with VisionTrack non-linear video, for its new television operation. The choice of a Solid State

Logic system was due in no small part to the ability to upgrade ScreenSound's advanced editing to Scenaria or OmniMix as the station's operational requirements change. The system will initially be used for creating programme titles and promotions.

On Broadway

Malaysia's expanding music industry has received a boost with the arrival of another SL 4000 G Plus equipped commercial recording studio. The facility, owned and operated by Broadway Entertainment, which also owns Broadway Publishing and Broadway Records, re-opened in August following its refurbishment. Past projects include local album recordings for BMG, Warner, and Pony Canyon. "We all know that SSL mixers are popular around the world, and I used SSL all the time when I was a freelance engineer," said studio manager Boon Tan. "It's a great console, especially the automation system. There aren't many good mixing rooms in Malaysia, and we believe this will be a very popular room."

Digimax Invests In Surround Sound



"Digimax can now offer the highest quality audio mixing in stereo or surround sound."

Digimax, one of Taiwan's leading audio and video post-production houses, has acquired an OmniMix system for surround sound mixing. The studio specialises in CineGraphic and TeleCine special effects and D1/D2 digital editing. "We purchased the OmniMix to refine our audio quality," says Cathy Cheuh of Digimax. "It means we can now offer clients the highest quality audio mixing in stereo or surround sound." Digimax reports that engineers are especially happy with the new system, and work faster and more easily thanks to quick search, and dynamic reset. "OmniMix is very agile in operation," adds Cheuh. "It can be set by engineers according to their personal preferences, and is very well suited to complex film production work."

Restoring Legends

When you're restoring film classics such as *Laurel & Hardy* or *The Little Rascals* to better than their former glory, nothing but the best post-production equipment will do. Which is why Film Technology Company, Inc., a leading US film preservation lab and video mastering facility, has installed a Solid State Logic OmniMix Plus in its main screening room.

The company restores and services numerous film libraries, and is in the process of working on the entire Hal Roach library.

The OmniMix Plus is part of an expansion and upgrade of Film Technology's Sound Department.

"We wanted the very best, most flexible and comprehensive mixing system right from the start," says Ralph Sargent, Film Technology's President and Director of Engineering. "It had to be a completely integrated package of mixer, sound processing, sound and vision recorders, editing station and machine control system which could address every other motion picture and video recorder in the building. The OmniMix Plus completely fulfills these requirements."

According to Sargent, the OmniMix Plus will make his Sound Department more productive and efficient. "I like the fact that every channel can be assigned a vast array of equalising and sound processing



Film Technology's main screening room, with OmniMix: "We wanted the very best system right from the start."

algorithms, and that all of this control is committed to memory, reproducible, and alterable as the work progresses." The OmniMix Plus equips Film Technology to deal with future motion picture sound formats, as well as current formats and surround sound. "We can effortlessly handle SDDS (8 channels), AC-3 (5:1 channels), regular LCRS Dolby Stereo, and other standard motion picture and television formats. We are ultimately looking towards the DVD market," says Sargent.

Broadcast & Post Production

Fast Work At NRK

Norway's national broadcaster, NRK, has taken its in-house audio post facilities fully digital with the installation of an OmniMix system. The system is in constant use on a mix of documentary and drama projects, and feature film co-productions. OmniMix was "the logical extension of the system we already had [three ScreenSounds with SoundNet]", said

Stein Ødegaard, NRK's Operational Manager for Sound Post-Production. "We were looking for a digital mixer, and we knew that OmniMix would require a minimum of training and familiarisation." The installation and studio refit came as NRK prepared to launch a second national TV channel, which meant a speedy installation. "It was very important that we had as little down time



New OmniMix at NRK

as possible, and went straight into production without any trial period," explained Bjørn Suhrke, Head of Engineering, "and that's just what happened. SSL and Benum [Norwegian Distributor] did a magnificent job."



Axiom Sweet Spot

The Axiom Digital Production System has been further enhanced with new features designed for ease and speed of operation – Channel Banking and Bay Swapping. Axiom is constructed around

an 8-channel bay principle; Channel Banking allows any bay to control double its number of physical channels, a valuable facility where space is at a premium. Shift keys provide instant access between Banks – by individual channel, channel groups, or globally – ensuring all channels are constantly available to the operator.

Bay Swapping is designed to allow 'sweet spot' mixing, by enabling the central bay to be swapped at will for another console bay at the touch of a button with no disturbance in the audio. This allows operators to maintain an ideal listening position while retaining immediate and absolute control of all parameters across all channels.

Warner Bros. TV

Only 18 months after launch, Warner Bros. Television Network in Burbank is ensuring that it stands equal in every respect with the established networks. To this end a new Axiom has been installed in its brand new audio sweetening room for use on promos, in particular animated slots. "We liked the Axiom's expandable features, and we wanted to give our promo facilities the same or better capability than the more mature networks have," says Chuck Dages, Senior Vice-President of Technology.

Dave Bianco – Producing Success

Dave Bianco, Grammy Award-winning producer and engineer, is nothing if not versatile. He won his 1996 Grammy, in the Best Engineered Album (Non-Classical) category, for Tom Petty's 'Wildflowers', but built quite a reputation in R&B in the 80s. He's recorded Nazareth and The Jacksons live, mixed Ozzy Osbourne and Throwing Muses back-to-back, and is about to finish mixing albums by, amongst others, Teenage Fanclub. To this end he's booked a big block of time at his favoured studio, Larrabee North,

where he can work on his favourite console – an SL 9000 J Series. "I was blown away by it – it was just the best console I'd ever heard. I told Kevin Mills [owner of Larrabee] that he had to get one..." In fact, Kevin bought two. Dave's approach to production draws on both his live and studio experience. "What I look for in a studio is the ability to get a real variety of sound out of the live room, from very intimate, ambient sounds to a big, live sound. Next, the

playback in the control room should sound even better, more exciting – if you can make a few simple elements sound great, then the less stacking of sounds you do, and the more punch the final mix will have. "I like the control room to sound exciting. I hype the monitors, and do

Music & Film

The Big Picture – SSL At Warner Bros.

Think classic Hollywood movies and big movie scores, and you're thinking Warner Bros. The music for many a blockbuster such as 'Batman' has come from Warner Bros.' famous stages in Burbank, and for many years SSL consoles have been at the forefront of Warner's film soundtrack recording. That involvement continues with the recent installation of two new SL 8000s. The new 88-channel SL 8000 in Dubbing 5 will be used for film re-recording, and features three independent computer systems. "In a console this large, you don't run out of automation slots," says Kevin Collier, WB's chief engineer. "Each of the mixers has total control over their automation mode, and they don't get in each others' way." The second, 64-channel SL 8000 has been installed in Dubbing 7 for work on several TV sitcoms, including 'Seinfeld'.

Apologetic thanks: Many thanks to Mix Magazine for their kind permission to use excerpts from their 'Dusk Till Dawn' article, written by Mel Lambert, in issue 17 of the SSL Newsletter.



Music & Film

New G Plus For Major Italian Film Production Complex

The legendary Italian movie production complex **Cinecitta** has installed a 48-channel SL 4000 G Plus, with VCA automation, and special film panning, in its new THX-equipped mixing studio, Studio B. Technical Manager Maurizio Sperandini commented that the console

was: "perfect for film sound post-production. This is also a sound business decision, as the competitive price enabled us to remain within our budget." Cinecitta's impressive audio recording and post-production facilities allow dubbing, mixing, syncing and re-recording in any

format. Both mixing studios are Dolby Digital Stereo equipped, with THX monitor systems. The Cinecitta complex also includes video mixing studios, video dubbing/editing studios, and digital sound editing suites specialising in sound restoration of archive films.

whatever it takes to get it sounding good. That means you can be mixing and recording at the same time, and really get everybody's blood going. When everybody's pumped up like that, you can just work away until you get it right,

and get a track down in two days." The SL 9000's automation clearly fits in well with Dave's practices. "It's so fast and immediate. I'd say it combines the best of Massenberg, Flying Faders and traditional SSL automation, all rolled into one computer system. But above all it's actually fun to use." He reserves his highest praise, however, for the sound. "I like its clarity, top end, and general

punch. It's a very clear low end, too – not mushy like a lot of big studio desks. I've tended in the past to record on Neve and mix on SSL, but the SL 9000 has changed my approach. At Record Plant we put up a bunch of Neve pre-amps – 1066s and 1073s – and the SL 9000 pre-amp just blew them away, on everything from kick drums to cymbals to guitars."

"I was blown away - it was just the best console I'd ever heard."



Broadcast & Post Production

Audio For Animation

Dubbing sound for animation is one of the most demanding tasks in post-production, and one that M2 Television in London, with its comprehensive range of facilities from audio



Dubbing sound for animation at M2

post, through graphics, to on and off-line digital video editing, has made its speciality.

M2 has a wide range of broadcast clients covering all areas of programme making, from light entertainment and documentaries to full length animation series. In the main audio dubbing studio, a Scenaria now provides the ideal tool for fast, efficient audio post, complemented by two ScreenSound-equipped suites, all linked via SoundNet.

"The mixing capabilities of Scenaria are just phenomenal – they really put the fun back into mixing," comments senior dubbing editor Richard Lambert. "I usually use up to 20 of Scenaria's

38 tracks when dubbing an animation project," he adds, "compared to 8 to 12 in documentary work." It is in project management, however, that the Solid State Logic systems really benefit M2, which has always prided itself on offering a complete service to production companies. "We can complete everything for a 30-minute animated film, from tracking to mixing, in a week. With SoundNet, it's a very smooth process."

Music & Film

Broadcast & Post Production

Mega Success In Rio

Opened in June, Studio Mega is Brazil's newest major facility. Mega reports that Studio A, with its new 64-channel SL 4000 G Plus, has been fully booked since opening. The studio has been built at the foot of Rio de Janeiro's landmark Cristo Redentor by local producers Philippe

Neiva and Liber Gadelha. The original concept was for a modest facility, but the final result is far more ambitious, including a full post-production complex that will be based around a Solid State Logic OmniMix for audio. Studio Mega generated immediate interest from the major labels, in particular Polygram, and has already been used by Brazilian megastars Lulu Santos and Marina.

Digital Film In Switzerland

Sound Design Studios, one of Europe's top film facilities, has installed an SSL Axiom in its newly refurbished Studio A.

Located in Berne, Switzerland, SDS attracts talent from far and wide. "We want to underline that position with the



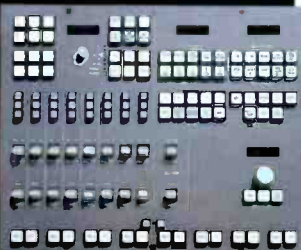
Ulrich Grimm (left) and Hans Künzi (R) with the new Axiom at SDS

best in digital technology," says co-owner Ulrich Grimm, "and from our point of view the Axiom is ideal for film mixing." Facilities at SDS, besides the THX-equipped Studio A which specialises in Dolby Surround and 5:1 digital work, include a suite dedicated to CD preparation and pre-mastering. "Specialising in Dolby Stereo or 6-channel digital work makes us very interesting for film production companies from around the world," adds Ulrich.

SL 9000 J Film Monitoring

The new SL 9000 J Film Monitoring Panel was developed in conjunction with the world's leading scoring engineers. All panel settings are stored by project in the J Series computer. Principal functions include:

- 32:8 monitor matrix.
- Bus/Tape switching on every input.
- Dedicated Music, Dialogue and Effects faders.
- Input level trims.
- Two dedicated stereo record outputs.
- Outputs for three 8-channel speaker systems.
- Assignable Bus/Tape and Record On/Off traditional paddle switches.



SSL Expansion Continues

In response to an upsurge in Canadian business, SSL has opened a regional office in Ontario, providing sales and technical support throughout the country. The office is managed by Tim Lyons, who will be familiar to the majority of SSL users in the region. He has had more than nine years of experience working with SSL and SSL equipped studios.

New Brochures

New brochures are now available for:
Axiom
Aysis
SL 9000 J
G.Plus Special Edition

SL 9000 J Studios Dominate TEC Awards



Four out of the five world class studios nominated in this year's TEC awards, presented by Mix Magazine USA, are Solid State Logic SL 9000 J studios, confirming the industry standard status of the ultimate analogue console.

The nominees are **The Hit Factory** (New York), **Sony Music Studios** (New York), **Ocean Way Recording** (Los Angeles), and **Masterfonics** (Nashville).

The Hit Factory has four SL 4000 G Plus consoles in other rooms, besides the 96-channel SL 9000 J installed in Studio 3. "We consistently offer clients break-through technology," says Executive Vice President Troy Germano. "The SL 9000 is the wave of the future." Sony Music Studios is installing its SL 9000 J in Studio C, where it will be used for music recording and mixing, as well as film scoring. "The word on the street is that the SL 9000 is a great sounding board. In fact, key creatives such as [producer] David Kahne and [mixer] Michael Brauer already have a couple of projects for our SL 9000," says Ian Huckabee,



Director of Audio Operations for Sony Music Studios.

At Ocean Way, the flexibility of the SL 9000 J in its Sherman Oaks facility, Record One, has allowed the studio to accommodate a wide range of music recording and film soundtrack projects.

Owner and engineer Allen Sides notes

that operational benefits aside, "great low end impact, effortless open top end, and exceptional overall clarity make the SL 9000 without question the best modern console I have heard."

Masterfonics installed an SL 9000 J in its new Tracking Room, a major expansion incorporating a Tom Hidley-designed 'Infrasonic-ready' control room. "It was obvious that we needed a 'no compromise' console in this room to be able to achieve our ambitious goals," said owner Glenn Meadows. "The SL 9000 became the only logical choice." Solid State Logic would like to take this opportunity to offer all nominees our congratulations and to say how fabulous we think Mix Magazine and the TEC Awards are!



Hit Factory's Studio 3.



Sony Music Studios.
 David Smith, Director of Audio Engineering and (seated) Ian Huckabee, Director of Audio Operations and Marketing.

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Genelec 1029A-1091A

Active monitoring specialist Genelec has a new close-field system centring on the 1029A 2-way bi-amplified monitors. The simultaneous introduction of the 1091A matching subwoofer creates a complete system at a new low price point for Genelec. The cabinets feature Genelec's proprietary Directivity Control Waveguide, and contain 5-inch LF units and 3/4-inch hard-domed tweeters powered by 40W amplifiers. The new housing design is an aluminium enclosure for ruggedness and heat dissipation, and also provides RF interference protection as well as magnetic shielding. Besides volume, control is provided for bass and treble tilt for room response matching. The subwoofer is fed in parallel with the main pair via built-in connectors, and follows the existing volume controls. Its quoted response goes down to 40Hz, but bass roll-off is provided via DIP switches on the 70W amplifier module.

Genelec, Finland. Tel: +358 17 81 33 11.

Canford-Sennheiser headphones

Canford Audio, licensee of the BBC's patented headphone level limiting circuit design, has incorporated it into a new model of headphone in collaboration with Sennheiser. The BBC circuit is usually fitted in-line, but the Canford model has it built in to the ear capsules of a pair of Sennheiser HD480II headphones. The limiter circuit is designed to remain transparent until 93dB is reached, above which it will not go, meeting safety at work regulations.

Canford, UK. Tel: +44 191 415 0205.

Steinberg Red Valve-it

Steinberg's latest contribution to the pool of TDM plug-in software is Red Valve-it, a 24-bit processor providing valve amplifier simulation. This comprises three elements: the drive section, 3-band EQ and a gate with automatic

calibration. The preamp has different tube sound characteristics and speaker emulations delivering a variety of sounds from jazz to distorted rock settings. Two stages of tube emulation are included, in the input stage and the drive section, and a speaker cabinet simulator offers combo and stack settings.

Steinberg, Germany. Tel: +49 30 21 1594.

Steinberg, US. Tel: +1 818 993 4091.

Harman Audio, UK. Tel: +44 181 207 5050.

Mackie HR824

Mackie has introduced an active bi-amplified close-field monitoring system claiming neutrality and accuracy among its virtues. The HR Series HR824 incorporates several special design features intended to produce a flat extended frequency response above all else, including a 150W bass amplifier directly coupled in a servo loop to the 8.75-inch LF driver, giving a response down to 42Hz within 1.5dB. Each loudspeaker is factory trimmed to a close tolerance and a Low Frequency Acoustic Space control compensates for different monitor locations in open space, against walls or in corners.

Mackie, US. Tel: +1206 402 6148.

Key Audio Systems, UK. Tel: +44 1245 344001.

Oram Series 4

AES will see the launch of the latest in the Oram console family, the Series 4. This is a modular 4-bus console intended for broadcast, theatre and studio applications with an identical input section to the Series 8. Frame sizes up to 32 inputs are available with many options including PPMs and transformer I-O. Joining it will be Oram's Octasonic, a 1U-high rackmount unit containing eight of the mic preamps as found on the Series 24 console.

Oram, UK. Tel: +44 1474 815300.

SonicStudio enhancements

Sonic Solutions' SonicStudio has reached



Genelec's 1029As with the 1091A subwoofer create a complete monitoring system at a new low price point



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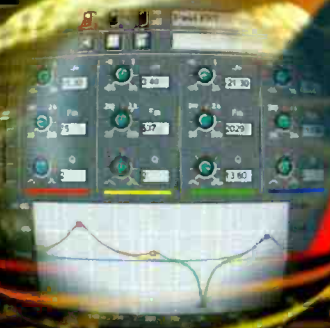
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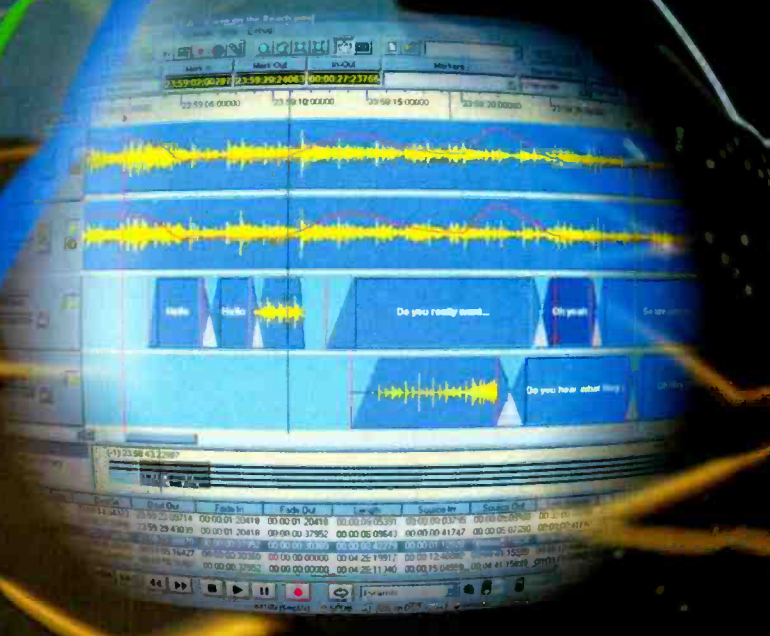
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RSP Technologies' Project X automated digital console

v5.1 with the addition of new features for CD mastering, broadcast and post. It is now possible to play any audio track from a DDP Exabyte tape, and also to rewrite PQ and ISRC data on existing tapes. Dithering, Super Bit Mapping and Turbo Bit Mapping have been improved, and the 24-bit mixing desk has new automation features. Simultaneous multi-source recording, double speed playback, and instant sound triggering are all features aimed at radio broadcast both on-air and in production, while extended abilities to import file formats including OMF, XFS and AIFF have enhanced the system's appeal to the post market.

