

February 2000 \$10.00

# Studio Sound

THE INTERNATIONAL PROFESSIONAL AUDIO MAGAZINE  
FOR RECORDING, POSTPRODUCTION AND BROADCAST



## EXCLUSIVES

Studer On-Air 5000

SoundsLogical WaveWarp

Microtech Gefell M 930

Canford mic preamps

Sintefex Replicator

Roland SRV3030

Merging Sphynx

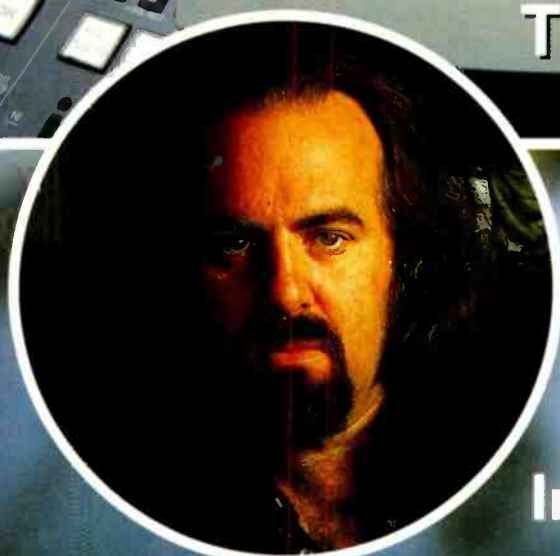
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**4 Editorial**  
On cheap radio programming and cheaper marketing

**8 Soundings**  
Professional audio, postpro and broadcast news

**10 Letters**  
Varied and topical debate from the pro-audio coal face

**12 World Events**  
Into the New Year with the pro-audio events calendar

**14 SSAIRAs**  
It's time to cast your votes in *Studio Sound's* awards

**REVIEWS**

**16 Lexicon 960**  
Exclusive: Lexicon's new flagship previewed processor

**20 Studer On-Air 5000**  
Exclusive: Self-op digital broadcast desk

**24 Merging Sphynx**  
Exclusive: Swiss modular audio conversion system

**28 Euphonix System 5**  
Exclusive: High-end digital console from hybrid masters

**34 AES Preview**  
A selection of secrets from the Paris AES Convention

**40 Sintefex Replicator**  
Exclusive: Modelling signal processing system

**47 SoundsLogical WaveWarp**  
Exclusive: Dedicated signal processing system for the PC

**48 Roland SRV3030**  
Exclusive: Impressive effects processing from Japan

**50 Joemeek VC6Q**  
Classy British outboard recording channel

**52 MotU 24i Core System**  
Exclusive: New audio interfacing for PC and Mac

**54 Microtech Gefell M 930**  
Exclusive: New bench mark condenser microphone

**56 Canford Audio mic preamps**  
Exclusive: Low profile, high performance preamps

February 2000 *Studio Sound*

**58 Hebden Sound 6000 series**  
Modular microphones with a heavy heritage

**60 CEDARAZX+**  
Exclusive: Tape machine azimuth correction made simple

**FEATURES**

**62 Interview: Arthur Baker**  
The remixer's role model

**67 Postproduction: Stop Making Sense**  
Remastering Talking Heads

**71 Special Focus: Dynamic mics**  
Latest developments in dynamics

**75 Broadcast: On-line Audio**  
Audio distribution in the digital age

**85 Soft Focus: TC Works**  
Plugging the plug-in

**93 Facility: Ashram Studio**  
Recording retreat in Madrid

**97 Special Focus: CD Printing**  
Labelling the disc

**101 Recording: Multichannel SACD**  
High-def sound in the round

**106 Facility: International Recording**  
Exploring an Italian tradition

**COMMENT**

**118 Comment**  
From our UK and US-based correspondents

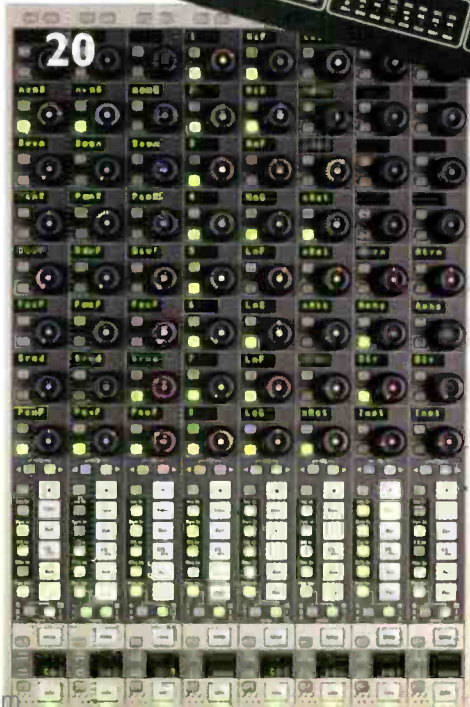
**119 Broadcast**  
Choices challenge the couch-potato lifestyle

**126 Open mic**  
Challenging high-end manufacturers on resetability

**TECHNOLOGY**

**121 Masterclass**  
Mechanical mastery of Studer's multitrack recorders

**124 Dr John**  
Headphones



## Honest Radio

TO CHANNEL ENERGY into denouncing poor quality TV programming caused by the need to fill the glut of available air space is to waste energy. It also misses the opportunity to point a finger at radio which is also guilty of such crimes and has been committing them for a good deal longer.

The advances in radio automation conjure up images of huge station complexes, largely devoid of human life, addressing a narrowly vertically targeted audience in the middle of the night by the light of a solitary angle-poise lamp. Only the spill from a discarded pair of headphones and the twitching meters tell you it is live.

Radio has been slicing the salami with the aid of an electron microscope for years: most major road junctions in the US seem to be served by a dedicated station and there is a station somewhere at any time of day that recognises you, your profile and your listening needs.

The problems and shortfalls are largely in tune with those in television—an inability to spread the available budget or income thickly enough to do everything well and to a consistently high standard. But what drives them is identical—grab the airtime, grab the frequency, God forbid anyone else should have it, and fill it no matter how.

If I were feeling sympathetic towards the cause of the poor beleaguered multistation conglomerate I could concede that they are fulfilling a community need. As I'm not I'll say that they suffer from chronic delusion. There is no moral requirement to stuff the airwaves, none of us wake each morning and weep for more radio stations.

The branch into the Internet will only serve to underscore that the stations that survive will be those that are properly funded and that entertain and inform. A little more honesty needs to be applied to the appraisal of its function and purpose.

**Zenon Schoepe, executive editor**

## Fashion victims

AS SKIRTS GET SHORTER, you can rely on the fashion industry to be working on making them long again. It is part of the definition of fashion (as opposed to style) that change is constant and the most obvious changes are always reactionary.

Now the feverish pursuit and promotion of web names is e-commerce's short skirt. It's cheap and obvious, designed to cause a sensation, to burn a brand into the mind. URLs can be found on everything from hookers' business cards to the menu from my local curry house. So it is that names123.com put banks.com on its auction site with a £1m reserve and that bradpitt.com has been offered to the American actor for a reported \$16,000. And that the Yahoo search engine was bought by Broadcast.com for over \$5bn last year, that Alta Vista is consequently considering a public offering, that Lycos is currently advertising on television and that a bunch of British students were able to sell their student web site for £10m. Like the skirt, the stakes are high.

Granted, more far-sighted web-watchers were quicker off the blocks, preemptively registering other people's trademarks and anticipating their needs—21st Century Fox, for example, was registered with the intent of holding Fox to ransom. Not all such ventures proved immensely profitable, however, as the British Inland Revenue bought www.inlandrevenue.org.uk in order to avoid confusion with their own www.inlandrevenue.gov.uk. The Revenue paid just £194—including VAT. But things are already moving on. The first long hem belongs to a recruitment agency, Brook Street, whose current London Underground advertising campaign carries no contact details whatsoever.

Exactly the same mechanism can presently be seen at work in pro-audio. The profusion of small digital consoles that challenged last season's big analogue desks is already giving way to large-scale digital consoles, for example. And the abundance of plug-in processors that emptied outboard racks are about to be outclassed by dedicated multichannel machines from elite manufacturers.

Lately the demands of high-quality multichannel audio have begun to force project studios to concede ground to more traditional facilities. It's a trend you can expect to develop further in the foreseeable future. For a while, at least.

**Tim Goodyer, editor**

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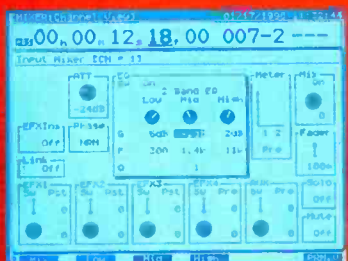
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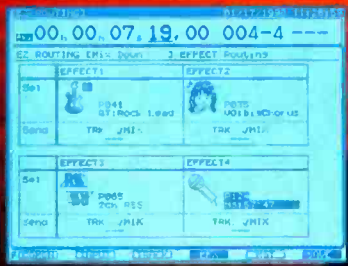


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\*VS-1680P is supplied with internal 4.1 Gig H/D and one VS8F2 effect board (2 stereo/4 mono FX processors)

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■ Tokyo based audio facility VASC has built a new postproduction room fitted with a 20-fader, 48 channel Amek DMS console which is teamed with a 24-channel Fairlight MFX3, and a DoreMi video hard-disk replay system to provide drama postproduction for key broadcasting clients such as Fuji TV, NTV and TV Tokyo. The console is equipped with surround panning joysticks to allow expansion to 5.1 surround for DVD drama production. A further DMS has been installed in the Tokyo studio of producer Maki Fuji. The Blue Room boasts an impressive collection of keyboards including ARP, EMS, Doepfer, Waldorf and Sequential Circuits.

**AMEK, UK. Tel: +44 161 868 2400.**

■ Britain's first national commercial digital only radio operator, GWR Digital, has chosen the Orban OPTIMOD 6200 for two of its digital channels, Planet Rock and Core. The OPTIMOD 6200 is the world's first all-digital audio processor designed expressly for DAB radio, 2-channel television and webcasting. Adult classic rock station Planet Rock and the teenage chart music channel Core reach up to 69% of the UK population with additional transmitters planned to reach 85% by the year 2002.

**GWR Group, UK.**

**Tel: +44 1189 284300.**

**Orban, US. Tel: +1 510 351 3500.**

■ California-based television and film composer John Debney has installed a new 80 fader Euphonix CS3000 in his newly opened facility, John Debney Productions, in California. The 5.1 equipped facility features a Martinsound MultiMAX multifunction monitor controller, E mu and Roland samplers and a PMC Bryston monitoring system. Known for film scores including *Inspector Gadget*, *Dick* and *End of Days*, Debney also composes music for episodic television and theme parks. His first project on the CS3000 is a United Artists Release called *Relative Values*.

**Euphonix, US. Tel: +1 650 855 0400.**

■ Australia's Victoria State Houses of Parliament has seen two SoundField ST250 microphones and custom steering software installed. House of Commons speakers will be recorded through the new system. The nearby Sydney Opera House is currently evaluating the SoundField Mk.V.

**SoundField, UK.**

**Tel: +44 1924 378669.**

■ Canada's LiveWire remote recording operation recently purchased a vintage Ampex ATR104 tape deck modified by ATR Service in York, Pennsylvania to 1-inch 2 track format, the first such machine in the country. Recent projects include Mary J Blige at MuchMusic and CBC TV's live coverage of the 1999 Gemini Awards from the John Bassett Theatre in Toronto.

**LiveWire, Canada.**

**Tel: +1 416 975 0905.**

■ Atlanta, Georgia's Southern Tracks Recording has augmented its SSL 4064G Plus mixing console with a Martinsound MultiMAX multichannel monitor controller in response to record company demand for 5.1 mixes. The MultiMAX has been used for a number of remix sessions and for live concert mixes, including a recent Rage Against The Machine show. The facility is also getting requests to remix archive albums for DVD release in DTS format. Southern Tracks Recording has been involved in the production of albums by Pearl Jam, Bob Dylan, and Aerosmith. The single room facility, built from the ground up in 1983, was the first in the South to install an SSL.

**Southern Tracks Recording, US.**

**Tel: +1 404 329 0147.**

**Martinsound, US.**

**Tel: +1 800 582 3555.**

■ Singapore's Opuz music and postproduction facility has ordered a Soundtracs DS-3 digital console for a new studio. Aimed at the commercial, jingle and film scoring sectors, the new room was designed by Sam Toyashima.

**Soundtracs, UK.**

**Tel: +44 208 388 5000.**

■ Danish national radio and television broadcaster, Danmarks Radio, has purchased a 10-channel Sony WL-800 wireless radio mic system for use at large out-door musical events. Consisting of 5 WRR-850A dual diversity receivers, 5 WRT-867A mic transmitters, 5 WRT-860A belt transmitters, a WD-880A spectrum filter, a WD-820A splitter and 2 AN-820A antennae, purchase represents Danmarks Radio's first use of a Sony wireless system. Across the Skagerak to Germany, Augsburg Radio+Tele, I has purchased two 16-input Cadac C-type location consoles. The first sales of the new 5.1-capable console join that of a Cadac B type to Berlin's ZDF for live on-air and location work.

**Danmarks Radio, Denmark.**

**Tel: +45 3135 0647.**

**Cadac, UK. Tel: +44 1582 404202.**

**Sony, Europe. Tel: +44 1932 816269.**

■ London's Abbey Road Studios has purchased three Marantz CDR630 CD recorders for mastering use.

**Abbey Road, UK.**

**Tel: +44 171 266 7000.**

**Marantz, UK. Tel: +44 1753 686080.**

■ Tucson's Pacific Star has purchased a Klotz Vadis digital audio platform and five Vadis DC mixing consoles for a new facility combining the KVWF-M, KRQQ-FM, KNST-AM and KCEA-AM radio stations into one building. Each station uses a DC for its on air control room; the fifth console is installed in the facility's news production control room. The Vadis platform allows stations to share audio sources from anywhere in the plant.

**Klotz Digital, US.**

**Tel: +1 678 966 9900.**

■ Norway's police have taken a CEDAR Windows system for forensic applications including real-time DeClicking, NR-3 noise reduction and spectral analysis software. The system is installed in the Police Audio Laboratory in Oslo.

**CEDAR, UK. Tel: +44 1223 414117.**

■ France's Erato Disques, a division of Warner Classics, has invested in a pair of Studer A5 active monitors for location recording use for its fledgling surround catalogue. To date the A5s have served on recordings of Ravel's *Bolero* by the Orchestre des Concerts Lamoureux conducted by Yutaka Sado and *Verismo* by Argentinian tenor Jose Cura with the Philharmonia Orchestra. Also in Paris, Mactari has installed a second Soundtracs DS 3 console for film, TV and post work.

**Studer, Switzerland.**

**Tel: +41 1870 7511.**

**Soundtracs, UK.**

**Tel: +44 208 388 5000.**

■ London's GDO post facility has installed a DigiDesign Pro Tools V5 with Pro Control in Studio 3. GDO has designed the new Studio 3 principally for sound design on promos, television programmes and independent feature films. The Pro Control interface is augmented by two Apple Studio Display flat screen monitors, with the Apple G3 installed in the machine room to minimise noise levels in the studio. The Focusrite ISA430 Producer Pack supplies mic preamp, compressor and EQ, and a wide-screen video monitor and Tannoy speakers complete the setup.

**GDO, UK. Tel: +44 171 565 1100.**

**Digidesign, UK. Tel: +44 1753 658496.**



▲ Spain Music recording facility AreaMaster recently opened a new studio complex designed by renowned acoustician and Studio Sound contributor Philip Newell. The complex offers four day-lit rooms with air conditioning and a view over the surrounding mountains. Centre to the main room is a 40-channel D&R Octagon console with dynamics and moving faders. The second room houses a 32-channel D&R Orion console and the facility also offers three fully-equipped rehearsal rooms, bar area, private car park, satellite TV and an outdoor terrace.



▲ UK: London's CTS Studios has added a CXS surround panel to the AMS Neve Capricorn digital console in Studio 2, making it the only desk of its kind in the world. The installation reflects an increase in film scoring and mixing work, and growing popularity of the desk.

## Warner-EMI merger

**US:** The proposed merger between Time Warner and EMI Recorded Music will put Time Warner's Music Group into bed with EMI. Time Warner will own half of the joint venture, while EMI's Recorded Music parent, EMI Group, will own the other half. Time Warner is paying more than \$1bn for control of the joint venture and will have six directors on the board while EMI will have only five.

Negotiations for the deal preceded Time Warner's recent agreement with America Online to pursue development of digital music distribution on the Internet. The proposed deal addresses problems faced by both EMI and Warner Music as Warner is historically strong in the US and EMI has been weak in the US but strong in the rest of the world. Recently both companies have struggled to develop new artists and both have seen their share of the American market decline sharply.

Time Warner president Richard Parsons and EMI Group chairman Eric Nicoli will be cochairmen of the joint venture. Warner Music chairman Roger Ames is expected to be chief executive with EMI Music head Ken Berry chief operating officer. The new company will be the world's second largest music group, behind the Seagram Universal Music Group.

## Digital radio

**World:** The American Digital Radio and the global broadcasters'





▲ UK: Soho has a new post house in the form of Jungle, a 4-studio dubbing facility in Dean Street. Sister to Zoo, the new facility has been designed by Recording Architecture and houses Fairlight MFX3 Plus workstations and Fame consoles in all rooms along with Quested H208 main, H108 rear and VS1115 sub monitoring systems.

consortium Digital Radio Mondiale plan to develop and promoting a world-wide standard for digital AM broadcasting. 'Our aim,' says Peter Senger, chairman of DRM whose members embrace the US, Europe and the Far East, 'is to ensure that a receiver bought

anywhere in the world will work anywhere in the world. Just as important, is ensuring that the transition from analogue to digital is as smooth and as low-cost as possible both for the industry and listeners around the globe. 'Our successful testing demonstrates the viability and superiority of our DAB system,' said Robert Struble, president and chief executive officer, USA Digital Radio. 'We are prepared to take the next steps toward global implementation and look forward to working with DRM in developing a universal digital radio standard.'

### AES Conference

UK: A forthcoming UK AES conference entitled *Moving Audio Pro-Audio Networking and Transfer* is scheduled for 8th-9th May 2000 to address the 'next wave in audio technology'. With digital equipment making possible operations and organisations

that were inconceivable only a few years ago, the future will be determined by the way that we use networks to transmit streams of digital audio and to exchange digital files. The capacity and speed of the latest generation of networks and storage media will bring similar benefits, and changes, to the business of professional audio.

There will be many new issues to consider when audio is transmitted over a network. How fast is fast enough? What does real-time really mean? What errors can be tolerated? Of the competing technologies, how do the benefits compare? Could a single technology handle all audio needs? Can a network always beat physical interchange?

AES, UK. Tel: +44 1628 667002. Email: AESUK@aol.com

### SPARS mastering

US: A new Mastering Group led

by Masterfonics' Glenn Meadows has been established within SPARS to provide an information exchange between manufacturers, facilities and engineers involved in mastering. Set up along the lines of the SPARS Educators group, the new group will host meetings at trade shows and have a presence on the SPARS website. A selection of high-profile parties including Masterfonics Mastering, Airshow Mastering, Digital Domain, Bob Ollsson Audio, Colossal Mastering, and 3D Audio have already declared their support. SPARS, US. Tel: +1 800 771 7727. Email: sparts@spars.com

### Harman to acquire Crown

US: The Harman Pro Group has reached a preliminary agreement to acquire Crown International. Founded in 1947, Crown International is headquartered in Elkhart, Indiana. Once the acquisition is completed, Richard Newberry will continue to serve as President of Crown International, reporting directly to Mark Terry, President of Harman Pro Group North America. 'Crown is very much a company that is at the top of its game right now,' Terry emphasised. 'Last year Crown's revenues were over \$70m. Our goal is to provide management with the resources they will need to continue to lead in the markets they serve.'



▲ US: Nashville's Sound Kitchen, has recently invested in the SoundField SPS422 Studio Microphone System. Boasting 6 SSL-Neve rooms equipped with TAD monitoring, the Sound Kitchen has sited the SPS422 in the most prestige studio known as 'the Big Boy Room' where it has become first choice for acoustic instruments, in particular strings, vocals, drums and choirs.

Sound Kitchen Operations Manager, Tim Coyle, comments, 'We've never heard anything so accurate. When it's in use as an overhead on a drum kit, it's possible to localise every cymbal perfectly within the stereo picture. Our clients always request that the SPS422 processor is placed in the control room so they can experiment with the balance between direct and ambient sound from an ideal listening position.'

Studio Sound [www.prostudio.com/studiosound](http://www.prostudio.com/studiosound)

February 2000 9



## Little guys; big screen

I READ in the August 1998 issue (yes, I'm behind a little) in an article entitled 'Digital and the Bigger Screen' that *The Phantom Menace* was the '...first movie digitally projected for movie-goers'. In fact, an independent film called *The Last Broadcast* was the first to be beamed directly to a movie theatre and projected. Web-sites for the film and for the theatre follow. Please give some credit to the little guys.

Film web-site:

[www.tebweb.com/lastbroadcast](http://www.tebweb.com/lastbroadcast)

Theatre web-site:

[www.countytheater.org](http://www.countytheater.org)

**George W Groves, US.**

## Dropping an ISDN line

I HAVE ONLY recently found time to read the September's articles, as against the news! The article by Jeff Cohen on ISDN on Line has at least two inaccuracies, which I would be grateful if you could pass on to Jeff Cohen.

The BBC's FM radio stations did indeed operate from 1955 but there were no microwave links to them. By the time of my arrival in the BBC in 1964, the VHF FM station at Wrotham, in Kent, was fed by GPO lines which were equalised to above 15kHz for three services Home, Light, Third (plus spares). The regional stations were fed from their local studio centre which had a distribution arriving from the preceding station on lines which went at least to 12kHz. The only microwave links into some VHF sites were reserve links for national emergency purposes. The tests of the Zenith-GE Pilot system from Wrotham on the Third programme transmitter were fed over two

analogue lines which were arranged to be in the same cable and phase matched. Two such pairs existed, although the individual circuits were also used for mono feeds to other services. After it became a real service the initial extension of Radio 3 stereo to Sutton Coldfield was indeed by BBC link, an off-air receiver at Whippsnade had its IF fed by link to Sutton Coldfield, a similar system was later provided on to Holme Moss. These were superseded by the linear PCM system around 1970.

Reports from correspondents were never to my knowledge received into Tatsfield (other than links to things like the Faulks' trans-Antarctic expedition), the GPO used HF Radio Traffic channels (telephone circuits) taken from telephone use and the full system bandwidth fed via the GPO switching centre at Brent on audio circuits to Broadcasting House. The long distance HF radio links normally carried at least two telephone conversations (one on each sideband) and a telegraph, so better quality was achieved by using the whole transmission bandwidth for the broadcast report. At the sending end it was more usual for the correspondent to go to the local broadcaster who had audio connections to their HF relay station. In the 1960s this was how reports from places like Delhi, Cairo were received most days.

I hope you don't mind me sending you this information, but articles such as yours become the source material for later histories. I worked in LCR from 1964 until the mid 1970s, although staying in touch with it into the 1980s when I was Head of Project Management charged with modernising it. I am still a practising project manager,

having carried out the Classic FM project in 1998-9.

**Jeff Bottom, UK.**

## Square deal

IN ANSWER to Nicholas Butt's question about the relevance of square waves to well recorded audio (Letters, *Studio Sound*, October 1999), the answer is that they represent a severe test of transient response. In fact, Keith Holland, in his loudspeaker tests, uses an even more severe test, a step function.

The reproduction of accurate transients is fundamental to good high fidelity and if my part of a system causes audible degradation of a square wave, it will probably also cause audible degradation of musical transient. In fact, the better that they are recorded and mastered, the more likely it is that they will audibly suffer if the transient response is degraded.

**Philip Newell, Spain.**

## New directions

I WAS READING John Watkinson's article on directivity in the November issue of *Studio Sound* and came across the following: 'The 45° crossed-eight microphone has the attribute that the smear and loss of high frequencies is worst in the centre of the image...'

It seems to me that at a centre position, though the upper frequencies will be attenuated by the aperture effect, this effect will be symmetrical in the two microphones and the image will not smear. The worst image smear, I would guess, would be around 22.5° and this would be true for either M-S or 45° crossed-eight microphones.

**Rudy Chalupa,  
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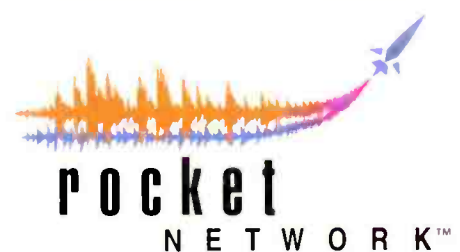
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## February

3-5

### SMPTe Advanced Motion Imaging Conference

Fairmont Hotel, San Francisco, California, US.  
Contact: Bryan Nella, SMPTe.  
Tel: +1 914 761 1100 ext 110.  
Net: www.smpte.org

6-9

### SIEL 2000

Paris-Expo, Hall 3, Porte de Versailles, Paris, France.  
Contact: Reed-OIP  
Tel: +33 1 41 90 48 45.  
Email: siel@reed-oip.fr  
Net: http://siel.reed-oip.fr

8

### AES Lecture: Rights, Management and Technology for Delivering Audio on the Internet

Gilwell & Brownsea suite, Baden Powell House, South Kensington, London SW7, UK  
Refreshments 6.30pm.  
Lecture 7pm.  
Contact: AES.  
Tel: +44 1628 663 725  
Fax: +44 1628 667 002.  
Email: uk@aes.org  
Net: www.aes.org/sections/uk

9-10

### Live! Show 2000

Alexandra Palace, London, UK.  
Contact: Justine Smart, Nexus Entertainment.  
Tel: +44 1322 660070.  
Fax: +44 1322 616319.

17-20

### ITS Technology Retreat

Hyatt Regency Suites, Palm Springs, California, US.  
Contact: Nancy Zern, ITS.  
Tel: +1 703 319 0800.  
Fax: +1 703 319 1120.  
Email: nancyzern@erols.com

19-22

### 108th AES

Palais des Congres, Paris, France.  
Contact: Hermann A O Wilms.  
Tel: +32 2 345 7971.

Email: 108th\_exhibits@aes.org  
Net: www.aes.org

## March

5-7

### Entech 2000

The Dome, Sydney Show-ground & Exhibition Centre, Homebush, Sydney, Australia.  
Contact: Caroline Fitzmaurice, Connections Publishing.  
Tel: +61 2 9876 3530.  
Fax: +61 2 9876 5715.  
Email: caroline@conpub.com.au  
Net: www.conpub.com.au

14

### AES Lecture: Understanding A-D and D-A Converter Measurements

Gilwell & Brownsea suite, Baden Powell House, South Kensington, London SW7, UK  
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Lecture 7pm.  
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Fax: +44 1628 667 002.  
Email: uk@aes.org  
Net: www.aes.org/sections/uk

15-19

### ProLight & Sound 2000

Frankfurt, Germany.  
Tel: +61 81 750 11.  
Fax: +61 81 757 00.  
Email: info@werbebauges-mbh-octanorm.de  
Net: www.werbebauges-mbh-octanorm.de

26-29

### SIB International

Rimini Trade Fair Centre, Rimini, Italy.  
Contact: Ente Autonomo Fiera di Rimini.  
Tel: +39 541 711 711.  
Net: www.fierarimini.it

## April

5-6

### ABTT: Association of British Theatre Technicians show

Roayl Horticultural Hall 2, Greycoat Street, London SW1, UK.

Contact: ABTT.

Tel: +44 20 7 403 778.  
Fax: +44 20 7 378 6170.  
Email: office@abtt.org.uk

12-14

### Optical Disc Production 2000

Tokyo Big Sight, Tokyo International Exhibition Centre, Japan.  
Contact: Mesago.  
Tel: +81 3 3359 0894.  
Fax: +81 3 3359 9328.  
Email: kunimoto@message-jp.com  
Net: www.mesago-jp.com/odp

15-18

### DVD Summit III

Dublin, Ireland.  
Contact: DVD Summit.  
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Fax: +353 1 667 1713.  
Email: info@dvdsummit.com  
Net: www.dvdsummit.com

## May

8-9

### AES UK Conference Moving Audio: pro-audio networking and transfer

Church House, London, UK  
Refreshments 6.30pm.  
Lecture 7pm.  
Contact: AES.  
Tel: +44 1628 663 725  
Fax: +44 1628 667 002.  
Email: uk@aes.org  
Net: www.aes.org/sections/uk

8-9

### TV 2000

Budapest, Hungary.  
Contact: Scientific Association of Infocommunications.  
Tel: +36 1 353 1027  
Fax: +36 1 353 0451.  
Email: hte@mtesz.hu  
Net: www.mtesz.hu/hte

## June

3-6

### Nightwave

Rimini Trade Fair Centre, Rimini, Italy.  
Contact: Ente Autonomo Fiera di Rimini.  
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12 February 2000



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## 2000 SSAIRA VOTING

**T**HE THIRD YEAR of the *Studio Sound* Audio Industry Recognition Awards finds us departing from previous years' events in one significant respect only: due to the early timing of the European AES Convention, we will not be holding our Awards ceremony in Paris, but in London at a slightly later date. In all other respects you are invited to vote for your favoured pieces of new equipment through the established channels of post, fax and email (details below). Based on the growing success of the previous two Awards, we are anticipating an even bigger response this year. Please support the manufacturers of your choice with your votes.

### Ways to vote

Readers can vote for one product in each category in four ways.

1. By filling in the form and posting it to: SSAIRAs, *Studio Sound* Magazine, Miller Freeman Entertainment, 8 Montague Close, London Bridge, London SE1 9UR, UK.
2. By faxing the form to: +44 171 407 7102.
3. By emailing their unique reader identification number, the category numbers and their votes to: SSAIRAs@unmf.com
4. By filling in the interactive voting form on the *Studio Sound* web-site: [www.prostudio.com/studiosound](http://www.prostudio.com/studiosound)

14 February 2000

## N O M I N A T I O N S

### 1. Large scale console

AMS Neve Libra Post; Calrec Alpha 100; Euphonix System 5; Midas Heritage 2000; Toa ix5000B; Soundtracs DS-M

### 2. Medium to small scale console

Allen & Heath ML5000; Audient ASP8024; D&R Airlab; Klotz Digital Spherion; Mackie D8b; MTA 924; Soundcraft Series Two; Soundcraft Series 15; Studer On-Air 5000; TL Audio VTC; Triton TS-24; Roland VM3100 Pro

### 3. Outboard dynamics

Avalon 747SP; dbx Quantum; Drawmer DC2476; Joemeek C2; TL Audio Valve Classic C-1; Tube-Tech SMC2A

### 4. Outboard preamp

Aphex 1100; Presonus MP20; Summit MP4X; TL Audio Valve Classic PA-1

### 5. Outboard equaliser

Focusrite ISA430; KT DN422M; Summit MPE200; Summit EQ200; TL Audio Valve Classic EQ-2

### 6. Outboard Reverb

Eventide Orville; Roland SRV3030; Quantex Yardstick; Sony DRE-S777

### 7. Combined outboard device

Eventide Orville; Focusrite ISA430; Joemeek VC6Q; Jünger Audio Accent I; TC Intonator

### 8. Monitors

ATC SCM70SL; Genelec I036A; HHB Circle 3; Munro MA1; PMC TBIS; Tannoy Reveal Active; Westlake LC5.75

### 9. Microphone

Audio Technica AT895; Audio Technica AT4047SV; DPA 3541; Earthworks SR77; GT Electronics AM40; Joemeek JM47; Neumann Series 180; Sennheiser Evolution wireless

### 10. Convertors

Apogee PSX100; Euphonix multi-channel convertors; Prism ADA8; Weiss SFC2 SRC

### 11. Audio editor

DAR Storm; Digidesign Pro Tools V5.0; Soundscape R.Ed

### 12. Audio recorder

Digidesign Pro Tools MIX plus; Euphonix R1; Fairlight Merlin; Marantz PMD650; Sony MDS-E11; Sony MDJE530; Soundscape R.Ed; Studer A827 Gold; Tascam D40

### 14. Location portable equipment

Copper CS208; Marantz PMD650; You/Com ReporterMate

### 15. Plug-ins

Aphex Big Bottom; Digidesign Bruno/Reso; Digidesign Sound Replacer; CEDAR Declick 96 (SADiE); CEDAR Declick (Soundscape); Line6 Amp Farm; Steinberg TL Audio EQ-1; Wave Mechanics Pure Pitch/Pitch Doctor;

### 16. Special category

CEDAR BRX+ debuzzer; CEDAR AZX+ azimuth corrector; Neutrik Minirator MRI; mSoft ServerSound; Symbolic Sound Kyma 5

**VOTES CAN BE CAST** by photocopying or cutting out the page opposite, filling it in and returning it to: SSAIRAs Nominations, *Studio Sound*, 8 Montague Close, London Bridge, London SE1 9UR UK. Fax: +44 171 407 7102. Alternatively, you can email the category numbers and your nominations to [SSAIRAs@unmf.com](mailto:SSAIRAs@unmf.com)

**Readers will only be allowed to vote once. Readers may only vote for one product in each category.**

**Your reader identification number is the nine-digit number starting with a zero that is located in the middle of the top row of your *Studio Sound* address label. In all instances the inclusion of the reader identification number is essential.**

The objective is to identify equipment

that genuinely warrants recognition for being special in some way.

Readers are not obliged to vote in all categories and their attention is drawn to Special Category 16 which serves as a 'catch all' for any products not covered in the other categories.

Any questions can be directed to Zenon Schoepe and Tim Goodyer at *Studio Sound*. Tel: +44 171 910 8500.

[www.prostudio.com/studiosound](http://www.prostudio.com/studiosound) Studio Sound



# SSAIRA FAX VOTE

V O T I N G

1 Large scale console

7 Combined outboard device

14 Location portable equipment

2 Medium to small scale console

8 Monitors

15 Plug-ins

3. Outboard dynamics

9. Microphone

16 Special category

4 Outboard preamp

10 Convertors

5 Outboard equaliser

11 Audio editor

6 Outboard reverb

12 Audio recorder



V O T I N G  
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# Lexicon 960L

The race to establish a bench mark professional multichannel digital effects processor is on. **Dave Foister** introduces and explains the first contender

**T**HE LEXICON 480 is about 14 years old. Think about that. Think about what else has changed since then. When it first appeared there were almost no digital mixing consoles, and DAT was a novelty. DSP advances so fast that some of the '80's contemporaries are now regarded as retro. Yet it remains one of the most highly regarded reverbs in the business, giving it a product life normally only expected from microphones and possibly mixing consoles, certainly never from digital processors. Think about the achievement that represents, and then wonder how Lexicon could follow it.

There is a hint already in the latest cartridge for the 480L itself: the Surround/High Density cart. Responding to the growing need for proper surround reverb, particularly in film and TV post, but increasingly in music too, the new cart provides true 4-channel surround reverb using the entire DSP resources of the unit. There is also the facility to have the same program on both pairs of outputs and mix them to stereo; the result is a very dense and smooth reverb. But of vital interest here are the surround programs, many of which are based on stereo Lexicon favourites from both the 480 and the 300—the 300's halls, Studio A and Contemplate, and the 480's Woodrooms, Large Chamber, and Snare and Fat Plates.

The literature for the cart gives an insight into Lexicon's approach to the whole business of reverberation, and particularly that of Dr David Griesinger, the man at the heart of Lexicon's reverb developments all the way back to the 221. It is clear that Griesinger is a man with strong views backed up by extensive research, and the direction Lexicon has followed as a result does not necessarily correspond with that of other manufacturers. We generally think of reverb generation as being an attempt to physically model a real space, and the adjustable parameters on most reverbs reinforce that view. Lexicon prefers to model what the human ear hears—and wants to hear—hoping in the process not only to produce natural convincing reverbs but even to improve on what nature has to offer.

The research on which the approach is based has to do with the identification of speech elements—phones and phonemes—together with intelligibility. Clear timing factors emerge that dictate how a room or artificial reverb is going to affect these parameters, and there is a crucial space of time from 50ms after the instigation of a sound to

around 150ms after it that can determine whether the source will remain clear or become muddy, depending on how much energy the reverberation puts into the space. Up to 50ms early reflections are not distinguished as discrete repeats, and after the 150ms the reverberant tail needs to be smooth and convincing. The gap between is where, according to Griesinger's research, many real spaces inject too much energy to allow maximum clarity, and where a well-designed algorithm can improve on this aspect while still sounding completely natural and realistic.

The work done with the 480 Surround cart is the first step towards bringing these factors into the surround arena, but Lexicon's new flagship processor builds further still on this to produce a full 8-in, 8-out surround reverb with enormous flexibility, huge capacity for further hardware and software development, and real commitment to making surround reverb work properly in a full surround mix. Griesinger's ideas are augmented by those of Michael Carnes, who has handled much of the development of the new device's algorithms. The new box is called the 960L and is aimed unashamedly at the high ground of music and post, the areas where Lexicon is traditionally first choice. With this in mind it comes as a fully spec'ed package with all the I-O and the new remote as standard; when you see what this offers, and the power lurking within, it starts to look like something of a bargain.

The surround algorithms are in a sense a logical extension of the thinking behind true stereo reverb, an area that can distinguish the serious players from the me-toos. The way a stereo input maps on to a stereo reverb field says a lot about how well the programmers understand what's going on in the physical world, and the increased challenges of making this work with multiple inputs and outputs are something few can rise to yet. The expectation of the 960 is that surround mixing will be to five main channels, so one of the many available configurations has five inputs and five outputs, allowing a 5-channel panned aux send to excite the reverb in the most natural way possible. Bill Benoit, who creates many of the presets from the raw algorithms, likens the approach to having five or more doors into a space; if you enter by any one of them and make a sound, the reverberant field will be influenced by where you are, although it will soon

settle into a diffuse field around the entire space. Lexicon's term for how the company's central approach has been extended and rethought for surround applications is 3DPM, for Three Dimensional Perceptual Modelling, although everyone's keen to avoid any confusion with the idea of perceptual coding; 3DPM has nothing to do with data reduction or compression. The word is simply used to distinguish the method from the physical modelling often used elsewhere.