Sonic Solutions, US. Tel: +1 415 893 8000.

Rane DA216 and BB44X

Rane's new DA216 distribution amplifier takes over from the discontinued FDA28, doubling the capabilities and adding flexibility. The new unit can be configured as 1in 16 out, 1 stereo to 8 stereo, 2 in to 16 out, and 2 independent mono in to 8 mono dual outs.. Alongside this comes the BB44X level conversion-isolation box, matching +4dB and -10dB levels in both directions at once. The circuitry is entirely passive, using nickel-core transformers, and the unit can be expanded to eight channels.

Rane, US. Tel: +1 206 355 6000.

Deltron connectors

Two new audio connectors are available from Deltron. The first is a range of 1/4-inch jack plugs, including what Deltron describes as a silent version allowing musicians to unplug a guitar without the inherent buzz associated with mains hum pickup. A long list of special design features

makes it clear these are professional plugs, with helpful details like two grooves for colour coding rings. At the other end of the scale is the Litton Veam range of multipole circular connectors, offering from 25-150 pins in male, female, panel and cable versions, with a full range of accessories including chained-on dust covers and special tools.

Deltron, UK. Tel: +44 181 965 4222.

HHB media

HHB's commitment to supporting the full current range of recording media is underlined by the publication of a new 8-page brochure containing full information and technical data for its Advanced Media Products range. HHB now produces DAT, two types of CD-R, MiniDiscs, two sizes of M-O discs, and the newly introduced S-VHS tape for ADAT users. This 45-minute tape is optimised for ADAT recording, and has an unusually smooth magnetic surface, a special high density binder system, and a precision moulded shell.

HHB, UK. Tel: +44 181 962 5000.

HHB, US. Tel: +1 207 773 2424.

Vortex codec

Vortex Communications' VX-1000S Baby Blue codec is based on the VX-1000, and has a built-in ISDN terminal adaptor allowing connection of two telephones for voice calls to PSTN numbers using ISDN. When used with an external Bonding TA, the unit provides as standard stereo operation giving up to 20kHz over a 128kbit/s data channel.

Vortex, UK. Tel: +44 181 579 2743.



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Butch Vig: one of the architects of the Seattle grunge scene who took most of his cues from the British music scene of the 1960s

Music from Garbage

Butch Vig owes much of his reputation to his relationship with Nirvana, but the modest American producer, engineer and musician has many more strings to his bow. **DAN DALEY** gets the dirt on the Garbage man

HIS DISCOGRAPHY, which has only recently been completely catalogued, and includes records and remixes for such diverse and best-selling artists as Nirvana; Killdozer; Smashing Pumpkins; Urge; Overkill; Sonic Youth; Nine Inch Nails; Depeche Mode; Freedy Johnston; U2; L7; and Soul Asylum. Add to this his own well-received outfit, Garbage, and the fact that all this activity was crammed into the last dozen years, and you would be justified in regarding Butch Vig as one of the hardest working men in the business. What comes as a pleasant surprise, though, is that Vig, characteristic of the honest, hard-working and straight-shooting Midwest from whence he came, is also just about the nicest guy in the business.

Calm, with a quiet sense of humour, a dose of humility unencumbered by self-deprecation, and a tendency towards spare but thoughtful replies to questions, Vig readily deserves both sobriquets, and he wears them well. Initially he escaped the recognition he deserves, as it was not until Nirvana's critical-mass media sensation in 1992 that anyone realised who it was slaving away in his personal studio in the relative backwater of Madison, Wisconsin.

Once the Seattle cat was out of the mass culture bag, Vig could just as easily have lived on a Tibetan mountaintop and the world would have found him. It's not like Vig's workload suddenly increased; from the late 1970s through the early-1990s, he was busy drumming for Spooner and Firetown (the latter of which had a short-lived deal on Atlantic Records), building a recording studio (Smart Studios, with longtime partner and Garbage collaborator Steve Marker), starting an independent record label (Boat

Records) and producing more bands than he can remember. After a year of world touring with Garbage—a tour that is not yet over—Vig has a long list of phone calls to return from bands that want his touch. Smart Studios has had completed a revamp that will take him and his productions into their next phase. Yet, by all accounts, he is still happy to down a beer with the locals as just another long-haired guy in a college town that looks like his only connection with all the records he's produced is that he bought them at HMV.

Undeniably an American phenomenon, it's curious to note that Garbage exhibit many of the production traits of British bands. The observation is not new—and certainly familiar to Vig who readily locates his early production influences on the far side of the Atlantic.

'A lot of great producers came up through that English hierarchy system, where you start out as a tea boy and they dump on you for a long time,' he agrees. 'Then you become a tape operator or a second engineer, and then someday someone doesn't show up for work, and you're the mixing engineer.'

'I always thought that UK records sounded more ambitious than American records. It's

a broad generalisation, but I thought they came up with cooler sounds and more interesting arrangements. George Martin is probably my biggest hero. I'm a huge Beatles fan. Anyone who becomes a producer now

'I always thought that UK records sounded more ambitious than American records. It's a broad generalisation, but I thought they came up with cooler sounds and more interesting arrangements'

has probably cut their teeth on those records and uses them as a reference point.'

And like certain early British bands, it seems that Vig has an art school background...

'Film school,' he corrects. 'I would do soundtracks to other students' projects, and I'



Vig, third from the left, with fellow Garbage folk

INTERVIEW

do them overnight. I got very into electronic music scores—four semesters of electronic music. Ambient, experimental music—and at school there were few keyboards, so I learned by manipulating tape and hooking up old VCAs. It gave me a very ambient, noir-sounding background.

'At film school we went into Steve Marker's basement, and recorded pop and rock things. We had six microphones, a Peavey 1200 mixer and a Roland Space Echo. We'd invite local bands in and record them. In our senior year, we tried the idea of making it into a small business. We took out some loans and moved into a warehouse on the east side of Madison. We moved up to an Allen & Heath mixer, a dbx 160, and some AKG mics. We went to a local egg company and bought 1,000 egg cartons to break up the standing waves in the place.'


This was the origin of the project that was to become Vig's Smart Studio. Christened after the term Vig and Spooner used to describe their practice of drinking beer before school ('If we said to ourselves "let's get smart tonight", it actually meant just the opposite'). Smart is the result of having made countless and progressively more successful recordings.

'As soon as we went to

'It wasn't a profitable venture for the first five years; we were charging \$10 per hour and sometimes we just asked them to buy the tape and bring some beer'

an 8-track a lot of local bands were passing through,' Vig recalls. 'It wasn't a profitable venture for the first five years; we were charging \$10 per hour and sometimes we just asked them to buy the tape and bring some beer. All the money we made we poured back into the studio. I was married and my wife had a decent job at a pharmacy, the apartment we were living in cost \$300 per month and Steve slept at the studio. We made a ton of good-sounding, fast, cheap albums.'

THE NEXT STAGE in Vig's education as a producer came from his recording experience with his own band, Firetown.

'We went out to New York to make the record, and now were playing in the 



MAKING NEVERMIND

'I WANTED TO CAPTURE the live feel of the band—they sounded amazing live—but be able to control the sound, too so I set up a drum tunnel on the kick drum, which is basically a bass drum extension. I put a Sennheiser 421 Inside next to the batter head and a Neumann FET 47 at the other end of the tunnel for the boomer part of the sound. I mixed them to one track leaning it about 60:40 towards the Sennheiser.

'I used an AKG 414 on the drum overheads about two to three feet above the cymbals, a 451 on the hat, 421s on the rack toms, and a Shure 57 on the snare. I mic just the top of the snare; I'm not a fan of a bottom mic on a snare. It always sounds out of phase and I don't like the papery rattle from underneath. I never did it when I was starting out; I learned the technique when I began working with other engineers and producers, but I'm not a huge fan of it. I'm always checking phase, listening for it over headphones. I don't want things to sound mushy. Sometimes moving the mic a quarter of an inch or tilting it makes all the difference in the world.

'For drum ambience, I used three Neumann U87s; one far off for mono and the other two as a stereo pair about 20 feet above the kit to either side and at about a 45° angle. The whole record was done with that setup, except for 'Something In The Way' where Kurt [Cobain] recorded his vocal and acoustic first in the control room and added everything else later.

'On acoustic guitar, sometimes I like to use a Calrec Soundfield microphone because I like the fact that you can change the stereo pattern on it. On Nevermind I used 414s or 451s, moving the mic around until it sounded good. Kurt had this old beat-up five-string acoustic that he never changed the strings on and never tuned. I brought in Martins and Gibsons but he always preferred that one. On electric guitars I'm a Fender Bassman fan. I turned Kurt on to that. We also used a Mesa Boogie into a Marshall cabinet. For clean, edgy sounds we used a Vox AC-30. Kurt used an Electro-Harmonix Small Clone to get that ringy chorus sound on 'Teen Spirit' and 'Come As You Are', and a Rat distortion pedal on a couple of songs.

'The bass is a split signal between a direct and an amplifier, with me leaning about 80% towards the microphone signal. I would put a an AKG D112 and an FET 47 very close to the speaker of an Ampeg SVT, again, always checking for phasing. Sometimes if you flipped the DI out of phase the mics sounded better.

'On vocals, I used a tube U67. Sound City had great tube mics, and they sounded very good with just a little compression from an LA-2A. I would also compress the kick to tape using the onboard compressor on the Neve 8068 console.'

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big league—working on a killer Neve at Media Sound [one of the last sessions at Media, which closed in 1989]. I think it was difficult for us because we'd always done everything on our own terms, and all of a sudden we had people telling us what we had to do. We got along with the producer outside the studio, but I don't think we every really felt that he understood what we really wanted to do.

'But I learned a lot technically because we worked in great studios. I absorbed a lot of the technical things with mic placement, tape editing, fly-ins. I also learned about dealing with artists, with label politics and the psychological game of making records, much more so than when we just did on a small indie label. Even though it was a difficult record for me to make, it was one of the most valuable experiences I ever had.'

At this time, Vig's production work started to gain commercial recognition through the likes of Killdozer, Rectal Drip and Die Kreuzen. The Seattle label, Sub Pop started to take serious interest. The breakthrough was heralded by Smashing Pumpkins' *12 Point Buck* which was coproduced with Billy Corgan at Smart in six days on a budget of \$2,500. By this time the studio had attained 24-track status through an Otari MX-80

'On electric guitars I'm a Fender Bassman fan. Kurt had this old beat-up five-string acoustic that he never changed the strings on, and never tuned. I brought in Martins and Gibsons, but he always preferred that one'

and TAC Scorpion console. Subsequently, the Scorpion gave way to a refurbished Harrison 32:32 console with Uptown automation that is still installed in Studio B.

'It was interesting,' Vig recalls of his involvement with the Pumpkins album *Gish*. 'On "Crush" we slowed down the tape after Billy put the acoustic guitar down. Down about one step, then we overdubbed everything else. It gave it a more languid feel and the acoustic sounded warmer.'

'I really appreciated Billy's work ethic on that record—we were working 16 to 18 hours a day and *Gish* was hard, meticulous work, but was done pretty quickly, recorded and mixed in about 30 days. We experimented with dynamics and guitar sounds, and Billy pushed me and I pushed him back. This was the first record I had the luxury of being able to spend some time working on the sounds. You can't do things like that when you make a record in a week like we had been doing.'

The succeeding album, *Siamese* 🐾



GARBAGE

'I WAS DOING REMIXES with my partners at Smart Studios, Duke Erikson and Steve Marker, for artists like House of Pain, Depeche Mode, U2 and Nine Inch Nails, and a friend came in while we were working on a NIN remix. We had cut everything off the track except for Trent [Reznor]'s vocals and recorded all these noise loops, and

my friend says, "This shit sounds like garbage" and I said, "Yeah, we turn garbage into music"—but I really enjoyed working on Trent's music. I admire him; he's very charismatic and makes ambitious records.

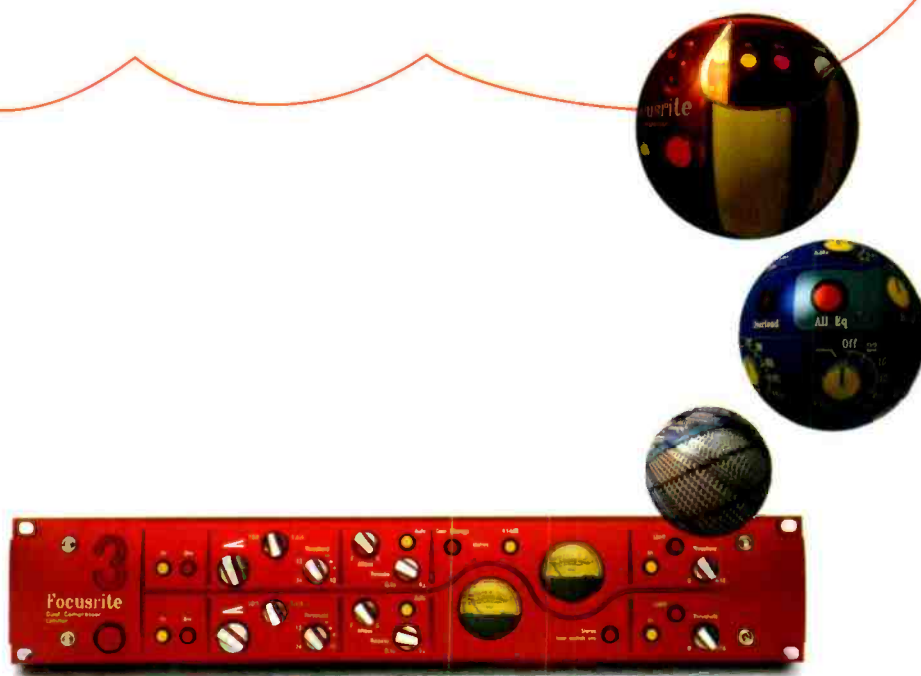
'Garbage's album was done totally differently. Before we started recording I had just finished working with Freedy Johnston and Soul Asylum, using more traditional techniques. We didn't have a band, no singer, no songs. But we didn't want to approach it from a traditional standpoint. We wanted to bring in elements of techno, hip-hop, punk rock, pop music, and noise, and use the technology in the studio to layer the songs with all these different loops.

'We'd start with drum loops: sometimes we'd set up a kick and snare and put up one ambient microphone, compress it through an 1176, and play for an hour. Then we would find one or two bars that were cool, sample that into an Akai S1000, loop it, process it through an Eventide 4000, and print it to track one. We would repeat that process over and over again, but also with bass, guitars and keyboards.

'We tried all sorts of stuff: running tracks backwards and through filters and distortion boxes and an H3000 harmoniser, and out of all these loops we were slowly starting to create songs. Steve saw Shirley Manson on MTV with her band Angelfish. We fell in love with her voice and asked her to sing on a few songs. Her arrival really got things moving. She ended up joining the band and co-writing all the songs. Her arrival gave the Garbage the focus it needed. We became a band after that.'

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INTERVIEW

smashing pumpkins + siamese dream



Dream,
saw the dynamics
that propelled *Gish* still

further.

‘Wild dynamics,’ Vig agrees. ‘Really powerful rhythm tracks, and locked-in guitars. There’s always a point at which the song comes down to a pulse. That’s a Pumpkins trademark. The challenge was to capture that pulse in the studio. We would record a song and then rebuild it, sometimes measure by measure. We recorded the band’s rehearsals in the studio and used them as work tapes. By the time I was finished with *Siamese Dream*, I knew every single note on the album.’

The *Siamese Dream* project also involved a change of location—moving from Smart to Triclops in Atlanta.

‘We wanted a change,’ Vig explains. ‘We had done the first record at Smart. We didn’t want to go to Chicago because it’s their home turf. New York and LA have too many distractions. It was getting to be winter of 1993, we wanted someplace a little warmer, and I wanted a Neve. So Triclops was perfect. We spent five months on the album, but instead of recording all the basic tracks at once, we would work on one song until it was basically finished,

SMART STUDIOS

SMART STUDIOS IS LOCATED IN MADISON, Wisconsin, which before Vig put it on the cultural map was known mostly for its dairy products. There is nothing cheesy about Smart, however.

Designed by Russ Berger, the studio has two rooms. Studio A is fitted with a Trident 8-C console with 56 channels of Uptown automation and floor-to-ceiling glass between studio and control area. The room also offers a custom 4-channel cue mix system. Studio B is designed for mixing primarily, although it has a comfortably large glass-doored iso booth connected to it. The control room has two Harrison consoles (one of which was previously owned by the Osmond Family) joined together for a 56-input desk with Uptown automation.

In addition to other technicalities such as Sony and Otari 24-track analogue machines, Panasonic SV-3700 DAT decks and large array of outboard processing and microphones, Smart Studios offers clients a large lounge area, barbecuing and other kitchen facilities.

then start on another song. For some songs, we used a similar setup as *Gish*, but on other songs we tried a more experimental approach. Sometimes we’d move the drums to another part of the room and did things like switch bass amps or snares in the middle of tracking a song and then edit different takes together to get these abrupt scene changes. In the studio we set the amps up in a semicircle, and once we’d get the basic track, we’d put the song under the microscope.