Absolutely fundamental to the naturalness of 3DPM is the enormous emphasis Lexicon places on complete decorrelation of all the elements of the reverb. Too often a reverb will settle into a steady state where comb filtering within each channel and between channels starts to become audible, adding colouration, undermining the illusion and compromising mono compatibility. Lexicon algorithms never stay still long enough for this to occur, and in the 960 the principle has to apply across all the outputs. Lexicon points out that it is still the case that the bulk of recorded material will end up being heard somewhere in mono, and that whatever we do should still work in those circumstances; but mono only exaggerates problems that are still there in full surround if sufficient care is not taken.

Like the 480, the 960 can support multiple 'machines' simultaneously, and several configurations present an intriguing set of possibilities. If one is set up as described above, with five ins and five outs, there is still capacity for a second 5-output machine, this time fed with a stereo signal on two inputs. The two machines' surround outputs are mixed on to the same physical outs. At the other extreme, the 960 can behave as four completely independent stereo machines with quite separate ins and outs and the full palette of stereo effects available to all four.

This points straight away to the hardware capabilities of the basic unit, all of which will be capable of being increased in the future. The format is familiar: a 4U-high box with nothing on the front but a diskette drive and all the connectors on the back, and the whole thing controlled by a dedicated remote. The 960 hardware is all new, with a PC chassis hiding inside the box complete with CD-ROM for software upgrades, and all-new DSP cards combining the current proprietary Lexichips with Motorolas as appropriate. One single card provides all the multichannel multimachine capacity described, and

there are slots for no less than two more. Everything in the unit is designed with as-yet-unforeseen expansion in mind; the architecture is as open as it gets. Nothing is set in concrete, even down to the provision of a removable panel section on the back that at present has no function envisaged for it at all.

Ins and outs consist of eight each balanced analogue, with 24-96 converters of which Lexicon is clearly very proud, and four each AES-EBU, also 24-96 capable. Converters have been doubled up to find an extra 3dB dynamic range, so that the noise performance in this area is now close to that of the supporting hardware. There is room for another strip of XLRs, and where there are already options they are options to leave things off—some users might not feel the need for any analogue I-O at all, for instance. Single-wire 96kHz operation has been chosen with maximum compatibility in mind. MIDI and wordclock are of course also there, and like the 480 there are two remote connectors for simultaneous control by two operators.

The remote is completely new, and by comparison makes the familiar LARC look like a 1970s calculator. This is the LARC2, and it is a little bigger in order to make room for eight moving touch-sensitive faders, a joystick, a whole set of dedicated buttons, some illuminated, and an amazingly neat little high-resolution colour display screen. Good use is made of colour to highlight what you're doing, and even very small text is easily legible. Much, much more information can be seen at any one time, and the moving faders deal with the issue of having to null the old LARC controls.

A good example of what the LARC2 can do comes with a look at the main Edit page. Here rows of eight parameters appear, one for each fader, and simply touching one of the faders highlights its parameter and adjusts it, showing the current value prominently at the top of the screen as well as in its box in the grid and above the fader itself—you are never short of information with LARC2. Moving down a row with the arrow keys sends the faders instantly to their positions for the next row of parameters, like a digital console. The resolution allows all the parameters for a preset to be on screen at once, making it much easier to get straight to what you want, and although the basic labels retain the shorthand of the LARC, each parameter gives a full description of itself when selected.

Lexicon is real-world enough to know that many situations do not allow the time to probe all the possibilities of an algorithm for the ultimate fine tuning, and on units like the PCM81 and 91 there is a basic set of adjustment controls for fast access and a more detailed expert set. Like those boxes, the 960 allows. >







< independently for each preset, a favourite row of parameters to be assigned to what it calls the V-Page for immediate adjustment, and these are shown above the faders and immediately available regardless of what screen is currently displayed. The faders also have a Fine adjustment mode for moments when the resolution is too coarse for the delicate touch. Selecting this mode puts all the faders in their central positions without altering their values, and allows small incremental values to be added or subtracted from the existing settings.

The joystick too is fully assignable. Its obvious role is mapping inputs to virtual positions, a particularly useful option if your console does not have 5-channel panning. Here a source can be walked around the room smoothly and evenly, and this perhaps shows up the success of the 3DPM techniques better than anything: even with the dry source muted, its position in the sound stage is always perfectly clear while remaining part of a smooth unified field across the room. The joystick can otherwise be used to control any two parameters simultaneously, so that for example vertical movement could be the room size while horizontal is the diffusion.

There's a lot of room for text on the screen, so there's plenty of context-sensitive help, and room for not only labelling your own presets (or regis-

ters) but attaching copious notes about what they do. Entering text is a whole lot easier than with conventional nudge keys and dials, but for faster working still there is a socket for a standard PS/2 keyboard on the back of the LARC2. Flipping between the 960's internal machines is easy, and if you have two remotes each can be controlling a separate machine. The one element that is downsized from the original LARC is level metering, which now consists of three LEDs—green, yellow and red in ascending order of level—for each channel, placed in a row above the main screen. Given a calibrated system these do the job, and are much more visible at a distance in case of overloads.

This interface is a vast improvement on the old LARC, but the basic nature of the original never did anything to put people off the 480. The reason you buy a Lexicon is the sound, even more so with the big ones, and the 960L has a lot of reputation to live up to. It does so emphatically—this reverb is awesome. The surround simply fills the room with the chosen ambience, immersing you in a stunningly natural, shut-your-eyes-and-you're-there field of sound. This remains true whether it's a concert hall or a small percussion space, and one of the oddest things was hearing what was immediately identifiable as a plate—but all around



the room. There is never any feeling that you're hearing one reverb at the front and another at the back; there is seamless continuity both around the perimeter and across the room. One big thing I judge any surround system by (because I know how well it can be done) is how big the sweet spot is, and more to the point how dependent on a sweet spot the illusion is. Some sound stages collapse if you get too far off centre, but the good ones preserve clear imaging around the room even when you are standing outside the loudspeaker array. The 960 does just that. The solid sense of space is retained right across the room—with the kind of changes you'd expect if you stood in the corner of a real room—even if you're right in front of a speaker or even standing behind one.

Running two machines gives you the chance to get fancy, with, for instance, a stage ambience on one and a hall on the other. You can then weight one to the front and the other to the back, creating a space with real character, but not the clumsy separation that two stereo reverbs would produce. You can create a space with a main overall character, but some architectural feature down one side—a corridor, say—that picks up sounds panned over that side.

This is the kind of flexibility that has made the 480 so popular in post, and it's all there in spades on the 960. Again,



960L DIGITAL EFFECTS SYSTEM

lexicon

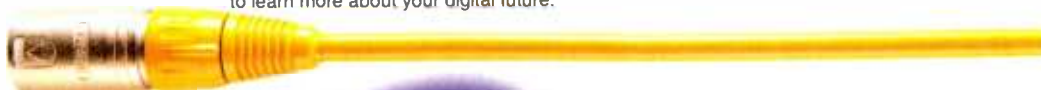
familiar favourite Lexicon patches have been ported over into the surround system, so running it in stereo you get something that resembles four 480s in a box, all the way up to two full surround 480s and much more besides

—and that's with just the one card. The 480 long ago became the one everybody else had to try to measure up to, and there's no doubt that when it comes to surround the 960 is going to do exactly the same thing. ■

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# Euphonix System 5

Euphonix' move from digital control to full digital operation was as inevitable as it is meticulous. **Rob James** assesses the future of the company's digital console

**E**UPHONIX HAS COME a long way in a decade. Arriving at a time when the industry seemed a little moribund it made ingenious use of digitally-controlled analogue technology and survived turbulent times to become a major player. It seems appropriate to greet the company's first all-digital console at the dawn of the new century.

The big digital console has become a routine sight in many spheres of sound mixing. Early developments were protracted and tentative with ruinous costs, dubious products and sometimes poor reliability, at least of software. The market has settled down somewhat and a number of control surface designs have gained adherents, if not disciples. Several manufacturers have tried to convince us that one control surface can serve all applications discovered the

cessing power without a complete redesign. It is also inherently more flexible in allowing many permutations of console design with the same hardware. Arguably this is also more cost effective since it is possible to have a console with almost any mix of features in individual channels.

The alternative approaches also have advantages. In most designs all channels have identical facilities as did analogue desks. Expanding a system is possible in smaller units and, since there are usually more processor cards, a failure in one is less destructive. In the Euphonix System 5, since all processing for a single channel is done on a single chip, troubleshooting and redundancy is manageable and, more importantly, processing delay is reduced.

On the control side there are also options: one approach is the analogue style surface, another is to use blocks of reasonably conventional looking channel strips which control a larger number of channels by using layering. The third is to use a minimum number of controls on channel strips with a comprehensive assignable centre section setting the bulk of parameters. Whichever model is used the trick is to come up with the most transparent and intuitive way of keeping track of what is going on.

The System 5 uses layering and an assignable centre section as the basic control model with a cross between the pool and dedicated processing architectures. With fixed architectures the console you get, in terms of number and type of channels and buses is the one you specify. With pool architecture any console can be specified within limits, provided there is sufficient processing.

Euphonix has chosen to a slightly more restricted approach to minimise confusion. You can't design your own channels and all channels have the same processing functions, however, the number of channels and number and type of buses is flexible. You are provided with a library of 'mixer models' designed to cover most commonly found tasks. There are different models for 48kHz and 96kHz sampling rates. As might be expected, the higher rate gives smaller models for a given amount of processing. The general rule is fewer channels allow more buses and vice-versa.

System 5 is modular in concept throughout and breaks down into three independently scalable groups of elements: I-O, processing and control. Each of the Input and Output units, the Studio Computer unit and the Pilot computer units are in 2U rackmount format. The input units connect to a Studio Hub unit, also a 2U rackmount. Outputs either go direct from the Digital Frame processing units to the Output boxes or via a further Studio Hub. The various input and output boxes are the same as those used with the RI recorder or are available 'stand alone' for people who simply require an interface to other MADI equipment. Each I-O box handles 28 channels giving 24 primary format channels and four aux channels which add a further two analogue and two AES-EBU. The AES-EBU channels have automatic sample-rate conversion. All the I-O is 24 bit with dither on the AES-EBU outputs selectable in sets of two channels, internally the system works with a 32-bit floating-point audio path, and 40-bit floating-point computations inside the DSP chips. Latency is approximately equivalent to moving a mic 30cm including conversion. Time alignment is near constant unless you sub-group or split feed a signal via an insert. In any case there are pre-delay adjustments to compensate for this. System 5 works at 96kHz and the various rates around 44.1kHz. Internal clock rates are either 44.1kHz, 48kHz or double these.

Each Digital Frame can take nine DSP cards with a further slot for a 'redundant' processor card. If an on-line processing card fails the redundant card automatically replaces it and the operator is alerted to the problem. There are six SHARCs per DSP card, each processing two full function channels. Cur-



hard way this is not so. Mirroring custom analogue consoles all the major players now offer either different surfaces or a variety of building blocks tailored to suit specific applications and Euphonix is no exception. Nowadays the most obvious philosophical differences are to be found in the underlying architecture and technology employed.

One area of disagreement lies in the disposition of DSP. There are effectively three common approaches: one processor per audio channel, one processor or card per block of channels and the 'pool' where all channel processing takes place within a centralised DSP core on relatively few cards. In the latter, functions are dynamically allocated to processor time slots rather than specific chips. If well executed this approach is potentially more future proof than the alternatives - if developments arise which require more processing power (EQ modelling for example) it is possible to reallocate pro-



rently there is a limit of four 'core frames' which gives a maximum of around 240 channels or correspondingly less with the maximum 48 groups, 48 mix and 24 aux buses. Consoles are provided with six extra channels of processing over the maximum specified which can be used as full processing group masters or extra channels.

Control is where the Euphonix design philosophy starts to show. Each block of eight physical strips and the centre sections can be considered as stand alone units. The only connections to each block are a mains plug and an RJ-45 100baseT network connector. The SC261 studio computer which handles the housekeeping and automation connects in the same way and includes a re-writable CD-Rom drive for backing up projects.

Each physical control block is connected to an off-the-shelf 100baseT switching hub as are the Pilot Computers. There are two flavours of these in the console I saw, the SC253D which controls a single Digital Frame full of processing via IEEE 1394 (Firewire) and the SC253i which deals with machine control and remote control of the the MC524 Monitor Interface and ML530 analogue Mic/Line Interface using a proprietary connection protocol. eMix is the management software program for System 5 which runs under Windows NT on the System Computer and includes applications for File Directory, PatchNet, Bus formatting, System Setup, Format Fold-Down and External Input Setup. PatchNet is a MADI patching system which uses a MADI routing hub and handles all patching for the console and external device inputs and outputs. The cost of I-O is now low enough to make the patchfield free studio a reality.

The most striking feature of the surface is the rotary controls. As might be expected on digital console these are attached to endlessly rotating shaft encoders. The feel is peculiar on first impression, stiffer than usual with some inertia. This is due to mechanical gearing used to increase the encoder resolution. An annular ring of sharp focussed LEDs indicates the current position and the illuminated spot in the centre changes colour depending on what is being controlled. Two pairs of red and green LEDs above and below the centre spot indicate knob and switch automation status. The knob cap is also a mechanical soft touch switch, used to put the controlled function into automation write, or to bring up the numeric position of the control in the associated 4-character alphanumeric display.

Left and right page keys scroll the rotary controls through up to four pages for each group of functions. The first page is a combination of the most frequently adjusted parameters. Each Strip can control two channels—Main and Swap. A Strip may also control a VCA-

style level control group as well as a channel, or 2-level control groups.

If an ML530 Mic-Line interface channel is patched to the input, the top four knobs allow remote control of the analogue input functions. The order of the four processing sections in each channel may be changed for different applications but you still can't put the dynamics post fader. At first glance this is a 2-layer design which could be used in in-line fashion. In fact there is a lot more to it than this as any processing channel including group masters can be called to a strip and attached to either layer. Complete sets of these assignments are made and saved as Layouts. For example, one layout could bring up channels 1-48 to Strips 1-48. Another layout could group together a set of similar audio channels such as all drum channels or all dialogue channels. Layouts do not save settings such as EQ, they simply save the layout of channels on the console, which Strips control which channels. This means you can have as many layers as you like.

EQ bands are not 'full-range' to give a more analogue feel and higher resolution of the frequency select controls. The four parametric bands give  $\pm 15\text{dB}$  of boost or cut and are supplemented by two independent filters. The dynamics display shows the level, the gain reduction and also uses the 'gain-ball' also seen on the CS-3000. Dynamics may be self-keyed or patched to another source. A link input allows any number of dynamics to be linked together to provide proper multichannel dynamics.

The WAVE key has three functions; pushing both the Main and Swap channels to the centre, as a Strip select key. Strip Expand allows the user to take a single Strip and expand it so it takes up several Strips on the surface all working on the same Channel. This allows each set of knobs to show different parameters; EQ, Dynamics, Aux, Group, Mix, Input Pan... The centre section is logically split into function groups. Machine Control, Monitor and comms, the Utility panel, automation control, bus masters, group masters and the centre strip can, in theory control the whole console with its 48 knobs and eight faders. The select panel keys show when channels are on in banks of 32 and allows you to mute and solo channels not on the surface—particularly useful in film work. The WAVE or attention key on the normal strip 'pushes' a strip to the centre section or any channel can be 'pulled' to it. The 48 knobs are still not enough to show every possible function of a single strip. In future versions this will be user configurable.

System 5 has a total of seven monitor outputs. The main control room monitors can handle eight outputs for any

format up to 7.1. There are also two alternate speaker feeds and Alt2 which is stereo. Four feeds are used for SLS or Cue feeds. Mon A can deal with up to 8 outputs, the other three are stereo.

Selections to the speakers can be either additive, which allows summing of sources, or used in 'intercancel' mode where only one source is permitted at a time. This allows for safe monitoring of pre-dub returns. These do not use up DSP resources.

Also for multichannel work, fold-down options are provided, selectable on a screen matrix on the Studio computer. Many combinations of input and



output format can be set up and saved for future use as presets. It is also possible to 'fold up' to a 5.1 mix in a 7.1 environment. For example, to bleed something onto the inners.

You might expect a new console from Euphonix to be ready for music. The surprise is just how close it is for broadcast and film. For broadcasters there are good comms and hooks although there is no mix minus in the phase cancelling sense. You simply 'reverse route' to the destination via sub groups. If you want film style paddles for source direct and record switching, they are coming soon.

The Bus master control sits next to the centre strip. Up to 16 sections or stems of mix buses are available. Each section can have from one to eight buses. Depending on the mix model chosen >

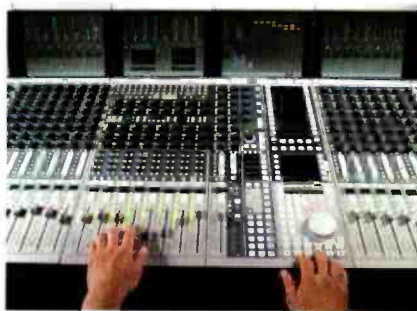


< very sophisticated busing arrangements are possible.

All the meter displays are high-resolution bar graphs. The colours and dimensions may not suit everybody—there is only a narrow grey bar to show you are going over your chosen brick wall although a red segment at the top of each meter does attract the eye when digital clipping is reached. I feel there is some room for improvement here. The TFT screens would lend themselves admirably to vectorscope style displays

Four basic automation modes. Isolate, Write Absolute, Write Relative (trim), and Read can be applied globally or to individual strips or functions. Automation can be written at any speed from crawl up to play but there is no automation play in sync reverse. Fill to Punch fills automation data backwards to the punch in point. There are other well thought out fill functions, backwards and forwards. You can also work in 'regions' and for those 'moments' there is unlimited undo-redo. As work progresses a 'mix tree' of passes is created. When this becomes untidy, the mix tree can be 'pruned' to remove spurious passes.

Automation editing, CS-3000 style, is slated to arrive in a future software version as are EQ and Dynamics libraries. Faders can be punched in by either touching them or from the fader parameter select key.



I was delighted to find one of my favourite automation punch-out modes for knobs and faders, Autotakeover. When selected the operator initiates a punch out using the punch key, however the object will not actually drop out until the level matches the underlying automation level from the previous pass.

Euphonix has clearly thought long and hard about System 5. Not least, it has been careful not to re-invent the wheel—where the computer industry already has a suitable solution then the Euphonix motto is 'leverage it'. This is evident in the control interconnects and the use of industrial PCs and operating systems. The philosophy has always been to provide a control surface which doesn't require its own post

(zip) code whilst retaining maximum visual feedback. It employs a number of ingenious ideas to this end and to keep things quiet there are no fans or hard drives in the surface.

My acquaintance with the System 5 was all too brief. I have really only begun to explore its charms but there is a sense of immediate familiarity about the whole surface. An operator coming to it cold should be able to get a mix out of it without too much grief. But the System 5 is much deeper than this might imply. The surface conveys a vast amount of information graphically. Colour is used to particularly good effect.

Some things are still a little cumbersome in v1—loading a mix model which uses a different number of frames or sampling rate requires a re-boot of the system and a bit of fiddling about but even in this version there are many 'smart' functions. One example is copying of settings between strips.

This is an extremely promising debut for System 5. I believe it will be seen as the first of a new generation of digital consoles. I also think the fundamental architecture may well represent a pivotal point in the design of high-end audio systems generally. ■

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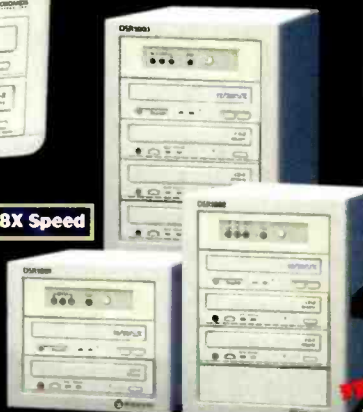
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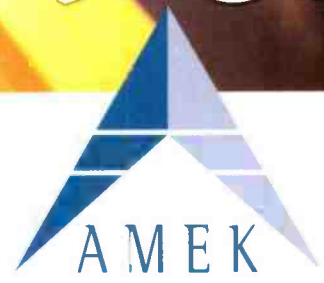
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# Merging Technologies Sphynx

Designed to enhance the Pyramix workstation or offer high-quality audio conversion, Merging Technologies' Sphynx is a curious beast. **Terry Nelson** solves the riddle

**T**HE AUDIO INDUSTRY loves boxes with mystique. Kit that promises esoteric performance yet offers no account of how it achieves it is the pornography of pro-audio. It is as true of the digital age as it ever was of the analogue age.

One of the new niches to appear is that of A-D and D-A converters and much is made of the performance and potential of expensive high-end converter systems. However, experience tells us that it is often the 'simple' things that are generally the hardest to do well and maybe this accounts for the plethora of converters that are now coming onto the market.

Merging Technologies is best known for the Pyramix Virtual Studio system

a second SELECT button that allows the required sample rate to be selected as well as its multiple. For example, 44.1kHz would be x1 and 96kHz would be x2.

The Input Level Meters section is not so much metering as zero level indication and signal present, two rows of eight LEDs indicating 0VL (0dBFS) and 1VL (-60dB).

Finally, the Monitor section features two rows of four LEDs indicating the inputs and outputs of each of the four pairs of channels to be monitored on headphones. The input or output required is selected by pressing a SELECT button. The LEDs also act as a useful status indicator upon power up by indicating the number of I-O modules

an additional female XLR for AES-EBU reference signal. When AES-EBU modules are installed, only the odd-numbered connectors are used (AES-EBU 1-2 are on connector 1, AES-EBU 3-4 on connector 3). The roster of connections is completed by three BNC connectors for Video-Wordclock (Input, Loop, Output), two RCA (or Cinch) connectors for SPDIF and four ODI (ADAT lightpipe) optical connectors. These are grouped as A I-O and B I-O. The A and B inputs can be selected from the front panel in Configuration mode (of which, more later) or a Pyramix DAW, with the A input being the main ADAT source. The B input can also be used for an optical SPDIF signal. Output B mirrors output A and permits daisy-chaining of



and has more recently turned its attention to hardware. Most people need to get in and out of their DAWs with analogue signals and to this end, Merging has released the Sphynx converter system that can either be used with Pyramix or as a stand-alone system.

Sphynx is interesting for a variety of reasons, but primarily because it is a modular system that can be easily expanded or changed from two to eight channels according to budget and/or requirements. It comes in a 2U-high rack chassis with white legending on a black finish and is laid out as follows.

The first control is a rocker on-off mains switch followed by a REMOTE LED that lights if the unit is under remote control from a source such as a DAW. The panel is then divided into four clearly marked sections as follows: Synchronisation, Sample Rate (kHz), Input Level meters, Monitor.

The Synchronisation section shows the sync status of the unit and has LEDs for Internal, ODI (ADAT optical), AES, Video, Wordclock, SPDIF. A SELECT button allows the sync source to be selected. The moment the unit detects the right signal, the LOCK LED lights.

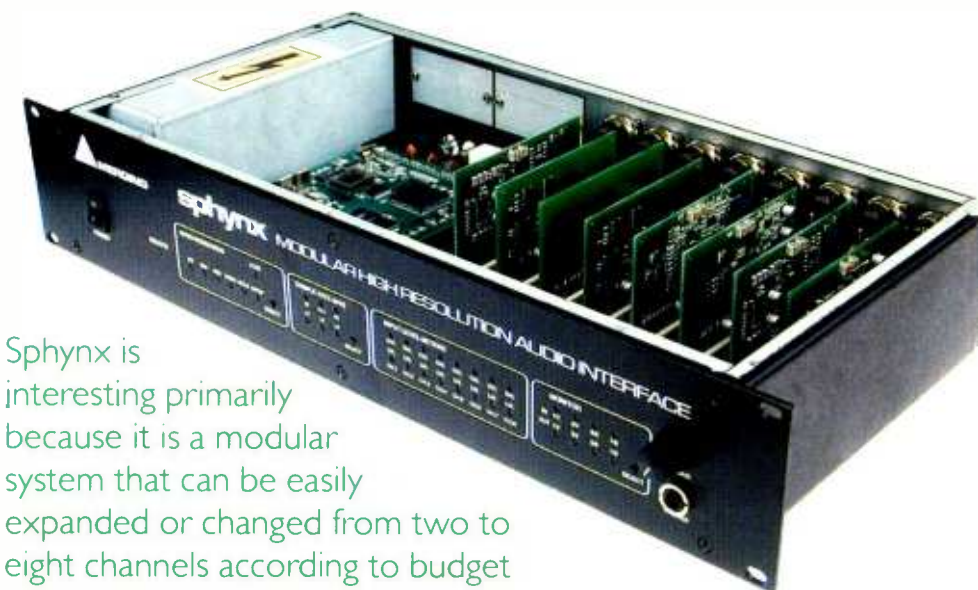
The Sample Rate section features LEDs marked 32, 44.1 and 48 with corresponding LEDs underneath marked x1, x2 and x4. The section is completed by

installed. The review example contained three modules, which meant that six LEDs lit for several seconds before defaulting to the last setting at power down. The channel LEDs also provide a quick check for output status: if you select an output that has no signal, the associated LED will flash.

The rear of the chassis offers two rows of XLR sockets with gold-plated contacts, the top row being Outputs 1-8 and the lower row Inputs 1-8. There is also

ADAT compatible equipment. It can also be set to output an SPDIF formatted copy of ADAT Channels 1 & 2. Since the review unit was received, the A and B connectors have been updated to each receive four channels of 24-bit digital audio when operating the unit at 96kHz or other high sampling rates.

The remaining facilities are an IEC mains connector and two blank plates marked Aux 1 and Aux 2 for optional connection modules (such as TDIF) >



Sphynx is interesting primarily because it is a modular system that can be easily expanded or changed from two to eight channels according to budget



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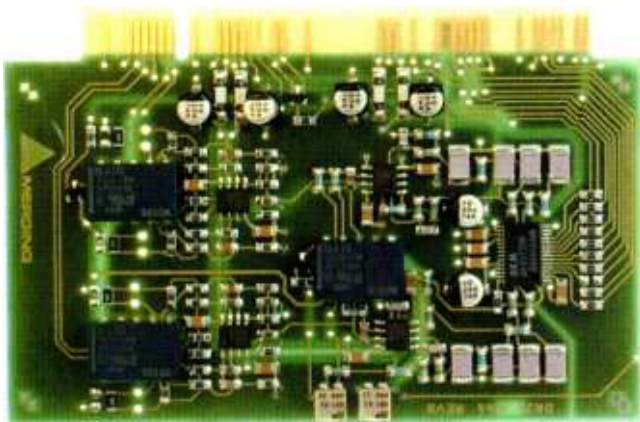
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◀ currently under development.

As it stands, Sphynx is equipped with ADAT lightpipe and SPDIF I-O. The rest of the unit is then configured with dual channel input and output modules as required—for example, 24-bit/48kHz A-D and D-A, 24-bit/96kHz A-D and D-A and 24-bit AES-EBU up to 96kHz.



**D-A 24-96k Convertor board**

The input signals from the modules are also fed to the ODI output for direct connection to DAWs, consoles, and so on. Modules can be easily changed by removing the chassis top cover and the input and output modules are different sizes to avoid confusion.

Special attention has been paid to the balancing in the analogue circuitry and the unit has good line drive characteristics for long lines. The unit is calibrated at +4dBu input and output with 20dB of headroom. However,

a row of trimpots can be accessed with a small screwdriver through holes in the chassis cover to calibrate the unit to house levels.

The Configuration Menu status is displayed by the level meter LEDs and the OVL and LVL values are selected by the select buttons for Synchronisation and Sample Rate respectively. Parameters that can be accessed include calibrated or 'custom' analogue I-O levels, dither, SRC, I-O selection of dual AES-EBU and source selection for the ODI-B output.

I found Merging Technologies' Sphynx converter to be easy to install and use and provide high quality conversion facilities for what can only be termed a 'reasonable price'. The unit will find applications with Pyramix and Softimage users as well as studio installations with ADAT, SPDIF and AES-EBU equipment. Once the TDF modules are available, Sphynx will cover all formats. From an aesthetic point of view, the front panel could be considered a bit chunky but it always lets you know what is going on and in the heat of a session or broadcast.

You can certainly let this Sphynx take your studio between its paws. Highly recommended. ■

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**HOT ON THE HEELS** of the Mykerinos PCI card, comes a new MADI daughterboard to add to its list of I-O modules. Features include standard MADI operation of 56 bidirectional channels at 48kHz on either BNC or optical connectors and a separate wordclock I-O on BNC. Merging has gone the extra mile and developed its own chip to provide 64 bidirectional channels at 48kHz, 32 channels at 96kHz and 16 channels at 192kHz.

The new module allows direction connection via MADI to digital consoles including Studer, Harrison, Neve and recorders such as the Sony PCM3348HR.

In conjunction with the Mykerinos PCI board, Merging has released Pyramix 3.0 Virtual Studio, which is a considerable leap forward from the already comprehensive Pyramix 2.2. The system features an up to 64 x 64 matrix mixer with full automation and a full range of DSP effects. Surround mixing takes an important place in the

new Virtual Studio.

Last, but not least, is the Onouris long distance convertor for Toslink optical cable runs. This unit recognises the limitations of the 10m maximum cable run for Toslink cables (as used by all ADAT compatible equipment) and provides conversion from plastic fibre cable to a glass optical cable system, thus allowing cable runs of up to 1000m. Merging can also supply glass optical cables.

The unit is extremely simple and features a glass optical cable input converting to two plastic fibre outputs in parallel and a plastic fibre input converting to glass optical and plastic fibre outputs in parallel. This means that Onouris can also be used as an optical D-A. Equipment fully supported by the unit includes Softimage DS systems, Yamaha 02R and 03D consoles, Ramsa DA-7, optical SDIF compliant devices, Alesis ADAT and other ADAT compliant devices.

For those people looking to get noisy equipment out of the control room, this unit is certainly good news.

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# Studer On-Air 5000

Linked genetically to the 94 I, Studer's new on-air desk also has much in common with the flagship D950 digital console. **Zenon Schoepe** reports

**S**TUDER HAS UNDERGONE something of a renaissance. The last decade has seen major upheavals for the Swiss company, changes of ownership and dramatic changes in the market that it has served and helped to create. Best known for its role in multi-track it has always been active in consoles and turnkey installations. What the last few years have witnessed is a reinvention of the company and a rejuvenated drive in to what it has always done best—pioneering technology in application. It is strange that some regard it as rather staid when it has frequently been among the most original and imaginative of manufacturers. Studer's take on a subject is always slightly different from the rest.

The software developments for the D950S, to use an example, are remarkable in their ambition and the company's spin on the whole multichannel sound issue, and its employment of ambience processing within this context are impressive and unique. It's reinvented itself as a manufacturer of monitors and reapplied its digital technology across its desk sectors. Turnkey installations remain an important chunk of its work and having desk content at a number of levels within its portfolio clearly remains important. It also has the Studer Digi-Media radio automation system that has recently been expanded with additional modules, such as RDS and DAB control, Internet Publisher, remote control and a DigiMedia Pro databank replicator. More than 140 systems have been installed world wide mostly in conjunction with the company's On-Air 2000 digital continuity console.

Which brings me rather inelegantly



and in a round about way to the On-Air 5000. Targeted at radio broadcasting and launched at the IBC last year, it uses Studer's TDM technology which is based on its MADI range of products. Key to it is DSP power distribution for routing, level and processing functions and it is scalable. The DSP core of the desk consists of DSP processing boards

each containing six SHARCs. Up to 20 boards can be fitted into the core rack next to the MADI boards and communication boards. The fully fitted DSP core delivers the processing power for up to 256 audio channels.

It can detect errors and defects before they effect the system and processing is redirected to an optional redundant >

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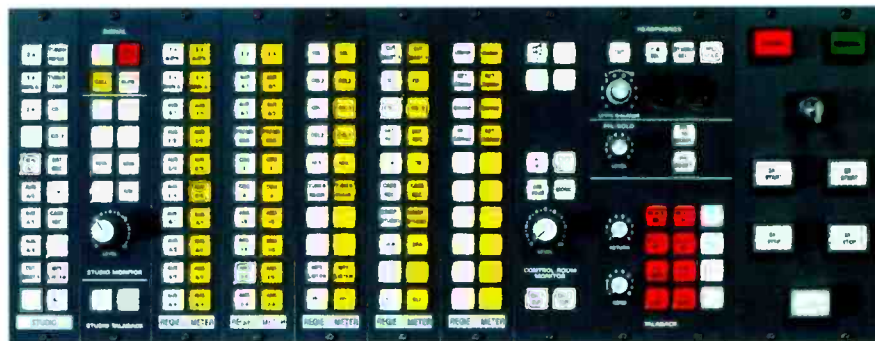
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< DSP board. The engineer is informed of the failure and can replace the faulty system part without interruption. I have seen this done on the D950 and it is extremely impressive. Aside from the message from the system you wouldn't even know that something cataclysmic had happened.

The 5000 is derived from the same core used in the D950, but has historical similarities to the 941 which represents earlier generation Studer digital processing with none of the SHARCs of the current range. It also differs significantly in a number of operational areas. The 5000 is more flexible in terms of monitoring, the channel is largely similar, but adds inserts, delays and, of course, the integration of the MADI router which facilitates the use of more



than one room working around the router with interconnection and control across the system and, by definition, across the station.

Visually the channel strips look similar even though the 941 went to 24 channels, but monitoring and metering sections are very different and much improved. It is worth dropping the On-Air 2000 into the discussion here as it is relevant to Studer's bigger picture. The 941 used a separate core rack as on the 5000 while the On-Air 2000 contains all its processing in the worksurface and does not have the horsepower to extend to the requirements of the 5000. Hence the D950 connection.

The On-Air 2000 in maximum 24-channel configuration asks about 40,000 Swiss Francs while the 5000 of a similar size asks around three times as much, but is some 20% less than the 941 that it replaces, and that saving is attributed in its entirety to the use of the SHARC core. The 5000 started shipping recently and around 20 941s are in the field.

The On-Air 5000 can have up to 32 signal paths, which are aided by an matrix on the inputs and how far along this route you want to go depends on the amount you are prepared to spend. How your 32 fader desk looks depends on what you specify and how elaborate you want to go with the metering and monitoring, but the worksurface package is modular, compact and is designed to fit in with a studio's furniture. The worksurface panels can be moved around according to preference.

In terms of configuration the desk spans on-air self-op applications or as part of a system for larger events. It uses snapshots and a key feature is the use of chip cards that permit the configuration of the desk to suit the operator.

Detailed operation centres around the established principles of selecting a channel on a switch which assigns control of its parameters over to central facilities panels.

A strong selling point of the console is the multiplexed system it employs to generate what is effectively 'off-air' modes that allow programme preparation and communication to be made while the remainder of the system runs to air. It'll run to 16 return feeds while two separate multiplex levels give a clean feed for participants while a

second 'conference' level exists for the off-air chat.

A stage box handles interfacing with the studio and contains converters in analogue, AES-EBU or ADAT 8-channel and converts these to MADI. I-O interfaces are contained in a separate rack that contains the DSP core. Hot switchable, these can carry redundant spares which will kick in should a problem arise, in a similar fashion to the flagship D950 digital console, but then it is related to it.

A PC is tied in with the rack and is used for the set-up and configuration routines, such as naming channels. However, it plays no role in the actual live operation of the console, it is the realm of the system administrator.

The fader block houses up 32 faders in blocks of four and each has an assignable rotary control, a 4-character display and two keys dedicated to it. Additionally there's an 8-character input source display plus PFL, ON, SELECT and TALKBACK switches. Pressing a channel's SELECT key hands over control of its parameters to a central control unit containing controls for gain filters, EQ, compressor, limiter and auxes. This is also the area in which input matrixing and channel-strip rotary and switch assignment is performed.

The monitoring and meter bridge panels can be specified by the customer together with extra lamp and remote switches.

A look at the central control unit gives most indication of what the 5000 can >

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do and also serves to illustrate a similarity and consistency in presentation that is highly relevant to the desk's target market. It's meant to be simple, and it is. I have to admit that I got off on the wrong foot by expecting to find secret functionality and complexity. There is



none; it's very much WYSIWYG.

Inputs, always operating as stereo pairs, can be specified as stereo, mono, left leg to both channel, right leg to both or reversed. A gain rotary is accompanied by phantom, mic, line selection and phase reverse. An output section contains a bypassable balance rotary together with assignment switches to the two stereo masters. Sweepable high and low-pass filters can be bypassed while the EQ is 3-band with  $\pm 15\text{dB}$  arranged in sweepable bands with 3-position Q on the mid and two peaking plus a shelving preset on the HF and LF. Band gain is displayed on a horizontal LED bar graph while frequencies are shown on a display. A similar block serves operation of the dynamics with threshold and release rotaries, separate bypasses for the compressor and limiter (the limit point is specified in the configuration routine) and five preset compression ratios. Then there's a manual and bypassable delay section and six keys which can be assigned RDS identification status for driving an RDS coder. Two stereo auxes are provided.

The MPX listen and preparation features that I have already alluded to are ingenious and clearly presented. An MPX listen rotary adjusts monitoring level of a channel's prefader signal to a listen loudspeaker and is muted when the channel goes on-air. A master preparation switch, located in the MPX Master section, activates a rehearsal mode with a channel's preparation key instigating its participation in this mode.

This generates a prefade mix of all participating channels and sends this to the participants minus their own contribution. When a participant goes on air their channel drops out of preparation mode and their return carries the source selected on the MPX send from the transmission signal minus or including their contribution, Aux 1 or an

external source.

Master functions include a generator, master limiter activation, and master control of auxes. It's here that the channel rotaries and two switches can be assigned a function including MPX listen, MPX send, the auxes, input gain and balance.

The On-Air 5000 has been designed with a comprehensive talkback system. The talkback source can be the built-in mic or an external one. Several destinations such as auxiliaries and master outputs are available. In addition, each channel is fitted with a TALKBACK button, that activates talkback to the clean-feed output of the corresponding



channel. The talkback signal can be monitored on a speaker built-in to the meter bridge of the console.

The layout is clear and uncluttered with plenty of room between controls, the switches are smallish, but are unmistakably positive in action and they're supported by useful levels of illumination. I like the repeating blocks of the worksurface and the recurring themes of horizontal LED bars and numerical displays. Fancier ways of displaying values may exist but Studer's interpretation on a desk of this type wins on unfussiness and clarity.

The preparation mode is an example of translating a common radio requirement in to a simple bullet-proof solution. You set it up according to how you intend to work and leave it there as a default for access on a switch. But then it is typical of the thought that has gone in to the 5000.

The temptation when designing a desk with this amount of horsepower on tap must be to extend the extras and the features—to go for that extra band of EQ, more controls in the

dynamics, more auxes even. Studer has shown its understanding of the target market by what it has chosen to leave out. That is uncommonly wise yet typically Studer. ■

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## AES Preview

All eyes are on Paris and this month's 108th AES Convention at the Palais des Congres (19th–22nd February). **Zenon Schoepe** gives the inside line on the new product additions.

**F**airlight's new affordable post solution system combines a 24-track, 24-bit DAW and a surround-sound digital mixer. Featuring many of the technologies developed in the FAME and MF3plus systems, Prodigy is being offered at an introductory price of US\$68,000. It offers 16 assignable faders and joysticks integrated into a dedicated recording, editing and mixing production centre. It also features 36 channels of fully automated mixing capability, moving faders, surround sound joystick panners, floating point DSP and 24-bit A-D and D-A converters. Prodigy is MediaLink network ready.

● **D&R** now has an all-digital broadcast console. The DSP of the Sirius can handle 32 channels with 4-band parametric EQ, compressors and Expander-Gates in every channel. A Router before and after the digital engine enables the engineer to connect 64 audio sources and 64 outputs which can be assigned to the 32 inputs and 24 output buses. The remote worksurface has dedicated touch-sensitive motor potentiometers to reposition memory data and a fully loaded superchannel can be assigned to every input module to control all parameters of the input module.

A console consists of a 19-inch DSP/I-O rack, control surfaces and super-

channel module. Current available I-O interfaces are: AES-EBU with four stereo in and four stereo outs plus 8 remote I-Os; an analogue input interface with four stereo analogue inputs plus 8 remote I-Os; an analogue output interface with four stereo analogue outputs; and a mono analogue interface for eight mics inputs. It is possible to link several systems together for audio networking.

● **The Sony DMX-R100** digital console is making its European debut. Sharing the same design philosophy as the Oxford, the 48-channel, 1200mm wide DMX-R100 offers a range of features including touch-sensitive motorised faders, integrated metering, a large colour LCD touchscreen, MIDI and multiple 9-pin machine ports, dynamic and snapshot automation, 5.1 surround sound processing and a 96kHz processing mode.

The OXP-R3 Lite and UltraLite are intended to bring the Oxford console's flexibility, ergonomic control surface and sonic integrity to a broader market. Sony is also demonstrating latest software developments that adds extra sampled 'sound spaces' to the DRE-S777 sampling reverberator.

● **Genelec** has launched the S30D, a high resolution 96kHz/24-bit digital

active monitoring system based on the S30 (S30C) which was launched in 1978. The new monitor supports AES-EBU inputs while the system's D-A converter has an interpolator, which increases the internal sampling rate by up to eight times before a fourth order delta-sigma modulator. The conversion process used has high resilience to clock jitter, excellent linearity and automatic detection of word length and sampling rate. Digital thru allows the digital signal to be retransmitted to other S30D loudspeakers and digital equipment. Also shown for the first time, Genelec's new 2029B high resolution 96kHz/24-bit digital, active monitoring system is based on the 1029A. The system supports AES-EBU inputs with a word length of up to 24-bits and a sampling rate of up to 100kHz. The system is designed to accept either SPDIF, AES-EBU digital audio or conventional analogue audio inputs, while the digital interface is built into one of the system's enclosures.

● **Software version V1.30** on the Sonosax Stelladat II, is now implemented and includes RS422 protocol and chase mode. The Stellamaster is the first post-production DAT tape recorder fully compatible with the Stelladat II (2 or 4 tracks, 44.1kHz, 48kHz or 96kHz sampling rate) and includes RS422 protocol. The



Neumann

company's SX-BD1 is a device designed to simplify the pick-up of sounds for ENG, EFP and direct sound for films, in the well-known Sonosax reduced-size. Also applicable for use with DV or miniDV cameras the device can be fixed onto a boom pole, and includes a microphone amplifier, phantom power, gain settings, LF cut filter, headphone monitoring amplifier, a small LED meter and a Sonosax optolimiter. This allows a boomman to adjust level without assistance and the device is powered by just four AAA batteries.

● **Sennheiser** is presenting the Digital 1090 system as the first radio-mic system to offer fully digital operation at an affordable price. The system is said to be particularly well suited to complex instruments like guitars with a lot of low end and strong attack. The systems comprise a multiversity receiver with a choice of hand-held, instrument body-pack and lavalier/bodypack transmitters. The company's MKH 800 is a high performance studio condenser microphone with switchable polar patterns that claims a frequency range up to 50kHz.

● **The KMS 105**, a super-cardioid, live performance vocal microphone is the latest from Neumann. Following the renovation of its complete design and development facilities in Berlin, the company has used its time-efficient microphone prototype process to create a German engineered microphone for live performance.

The KMS 105 has a maximum SPL of 145dB, reduced handling noise due to a triple process involving capsule tensioning, mounting and microphone electronics, and a reduced sensitivity to plosives owing to a sophisticated inner basket structure. With 127dB of dynamic range and a 20Hz to 20kHz frequency response, the sound of the KMS 105 is claimed to be so true that even backup instrument bleed-

through sounds natural. Its high resolution and neutral off-axis response also make it suitable for use with in-ear monitoring systems.

The KMS 105 is available in nickel or matte black casing, and its shape is reminiscent of Neumann studio microphone designs.

● **AMS Neve** has launched Encore automation for the V consoles. Based on the system in use on its digital consoles, it can be retrofitted easily to existing V Series desks. Encore for V offers Flyer Faders users familiarity, yet considerably more power and features.

Derived from the automation system fitted to the 3-man Logic DFC, it includes a new integrated Recall system with a number of innovations for reducing console setup time. Users also benefit from advanced machine control technology while options include an integrated multimachine control system, capable of synchronising up to 6 machines via 9-pin with up to 33 machines connected via ES Bus modules.

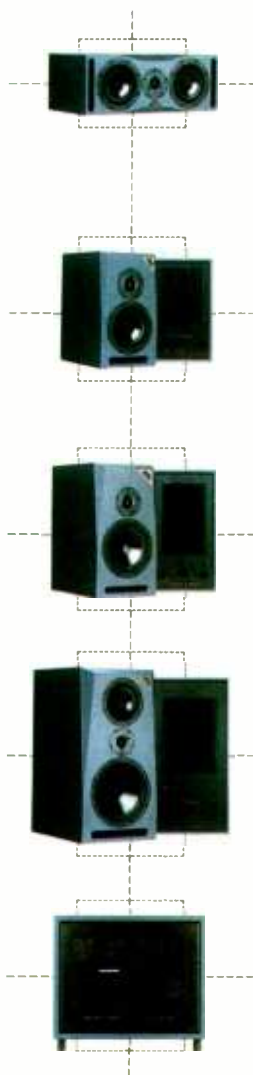
● **Tascam's US-428** is a 24-bit DAW controller that uses the Universal Serial Bus. The unit provides direct audio I-O, MIDI interface and hardware control capabilities for PC and Mac computers, running sequencer and digital audio recording software packages. Audio and data interface is via a single USB connection, without the requirement for additional I-O interface cards. The US-428 provides four analogue inputs-two balanced mic/line XLRs and two balanced mic/line 1/4-inch jack. Two SPDIF digital I-Os are also provided and signal clocking can be internal or from incoming digital signal source.

The company will also exhibit its forthcoming 24-bit/96kHz capable DA-98HR MDM which offers a host of features over its lower cost stablemate. These include an on-board SMPTE synchroniser. >



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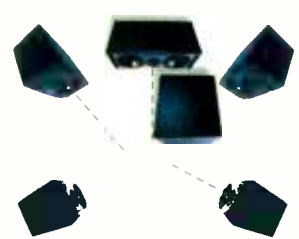
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The Midas Heritage 1000 is designed for theatre applications where space is at a premium with similar automation facilities to the company's XL4 desks

◀ AES-EBU I/O, confidence monitoring, auto punch with 0.1 frame accuracy, On-tape data memory for set-up information, individual track input monitor select switches, internal tone generator with selectable reference levels, track-slip from -200 to +7200 samples, Word Sync In/Out/Thru, Video In/Thru and optional +8 '96kHz switchable analogue I/O board.

### ● The Midas Heritage 1000

is designed for theatre applications where space is at a premium with similar automation facilities to the company's XL4 desks. All routing may be automated, whether VGAs, auxiliaries or audio subgroups.

First shown at NAMM is the DN9848 digital loudspeaker processor. Providing four inputs and eight outputs into 1U-high of rackspace, the unit's small size allows flexibility for FOH and monitoring purposes. The DN9848 is configurable for any loudspeaker system, and the company believes that it provides a cost-effective solution for users working with more than one brand of loudspeaker system. Other features of the DN9848 include delay, compression, look-ahead limiting and comprehensive EQ providing 80 full-time bands of parametric EQ.

● FAR has introduced a competitively priced and totally newly designed active range of speakers. A new platform has been designed to provide great efficiency from the smallest model AV2 up to the biggest AV100. The AV50s two woofers are driven by a 350W amp and the tweeter and midrange are loaded with a low diffraction wave guide that ensures a wide angle for stereo imaging. An upgrade of the wave guide will also

be shown which ensures total control in the manufacturing quality process.

● **Soundscape Digital** has added an OMF1 import-export plug-in for the R.Ed Recorder Editor and SSHDR1-Plus editing systems. The software lets users export a Soundscape project as an OMF file to any removable media or through a network that can then be imported into Pro Tools, Fairlight, SADIe or other systems that support OMF1 or OMF2 files. Similarly any project created in AVID or Pro Tools can be loaded into R.ED or SSHDR1-Plus for editing.

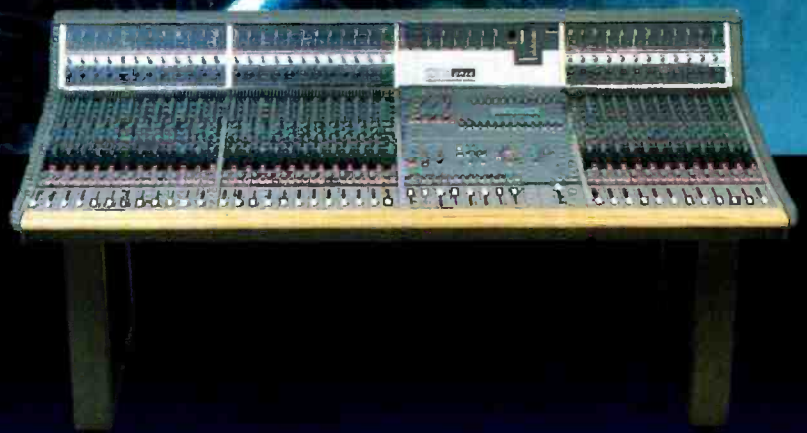
The new function is included in the Soundscape EDL Processor but can be purchased separately. The OMF Composition Import tool imports an OMF1 or OMF2 project into Soundscape and can deal with several different audio formats including AIFF, WAVE and SD2. The OMF Composition Export tool exports all audio project information from Soundscape Editors and as SSHDR1 and R.Ed are 24-bit devices, the audio is automatically converted to 16-bit data if for example, SD2 is chosen when using the Tascam MMIR-8 or MMP-16.

● **German radio** and intercom manufacturer Riedel has a Digital Network and is introducing an ISDN codec for intercom and reporting. The dual-ISDN codec CDM-102 supports G.711 and G.722 formats and provides integrated terminal adaptors for direct SO connection. Combining the functionality of telephone hybrids and G.722 reporter codecs with auto-format detection of incoming calls the codec is a replacement not only for analogue and digital hybrids and analogue 4-wire PTT communication lines, but also provides the ISDN basestation for reporters, correspondents and outside broadcast sites.

Intelligent interfacing to the Artist M digital matrix intercom system allows remote operation of keypanels via ISDN providing all the features of a studio-intercom at the remote location. The 19-inch/3U-high mainframe RMF-116 has redundant >



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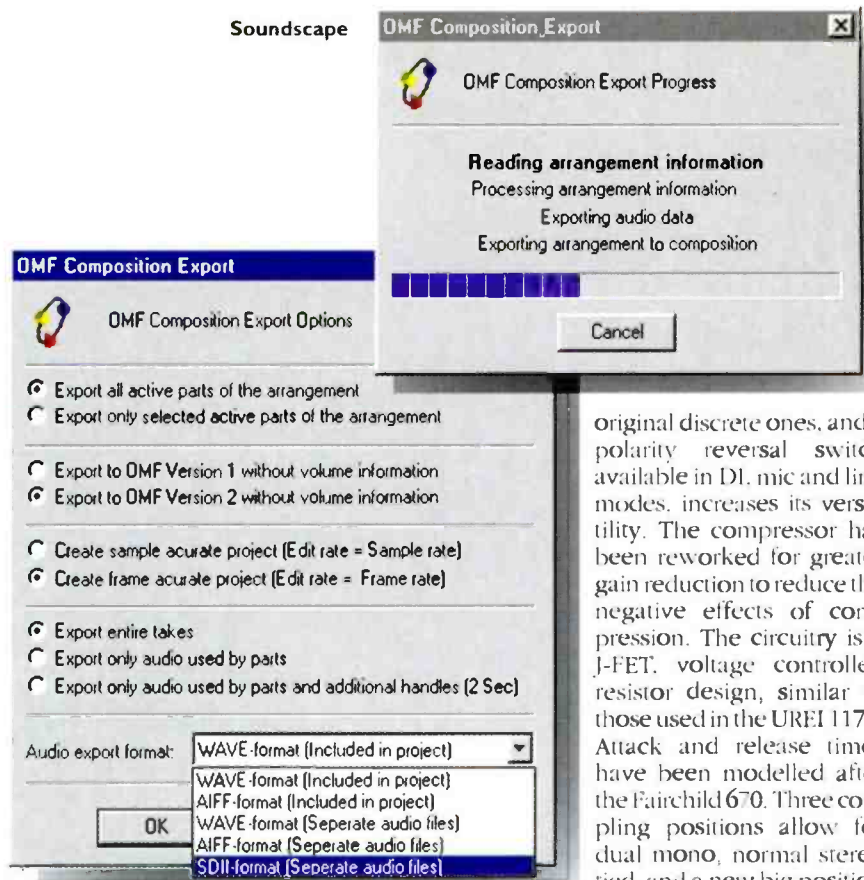
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< power supplies and can be fitted with up to 16 dual codec modules providing a total of 32 ISDN audio codecs in just a 3U-high box. Setup, control and monitoring is done via the Windows software CSW-100 which also allows storage and recall of system- and program-related setups.

● **Lectrosionics** has added three products to its 100 series wireless mic system. The UM110 235ch UHF belt-pack transmitter, UH110 256ch UHF XLR-3 transmitter and the UCR110 256ch UHF diversity receiver are all PC programmable. The 100 Series has been designed to operate with the latest generation of digital camcorders. It can be programmed for up to 256 selectable frequencies over a 25.6MHz band to avoid interference from local RF sources. The UCR100 receiver is highly sensitive and the matching transmitters provide the full legal power output for outstanding operating range and freedom from drop outs. The audio signal processing circuitry includes Lectrosionics' dual-band compandor, wide range input limiting in the transmitters and a variable low frequency roll-off control on the belt-pack transmitter. The result is said to be low noise and distortion.

● **Drawmer** has released the Mercenary 1969 valve compressor, based on the 1960 unit. The 1969 uses a new topology for lower noise and improved clarity. Burr-Brown op-amps have been chosen for a silkier sound replacing the

original discrete ones, and a polarity reversal switch available in DI, mic and line modes, increases its versatility. The compressor has been reworked for greater gain reduction to reduce the negative effects of compression. The circuitry is a J-FET, voltage controlled resistor design, similar to those used in the UREI 1176. Attack and release times have been modelled after the Fairchild 670. Three coupling positions allow for dual mono, normal stereo tied, and a new big position which puts the high-pass filter

in the side chain to give extra bass to the stereo signal. The high-pass filter rolls off the detection signal at 100Hz to minimise undesirable pumping. Built around the 12AX7 tube, the gain-make-up section rounds out the new 1960 and supplies more punch and definition than the original version. 'Fletcher' of Boston-based Mercenary Audio, with experience as a recording engineer, producer, and audio dealer working with a range of analogue gear was a useful critic in the design of the unit. An updated DC2476 Masterflow digital processor with version 1.09 operating software features are auto-contrast, crossover filter adjustment Monitoring and the peak limiter is now set at -0.1dBfs for optimum headroom. The FX Bypass function for each processing stage is now shown on the LCD screen.

● **Nicral** has entered the audio router market with its ARC-D2 Audio Router. It uses digital TDM technology to deliver 'a compact, high-performance router' with flexible arrangements of digital and analogue audio I-O cards. Matrix sizes range from 16x16 to 128x128. Crate sizes start at 1U-high box for a 32x32 stereo matrix. The top of the range 4U-high box can house 128x128 stereo with easy upgrade ability and access for service and maintenance. The ARC-D2 can be controlled as an integral part of the ARC Multi-Master ISDN Control and Audio Routeing System, or by its own ARC-D2 control panels. ■

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# Sintefex FX8000 Replicator

A sophisticated convolution analysis technique enables the Replicator to copy any piece of classic outboard. **Dave Foister** examines this year's model



IF THERE'S SSAIRA going for most outlandish new product of the year, I hereby nominate the Sintefex Replicator. Analogue replicas of classic processors are one thing; off-the-shelf digital simulations of them are another; but a device for cloning any other processor you care to hook up to it is a highly adventurous first, the work of a mind that thinks sideways. This, then, is what the Replicator is all about—digitally analysing the behaviour of a connected device and duplicating its effect on a signal passing through it.

It does this using convolution, sending a stream of impulses at steadily increasing levels through the connected processor and analysing what comes back. This gives it all the information it needs about behaviour in both time and amplitude domains, and enables the DSP to model this behaviour. A very important aspect is that this allows the processor's response to increasing signal levels to be tracked and reproduced, in a bid to emulate the classic analogue warmth of connected processors that digital traditionally misses.

The Replicator is a big deep 2U-high box that lets you know on power-up that it's basically a computer; there's a hard drive whirring inside and a lengthy and satisfyingly flashy boot routine. Driving it centres round a large bright black-on-white screen, with a full set of five soft keys, a data wheel and four cursor keys to get around it. Nearby are five dedicated keys for switching elements of the processing in and out, and for calling their parameters to the screen.

The rear panel is important to consider at this stage as it gives some idea of the principle of operation and the potential flexibility of the Replicator. Its main inputs and outputs are on a big D connector, and a flail breaks this out into stereo analogue XLRs and AES-EBU in and out. The card carrying the D sits in one of four

slots, the rest of which are blanked on the review box, revealing that this is potentially an 8-channel processor. The cards also carry unbalanced analogue in and out on phons. Elsewhere are optical connectors handling ADAT or SPDIF, coax SPDIF connectors, sync for AES clock, and most importantly the outputs delivering the analysis signal that the Replicator uses to model the connected device. This appears in analogue and digital formats for connection to a wide range of equipment.

The procedure is simple. This analysis signal is connected to the input(s) of the device to be modelled, and the device's output(s) are connected to any channel input. The screen helps with navigation to the Sample page, which first allows a tone to be sent for checking all the connections, then allows an automated sequence of impulses to be run through the device. Since these step up from very low levels to 0dB it's wise to have any connected monitors turned down first. The screen reports when the sampling is complete, and the result can be saved in one of over a thousand memories—as the unit has its own hard drive, the eight banks of 128 samples, along with more complex files we'll come to later, can be accommodated easily. Fortunately there is also room for long descriptive names to identify all the files.

What we now have is a snapshot of the connected device as currently set, which can now be replicated by the DSP in any of the audio channels. To use the setting, the Replicator channel must obviously be repatched into, say, a console insert point. There are many obvious candidates for this sort of snapshot, and as many reasons for wanting to use them. Suggestions include storing the characteristics of a borrowed or hired device; making the characteristics of a single unit available on several channels, so that if you only have one of your

favourite EQs, you can set it up for one channel, clone it, put the Replicator in its place and move the real EQ on to the next, repeating until you run out of Replicator channels; and allowing a favourite EQ setting to be duplicated across a stereo pair (or a full surround mix) with a degree of precision analogue processors cannot manage.

I checked this central sampling process out using my console EQ, once with a subtle setting and once with an extreme aggressive one. The procedure is very straightforward and logical, requiring a little time, but not much thought, and the obvious next step was direct comparison with the EQ I had just sampled. Both times the sound was indistinguishable from the original. I was tempted to sum the two and invert one to see what was left, but the inherent processing delay, small as it is, ruled that out. The point was that I could believe I was listening to my console EQ—which, for better or worse, I know quite intimately.

Sintefex provides a selection of samples already on the unit's drive, and they show how the type of signal path that can be sampled in this way can be anything you care to name: EQs, valve circuits, the characteristics of analogue tape, even a room sampled via a loudspeaker and microphone or a distorted guitar amp via close or distant mics. What all of these have in common is that the sampled effect will be simply a snapshot: the response and behaviour, apart from the nonlinearities introduced by varying levels through the device, will be set in concrete. What you get then is not a replica of your favourite EQ that you can use just like the original, but a replica of your favourite EQ stuck on one setting. This still has many powerful uses, but obviously the full benefit of the concept comes only with real adjustable replicas. Encouragingly, >



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◀ a specimen preset provided with the Replicator shows that this is already possible, albeit only at the factory at this time.

The preset is called Classic EQ, and with two each of Boost and Atten controls, plus frequency switches marked in cps and kcs and a Width knob, it doesn't take much to work out what it is—in fact later software comes clean and says Pultec on the screen. The point is that all the controls are fully adjustable, a function made possible by taking a lot of samples of the original and assembling them together with the required front panel controls. Although this is currently a very time consuming procedure, Sinterflex intends to have software tools available this year to allow users to do it themselves.

Note that, although the sampling process takes account of changes in the device's character as signal levels change, the replicated effect does not have to use these elements if a straight clean linear behaviour is required. The switch for deciding whether to allow the nonlinearities or not is on a dedicated section of the front panel; also here is a Drive control that determines how hard the nonlinear aspects will be driven, and a Limit indicator that shows when you've gone far enough.

One type of processor that is very much a special case where the Replicator is concerned is the compressor. The parameters required to simulate the variable behaviour of a compressor are very different from those associated with EQ, and are such that the Replicator can come much closer to modelling a com-

plete adjustable compressor. Although nothing like the number of samples is required to do the job as would be the case with EQ, the process of analysing what the compressor is doing is still not quick; it is, however, very simple, and the results justify the work.

Analysing a compressor comprises two separate jobs. The first is to sample the characteristics of the compressor's basic signal path—exactly the same procedure as for an EQ. Its controls must be set so that it will not attempt to do any actual compression—ratio of 1:1, threshold as high as possible and so on—and so the fundamental character of the compressor is established. Then a series of curves must be sampled, each with a known threshold and compression ratio and saved separately to the disk. The number of available compressor curve memories is relatively small, but once you have a set for your chosen compressor these can be associated with the signal path sample and stored as a complete program.

What you then get is a Compressor screen with the basic controls required for operation of the device—ratio, threshold and attack and release times—plus a graphic of the transfer function as currently set. The compressor section is always available on the Replicator even without the use of

sampled characteristics, in which case it offers a choice of knee shapes and operates like a conventional digital compressor. It constitutes a separate block from the one used for EQ simulation, so the two can be used together. With the samples for a real compressor loaded, it behaves just like the original but with the same simple set of controls, so any special timing characteristics or signal-dependent release times are lost. All the same, the compression ratio is variable, and not restricted to just the sampled values, although it won't go any higher than the maximum originally sampled. Inter-channel linking is provided on a dedicated section of the front panel, along with a dedicated threshold control and gain-reduction meters.

At the end of it all, the Replicator seemed to be giving me a very accurate and very useable emulation of the original, with its characteristic smooth sound and soft knee

An obvious test for this function was to hook up the Focusrite 430 that I still had from reviewing it the previous month and to attempt to replicate its compressor. The procedure for doing it was easy to master, although it meant hanging around the Replicator for quite some time initiating the sequence of analysis

routines. At the end of it all, the Replicator seemed to be giving me a very accurate and very useable emulation of the original, with its characteristic smooth sound and soft knee, so it was undoubtedly time well spent. Factory programs include an 1176, a d160, a c11b and an al3630.

In the same way that there is always a compressor available regardless of whether any replicated processors are loaded, so there is also an onboard EQ. This is a straightforward 4-band digital parametric, with generous control ranges and a graphic display of the resulting curve. Usefully, the actual contribution of the currently selected band is shown on the display in grey as well as the complete EQ curve. >

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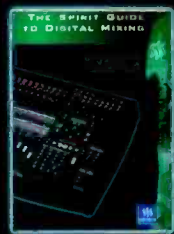
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< There are no shelving bands, and the number of bands actually available might vary depending on what else the channel is doing and the sampling rate in use—the Replicator goes all the way to 24-96—but the EQ is a useful adjunct nonetheless.

Potentially equally useful but still in the development stage at the moment is a section marked AFX for after effects. This is for adding delay-based effects like reverbs, and at the moment comprises various types of straight delay including multitap, with adjustable delay, pan, level and feedback on each tap. Future plans include allowing the Replicator signal path to be placed in the feedback loop to allow emulation of analogue delay devices, and reverbs using samples of actual rooms to provide the required colour, although not a full replication of the original reverb behaviour.

Navigation of all this takes a little practice, but is logical enough considering how much there is to find. Dedicated keys select the various building blocks on to the screen and also switch them in and out; the catch here is that a quick touch does the switching while a longer hold brings up the display, which makes it a bit too easy to switch a process off accidentally—I would have preferred the functions the other way round. Like all good multi-effects processors, the Replicator allows these various elements to be arranged in any order in the input-output chain.

To complete the picture, there are digital controls for input and output level (mind the zippering) with clip lights and an elaborate meter screen for the input. What this shows depends on how many channel cards are fitted to the Replicator; in the case of this simple 2-channel version the meters show both instantaneous levels and short-term peak hold, creating a kind of arrow effect. With more cards more channels are shown, but with less detail.

Extensive facilities are provided for file backups and data interchange, using a

FX 8000 DIGITAL AUDIO EFFECTS REPLICATOR



simple piece of PC software called Replimat. At its most basic, this allows data to be exchanged between PC and Replicator via MIDI, but this is inevitably very slow. More impressive is a facility allowing data to be transferred digitally in the form of WAV files; the unit can create WAV's from its internal data and Replimat converts these appropriately. Sintelex' web-site has software updates and files for samples and programs available in this format, and given the necessary facilities on the PC, backups can be made on CD-R easily using this feature.

If I had to pick the Replicator up on one point, it would be the necessity for so much repatching when switching between the two modes of sampling an effect and then actually using it. It adds significantly to the time it takes to carry out the analysis, and careful thought is required in order to keep track of what you're doing and avoid silly mistakes—the potential is there after all to have extremely loud test impulses appearing from the monitors, or to inadvertently set up a loop. Since the unit has a dedicated analysis output, it would seem sensible to have a corresponding analyser input, separate from the main channel ins and automatically selected

by the software when a sample is to be taken. On the other hand, a reviewer is always lashing a piece of equipment into his system with adaptor cables, and the process may be much simpler if the Replicator appears on a patchbay.

The FX8000 Replicator is in one sense an extraordinarily simple and obvious concept: the fact that technology now makes it so straightforward in operation is almost equally extraordinary. If Sintelex can get the full-blown adjustable thing in action, there will be a few nervous manufacturers and hire companies out there—your client with a Replicator may never give you any more repeat business. Until that time the limitations of the snapshots will prevent it replacing beloved EQs, although the next time that compressor decides to go noisy it may find its days numbered.

The FX8000 is in fact more than it needs to be. Sintelex could have marketed the Replicator and Compressor sections as they are with no more frills. The addition of the on-board EQ and the delay section are nothing more than bonuses on a device that keeps suggesting new uses for itself, and its open architecture, ongoing development, web support and easy data transfer make it more desirable still. With the right exposure and an imaginative reception this could make a big impression. ■

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## Multichannel meters

Designed for multichannel working, Logitek's Ultra-VU 5.1 and 7.1 meters are based on the company's Ultra-VU meter. Six or eight LED bar graphs are packed into a single enclosure with analogue or digital inputs. Analogue inputs are bridging and accept balanced or unbalanced signals and a level trim control allows calibration of any reference within the -10dBu to +24dBu range for full-scale indication. The digital model can accept professional or consumer digital signals and automatically locks to the sample rate. Each bar graph is composed of 62 LEDs with true 300ms vu ballistics with peak indication and hold. Operating modes selectable from the front panel include loudness filter and fine resolution. The packages are the same size for both versions, only differing in the number of vertical meters, and the power supply is in a separate enclosure and can be located away from the console. A Super-VU 5.1 surround meter is also available that differs from the Ultra version predominantly in the use of 40-LED bar graphs. The latest addition to the Logitek stereo meter line is the Tru-VU model which is based on the curved LED meter-face found on the company's ROC digital consoles. This styling is said to retain some of the feel of analogue vu meters with the immediate response of electronic meters. It represents the true 300ms vu ballistic standard along with a peak display. The two meters come in a rackmount that is similar to the company's analogue 2VUB and contains the power supply, connectors and controls.

Logitek, US. Tel: +1 800 231 5870.

## DIGAM digital amps

Master Europe GT amplifiers use DIGAM digital amplification technology and complement the company's Granit-Line range of speakers. The amplifiers sport high power



of up to 7000W RMS, are lightweight at 9.5kg, 1U-high and have high levels of protection. A 4U rack can output 28kW in to 2Ω and weighs only 38kg. The power supply consists of a 2-stage, high frequency switching circuit and a power factor stage that is said to improve performance and avoids power supply fluctuations. Output is independent of impedance load. Protection circuits include short circuits, direct current, reactive loads, overheating and peak power limiters. Models include the GT2000 (2 x 1000W), GT3000 (2 x 1500W), GT5000 (2 x 2500W) and GT7000 (2 x 3500W) all in to 2Ω.

Master Europe, France. Tel: +334 67666790.

# SoundsLogical WaveWarp

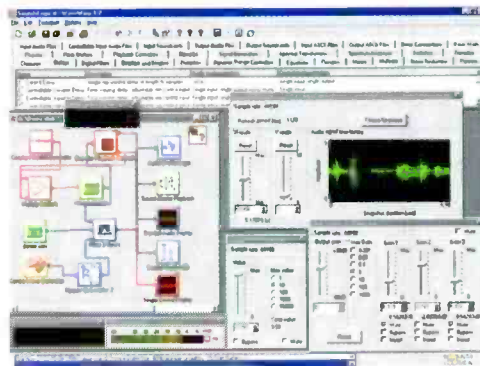
In contrast to dedicated plug-in processors, WaveWarp brings advanced effects to the Windows platform. **Rob James** gets involved

**W**AVEWARP IS DESCRIBED by its authors, SoundsLogical, as a 'modular audio effects processor geared to musicians, engineers, sound designers and educators who require complete control over the effect architecture.' The first hurdle to negotiate with WaveWarp is to acquire and install it. So far as I am aware it is only available via download from the net. Downloading was surprisingly quick, given the size of the file (over 10Mb). Installation requires you to have an email address as, when the software is installed a unique code is generated based on the hardware configuration of the PC, this code is emailed to SoundsLogical and a validation code is automatically returned. This all worked perfectly satisfactorily for me, but I have strong reservations about a copy protection system that relies on the hardware configuration of my PC remaining constant.

The object-based software uses a 'drawing board' metaphor for the construction of effects. Objects are grouped in libraries by function, signal generators, panners, pitch shifters, filters, mixers and so on. Objects are dragged from the libraries onto the board and connected by clicking and dragging. There are some restrictions—mono outputs may only be connected to mono inputs and likewise for stereo for instance. Algebraic feedback loops are not available, there is an implied delay of one sample. Control signals come in two flavours: Amplitude Control signal inputs denoted with a red 'A' expect an input with a numeric value between 0 and 1, Frequency control inputs denoted with a red 'F' expect an input of 0 to half the sampling rate.

Real world input is catered for via .WAV files. Audio output is via any soundcard or to a .WAV file and, in some instances text files. There are around 250 objects in the libraries. Objects are divided into five basic groups by colour. The icon design further reflects the specific function. Audio effects are blue, inputs, are green and signal generators, orange. Control components are red and audio to control or control to audio are red-blue.

The best place to begin is by experimenting with the collection of almost 200 example drawing boards. These provide some insight into what can be achieved with this package. Each example has a useful 'description' icon. Clicking this brings up a box with a text description of the functions and features of the example. Double clicking functional objects gives access to any adjustable parameters. Where appropriate these are in the form of on screen sliders or numeric input boxes. One notable feature is the multi-rate capability that allows various sampling rates to exist within a single drawing board. Using this feature it is possible to use up and down sampling. In turn this allows processes to run at a few hundred Hz instead of many kHz, enabling the use of highly elab-



orate and efficient filters, for instance. It is also possible to experiment with granular and other synthesis techniques and DSP 'convolution'.

WaveWarp can use filter designs and coefficients generated by the applied maths application MatLab via a number of import and export conversions. This opens up the possibility of using WaveWarp to prototype algorithms which could later be incorporated in hardware designs.

On first sight WaveWarp is a highly attractive idea. A moments thought will reveal some of the snags. A DSP-based effects processor is a highly complex piece of kit. Not only is the hardware design a specialist area but so is the software. WaveWarp successfully shields the user from the necessity to write raw code. However, it does not remove the requirement for an intimate knowledge of how DSP effects are constructed from software building blocks. You may well know what an Inverse Chebyshev IIR filter is as opposed to a Butterworth. I don't (although I'd like to) and I am fairly sure the majority of successful sound operators and musicians don't either. Life is too short for most busy professionals to attempt to work this far down into the nuts and bolts.

However, as an educational tool WaveWarp should excel. All that is needed is a book on digital audio and signal processing written specifically to accompany the software and assuming little or no prior knowledge. I was grateful for the opportunity to use this software if only to discover the true depths of my own ignorance. A better understanding of what is under the bonnet can only a good.

There are some other interesting possibilities thrown up here; if SoundsLogical so wishes I am sure it could enable WaveWarp to be used as a third-party development kit. Developers could distribute their applications with a run-time version of the WaveWarp engine.

Meanwhile, WaveWarp remains a splendid achievement as an educational tool and algorithm construction kit for those with the knowledge to properly exploit it. Even without going into detail, a number of the example drawing boards should prove interesting and useful tools for those of us without the knowledge or time to roll our own. ■

### Contact

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# Roland SRV3030

The latest in a line of solid processors from Roland, this device offers more than most. **Zenon Schoepe** undergoes Dynamic Separation

**L**OOKING TRADITIONALLY busy as only 1U-high effects units can, Roland's SRV3030 contains two processors (unit A and B) with reverb, flanger, resonance, modulation, effects and RSS effects available on both, but which can be combined in various configurations to include true stereo processing. Convertors are 24-bit with balanced jack and XLR I-Os. You get 100 users memories (expandable to 1000 with an optional memory card that slots in to the front) and 100 factory presets. Preset selection is via a push-to-make dial and operation centres around a small, but well planned LCD that works in conjunction with a number of associated controls and modes. Editing is performed in three conveniently defined modes and in all instances, except when working in true Stereo mode, you can flick between the parameters of the two units on the UNIT A/B button. Direct Edit handles rudimentary adjustment by three dials marked reverb level, reverb time and assignable parameter, which varies according to the preset, but EZ Edit allows you work in a manner that bases its process on more specific aspects of the sound. Thus you are presented with a selection of pages that are scrolled through on the preset number dial and the three parameters that appear are available for adjustment on the three aforementioned dials. It is here that you'll encounter such general parameters as room size, liveness and distance to source among many others. This is a marvellously well thought out halfway house on the way to the



full in-depth parameter control of Custom Edit. In honesty EZ Edit is about as far as you would ever want to go on a job because it offers loads of opportunity to change fundamental characters, tails and attacks in a way that can be unmade fairly simply. Custom Edit is really for those quiet evenings in front of the fire, you can create your own reverbs from scratch, but the process is detailed, involved and requires a certain amount of concentration. It's the only point at which the LCD starts to look too small for the task and hands over part of the management of tweaking to your own memory. You don't want to rush this. In terms of reverb you are looking at some 50 parameters right down to early reflection diffusion size. Sophisticated and complicated stuff then.

A strong selling point of the SRV3030 is the implementation of what Roland terms Dynamic Separation which means you can programme a preset to respond differently to different input types and input intensities. A most obvious exam-

ple is the creation of reverbs that 'explode' once a 'threshold' is exceeded on the input. The dynamic separator can be inserted at a number of points in the algorithm and can separate according to attack, loudness, note density (yes it can be made to ramp back reverb thickness in the busy bits to aid clarity and ramp back in on the simpler bits, for example), and separate a kick drum from the rest of a kit. This might sound a tad far fetched, but I can vouch for this process working and working extremely well. It can be tricky to set accurately, but once poised correctly it delivers a degree of sophistication that really ought to be the preserve of the absolutely top-end boxes. Brilliant technology. You can also invert the separator to work below the 'threshold' as opposed to above.

There's also a PREVIEW button on the front that fires a sound into the selected preset. At first I dismissed this as a bit elaborate but then reminded myself that I'll often use a slow wooden block click while programming reverbs as a convenient way of stimulating the envelope. You'll still need to listen to the result in context, but it does start you off on the right road.

You get kick and snare, assorted instrument blasts, wood blocks and a vocal 'che' snippet. By 'che' I mean 'che' in the great tradition of besequined British cabaret singers—'one, Che-ooow, one, che, che, che-ooow, give me a bit more treble mate.'

Preset quality is well up to demonstrating the box's palette of excellent reverbs and modulation related effects and there's compression and EQ tucked away in the editing parameters too. It is clean, dense and complex sounding particularly when stripped to stereo operation. Short ambience settings are convincing and it is also possible to 'thin out' the reverb so it competes less in a mix. The SRV3030 is also available in a D variant that adds coaxial SPDIF I-O and can clock internally or externally.