‘As before, the meticulousness of the band came into play. The guitar and bass parts were overdubbed in the control room, which gave me more options and flexibility with the sound. I’d set up maybe four mics on the Marshall cabinets: a 414, a 57, a U87, and a Beyer M88. I would unplug the guitar from the amp, turn it all the way up, and listen to the hiss through

‘*Gish* was hard, meticulous work...

This was the first record I had the luxury of being able to spend some time working on the sounds. You can’t do things like that when you make a record in a week like we had been doing’

headphones to see where to place mics to get the best phasing and frequency response. It was all close-miking, no ambient microphones on the guitar amps.

‘As a drummer, I learned that you have to make the drums sound good acoustically first. It doesn’t matter about mic placement or EQ if it doesn’t sound great to begin with. You tune them and get the drummer to play it right. Then you start moving mics around. Then, if you need it, you add EQ or compression. These are the techniques that have stayed with me from low-budget days right through now. I still try to do it pretty quickly.

‘Most of the bands are bass, drums and guitar-oriented, and you want to maintain a sound in the studio similar to the live sound. But if there is enough isolation between the microphones, when there’s a problem, you can go back and fix it. As a drummer, I get obsessed about grooves. I tell the bass player and drummer to pay attention to patterns. I try to coach them as much as possible to pay attention to what the other musicians are playing. It’s a learning experience. A lot of times, some of the albums I produced were the first time the band was ever in a recording studio. I had to be a psychologist as well as the producer and engineer, and I answered the phone and made the coffee. I didn’t use an assistant engineer until I made *Nevermind*.’

And it was *Nevermind* that broke Vig to the world. Although it appeared after *Gish*, *Nevermind* began life before it, being a collection of six ‘glorified demos’ made

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INTERVIEW

for Sub Pop at Smart. Geffen stepped in and requested a producer with a track record—but the band held out for Vig, based on their work in Madison on the Sub Pop session. 'I think the band wanted to maintain their indie aesthetic,' he comments. Producer of choice secured, the project went to LA and into Sound City Studios.

'They felt comfortable there,' Vig recalls. 'It's a great studio—no frills; but Tom Petty, and The Jacksons, and Fleetwood Mac, had all done great work there. They have two Neves, and a great big gymnasium-type of tracking room. I had never worked in LA and wanted to. I had the band's management call around at studios, and we decided on Sound City. It was a good deal; the band's budget for *Nevermind* was around \$65,000.

'It did seem like a healthy budget at the time, and I did get the sense that major labels were trying to align themselves with the independent labels and develop bands for

relatively little money. Major labels were using indie labels kind of like the way major league baseball clubs use farm teams. They were trying to sign deals with labels like Sub Pop and Matador, who had their finger on the pulse.'

The dynamics on *Nevermind* share the characteristic urgency of Vig's other work. Part of the effect is achieved through the arrangements of the songs and part comes from Dave Grohl's drumming.

'He's an amazing drummer,' Vig agrees, 'and when he really hit the drums it sounded great. There was no problem with tape saturation [on Ampex 456], and we recorded pretty hot, so even in the quiet parts we had healthy level. In sections where it was quiet, we would mute out any noisy channels in the mix.

'Another part of the dynamics was convincing Kurt to layer guitar parts in the studio, which you obviously can't do live.

'As a drummer, I learned that you have to make the drums sound good acoustically first. It doesn't matter about mic placement or EQ if it doesn't sound great to begin with. You tune them and get the drummer to play it right. Then, if you need it, you add EQ or compression...'

He tracked with the clean sounds, and then overdubbed the heavier sounds later. At first, he took a kind of punk-purist attitude and didn't want to layer guitars because he thought it was fake. I told him in order to translate the live sound to the studio you need to over-exaggerate certain things to make them sound larger than life.

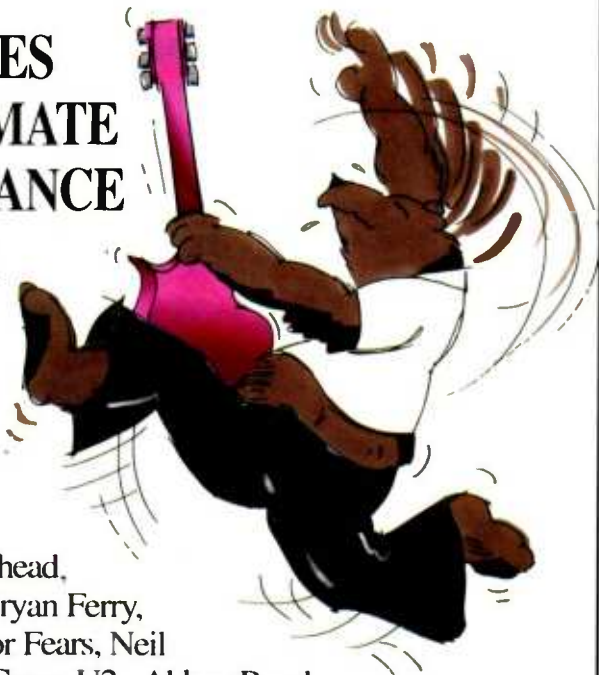
'We rehearsed for several days before we started recording. I knew about half the songs from the original demo, but 'Smells Like Teen Spirit', 'Something In the Way', and 'Come As You Are' were new songs. We rearranged 'Teen Spirit' by shortening the chorus and cutting the solo down. At the end of the song in its original arrangement, Kurt was singing this little *ad lib* at the end. I told him to put it at the end of every chorus and it became the transition to the verse.'

Looking to the future, Vig intends to return to producing other artists after making a further Garbage album with Steve Marker and Shirley Manson among other things...

'We also have a new label called Vibecrusher,' he elaborates. When we were working at Smart in the early days we had our own label, Boat Records. We signed bands as a labour of love, and not as a money-making proposition. Since the success of Garbage we've had a bunch of offers to start another label. We want to start on a small scale, kind of like it was before, but also be more diverse and flexible. We want to get involved with artists at a grass roots level, take a low-key approach, and let them develop slowly. We might collaborate with other artists on remixes and we'd like to get involved with film soundtracks.

'Whatever we do, hopefully it will be challenging, but also a lot of fun!'

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Funky funky



A recording studio that boasts as much of a social history as a technological one is unearthed in the depths of Manhattan.

DAN DALEY discovers where rap and rock meet

IN MANHATTAN, downtown is as much a state of mind as it is a place. Certainly mass-media offerings like Jay McInerney's early 1980s *Zeitgeist* chronicle *Bright Lights, Big City*, and John Waters' *After Hours*, have presented downtown Manhattan as a demi-monde unto itself. As such it has its own rules set by a consortium of ageing Yuppies, aimless GenXers, undocumented illegals, self-employed (and often self-styled) artists, computer hackers, endangered species such as original local residents (less than 50,000 people lived in the TriBeCa section 15 years ago, this on an island of three million inhabitants) and a sprinkling of wealthy, limo-wielding Eurotrash thrown in for Continental spice.

Wall Street is down here, but its connections to the cobblestoned streets of lower Manhattan are mostly virtual, and the suits would rather scurry at the end of the day to their large homes in Southern Connecticut or Long

Island's exclusive North Shore. TriBeCa, the acronym for the triangular patch below the noisome mercantile strip of Canal Street—which on a good day looks like a bad day in Kowloon—gained notoriety from the establishment of director Martin Scorsese's film centre, but *auteurs* compete for elbow room at the lush fern bars that sprung up in its wake with hollow-eyed CD-ROM hackers who work through the night, and start thinking about drinking about when Dracula gets sleepy. In short, downtown defines the term 'funky.' And what better place for a place like Chung King. Or as its founder and owner would put it, what other place is there?

John King is a hard-core downtown person, who says he has no need or use for anything that exists North of Houston Street. The son of a Connecticut fine arts painter, he pilots his own pressurised, hot-rodded single-engine Mooney in which he likes to take friends and guests up to 30,000 feet and scare the living bejesus out of them. The studio car he tools around town in, with the Chung King logo painted on the side, is a white Mazda Miata convertible. He has thick white hair that makes him look a bit older than his 43 years, and round spectacles that give him an owlish visage. But the white hair is a decoy; the man never seems to stop moving and isn't shy about changing clothes in the middle of an interview, donning jeans and a paint-stained shirt as he gets ready to oversee another day in the construction of the new 20,000-foot² Chung King facility in TriBeCa.

'I've been completely insane for the last year and a half building this place,' King says with the nonchalance of the truly manic. 'I drove everyone nuts, including myself and the construction people. I had crews quitting on me one day and then coming back a couple of days later. But when this is done, it's gonna be worth it all.'

'THIS' IS CHUNG KING'S new facility, which is located on the 12th floor of a large brick-faced former warehouse on Varick Street a few blocks from the Holland Tunnel under the Hudson River. The first studio, the Blue Suite, hosted its first session on 1st October last year, and two more rooms have come on line since—the Green and Red suites—with another two planned for later this year or early next, including a postproduction suite for which a Neve Libra digital console is contemplated.

The studios fit into the space in a Byzantine fashion that only becomes clear when you look at a floor plan, befitting the mediaeval interior decor King designed for the lobby, with hand-rubbed grey stone walls and low-light torchier sconces that give the place a castle-like ambience as you wend your way through the halls. The Blue Suite's control room is focused on a 72-input Neve VRP, refurbished by AMS to King's specifications, which included changing out the desk's capacitors. The board is also equipped with Flying Faders automation and Recall fully fitted for surround-sound

downtown

mixing. The room is linked to a Studer D827 48-track digital recorder and a pair of Studer A827 analogue multitrack decks. Monitoring is via TAD-loaded Augspurger main monitors, Tannoy DMT 12 mid-field and Yamaha NS-10 close fields. Genelec 1031As and other speaker types are optional.

As with the other two control rooms, Blue's control room has outwardly bowed, thin-slatted diffusers on the rear wall, conceived by King and studio codesigner Frank Comentale, and intended for moderate effect.

'I don't like a really live or a really dead room; I like some ambience in a control room,' King says.

The recording studio is 60-feet, by 40-feet, by 13-feet and has two adjacent isolation booths all with hardwood floors, and slate-and-wood reflective surfaces. Each of the studios also has its own private client lounge, positioned to exploit the views that being 12 stories up on the fringe of Manhattan can offer. The Blue Suite's view is facing the Hudson River a few blocks west. The Green Suite has a similarly sized and laid-out control room, this one equipped with a 64 input SSL G+ with Ultimation and Total Recall. While a Tascam ATR-80 24-track analogue deck is assigned to the room, other digital and analogue decks can be optioned. The monitoring is the same as the Blue Suite's.

The Green studio room is slightly smaller at 40-feet, by 20-feet, by 13-feet, and its private lounge view is of the roofs of SoHo to the North-East. The Red Suite's control room and studio dimensions are the same as those of Green, but it is equipped with a 72-input Neve VRP with the same accoutrements as the Blue Suite's. Its private lounge overlooks Greenwich Village.

Technologically, King likes to tinker with off-the-shelf equipment. In addition to the Neve modifications, he and technical consultant Dan Zellman modified other systems, including rewriting software code and changing power supplies and cabling on the TimeLine Supervisor system, that King says was necessary in order to have the house synch system for video lockup work as flawlessly as he says it does. But the overall physical design of the studio is what seems to have most consumed him.

'One of the keys to the design here is total isolation between the studios,' explains King as he walks through the facility, which was constructed by architect George Rycar. 'Everything was done with high-density concrete barrier structure materials and virtually every wall in the facility—and certainly every wall with an acoustical purpose—is non-parallel to any other.'

This isn't simply technical obsession on King's part; as he quickly adds, 'In New York City, to make any money you have to have all your rooms working all the time. So there has to be total isolation no matter what kinds of sessions are going on next door to each other.'

WHO THOSE CLIENTS ARE, or have been in the past, is a critical key to Chung King. This is John King's second major facility (he started a basement studio in New York in 1977). The first was opened in 1984 on Centre Street on the edges of Little Italy and Chinatown and across the street from the ancient former NYPD police headquarters building where Theodore Roosevelt had his offices when he was police commissioner in the late 19th century—and which, thanks to the Yuppification of downtown Manhattan, is now occupied by rather pricey luxury condominiums. But when King opened his first studio there on the sixth floor of a somewhat dingy loft building, the area was still the purview mainly of wholesale seafood and meat markets catering to the area's Chinese and Italian eateries.

King was interested in producing rock bands, and he did a string of them there, as well as hosting sessions for metal acts like White Zombie and Danzig. Even then, when pop music was dominated by haircut bands like Duran Duran, Chung King was being sought out by music's fringes. King claims that the pair of truly vintage Neve 8014 broadcast consoles he had jammed together into a 32-channel desk were 'the best-sounding console ever, with Neve 1073 and 1066 EQs and the shortest signal path of any console,' and being a connoisseur of vintage gear, he now regrets selling.

The studio also became a magnet for the then-nascent genre of Rap music, which in the early 1980s was still far off from going mainstream. The basis for that was the relationship that King developed with Def Jam Records founders and producers Rick Rubin and Russell Simmons. Rubin and



Laura King and John King owners of Chung King in New York

Simmons used Chung King as a base for their early productions, including Run-DMC, LL Cool J and the Beastie Boys. In fact, the studio, which was originally named Secret Society, was rechristened Chung King House of Metal when Rubin referred to it as that on the liner notes of Run-DMC's first record. The rapid and expansive success of Def Jam quickly caused Chung King to become the Mecca of Rap recording on the East Coast. A second SSL room was added on a lower floor to handle the overflow. But it was the sixth floor room that most viscerally took on the trappings of Rap: the proclivity of rappers to 'tag' their turf with graffiti was irresistible, even in the recording studio. Over the course of the mid-1980s, almost every inch of the walls, floors and ceiling of Chung King's first studio became covered with spray painted and marker-drawn tags and logos, making the studio look like a subway station in the Bronx or a freeway overpass in Compton.

'Heavy D and The Boyz were the first ones to do it; he spray-painted the studio door,' recalls King. But what might have sent other studio owners into a rage was viewed differently by King and his sister, Laura, who came in to help him manage the facility several years after it opened.

'What you have to understand is that we had rules about it, but we controlled it,' says King, who claims an affinity for R&B and as a producer was experimenting with melding rock guitars and drum loops. 'We used to have a clean-up charge, but then the graffiti thing became a thing unto itself. You left your mark, but you didn't go crazy with it. And that was alright, because it showed we had a level of respect for their culture. 🙌'



The Red lounge

FACILITY

And it showed we had a sense of humour about it, and that was incredibly important for building respect and relationships. It became a part of the total experience of Chung King, which became the Abbey Road of Rap for five years. I love great music, and well-done Rap can be like a symphony. So I hung around with them during and after sessions and drank beer with them at night. And as you got to know them you realised that your perception of them changed—some rappers can look pretty scary, but the scariest ones turned out to be the nicest ones most of the time—and they developed a respect for the studio. People read the name of the studio on the back of the CD and the business just grew from that!

As Rap grew, so did Chung King, to three rooms, with a Neve VR3, and VR and an SSL G-series, and King's relationship with rappers was as much to their advantage as to the studio's; more and more New York

studios, which, like the overwhelming majority of US recording facilities are predominantly white-owned, were refusing to book time with Rap artists, either overtly or subtly, with calls for black Rap bookings told that there was no studio time available. In their defence, studio owners cite destructiveness, rudeness and non-payment of charges in some instances on the part of Rap clients. Their perspective is summed up by the description, by one anonymous studio owner, of a Rap session as 'One guy with a drum machine and an entourage of 40'.

Some of the things that King observed that allowed him to maintain his balanced perspective: 'A lot of these kids were brought up hustling on the streets, so that's natural to them. If they put something over on you, you don't blame them, you blame yourself.'

Day-to-day interaction between King and Rap clients laid the foundation of a mutual empathy. There were incidents along the



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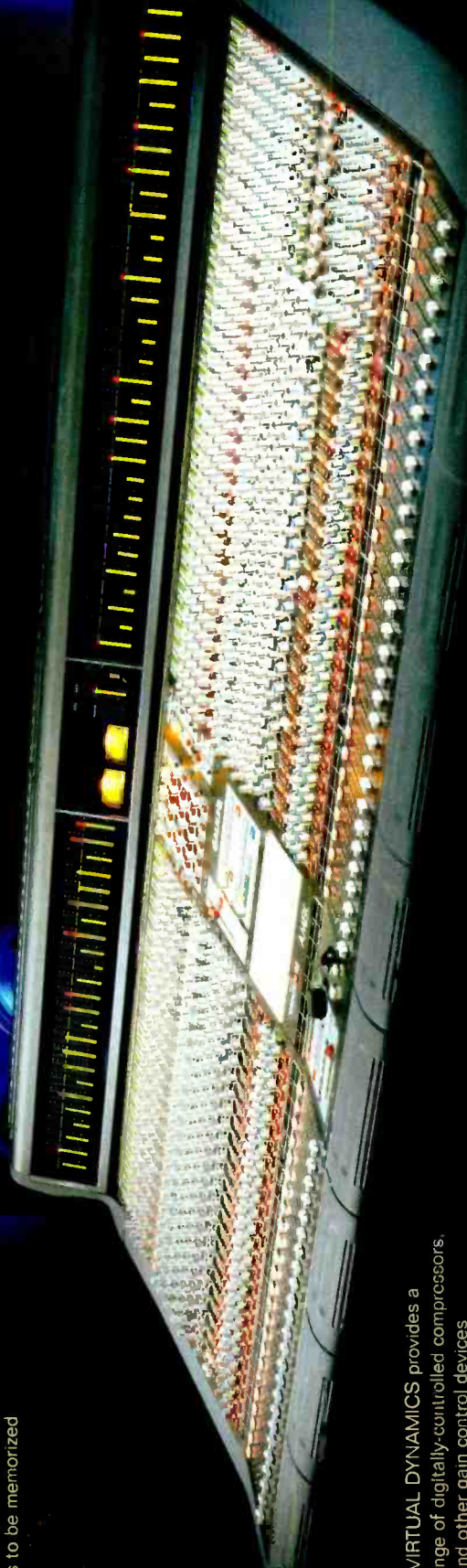
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way, some humorous, some less so. Some urban clients crossed the line in terms of graffiti content or location, or the size of their entourage, known as 'posses', and it was made clear to them that their business might no longer be welcomed in the future. Chung King's policy was to limit the size of entourage; even in the new facility, a sign at the reception desk alerts clients that no more than eight people are allowed in a studio at once, and King has a policy of charging clients \$25 for each person over that number that shows up at a date and putting it on the final studio bill. He also used subtle methods rather than overt ones to limit the effect of free graphic expression on the studio's physical plant.