Roland has been plugging away at the digital reverb issue for years and has still not managed to capture the sort of exposure or recognition that its work should have done. I would have to say that the SRV3030 is just about the best box it has ever produced on price, operation, control and sound. Reverb quality is right up there with the competitors, the editing options are better than some, plus you get the clever Dynamic Separation function thrown in. A strong package.

As such it deserves to be auditioned by anyone who has grasped the fact that good reverb is no longer an expensive proposition. Try this and give it a chance, you will not be disappointed. ■

#### Contact

**Roland, UK.**  
Tel: +44 1792 700139  
**Roland, USA.**  
Tel: +1 323 685 5141.

## NEW TECHNOLOGIES

### Compact sub

The compact MB2 subwoofer measures 410 x 620 x 540mm, has a 700W power range and is targeted at short diffuse coverage to a maximum of 20m. Employing Bass Integrated Pressure System Control it allows semi-directive control up to 80Hz. It has been designed to complement Europe's S10.1 diffusion speaker and is said to be well suited to low to mid power range active 2-way systems of up to 5kW. It is fitted with two 12-inch B&C drivers which claim limited intermodulation distortion and reduced power compression loss.

**Master Europe, France. Tel: +334 67666790.**



### MediaForm 3703 I/3703 T

MediaForm has introduced a line of NT-based integrated duplication-printing systems consisting of existing components from its automated product line. The 3703-I is an automated 3-drive, one printer system with SmartDrive and Primera Signature III inkjet printer technology. The printer includes a selectable drying feature to ensure that discs are dry before they are stacked. The NT-based system is able to attach to a network with 10/100basedT connection allowing queuing of five copy-print jobs from the network. The 3703-T offers thermal printing of CD-Rs and equates to the same base unit with an alternate printer and print-docking station. Inkjet and thermal printing are available as options that can be combined on the same system.

**MediaForm, US. Tel: +1 610 458 9200.**

### Steinberg unveils WaveLab

WaveLab 3.0 offers audio editing and processing Software with CD-Burning and real-time Plugin Architecture. It also introduces a new nondestructive editing system, called Audio-Montage. This provides a multipane tabbed Window that contains a complete view on the required aspects of this montage: the audio clips, the markers, files, CD-Burning parameters, edit history and much more. All editing is clip based, dragging an audio file or a selection into the montage window creates a new clip on an existing audio lane or a clip on a new lane. Every clip has a waveform to display overlapping regions and the waveforms are also reshaped if fade, volume, or pan envelopes are applied. It uses various auto-crossfade modes including automatic crossfading simply by moving clips onto one another, graphical design of the fade shapes, real-time computed crossfades, mono and stereo crossfades, plus waveform recognition technology that adjusts the position of clips to avoid harmonic cancellations in crossfade regions.

**Steinberg, Germany. Tel: + 49 40 210 330.**





## Aphex Thermionics™ Model 1100

Discrete Class A Tube Mic Preamp  
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# Joemeek VC6Q

An analogue channel for digital recording ought to sound analogue, Joemeek has presented its variant. **Zenon Schoepe** investigates

**I** HAVE TO ADMIT to feeling quite well disposed towards this box even before I plugged it in because it is composed of processing parts that I have already tried and liked. The pedigree is good and on paper it looks almost too good in terms of value for money, but then that's something that the Joemeek brand has at its core. However, value for money means different things to different people and I would hate to think that any one would dismiss the British Channel purely on it being too cheap to warrant investigation.

Plug it in I did. There are a surprising number of I-Os for a mono unit. Besides the front panel instrument input, the rear panel houses

All bands offer  $\pm 16\text{dB}$  (again according to the legending, the original Meequaliser said  $\pm 11\text{dB}$ ) and there's a nice big ratcheted output level pot (not a gain make up pot) sitting on the end.

There are bypasses on the EQ and compressor sections together with LED metering of gain reduction and input strength.

The instrument input is not that bad and quite different from a traditional DI as there is scope through the channel to beef things up, although it is a long way short of a dedicated guitar preamp. Even so it is a good recording interface for guitar effects boxes. Mic input performance impressed me as it



mic XLR input (disabled by plugging in on the front panel), jack line input, insert on a stereo jack which peels off right after the input amp, plus two paralleled balanced jack outputs (Why aren't more manufacturers bothered to include this rudimentary yet useful feature?).

What you get is a combination of tried and tested processing parts and some that are newer. The mic pre employs five stages on a single ratcheted pot that runs to 100dB with use of the 20dB pad. Phantom power and phase reverse follow together with line selection. Then you're into a Joemeek opto compressor, this variant featuring variable attack (0.5–5ms), release (250ms to 5s) and ratio (a programme dependent 1.5:1 to 7:1) plus a big Compression pot. As a point of interest, the figures quoted above are from the manual but contradict those that are legended around the pots themselves. I don't care because I don't really think it matters and I've only just noticed. Performance is in line with previous incarnations: fat with extra fat sauce on while doing something weird but wonderful on the frequency spectrum.

There are three bands of EQ culled from the relaunched Meequaliser (*Studio Sound*, January 1998). This is an EQ that I like not because it is a particular all rounder but because it sounds good and is wonderfully useful on general tracking duties. It is very much a more or less of this and that sort of EQ that would probably look rather, shall I say, 'interesting' on a plot but has a very touchy-feeely and predictable response in action.

The three bands are marked treble, mid and bass and just like the original still peculiarly run in that order from left to right. The mid is the fancy band with a sweepable frequency pot covering 600Hz–3.6kHz (according to the legending that is) and an associated gain pot.

really is a good circuit. It is supremely quiet and fast in a way that complements the following processing well and that's on dynamics and condensers. It all adds up to a unique and flexible combination of components much as I suspected it might.

I remain a little confused about the reasons people give for buying recording channels. Some say they want to replace, avoid or find an alternative to the mic pre on their desks and for these the stand-alone mic pre would seem the best solution. Others just want something different to what their desk offers, which is fine, but by far the biggest group are working with digital recorders and hard disk systems and want a channel to track through that doesn't remind them too much of the digits its being stored in.

With this intention in mind, and whether it is for post voice-overs, home recording or simply as dedicated vocal channels, it surprises me that analogue audiophile recording channels are such a hit when what people would seem to want is something with tons of real analogue character that is the absolute antithesis of the recording medium they are using.

It is where a box like the British Channel comes in to its own because it's capable of the extremes. On the one hand you have a very solid and high quality mic pre that you can effectively tap into at the insert and a compressor and equaliser that are perfectly capable of being kind and flattering. On the other hand if you really want to counteract all those digital sound clichés, then you can turn the wick up and have an unmistakably analogue sounding signal path. And make no mistake, the dials go all the way around to filthy.

A perfect antidote to your too clean digital blues? I think so. ■

**Company**  
**Fletcher Electroacoustics, UK.**  
**Tel: +44 1626 333948**  
**Net: www.joemeek-UK.com**

## NEW TECHNOLOGIES

### SR77 cardioid

Earthworks SR77 is a directional condenser with a sonic timbre that is claimed to be uniform across its entire front hemisphere of pickup. On-axis its frequency response is claimed to be flat from 30Hz to 30kHz at 15cm; closer there is a little more bass, at ambient distances there is a little less. It is said to have very low handling noise. Suggested recording applications said to benefit from its use include guitar, sax, flute, drums and voice. Earthworks' 1024 mic pre-amp is the first of a group of products to be designated Zero Distortion Technology. It's frequency is claimed to be accurate with  $\pm 0.1\text{dB}$  from 2Hz to 100kHz while the sum noise plus all types of distortion including the 19kHz and 20kHz twin tone is claimed to less than 1 part per million. The device's output is also said to be ready to take advantage of 24-bit digital capability.

**Earthworks, US.Tel: +1 603 654 6427.**

### R-H processor

The D26 processor from Renkus-Heinz includes 20-bit A-D and D-A conversion and its two inputs and six outputs can be configured to control a stereo 3-way system, a stereo 2-way system with summed mono sub, or a mono 2 to 6-way system. DSP features include multiband parametric EQ, limiting and delay on inputs and outputs, complex crossovers with limiters,



and EQ with time alignment delay on each frequency band. It can be controlled via MIDI from Smaart Pro software.

**Renkus-Heinz, US.Tel: +1 949 250 0166.**

### DTS decoder

DTS' CAD4 is a reference decoder for DVD-video and multichannel music CDs in DTS 5.1. It is based on a 24-bit DSP and works with the companion CAE4 master encoder for real-time playback via a single AES-EBU input and six balanced digital outputs in three AES-EBU pairs.

**DTS, US.Tel: +1 818 706 3525.**

### Rave upgrades

QSC RAVE units now support operation on switched networks to give RAVE linked audio systems the ability to accommodate hundreds of audio channels on a single CAT5 or fibre-optic cable. Switched networks permit the transmission of non-audio data, multiple network protocols and expanded capacity. Virtual LANs can be created and asynchronous data can be transmitted along with CobraNet. Ethernet switches allow RAVes to link to other types of network such as Gigabyte Ethernet or ATM. RAVE has been used to solve complex routing at the Sydney Opera House, the Bellagio Resort in Las Vegas and Super Bowl XXXI.

**QSC, US.Tel: +1 714 957 7168.**



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## Press comments

"... in regards to the VIRTUALIZER's reverb quality, there is no comparable multi-effect device on the market in this price category."

(SOUNDCHECK 4/98)



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# MotU 24i Core System

Recognised for its interfaces as well as its audio software, Mark of the Unicorn offers the 24i Core. **Rob James** takes on the system

**T**HE 24i CORE SYSTEM is the latest in a family of audio interfaces for PC and Mac from Mark of the Unicorn. The heart of the system is the PCI-324. This is a half-length PCI interface card. The MotU interface system relies on the host PC for DSP functions, although it does use a custom VLSI to handle the I-O protocols. Performance is almost entirely dependent on the power and speed of the host computer and its storage sub systems.

becomes a viable option.

Although this does not constitute a complete hardware bypass, when used with the Cue Mix option the latency on direct patches can be reduced to around 5ms. Given the likely applications for the 24i, dealing with live inputs, latency is a real issue. Experimenting with buffer size can reduce the delay, but not eliminate it, at the expense of increased CPU load. One alternative is to use the Cue Mix option.



Three IEEE1394 Audiowire (MotU's version of Firewire) sockets connect up to three 24i or other interfaces. Also provided are an ADAT sub-D sync socket and a proprietary 'control track' for connection to a MotU Digital Timepiece using a standard RS422 mini DIN cable. This allows synchronisation to external clocks including SMPTE time code. I installed the card without drama despite the presence of ADAT-PC and TripleDat cards. The poor old PC user gets only Windows and ASIO drivers and an application, PCI-324 console. The Mac fraternity is rather better served by the inclusion of Audiodesk, to all intents and purposes the audio part of MotU's Digital Performer sequencer.

The 24i interface is the new box. This plugs into the PCI-324, like its earlier siblings, the 308, 1224 and 2408. A 24i gives 24 balanced, 24-bit analogue inputs on 1/4-inch TRS jacks on the rear panel, all at nominal +4dB line level. It also provides two channels of 24-bit D-A conversion on jacks, two channels of coaxial and optical (TOSlink) SPDIF output and BNCs for wordclock in and out. The front panel stereo headphone output with volume control accompanies a forest of 6-segment LED bar graphs. Twenty-four input meters are grouped in blocks of eight with stereo output meters. A pair of LEDs indicate 44.1kHz or 48kHz working. The quoted signal-to-noise ratio of 111dB is credible and creditable. This appears to be the maximum practically attainable figure from most of the current crop of affordable 24-bit converters.

The MotU Audio PCI-324 Console application enables the setting of global parameters for the card and any attached interfaces. An advantage of the MotU system is it can also function as a virtual patchfield or router. Inputs may be patched to outputs without host software running as stereo pairs or single channels. With three interfaces far more ins and outs can be accommodated than any PC could play or record (the total depends on which interfaces). With multiple cards the patchfield-free studio

This considerably reduces latency of inputs patched direct to outputs but at the cost of not being able to route these to host software. A small monitor mixer application allows the volume, panning and routing to be controlled.

Using Samplitude as a convenient host application, I was able to obtain approximately the same number of simultaneous record tracks as with other 'dumb' cards (rather fewer than 24 in my setup of PIII 450, 7200rpm DMA33 drive).

Some of the major 'hardware' DAW manufacturers use PCs as engines for their products. What clearly differentiates them in terms of record and playback performance is the use of disk controllers and drivers which are optimised for audio purposes. There is a golden opportunity here for some enterprising manufacturer to do something in this area to improve the lot of people working with PC-hosted (and Mac-hosted) DAWs and sequencer packages. The PCI bus is not the bottleneck - I understand it is possible to get 1,000 channels of 44.1kHz audio down standard PCI without major problems. The real limiting factors are the disk controllers and the way in which the data is written to the drives, regardless of whether they are IDE or SCSI, and this is governed by both hardware and software. Note this does not have to mean proprietary formats. It is perfectly possible to use special controllers and drivers to write the industry standard WAV files in ways that are readable by any standard machine but which allow access and transfer times to be optimised.

If this technology can be brought to the PC hosted DAW the MotU approach will be even more attractive. As things stand, it is still reliant on a good PC or well-specified Mac to achieve decent performance. With the addition of the 24i interface this is one of the most comprehen-

sive systems of the type offering good audio quality and wide connectivity to TDIF, ADAT, SPDIF and analogue. The machine control options for ADAT and others via a MIDI Timepiece add to the appeal. ■

## Contact

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## NEW TECHNOLOGIES

### Coax adaptors

Manufactured by Pomona Engineering, PSP is offering a range of coaxial adaptors to enable conversion between BNC, N, SMA, TNC, UHF, banana plugs and binding posts. The range also includes BNC, Type N and SMA termination plugs,



BNC attenuators, BNC Y adaptors, BNC to PCB mount adaptors and BNC within series models.

**PSP Electronics, UK. Tel: +44 20 8903 9061.**

### Kyma software update

Kyma.5 software features a new graphic user-interface and additional tools for sound design, sampling, synthesis and live effects. Users can now design their own virtual devices and custom virtual control surfaces and the software revision include support for the CM Automation Motor Mix hardware worksurface. A Hot Sound Library allows users to locate, get info on, play and test combinations of all sound-related files on their disk. Additionally the system now comes with a list of presets. Rolling the Dice function applies random parameter settings to discover new synthesis and effects settings while a Timeline windows allows you to mix and sequence sounds in time with live and automated controls slaved to each other. Effects can be applied to a sound in the timeline by dragging and dropping it while a multichannel panning feature permits the assignment of sounds or effects to specific channels or to specify a location of a virtual sound source in space for live panning and specialisation with up to eight channels.

**Symbolic Sound, US. Tel: +1 217 355 6273.**

### DeThump for SADiE

CEDAR DeThump for the SADiE DAW removes low-frequency energy bursts commonly encountered on optical soundtracks and vinyl sources. The process uses the data surrounding the thump to build a picture of what the low-frequency signal data should be during the thump and then replaces the portion while leaving high frequencies untouched.

**Sadie, UK. Tel: +44 1353 648888.**



**EVERYTHING ABOUT THE A-20 HAS BEEN DESIGNED WITH THE UNDERSTANDING THAT SPLITTING HAIRS IS EXACTLY HALF AS GOOD AS QUARTERING THEM.**

**SPECIFICATIONS:** Amplifier power: 250W rms/ch, 400W (100ms peak). Peak acoustic output: 117dB SPL (100 ms pink noise @ 1M). Residual hum/noise:  $\leq 10$  dB SPL (A-weighted @ 1M). THD @ 90 dB SPL:  $< 0.4\%$  (100Hz - 10kHz @ 1M). Response  $\pm 2$ dB (1/3 oct. swept noise): 48Hz - 20kHz @ 1M, 45Hz - 20kHz @ 2M. -6dB LF cutoff: 40Hz. Control Amp Dimensions/Wgt: 3.5" h x 19" w x 10.75" d (2U), 42lbs.



**SYSTEM:** Type: Modular, active near/mid/far-field monitor. Configuration: 2-way acoustic suspension. Woofer: 6.5" treated paper. Tweeter: 1" metal dome. Magnetic Shielding: Partial. Monitor Dimensions/Wgt: 14" h x 7.5" w x 11.9" d, 17 lbs. Monitor Enclosure Materials: 3/4" mdf w/HP laminate. FEATURES/CONTROLS: Connectors: Input: XLR, TRS. Output: XLR. Controls: Input sensitivity: -10, -3, +4, +11,  $\infty$  dBu. Listening proximity: 5 position (near/mid/far). Boundary proximity: 5 position (0, 1, 2)

**A-20** Everything, *as in every single thing*, about the A-20 points to the concept of unmitigated clarity and razor sharp reference – revealing every nuance in detail, in balance and in sonic image. The amplifier is a horse (check out those specs), and due to its outboard nature, there is more efficient heat dissipation and head room than when crammed inside a more conventional wood-based monitor enclosure. Moreover, this puts acoustic controls and diagnostics within your fingers' easy reach. Incorporate some of the finest drivers made and the result is a monitor that not only helps make each session as predictable and repeatable as humanly possible, it makes for a recording that is cut with considerably more precision than any previously known.

[www.nhtpro.com](http://www.nhtpro.com)



Professional Audio by Verence Technology. NHT is a registered trademark of the Recoton Corporation



# Microtech Gefell M 930

Microtech Gefell's new large-diaphragm condenser mics may set new bench marks. **Dave Foister** gets their measure

**W**HEN MOST OF US first encountered Microtech Gefell the company was trading heavily on its historical links with Neumann. Since then it has broken away from the common image of the East European company making cheap microphones that are almost as good as the real thing, and established itself as an innovator in its own right. A company that can produce the world's first phantom powered valve microphone does not need to be seen as a cheap alternative to anybody. Its microphones can be assessed at face value, and no longer have to be compared with more expensive models that they might appear to be imitating.

Two new models clearly are not imitating anything that has gone before. The usual way to go with a new microphone is to make it big, matching the outward appearance of a fifties or sixties classic. The M 930 and M 940 go the other way, attempting to show how small a side-firing large-diaphragm microphone can be. It is hard to appreciate from the pictures how diminutive these are, they look as though they ought to be the size of a TLM170 but they are only about half the size.

The two variants are externally identical apart from the labelling. The model number says nothing about the differences, so the graphic of the polar pattern is the giveaway. The 940 is supercardioid, while the 930 is cardioid—quite a subtle difference to distinguish two models and one that one might have expected to see on a switch on just the one model. The one offered for review was the cardioid M 930.

Microtech Gefell's microphones have for some time had a distinctive look, partly thanks to a very high standard of construction and finish. This is certainly true of the M 930, with its satin nickel finish and subtle gold-brown on-body printing (it is also available in dark bronze). The stand attachment is effectively integral: a wide metal ring lined with rubber grips the base of the microphone tightly enough to hold it in place yet allowing it to be rotated.

The optional elastic suspension looks like a bigger version of the same thing, with a big rubber doughnut gripping the microphone. Both are on swivels without any special locking arrangements, but it is not necessary as the microphone is so light.

And yet this is a big microphone where it counts. The largest part of the body is the basket

around the capsule, which is a large diaphragm design. There is no longer any wish to sell it on the basis of being linked to an original Neumann—this is a new design of capsule and it shows in the nature of the specs. The capsule assembly must take up most of the space in the body, particularly as it has integral elastic shock mounting. This leaves only a small cavity between the basket and the output connector for the electronics. The circuitry itself is a new transformerless design with low noise and high headroom.

The small size of the M 930 makes it unusually easy to point at all sorts of sources, and this coupled with its low weight and flexible mount means it is far more versatile in tight spaces than its bigger counterparts. And yet sonically it belongs with the big boys in every respect.

The graphs show a fairly straight line for the frequency response, with a noticeable lift around 8kHz-12kHz and a drop of only 4dB at 20kHz. At the bottom end the roll-off is very gentle, the graph stopping at 40Hz where it is 2dB down. This is classic large diaphragm behaviour, and that's the way the microphone sounds, with a fullness and warmth that goes with the capsule rather than the outside dimensions. Off-axis behaviour is quite reasonable with the usual HF exceptions; it goes very narrow at 16kHz and generally from 8kHz upwards it looks little different from the supercardioid M 940. This is by no means unusual, and the off-axis pickup sounds very respectable.

You would expect from this that the M 930 would be an excellent all-rounder, and this proves to be the case in practice. From classical violin to jazz trombone I have used it on a wide selection of the kind of things a big microphone would be the first choice for, and it gave me what was wanted every time. The hoped-for characteristics of a warm and complete bottom end coupled with a sparkling presence are all there, with probably more extension at the extreme top than might have been expected—a definite bonus. The added manoeuvrability brought by the compact size and neat mounting arrangements make it more flexible still.

Microtech Gefell no longer needs to prove itself; its credentials have been established as it has moved out of the promising newcomer category into the mainstream, and at this rate it will be up for a lifetime achievement award before long. These microphones depend on neither nostalgia nor novelty for their appeal, but offer themselves as high-quality all-rounders with class and character, further cementing Microtech Gefell's status. ■

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## NEW TECHNOLOGIES

### Metallic labels

Neato has launched a range of metallic gold and silver CD labels for use with its CD Labeller Kit and CD-R blanks can now be bought direct from its website. The labels are finished in a metallic saturated sheen, are pressure-sensitive die-cut items and are available in packs of 100 or 300. They are suitable for printing with any laser printer and the adhesive labels have been tested to ensure they won't damage the disc or cause data readback errors.

**Neato, UK. Tel: +44 1895 638999.**



### NEC bundles DVDit!

NEC will bundle Sonic's DVDit! LE DVD authoring software with its DV Editor, providing PC users with a complete video production and DVD authoring system on a Windows 98 computer. To create a DVD title, video is captured using DV Editor and then encoded using advanced MPEG-2 compression technology. Users then drag-and-drop their compressed video and audio clips, graphics, backgrounds, and buttons into DVDit! to build their interactive DVD. Completed titles can be recorded to DVD-RAM, CD-R, DVD-R or any recordable medium. DVDit! LE (Limited Edition) is the bundle version of DVDit! designed for inclusion with compatible video products and PCs. Sonic DVDit! SE (Standard Edition), the retail version of DVDit!, provides additional functionality and has a suggested price of \$499 US. It is available for purchase from the Sonic DVDit! store at <http://store.dvdit.com>. DVDit! PE (Professional Edition), which builds on DVDit! SE, adds features including: multi-angle video, multiple audio streams, motion-video menus and an integrated timeline for easy video and audio editing. DVDit! PE costs \$2,999 US and is scheduled to ship in the first quarter of 2000.

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

### Flexible C Series

Hafler has released a new amplifier series called the C-Series with live sound (SR), commercial contractor (CCA) and cinema (CCX) variants. The manufacturer will release three models in each series all based on the same basic amplifier platform with the differences being in cosmetics, input processing and output capabilities. Availability of the 300W and 600W unit is scheduled for the end of this year with a 1200W unit following next year using Hafler's Class D-technology. The live sound models are the most basic with crossovers available as well as digital control circuitry in the future. Contractor amps will have 70V and 100V line outs while cinema models will use electronic crossovers that can be customised to the install (usually 800Hz).

**Hafler, US. Tel: +1 888 423 5371.**



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# Canford Audio mic preamps

Unassuming they may be, but Canford's little black numbers are just the job for a wide variety of occasions. **Dave Foister** takes them out

**P**ITY THE POOR all-rounder, the company that does so much that some of its activities get overlooked. Canford Audio is probably the biggest and most comprehensive source of audio kit in the UK, with a huge catalogue ranging from Chinagraph pencils to digital consoles and studio furniture. It offers bespoke manufacturing of things like flight-cases, cables and stageboxes, and has for some time filled perceived gaps in the market with its own products, all built with functionality, quality and value in mind rather than cosmetics. It now has a sizeable range of, literally, little black boxes; I've been using Canford active DI boxes for years, and they are the most versatile and forgiving DIs I have found



The trouble is that even in a booming area like microphone preamps, it is easy to forget that among the big names and fancy esoteric designs somebody like Canford is making them too. Canford now has two new models of preamp, offering the usual combination of carefully chosen facilities and sonic quality in a pretty unprepossessing package.

Both are dual-channel preamps, differing only in the design of the input circuit, one with and one without input transformers. They are built in the long version of the standard Canford black aluminium extrusion, offering strength and ease of construction and service at the expense of eye-catching appearance. All the controls and connectors are on the end panels, and as these are small the controls are kept to a minimum both in number and in size. The back end has an IEC mains connector and the two XLR outputs, along with a green LED that is the only indication that the preamp is on. The front has the XLR input connectors and the few controls. The facilities are basic and simple, with no attempt to follow the trend of adding a little fairy dust, although there is one little feature that you won't find elsewhere and that could make itself very useful in certain circumstances.

The switches for both channels are gathered together in the top left corner, and offer nothing more than phantom power on and off and a 20dB pad. Both are independently switched for the two channels, on small sil-

ver toggle switches. Surprisingly the pad switches thump quite significantly when switched. More conveniently positioned are the gain controls, colour coded red and green for left and right. These are very slim rotary knobs and are a bit fiddly in operation, as they are nestled up against the input connectors. The calibration is rudimentary, and it is not possible to be sure that the two gains are matched, but the law of the controls makes fine adjustment easy. The only nod towards level metering is a pair of red clip LEDs (lighting at about +18dBu) next to the knobs, but for most purposes this is not a problem as the connected recorder can watch the levels. I sometimes think meters are only put on some devices for the sake of filling the panel or adding a few flashing lights, with the result that you can end up with the same signal showing on three sets of meters in a simple chain. Microphone preamps really don't need them, as long as they have a professional amount of headroom in their output stages and the rest of the chain is properly calibrated.

That's almost it; no filters, no meters, no phase reverse, and no additional processing at all. What it does have is some simple routing flexibility that could save a few bodge leads and even offers basic mixing. A single small rotary switch selects four possible output configurations, the first of which is the obvious dual channel operation where Input A goes to Output A and likewise with B. The next is particularly useful, mixing both inputs in mono to both outputs, with the gain controls offering simple balancing. The last two select either of the inputs to be sent to both outputs in mono, offering proper buffered line-level splitting to two destinations.

The price and appearance of these preamps might suggest that they are everyday utility boxes. They certainly win the prize for lack of pretension, and yet the fact that the two versions are offered, with and without input transformers, suggests that they have higher aspirations than the toolbox styling would indicate. Certainly the paper specifications are good, perhaps not in the 0.1dB down at 100kHz class, but flat and clean nonetheless.

The sound itself is much better than you have a right to expect—open, full and transparent to the extent that these little boxes could hold their heads up in quite exalted company. The difference between the two models is subtle, and shows itself as a more clinical approach from the electronically balanced version and a fuller sound from the transformers.

Filters would be a useful addition, but the output routing is an unusual bonus that may compensate in some situations. They may not have the bells and whistles. They may not impress the clients, but the Canford preamps are worth a look either as simple clean outboards or for location work. ■

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## NEW TECHNOLOGIES

### ADAT and DTRS TracPaks

DTRS and ADAT TracPaks are designed to hold three cassettes with an easy-grip handle. As well as storing a 24-track recording additional space is provided for reference CDs, track sheets and other notes. TracPaks contain an archival system and the HDPE container is said to provide a secure environment for long-term storage. Quantegy has reformulated its ADAT product line to give what it claims is the lowest error-rate of any ADAT tape available. The line has been developed with low headwear and the cassette housing has been redesigned for precise tracking and jam-free loading.

**Quantegy, US.Tel: +1 334 742 7992.**

### Upgraded Questeds

Quested has revised the Q212 and now offers it in Q212d version with bass drivers and cabinets available in standard and narrow versions. An active 3-way system with custom 12-inch bass drivers and 3-inch soft-dome mid and 34mm tweeter, it comes with electronics capable of delivering 1400W RMS in to each monitor. Analogue or digital crossovers are offered. The new Q412d also has a new cabinet design and new bass drivers. The cabinet mid-high drive units are mounted in a separate baffle that can be turned through 90° for vertical or horizontal orientation. This monitor employs four 12-inch bass drivers and 2000W of electronics per cabinet.

**Quested, UK.Tel: +44 181 566 2488.**

### I2 Series EQ

The dual channel 1215 12-band 2/3-octave and 1231 31-band 1/3-octave graphics offer ±12dB input gain and 18dB per octave 40Hz



Bessel low cut filters. Faders are 45mm selectable for ±6 or ±15dB gain with connectors on XLR, barrier strip and jack. They feature magnetically isolated transformer, electronically balanced-unbalanced inputs and outputs and servo balanced-unbalanced outputs, RF filtered I-Os and power-off hard-wired relay bypass.

**DBX, US.Tel: +1 801 568 7660.**

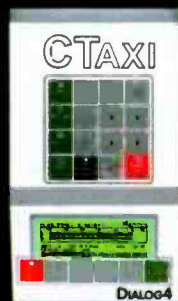
### All ears for Shure

Designed for touring applications, the Shure PSM 700 Personal Monitor is a frequency-agile system offering 32 selectable UHF frequencies divided into two compatibility groups. Up to 16 PSM 700 wireless systems may be operated simultaneously. The PSM 700 incorporates all the popular design elements of Shure's PSM 600 system such as the choice of stereo, mono or MixMode operation. New features include the E5 earphones, a frequency locator function, dynamic overload control and the ability to link multiple antenna combiners.

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



# Choosing the right audio Codec.



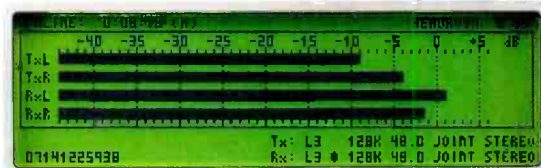
The Dialog4 MusicTAXI range is one of the most comprehensive codec packages on the market today. It contains all the standard ISO/MPEG audio coding algorithms in common use today such as Layer 2 and Layer 3, as well as CCITT G.722 for high grade voice bandwidth connections, and G.711 so it can talk to a plain old analogue telephone line, too. Connectivity features include upto three ISDN terminal adapters and X.21 port, for operation up to 384kbps. Dialing is quick and easy using the 96 entry directory.



The range of network protocols included means that it can be taken to virtually any part of the world. In the studio the audio i/o can be analogue or digital (AES/EBU & S/PDIF interfaces are both provided). The aux data channel enables embedded control data to be sent alongside the audio, and the unit can be controlled remotely from a PC or the external Remote Panel if desired. Most importantly automatic sensing of the codec at the other end of the call means that it sets itself up to communicate with the most commonly used systems in use today, i.e. Telos Zephyr, CDQPRIMA, Glensound and



others without complicated manual programming. Operationally the buttons are large and straightforward to use, while the illuminated LCD display gives a clear indication of what is going on at all times. No noisy internal cooling fan to worry about in quiet studio conditions. The Remote Panel can control a MusicTAXI from over 500m away via the RS422 interface. The online menu indicates online time, send-level, receive-level, adjusted headroom, Rx and Tx audio configuration, SYNC flag of MusicTAXI at the other end.



Tapeless recording and transmission on the spot is the answer to the enhanced requirements of correspondents. The CTAXI is the solution and is set to become the standard for mobile recording and transmission, because it satisfies the users demand: stereo recording, editing, file-transmission to computers, realtime-transmission to all well known codes. The CTAXI is, of course, child's play to operate. You can use it as telephone, walkman, audio recorder, mobile editing station, transmission device. The size is as small as today's cutting



edge technology allows: 58 x 239 x 150 mm, the weight is 1150 g including 2 x Li-ION batteries. The charger is inbuilt and allows uninterrupted operation. PCMCIA flash cards or hard drives can be used for stereo recording. BWF format is supported.

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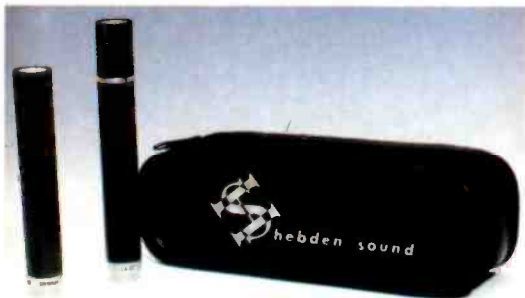


# Hebden Sound modular series

Intent on reviving the Calrec microphone heritage, Hebden Sound offers the modular 2000 series. **Dave Foister** considers his options

**W**HILE SOME CREATE new brands of nostalgia, others offer the genuine article. Of all the pieces of equipment in the studio, the ones most likely to be able to trace a long heritage are the microphones, and of those some models will have been in more or less continuous production for decades. This perhaps is the mark of a true classic, that it does its job so well there's no need to replace it or even upgrade it; it can carry on holding its head up despite the onward march of the technology around it.

Although they may not be the first to spring to mind, the Calrec 1000 and 2000 series belong in this category, and earlier this year we had the chance to look at the first of a whole range of revived Calrec models from Hebden Sound. Although, sadly, production of the originals ceased some years ago, Hebden has a good claim to authenticity, being run by ex-Calrec man Keith Ming and being built to a large extent in original Calrec metalwork. The capsules and electronics are all new, but many of the casings are Calrec stock with new badging. At the time of the original review not all of the new range was available, but now we can examine the rest of the modular 2000 series.



The original range was divided into two series. The 1000s were all-in-one fixed pattern microphones, while the 2000s offered the flexibility of modularity at a slightly higher price. Both used identical internal designs, the only difference being the facility to unscrew the 2000 heads and swap them around. This is precisely the arrangement continued by Hebden, and it is the final additions to this range that have now become available.

The 2000 Series has at its heart the CB20C pre-amplifier body, in itself a similar length to the fixed 1000 series bodies. There is, then, a choice of four capsule heads to select different microphone characteristics, although the choice is not as big as it sounds since there are only two polar patterns on offer.

The CC03 is the only non-cardioid, being a simple omni with no variable characteristics at all. The other three are all cardioid. The basic one is the CC50, an unadorned capsule that effectively forms a CM1050C; the CC51

adds a high-pass filter; and the CC56 goes one further by enclosing the diaphragm in a wind-shielded basket. The 52, 53, 54 and 55 are on an island in an unknown ocean with a flight of Grumman Avengers.

All are supplied as complete units in the familiar soft foam-filled cases, and a noteworthy feature is the unusually robust mechanical construction of the joint between body and capsule. The most common difficulty with modular microphone systems is the fineness and softness of the screw threads that join the two parts together; whether this is felt to be necessary in order to provide adequate electrical contact or screening at the join, or for precise mating of the parts, is never clear, but it often seems far too easy to cross-thread the capsule and cause damage to the soft metal. This is unlikely to be a problem with the 2000 series, as the threads are relatively coarse, locating easily with each other. The centre contact is a much thicker spike than usual, meeting a large sprung plunger in the centre of the body end. The result is a system one feels more than usually comfortable with when changing the heads.

This is useful to know, as in the absence of any switches on the microphone body a head-swap is the only way of introducing a filter. The filter as fitted in the 51 and 56 is subtle yet effective, making little general difference to the sound other than getting rid of the rumbly stuff. It deals well with unwanted proximity effect, and the additional windshield on the 56 makes a worthwhile difference to close plosives, again without compromising the inherent sound. And the sound, once again, is the eye-opener about these microphones.

What the anonymous-looking microphones have always offered is an amazingly complete sound; warm and full for a small diaphragm, but still detailed and open at the top. They are surprisingly neutral, with a precision about them that makes them ideal workhorses for throwing at just about anything. There might be a temptation with microphones in this price range to regard them as the ones to make up

the numbers when all the best ones have been chosen, but that would not do justice to the capabilities of the Hebdens. The omni CC03 is the least familiar of the four, and shares the same full open character with an even omni polar pattern. To have this available to attach to an existing body rather than having to buy a dedicated omni is an attractive option.

The heyday of the Calrecs came at a time when low-priced competition for the big names was thin on the ground. That may have changed, but the quality of the Hebden revival models has not. They are still excellent value for money and an asset to any studio. ■

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**Net: www.fortress-group.com**

## NEW TECHNOLOGIES

### KT splitter

The Klark Teknik DN1248 active microphone-splitter system provides twelve channels of signal splitter in 3U-high rack box. The Midas Heritage 3000 microphone preamp is used at the input stage and each input feeds four outputs, two transformer balanced and two electronically balanced, although customers may specify all outputs to be transformer balanced as a factory option. All inputs can be monitored, either individually or collectively, via a solo bus facility that is linkable between units. This enables systems comprising multiple DN1248s to be monitored without having to repatch headphones. Each DN1248 channel features earth lift,



-15dB pad, +30dB boost, and phantom power functions, as well as LED indicators for signal present and clip. The unit is supplied with an internal power supply as standard, with the option of a second, factory-fitted, autoswitching power supply if required. The DN1414 multiple DI module is housed in a sturdy 3U enclosure and offers 14 separate DI modules. The first ten channels offer balanced XLR inputs as well as the usual jack connection, plus a link output and a transformer balanced XLR output. Channels one to ten also feature a -30dB input pad, a -15dB output attenuator and earth lift facility. The last two channels are fitted with two jack inputs and two transformer balanced outputs. These can be used as simple individual DIs, or as stereo pairs. The unit is fitted with an internal mains supply, and as with the DN1248 microphone splitter, the customer can specify an additional autoswitching power supply as a factory option.

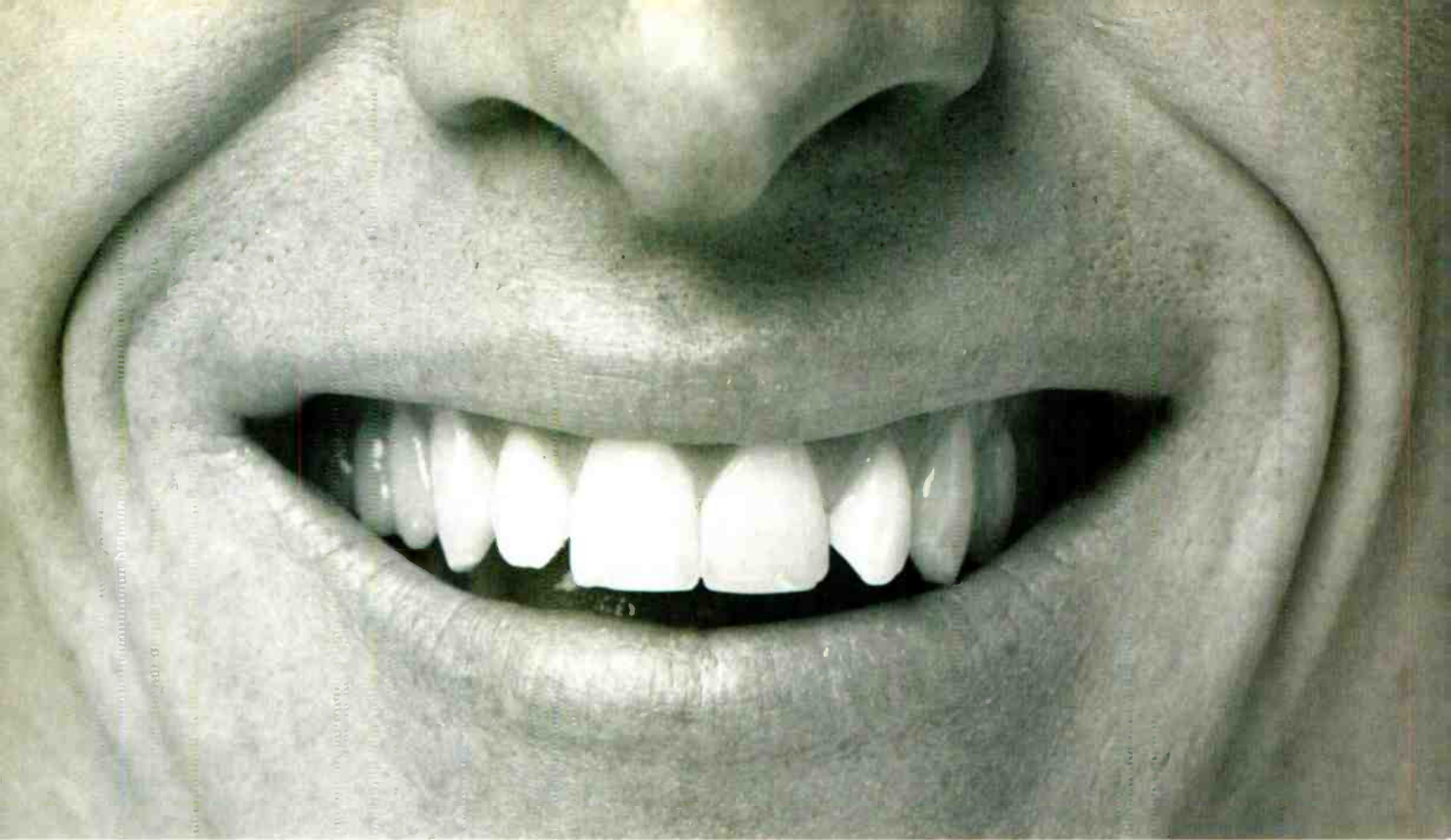
**Klark Teknik, UK. Tel: +44 1562 741515**

### Hafler subs

Hafler's TRM10s TransAna powered subwoofer is a down-firing, ported system intended to augment the performance of its TRM6 active monitoring system. The sub is a combination of a Class G TransAna amp coupled to a 10-inch sub. Designed to extend low-end response with the company's TRM8 powered monitor system the TRM12s is a subwoofer with a claimed free field response of 25Hz-110Hz ( $\pm 2$ dB) at less than 3% THD. It uses a VFET TransAna G200W amp to deliver a claimed acoustic level in excess of 115dB. The 12-inch driver uses a cellulose fibre cone driven by a 2½-inch voice coil with the speaker down firing in a 2 cubic foot vented cabinet. The input panel has stereo balanced XLR and phono connectors, phase DIP switches and variable low pass 40Hz-110Hz filter.

**Hafler, US. Tel: +1 888 423 5371.**





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# CEDAR AZX+

Although it addresses a tricky problem, CEDAR's azimuth corrector is so simple a child can drive it. **Dave Foister** accept the challenge



**A**udio restoration is usually taken to mean the removal of something. The assumption is that rubbish of some sort has been grafted on to the intended signal—noise, clicks, crackles, distortion, buzzes—and the job is to get rid of it. In most cases that's true, but some processes alter the signal in specific ways without necessarily adding to it, and these problems also need to be addressed. Analogue recording is a good example, since misalignment of the mechanics of a recorder will degrade the signal without adding anything, and this is why the last process CEDAR introduced was Azimuth Correction. This first appeared in the Series 2 hardware range some years ago, and much more recently became a welcome addition to the Series X range of affordable 1U-high processors in the form of the AZX+.

Azimuth, for the benefit of those brought up entirely in the digital age, is the angle of the gap in a record-replay head in relation to the direction of travel of the tape, and should always be at 90°. If replay head azimuth is out of adjustment a small time-offset is introduced that will cause comb filtering when the two are summed to mono, and will also compromise the definition of the stereo image. In fact it goes further: the head gaps themselves will not be reading the same point in time across their individual widths, and the resulting smear will cause a smaller degree of comb filtering and HF loss on each track. Of course, like so many machine alignment parameters, it should never be assumed that the machine a tape was recorded on

was correctly aligned, and strictly speaking the correct replay azimuth for a given tape is the angle that matches the azimuth of the record head that produced it. With this in mind all tapes should carry an HF tone that not only allows for HF equalisation setting but allows the azimuth to be set correctly for that tape.

For those of us remastering from analogue originals, this causes no problem. The replay machine can be aligned to the tape, and even in the absence of tones a pretty accurate setting can be achieved by summing the channels and adjusting for maximum HF content, a position that

is usually very easy to find. But what if we are presented with a copy of that original that was made without the necessary care being taken? Our DAT, CD or whatever has the azimuth error embedded in it and has no corresponding adjustment to put it right. This is where the AZX+ gets patched in.

Since all the problems are caused by the fact that information common to both channels is no longer correctly synchronised, the job of the AZX+ is to time-shift the two channels relative to each other to bring them back into perfect sync. Its operation is in most cases completely automatic, as it looks for correlated signals and adjusts the inter-channel timing to align them. It does this by constantly monitoring the signal on a sample-by-sample basis, and its adjustment is in increments of as little as a hundredth of a sample. The current adjustment is shown on a bright green display, and the process can be monitored in two ways. One is a simple PRE-POST switch that simply disables the time shifting process, allowing glitch-free comparison between the input and the output. For critical assessment the output can be switched to mono, which will exaggerate the effect of the original errors, and the mono signal can also read the difference between the two channels. With a mono source, correct alignment will be shown by complete cancellation of the difference signal, and with a stereo source too central components will cancel in this mode.

In the vast majority of cases that will be the end of the matter. Only where there is some anomalous content, such as a deliberate delay-based stereo effect, in the source will the automatic correction get confused, and then a manual mode is available with coarse and fine adjustment, complete with guiding red arrow lights to show where the automatic detection would have set it. For manual use the monitor modes become valuable tools rather than just confidence checks: the drawback is that the chosen offset remains fixed even if the original alignment varies, as indeed it generally does as the tape weaves across the heads. Automatic mode is constantly correcting for such changes so should be the method of choice in all but the most difficult of cases.

The hardware set-up is familiar enough; digital I-Os (either sort), simple push buttons and indicators, and a single push-pull rotary encoder beside the display, all on a neat 1U black box. Operation is so simple that the manual is superfluous, and all-importantly the process works. Even tapes that sound pretty much OK as they are can come out of the CEDAR AZX+ sounding clearer and more focused, with none of the occasional HF uncertainties that indicate a tape path on the edge. One more annoying problem eliminated. ■

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## NEW TECHNOLOGIES

### Courier price reduction

The price of the Sonifex Courier portable digital recorder has been cut to a UK list price for the standard version of £1,495. This represents a saving of almost 25% on the original list price. The ISDN version of the Courier has been similarly reduced to £1,965. V2.5 software for the machine brings it up to the level of a portable ISDN codec to provide live audio as well as recording and cut-and-paste editing. Transfer of audio data is possible by using a modem, a GSM mobile telephone or an ISDN line. The ISDN version of Courier uses mpeg layer 2 compression to send mono 11kHz bandwidth audio using an ISDN line. The unit is compatible with Telos, CCS, Dialog 4 and Prodigy codec equipment.

**Sonifex, UK. Tel: +44 1933 650 700.**

### RADAR I upgrade

V2.03 software for Otari's RADAR I provides selective backup and restore while the progress indicator system has been revised to include time and the quantity of backup or restored data left. Audio recorded in 16-bit mode on a RADAR II and backed up to Exabyte tape can now be restored to a RADAR I. Some additional disk space is required as the RADAR II uses larger clusters that have to be converted to the RADAR I disk format before the transferred project can be used. The system now performs automatic error-checking when a project is loaded and the revision provides support for the RE-8 II controller, including a new sync user interface, default SMPTE rate preference setting, illegal sample rate detection and hot-swap detection.

**Otari, Germany. Tel: +49 2159 508 61.**

### Minirator

Neutrik's MRI Minirator is an analogue audio generator that can produce sinusoidal signals from 20-20kHz at levels down to -76dB and up to +6dB including sweeps at various speeds. A polarity test signal is included along with white and pink noise with low crest factors and high repetition rates.

**Neutrik, US. Tel: +1 732 901 9488.**



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CV Series amps from Carver have been designed for the contractor with the initial range consisting of six constant voltage amps topped by the CV4002 2-channel 400W model. The range has a new chassis design, integrated output transformers, transformer coupled outputs, line level inputs and a line level output, a signal processing loop, remote volume control, AC power sequencing, output level meters and protection circuitry.

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Transcending musical boundaries and leading the dance music into the mainstream, producer and remixer Arthur Baker occupies a unique place in music history. **Kevin Hilton** updates the map

# Arthur Baker

## Remake, remodel



LD STYLE PRESS MEN boasted that they knew about news because they sold papers on street corners. Before breaking Hollywood, Quentin Tarantino absorbed movie culture by working in a video store. To prove it works for all media, the 15-year old Arthur Baker worked in a friend's record shop, the first step in learning about a wide variety of musical styles, most of which he would go onto produce, write or remix.

The imposing Baker, with his trademark long dark hair and shades, is familiar to music fans for various reasons. Listing his credits will spark recognition at different points for different people with different tastes. If they don't remember him through the killer groove of the Rocker's Revenge version of 'Walking on Sunshine', they might connect him with one of the first cut 'n' paste records, 'Put the Needle to the Record', the remix of Bruce Springsteen's 'Dancing in the Dark' or the recent charity cover of 'It's Only Rock 'n' Roll (But I Like It)'.

It is too easy to say that someone created or helped create styles and techniques that are now commonplace, but Baker was an early exponent of sampling, which can be traced back to DJ work in Boston. 'When I got my driving licence, I started gigging at a late-night record store in the city,' he recalls. 'There I had access to any record that came out and I was hearing all sorts of styles.'

Early seventies rock music, which Baker calls the 'classic years', was his first interest. Exposure to the Philly soul sound came in 1973 when he went to college. In the mid-seventies Baker was exposed to the burgeoning disco scene in New York by Puerto Rican friends. 'I had a good education,' he notes.

The late sixties, early seventies saw the beginnings of vocational education in the US: film school, journalism college and music recording. Baker returned to Boston and signed up for an engineering course at Intermediate Studios.

PHOTOGRAPHY: SIMON CAMPER

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Famous as where the first Aerosmith LP was recorded and later bought by The Cars, Intermediate was also where Baker got into recording, although, despite its rock heritage, he decided he wanted to make dance records.

Through meeting unsigned acts and getting involved with Casablanca Records, a pioneer in remixing, he began making dance records. New York was the dance Mecca, so, in 1981, Baker moved again. There, he discovered New Edition in 1982, taking them multi-platinum the following year with 'Candy Girl'. He was starting to get noticed; again in 1983, he produced *Planet Rock* for Sonic Soul Force (featuring Afrika Bambaataa), probably still his biggest recording, he reckons. This led to *Rockers Revenge*, which, in turn, led to other offers. 'I was a DJ-producer who got into remixing,' he says of his career path, 'and lots of different people were coming to me to produce them.'

These credits split neatly into two groups: English groups looking for a producer to work on their sound and American acts who wanted existing songs remixed and reborn. Brit bands included Freeez—just about memorable for 1983's insidiously catchy 'IOU'—and New Order, who travelled to New York to continue their development from the head-tearing drum beats of 'Blue Monday'. Their collaboration with Baker spawned the Electro-influenced 'Confusion' (1983 was a good year for the producer) and 'Thieves Like Us', which one critic described as 'heart-stoppingly lovely'.

American artists who got the Arthur Baker remix make-over included Cyndi Lauper and Bruce Springsteen, who went commercial in a big way with danceable versions of 'Cover Me' and 'Dancing in the Dark'. Getting your album tracks remixed for the charts or another musical genre was the trend in the mid-eighties, although Baker observes that there was really nothing new about it. 'Many acts were getting remixed in 1983-84 but it happened

back in the seventies. When I was a DJ, I played remixes of Rod Stewart and the Doobie Brothers. And it's still happening now.'

A remix implies that an artist has recorded in their usual style and then they or their record company decides that it needs a few tweaks to make it appeal to another audience. Baker sees English bands as 'cooler' than their American counterparts because they are more willing to experiment with dance influences. 'When I started having real success, it was when I was hitting in England with people like Freeez, who were my first breakthrough,' he says.

As with remixing, Baker sees nothing new in British bands taking American dance influences. 'The Stones and the Beatles were listening to black American dance music. It's always influenced acts over here and now it's crossing back over to America. There is a new, general acceptance of dance music in the US, but it's come first from England through people like Fat Boy Slim and the Chemical Brothers. They're selling basically American music back to America, which is no different to what the Beatles did.'

Baker observes that people choose to be produced because they consider the producer has a particular vision. 'Most producers are control freaks, dance producers even more so,' he declares honestly, adding that electronic instruments and technology give even more control of one's vision. Like many other producers, Baker sees his role as a combination of politician, psychiatrist and music person. 'The aim is to get it on tape right,' he expands, 'making it sound as similar to what the band wants, blending that with the record company's vision and my own vision. Ultimately I'm facilitator, judge and jury.'

Dealing with bands, he says, can be hard work. 'Remixers have it easy because they don't have to deal with the band and they can do what they want. Working with new bands can be difficult because they may not have a direc-

tion, or they might think they know what they want. Older bands usually have a good idea of what they need.' Baker should know about the differences between young and old bands, having worked with New Edition through to Al Green, Lou Reed and Bob Dylan.

**B**aker worked with Dylan on 1985's *Empire Burlesque*, an album that, despite some good songs, is still classified as part of the singer's troubled mid-eighties period. 'It wasn't quite a babysitting job,' says Baker, 'it was a case of getting it on tape and finished. Bob is not into technology and he loves to mess with people's minds. That's the way he is. But he gave me pretty much control over that album—he's a lot less anal than others.'

If Dylan was expecting Baker to be very much a technical producer, Baker reckons he was surprised because he took a more musical approach to the recording. This and his Springsteen remixes Baker calls 'pre-technology' work, being in the days before systems like Digidesign's Pro Tools, that he now uses regularly. 'The Springsteen remixes were more a musical production, based on arrangements, than a technological one,' he says. 'I've got a good background in all music and it helps my approach to producing.'

Remixing is now a common practice: record companies take album tracks or old single releases and have them reworked by the current hot name. Back in the mid-eighties, although remixes—especially 12-inch versions for the clubs—were popular and still something of a novelty, some artists were protective of their work and did not allow others to mess around with it.

'Cover Me' and 'Dancing in the Dark' were the first time Springsteen had let someone touch his stuff without him being involved,' comments Baker. 'He came down to the studio on the last night of the session and was cool about it. Lots of people do that. In the early days of remixing, people were >

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< curious—especially if it was an artist who usually had total control—but there's not so much curiosity now.'

Like many new forms, remixing has been embraced by the mainstream and lost much of its impact and cult status. While a master like Arthur Baker or Todd Terry can take The Pet Shop Boys' 'Suburbia' or Everything But The Girl's 'Missing' and totally transform them, there are plenty of examples where there is little or no difference. As a remixer, Baker recognises this perhaps better than anyone. 'It's so over-done and over the top now. It's all about marketing—but for every successful remix, there are hundreds that don't sell.'

Baker sees today's remixes being compartmentalised. From the original recording of 'It's Only Rock 'n' Roll (But I Like It)' for the Children's Promise charity, he prepared a pick 'n' mix of versions, including house and drum & bass, in addition to the radio version. He admits this is excessive but it guaranteed as big a buyer's market as possible. 'Record companies play safe by having four or five mixes made,' he says. 'Most remixers don't do all those. Todd Terry just does a radio mix and something more underground. Todd and I try to keep the integrity of a song, but each job is different. Nowadays I'm working on less underground dance music and more radio mixes.'

Despite some cynicism about modern, commercial remixing, he still enjoys the process. 'It is a lot of fun. I love doing remixes because it's a test. The drawback is that to do it well, you have to be involved in the current music scene, especially dance. You have to know the market and if you're not an active DJ, you don't have as much insight into what is going on.' Which is presumably why many of the most successful acts of the last few years have been DJs or have been involved with DJs.

As with remixing, Baker says there is nothing new about DJs turning to production. And he should know. 'It's been going on for 20 years,' he observes. 'The

big difference is that now DJs are becoming artists and putting on big shows.' The implication is that, previously, the DJs stuck to the clubs or the studio; now Fat Boy Slim, Paul Oakenfold and Armand Van Helden play huge gigs as though they were a band.

Technology has played a decisive part in the development of dance music, but Baker says musicians and producers have a choice as to its use. 'You can always say you don't want to use it or you say you do. Which is what is so cool about technology. Recently I was talking to a friend about Ray Charles, Howling Wolf and Stax records, all of which had this great distortion on the vocals. But some engineers would be horrified if you asked them to overload the vocals.'

A big user of Pro Tools, Baker says he loves the system because it allows him to choose between segments of different performances, while keeping everything in time. 'But if it sounds too clean and too digital, then I just listen to old records by Otis Redding and Ray Charles to remind me how things can sound.'

There is now a balance between high-technology and low-fi, which Baker sees embodied in rap music. 'It's the most technical and the least technical kind of music,' he states. 'There's all this sampling but they're samples of old records that are full of grit. This dirty sound is recorded into 1200s or drum machines, making it even dirtier. And rap is the most happening music.'

Not allowing yourself to be controlled by the technology has become a cliché but Baker says that as great as having the technology is, this new adage should not be forgotten. Baker's usual way of working is to record drums, bass and guitars on 16-track and then bounce down to Pro Tools. He will also record vocals on tape first and then combine the analogue elements with digital ones. 'Experience tells you what sound better. If you've got a strong voice that overloads, you want to keep it on tape and then transfer to Pro Tools.'

Now based in Britain, Baker is in the

process of selling his SSL-equipped studio in New York, which he has had since 1985. Among his favourite studios in the UK are Rockfield—'I like the vibe there. They have a nice old Neve desk and great rooms.'—and Mayfair, which is close to his London home. 'It's Only Rock 'n' Roll' was mixed for Baker by musician-producer Merv de Peyer at his Blue Tonic Studio, using Yamaha 001Vs and Logic Audio software

'I'm not a fascist about what I use,' Baker says flatly. 'You can make good records on most kinds of equipment. But the studios don't want you to think you can mix on a £5,000 board when you could have a £200,000 one. You can use both with equal results.'

Remixing, he says, is all about control. This would appear to extend to Baker's two charity records, one of which was made pre-technology, the other using everything the musical computer world could offer. In 1985 came 'Sun City' by Artists Against Apartheid, which Baker put together with Steve Van Zandt. 'Steve had just left Springsteen and was still in touch with a lot of people, so we set our sights for who we wanted very low. On Children's Promise last year, I set my sights higher. You always have a wish list. During 'Sun City' Steve lost it every day or so. Children's Promise was more organised and I got a lot of people who were on that list.'

Baker recalls the 'Sun City' sessions as '20 reels of 2-inch tape that flew round the world'. When it came to the mix, three machines were used to bounce everything down. This was reminiscent of the mix for New Order's 'Confusion'. Again 20 reels of dubs were involved, which were edited on 2-inch. 'We definitely came up with good things doing it that way but it was too many passes. With Pro Tools, you do the arrangement and form the structure without the need for any edits.'

Nonlinear editing has made the incorporation of samples from other records

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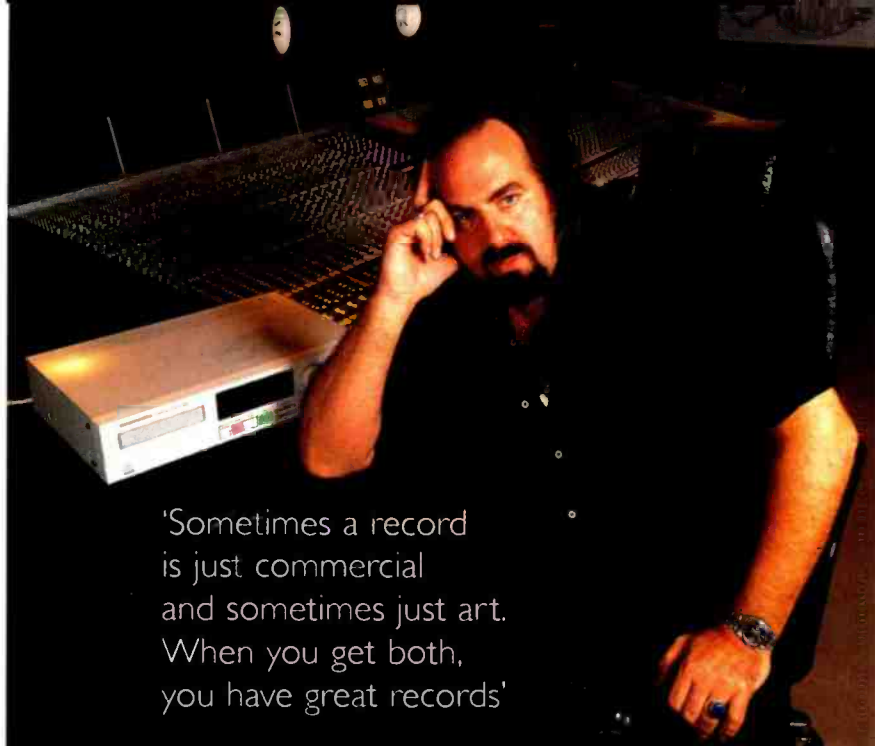


an easier proposition. The initial mixes of 'It's Only Rock 'n' Roll' featured some samples—notably Led Zeppelin's 'Whole Lotta Love'—that did not receive clearance and so had to be removed at short notice. Merv de Peyer has said that Baker loves using samples, a passion that has its roots in his club connections.

'Put the Needle to the Record', released under the name Criminal Element Orchestra, was arguably the first cut 'n' paste disc. Baker heard many of the cuts he used—Prince, Jody Watley—played by Gail King, one of the few female DJs at the time, at the Red Parrot club. 'We made it before looping, just using an Akai sampler,' he recalls. 'Nobody had done it before, using drum machines, click tracks and varispeeding to keep everything in time.'

Despite its historical importance, 'Put the Needle to the Record' was overshadowed by the MARRS hit 'Pump Up the Volume'. At the time Baker was taking white labels of his track around radio stations, he met Dave Dorrell, the man behind MARRS. 'I listened to his mix and said that he should use other samples,' Baker reminisces, saying he gave Dorrell a white label. 'When I took 'Needle...' to Cool Tempo Records in England, 'Pump Up the Volume' had come out and they thought it would take away our potential, particularly as it had sampled us.' MARRS took the heat off Baker as artists began to take legal action to protect their work. 'I assumed we would get sued,' Baker says, 'and I suppose I wanted to get sued because it would have been a test case. But MARRS got the attention, not us, perhaps because it wasn't big enough.'

Sampling has been partly blamed for a lack of imagination in current chart music and the recycling of old hits. Baker says it is done because people like to dance to familiar music. 'If you pay for the use, there's nothing wrong with it,' he states. 'Sometimes things are samples but you don't realise it. Fat Boy Slim's 'Praise You' is pretty much a sample with a beat but it is a creative use



'Sometimes a record is just commercial and sometimes just art. When you get both, you have great records'

that is also commercial. There is always the commercial versus art argument; sometimes a record is just commercial and sometimes just art. When you get both, you have great records.'

Though pretty much based in London, Baker still works in the US and has plans to go to Memphis to record with Al Green. His business connections with America are likely to continue as he has become more involved with the movie business. While living in New York, he met many directors, including Jonathan Demme, and became a music advisor during the late eighties, a time when contemporary songs were deemed important to movies. 'John Hughes [*The Breakfast Club*, *Pretty in Pink*] wanted to make movies kids could relate to. Sometimes it worked: sometimes songs were just tacked on the end credits to sell the soundtrack LP.'

Baker says he is most proud of his music supervision on *Fried Green Tomatoes at the Whistle Stop Cafe*, a gentle period piece that did not rely on obvious commercialism. His involvement in the British clubbing film *Human*

*Traffic* shifted from music supervision—a role taken over by Pete Tong—to associate producer. He invested money in the project because he 'believed in it from day one'.

Movies show another side of Arthur Baker, something he is keen to develop to maintain his creative interest. 'I try to stay creative—most of the people I admire do other things. I'm also involved in photography but my main priority now is to finish my own LP.' Baker began work on the album a year ago and has been working with Mani from Primal Scream and the rhythm section of Reprazent. He hoped to have finished enough material to release an EP sometime this month.

This project could put outside production on hold for while but you never know. The night before our conversation, Baker had seen a band that 'blew him away' and could have him producing again. 'You've got to be open to what happens—you need inspiration from somewhere.' Looking over his credits, Arthur Baker has never been short of inspiration. ■

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**Neil Karsh** is the Vice President of Audio Services for New York Media Group. Recently, Karsh selected LSR monitoring systems for two of his Manhattan facilities, *Lower East Side* and *East Side Audio*.

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Los Angeles



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**'S**OUND IS WORTH MONEY'. Just one of the fragmented and trade-markedly quirky yet thoughtful sleeve notes written by David Byrne for the *Stop Making Sense* album. Originally released in 1984, this soundtrack to Talking Heads' acclaimed concert film has proved correct the former head's observation: it has been digitally remastered for CD rerelease and remixed and enhanced for the reissue of the movie and its first appearance on DVD.

Unlike other, less worthy reissues, this is not just commercial opportunism. Even at the time, *Stop Making Sense* was hailed as one of the most imaginative and accomplished film records of a live band performance. Talking Heads had already placed themselves at the forefront of visual music, pushing the creative and intellectual boundaries of music video with the clips for 'Once in a Lifetime' and 'Burning Down the House', and 'Stop Making Sense' duplicated the feat for concert movies.

At a time when other bands were hiring video directors who had fully embraced the then emerging new technologies of computer graphics and wire controlled or crane mounted cameras, the Heads stripped it down to basics: the band, imaginative lighting, some back projection and fluid, unobtrusive direction. David Byrne conceived the staging but equal credit for the look and feel of the film has belongs to Jonathan Demme, the independent director of *Citizen's Band*, *Swimming to Cambodia* and, more commercially, *The Silence of the Lambs*.

A less obvious high-tech element was digital audio; the movie soundtrack was recorded at the Pantages Theatre in Hollywood by the Record Plant Mobile and mixed on Sony 3324 at Warner Bros Hollywood Studio. For the nineties the CD has been remastered and the movie re-mixed. In this new age of consumer formats, a DVD version was a necessity. The greater capacity has enabled a 5.1 mix of the concert footage soundtrack; another 5.1 near studio mix of the live tracks and some bonus songs; a straight left-right stereo of the live footage; and commentaries by Demme and the band members.

Long associated with Sire Records, Talking Heads released the original *Stop Making Sense* soundtrack on EMI. The DVD version now surfaces on Palm Pictures, Chris Blackwell's recording, visual and film making venture. The founder of Island Records describes the profile and aims of the new label: 'We're committed to where our roots are: Jamaican music, jazz music, African music, world music, new music.' This aim is underlined by initial releases *In Search of the Lost Riddim* by Ernest Ranglin, who featured on Blackwell's very first Island release in 1958, and *Nomad Soul* from Senegalese superstar

# Stop Making Sense

Making sense of Talking Heads' classic 1984 concert film for DVD release.

**Kevin Hilton** marks a watershed in the band's art and politics

Baaba Maal. Ranglin also guests on Maal's DVD of his Royal Festival Hall show of July 1999.

Other releases have included Moeen Worker's *Detonator* and the album described as space age dub for the millennium, Sly and Robbie—*Drum and Bass Strip to the Bone* by Howie B, plus a Latin dance class salsa compilation on both CD and DVD, albums from Da Lata and The Indian Strings Project. Blackwell has also moved into film production: *The Criminal*, funded and co-produced by Palm Pictures, began principal photography in March 1999.

So where do the Talking Heads—variously described as white funk-punk weirdos, nerds who hybridised black music with pop and art school students with a sense of humour—fit into all this? Probably the same place they fitted in anywhere—their own peculiar funky little niche. After all, Island was never an all Jamaican or African label; Bob Marley and Black Uhuru always cohabited with such as Traffic and Jethro Tull.

New releases of anything today are about added value. Rereleases doubly so. CD audio established both remastering and the inclusion of bonus tracks as valid ways to re-dress old material. DVD has the capacity and the potential to go beyond such artistic limitations; all involved in this new version of *Stop Making Sense* were determined to exploit the possibilities. 'Palm Pictures is very bullish about the DVD format,' comments Peter Saraf, a production partner of Jonathan Demme. 'They released the first DVD single and because they're both a film and a music company, they're into DVD as a music format as well as a picture one.'

A big fan of the film, Saraf was not associated with Demme when it was originally released. But he spent five years cutting through the tangle of distribution and licensing difficulties, something not made easier by a band that had disintegrated through personal recriminations. Guitarist-keyboard player Jerry Harrison, drummer Chris Frantz and bass player Tina Weymouth had reportedly become tired of David Byrne's dominance of the group. It was Byrne who officially called an end to the band in 1991, after several years speculation regarding reconciliation and reformation.

'The licences had expired on the distribution of the picture,' Saraf explains, 'and the band was in disagreement. It had been my project for the past five years to get it rereleased and I finally got all the Talking Heads together to agree on it. Until all those other issues were worked out, nothing could happen. But once it was done, it all fell into line pretty quickly and we did the deal with Palm Pictures.'

With the agreement of the band and a new distribution deal, *Stop Making Sense* was set to return to cinemas and record stores. The intention was always to completely remix the audio of the various release media, but it was here that another problem was struck. 'Believe it or not, we couldn't find all the elements,' Saraf says, sounding still slightly incredulous himself. 'We found all the sound components, but there were no film stems, which meant we had to go back to the digital audio masters.'

*Stop Making Sense* was one of the first movies to have its soundtrack entirely recorded on DASH, a fact rhetorically questioned by Byrne in the sleeve- >



< notes: Why was a digital system used for the sound? Regardless of whether foresight was behind the decision, Jonathan Porath, who mixed both the 5.1 and new stereo soundtracks for the movie re-issue, says it ensured the integrity of the sound, better than if it had been analogue. 'It was helpful that the sound wasn't wowing or moving around. There wasn't any flutter and the sound was cleaner, with no hiss,' he says.

Porath is chief engineer at New York audio-to-picture rerecording facility Sound One, where film was redubbed and new film stems created. (The movie was originally rerecorded at Can Am and Ocean Way in Los Angeles and Right Track, New York.) 'We locked together the original 24-track recording and the 2-track that was part of the original recording of the concert,' Porath explains. The original mix was jettisoned, returning to scratch instead.

Basic elements were recorded into an Akai DD8 dubber at Sound One. Once the tracks were prepared, film stems were created, mixed so Porath could take them apart to produce whatever was needed (of the music, of dialogue and so on). 'The stems were made wider for the DVD mix,' Porath says. 'These were a remastering of the film mixed in a close-field environment, with a deeper subwoofer track. Because every theatre is different, you have to be very conservative in mixing the sub-bass. But because there are no standards for the home, you can put in a lot of bass and the viewer can choose to turn it down if they want to.'

The focus was on the theatrical 5.1 remix, which took three weeks to prepare at Sound One. Mixed into the dubber itself, the tracks were then taken to Sony Music Studios, where they were mixed through an AMS Neve Capricorn console, making, Porath says, the process even more digital. The DVD mix, which took two days, was tracked back into another DD8.

Discrete 5.1 surround is still something of a creative issue, particularly for



the home. Porath says it prompted 'a lot of discussion', particularly as it is not just a case of recreating what was done for the theatrical release.

Porath says his mix differs to other concert films because it keeps the audience in the stereo surround channels. 'There may be less audience on the DVD than in the theatrical version but the effect is that you hear the band in front, with the audience to the side and back.'

What is heard, Porath says, is the audience reaction with true reverb, using what was recorded by the stereo room mics used at the time. These theatrical mixes were overseen by David Byrne, who attended most of the sessions, producer Eric Silver and Peter Saraf. 'We tried to mix a song a day,' Porath says. 'Everything was played to David and Jonathan Demme. In this kind of situation it can take forever to get a sound people are happy with, but once you're there, you have to keep with it to maintain the continuity of the film.'

Times and tastes change. Byrne and Porath decided to move on from the sound of the original album, which is described as 'very dry'. Porath comments on the new approach: 'I kept it very, very warm, with a good live feel for a concert. It's pretty, with plenty of air round it, which is a change from the eighties original. The eighties—and the sound—was an era unto itself.' Apparently it was Byrne's intention to update the low-end sound, making the drums and keyboards harder and heavier sounding. Porath additionally prepared a 2-channel stereo mix, with mono surround, of the 5.1 film mix, which can be selected

by viewers without a discrete surround setup in their homes.

DVD's capacity for multi-choice menus was exploited when it was decided to include a second. This realises Palm Picture's aim to combine both music and pictures. Peter Saraf sums up: 'We thought that people might listen to this soundtrack just as a CD after they've watched the movie a few times.'

This version was mixed by Eric (ET) Thorngren, who worked on the original live album and went on to record and mix *Little Creatures* (1985), Talking Heads' most commercially successful album. Initially prepared at Crush Digital Video in New York and finished at Plant Recording Studios in San Francisco with Jerry Harrison, the 5.1 studio version is differently EQed and compressed, places less emphasis on the centre channel, sounds less like an auditorium and has elements like synthesisers panned to the rear loudspeakers. The 24-track film mix was laid back to DA88 and then loaded into Pro Tools for the new remix.

Also included are additional tracks seen in the movie version, but that, due to the constraints of vinyl, were not included on the original LP. These were also remixed by Thorngren and solve the problem faced by fans of the film who had to hook their VCR up to a tape recorder to have audio-only versions of the bonus tracks. Alongside all this is the commentary, edited together from the recollections of all four Talking Heads and Jonathan Demme, recorded separately (except Frantz and Weymouth, who, as a couple, reminisced together) at studios of their choosing and assembled by Eric Silver and Patrick Anding of Palm Pictures at Noise Production in New York.

Last word, as was the first word, to David Byrne: 'People will pay to watch people make sounds. Little wonder when the sounds people are making are as seminal and as funky as those on *Stop Making Sense*.' But one question remains: Why a big suit? ■

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Eclipsed by the attention currently and continually lavished on condenser microphones, the dynamic mic has continued to soldier on and serve a variety of applications.

**Tim Goodyer** comes up to date with dynamic mics

**A**S A LIVE ENGINEER, dynamic mics would play a quite large part in your life. As a video director, you would be at least passingly familiar with Shure's classic 55SH. As a studio engineer, however, the performance—not to mention cachet—of exotic condenser models frequently eclipses the humble condenser. There are exceptions, of course. The power of a snare drum as conveyed by a Shure SM57, for example, contrasts starkly with the more refined efforts of condensers. Similarly, AKG D12s and Sennheiser 421s regularly find themselves surrounding other elements of the drummer's arsenal in preference to their more discerning cousins. Only ribbon mics aspire to some of the exotism of the condenser.

In magazines too, the lure of the condenser mic is strong, especially if it claims to be part of audio's glorious past or promises to help shape its future. Reissued models, updated models and collectable models all conspire to occupy shelves in the mic cupboard and lines on the studio brochure. But the dynamic microphone continues its long-standing occupation of the recording studio, and mic manufacturers still

bring new models to the market with the recording studio (somewhere) in mind. Not all claim the success that seems rightfully theirs—Sennheiser's small yet capable MD504 (now the Evolution 604) being a prime example. Here, then, is an overview of dynamic and ribbon mics that have recently offered themselves to the market.

Shure's SM7A is an improved version of the classic SM7, aimed at broadcast and voice-over work, radio talk-shows and newsdesk applications. Designed for speech and music applications, the SM7A features the same 50Hz–20kHz frequency response as the SM7. Shure claims that the mic is uniform in frequency and symmetrical about axis, its unidirectional polar pattern inherently offering maximum rejection and minimum colouration of off-axis sound and that its redesigned humbucking coil aids broad-bandwidth shielding from electromagnetic hum. Like the SM7, the SM7A is ruggedly constructed and offers bass roll-off and 4-way midrange emphasis controls; internal air-suspension shock isolation; a built-in pop filter; and a precision, locking yoke-mount.

Intended for live performance and recording applications, the low-profile

Beta 91 and the miniature Beta 98D/S are additions to Shure's Beta family. Both are all-new designs, the 98D/S is a miniature condenser unit designed expressly for toms, offering a maximum SPL rating of 160dB (800Ω), and a suitably optimised frequency response. Its consistent supercardioid pattern insures isolation and maximum gain before feedback. Equipped with a flexible gooseneck, the 98D can be employed in either horizontal or vertical configurations on drum rims, cymbal stands, or virtually any typical stage hardware. The Beta 98D/S comes with a detachable preamplifier to facilitate rapid cable preamp replacement or repair. Small, positive-locking windcreens are also provided for outdoor use and added cartridge protection. Optionally, the standard supercardioid cartridge can be interchanged with a cardioid unit as required.

The Beta 91 is Shure's successor to the SM91 and aimed for use on tom toms. Fitted with a cardioid capsule, the Beta 91 provides high gain before feedback and rejection of unwanted noise. Shure maintains that it is best deployed resting on a pillow or blanket within the kick drum. Like the Beta 98D/S, it comes with a >



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< detachable preamp section and connecting cable.