'We had to "rap-proof" the [original studio] to some degree,' he says. 'Even things like picking the colour of the carpet to match what would become stains. We used to keep a bucket of paint in the office to paint over the graffiti in the elevator. We repainted that elevator literally over 300 times during those five years. It got so that the paint layers were so thick you could peel them off with your fingernail. We had an assistant on staff whose full-time job it was to repaint the elevator. And when stickers became popular, we had to develop countermeasures—we learned that vinegar and hot air removed them pretty well. It got so that we established a graffiti patrol every night before we closed down to see what needed to be cleaned. They tried to trick us by waiting until we had removed them and repainted the elevator. So one day I covered the walls with the thin layer of Vaseline to make it easier to remove the stickers. It got to be like a game sometimes, but I was trying to channel their graffiti urge rather than restrain it, and turn it into a positive experience. For instance, everyone was allowed to graffiti the mouse pads and the DJ mixing floor; everything else was subject to some kind

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FACILITY

of fine for a while. But the level of mutual respect was definitely an undercurrent while it was going on.

However, the Urban music culture changed as the second generation of rap came of age. The 'gangsta' posturing of the original crew began to be taken chillingly literally by some of the next generation. 'The psyche of the new [rap] artists started to get ugly sometimes,' observes Laura King. 'I mean, it does get uncomfortable when you're in the same room with a 15-year-old who thinks he's supposed to want to kill you.' Most ironically, perhaps, is the fact that the graffiti line was crossed most noticeably by heavy metal group Danzig, which during their visit to Chung King contributed Satanic pentangles and similar ritualistic icons to the *ad hoc* interior decor.

'That actually offended the Rap artists,' says John King. 'At that time [in the early 1990s] Joseph Simmons had become a

preacher and he found it in bad taste!' And from a business point of view, King was watching rap itself become a victim of a changing music industry, one in which cheque book A&R was giving record deals to almost anyone with a drum machine and an attitude, diluting the artistic base of clients that Chung King had served for a decade.

THESE EVENTS as well as the fact that for-hire studios in the US are in an expand-or-die cycle propelled by home recording, made King start the long, arduous and financially taxing process of building a new studio from scratch. The current total is \$2.5m, which will increase significantly as the next two rooms come on line in the next 12 months. Costs were controlled to some extent by moving two current consoles, one Neve and one SSL, to the new facility, which was tricky because the




The Green Room with Neve Capricorn 128

original site did not close before the new one opened, and King expended a lot of frenetic kinetics shuttling between the two, managing one facility and supervising the construction of another.

'It was nuts; we were moving microphones back and forth between the studios by bicycle,' he says. In the process, Chung King's client base has become considerably less comprised of rap, with the economics of the new studio pushing its rates beyond the reach of a lot of the independent rappers who thronged the first Chung King.

Rap clients now are about 20% of those who book time here, King estimates. But his friendships with many of them endure; walking out of the building for some lunch, King is greeted by Russell Simmons from the driver's side of Simmons' four-wheel-drive vehicle. And by happenstance, the offices of Def Jam are now located right next door.

'Mostly what this place is, though, is New York City,' King says effusively. 'It's got everything New York is famous for right nearby: nightclubs, restaurants, bars, stores, hotels. SoHo has the lowest crime rate in all of New York City; it's lower than a small town in Ohio, thanks to this police precinct here. There's a three-star French restaurant 20 feet away from the studio entrance. West SoHo is becoming the Music Row of New York.'

King pauses for a moment, having temporarily run out of superlatives. Then, in a summation that saves him a walk to the thesaurus, he adds, 'You gotta love it - it's downtown!' 

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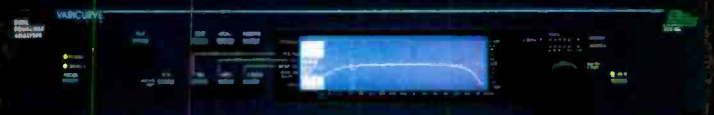
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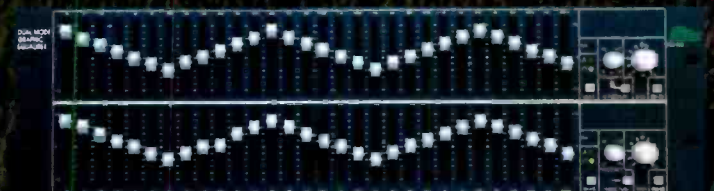
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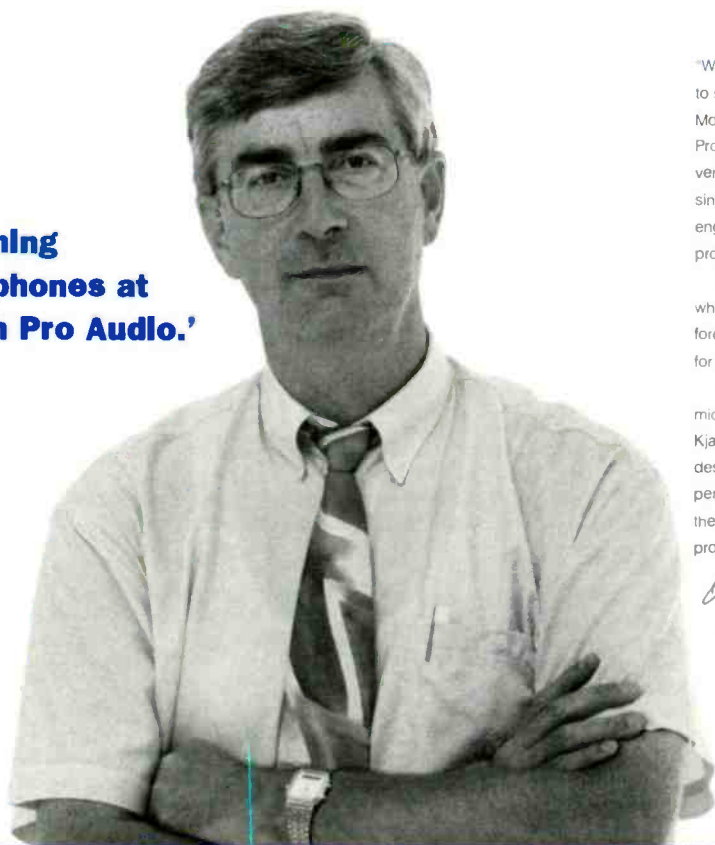


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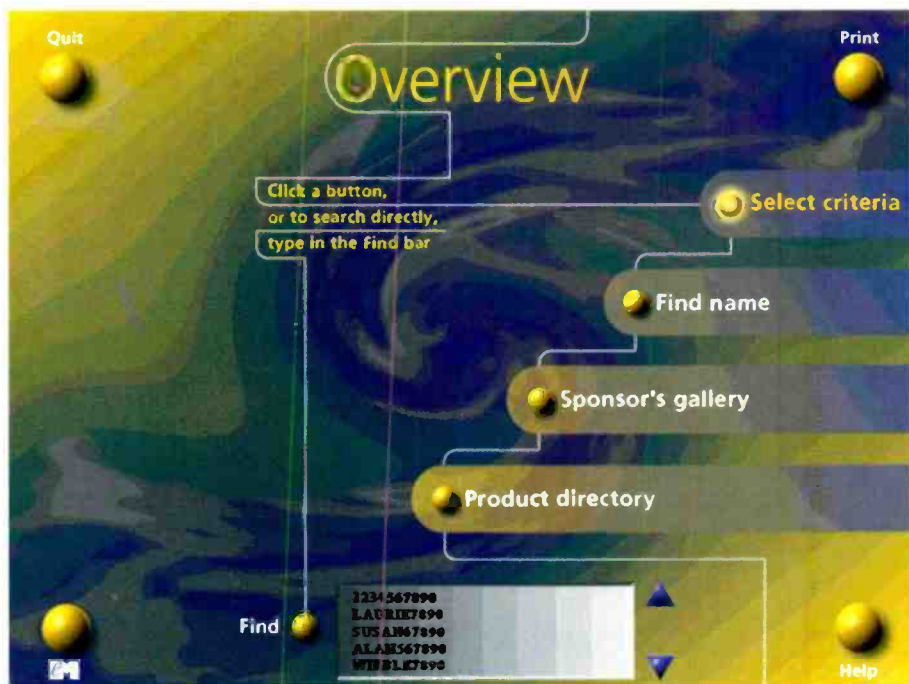
Studio Encyclomedia

EncycloMedia aims to make its searchable CD-ROM international directory of recording and postproduction studios an essential reference tool for the recording industry.

SIMON TRASK books an exclusive session with the Studio EncycloMedia:

AS A SESSION musician, composer and producer with many years experience in the music business, Graeme Pleeth saw the need for a directory that would make it easy for studio bookers to find the right studio for their needs, anywhere in the world—and saw the answer in CD-ROM technology. He formed a company called EncycloMedia, and the result, after nine months of intensive development work, is the Studio EncycloMedia CD-ROM. Think of it as a kind of dating agency on disc, aiming to unite recording clients with their perfect studio partners.

Detailed information compiled from a questionnaire sent out to participating studios around the world has been stored in a database on the disc, and with a computer and CD-ROM drive studio bookers can in turn use the disc to search for studios that meet a wide range of criteria, via a user interface that is visually appealing, well structured,



and very easy to use. The software compiles a list of studios that meet the user's search criteria, and users can scroll through the list and look at the information stored for each studio in as much detail as they want, with up to three photographs and/or floor plans for each studio adding a visual element to the factual information.

The company envisages the CD-ROM being useful to a wide range of users, including A&R executives, artist managers, producers, publishers, session musicians, ad agencies, and TV and film companies. Whether you

want to find studios in New York which have an SSL desk, a Bosendorfer grand piano and on-site catering, studios in the south of France with 48 tracks of ADAT, Lexicon reverb and a swimming pool, or studios in Vienna with 16 tracks of hard-disk recording, Neumann microphones, and a games room, the Studio EncycloMedia's in-depth database aims to provide the answers. Searches can be as broad or as narrow

as you want, so, for instance, you could search for rural studios in Denmark, or studios in the US with ISDN facilities, or you could search for studios that have a particular combination of tape machine, mixing desk, effects, and mics, plus rehearsal rooms, a digital editing suite, an on-site car park, a tennis court, a swimming pool, and a nearby record shop.

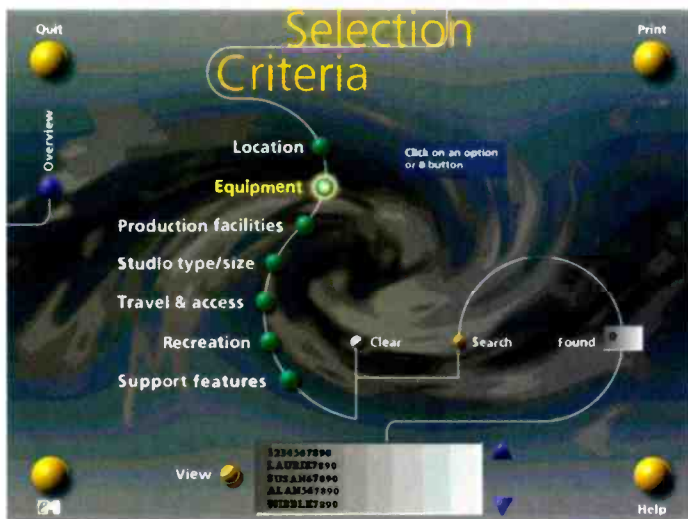
The studio questionnaire has already undergone several revisions in response to feedback, and, for instance, has been expanded to include questions specific to postproduction studios.

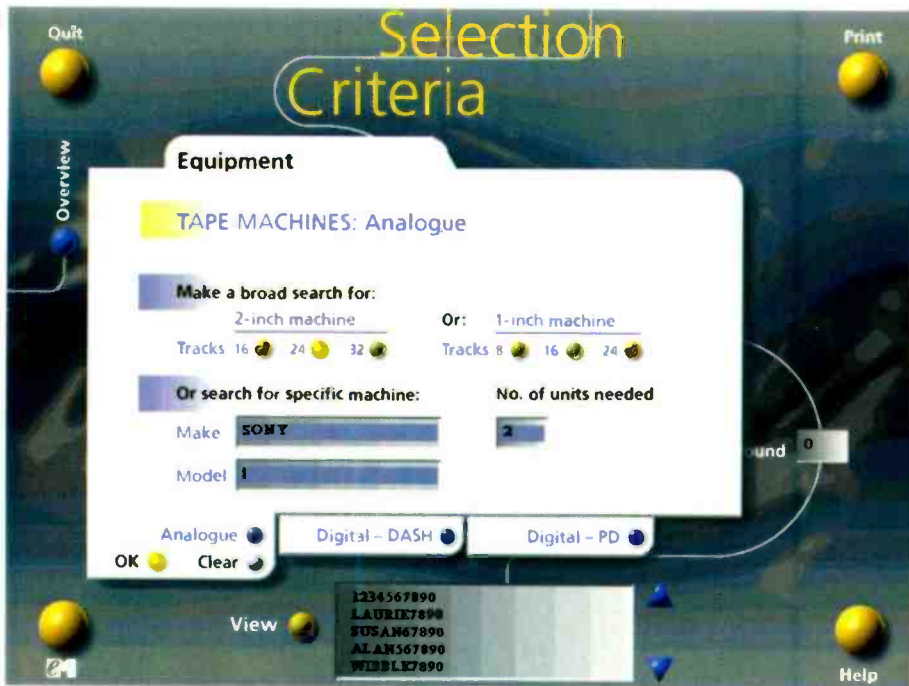
Natasha Elkan, head of marketing and PR at EncycloMedia, comments: 'We're taking on board the industry's comments, and not saying we know everything about it because we don't. Even now, studios are saying to us "Can we do this?", mainly on a presentational front. We very much welcome that!'

'The thing that's coming out of this is that it's a dynamic process, we need feedback from all these studios, so we are listening,' Pleeth concurs.

Pleeth and Elkan are keen to emphasise that the EncycloMedia team have years of experience in the music industry, and that the Studio EncycloMedia is 'For the industry, from the industry.'

'We are taking a long-term view of things, because everyone is a part of the industry, and it matters to them how people see this project,' says Elkan. 'Because Graeme has come from the industry, and the other shareholders have come from the industry, we obviously wouldn't want to do anything to





Europe, and had to compile this information myself from a variety of sources. Now this information, in as much detail as you want, will be available at a few clicks of the mouse!

Of course, the usefulness of the Studio EncycloMedia ultimately depends on how many studios are in the directory. EncycloMedia is launching a Special Edition disc at the Los Angeles AES Show which will feature 200 studios, but the plan is to increase this figure to 5,000 through subsequent editions. The company intend to release four editions before January 1998, with the second edition scheduled for release in March 1997. As well as adding new studios, the company will be introducing new developments such as drop-down menus to make selecting search requirements easier, and, more ambitiously, a Product Guide that will provide manufacturer information on studio equipment.

EncycloMedia stress that the CD-ROM is for all professional studios, not just the high-profile megastudios of the world. However, big studios have been among the keenest to get involved.

Comments Ian Davidson of the Virgin Studio Group: 'Being at the cutting edge of audio recording and postproduction technology, we wanted to get the message out to the appropriate audience. The EncycloMedia will be especially good at communicating new developments and keeping our clients up to date on developments here at Townhouse, Olympic and Manor Mobiles.'

Capri Digital Studios on the island of Capri south of Naples, a residential studio that cost £5m to build and offers world-class facilities, sees a particular advantage in the CD-ROM directory.

'We're a relatively new studio,' says Capri's Carloquinto Talamona. 'The Studio EncycloMedia will provide an excellent platform to display our studio around the globe. The CD-ROM is the way to work nowadays, and the best means of accessing studio information. Users will be able to judge studios on merit, not on past reputations.'

Joerg Mayr of TIC Music in Austria agrees: 'Situated in Austria, we are rather isolated, and it is difficult for us to attract international business as communications from Austria are limited. We feel that with Studio EncycloMedia comes the opportunity to present our studio to a global audience and attract international clientele.'

THE SPECIAL EDITION DISC

will cost £35 (\$50), and the second edition (due in March 1997) will be free to anyone who responds to a suggestions card that will come with the Special Edition. There will also be special rates for professional associations and educational establishments. Distribution will be through professional associations, sponsors Quantegy, and EncycloMedia shareholder Interactive Ideas Ltd, which is one of the largest CD-ROM distribution companies in Europe. Users will be able to take out annual subscriptions to the disc which will include the updates, at a cost of £70 (\$100) for all four editions if the subscription begins with the Special Edition.

harm their position within that industry. But it's very much formed into something bigger where we realise how important it is to the end users, to the studios, to the industry as a whole.

From the outset, EncycloMedia has had sponsorship from Ampex tape manufacturers Quantegy, who are also providing promotional and distribution support. Included among

the EncycloMedia shareholders are writer-producer and former Culture Club drummer Jon Moss and producer Mike Pela, both of whom became involved because they were so taken with the idea of the Studio EncycloMedia. Comments Pela: 'Such a database would have been so useful on so many occasions when I've needed, for example, a detailed list of Neve rooms in New York, or

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For mid-range professional studios, the opportunity to make their equipment inventory readily available is proving an attraction.

'Mid-range studios are changing very quickly, and they see it as a medium to portray the changes in the studio, it's a platform for their equipment,' says Elkan. 'If they have something which makes them very different from another studio,

then the people that need to find that thing will find them.'

Jurg Naegell of Pink Tonstudio in Switzerland comments: 'I love the idea that artists and producers will be able to search for specific instruments (such as a Bosendorfer grand) or antique equipment (like old Mutrons and Roland tape echoes). These items which I have in my studio would otherwise be extremely difficult to find.'