Beyerdynamic's M 99 is a new large-diaphragm dynamic microphone using beyerdynamic's TG-X technology for high SPL applications including bass drum and high-output instruments. By using the equalisation switching the M 99 can be frequency tailored to deliver crisp undistorted output for use by on-air presenters. The M 99 also incorporates a sophisticated integral suspension system that isolates the diaphragm assembly from the body and the hypercardioid polar characteristic minimises feedback problems in live applications or unwanted noise or reflected sound pick-up in broadcast environments.

Made from aircraft-grade alloy, the body is precision die-cast and finished in with a metallic varnish.

Royer's R-121 is a modern studio ribbon mic with specs reflecting the progress made since the heyday of ribbon mics. Royer claims to have pitched it squarely with digital recording applications in

mind. The Royer Speiden SF-12 (*Studio Sound*, November 1999) is a stereo ribbon mic using two matched capsules mounted in vertical alignment with a fixed 90° horizontal separation allowing both co-incident pair and M+S use. The frequency response is particularly good by traditional ribbon standards reaching 20kHz at the top end. The SF-12 is nicely finished in gunmetal grey ingot iron (forming part of the magnetic circuit) and comes in a wooden case complete with splitter lead and mount.

Both Royer models use ribbons manufactured to a particularly fine tolerance in 99.99% pure aluminium. The R-121's ribbon is 2.5 microns thick while those in the SF-12 with just 1/3µg. ■



Here are the notes we talked about...  
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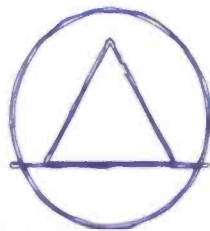
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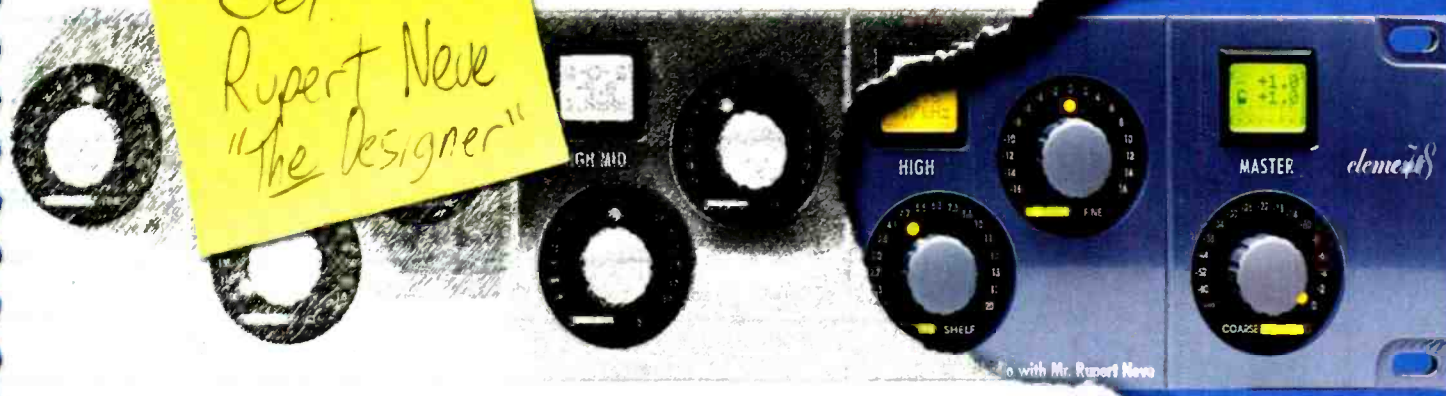
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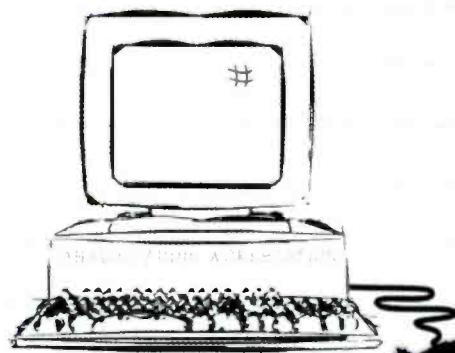
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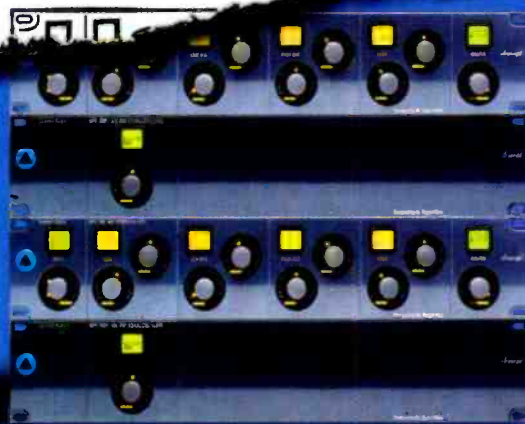


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# Streaming audio

In the first of two articles, **Simon Trask** examines the opportunities offered by the Internet and the systems available for delivering real-time audio

**T**HERE ARE ESSENTIALLY two approaches to delivering digital audio data over the Internet: as a non-real-time file download and as a real-time data stream (commonly referred to as downloadable and streaming audio respectively). With the former, audio playback is only possible once the data has been transferred over the network; with the latter, the data transfer is in effect also the audio playback. Loosely speaking, the downloadable and streaming approaches relate to the concepts of CD and radio respectively. The downloadable approach produces a storable audio data file that can be played on the host computer at any time, and transferred to CD or to the flash memory of a portable digital audio player for playback away from the computer. However, with streaming audio, typically the only file that gets stored locally is a pointer to the online location of the actual streaming audio data file, that itself doesn't get made available as a stored file on the user's computer.

Streaming audio may be a live feed from a concert or from a radio station's on-air output, or it may be an archive of a live event or a radio-station show. Another application of streaming media is the 'genre' music channel, as typified by Spinner.com, whereby you can 'tune in' to a DJ-less stream of music tracks all in a particular musical style—the techno channel, say, or the country music channel. Streaming audio is also commonly used in conjunction with downloadable audio to provide track previewing—typically a 30-s audio clip. Online record stores, for instance, can let you listen to an extract from some or all tracks on a CD to help you decide whether or not you want to buy it. Or for a downloadable audio track, that is probably several megabytes in size, a streaming audio clip lets you decide whether the track is worth the time and trouble of downloading. Uses of streaming audio are many and varied. Digitalnoise, for instance, specialises in streaming DJ mixes live from dance clubs in New York; the mixes are also archived on the digitalnoise website for those who can't tune in live. Meanwhile, the likes of ON24, Q1234.com and Investor Broadcast Network reach a very different audience with streaming delivery of conference calls, quarterly earnings reports, annual meetings, and related commentary and analysis aimed at investors. ON24

recently launched Radio ON24, which it refers to as 'a significant leap beyond the traditional model of broadcasting' into what it terms 'personalcasts'. Each registered user gets a personalised stream of news, opinion and information based on the stocks they've registered an interest in. Not that they're the only ones providing personalisation; personal 'radio stations' and even personal broadcasting are the latest online trend or gimmick in streaming media websites. An emerging trend is for text-based/publishing web-sites to expand into providing their own talk-based online 'radio stations' built around the subject coverage they provide on their sites; examples of this are Salon.com, ZDnet and CNET. And while many traditional radio stations are expanding onto the web, the fledgling CNET Radio is expanding from the web world into the traditional radio world through a deal with the US radio industry giant AMFM Inc, which will see CNET's technology show broadcast initially on AMFM's KNEW-AM radio station in San Francisco.

According to statistics from BRS Media, a company that provides webcasting and web-site hosting services to the radio industry and has been tracking online radio since April 1996, at the end of last year there were 8,866 radio stations on the web, with a total of 2,934 stations actually webcasting; of the latter, just 8.2% were Internet-only stations. While radio stations in the US and Canada make up almost 80% of the total number with a web presence, for stations that are webcasting the figure falls to around 50% (a fuller breakdown is available at [www.brsradio.com/iradio/analysis.htm](http://www.brsradio.com/iradio/analysis.htm)). The number of webcasting stations was up from 2,615 in September of last year, which in turn was up from a year-previous figure of 1,652. Speaking last September, BRS Media president George T Bundy commented: 'The fastest-growing segment of webcasting continues to be radio and radio stations streaming audio on the Net. In a span of over 36 months, the number of radio webcasters has leaped from 56 to over 2,600. The healthiest growth continues to come from both international and Internet-only broadcasters'. Online audience measurement for streaming media is only just getting off the ground, with Arbitron New Media and Media Metrix starting to track usage. Arbitron released its first audio >



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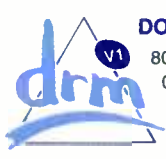


are starting to offer short-range FM transmitters which will take the streaming audio signal from the computer and convert it to an FM signal which can be picked up by 'real' radios around the house. Perhaps the most developed example of this concept is Sonicbox's imBand Tuning, which requires a broadband connection to the Internet. Its initial form, the imBand Remote Tuner at under \$50 consists of a base transmitter unit that connects to the computer, and a portable remote tuner unit. The base unit allows web-based streaming audio to be transmitted on an unused frequency from the computer to FM radios around the house, while the remote tuner allows users to remotely select from hundreds of web-based radio stations simply by turning a knob to 'tune into' the stations. Sonicbox is also licensing its technology to PC peripheral and consumer electronics manufacturers, opening up the potential of the system so that you'll be able to, say, wake up to the sound of an Internet radio station on your clock radio, or tune into web radio on your hi-fi system. The imBand system uses Microsoft's Windows Media Audio technology to deliver not only streaming audio but also downloadable audio, as streamed web radio tracks will be purchasable in digital download form. Bill Gates showcased Sonicbox's technology during his keynote speech at the Streaming Media West conference last December (when he also proclaimed that the mainstream use of digital audio and video—the Digital Media Revolution—was the next major wave of Internet computing). The Sonicbox system is currently on trial, with a full rollout expected during the first quarter of 2000. Yet another interesting development >

< webcast ratings for October of last year, covering four companies representing 240 radio stations with online feeds—ABC Radio Networks, BroadcastMusic.com, Lamusic, and Magnitude Network. Figures showed that more than 900,000 listeners tuned in across all four companies' webcasts during the month, listening for a total of 1.3 million hours. Adult alternative station KFAN-FM from Texas had the largest number of unique listeners (83,900), while Washington CD-based smooth jazz station WJZW-FM kept users tuned in the most, with eight hours and 26 Minutes average time spent listening over the month. Meanwhile, according to figures from Media Metrix, a leading web metrics company, 20 million home and 9 million work web-users used streaming media (audio and video) during 1999. Another development in streaming audio is the record label providing its own online 'radio station'—witness the launch of Radio Windham Hill as an addition to the web-site of the new age music label Windham Hill (itself a unit of BMG Entertainment). Terms like 'radio station' and 'broadcast' are convenient conceptual hooks, but in prac-

tice streaming media operates in a different medium with different possibilities. Hence Radio Windham Hill is, says the label, 'designed to resemble a radio station, complete with intros, full tracks and a DJ'—in this case a station that only plays tracks from the label. In effect it's a marketing exercise. Using Java-based technology from AudioBase, the station starts playing as soon as you arrive at the web site and 'follows' you as you go off surfing elsewhere (not everyone's idea of a good idea, perhaps). The technology also provides visual components such as pop-up windows containing information about label artists, links to URLs for music discounts, and information about special contests. This sort of augmentation of the traditional radio experience and synergy with music sales (whether downloadable or CD) is characteristic of the hyperlinked, multimedia environment of the World Wide Web in which streaming audio is embedded. Yet another fledgling application for streaming audio is web-based email such as Talkway, which allows users to record audio and video streams on the web and include them in email on the Talkway web-site. Unlike downloadable audio, which can be transferred to other media for portability, streaming audio is tied to the computer. However, some companies

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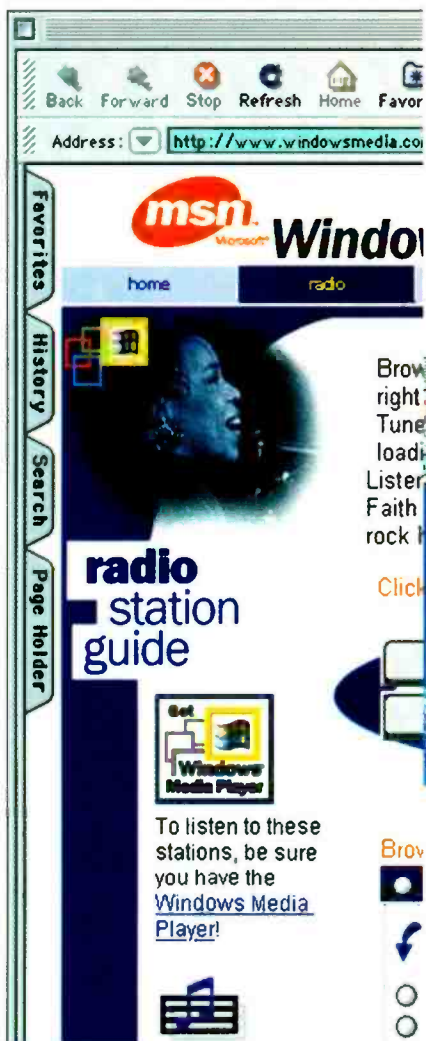
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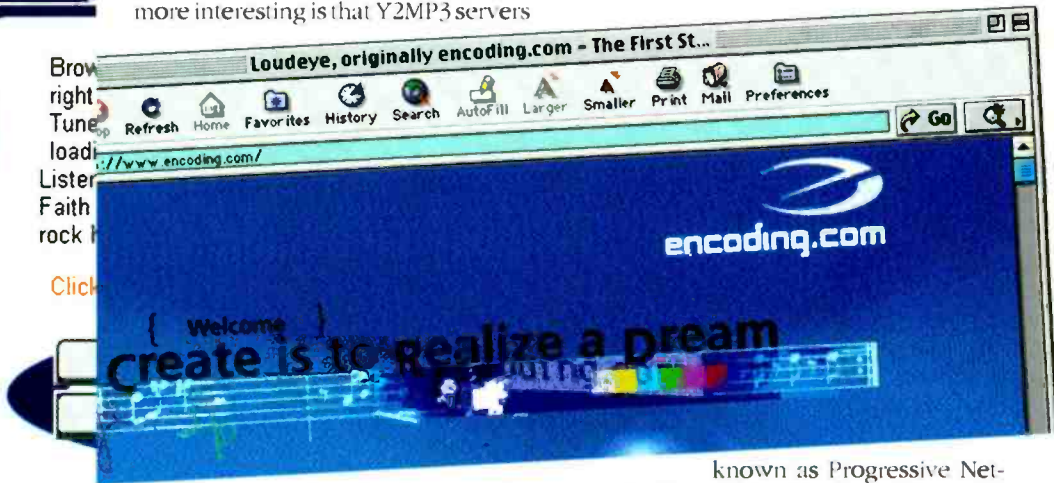




back of the current song, and change the playback volume, all via the web page interface. The standard system can store up to 100 CDs' worth of music encoded in MP3 format at 128kbps stereo: an optional second hard drive enables a further 166 hours' worth of tracks to be stored. Again, an optional low-power FM transmitter allows the music to be broadcast to local radio receivers. What makes the system even more interesting is that Y2MP3 servers

before', Y2Brand boldly proclaims.

The main technologies for streaming audio on the web are RealNetworks' RealAudio, Microsoft's Windows Media Audio, and Apple's QuickTime. All three companies provide streaming servers, authoring tools, and free players, and also have technologies for streaming video. RealNetworks was the pioneer of streaming audio and video on the Internet, going back to the mid-nineties when it was





connected to the Internet via a fixed IP address can enable jukebox sharing, meaning that tracks can be downloaded from any other Y2MP3 server that's online. Y2Brand has also announced that it is setting up what it calls 'the world's first MP3-based community radio station' in its local area of Palo Alto, California, broadcasting to the local Palo Alto community via FM transmitters and enabling Internet-connected users to upload their favourite music via the jukebox web interface and vote on what songs they would like to hear next. The company also plans to get other community radio stations on what it calls the 'web-MP3-broadcast bandwagon', and give each affiliate station a community portal presence on its web site. 'This should turn the radio world upside down, letting the audience listen to what they want to, when they want to, in a way never done

known as Progressive Networks, first with RealAudio and then with RealVideo, which are now integrated into a single RealMedia package. Although relatively late to the downloadable and streaming audio party, Microsoft has made major headway over the past year with Windows Media Technologies 4.0, its total package for streaming audio-video and secure music downloads. And, to its credit, the company has been doing its best to stimulate the broadband market (content and infrastructure) by starting the Broadband Jumpstart initiative and showcasing broadband content on its Windowsmedia.com portal site.

In the streaming media technology ratings war, RealNetworks says that it has more than 95 million unique users, with its latest release, RealPlayer 7, notching up more than 10 million unique users in two months, while Microsoft says that more than 50 million copies of its Windows Media Player have been down- >

< in streaming audio is the Linux-based Y2MP3 Community Jukebox Server from Y2Brand. Described by the company as 'a turnkey solution for groups that want to share their favourite music', the MP3 jukebox server runs on the open source Apache web server connected to a LAN and to the Internet, and can be administrated from a computer on the LAN via a web-page interface. Users with administration privileges can add and remove songs from the jukebox database, stop play-





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loaded to date, with the number growing by more than one copy every second. QuickTime lags considerably, with more than 20 million installed copies. To show that it's closing the gap on its competition (RealNetworks), Microsoft recently highlighted figures from Media Matrix' Soft Usage report for September 1999 showing that Windows Media Player (all versions) was used by 14.3% of home PC users while RealNetworks' RealPlayer was used by 16.8%, while Microsoft's Windows Media portal, Windowsmedia.com, saw a 909% increase in unique visitors from January through October 1999, with 3.9 million unique visitors in November 1999. Another study, from PC Data Inc, showed a 34% usage increase for Windows Media Player from September to October, compared to a 5.3% growth for RealPlayer.

Meanwhile, in December RealNetworks quoted a statement from Allen Weiner, VP of Analytical Services at Nielsen/Net Ratings: 'By every metric in our current research, unique audience, reach percentage, and usage per person, RealPlayer is the leader in streaming media'. Alarm bells sounded in some quarters just before Christmas when it was rumoured that Yahoo! Broadcast (formerly Broadcast.com), one of the major providers of streaming media on the Internet, with more than 400 radio station affiliates, was to ditch RealNetworks' technology and go with Windows Media only. However, in the New Year it was announced that a deal had been struck between the two companies that would see Yahoo! Broadcast continue to deploy RealNetworks' technology, in the form of the company's new RealServer 7 server software and RealProducer 7 authoring software; it's likely that Yahoo! used its strong bargaining position to negotiate a more favourable deal on server licensing fees (Yahoo! Broadcast's Mark Cuban had criticised RealNetworks' server pricing during his keynote speech at Streaming Media West in December).

The three major streaming technology companies all provide scalability up to broadband rates. At the more

modest dialup bandwidths (28.8k, 56k), streaming audio provides a listenable quality somewhere between AM and FM stereo, varying depending on the actual bandwidth of the stream being delivered; broadband delivery of course provides higher quality streams. While streaming media players buffer the incoming stream, dropouts are always a possibility, depending on factors such as server load and network congestion, in which case the player pauses to rebuffer before continuing the stream. Other activity on the receiving computer (including other Internet activity) can also have an effect on streaming consistency. However, it's also possible to listen to an audio stream over the Internet for extended periods of time without experiencing any dropouts. The choice of Internet transport protocol—TCP/IP or UDP—can also have an effect. The TCP/IP protocol which is the foundation of the Internet wasn't designed with real-time delivery of streaming media in mind. Instead it's geared towards avoiding router congestion and data packet loss; consequently it supports packet retransmission and has a built-in 'back off' feature that slows down packet delivery in order to avoid router buffer overflow and cope with network congestion (TCP, incidentally, stands for Transmission Control Protocol). TCP/IP's packet retransmission is of no particular advantage to streaming media, because it can't guarantee that retransmitted packets will arrive in time to be played in the media stream. Also, streaming media is tolerant of some packet loss, but needs a more consistent overall throughput, which is where UDP comes in, as it ditched TCP's data integrity and transmission slowdowns in favour of pushing the data through. Microsoft's Windows Media Services streaming media server employs an intelligent data retransmission scheme on top of UDP, whereby a 'UDP Resend' feature only retransmits lost packets if they can be sent to the client in time to be played. However, UDP is not always usable, as network administrators tend to close their firewalls to UDP traffic, in which case TCP (or HTTP + TCP)—based streaming has to be used instead. UDP traffic inherently has higher priority over TCP traffic (which includes web-page delivery and file downloads) because of the way the protocol operates compared to TCP. Streaming media has been criticised for contributing significantly to Internet congestion and slowdown. In response to such criticism, and to maximise streaming data throughput and reliability and drive the use of technologies such as IP Multicast needed for large-scale streaming broadcasts, the streaming media industry has been instrumental in building and supporting alternative content delivery infrastructures, sometimes called 'edge' or >



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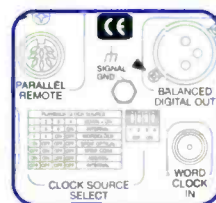


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Global One Hop Network). These companies sign up web content providers at one end of the delivery chain and ISPs at the other. Essentially, requests from subscribers of participating ISPs are routed via the relevant network, and content delivered back via the network and ISP, bypassing the Internet.

<'overlay' networks, and adopting server caching technologies (notably Inktomi's Traffic Server). Companies such as Adero, AboveNet, Akamai, Digital Island and SkyCache are all building global networks designed to optimise delivery of downloadable files and streaming media by replacing the 'multi-hop' Internet with one-hop delivery (AboveNet even calls its network a

In the US, RealNetworks has been instrumental in building the Real Broadcast Network, in conjunction with a variety of telcos, in order to facilitate large-scale webcasts; recently the company has announced an agreement with global networking company Madge Networks' subsidiary Madge.web which will see Madge build and run a European equivalent of the RBN, together with an associated European broadcast

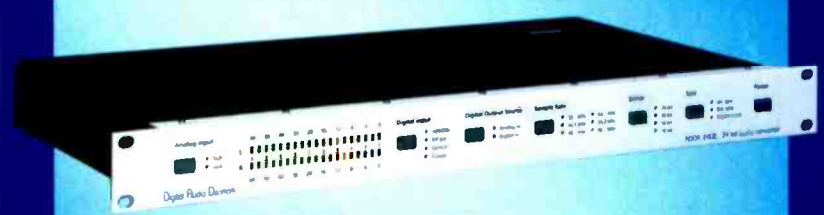
facility. The network, to be known as the Madge Broadcast Network, is scheduled to go live in the second quarter of this year. Of course, both the RBN and MBN use RealNetworks servers. IP multicast technology is deployed to optimise data delivery for large-scale broadcasting. Essentially, IP multicast starts with a single stream and replicates it across a server hierarchy according to delivery requests from users, as opposed to sending out a single end-to-end stream for each and every user—a process known as 'unicasting' which is not at all efficient for large-scale simultaneous transmissions.

RealNetworks also recently announced that it is trialling satellite delivery of audio and video streaming media services to customers or European ISPs in conjunction with satellite company Loral Cyberstar, again using RealNetworks streaming technology, of course. Another satellite company that is offering its data delivery services to streaming media content providers is SkyCache, which is format-agnostic, supporting all the main streaming formats. The company recently announced its Streaming Media transport service, again delivering live streaming media directly to servers located at ISPs, and also other Points of Presence, bypassing the Internet infrastructure (though, as with all the content delivery networks, as far as the user is concerned, he or she will be accessing content 'on the Internet').

The fast-growing demand for streaming media, whether for entertainment or business applications, is giving rise to a new industry of streaming media encoding services, pioneered by encoding.com (recently renamed LoudEye Technologies). Sonic Foundry, which has grown from an audio production software company to also provide audio-video production and streaming media encoding tools, has recently opened up its own encoding division. Another US company that provides streaming media encoding as well as hosting services, STV, has recently opened up a European office in the centre of London to service the growing European streaming media industry.

There is a large and still fast-growing amount of streaming media content on the Internet, with audio at the forefront. The technologies are increasingly in place for optimised delivery of 24/7 streaming media to Internet users. There is also widespread agreement that streaming media will drive the adoption of broadband—though equally it could be said that broadband will drive the adoption of streaming media. More exactly, a combination of unmetered dialup and broadband net access will encourage takeup of streaming media by net users by removing the 'chill factor' of clock-watching and, in the case of broadband, providing much better quality streams. The US,

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of course, has had unmetered Internet access for years—and it's hard to underestimate the positive impact this has on Internet media listening habits—while its rollout of ADSL and cable modem broadband net access is well under way. In Europe, the Netherlands, and Amsterdam in particular, is leading the way with affordable cable and ADSL broadband access to the Internet. And in France the incumbent telco is rolling out ADSL for the equivalent of £25/month flat rate charge (UK). The takeup of broadband notably in the US is already driving broadband-only streaming media web-sites, or sites which offers a mix of broadband and dialup streams, creating a two-tier streaming media world. Meanwhile, in the UK British Telecom is predictably dragging its feet on unmetered dialup and ADSL broadband, and telecoms watchdog Ofcom is letting it get away with it—while the cable companies, currently the only serious competition (for about 40% of the country, anyway) are being slow to take advantage of BT's reluctance. Still, BT is promising a Spring 2000 start for rollout of both flat-rate unmetered dialup at £35/month and flat-rate ADSL (albeit at 512kbps rather than the originally trialled 2Mbps) for around £50/month, exclusive of any ISP subs. Expensive compared to the US. France and the Netherlands, but prices will fall (perhaps not until next year, when BT will finally have local loop unbundling forced on it, facilitating competing services on 'last mile' copper loop). The 'last mile' is the final bottleneck for streaming media, a bottleneck that can only be removed by affordable flat-rate monthly pricing and rollout of broadband Internet access. Flat-rate dialup will likely roll out and be adopted more quickly than broadband, but it will at least be a start. Meanwhile, lurking in the wings is the wireless broadband Internet, which could challenge terrestrial networks and fixed-line Internet access within the next year or so. Hand-held Internet appliances are being touted by some as the Next Big Thing, ushering in a post-PC world (and yes, some Japanese companies are already working on music delivery to hand-held devices).

Back to the present, and a recent UK survey into PC-Internet audio usage conducted for Creative Labs by veteran pollsters MORI concluded in contemporary soundbite fashion that 'The PC is the new sound machine'. Among the key findings were that 50% of 15-24 year olds surveyed believe PC sound quality is better than the sound quality of the average home hi-fi, while 30% use the PC for listening to music, and, of all those surveyed, one in ten who use the Internet at home download music regularly from the net. If there's indeed a sea change taking place, there are many streams waiting to feed into it. ■

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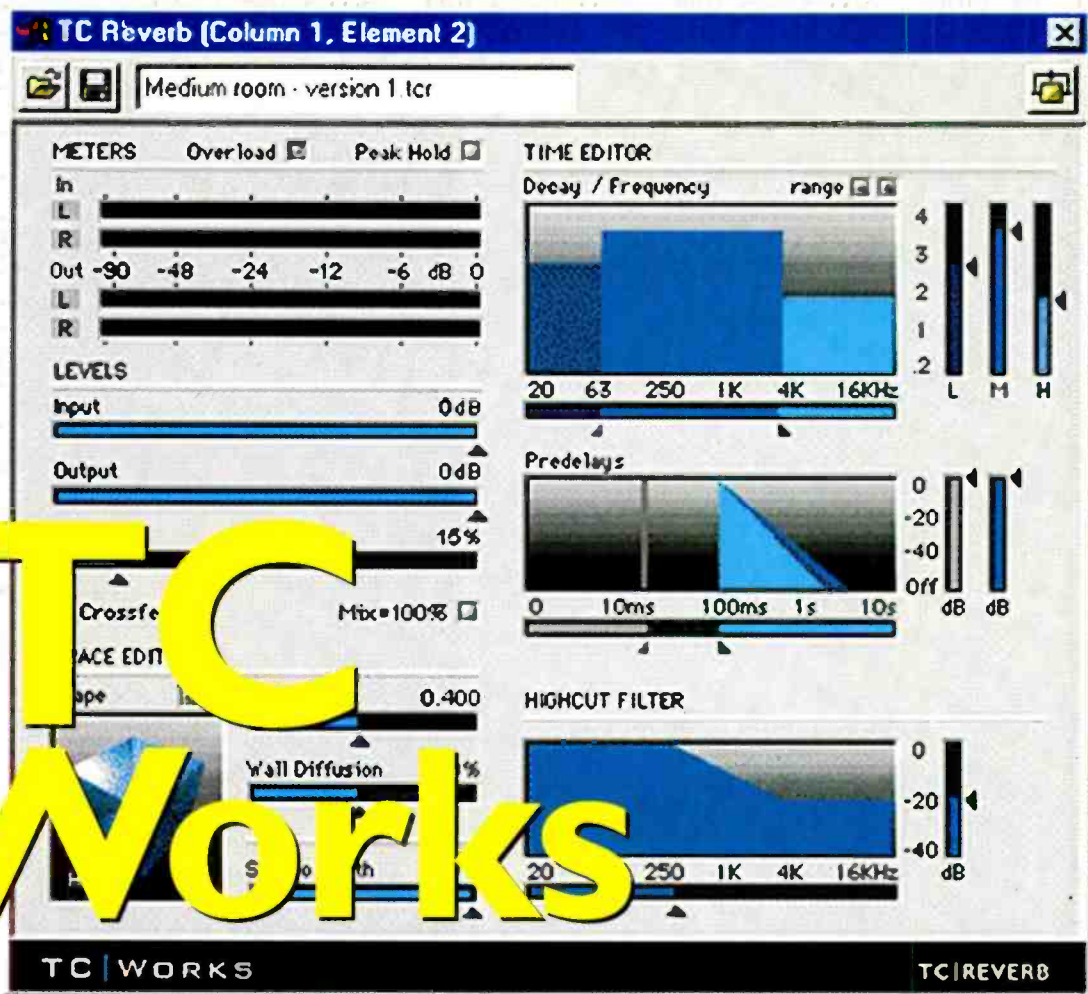
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Formed as a plug-in effects subsidiary of tc electronic, TC Works looks at the software alternatives to hardware effects processors. **Simon Trask** makes the connection

**T**HANKS TO GROWING processing power and increasing memory and storage capacities, software running on general-purpose desktop computers has been able to incorporate elements of music production that were previously the sole province of stand-alone hardware. From stereo and then multitrack digital audio recording and mixing onward into audio effects processing and sound synthesis, this progressive incorporation has been an overarching trend of the past decade, and has thrown up new players in the market. The resultant requirement for established companies is to be ever vigilant and flexible in order to respond to technological developments and resulting shifts in the market landscape.

The audio effects marketplace is a notable case. Once, if you wanted effects processing you went out and bought a black box or three, but in recent years software effects 'plug-ins' have emerged as an alternative for anyone using computer-based music production software. These are software programs which 'plug into' a software architecture of digital audio streams and virtual mixing desks via standardised software-defined interfaces to add effects processing to digital audio signals, acting as insert and/or master effects

in the virtual mixing environment.

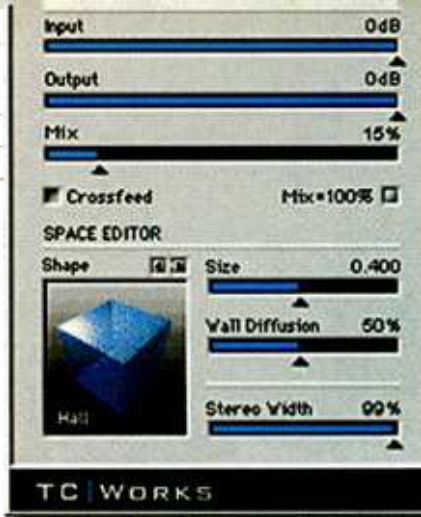
The reality of the marketplace nowadays is that black boxes and plug-ins co-exist. At the same time, inherent in the plug-in concept is the ability of third parties to provide effects for a variety of programs and platforms. So, rather than being locked out of the new production environments, companies which specialise in creating software audio-effects algorithms can find new outlets for their expertise. In addition to MIDI + Audio companies, these outlets include Digidesign, who pioneered the effects plug-in concept, and other high-end platforms such as Soundscape's SSHDR1, Studio Audio & Video's SADIe and Octavia, and Sonic Solutions' SonicStudio. Plug-in companies can find themselves with a range of platforms and formats that they can choose to support or not. Hence for real-time effects processing there's TDM for the Pro Tools platform, DirectX available as a generic format for Windows PCs, Steinberg's cross-platform VST format which has also been adopted by some other companies, and MAS from Mark of the Unicorn and used in Digital Performer and AudioDesk Mac software, as well as other manufacturer-specific formats for high-end platforms. And now, with the release of Digidesign's budget Digi 001 audio and MIDI production platform

comes another plug-in format, RTAS, which is short for Real-Time AudioSuite—a real-time version of Digidesign's long-standing AudioSuite file-based audio processing protocol. Another file-based audio processing format is Adobe Premiere. File-based formats, as the name suggests, are used for 'stand-alone' processing of audio files.

Following on from *Studio Sound's* recent series on MIDI + Audio companies, we're going to look at the companies providing the plug-in effects for today's computer-based music production platforms. These can be divided into those with and those without a background in producing stand-alone, black box effects units.

Although TC Works produces software plug-in effects, it developed from, and is a wholly owned subsidiary of, tc electronic, a name that will be familiar as an established and respected producer of high-end hardware effects units, and having a background in both analogue and digital effects. TC Works is a mere babe in comparison, having been founded in May 1997. Plug-in development actually began within tc electronic in the previous year, as a result of Digidesign approaching the company to support them, tc assigned a developer to the project, and the result was TC Tools 1.0.>





< consisting of TC Reverb and TC Chorus plug-ins. The success of TC Tools in the Pro Tools market prompted tc electronic to take a closer look at the plug-ins market, and as a result the company decided to set up TC Works.

The company is headed up by Ralf Schluenzen, who for six years prior to starting TC Works was marketing director at Steinberg, and is based in the software development centre of Hamburg, Germany, rather than in Denmark with tc electronic. 'It seemed to be a good idea not to make a department inside tc electronic, but rather to go for a company which can also have its own identity,' he observes. 'This has certainly paid off. I think that if you have a long-established hardware company it is very difficult to build a software mind-set. What is certainly true is that a software company has a totally different set of rules compared to a hardware company. The whole production process is different, also the marketing, and you have to work with different distributors.'

Of the decision to locate in Hamburg, which is also home to Steinberg and the birthplace of Emagic, Schluenzen comments: 'Germany has a very strong software market, Denmark doesn't. And Hamburg is a city that people like to move to inside Germany. Also, as a software company you really need to have your ear to the ground, and you have to be able to sniff a trend before it happens.'

TC Works has its own development team of eight people, with two additional developers in Italy, along with its own in-house graphics design facility for user-interface design and all printed materials, its own international sales department, and its own product and service department. However, manufacturing and shipping is handled by the logistics department at tc electronic in Denmark.

Following on from tc's successful introduction of TC Tools to the Pro Tools market, TC Works' first product—which shipped in September 1997—was v2.0 of TC Tools, adding a new plug-in, EQSat to the existing TC Reverb and Chorus-Delay TDM plug-ins. However, the company soon established that it wasn't going to be a Pro-Tools-only company by introducing the TC Native Reverb for DirectX a couple of months

later, and TC Reverb for Soundscape's SSHDR1 a month after that.

Through the first half of 1998 the company successively released TC Native EQ Works for DirectX (a bundle consisting of a 10-band parametric EQ and a 28-band stereo graphic EQ), TC MasterX for Pro Tools (a multiband expander-compressor-limiter), TC Native Essentials for DirectX (an entry-level bundle consisting of reverb, 3-band EQ and reverb plug-ins), and its first plug-in for the MacOS with a VST-compatible version of the TC Native Reverb.

The second half of 1998 saw the release of the TC MegaReverb TDM plug-ins for Pro Tools 24 Mix, the first reverb to take advantage of the increased performance offered by Digidesign's new hardware, followed by the TC Dynamizer for Soundscape (a multiband expander-compressor-limiter optimised for broadcast applications), v1.5 of TC MasterX (adding dithering and Pro Tools Mix 24 support), and the introduction of the TC Native Bundle for DirectX (TC Native Reverb, EQ Work, and the new Native DeX compressor/de-esser).

TC Works began 1999 by shipping v3.0 of TC Tools for Pro Tools TDM, featuring a completely redesigned GUI and 24 Mix support, and replacing the originally bundled TC Reverb with the superior 24 Mix-compliant TC MegaReverb). In April the company followed up with v2.0 of the DirectX-based TC Native Bundle, a free update that added the new Native L limiter-maximizer plug-in to the bundle, while in June it signalled that it plans to be more than 'just' a plug-ins company by introducing the SPARK stereo digital audio editing software for MacOS, offering not only VST and ASIO support (the latter allowing it to be used with any audio I-O card that has a Mac ASIO driver) and support for Digidesign's Direct I-O format (for access to inputs and outputs on Digidesign hardware) but also 24-96 audio support, 11 new VST plug-ins, a sophisticated multi-fx configuration capability, and the ability to send and receive samples via SCSI for a range of popular samplers and any sampler supporting the SMDI protocol. Version 1.01 of SPARK followed a couple of months later with new features and a single bug-fix (it's TC Works' proud claim that v1.0 was a stable version, not a mislabelled beta).

Set for release before the end of the year are the new v1.5 of SPARK, an entry-level version of the program called, appropriately enough, SPARKle, that will sell for well under £100 (UK), a new TC Voice Tools voice processing bundle for Pro Tools TDM (consisting of TC Intonator Voice pitch correction and TC Voice Strip gate-EQ-compressor-de-esser plug-ins), and a Mac OS version of the TC Native Bundle that will support both VST and MotU's custom MAS plug-in format. Clearly, TC Works shows no signs of slowing up, and if anything is accelerating its pace of development >



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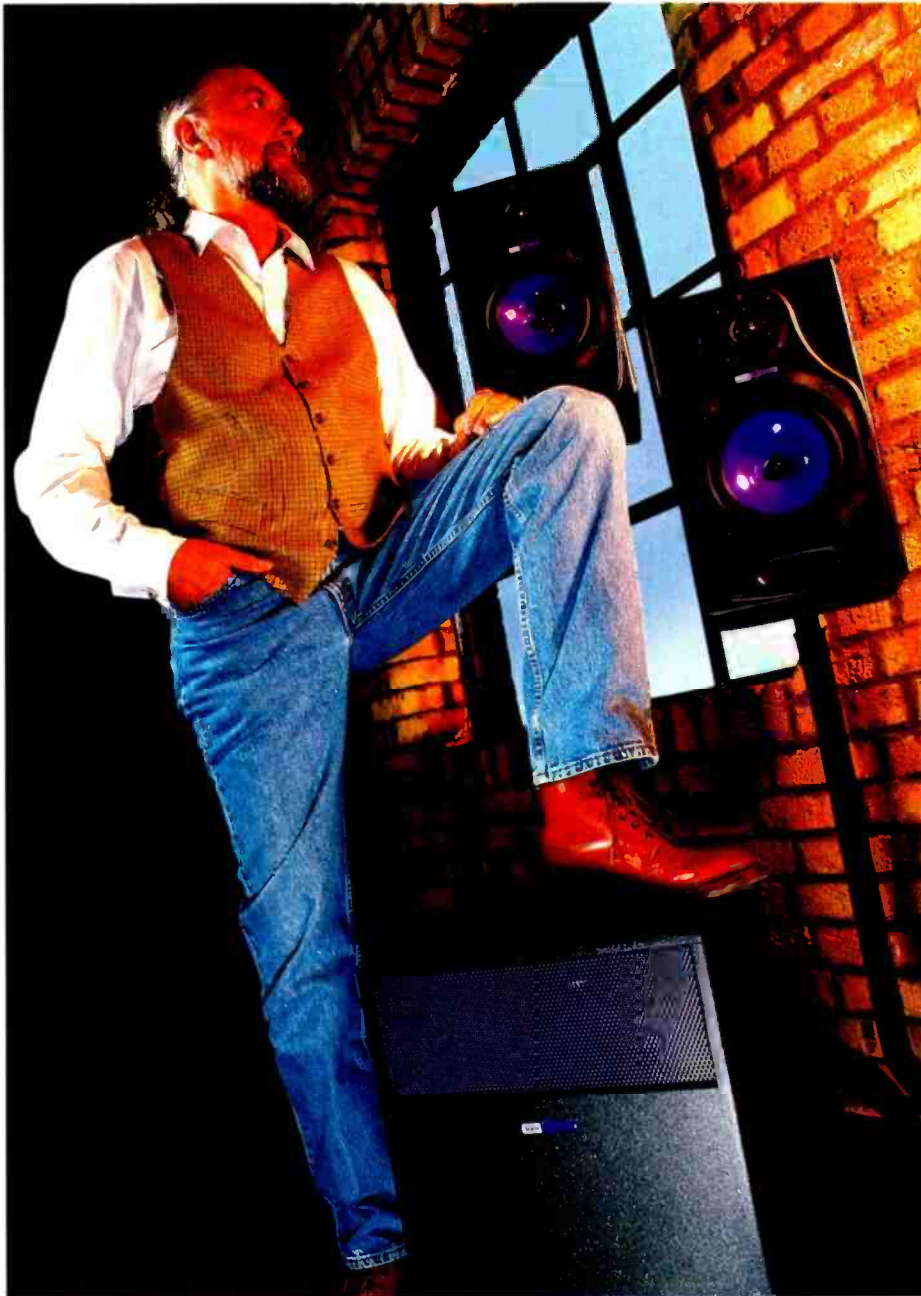


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*Left: Mick Fleetwood with HHB Circle 5 active midfield monitors and Circle 1 powered sub-woofer.*

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and expanding into new areas.

SPARK is the company's most ambitious offering yet. In addition to recording via I/O with real-time addition of up to two VST plug-ins, SPARK lets you import CD audio digitally from a CD inserted in your computer's CD-ROM drive, while at the other end of the process you can use Adaptec Toast (included on the SPARK CD-ROM) to burn your own CDs, CD-ROMS and Audio-data Hybrid CDs from a SPARK Playlist. In between, you have a graphical waveform display window where you can edit regions and waveforms (including pitchshifting and real-time and off-line timestretching) and create a Playlist complete with various cross-fade options, plus the Master View window that contains the Master section and the FXMachine section. The latter section provides you with a sophisticated FX routing matrix, presented graphically onscreen, offering up to four parallel streams of audio fed from your mono or stereo audio file, with up to five VST plug-ins on each stream adding effects processing in real time, drawn from a total of 11 available VST plug-ins included with SPARK. You can also use the FXMachine section to process input signals without first having to record them into the program as a file, so you can run live processing on a live signal. The VST plug-ins provided are the TC Native CL compressor-limiter and 10 new SPARK effects: Expander, Reverb, Delay, CutFilter, Bandpass, OneBandEQ, 3 Band EQ, ResFilter, FuzzSat and Grainalizer.

Version 1.5 will see some significant additions in the form of a new cut editor (like the Sound Designer cut editor taken a step further) and the ability to use the Master View section as a VST or MAS plug-in in its own right (given that you could have up to 20 actual plug-ins running, drawn from the 11 available, perhaps it should be considered a new category of plug-in—multi or matrix). But not only this, the new version of FXMachine can be used as a plug-in adaptor for MAS-environment programs—Digital Performer and AudioDesk. What this means is that MOTU owners will be able to run any VST plug-ins on the market within DP or AudioDesk. Schluenzen reveals that TC Works began developing for MAS as a result of an email campaign by MotU users. "They sent us emails, loads of emails," he laughs. "So we said "Okay, let's give it a go, let's try it." Proof, then, that "user power" can make a difference.

Schluenzen refers to SPARK, which is fast on its way to becoming the company's biggest-selling product, variously as an 'integrator' and 'somewhat a combining piece of the puzzle in between the markets of musician and sound engineer', which it straddles. He adds that 'I believe you will not be able to separate the pro-audio and MI markets

that easily anymore in the future, due to the technological developments. They'll continue to interweave in wide areas.'

TC Works is doing its part to muddy the waters with SPARK. Now, as Schluenzen puts it, 'pros who don't want to use a sequencer can start playing with VST plug-ins' using SPARK, while the company plans to 'build it further into the pro arena' by adding TDM support alongside VST. Schluenzen elaborates on the reasoning: 'We want our users who have Pro Tools and a MasterX to be able to use SPARK and MasterX. And we will not port MasterX over to the native platform, because there is no market for it. Of course we get a lot of requests for MasterX for DirectX or VST, but would those people be willing to pay for it? No, they would want it for 99 quid. And I'm afraid that's not possible. They don't realise that MasterX and the dynamics

technology is inside, which is also used in the Finalizer and originally in the MD2 for the M5000 digital audio mainframe by te electronic. Years and years, and years of development in that technology, of man-years, of several people for years, and that doesn't come free.'

Schluenzen at present sees clear distinctions on a number of levels between the Pro Tools-TDM market and the native processing market as exemplified by VST and DirectX—which he defines broadly as the sound engineer and musician markets respectively. For instance, on a 'behind the scenes' technological level, designing for fixed point on the Pro Tools DSP platform and for floating point on native platforms means adopting different approaches, each with their own trade-offs. But market expectations and understanding of the value of plug-ins also differ. 'It's a totally different >

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< way of thinking when we design a reverb for DirectX or VST as opposed to designing a reverb for Pro Tools. On Pro Tools, nothing's more important than quality, so even if we require two DSPs at the same time to deliver a proper sound, it's fine. Our customers on that platform, they demand the best possible on the current Pro Tools hardware, so we're going to give that to them. It's not essential if we can run four, eight or 12 or 16 reverbs on one DSP, it's essential that the reverb we sell to them delivers proper reverb. Period. End of story. If we design a product for DirectX or VST, we deliver the best performance possible without blocking the computer to do something as well. If you want to load that reverb into Cubase and then get proper surround reverb, there's not much else left you can do on a current 500MHz Pentium III. You can probably run one mono track. But, of course you want to run 24 tracks or more.'

Schluenzen is in no doubt as to which market does best for them at the moment: 'The TDM plug-ins for Pro Tools sell extremely well for us, because the market has understood why they want plug-ins, and what the difference between a freebie and good technology represents. Maybe also because Pro Tools users know who *tc* is, because they also have other professional gear, they are in a different league. But if we talk to the VST customer, he's not there. Yet. To him, he gets a Wunderverb that comes with Cubase so it's a good reverb.'

Schluenzen refers to what he calls the 'good-enough factor' in the native processing market, meaning that for many native users what they get as standard is perceived by them as being good enough without the need to invest further.

'It really seems to be true that people don't know the difference between the Wunderverb and our reverb. It seems that many people haven't found out about better quality, or else they use the crack, the hacked software. I don't know, I haven't really found an answer to that, but my impression is that it might take another year before that particular customer understands why he wants a plug-in. Actually, for the last two months it's been picking up in the US market, but in many European markets the channel hasn't fully understood the plug-in concept, it seems. Our distributors have a tough time getting dealers to stock plug-ins in general—and if you don't stock, you don't sell! In the mean time prices are eroding, so only the strong will survive. And only very few have a brand name. I think the likelihood for new companies to show up in that field is pretty small.'

Although TC Works has made its name with its effects plug-ins, Schluenzen prefers to refer to his company as a solutions company. He elaborates: 'The TC

group in general, we see ourselves as algorithm makers, technology providers. We don't see ourselves as a hardware company, or a plug-in company, or whatever. We have certain technologies which have to do with audio processing, which we then implement into the different applications and markets. So, at the same time as we launched SPARK, *tc electronic* launched the System 6000, a visionary high-end processor with surround capabilities.

'TC Works' mission is really to become one of the major audio software companies, whatever that means, not to become one of the major plug-in companies; plug-ins alone are not the future, either for us or in general. We have the big advantage of being able to access nearly 25 years of experience whenever we need to. And, I think almost no other software company can claim that for themselves. The stuff *tc electronic* do is software-based, of course. I mean, it's computers which reside inside those little 19-inch boxes. So we share the same research. Meaning, the customer when he buys a TC Works product, he gets genuine TC technology. But as we have our own development team, also we develop new stuff like the real-time time-stretching inside SPARK.'

The original TC Reverb for the Digidesign and Soundscape platforms was based on the M5000, the MasterX multiband expander-compressor-limiter was based on the Finalizer, the original reverb model for the Native Reverb was taken from a model also found in the FireWorx and the G-Force, two models from the M5000 formed the basis of the TC Tools reverb, and some parts of the technology for the MegaReverb, such as the diffusion strategies, came from the M3000.

'In *tc electronic* we have a pretty big development department of almost 50 people now. And in this development department there's also some research engineers, and they do nothing but research new technologies all day. Of course when we design a new plug-in we consult with them, so this could be just a starting point or it could be an algorithm model. And then we take this model

and we have to implement it on the platform. With the Native Reverb, for instance, we didn't have a Motorola DSP, we had to live with a Pentium 133/166 at the time. So, we needed to find a way

to create the impression of a *tc*-quality reverb without really blocking your system. And, of course, there we consulted the people who did research on reverb at *tc electronic* for years, and years, and years. If there's a downside to this relationship, it's that we have to live up to the *tc electronic*'s heritage. Whatever we do, we have to live up to that. We cannot afford to disappoint the market with a bad product.' ■

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# Spanish Lessons

Madrid is home to a rich musical history and an unusual studios. **David Robison** retreats to Ashram

**E**VER FELT as if you're being watched? Or that some higher being, is following your every move? Standing on the sun terrace at Ashram Studio, staring at the 4-storey fibre-glass sculpture of a praying saint dominating the garden, you'd be forgiven for thinking that you were.

Ashram—the name means a place of retreat in Hindu—is a sanctuary of calm and charm in the suburbs of Madrid, 10 minutes from the airport. It's a multi-level, multicultural juxtaposition of light and air, wood and glass, the old and the new. Original Mexican carvings bookend a day room featuring a pool table and mini gym; doors from a 16th Century convent lead from kitchen to sauna and then to the outside pool set in dense flora. Spirituality and relaxation—as well as being able to record to the highest degree—was important to Nacho Cano, formerly of Spanish megaband Mecano, when he designed the studio in 1995.

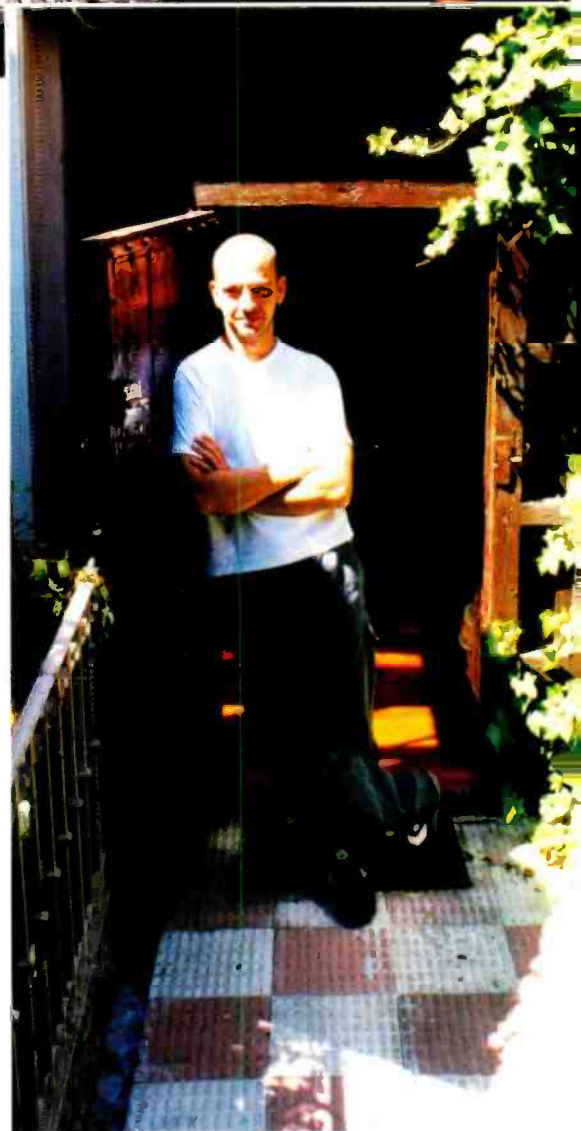
Spain is arguably the biggest exporter of music after the US and the UK, and not just because of the Latin American market, as Cano explains: "Also because of the tourists which add a lot of the money to the economy. In the summer holidays, people come here, they laugh, they want to take that music with them, even if they don't understand what is going on—that's how that song 'Macarena' caught on, as stupid as that."

But even though Ashram has played host to many Spanish artists over the last couple of years, its to take an active role in enticing more bands from international

climes. Part of this process has been to ship UK engineers over for assignments—when *Studio Sound* visited, the Sarm Group's Ren Swan had been mixing for a Mexican outfit, Moenia—and more engineers will be invited. Cano has found an increasing number of acts seeking the skills of the "English ear".

The centrepiece of the basement studio is a 96-input, 56-channel Euphonix desk, 64 tracks of Pro Tools MIXplus systems and 32 tracks of Akai DR8 plus mastering to Akai DD1000. There are four types of close-field monitors (Genelec 1031As, Dynaudio M1s, Yamaha NS10s and Auratones) as well as Dynaudio M3s. Outboard includes Focusrite Red and Blue units, GML EQ, Tube-Tech, BSS and Urei compressors, Drawmer and dbx gates and Apogee converters. Further FX include a Lexicon PCM 70, 480 and 300, Eventide H3500, Yamaha Rev7, Marshall JMP1 preamp and Ensoniq DP/4. Studios such as Skyline and Electric Ladyland in New York, the Estefan Studio in Miami and some of the London majors, were all influential on Cano's gear spec.

On his choice of the Euphonix desk, Cano says that in a country where domestic recording budgets are tight, fast technology is essential. It allows the artist to get into the desk. The technology of Neve and SSL has been designed by technicians, the Euphonix by musicians. In terms of sound, the Euphonix, the presence—like on Alanis Morissette records—it places things in a way that you can hear every >







< instrument, a very clean desk. So not only does it sound good, it reacts rapidly to the way musicians think.'

The walls in Studio Ashram's stylish and spacious live room don't have ears—they have hands. Plaster hands, holding candles, like in some scene from a thirties Cocteau movie. The sculpture of a 12ft bronzed Amazonian looking in through large patio doors just beats those for a curio. Here sits a Yamaha grand piano and access to 20 XLR inputs—a rock band could easily record in here—for a range of mics including Neumann, AKG, Shure and B&K. There's a wide range of MIDI and synth gear on hand to—several E-mu sound modules, Roland JVs and an MC-505 Groovebox, a controller keyboard and an Access Virus analogue-style synth. Steinberg's Cubase Audio, MotU's Digital Performer and Emagic's Logic Audio should keep composers happy.

'Hot and friendly,' says Ren Swan of the operation. 'It's a lot more laid back than London. But people in studios in Spain work as hard as they do in London—that surprised me. Technically they're easily up with all the English studios—the Euphonix is great and the engineers [Gugu and Louis] know how to use it, and there's never a language problem.'

'We intend to change as the technology changes,' continues Cano of future purchases. There is talk of buying a RADAR, but first there's the question of setting up a studio in Ibiza to compliment the Madrid setup. An ideal site has already been located (the control room will look out over the sea), and a completion date of mid-2000 is planned.

'I think it's important that people know that we can be competitive and we can offer a lot,' concludes Cano. 'People come here and they just don't want to leave. The studio was based around sun and light and water, and you can hear that on the recordings.' It can also arrange a small amount of studio residency—or nearby accommodation if required—and fabulous in-house vegetarian cooking (as sampled and recommended by your author).

'We want people to have fun,' Cano summarises. 'Enjoy your recording, put on your recording whatever you are experiencing. Of course, you need to concentrate, but once you go out, have fun.'

Madrid is the place to have fun: 10 minutes from Ashram are restaurants and nightclubs that never seem to close, cheap shopping, a bar on every corner, parks and art galleries—but don't forget, you're being watched. ■



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When it comes to labelling CD-Rs, there are more options than most of us imagine. **Tim Frost** gets on with the decorating

**I**F YOU GO TO A CD PLANT they call it decoration, but to you or me it's plain old printing. Whichever name you like to give the process, disc printing covers a massive range of options, colours and qualities. In the 'real' world of pressed CDs the expectations of what is printed on the surface of the disc is generally fairly modest—most opt for text saying who and what is on the disc, together with some neat, but simple graphics.

Although every CD plant is geared up to deliver full-colour picture discs, the extra cost, and wastage when the different colour screens don't align properly, means that most clients opt for keeping things simple and good, by using two or three colours. It's mildly ironical then, that in the world of short-run CD-Rs duplication—where, by definition, the discs are seen by very few users and the decoration on the disc will have no real effect on the attraction of its contents—the requirement is often for photo-realistic printing.

Why should this be? Amateur psychologists might point to the fact that, this is a reaction to crude hand-written labels that defaced many early CD-Rs. I suspect the answer is more simple than this. Studios and commercial organisations duplicating small runs of CD-Rs, are going on to print them in full colour simply because they can.

The CD-R printer market has moved forward so quickly over the last few years, that it is now difficult to find a printer system that won't print in full colour to at a minimum 300dpi and often at over 1600dpi. Just perusing the range of CD-R printers available makes for confusing reading as there are all sorts of mixes of print technologies, different levels of automation and types of data that you can feed to the printer.

Working at the most basic level, let's first cover and put to one side the stick-on CD-R label. Labels come in small sheets that can be run through any normal desktop printer and then applied to the disc using a 'patented' applicator that ensures that the label sits dead central on the disc. Labels are cheap and effective for marking up discs made on a PC's internal CD-R writer, but you soon run out of patience with them if you are producing any significant number of copies using a 'proper' CD-R duplicator.

Moving on to the proper disc printers, these follow very closely the look and feel of many CD-R duplicators, hardly surprising, since they are generally made by the same people.

Manufacturers use print mechanics



from well-known computer printer manufacturers such as Epson or Canon, so they are generally reliable and there shouldn't be any problems getting ink and ribbon supplies. It also means that there isn't any problem finding a reliable printer driver to work with your computer's operating system.

Normally at the cheapest end of the range are the inkjet printers, but the majority use thermal transfer as this generally produces better results. The thermal print process is effectively a dry process with 'ink' being transferred from a ribbon to the disc, with no drying time and no risk of the ink spreading or smudging.

Operationally, printers fall into two distinct categories—manual and automated. Manual printers like the Rimage Thermal printer look like a large stand-alone CD-ROM drive. The printer connects to a PC like any other printer, and comes with CD print software which is used to design the label. The software allows images to be imported from standard graphics packages and have

text features so that the quality of the disc image is limited only by your skills and imagination as a graphics designer.

The print process for CD-R is really no different to any other PC or Mac print process (although it should be noted that not every manufacturer supports the Mac with its print software). First put the disc in the printer, choose the image, press print and in under a minute, you'll have a printed CD-R. Most thermal printers offer three print options. At the most basic level, there is black only, which is ideal if all you want is identifying text printed quickly and cheaply. Then there is single pass colour, which is the standard colour printing option acceptable for nearly all uses. But for absolute quality there is 2-pass printing—analogue to the top quality print option on most ordinary colour printers. The advantage is near photo-quality images on the disc, but it does take twice as long to print and costs twice as much in ribbon usage. Even using 2-pass printing, the process of decorating a CD-R takes much less time than actually duplicating the disc. So apart from the extra labour involved in having to move the disc from the duplicator to the printer, overall the print process adds no extra time to producing CD-Rs.

The stand-alone manual printer is an ideal match for the single drive or small tower CD-R duplicators, but if your choice of duplicator is an automated robotic system or a large tower system producing larger numbers of discs, then an automated robotic printer is a better option. There are many examples, including CopyPro's PowerPro Auto-loader, MediaFORM's AP-1301C, the Discmatic OPAL7 and Rimage's Auto-printer. Like an automated CD-R dupli- >



Rimage Producer 2000 Amigo





The obvious advantage of the automated printer is that it can be loaded with discs and left to get on with it. But there is another key advantage in the way that the automated printer can handle custom printing on each individual disc

< cator, these printers have input spindles that hold up to 300 discs, one or two printer units and a robot arm to transfer the discs from the input spindle to the printer and then to the output spindle.

The obvious advantage of the automated printer is that it can be loaded with discs and left to get on with it. But there is another key advantage in the way that the automated printer can handle custom printing on each individual disc. While with a manual printer it is possible to choose a different image or different text for each disc printed, this is a time-consuming way of individualising the print process. The software that comes with most automated printers include the ability to make incremental changes for each disc and there are two important uses for this. One is for serialising discs, printing an individual serial number on each disc, incrementing as each disc is printed. The other, which is a little more snazzy, is to personalise each disc with the details of the recipient. So, although you may have made 50 copies of a demo, everyone receives a copy with their own name on it.

If the CD-R duplication operation is at this level of throughput and sophistication, then it is well to consider an automated duplicator with built-in printing, or indeed seeing whether it is possible to add a printer to an existing automated duplicator; some companies like Rimage offer a printer upgrade.

This is an ideal solution in several respects. From a cost point of view, it means buying only one set of robotics as the arm that moves the disc to the CD-R drive, also takes the disc to the printer unit. And from a convenience point of view, the disc duplication and printing becomes a single process, with blank discs loading at one end and finished, printed discs coming out the other. There is also the ability to fully consolidate small runs into one job. Since the duplicator can be loaded with several different duplication jobs at

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once, with a built in printer, the system can print the right labels on the right discs without any human intervention. So a large automated duplicator-printer such as MediaFORM's CD-3706P can be loaded with half a dozen different duplication jobs at once and it will produce the right number of copies of each master, printed with the right labels with no risk of the discs being mislabelled.

One other printing option that sounds a great idea is to print the disc information as text, onto a silk-screened CD-R. If you use a lot of discs, then it becomes economic to have the disc supplier silk screen them with your company logo, leaving space for the individual text printing. This not only looks good, but also means that the CD-R printing can be done in black only, with the cost and time savings this entails. There is one fly in the ointment with this idea, which is that the disc has to be exactly the right way round in the printer if the text is not going to end up at an odd angle, or worse still, printed sideways over the logo. Manufacturers like Microtech show that it can be done with its ImageAligner system, but this does involve a small video camera looking at each disc before it goes into the printer. The camera sends an image of the disc to a computer that uses image recognition software to analyse which way round the disc is, which then instructs the robot arm to re-orientate the disc correctly before it goes into the printer. This, understandably is an option only for the very deep-of-pocket.

One last small factor to take into account when choosing a printer is the availability of media. You can't print directly onto the bare surface of an ordinary CD-R, as the plastic won't hold the ink. To make a disc printable it has to be covered in a special surface ink—usually white, but sometimes gold or clear—that will hold the image from the CD-R printer. Making a surface that holds thermal print ink is relatively easy, but manufacturers are still finding it tough to develop a surface that accepts the water droplets that come from an inkjet printer, without letting them spread or smudge. So, although ink-jet is known technology for most, you will find that the range of inkjet printable discs is a little smaller than for thermal printing. ■

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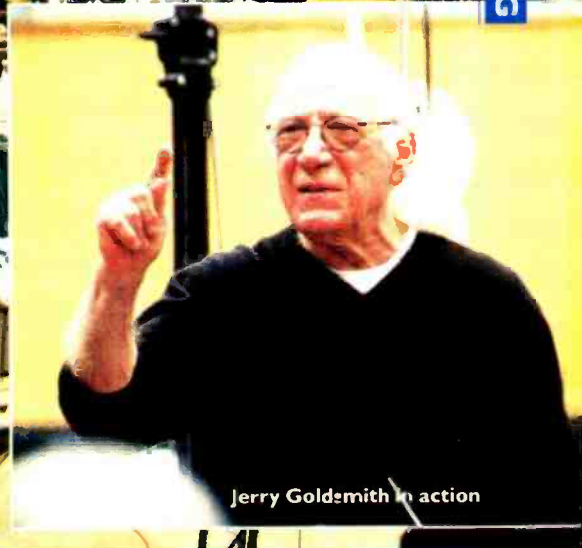
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# SACD and the Motion Picture



Jerry Goldsmith in action



Paul Reynolds looks on as Bruce Botnik and Jerry Goldsmith listen to a playback

As the Super Audio CD standard is prepared to confront the consumer market, **Tim Goodyer** joins Jerry Goldsmith and Bruce Botnik in a defining recording session

**A** BEAMING Jerry Goldsmith breezes into the control room from Abbey Road's Studio One. 'Remember that Bruce?', he challenges his engineer. 'How long ago was it?' Botnik responds. 'Twenty-one years?' 'Don't, don't...' replies Goldsmith.

The closing crescendo from *Star Trek the Motion Picture* theme is still reverberating around the room, delivered by over 90 members of the London Symphony Orchestra and captured by no less than four cutting-edge recording systems crowding the machine room. There are smiles all round as the recording of a selection of Goldsmith's innumerable movie scores are captured for imminent release on the fledgling SACD format moves smoothly forward.

Pride of place goes to the Augan-dCS recorder, 'the only system that stayed in the air all day yesterday', according to Philips' Business Development Manager Paul Reynolds. Also in attendance are a Sony 6-track using Ed Meitner converters (backing up the Augan), an early Philips DSD system and a Sony 2-channel 24-94 PCM system. 'This gives us three DSD systems and one PCM to

listen to mainly for the converter performance,' Reynolds explains. 'The old Philips system is a kind of reference because everybody knows the converters very well.'

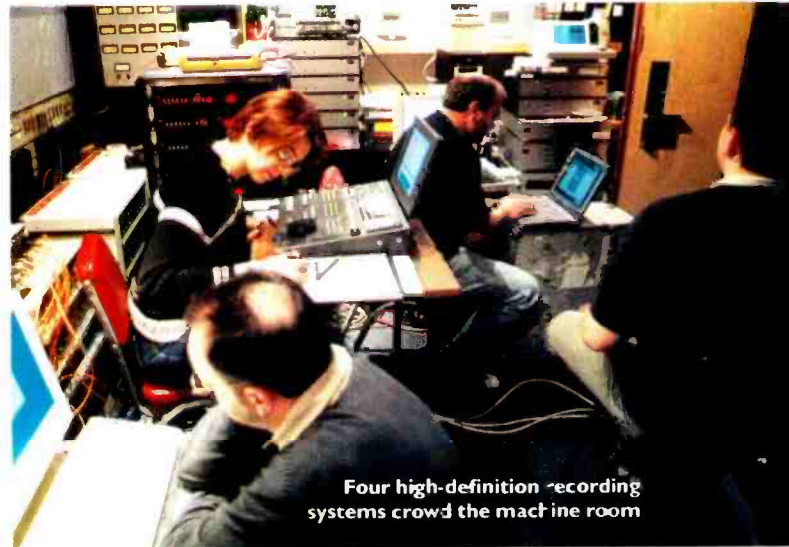
Apart from being responsible for today's session, it is Reynolds who placed the order for the three Augan-based systems with Dutch recording specialists Kompas last year. The exercise is intended to deliver a suitably impressive selection of Jerry Goldsmith movie scores to demonstrate the capability of the SACD format—one of the early converts is Goldsmith himself.

'It's a good cross-section of sound from the most bombastic to very delicate so it's a good test of the system,' he agrees of the session, 'but it's very scary actually. It's so accurate that you hold your breath when you listen to the playback. Most recordings, especially in a studio like this, sound ten times better in the control room than they do out here. With this system you can't conceal anything so everybody's got to be on their toes.'

'To start with I expected it to be a bit like quadraphonic, but it's nothing like

that at all. If you turn the rear speakers off you hear this tremendous absence. There's such depth in the sound and the dynamic range is so accurately recorded that it doesn't seem to crush your ears as it gets louder. I can't believe the sound.'

Botnik is in agreement, readily >



Four high-definition recording systems crowd the machine room



<describing it as 'transparent' and happy to be free from having to second-guess the performance of analogue tape. 'I've never liked digital recording quite frankly, but this sounds great,' Goldsmith enthuses.

After Sony's initial push, it is now Philips that is carrying the SACD baton, keener than Sony to emphasise its multichannel capabilities. 'Sony started off with stereo because it's considered appropriate for Japan,' explains

resources. There's a lot of work to be done in launching a new system so some things we split and then share, like hybrid manufacturing and multichannel authoring. Sometimes it doesn't always look like that.'

In justification he points out the Sony system at the Abbey Road session and that one of Philips' Augan-dCS systems is currently in transit to Berlin for a Sony session. 'In the end we know where we're going—in three years' time we'll both be at the same point.'

In the meantime Philips' have enlisted Holland-based Kompas Recording to develop and provide three DSD systems as a step towards opening the doors on SACD to the remainder of the recording industry. 'They want us to stand behind the system and propagate it to our colleagues,' says Ted Diehl who will take the fourth system for his company's own use.

'We have three phases in the project to develop these recorders,' Reynolds continues. 'The first phase will be finished at the end of this month, then we will open up the system so that you can have different converters or whatever to meet people's personal preferences. The third phase involves me ordering further systems to meet our workload and that will be in months if not weeks.'

Kompas had done test recordings for dCS on higher sample-rate systems and found themselves ideally placed when Philips needed someone to develop a

commercial system. From a preliminary meeting with Augan and dCS at the 1998 European AES Convention, all participating parties assembled the following year in Munich to shake hands on the deal.

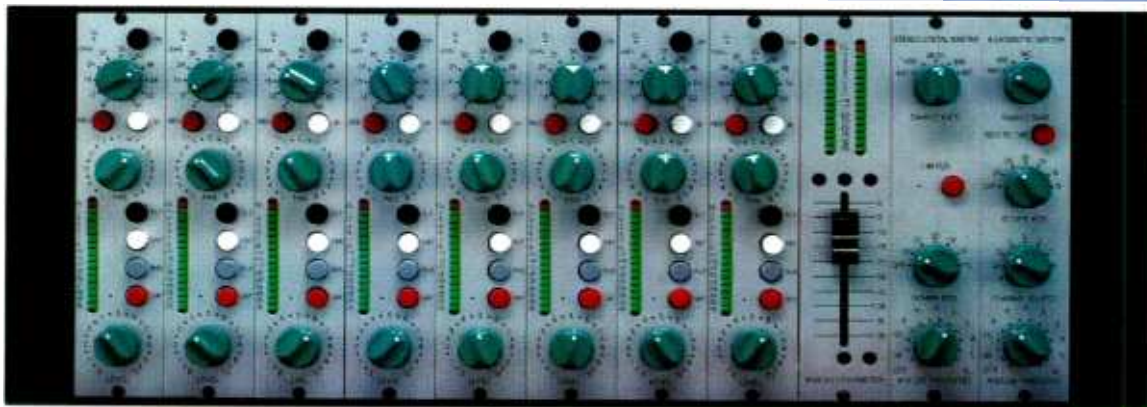
Kompas' own initial requirements had been for a storage device to replace the Nagra-D and Genex recorders that supported their early 24-96 and 192kHz ventures. The Augan system proved suitable, but it wasn't until Philips entered the picture that the project gathered momentum. 'We were flirting with SADIe and Augan but we found SADIe's IBM architecture limiting and the hard disk were a problem,' comments Diehl. 'The Augan machines were reliable and both they and dCS were designing systems from the ground up, and very few companies in the world are doing that. MO is a lot cheaper and more reliable than a removable hard disk, and MO discs hold all the information including crossfades and personnel details which give a project a continuity you can't get with hard-disk systems.'

'I was happy that our machine was usable in terms of sample synchronicity and the MO, but DSD technology itself is difficult,' offers Augan's Jan de Witt. 'In principle it's easier to do more channels on PCM,' dCS' Mike Storey agrees. 'DSD doesn't fit naturally into DSPs and there are still signal processing tasks that are trivial in PCM, but that are not at all easy in DSD. They wanted the ability to monitor and meter and the meters still have to be PCM meters because the elements in the recording chain are only gradually becoming DSD—so we have to provide a PCM output as well as DSD. Another thing is crossfading; whenever you do an edit in PCM you don't switch the signal off, you fade it down and doing a crossfade in DSD is not just a few lines of code it's a big thing, it translates into expense and you have to think hard about how you're going to keep the quality up. In addition, because of the way the data is packed it can be mistaken for PCM >



The recording team including Philip's Paul Reynolds (back left); Bruce Botnik (centre front); and Jerry Goldsmith (front right)

Reynolds. 'We're doing multichannel; because we sit mainly in Europe and the USA. All the high-end labels in the USA are doing fully-hybrid production.' The move has prompted speculation that co-operation between the co-inventors of CD had dried up. 'Not at all,' Reynolds counters. 'I sit in the steering committee where four of us—two from each side—work out the strategy. Sony started off with stereo and single-layer discs, while we were focusing on the multichannel side and hybrid discs. It's just a splitting of



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# Ash Howes

Photo: Chris Hook Studio: Battery Studios, London



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Left: The Augan-dCS system

explains, 'so any disruption of the DSD data causes high-bandwidth, full-scale noise. It is a big problem, but since the Augan system in its architecture does not do anything to the data and the MO medium is extremely reliable, nothing goes wrong.'

'It was a lot of work for us,' Storey adds, 'but was sensible work so

we were happy to do it. It is a reasonable investment for the future. We've solved the big problems; we're in support and update mode now.'

With the bigger problems in hand, everyone is working to Reynolds' 'Phase 3' to recruit more supporters to the SACD cause.

'There are a number of people who can make DSD recorders now,' Reynolds resumes. 'Sony have a lot of systems, but a lot of those are on loan because their business group doesn't want to sell them and have to deal with lifetime support and issues like that. They want a further generation before they're happy to sell. They also have multichannel systems of their own. Philips doesn't have a professional manufacturing business so I'm going to work with a few more suppliers—Augan is the first—to generate third-party confidence in SACD. Quite a few recording companies have already said to me "I want to do it, but not until I can buy a recording system off the shelf because I don't want to be beholden to Philips or Sony". They'll be able to do that soon—anyone can buy a system on the open market and there is no restrictive practice.'

The Augan system is an amicable agreement between Augan and dCS on

how the system is partitioned. We just want to make sure that all the systems available in the beginning are of very high quality. Today you can choose a system with converters from Sony, from Ed Meitner in Canada, Philips, dCS and there are two other companies I can't name that are working on it.'

'You can use other converters and you can use other recording devices with our system,' de Witt confirms. 'One of the requirements was that it should be almost "off the shelf" and that you could use the converters with a tape machine or any other suitable device or use any other converters with the Augan system.'

Apart from establishing a worthwhile SACD record catalogue, one of the intended benefits of reducing the considerable cost of the recording systems—quietly acknowledged to occupy six sterling digits but also to reflect the fact that such system are presently part of a research project.

'In the beginning a system is always expensive,' Paul Reynolds concedes, 'but from pro hardware through to consumer hardware we will be coming down in price. It's the normal supply and demand pricing structure'.

In the meantime, Jerry Goldsmith and Bruce Botnik are happy that SACD is on course to dramatically improve the standard of both professional and consumer audio. 'I said "just record the orchestra".' Goldsmith muses. 'To start with I expected it to be a bit like quadraphonic, but it's nothing like that at all. But if you turn the rear speakers off you hear this tremendous absence. It's just general information, but it's all there. There's such depth in the sound. And the dynamic range is so accurately recorded that the louder it gets it doesn't seem to crush your ears. I can't believe the sound.'

'I've never liked digital recording quite frankly, but this sounds great.' And with that he returns to the conductor's podium and calls the orchestra to attention to rehearse the theme from *The Russia House*. ■



Above: The Sony-Meitner system

< data if you're not careful—and if you put PCM data into a DSD system it blows things up.'