The Studio EncycloMedia will also be useful to educational facilities training the next generation of engineers and producers. Bill Lockyer, Sound Engineering course manager at Bridgewater College in Somerset, UK, is already enthusiastic: 'This is a great step forward in modern technology to provide students with accurate access to modern studio design from all over the world. To actually be able to research the information without Studio EncycloMedia would be long, costly, and nearly impossible.'

Of course, the Studio EncycloMedia has

The usefulness of the Studio EncycloMedia depends on how many studios are in the directory. EncycloMedia is launching a Special Edition disc at the Los Angeles AES Show which will feature 200 studios

yet to prove itself in practice, and this is where the Special Edition comes in, though primarily as a proof of concept. Rather like fax machines only became useful once lots of people had them, so the Studio EncycloMedia will only really become useful if lots of studios decide that they want to be included. However, as a product it's very well thought out, easy to use, and has an impressive depth of detail that will make it extremely useful to studios and studio bookers alike.

'We know the industry is interested in the concept,' says Elkan. 'People are waiting with bated breath to see what it's all about when it comes out. We had that from certain studios obviously, because they're nervous about something new. They seem to be holding their breath and wondering "Is this really as good as it seems?"'

Now the moment of truth has arrived, and if you're at the AES Show you can try out the disc for yourself. If the Studio EncycloMedia takes off, it could have a profound effect on the recording industry by putting together clients and studios in a way that hasn't been possible before. **\$**



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D.W.FEARN



State-of-the art analogue and digital sound-for-picture technologies are sharing their lives at Sony Pictures Studios.

MEL LAMBERT reveals intimate details of their relationship

IF WALLS COULD TALK, what myriad tales could the shooting and postproduction stages at Sony Pictures Studios' world-famous Culver City lot tell us of the history of motion-picture sound? Having passed through several corporate hands during its 70-year history, these halls still ring with the sounds and excitement of the heritage of film and TV productions.

Since Sony took over day-to-day running of the complex in the early 1990s, following the firm's acquisition of Columbia-TriStar

Pictures and its corporate offspring, it has been through a number of long overdue cosmetic and technical upgrades. With more than 30 years of experience with the facility, Michael Kohut now serves as executive VP of Postproduction, and is responsible for a number of departments, including digital sound prelay, digital picture editorial, and motion-picture sound editorial departments. (Kohut is also inventor of the SDDS sound system, and president of the R&D group responsible for developing the new 10-channel,

random-access, recorder-player based on a fixed hard drive and removable Iomega Jaz drives.)

'When Sony purchased this facility, our main focus was to become the first totally digital studio,' he recalls. 'We went from being one of the most antiquated facilities in the industry, to being one of the most modern, and largest, in the world housed in one location.'

'Producers come to Sony for our state-of-the art technology; but what brings the technology is the talent. When you have a

combination of a high degree of technology and talent, you can attract very good clients.'

Sony currently operates some 30 digital-sound editorial rooms; a number that increases to close to 50 during the busiest part of the television season. A total of 15 digital picture editorial suites are also available on the lot. In addition to theatrical release movies, the complex handles a wide cross-section of television production, including sound editing and mix-to-picture.

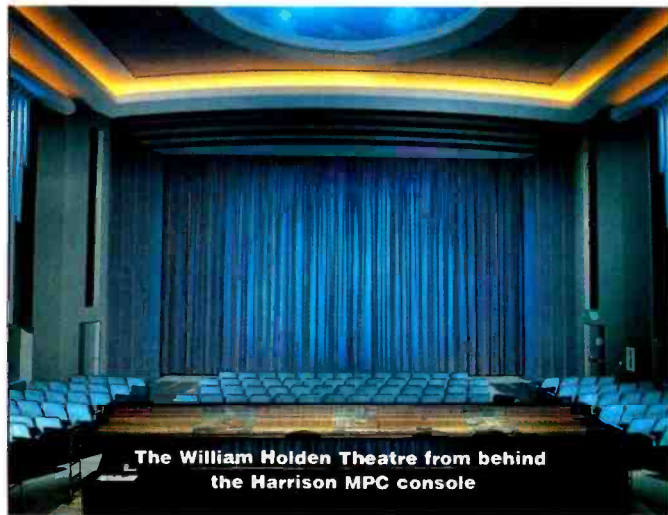
'The TV work load is split approximately 50-50 between in-house television features and third-party clients,' Kohut offers. 'We mix *NYPD Blue* and *Chicago Hope*, as well as a lot of big shows.'

Recent film mixes include Disney's *The Rock*. As Kohut recalls, 'The film's producers could not have accomplished dubbing without using our facility. The delivery date was brought forward by six weeks, which gave them very little time for editing and mixing. Since our three large stages—Gary Grant, Kim Novak and William Holden—happened to be open for that period, we were dubbing in all three stages at the same time.'

'The beauty of these stages is their consistency of sound; not just in the speaker configuration and acoustics, but all of the dubbing consoles are exactly the same. They could even take their mixes from one stage to another.'

Other recent productions include Columbia's *The Fan*, with Robert De Niro. 'Again we were doubling up on two stages to complete that film in time; it was another very tight schedule.'

Kohut is obviously proud of the efficiency and attention to detail of the editorial staff and rerecording engineers, and is no stranger himself to film rerecording. During his years



The William Holden Theatre from behind the Harrison MPC console

as lead mixer he scored seven Academy Award nomination for Best Achievement in Sound with such films as *Total Recall*, *Robocop*, 2010, *War Games* and *Pennies From Heaven*. He is also an Emmy nominee for Best Sound for the TV production *Roe versus Wade*, and holds two British Academy Awards for his work on *War Games* and *Fame*.

'I basically built a facility that will enable us to work sequentially or in parallel, dependent upon the demands of the production. Having been a mixer for many years, and understanding the time pressures, when we developed the final aspects of our stages all of those factors were considered. The movie always gets done. If we didn't have the facilities today, pictures like *The Rock* and *The Fan* would be very difficult for us to complete.'

IN ADDITION to upgrading and renovating existing editorial and dubbing stages, in early 1995, Sony Pictures Studios unveiled the jewel in Mike Kohut's crown. The former shooting Stages 3 and 5 were gutted and relaid into a sitcom rerecording room, an ADR suite and a Foley suite, in addition to a pair of state-of-the-art rerecording theatres equipped with fully automated 240-input, 72-bus Harrison MPC consoles. A clear vision is of paramount importance, Kohut considers, not only to handle today's session requirements, but to anticipate future demands.

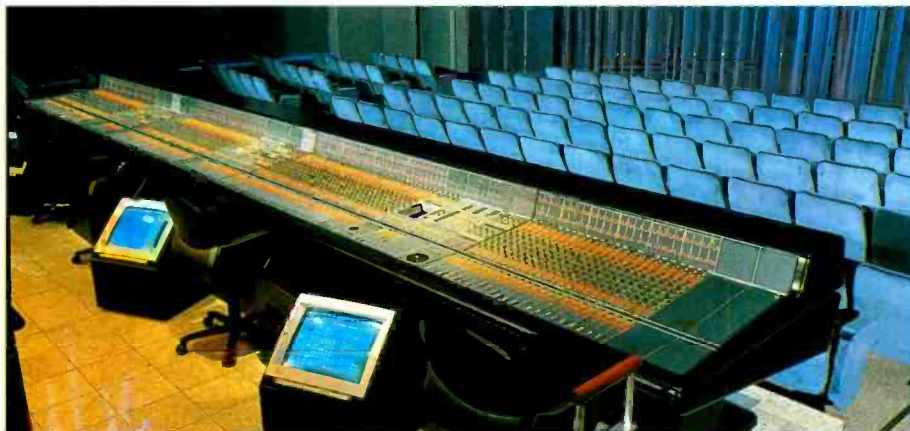
'When Sony bought the facility we needed to modernise and upgrade the consoles. I looked at all the consoles in existence, and they were all analogue. It would be very difficult for me on the first stages of development to go ahead and buy four or five analogue consoles, and then, in 1997, to have to go back to management and tell them I now need digital consoles.

'That's why we looked at Series Ten and realised it had a lot of great technology but it was not a console that could be used for the motion-picture industry. Through collaboration between our engineering groups, I thought that we could develop a digitally controlled surface, and then later put a digital back-end on it. And that's why we chose the MPC console. Harrison is working on a digital back-end, and other companies have a digital engine that we can retrofit to our consoles, which will give us the best of both worlds.'

Interconnecting the various editorial and dubbing stages in a visionary move that predates a significant investment in real-world digital technology, virtually all production areas throughout the Sony Pictures Studios lot are already interconnected using a variety of copper and optical technologies. 'Years ago,' Kohut explains, 'most dubbing stages operated with one, central machine room. Then, in the 1970s and 1980s we moved away from that configuration, and everybody built separate dubbing facilities with designated machine rooms.

'What I'm doing now is to make the lot a more cost-effective operation. Using new technologies you can build two or three machine rooms for a major facility such as ours, and interconnect each area via fibre or copper. If you do this in addition to being more cost-effective, more importantly, you can share and reassign the hardware between different areas.'

Three primary machine rooms are provided on the lot. Within the recently completed Stages 3 and 5 development, a machine room is shared between the William Holden and Kim Novak dubbing stages, but also capable



The 240-input, 72 bus, Harrison MPC console in the William Holden Theatre

of being interconnected to other areas via tie lines. In the Sound Department building, another machine room is shared between the Vincente Minnelli and Busby Berkeley Stages. The older, flagship Cary Grant Theatre has its own dedicated machine room.

In addition to analogue and digital audio links, a variety of D-sub connectors carry RS422 serial control data, Dolby Triggers, biphasic pulses and related control information between the various technical areas. Connection to outside facilities off the main lot is via a series of T1 lines, plus a 45 Mbit/sec DS-3 link for digitised picture information required for screenings. A number of ISDN connections are also provided throughout the facility, to enable digitised stereo audio, plus machine-control data and-or time code, to be fed into or from the editorial and dubbing areas, as necessary.

A number of sound editorial suites located throughout the lot are equipped with a variety of workstations. As well as cutting sound for motion pictures, the Sony lot handles a wide cross-section of TV productions. The current complement of workstations includes over two dozen TimeLine-Wave Frame DAW-80 systems with M-O drives for sound-file exchange; Wave Frame 1000 systems with Virtual Digital Mixers; Wave Frame 400 systems with WordFit ADR software; and a Sonic Solutions with NoNoise software. A number of dedicated transfer-machine rooms are used to provide inload from a variety of media, including Tascam DA-88/ Sony PCM-800 modular multitracks, time-code DAT and related formats. Picture playback in the editorial suites is from ASC Virtual Recorders (popular, because of their instant access, for ADR and Foley recording and editing),

SONY DYNAMIC DIGITAL SOUND

USING A VARIANT of the same ATRAC data-reduction codec developed for Sony's MiniDisc player-recorders, SDDS provides a total of eight replay channels. In addition to the familiar left, centre, right, sub-woofer and split (left-right) surround channels offered by Dolby Digital (SRD) and Digital Theatre System (DTS), SDDS provides an extra pair of behind-the-screen channels labelled left-extra and right-extra, located between the hard left/right and centre channels. Digital information is carried on the film as a series of digital bits of data printed optically outside of the sprocket holes on both side of the film. (The data track closest to the left-hand optical track is normally referred to as the main SDDS track, and the other as the backup).

In the movie projector, a separate film-sound reader provides input to a companion DFP-D2000 Digital Film Sound Decoder. Here, the multiplexed data stream is processed into its constituent 7.1 analogue channels, and connected to existing playback systems.

'Eight channels was absolutely critical to me,' inventor Michael Kohut says.

'I was working at Sony's Culver City lot when David Lean mixed *Doctor Zhivago* on six channels: five up front, plus totally discrete sound effects. It was magnificent.

'It would have been extremely difficult to develop SDDS without access to that

sort of practical experience here at the studio, including my hands-on experience as a mixer. From the beginning, I decided that eight channels were crucial, and that we must optically print the digital information onto the film. It was a big challenge. When we ran into difficulties, Sony's engineers wanted us to drop two channels [the left and right-extras]. But I told them that we couldn't do without them.

'In a big theatre, with a 60-foot picture, instead of having just three speakers up front, SDDS can be used enhance that sound experience with realistic pan movement from right to left. Split surrounds are important for effects; the sub-woofer is also crucial.

'I insist that the music be scored and dubbed down to five channels. Kohut offers. 'We then go to our SDDS print master with three, 8-channel stems: dialogue, music and effects. From those stems we also make our 2-channel, L-R Dolby surround-encoded mix. We can also reductions from SDDS to various 5.1-channel replay formats.'

The number of SDDS-equipped theatres continues to increase. Currently, there are some 2,000 screens around the world capable of showing and SDDS-encoded print, with a commitment over the next two years to put another 1,000 screen on line. 'Basically, 30% of new screens are going in 8-channel-ready,' Kohut says.



or 3/4-inch U-matic.

Three Analogue Tape Prelay rooms are equipped with Alpha Boss II computer-controlled systems, plus extensive CD sound libraries; additional effects are available on time-coded 1/4-inch, 35mm mag and DAT sources.

Three ADR suites and three Foley stages provide direct recording to hard disk, DAT, PCM-800, or 2-inch analogue tape. Picture playback is from high-speed film projectors or Sony Super Brite video. Extensive Foley pits, surfaces and props are also available, in addition to a good microphone selection.

The identically-equipped Kim Novak and William Holden dubbing theatres both feature automated Harrison MPC consoles equipped with 240 inputs and 72 mix buses, plus a 256 x 256 routing matrix and an 8-channel monitor-assign system. Playback monitoring is via an SDDS-compatible, 8-channel system equipped with Sony Theatre speakers. Picture playback is from a 35mm Kinton High Speed or a 35-70mm Simplex Projector onto a 44-foot x 22-foot screen. Also provided is a sound-proof producer's suite per room.

A CENTRAL DIGITAL machine room houses a variety of hard-disk recorders and players, as well as Sony PCM-800 MDMs and Sony PCM-3348 DASH multitracks. The proprietary hard-disk player-recorders were developed by Sony Pictures Entertainment Advanced Digital Systems Group, and will be manufactured by Sony Electronics, San Diego. The units utilise removable Iomega Jaz drives to provide up to 10 channels of record-replay, which will accommodate a full SDDS 7.1-channel mix, plus a 2-channel matrix-encoded L-R soundtrack, with 20-plus minutes of record-playback capacity for double reels.

When Sony completes development of a companion editing station, sound editors will be able to edit directly on the fixed and removable media. Claims Kohut: 'The system is based on a collection of digital audio servers that can be assigned via a high-speed network to individual editorial suites, and then linked to the dub stage. Inload systems will accommodate either digital-audio signals in a variety of industry-standard formats, or native sound files that can be transcoded directly to the Sony-format media.'

'In essence, we have been looking at the way these tasks have been handled for 50 years using mag, and then expanded that ability as we move forward into digital.'

Audio, video, data and control network capabilities are provided to the central machine room and other dubbing theatres, in addition to fibre-optic tie lines to Pacific Bell's Hollywood hub.

The identical Busby Berkeley and Vincente Minnelli Dubbing theatres also feature fully automated 240-input, 72-bus Harrison MPC consoles, with a 256 x 256 routing matrix and an 8-channel monitor system linked to Sony theatre speakers. Picture playback is from a 35mm Magnatech High Speed Projector. A central digital machine room again houses a variety of hard-disk recorders and players, as well as 6 Magnatech 6-track recorders; 2 Magnatech single-stripe recorders; 84 Magnatech reproducers; 6 Sony APR Series and Ampex ATR-124 analogue multitracks;



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RECORDING

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The flagship Cary Grant Theatre features a fully automated 360-input, 72-bus Harrison MPC console, with a 256 x 256 routeing matrix and an 8-channel THX-certified monitor system. The companion machine room houses a variety of hard-disk recorders and players; plus 4 Magnatech 35mm dubbers; 3 analogue 24-track and two Sony PCM-3348 DASH machines. Picture playback is from 35mm Magnatech High Speed and 35-70mm Norelco projectors.

Rerecording rooms 11 and 12, designed for video and film rerecording, both feature fully automated 160-input, 48-bus Harrison MPC consoles, with a 192 x 192 routeing matrix, and a 5.1-channel monitor system. The machine room houses a variety of hard-disk recorders and players, together with 4 analogue 24-track machines. Picture playback

is from a choice of 35mm Magnatech High Speed, 35-70mm Simplex or Sony Super Brite video projectors.

Rerecording room 15, used for sitcoms, episodic TV and related sessions, features an automated 68-input Otari Premier console equipped with an LCRS Virtual Monitor Matrix. A companion machine room houses variety of hard-disk recorders and players, plus 4 analogue multitracks, Magnatech 35mm recorders and reproducers, 1/4-inch and 1/2-inch analogue decks, DAT and NAB cart machines. Picture playback is from 35mm Magnatech High Speed or Sony Super Brite video projectors.

Sony Pictures Studios 'is uniquely qualified to offer superior postproduction services,' concludes Kohut. 'We are meeting and exceeding standards expected by both film makers and audiences that have come to appreciate the difference digital sound brings to the movie-going experience!'

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Sony Theatre speakers
Digital hard-disk machines
35mm Magnatech
High Speed projector
Magnatech 6-track Recorders
Magnatech Single Stripe recorders
Magnatech Reproducers
2-inch Sony and
Ampex 24-track recorders
Sony 3348 DASH recorders

RERECORDING ROOMS 11 AND 12

Harrison MPC console
(160 inputs, 48 mix buses)
5.1-channel monitoring
2-inch 24-track recorders
Hard-disk machines
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Digital hard-disk machines
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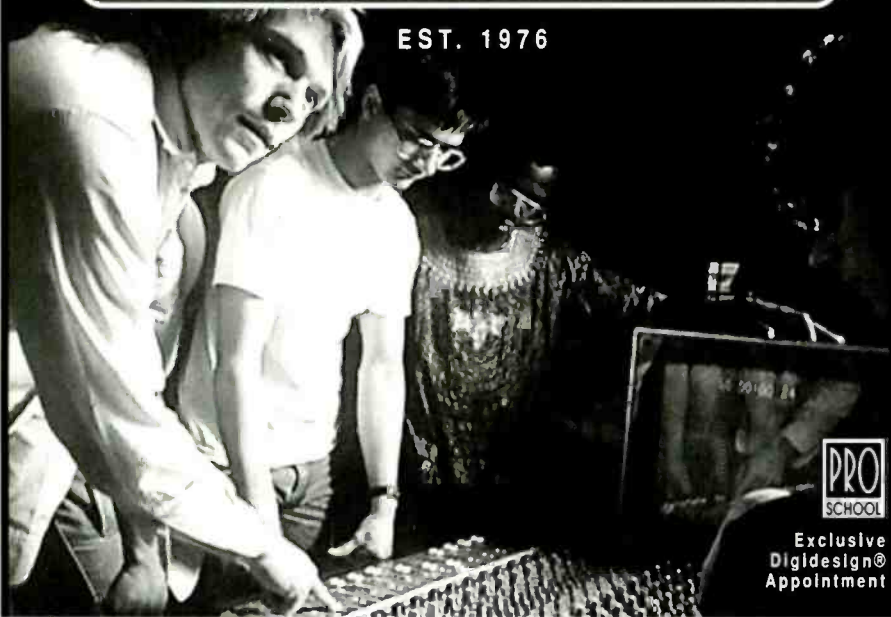
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The Surround of Music

Whatever the future of DVD, it seems certain that multichannel audio recording is set to become a new 'standard' for audio-only recording.

JONATHAN KETTLE eavesdrops on two projects recently undertaken by Decca to evaluate the surround challenge

SWITCHED ON classical-record companies are coming to terms with a future beyond Red Book CD-Audio. Take Decca Records as a case in point—while 2-channel CD remains Decca's priority, the inexorable drive towards multichannel surround-sound in movie houses, home cinema or ROM applications is starting to make an impact.

In recent years, Decca's output has diversified enormously, embracing film soundtracks and special video productions at one extreme, and cutting-edge contemporary music at the other. Pride of place in Decca's 1990s output have been the lucrative *The Three Tenors* VHS, laser disc and CD, rereleased this year on video featuring a newly mixed Dolby Pro Logic soundtrack, and digitally remastered for CD on Decca's AMS Neve Logic 2 desk.

The supposedly imminent arrival of DVD (Digital Versatile Disc, to clear any lingering ambiguity) has fuelled all manner of speculation concerning future use of the medium for purist recordings and high-profile releases alike; surround sound is one obvious opportunity. This year Decca embarked on two contrasting surround-sound projects—in April, a team was sent to Russia to produce the original surround-sound music master for a 1997 Warner-Icon art movie blockbuster, *Anna Karenina* which is based on the Tolstoy novel. Among others, it stars Sophie Marceau, Sean Bean and James Fox. Three months later, King's College Cambridge was the venue for a discrete 5-channel experimental recording, Music Director Stephen Cleobury conducting the King's College Choir in a choral showcase featuring music such as Handel's *Zadok the*

Priest, Allegri's *Miserere*, *Cantique de Jean Racine* by Fauré, and Walton's *Jubilate Deo*.

A 2-channel mixdown of the *Anna Karenina* soundtrack is scheduled for release in early 1997 as a prelude to the surround-sound film release. Despite the film's high production values, Icon remains noncommittal on the subject of a DVD Video release for the movie. And since film release dates haven't been finalised, it's no surprise to learn that it's premature to contemplate any decision concerning VHS or laser disc releases.

Icon Productions is no newcomer to high budget art movies, having been instrumental in creating the recent box office success *Immortal Beloved*. For *Anna Karenina*, the 'added value' of Decca's original surround sound music score—made on location with Sir Georg Solti conducting the St Petersburg Philharmonic Orchestra—is as important as the film's lavish sets and authentic costume designs.

Decca's contribution to high art in the movies required considerable ingenuity on the part of the audio production team. Jonathan Stokes, the recording engineer and Nigel Gayler, Decca's editing manager played an integral role in shooting the film. The

PHOTOGRAPH ABOVE: KEITH HAMSHIRE



Contrasted opportunities for surround sound. Above: The King's College Chapel session with Jecklin array as used for Decca's *Cantique de Jean Racine* by Fauré. Left: Warner-Icon's blockbuster art movie *Anna Karenina*




specially recorded Russian music, which includes sequences from Tchaikovsky's *Pathétique* Symphony and his opera *Eugene Onegin*, Rachmaninov's *Vespers* and Prokofiev's *Alexander Nevsky*, was used to drive all the important scenes shot. Playback of the music soundtrack on the set enabled precisely coordinated timing, and provided a source of inspiration for the actors and crew.

The rough 2-track edits used on the set had to be approved by Solti, Mike Woolcock the music producer, and John Sironach the film's music supervisor. A 2-channel monitor mix was copied onto DAT, downloaded to a SADiE hard-disk system, and sequences rapidly edited for each upcoming shoot. For the finished film soundtrack, Decca provided Icon with the equivalent 27-track edited master, following all the sequences approved on location by Solti.

THE PRODUCTION of *Anna Karenina* is a classic example of Decca's modern multitrack recording. For live recordings, large productions, especially operas, and those made under unfamiliar conditions, Decca uses multitrack, primarily as a safety net, almost always with an additional direct

to 2-track setup at the session, just in case this more favoured, more direct approach does 'come off'. Dave Harries, General Manager of the Decca Recording Centre, estimates that roughly 30%–40% of Decca's classical recordings have been made using multitrack in recent years. The nature of these recordings is such that many will lend themselves to postproduction surround mixdown.

The situation now, he says, is somewhat analogous to the position in the 1950s when stereo gradually replaced mono, and when Decca's Jimmy Lock made experimental quadraphonic recordings of Wagner's *Tannhäuser* in the 1970s.

'Decca did a lot of 4-channel recordings which remained in our library and were never issued. The recordings were done and then, at some time in the future, it was appropriate to release some, but not all. EMI was the same; the stereo recordings it made of Sir Thomas Beecham in the 1950s were only eventually released in stereo because the engineers experimented to the highest possible degree. It's no good for us to say today that 16-bit, 44.1kHz is what the public has been used to, and that therefore we don't need to experiment.' Decca has certainly been busy experimenting. 

CREATING THE ANNA KARENINA MUSIC SURROUND SOUND

JONATHAN STOKES regards surround sound recording as a large and exciting challenge. Since every hall has a very different acoustic, he tailors his microphone choice and technique to suit each recording location. He is encouraged because 'everybody who has heard recordings we have done in surround sound concludes that it is a definite improvement on stereo.

Here's how he tackled the music surround-track recording for *Anna Karenina*.

'We had a particularly fine hall in which to make the recording. The acoustic was such that in order to capture the unique sound of the St. Petersburg Philharmonic Orchestra and soloists I adopted a basic recording technique commonly used by Decca engineers. This relies on five Neumann M50 microphones (omnis) placed across the front of the orchestra to create the core sound. Cardioid microphones including Neumann 184, TLM 170, Schoeps MK21 (wide cardioid) and MK2S (omnis) were then used as spot microphones on the woodwind, horns, brass, timpani, harp, celeste, soloists and chorus to supplement this basic sound. Since the Philharmonic Hall has quite a generous acoustic and the music was being recorded for film in surround sound, this differed slightly from our normal approach. In having a fraction more focus/presence. In addition I then placed a total of ten microphones around the auditorium for the surround sound. These included omnidirectional, wide cardioid and cardioid in pairs and spaced pairs.

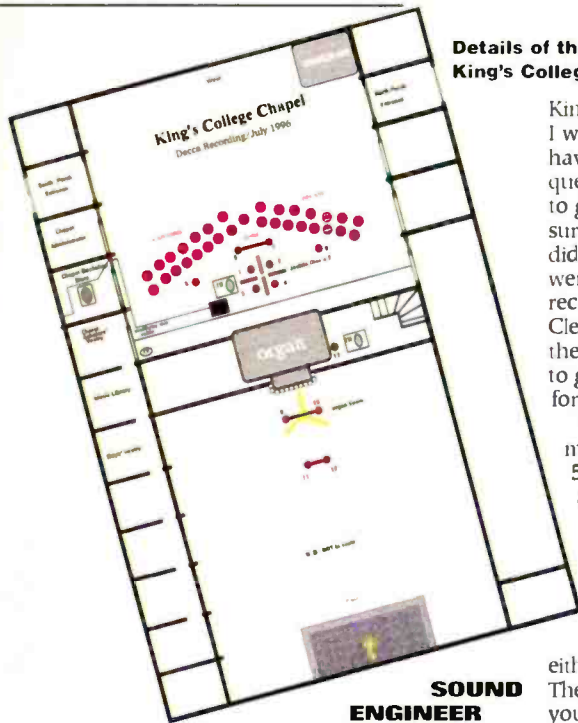
'The reasons I used so many surround microphones are: that this was the first time I had recorded surround sound in this hall, that time was not in abundance; and that it was difficult to assess how

the hall would sound at considerable distances from the sound sources. This is also why I used many different types of microphone.

'The room we used as a control room was not particularly large and the acoustic was not wonderful. By the time all the equipment had been installed there was limited space for the crew, conductor, soloists and members of the orchestra during playback. Therefore it was impossible to install a surround-sound monitoring system, and as time was limited, and artists were more familiar with listening in stereo, we monitored in stereo during the sessions. The mixing console we were using did not have dedicated surround sound panning. Therefore the simplest way to record the session was to take all microphones direct to track while simultaneously creating a stereo mix from those microphones that were applicable. This suited the needs for the sessions and also gave total flexibility for the surround-sound mix at a later date. We used a 32-track Mitsubishi 880 digital recorder, for this purpose.

'From the 32-track edited master, using the Logic 2 console, I remixed the programme in surround sound and sent a post-fade mix to a Sony 48-track recorder in order that there were spare tracks available to add dialogue, effects and so on later. We supplied Icon with our 'ideal' surround mix, but if for whatever reason they needed subsequently to change this they could. In addition I also put our ideal stereo mix onto two tracks for reference. Icon were then responsible for recording and mixing in all dialogue, effects and so on'

RECORDING



Details of the mic placement at King's College Chapel, Cambridge

SOUND ENGINEER

Simon Eadon worked on the King's College recording and

readily confirms that excitement surrounding DVD unification a year ago provided a lot of stimulus to investigate surround sound. The 5-channel recording he made at King's was his second to date. Jonathan Stokes has also been working in San Francisco to develop a purist surround-sound monitoring technique for orchestral music. Meanwhile Decca is known to be collaborating within the PolyGram group on the development of a 24-bit, high sampling rate, verifiable M-O recorder.

Unfortunately, the signs are that a pure audio application of DVD is less imminent than was initially hoped. For this reason the King's recording is unlikely to see the light of day as a surround-sound release in the short term. The good news is that tardiness in settling the DVD Pure Audio specification buys recording engineers like Simon Eadon time to refine their 5-channel recording methods. So just how far along the learning curve is he? His frankness is disarming:

'People haven't written huge theses on how to record surround sound. You can't go to a book and find out what someone says about how to do it, and sadly we can't benefit from Blumlein's thoughts on it. At

King's we were leaping into very deep water. I was just following a big hunch. It could have been absolutely disastrous, there's no question about it. But we were determined to get it to work, monitoring in 5-channel surround. If our first choice of mic technique didn't give us the results we wanted, we were prepared to try something else, reconfiguring the setup on the spot. Stephen Cleobury knew that at the first session there could be a lot of changes if we'd had to go back to the drawing board. But fortunately it did seem to work first time.

'I had already recorded Philip Pickett's mediaeval renaissance ensemble in 5 channel surround within the drier acoustic of Walthamstow Town Hall. At King's we used the same basic microphone array. There were four Jecklin discs with omnidirectional Schoeps MK2S mics as the focus of the sound. The discs, which look like four, thick, grey, plastic LPs with foam either side, have mounts for the microphones. The principle for 2-channel stereo is that you have two omni capsules fairly close together for a very phase coherent centre, and then as you go round to the edges the disc has a masking effect so that there is a very high degree of isolation at high frequencies between the sounds at the extreme left and right. You do get pinpoint stereo imaging this way.

'For the surround-sound recording I extended the principle, because I thought if it works for the front, why shouldn't it work for the sides and rear? We also used a little bit of time delay for the spot mikes on the organ, just to focus it up a bit. We had to do this because the organ was speaking the other way to the direction we'd chosen to record the choir.'

In the absence of a suitable carrier for the King's surround-sound recording it's likely that the 2-channel mixdown will initially be released on CD, the 5-channel master remaining firmly in the can for a suitable high-density carrier. Simon Eadon admits he was fortunate that his 5-channel-monitored King's recording does mixdown well to two channels.

Decca isn't the only company within the DVD Alliance Group to be grappling with multichannel audio classical recordings, and attempting to make 2-channel mixes. Roy Hankinson, technical manager at the Decca Recording Centre is concerned that high standards are maintained when



The Jecklin array featuring four Schoeps omni mics

KING'S RECORDING

MICROPHONES

1-4
◆ Schoeps MK2S (Jecklin omni array)
Church Front Left, Front Right, Back Left, Back Right

5-8
◆ Neumann TLM170 (wide cardioid)
Choir Left, Half Left, Half Right, Right

9-10
◆ Schoeps MK2S (CMC-6)
Organ Left, Right

11-12
◆ Neumann TLM170 (not used)
Back choir, Left, Right

13
◆ Neumann KM184
Organist Talkback

EQUIPMENT

◆ BCD Stage Box remote control mic amps and A-D converters.

◆ Probel AES-MADI converter for link between chapel and control room. Single BNC cable.

◆ Probel MADI-AES converter, Yamaha 02R digital mixer, with group outputs to Prism MR20:24 6/8-channel multiplexer feeding Tascam DA-88 digital tape decks.

◆ Session monitoring via 20-bit Prism Sound D-A converters, Chord power amps and five B&W 802 monitors.

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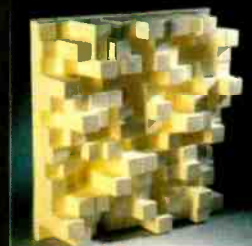
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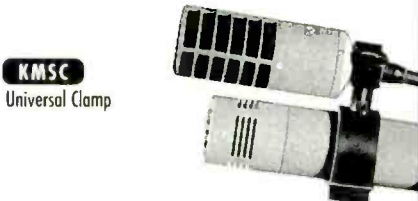
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making such mixdowns. On the evidence of the examples he heard during the DVD Alliance conference held in Brussels this September, he feels more work is required to refine procedures, taking into account the different recording styles of record companies, and recording engineers. After all, recording is not a science governed by theses, otherwise DG's records would sound the same as Decca's, and Sony's indistinguishable from EMI's.

Pure audio, high-definition, digital multichannel surround sound may take a long time to perfect, and longer still before it makes its mark commercially. In the meantime the surround sound pot will be kept boiling by video releases of films such as *Anna Karenina*. If production values continue to rise, surround-sound video releases should gradually reinforce the need for a high-definition music carrier capable of multichannel sound.

David Harries puts it more succinctly: 'I have absolutely no doubt that surround sound is a logical progression. Joe Bloggs consumer has 5.1-channel systems with MPEG and Dolby Digital. He's going to want his records to be as good, or better still. But Decca would not accept a pure audio carrier unless it was linear. As to the question of 96kHz or 88.2kHz and greater than 16 bits, in my view, higher sampling



The King's College session utilising 5-channel surround monitoring courtesy of B&W 801s

and more bits can also be justified. Currently, it's hard to see how the DVD Pure Audio standard is to be resolved, but I think that once DVD Video comes out and is accepted, then we'll be able to say much more clearly how the audio-only format can fit in.'

By that time, given its current programme of surround-sound experimentation, and its commitment to work on a 24-bit, high sampling rate optical-disc recorder for use exclusively within the PolyGram group, Decca will be well placed to cherry-pick from a library of surround-sound material, just as it was when stereo superseded mono. **S**

STAGING THE SURROUND SOUND RECORDING AT KING'S

AT THE KING'S SESSION I was struck by the extent to which the musicians were called upon to adapt their performance for the purpose of the recording. The choir was placed in the main part of the chapel in two tiers, the Cantors to the left of the conductor, the Decant to his right, facing East. For a service the choir is usually located the other side of the organ, facing North or South. The idea was to make the most of the extraordinary chapel acoustic, noted for its long reverberation time.

Several soloists stepped forward with choreographed precision during one complex partwork, to ensure that the mics captured each critical voice without risk of their being overwhelmed by the combined choruses. On a couple of occasions, the choir processed towards and around the mics. Of the three alternate takes tried, for one of these hymns, the most sonically convincing resulted from a side-to-side shuffle as the choir processed around the Jecklin array, always facing the microphones.

Simon Eadon acknowledges that musicians always perform differently for a recording and when performing for a concert or service. But he agreed that this aspect was magnified during the King's surround sound session. His justification? 'We wanted to explore the possibilities of the King's acoustic as much as possible by setting different pieces of music off within it. For example in *I Was Glad*, you want a really gutsy

sound. You don't want it to sound as if they're at the back of the church, whereas for other more contemplative pieces, you do want a more generous sound around it and therefore you'd want the choir set back a bit.'

To help him achieve these ends, some adjustments of mic height and level were required. Remote controlled mic gain made life less fraught than it could otherwise have been.

One of the few occasions where eyebrows were raised was when the sound of King's College organ emerged from the rear monitors—unsurprising, perhaps, given the way the choir and mics had been positioned relative to the organ (see diagram)—but Chris Hazell, the recording producer did initially need a bit of reassurance.

Summing up the experiment, Eadon reiterates the importance of taking risks: 'I think you have to take a leap into the dark, because otherwise you'll never reach the position where you can say, "Right, we'll never do X again, but Y does deserve further investigation". The only way forward is not to be frightened to experiment. I think it goes beyond microphone technique. You have to be open to everything. You have to have very open ears. And not be hidebound by having to use a particular technique and having to look at the maths. In the end, what matters is how the music affects you. Either it's convincing or...'

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A family affair

Images of cultural acceptance have endorsed the marketing of new media for several decades now. But the collision of multichannel audio and video is blurring the perception of domestic techno-bliss writes **KEVIN HILTON**

There's a famous photograph that depicts a family during the Golden Age of radio. This typical prenuclear grouping consists of a mother, father, boy (these last two with identical haircuts and smoking pipes, even though the boy's only about eight), and a dog, all gathered round one of those big wooden wireless sets. Come to think of it, all of them were smoking pipes, apart from the dog, who had a Capstan Full Strength.

For the early television era there's a similar image of a later family, with the addition of a teenager (because they hadn't been invented during the Wireless Age), and a baby, all of whom were arrayed around the TV set, which again was a huge piece of furniture, rather like an ottoman. They were staring intently at the screen, a phenomenon supposedly common at the time, and sent up by Tony Hancock, one of the big stars of the day, (and still a big star today, even though he's been dead for 28 years), in his 1959 episode 'The Set That Failed'. Hancock and Sid James' TV has broken, and they join a household who are so engrossed that they think the interlopers are merely extra members of the family.

Radio and television stopped being novelties a long time ago. People today listen to the radio and watch TV in very different ways to 30 or 40 years ago. Unless we're listening to a play, discussion programme or panel game, the radio tends to be something that's on in the background; there are some I know who use talk shows as a background noise, and only concentrate on something if they're interested in the issue.

Television has not quite become this but people are no longer glued to the set, as they used to be, apart from the die-hard couch potatoes, the kind of people who shudder when they remember the days before remote controls. People iron, prepare the dinner and even read with the TV on, and only sit down and pay attention if it's a show they really want to see.

THIS IS ALL pretty standard socio-logical stuff, but it could come slap bang

up to date with emergent technologies. As it's the elder of the two mediums, let's take radio first. DAB promises to change the senior service by multiplexing several services onto one frequency, with the capacity for additional channels, data, surround sound and visual images.

During the recent IBC Convention I attended the Philips-IRT demonstration of MPEG2 Musicam Surround, which gave good quality, well defined multi-channel sound (stereo compatible), with still innovative illustrating what was going on. All of this is very clever but who actually listens to the radio like that? In fact, it's the pictures that give the most problems. After all, isn't radio with pictures usually called television? And the pictures move on that.

In the past few years producers have been experimenting with surround sound for radio, notably Dirk Maggs and his colleagues at Audio Movies. Their work with short and long-form drama is both innovative and fun, pushing the boundaries of the old medium, which could also move into music production. And while others are experimenting with the format, including Wise Buddah Studios, some who are involved with this work still ask the question, who listens to the radio like that?

Although much has been made of surround sound for home theatre setups, it is still only a small proportion of the market—so if few people are going multi-channel for vision, how many are doing the same without pictures?

Surround sound for both media calls for discipline, setting up the living room with the required number of loudspeakers, hooking up all the cables and configuring the decoder. Although surround is being used on more and more TV programmes, from drama and comedy through to sport, radio producers may consider that there are only a few shows that would truly benefit from this addition.

The way that people listen or view also impacts on the coming convergence of technologies. Still with radio, how many people, aside from real radio nuts and extremely home-sick travellers, are going to tune into far flung stations over the Internet? Another display at IBC was demonstrating MPEG1/2 Layer III, the

coding for low-bit-rate applications, which can be used for audio-on-demand, and even moving pictures. Again, this means setting up the computer and dialling in on a phone line, which is not the same as walking in and switching on.

The same is true of the proposed combined TV and computer, unless there is a considerable change in attitude to how a now fairly automatic pastime is carried out. In real terms it's a case of technology allowing people to get carried away by all the cleverness—I know, I've done it myself.

Take the whole business of virtual reality, which appears to have become

The way that people listen or view also impacts on the coming convergence of technologies. Still with radio, how many people, aside from real radio nuts and extremely home-sick travellers, are going to tune into far flung stations over the Internet?

decidedly last year's thing. Even such a revered and considered figure as Arthur C Clarke once raved, 'Virtual reality won't merely replace TV. It will eat it alive'. A vision of virtual TV came in Oliver Stone's much hyped TV series *Wild Palms*, which included some truly silly scenes of actors suddenly appearing in the middle of the viewer's front room, reacting to things that the viewer couldn't see. Somehow I can't see that as being wholly satisfactory.

The technological future is coming, be assured of that. Let's make sure that we shape it rather than allowing it—or the manufacturers—to shape it, and us, for us.



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Console Games

The early days of the recording studio gave rise to much explorative technology—today, much has been forgotten, but some represents the height of excellence and fashion.

TIM GOODYER traces a brief history of the mixing console

QUIZ ANY ONE of a selection of recording professionals about where the heart of a studio lies and you will get a variety of answers. To the studio designer, the essential character of a studio is described by the control room acoustic. To the musician, however, it may well be the acoustic of the live room which is most important. To a microphone designer or connoisseur, the job of accurately tuning an acoustic event into electrical energy make it top of the list of elements determining the shape of a recording. And to many, the multi-track's central task of capturing and repeating the events taking place during a session would earn it the status of being the 'heart'. But to the majority of engineers it is the console that is all important.

It's easy to see why—at any point in a session the console is likely to play a decisive role in how the sound is handled. And whether you're talking about signal path, facilities, automation, ease of operation or simply status, the studio console has played a greater part in determining whether or not a studio secures a particular booking than any other aspect of its design or equipment.

The history of the recording console is, then, an important one. The foundations of the modern console were laid in the late 1960s, and by the early 1970s the picture had begun to take shape. Some 20 years ago you could count the number of London studios on your fingers, and yet through these studios, the country was leading the world in sound recording. Necessarily, the market for recording consoles was small and select, and supported few players—and of the five main manufacturers, four were English, and the remaining one American, as Steve Gunn recalls.

There was us with Malcolm Toft at Trident, Dick Swettenham was doing quite well with Helios, Clive Green with Cadac, Neve, obviously, and the American MCI who had started to get into the UK market partly because you could buy a multitrack machine and a desk from the same manufacturer. At Trident we found that we were always selling against MCI later in the 1970s. SSL wasn't heard of in those days and if Soundcraft was doing

anything, then it would have been the little IS portable for live sound—no studio stuff.'

Curiously, given its current pre-eminence in theatre sound, Cadac's rise to fame began in 1968 with a studio console built for London's Lansdowne Studios and continued with studio desks for Morgan and Pye, then for RCA's facilities in Madrid and Rome (which is still in service). Numerous 1960s and 1970s landmark recordings were cut on Cadacs and some are still in use today for the likes of Simply Red, Tina Turner, and Cher. It is a curious fact that while some desks chalked up lists of recording credits, certain recording projects ran up lists of desk credits—witness Queen's 1975 epic *Bohemian Rhapsody* and its experience not only of a Cadac console, but also of a Trident B, a Neve and Rockfield's custom console.

In 1976 Gunn was testing and installing Trident consoles. Like Trident, a number of manufacturers had grown out of the studios themselves who, having turned to in-house design to meet requirements not recognised by other designers, found their designs in demand from other studios. Today Gunn is part of Tony Larking's TL Audio operation, itself now a rising star in console manufacturer's constellation.

In 1976 Larking himself was getting into consoles, but in a slightly different capacity to that of manufacturer—although not the first to do so, he was finding a healthy trade in secondhand desks. 'At that time there was no such thing as the project studio, they were all commercial studios,' he recalls. 'If you had a 4-track studio you were charging £10 an hour and making a living.'

With such an exclusive market, there were no 'budget' consoles to be found. Nor was there any of the discounting so regularly practiced today: 'If a commercial studio wanted a desk and the price was, say, £60,000, they would pay £60,000,' Gunn recalls. And when the time came to upgrade, manufacturer loyalty was the order of the day. 'Because they liked the console and got on well with the manufacturer, people would stick with the same manufacturer and upgrade to a physically larger desk with more channels. They trusted them so there was no reason

to change.'

By the start of the 1980s much had begun to change. The recording market was expanding rapidly, and new consoles were going into brand new studios and new rooms. The modest numbers of consoles of the 1970s—just 14 or 15 Trident A-range consoles, and 20 B-range consoles were ever built—were being outstripped by the likes of SSL. According to SSL's Chris Jenkins, who was working at the Townhouse when it installed its first SSL console in 1978, the company progressed from the sales of one A-series, and three B-series in that year through three B-series, and four E-series the following year to 15 E-series (including New York's Power Station, LA's Record Plant, and the first BBC sale) in 1980. The next year's sales of 21 consoles saw the catchment extend to three Japanese facilities. Jenkins identifies 1984 as 'the start of mass production'. AMS Neve, meanwhile, is content simply to claim in excess of 4,000 analogue and 350 digital console sales.

'By the mid to late-80s so many people were taking out second mortgages and setting up studios thinking that they were going to make a fortune,' Larking recalls. 'But, of course, the market was saturated, and a couple of years later they all closed down and the equipment was bought, and sold off abroad. There were a few boom years in the 1980s and the arrival of cheaper multitrack consoles had made it possible for more people to set up studios.'

'People like Soundcraft and Soundtracs really expanded the market,' Gunn agrees. 'In those days you could buy the Soundcraft Producers Package, a 24-track machine and



Union Studios, Munich—home to a CADAC recording console

CONSOLES



**Power plant 78-input
GML-Neve 8048 console built between
April 1988 and April 1989. Designed by
Nicholas Clarke and Clifford Brown**

🔊 1600 desk, for about £25,000. That was cheap for a 24-track setup.'

The 'more bang for the buck' trend continued and lent success to the likes of Soundtracs and Amek while simultaneously paving the way for the next generation of 'budget' consoles—led by the American Mackie operation—that would accommodate professional project studios and enthusiastic hobbyists alike. But while the market in 'affordable' recording expanded, so did that in prestige vintage equipment. Throughout the 1980s the trade in secondhand classics boomed—and since most of the early action had taken place in England, most of that trade was directed towards America and to a lesser extent Europe.

The consoles that have been really sought-after are the old Neve consoles that were built in the late-60s, early-70s, particularly old discrete ones like early Neve and Trident desks,' Larking explains. 'A lot of the secondhand

ones have been found and bought and gone over to the States where they fetch the highest prices.'

Old consoles have also seen a new lease of life when broken to provide outboard EQ and mic amps. 'There was a big demand for Neve EQ so I was buying the mixers in, taking the modules out and repackaging them,' admits Larking. 'I don't think we've actually broken that many desks—I would guess around 15. That's over the last five years. Most of the ones we've broken up have been the 3000-series, custom broadcast desks that used similar EQ modules.'

Today the secondhand market in vintage consoles is all but dead—not through waning interest, but through the rarity of desirable desks. As Larking observes: 'there weren't that many built in the first place and those that were have all found good homes.' Rarity has also pushed prices of consoles and other vintage gear like mics and outboard through the roof.

'There's the example of a Fairchild 670 stereo compressor,' he offers, 'I had a couple of them five years ago that I sold for £2,000—£3,000 each. now I've heard they go for £12,000—13,000 in the States.'

ACTIVITY IN NEW console design is fast and furious at all levels of cost and complexity. Digital consoles in the form of AMS Neve's Libra, Amek's DMS and Soundtracs' Virtua, not to mention Yamaha's 02R, are bringing digital mixing to a new stratum of the recording, post and broadcast businesses. A popular technological staging post is that of hybrid digitally controlled analogue desks such as Harrison's Series Twelve and Euphonix' CS2000, allowing the level of control associated with digits but retaining an analogue signal path. Purely analogue consoles, meanwhile, command the respect due a mature technology and are still a viable option for manufacturer and studio operator alike as Amek's 9098 and TL Audio's mixers demonstrate. Where the 9098 enjoys the support of designer Rupert Neve's reputation, TL Audio's initiative has been taken as a direct response to the secondhand activity witnessed by Tony Larking.

'There was a gap in the market,' he explains. 'So many people wanted used Neve consoles but there weren't enough around, and the facilities on those that were around were very limited compared to modern consoles. So we had the idea of building very high-quality consoles to supply that market. It was a response from us to people who were looking for larger old consoles, particularly Neves. Old consoles are rare, they're very expensive if you can find them, they have limited facilities and they need servicing before you can use them.'

'There's also a big demand for smaller Neve mixers. They did some 8:2 and 10:2 mixers—some are called Suitcase and BCM10:2s—which quite a lot of SSL studios were trying to buy to use as a sidecar to give them alternative EQ. So we saw our valve mixer fitting into that bracket.'

Certainly, TL Audio's valve-based 8:2 mixers have delivered, finding favour in circles as lofty as those of *Bohemian Rhapsody* producer Roy Thomas Baker (who currently uses a TL Audio valve mixer alongside a Neve VR) and Synchrosound Studios in Kuala Lumpur. 🎧

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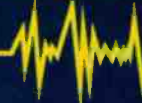


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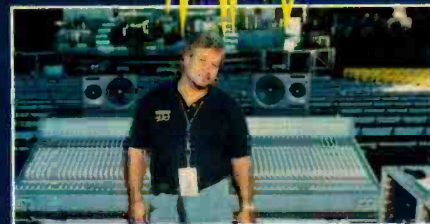
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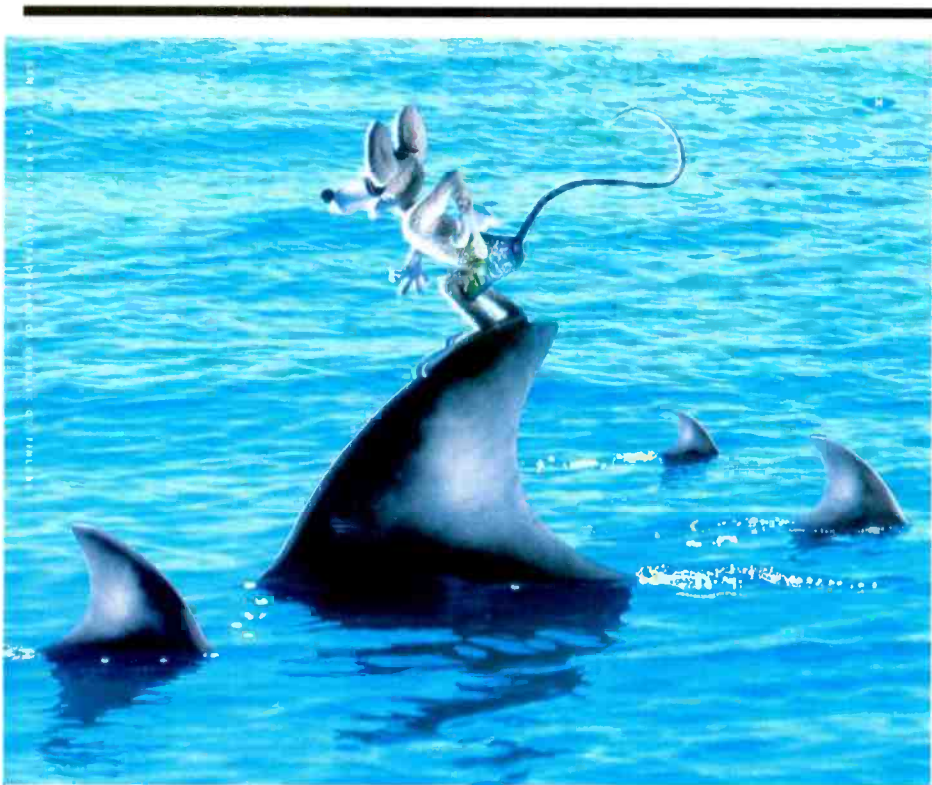


Trident TSM at Chipping Norton

Now there are three large TL Audio consoles approaching completion. Like their smaller sisters, these are the work of ex-Neve designer David Kempson.

'We went from the first mixer to the version with faders and aux outputs and facilities to link two together,' he recalls. 'But we were concerned that the selling price might be too high so we came up with a solid-state channel option such that you could have four channels of solid-state and four channels of valves for a more reasonable price. And from that the idea of mixed-technology consoles evolved. Now there are three possibilities: solid-state, valves and discrete class-A.

'We determined that it would be impractical in terms of heat, and size, and cost to build an all-valve console, so we've developed a hybrid design. We've identified points in the circuit—particularly the EQ, mic amps and mix amps—where valves offer a distinct acoustic advantage. But you will also find



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THE TALE OF A TRIDENT A-RANGE

'CHIPPING NORTON bought their 32-channel Trident A-range brand new from Trident—and Steve installed it—in the late 1970s. While it was installed at Chipping Norton, it was part of a circuit used by a clique of Trident users including SARM, Trident themselves and Chipping Norton. Gerry Rafferty's 'Baker Street' was recorded on it.

'In the early 1980s, they replaced it with a Trident TSM and sold the A-range to Ten Years After guitarist Leo Lyons for his private studio in Oxfordshire.

'In 1979 he moved to High Wycombe, and the A-range was too big for his new house so he exchanged it with us for a new Soundtracs console. One of the partners flew over from Waterfront studios in New Jersey to see it, and bought it. Waterfront then spent 700 man-hours restoring it. (See the full Waterfront story in *Studio Sound*, March 1996.)

'Most of their equipment is vintage stuff and Lenny works there regularly now.

'If they were to go back on the market today I'd guess its value would be around £40,000—50,000 because it's been refurbished and the A-range is very popular. It could be worth a lot more, it just depends who's out there looking at the time...'

quite a bit of solid-state circuitry. That's not to say a hybrid design is not as good as an all-valve design—we actually think it's better!

Kempson's 'better' consoles will include the Classic (which should ship late 1997 at about £80,000 for 32-channels), the Classic Gold (set for the second quarter 1997 at approximately £30,000 for a 32-channel in-line) and the VTC or Valve Technology Console (which should appear in prototype form at the LA AES and ship in the first quarter of 1997). Larking readily quotes cases of people looking for certain old desks and turning to him when they discover there are none available. He also recognises the popularity of more recent consoles, however, and those that seem to have lost their appeal.

'SSL 4000-series desks are now being sought after by people who have money waiting,' he explains. 'Depending on the size and exactly what it is, a 4000 would go for £40,000-£50,000.

'Where we might have been able to sell a 10-year-old 32-channel console for £4,000-£5000 a few years back, now everyone will go and buy a new Mackie for £3,500 or a Soundcraft or a Soundtracs. That killed a lot of the older consoles off since you either can't sell them or you have to let them go for £500 instead of £5,000!

The question raised by the preferences of today is that of tomorrow: what, if any, will be the first desks to become frantically sought-after examples of the early digital console era? **S**

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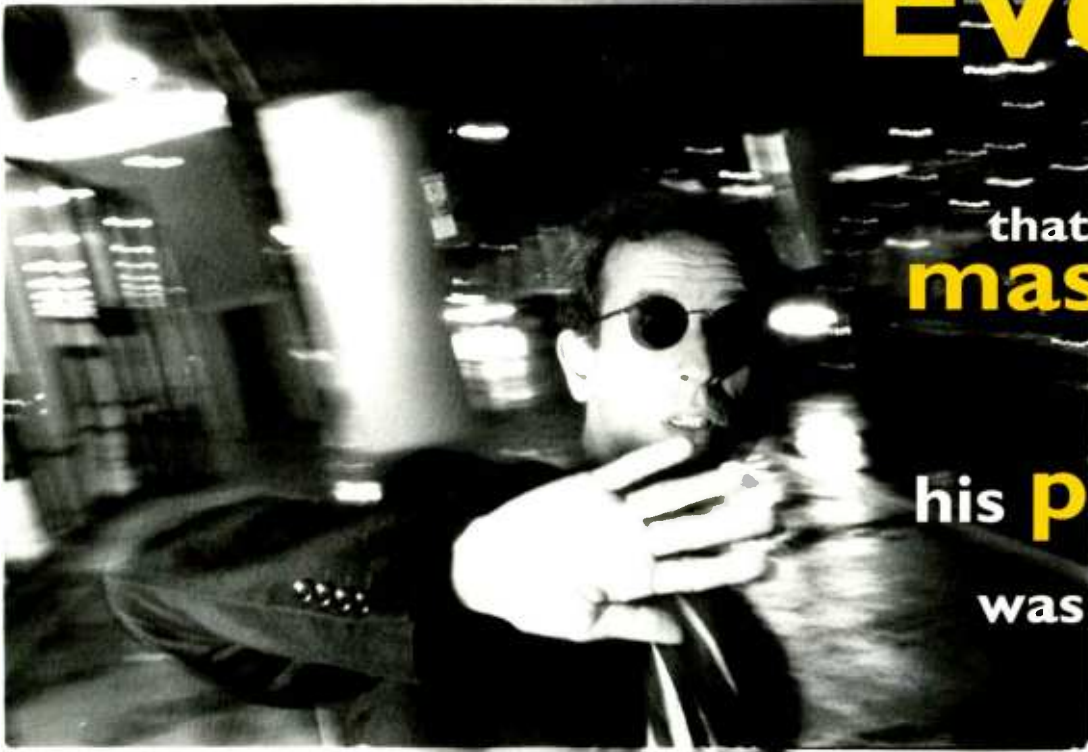
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World events

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◆ November 1st-3rd

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Pinewood, UK.
Tel: +44 171 242 8400.
Fax: +44 171 405 3560.

◆ November 5th-7th

Broadcast Engineering Society Expo 96

Hotel Taj Palace, New Delhi, India. Tel: 91 11 371 9978.

◆ November 5th-9th

IT/Expo Comm China

China International Exhibition Centre, Beijing, Peoples Republic of China.

Tel: +52 525 592 3257;
US Tel: +1 301 986 7800.

◆ November 6th-9th

Apple Expo 96

Olympia, London, UK.
Tel: +44 181 390 0203.
email: gautamp@computing.emap.co.uk.

Web: <http://www.apple-expo.com/apple>

◆ November 6th-9th

AV & Broadcast

China 96

Beijing Exhibition Centre, Beijing, China.

Tel: +852 2862 3460.

◆ November 7th

21st Sound Broadcasting

Equipment Show (SBES)

The Metropole Hotel, NEC Birmingham, UK.

Tel: +44 1491 838575.

Email: dmcv@pointproms.co.uk

◆ November 8th-11th

101st AES Convention

LA Convention Centre, Los Angeles, California, US.
Tel: +1 213 258 6741.

◆ November 12th-14th

BroadBand World

Expo 96

Navy Pier Convention Centre, Chicago, US.
Tel: +1 301 986 7800.

◆ November 13th-15th

32nd Inter BEE 96

Nippon Convention Centre

(Makuhari Messe),

Tokyo, Japan.

Fax: +81 3 5402 7605.

◆ November 15th-18th

Tonmeistertragung

Stadthalle, Karlsruhe, Germany.

Tel: +49 2204 23595.

◆ November 21st-24th

LDI 1996

Orlando, US.

Tel: +1 212 229 2965.

◆ November 21st-24th

News World 96

Intercontinental Hotel, Berlin, Germany. Tel: +171 491 0880.

December 1996

◆ December 3rd-5th

Online Information 96

Olympia 2, London, UK.

Tel: +44 1865 730275.

◆ December 8th-11th

Broadcast Cable &

Satellite 96 including

Pro-Audio India, Lighting

India and TV India

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◆ December 8th-11th

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◆ March 13th-15th

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◆ March 22nd-25th

102nd AES Convention

MOC Centre, Munich Germany.

Tel: +49 8142 14167.

Fax: +49 89 32399 351.

email: 102nd-chairman

@aes.org.

Web: <http://www.aes.org>.

April 1997

◆ April

Entech 97

Melbourne Exhibition Centre,

Australia. Tel: +61 2 876 3530.

◆ April 21st-23rd

Cable & Satellite 1997

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catherine.barrett@reedex.co.uk

Web: <http://www.cabsat.co.uk/>

May 1997

◆ May

Pro Audio Light

and Music China 97

Beijing Exhibition Centre,

Beijing, China.

Tel: +852 2861 3331.

◆ May

Expo Comm Wireless

Korea 97

Korea Exhibition Centre, Seoul,

Korea. Tel: +82 2 555 7153.

Fax: +82 2 556 9474.

June 1997

◆ June 3rd-5th

REPLitech international

San Jose, California, US.

Tel: +1 609 279 1700.

Fax: +1 609 279 1999.

◆ June 4th-7th

4th Annual Latin-

American Pro Audio &

Music Expo Mexico 97

World Trade Centre,

Mexico City.

Email: chris@ssiexpos.com.

◆ June 7th-10th

Nightwave 97

Rimini Exhibition Centre, Italy.

Tel: +39 541 711249.

Fax: +39 541 786686.

◆ June 25th-27th

AES 8th Regional

Convention 97

Sunshine City Convention

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Web: <http://www.aes.org>.

July 1997

◆ July 1st-4th

SMPTE 97

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Sydney, Australia.

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Fax: +61 2 9976 3774

email: conference@peg.apc.org.

◆ July 3rd-5th

PALA 97

Bangkok International Trade

Centre, Bangkok, Thailand.

Tel: +65 227 0688.

Fax: +65 227 0913.

August 1997

◆ August 25th-28th

SMPTE

Sydney, Australia.

September 1997

◆ September 8th-11th

Midem Latin America &

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Email: jane-garton@midem-paris.ccmil.compuserve.com.

◆ September 12th-16th

IBC 97

Amsterdam.

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Fax: +44 171 240 3724.

email: show@ibc.org.uk

Web: <http://www.ibc.org.uk/ibc/>

◆ September 26th-29th

AES 103rd Convention

Jacob K. Javits Convention

Centre, New York, US.

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Fax: +1 212 682 0477.

Web: <http://www.aes.org>

October 1997

◆ October 16th-20th

International Audio,

Video, Broadcasting and

Telecommunications

Show (IBTS 97)

Milan, Italy.

◆ October 29th

22nd Sound Broadcasting

Equipment Show (SBES)

Hall 7, National Exhibition

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November 1997

◆ November 4th-6th

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Fax: +44 118 975 6216.

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Web: <http://www.aprs.co.uk>

◆ October 29th

22nd Sound Broadcasting

Equipment Show (SBES)

National Exhibition Centre,

Birmingham, UK.

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June 1998

◆ June 2nd-5th

Broadcast Asia 98

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◆ October 12th

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PRODUCT & BROCHURE SHOWCASE

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You'll need to demonstrate a proven track record in pro-audio. Mac familiarity and/or Pro Tools experience would be an advantage.

If you'd like to shape the future of MicroProse best-sellers, send your CV with covering letter to Louise Taylor (HR Co-ordinator) at the address below or telephone John Broomhall on 01454 893893 for an informal chat.

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- Repair and installation of digital audio mixing consoles

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Please apply in writing to:

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Neve 8108 - 56 channels, 48 group, in line with b p/b £15,000

Neve 24/6 - 26 x classic, discrete 33122, 3 band eq modules, 4 x comp/limits, bargain!! £24,995

Neve Kelso - 16/2, high quality mic amps, simple eq £2,995

AMS Virtual Console - 48 channels, reset, dynamics ext. p/b £15,000

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SSL 4048 EG - 48 mono, 8 stereo (56 modules) dual line, TR, G comp, mic amps £30,000

SSL 4040 - loaded 32 mono, no computer, no recall 1985 £24,995

SSL 5316 - 20/4, 16 mono, 4 stereo, 8 IMO's, reset, 5 dynamics ext. p/b £20,000

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Amek Einstein Super E - 40 channel, Supertrue Atari 1990 £33,000

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DDA D series - 32/8/16/2, NEW, 1yr warranty £9,000

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Yamaha DMC 1000 - Stereo software, DA, A/D's, etc. Wooden surround £245

Yamaha DMR 8 - 2 systems available with loads of accessories + DRU 8 £495

Pyz A71 console, discrete germanium & crunchy. With the coolest knobs ever!! £495

Studer 10/2 - high quality 3 band eq, 2 limiters, meter-bridge £495

Studiomaster 8/4 - wedge 19" rack mount console £245

MULTITRACKS

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Studer A 800 Mk 1/2/3 - Several available at the moment. Call for details £call

Studer Dyaxis 2 - with multi-desk control surface, removable optical V.2.3 software £9,995

Otari MTR 100 SR - remote and locate, internal SR cards, 1 private owner £26,000

Otari MTR 90 Mk 1 - Remote and locate, needs some TLC hence £2,995

Lexicon Opus Workstation - 4 x 1.2Gb, Exabyte, eq option, CPU-2 AES/EBU, etc. £14,000

Tascam - DA 88 - 2 x 6mths old, low hrs, 1 x 2 yrs old, new heads. All excellent £2,350 ea.

Tascam - DA 88 accessories, 2 x SY 88 cards, big & small remotes £call

Timeline Lynx System - Time code module, film module, system supervisor, KCU remote. Bargain! £1,995

2T MACHINES

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Studer A 80 - Mk 2 with meters, monitor trolley, little use £795

Studer A 80 - Mk 2 1/4" with monitor, good condition £750

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ASC Revox PR 99 Mk 2 - 5 in stock, with trolleys £695

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Klark Teknik DN 27 - 27 band graphic £1,250

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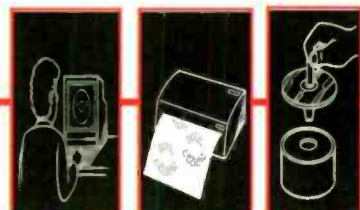
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Good enough for you?

When the CD rolled in, the 'professional margin' rolled out, and took with it the quality assurance long offered by audio pros. Can we re-establish our professionalism asks **MARTIN POLON**

FOR MOST OF US involved in engineering as opposed to politics, it is the issue of quality that has been the driving force behind the professional audio business. Equally, it has been the driving force of the engineers who design the complimentary consumer audio universe. Everything has traditionally been done on the basis of the best way being the only way. Recording studio equipment has been built to standards that equalled if not exceeded the very best equipment available to the military—the standard for comparison in more sanguine days. Similarly, 'name' manufacturers of domestic audio equipment have had their own standards to observe.

It is equally true that yesteryear's listeners were brought through decades of genuine improvement in consumer equipment and in the quality of recordings—a trend that ultimately spawned the hobby of 'audiophile' listening. Today, we have seen the art of audio engineering and of digital electronic technology combine to produce equipment for the studio and the home that at least, on the surface, promises an amazing degree of versatility and functionality.

On their introduction, Compact Disc recordings were supposed to be the most technically perfect renderings of musical performances yet available. That they defacto replaced the LP record was (to the public at least) due to the quest for audio quality as progress. Never mind the argument that the LP was at least partially destroyed by record company greed, as stamp cycles without adequate stamper replacement begat shorter cooling cycles which begat reprocessed vinyl which begat card-board sleeves without plasticine liners....

No matter what the minor peccadillos, quality always climbs to the top. Philips could introduce a thin analogue slow-speed (by those standards) audio tape cartridge that they called the cassette with mediocre recording and playback response and it would evolve into a format capable of rivalling studio tape two decades later. The bottom line was always Quality.

It appears that that is not true in the 1990s, however. We are about to greet the next millennium, with the phrase 'good enough'.

'Good enough' is everywhere.

We find it in the home with so-called compact audio systems that are literally selling off the retail shelves like pancakes at Christmas. These \$200 (£125 sterling) to \$700 (£450 sterling) 'systems' are in fact not separate components mounted in a rack as they appear to the untrained consumer eye but a common stamped and dipped metal panel housing the controls for the assorted CD player, tuner, preamplifier, power amplifiers, equaliser and cassette deck that the front panel implies but the system cannot deliver. The functions are there but all of the electronics inside are mounted on a single circuit board and the 20W to 60W per channel promised are derived by the same sort of higher mathematics that has pushed today's car prices up to \$20,000. The units themselves are so well designed visually that even the phony 3rd US Army built by British camouflage experts for General George S Patton in World War II that so confused the Germans, had nothing on these new systems as masters of deception.

With OEM loudspeakers, these systems are invading homes in the western world while decent components sit on the shelves languishing at retail stores.

Then we can look at the DVD-Audio, with more


than one record label looking for a piracy-marking technology to be embedded in the noise floor of the disc, which with the use of low bit rate coding, would be at about -30dB. This digital marker, which would add the occasional rustle or swirl of digital noise, could be used to identify the artist, the album ID, the record label and perhaps even an individual ID for that particular pressing. It could also be used for the DVD-Video to track illicit copiers of that format. It would, one supposes, be especially useful for record label 'agents' tracking down the odd resident of West Thorton Under Thames who had inadvertently made a digital copy to play in his car some years hence. Hail to the digital audio *Geheim Stats Polize*.

Then we can consider the need to increase record label profits on CDs by mere pennies by going to low-bid 'contract' pressing facilities, high speed mastering, reduced number of quality inspections per 1,000 discs stamped, *ad infinitum*.

How about the practice of rejecting returns from record stores of defective discs, thus forcing record retailers to haul their shrink wrap machines out of the back store room and rewrap the bad discs for resale.

Best of all, the current practice enjoyed by many in the record label A&R business to force artist groups to buy and build a studio for rehearsals and sessions instead of using a professional studio where acoustics and staff skill could only enhance the project.

The answer to this and many other unfortunate developments in the audio universe is always that it's 'good enough'. The problem is as we watch a generation mature in a world where audio is only good enough, they will never hear what those before them have heard and we will be permanently locked into a cycle of good enough. In studios around the world, those in charge of projects are beginning to ask the question about extra effort on a project since the listeners only know good enough.

It is time to stop this and make audio quality our byword—as it has always been in the past. If we accept the status quo, it will not be long before 'good enough' will be replaced with 'okay'. 

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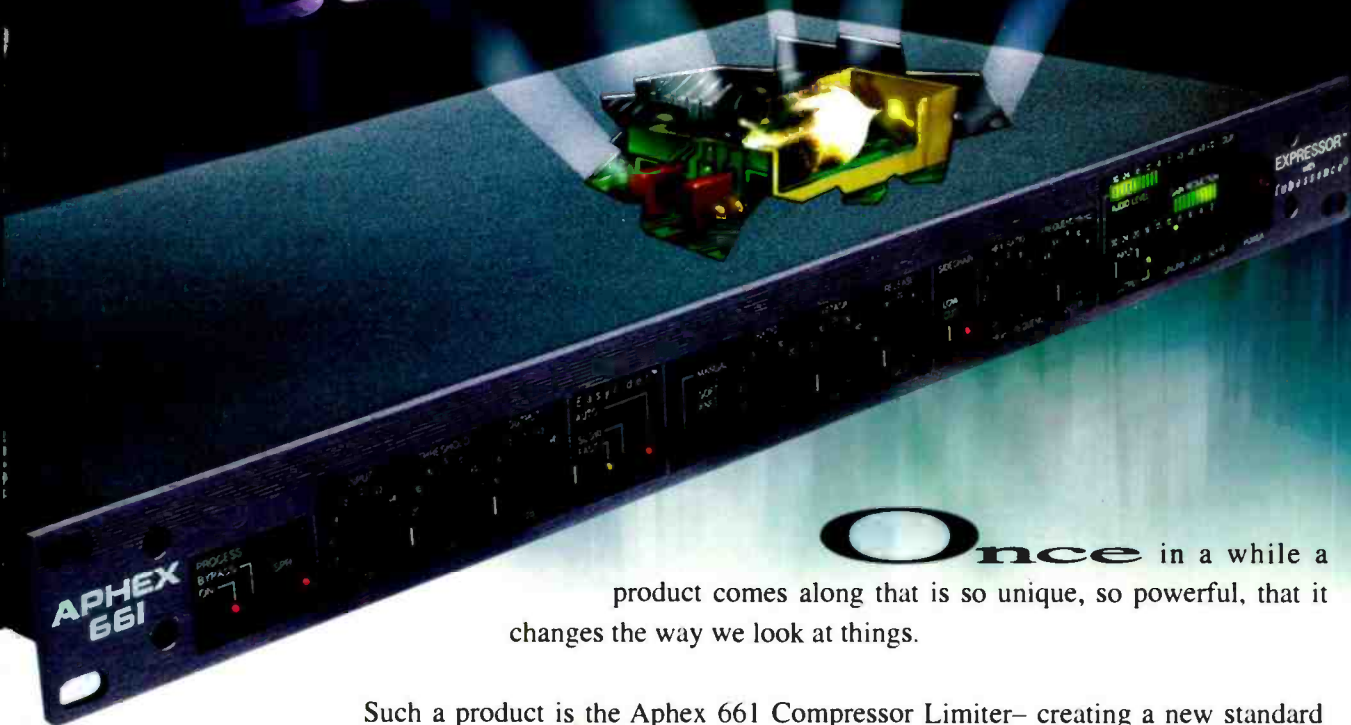
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