'The DSD data is mapped as PCM data over three or four AES buses and the machines deal with it as PCM data,' Kompas director Bert van der Wolf

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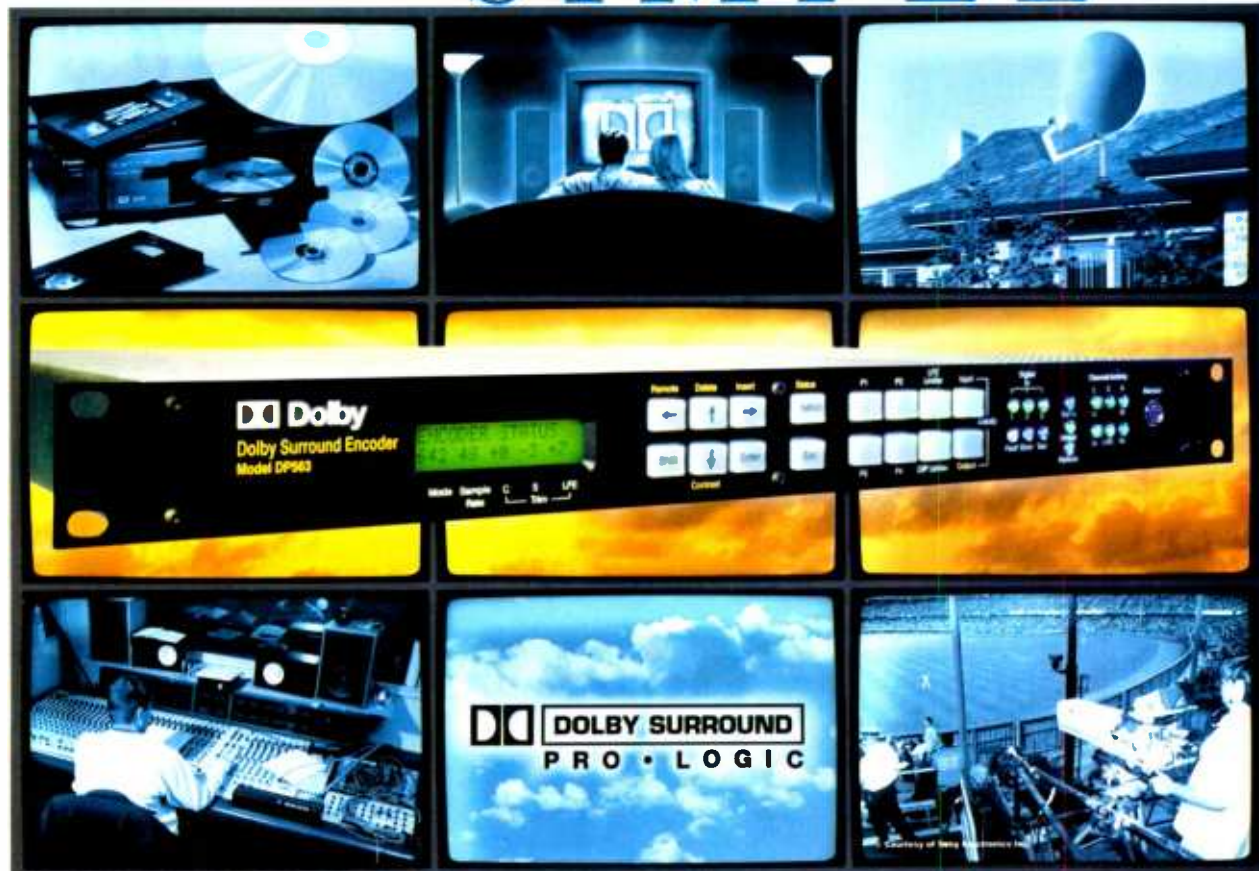



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# International Recording

All roads lead eventually to Rome where film sound is concerned.

**Zenon Schoepe** reports from a facility that justifies the 'international' in its title

**I**F YOU ARE INTO FILM SOUND then your road around the globe to pay homage to historically important facilities must eventually lead to Rome and International Recording. Historically significant for Italy and internationally renowned for films by Benigni, De Sica, Fellini, Bertolucci, Antonioni, Zeffirelli, Visconti, Tornatore and various works by Sergio Leone. Scores produced at International Recording include those for the film *Cabaret*, *Romeo & Juliet* and *The Godfather*. It remains a bastion of modern film technology in the region with Italy's two AMS Neve DFCs. It's always been a family and is unusual in still being one.

The company goes back to September 1957 when it was founded by the late father of International Recording MD Paulo Biondo. Biondo senior had played a pivotal role in bringing professional music and film sound facilities to the country after a long and illustrious career at the RCA Corporation and was a founder of the operation in Italy after long spells in Europe and the US. 'RCA was the greatest electrical industry in the world, it had 200,000 workers around the world,' comments Paulo Biondo.

In 1951 RCA decided to build a record industry in Europe. Destined originally to be in Munich it was moved to Rome and called Radio Television Italiano, not RCA due laws that forbade foreign naming, but changed when these laws

changed in 1954 to RCA Italiano. Biondo's father owned 30% of the company and sold out in 1957 and opened International Recording in New York, but the venture fell through and he took the name to Rome.

'I was brought up in a recording studio—it was NBC studios,' explains his son. 'I've seen how the quality has improved in this business almost on a day-to-day basis from the beginning. There is not much more to say about sound, the quality has been there for a while now, but I would hope that we could get a greater quality on the creative side because there is an imbalance that is more apparent to people who have lived through all the changes that have happened over the decades.'

Biondo's father's investment went into the company and the building in which it is still housed in the centre of Rome was built between 1958 and 1960 specifically for music recording, but also for film work and introduced studios for ADR and film and TV post. It started with three stages, two ADR and one mixing and music stage that was busy continually for 20 years. 'It was booked practically every day and night, we had six months of advance bookings. Nobody else in Italy could even dream of that sort of scale,' states Biondo. Music was the 'main dish' and projects included Pink Floyd's *Zabriskie Point*, Coppola's *The Godfather*, *Cabaret*, the list goes on, and it was more affordable than other

recognised recording centres.

'In those days the Eastern European countries weren't as popular as they have since become for orchestral recordings,' continues Biondo. 'America got expensive, so they moved to London, the same happened there as they came to us in Rome which is where we got a lot of our business in the late sixties and early seventies. Budapest was next followed by Prague and Sofia. The last recording we did was *Conan the Destroyer* and then we quit. We stopped doing the music because we discovered that mixing was more profitable and the competition from foreign studios, particularly from Eastern Europe, was great. We upgraded the studios and put in new Neve consoles to replace the existing Westrex desks.'

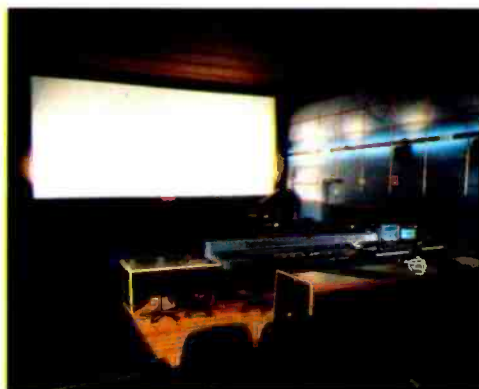
Along the way it had acquired an operation in Southern Rome, NIS Film, in 1968, which Biondo says was built for classical recordings and is the largest complex of studios in Southern Europe. International Recording needed to expand for the space and the new complex had such conveniences for larger productions as ample parking. The complex housed five studios, three of which were capable of doing music and mixing. The two operations merged in 1972 and the NIS Film site was kept until 1992 when it was closed because the double bills were becoming prohibitively expensive. The International Recording operation was then

expanded instead.

'The NIS Films complex was in need of refurbishment so we thought we ought to spend the money here and take more space in the building,' says Biondo. 'The value of that operation was the huge studio which is 35m long, 17m wide and around 12m high. It's still sitting there because nobody has the money to refurbish it, it is so large. It's a fantastic place.'

At the time of my visit the last remaining 8000 series Neve left over from the last upgrade was about to be replaced by a D&R Cinemix. 'It's a television mixing studio so the rates can't be high but the other reason for choosing the D&R is that we use local freelance mixers because we can't afford to keep mixers on standby and on the payroll. None of these freelancers would be prepared to mix on a DFC unless they have at least six months of training and experience on it,' he explains. 'The Cinemix is popular around Rome so the freelancers are familiar with them. I'd love to have DFCs all around the studios because we're very happy with them and our mixers love them.'

Staff numbers run to around 40 full-time, plus some 20 occasional workers, including two DFC mixers with a third in reserve and two more in training. An



additional studio, ranked beneath the D&R room, has two Yamaha digital desks linked together for sit-com work.

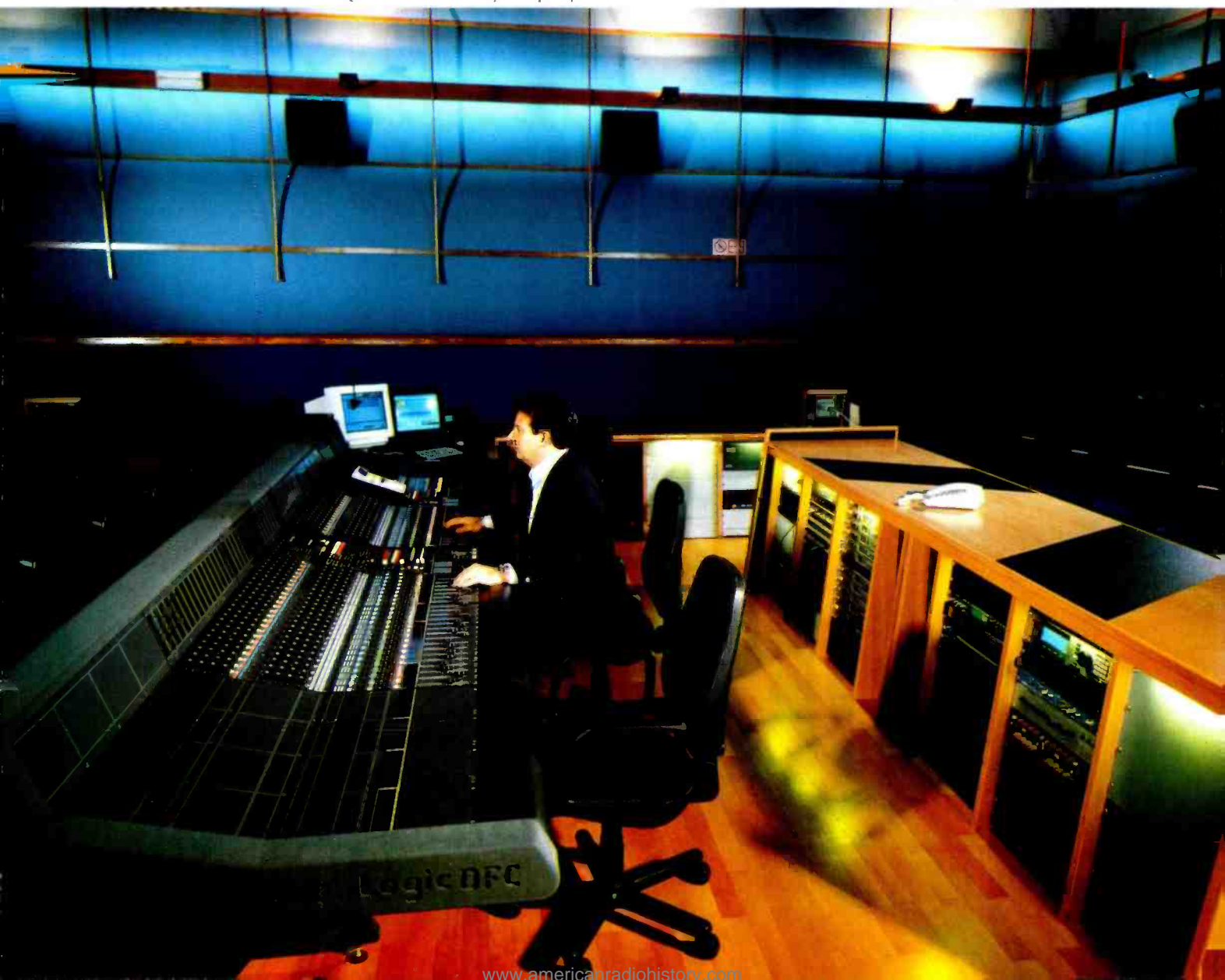
'The only music we still do is for foreign versions,' explains Biondo. 'We do the songs and choruses and that's on-going and something that is complementary and necessary for the foreign version work we do. We would be ready to build up a music studio if the business were profitable. We would love to, it's our cup of tea, we know how to do it but it doesn't pay. But it has been a business card for us for many years and it has helped to introduce us from a quality standpoint to the film work. If you have a background in film production your people have been in the

field using microphones behind cameras and, on the same level, if you have been handling mics for music you are well prepared to do film or anything else you'd like to do. Not many people in this town have that kind of experience in the film business.'

When the NIS Films operation was closed the International Recording site was expanded to keep the work that they otherwise would have lost and Biondo is proud of the fact that he managed to keep all employees.

'Most of the people who have worked here started from scratch because there is no school for this type of thing. When you meet film technicians who say they have experience you would tend not to want to employ them,' he says, 'you would rather train them yourself. We were practising SMPTE and other standards because we were providing an international service and that is not the case elsewhere locally.'

Biondo says that TV work rates make it difficult to sustain a forward looking business on this alone but serves instead as a means of 'filling in' work. 'The more you do it the less you earn,' he claims. 'You need to be able to do just a little to cover the blank spots on the bookings form. If I was offered 300 hours of TV >





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< dubbing in to Italian I would take 30 and ask them to allow me to spend them the best way I choose. Cinema production is our main activity here, be it local or European—Bertolucci or Zeffirelli productions are more international than Italian. We handle around 20 local Italian productions a year but the real bulk of business is foreign versions for American productions as we have deals with Warners and Disney and a good slice of UIP plus some Fox pictures and independents. More than 120 a year.'

In instances where films are actually shot in Italy International Recording is frequently involved with the ADR, rushes and transfers, something that was started on *Cleopatra* in 1962 but made easier with the Dolby Fax in 2000.

It also assists in the completion of non Italian language foreign versions, >



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 Eventide Orville  
 Lexicon 480  
 2 Supaplex 35mm projectors (SR,D, DTS, SDDS)  
 Magnatech high speed mixing projector  
 3 Magnatech 35mm 6-track recorders  
 10 dual Magnatech 35mm multitrack dummies  
 Sony LCD video projector

**Studio 2**

AMS Neve DFC, 48 frame  
 8 Akai DD8 24-bit  
 8 Tascam DA88  
 Eventide DSP4000  
 Lexicon 480  
 Magnatech high speed 35mm projector  
 Sony LCD video projector  
 Prevost 35/70mm projector  
 Magnatech 35mm 6-track  
 2 dual Magnatech 35mm dummies

**Studio 3**

D&R CineMix 48-frame  
 6 DD8 24-bit  
 6 DA88  
 Eventide H3000  
 Lexicon PCM70  
 Quantec Room Simulator  
 Magnatech high speed 35mm projector  
 Sony video projector  
 Prevost 35mm projector  
 2 Magnatech 35mm 6-track  
 10 dual Magnatech 35mm dummies

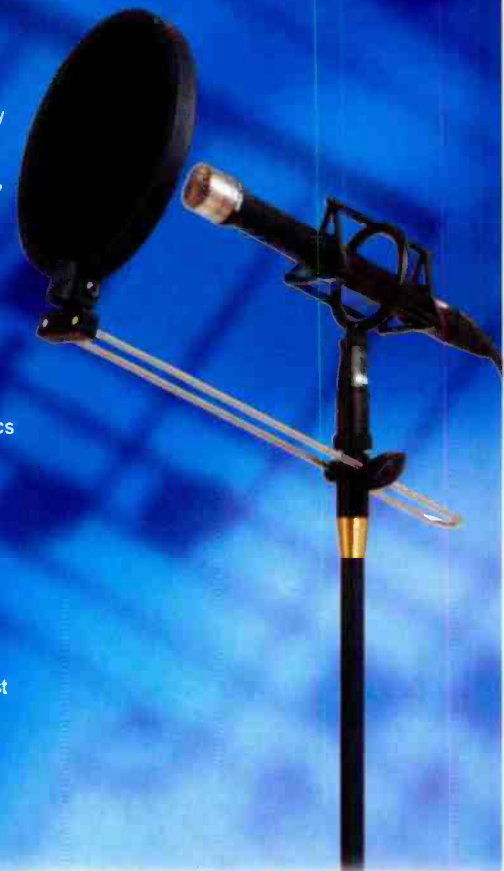
Other facilities include cutting rooms with Prevost moviolas; two Avid FilmComposer editing rooms; an audio transfer room for all standards; an audio transfer room for optical transfers (SR,D, DTS, SDDS); Dolby Fax; CCS CDQ2000; six ADR rooms with Yamaha 03D, Akai DD8, Tascam DA30, Neumann U87, FED V-Mod, Sony video projection and Dynaudio monitoring.

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PAULO BIONDO IS ONE OF THE REAL film people that you can still meet in the business whose experience spans back to the technologically revolutionary years, and who has seen it all develop and change for better or for worse. He's as happy talking about gear as he is talking about using it, the running of a studio, the film business and Italy's tapestry of political issues that influences it. You get the impression that he's the sort of man who knows what he wants and generally gets it.

He's particularly unkeen on the idea of tying in exclusively with a film company. 'We've been operating here for 40 years and not because a particular film company has been working in our studio at the expense of others,' he says. 'We've done well because every day we confront ourselves with the issue of quality and not with an exclusive deal that may guarantee us a year's work. Our's is a day-by-day approach and it's not the easiest option.'

He claims that one of the often overlooked drawbacks of working in and serving an international clientele is that

you become susceptible to the same lulls and peaks that the originating country experience. 'If an earthquake hits California I will be out of business,' he laughs.

However, in Italy there is an enormous amount of business in terms of hours that have to be dubbed and edited in Italian either from imported or local production. We have many private TV channels here, cable is starting and we have a lot of satellite. I would say that there is as much work in Italy of this type as there is in Germany or France, there is not a great difference. The only thing is that in terms of negotiations the price can go so low, the competition is strong. It is strange that in terms of our time occupancy film only accounts for 10%, and I believe that would be the same in Germany and France. For every film ADR there are another nine that take place in television but, as far as we're concerned at International Recording, that one often pays you more than all the nine TV jobs put together. What is unfortunate is that we are competing with facilities that would also give away that one film job

at the same price as their TV work. They're selling out their prime time studio work which is stupid. The only way I can counter that is to point out that I have DFCs with these name mixers, the studio is large and we have 40 years of experience.

'If everything works out and the picture is released and there are no complaints, the sound becomes not a big deal—few people would pick out the track as being fantastic. Instead they would only observe that they have had no complaints,' he says adding that things are beginning to change with an increase in the sophistication of cinema theatre playback sound systems.

International Recording rates are said to be cheaper than France, but work out to be largely on a par with Germany with the added convenience of Deluxe and Technicolor operating rooms.

'It is always a struggle but there is business and the main issue is television that promotes business,' he says. 'That doesn't mean that television necessarily invests its money in TV programmes but it does invest in films which eventually end up with TV rights.' Cinema in Italy is healthier than of late as the local produce, according to Biondo, has started to realise that it has to compete on creativity with all international releases. 'Quality is not linked to budget, it's linked to professionalism,' he states. 'For too many years it has been said of America "Oh, they've got the money" and that is just so untrue. But the film industry in Italy has always got professionalism and budget mixed up.'

International Recording has been responsible for an impressive collection of first-run English-Language movies. These include: *The Godfather*, *Last Tango in Paris*, *The Man of La Mancha*, *The Taming of the Shrew*, *Romeo & Juliet*, *The Kremlin Letter*, *Brother Sun, Sister Moon*, *Blow Up*, *The Damned*, *Zabriskie Point*, *Avanti!* and *Death in Venice*.

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◀ something that has been made easier with the installation of the DFCs. 'Finally we are equipped properly—the DFC is the key—because that's important for people who are trained to work on them and there's mix compatibility,' explains Biondo. 'We've even ended up doing Spanish and German versions which I find gratifying. It's a better and more convenient approach for the film companies compared to the spread out nature of a country like Germany. London is England and Rome is Italy as far as they are concerned.'

Biondo maintains that new consoles were essential for the complex and the DFCs were a solution which also fitted in with a projected partnership with DFC power users Todd-AO which is still pending.

'I love Neves so for me it was very easy to make this decision,' he states. 'Cost is really not the issue at this level because there's not a lot in it between the competing desks. AMS Neve's digital knowledge was already in a third generation with this console and that is a concern for a buyer. We know that there are problems in introducing digital equipment of this type, we knew exactly the problems that we would encounter and we encountered them and resolved them. We had to change all our dubbers immediately, we are in the process of dismissing all our 35mm equipment and we lost 75% of them and that is a very big change for a facility. We bought Akai dubbers once we had confirmation that they would be upgraded to 24-bit so there was the expense of around 50 of those. We run Pro Tools here but we're looking into Fairlights now as well but we're now getting working elements on Akai MO disks from LA which means something about its choice as a standard.'

The two DFC studios and the D&R room have been refurbished after the original late fifties design of Michael Rettinger and retain much of the original dimensions with corrections made for modern practices and tastes. Monitoring throughout is JBL and all formats are supported and worked in (including the new EX) right up to the optical transfers. 'The only thing we don't do here is developing,' he adds.

When the music work ended the complex extended its ADR studios. 'As we were now mixing in three mixing studios, two ADR studios would provide sufficient recorded material to occupy one mixing studio. We now have four mixing studios and six ADR studios with a seventh being built,' says Biondo.

What strikes the visitor most about the International Recording complex is how un-Italian the whole place feels. Once you're past the lobby and into the working areas you could be in Hollywood or London. The mixing rooms are splendidly impressive in the same brooding high tech way that state of the art the-

atres are in any of the major studio concentrations in the world. International Recording truly does live up to the 'international' in its name, stance and appeal. But this is clearly Biondo's intention and does justice to what is after all one of the great established film making cultures.

Take a lift up a few floors and you emerge in an area that bustles with the activity of the ADR feeder rooms. The sheer number of suites and the intensity of the work in progress surprised me and was more akin to a commercials atmosphere than my previous experiences of Italian film post. Engineers aren't just waiting there to greet you, they have to finish a voice-over line before they can tear themselves away for a few words of welcome. There's a factory feel with

the concentration on consistent quality throughput that typifies a busy and in-demand service. Biondo is torn between his duties as guide and quickly becomes embroiled with clients and engineers keen to ask for his opinion and advice. I break for a cigarette, then another. He returns apologetic but there is 'always business to attend to' and explains specifics of the project in question. I order a taxi feeling that I have distracted him for long enough and suspect that he still wants to return to contribute to the 'business' in question and that his phone call message list will eat in to his evening.

It is rare to witness such selfless and involved dedication and to see it instilled in to the hearts of others. International Recording has the attitude that legends are made of. ■

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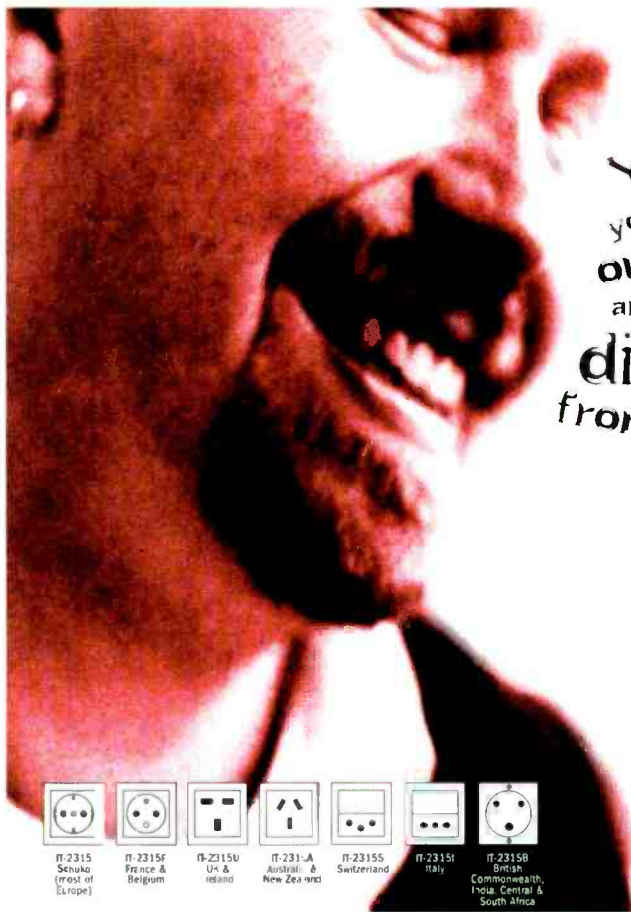
Early Bird Delegate rate (until 31 March 2000): **UK £560 +VAT**  
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For more information on DVD Europe 2000:

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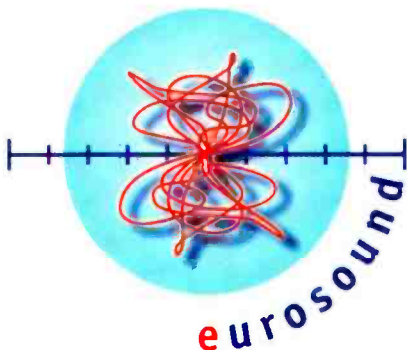
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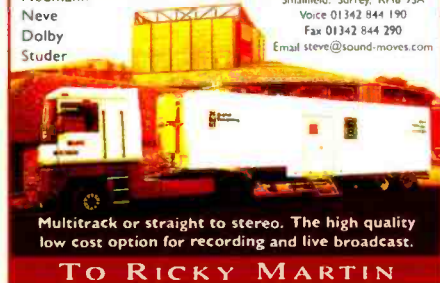
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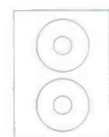
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## US: The post-modern world

The world of media is being changed by electronic advance; there's nothing like Tinseltown in the electronic reign writes **Dan Daley**

**T**HERE IS A NATURAL HUMAN tendency to view certain institutions as eternal, once they've been around long enough. The Vatican. Freemasonry. The Torah. Ronald Reagan. They give the impression that, having been here long before us, they will continue to exist long after we're gone. That, of course, is not the case. Just ask any Roman.

However, there is one institution in the States that seems to have achieved that status: Hollywood. While it dates back only to the third decade of the 20th Century, its power to create myths—including its own—has conferred upon it a seemingly never-ending story quality. In a country only 224 years old—a mere eye blink in European terms—the 75 years that Hollywood has been the film capital of America seems like an aeon.

As an entertainment capital, Hollywood has achieved something no other US city has: it has maintained itself as the business, creative and technical locus of a media industry. Music recording has certainly been a vagabond over the same period, wandering between New York, Los Angeles, Nashville, Miami and points in

between. Globally speaking, Bombay may have a larger film business in terms of sheer numbers, but then again, India has 1.3bn people who want to be entertained. In terms of the perceptual, however, as well as the financial, Hollywood conceals the Holy Grail of show business.

What further lends a sense of eternity to Hollywood's hegemony is that it has built up a technical support infrastructure that are the Roman legions of its day. Film-makers range the world shooting pictures, but they return like pilgrims to Hollywood to put the pieces together and use the city as an altar from which to present their offerings to the consumer gods.

But over the course of the next 10, or so, years, Hollywood is going to have to come to grips with the inevitability that nothing does indeed last forever, and that includes Tinseltown. The harbingers are already manifest and manifold, both technological and economic. Desktop video is already a reality; there are several dot-coms that are webcasting original entertainment programming via the Internet. It's quite herky-jerky-looking stuff, but then, *The Great Train Robbery* looks rather primitive com-

pared to *Terminator*, too. Once the bandwidth becomes available and the quality attainable, then the traditional Hollywood way of making movies will face a threat the likes of which it has never seen, greater even than when that upstart, television, turned the film industry on its ear back in the fifties. Let history be the guide here: what happened to the record-making business in the last 15 years—in which digital technology made the process affordable and pervasive, and the Internet made it widely available and beyond the grip of a handful of major distributors—is poised to happen all over again with visual media. Who needs Hollywood and all of its mighty resources when all you'll really need is a 40Gb hard drive, some software and some hard ambition?

Hollywood's technical infrastructure will certainly feel the effect of that paradigm shift. But it's already reeling a bit from other, non-solder-based punches of the socio-economic sort. On a front closer to home, our neighbour to the north has been rather successfully siphoning off a lot of post-production work, thanks in large part to a recent currency crisis that over the last two years saw Canada's dollar decline from its historical ratio of around 80% of the US dollar to as low as 60c. Things have turned around for Canadian Loonie lately, but not before post houses in Vancouver and Toronto have managed to make their special effects felt in Hollywood. Canada had a similar opportunity to gain post

## Europe: Missing links

The way forward for decentralised broadcasting takes more definite shape with new standards and new technology writes **Barry Fox**

**T**HERE WAS MORE ON ISDN in Europe, recently prompted by the news that yet another large British company has built a small studio so that its executives can make live radio broadcasts without travelling to a radio station. But the quality of speech which the BBC was getting down the line was no better than an ordinary telephone.

The BBC production staff blamed the microphone but I'll wager the real culprit is the company's IT manager, who is not as clever as he thinks he is, and has installed an ordinary 3.4kHz bandwidth phone with a built-in A-D convertor. He might just as well have used an ordinary phone line, because virtually all major phone networks in Western Europe now use digital exchange links and are free from the snap, crackle and pop that afflicts analogue lines.

To exploit the capability of ISDN, companies must install a codec which takes the sound from a high-quality studio microphone, converts it into compressed digital code for transmission down a 64kilobit/s leg. At the same time, good-quality sound comes back up the line for a headphone feed. These codecs cost at least £2,000 a time and the UK remains cursed with a split standard; the BBC and most broad-

casters use the ITU's G.722 while independent stations use the proprietary aptX system. There are supposedly automatic dual standard units but these can still fail if the user fails to switch manually between 15kHz and 7kHz modes.

There is now a ray of hope. In September 1999 the ITU added a new 'recommendation' to the codec standard, known as G.722.1. This uses new compression technology, called Siren, which was developed by PictureTel for videoconferencing. Sampling is at 16kHz and the ITU has been satisfied that coding at 32kbps gives the same quality as 64kbps, with 24kbps a workable option. Processing delay is less than 60ms, so conversation between two remotes does not sound stilted.

All that is required now is a low-cost codec built to 722.1 standard and we might finally see an end to the current VHS-Beta situation that leaves news studios inside the BBC unable to set up direct links with aptX remotes; they have to patch through the main control room.

There is a further incentive in that the British telecoms watchdog OFTEL has made its decision on how the country will move into ADSL. As the UK led Europe into the liberalisation of the phone service,

OFTEL is confident all problems can be solved in time for full-scale free competition in ADSL by mid-2001. Spurred by this unwelcome competition, BT will start offering its own DSL services for around 6 million homes in the UK a year earlier. There is already a bewildering range of tariffs, ranging from pay-as-you-go to unlimited access with always-on connection at £35 a month

OFTEL's move could signpost the future of ADSL in Europe.

As a result of its earlier monopoly, British Telecom owns the copper wires that run into most UK homes and will be forced to let rival service operators install ADSL equipment in the BT exchange. The rival operators will then supply matching ADSL modems for subscribers' homes. So BT's



ground about decade earlier, but that was scuttled when the government unwisely raised the Goods & Services Tax on those services. In the dot-com-based entertainment frenzy of the moment, it's doubtful that they will make the same mistake again.

Could this be the end of Hollywood? It doesn't have to be. Americans are good at reinventing themselves, and Hollywood, land of illusion and suspension of disbelief, is the perfect place for that. Audio post facilities have the same opportunities as music studios to position themselves to plug into the new media and provide services for it. We've already seen several post facilities enter the DVD authoring realm in pursuit of just that. Hollywood has the muscle to take the bull by the horns, as it did with television, and make the new media serve its own purposes.

But if anything will hold Hollywood back, it's the pervasive corporateness that has infused the entertainment industry in the last few years. The notion of safe, committee-based decision-making that characterises the corporate mentality is antithetical to what makes Hollywood what it is. In short, can Hollywood get out of its own way as it faces the desktop future?

Nothing lasts forever, and Hollywood is about to learn that lesson in a big way. What hopefully won't change are the lyrics to a certain song. Because it just does not sound right to the ear, 'Hoo-ray for ... Cleveland'?

lines will be carrying a wide range of ADSL services from different operators. Obviously this raises technical compatibility issues, and BT is also unhappy about the security risks.

Most telephone exchanges are now large buildings which are largely empty. All the old Strowger electro-mechanical switches have gone, replaced by relatively few digital TXD racks the size of large refrigerators. This has left acres of spare floor space and there are usually empty living quarters above the exchange. Phone companies like BT dare not rent out these living quarters for fear of giving terrorists close access to vital communication nerve centres.

OFTEL is confident all problems can be solved in time for full-scale free competition in ADSL by mid-2001. Spurred by this unwelcome competition, BT will start offering its own DSL services for around 6 million homes in the UK a year earlier. There is already a bewildering range of tariffs, ranging from pay-as-you-go to unlimited access with always-on connection at £35 a month.

Data rates for ADSL far exceed those available from ISDN, even for the upstream links out of the home or office. So there is no need for the heavy compression used on G.722 or aptX codecs. But the DSL modems work by splitting the signal between many narrow carriers, and this adds its own processing delays.

Who will be first with a DSL codec that rivals G722 and aptX? And what will the processing delays be?

## Taxing the couch-potato

The arrival of digital diversity may challenge viewers' right to a lack of choice writes **Kevin Hilton**

**T**HAT HILARIOUSLY INEPT, fundamentally boring turkey, *Plan 9 From Outer Space*, begins with the hilariously inept words: 'We are all interested in the future because that is where we will spend the rest of our lives.' Now that the M-thing has come and gone, it is reasonable to assume that we are entering a new age, but the truth is that, like tomorrow, the future never comes.

Perhaps it is more correct to say that the spirit of the future is with us; what we are going to do with this spirit, and how, is another matter. This is something that broadcasters now have to face. Digital technology is being implemented at an increasing rate; it will change television and radio, but there can be no forgetting that we are not quite in the future yet.

Ted Taylor, director of technology at news organisation ITN, endorses this point: 'There are many possibilities, but I don't think we should get too carried away with what the technology can do and, in the process, forget the traditional couch-potato. Maybe a lot of people don't want the choice, they want somebody to make the choices for them.'

Choice has been cited as one of the big advantages of digital broadcasting; it goes beyond more channels and into other media. Lawrence Kaplan, president and CEO of high-tech server company Omneon Video

Networks, describes the situation as an explosion: over the air, on web-sites and through cable channels and other outlets. 'Content providers have to create different versions of programme streams for different distribution techniques,' he says. 'It is very much a multichannel environment.'

It is unusual to find a broadcaster that does not have a web-site; it is even more unusual to find one that goes beyond the basic channel guide and plugs for programmes approach. News is arguably the most obvious material to be presented on a web-page; text stories and photographs are seen on sites offered by broadcasters, search engines and Internet service providers. The challenge will be in taking this further: companies can no longer get away with putting up a site and updating when they can or feel like it, something tangible has to be had.

ITN's Ted Taylor sees the changes being implemented piecemeal, much in the same way as the shift to widescreen TV presentation. He adds that interactivity and connection to the Internet will mean different things to different organisations. 'There is easy interactivity, where you just add a web address; beyond that there will be every shade imaginable. Cable companies have probably got the edge

because of the back channel.'

Having powerful technology, particularly in the creation process, will increase the possibilities. Broadcasters began bringing TV and radio news operations together in the predigital days and this cross-media working looks set to expand. It is aided by the breaking down of the barrier between production and distribution. Lawrence Kaplan at Omneon observes, 'We particularly need to give the ability for large numbers of people to collaborate on the same material at the same time. When people talk about multi-channel, that traditionally means stand-alone equipment playing out N number of channels. We can do that, but we are looking at the essence of a new type of infrastructure for the new millennium, that is to be able to play out one channel or thousands from the same framework.'

Digital has already changed the way programme material is created, so it is unlikely that the process will undergo any more drastic changes. The key point now is re-versioning. Digital channels rely on repeats, although they are dressed up as 'another chance to see' and 'classic episodes'. Five years ago, programme makers began 'future-proofing', shooting in widescreen and mixing in surround sound, the idea being that an old show would have something new to offer.

Such processes have to develop, not only for the new media but also to keep broadcasting interesting. Bob Pank, technical communications manager at Quantel, sums matters up neatly: 'Once the content has been created, it is a question of converting it and making it suitable for the specific form of distribution. Television and the Internet work quite differently, but one will not dominate the other.'

Digital is given the credit for the changes, but some observers say the real are yet to happen. John I've at Sony Broadcast comments: 'Over the next five years, digital should be delivering on the original promises made for it,' while Mike Parker of DAR says that we are only now seeing totally digital audio systems.

True digital streams will allow traditional programme material, live shows, e-commerce, DSL and, streaming video to be created and controlled. Lawrence Kaplan agrees that new types of companies that create and distribute Internet video do not acknowledge any separation between production and distribution.

Potential is growing, but it is up to programme makers and viewers alike to take advantage of what will be offered. If they do, the couch potato could become an endangered species.

Choice has been cited as one of the big advantages of digital broadcasting



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# Mechanical Masterclass

Shifting the emphasis from the electronic to the mechanical domain, **Raymond Budd** and **Martin Berner** examine the mechanical adjustment of Studer A800 and A820/A827 machines

**I**N PREVIOUS ISSUES we have looked at developments and modifications in the electronic domain. However they can all be deemed irrelevant and useless if your recorder is not set up correctly in the mechanical domain. A poor mechanical setup can result in anything from tape slippage to permanent tape damage.

A good mechanical setup is mainly derived from the following points: good quality rollers and pinch roller, correct roller height adjustment, correct tape tensions and a good braking system.

Taking the tape tension setup first, we alight on one of the single most important adjustments that you can make on any tape machine. Nearly all tape damage is caused by incorrect tension adjustments. It's amazing how few engineers regularly check their tensions—a simple procedure that should be undertaken on a daily basis. The procedure begins with placing a calibrated tenelometer (for calibration information please refer to the Studer service manual), in positions marked X and Y in Fig.1. Measurements should be performed approximately in the middle of the tape—that is both pancakes should be approximately the same diameter. Tensions should be as follows for 2-inch Studer A820 and A827 machines. (See Table 1).

A820 and A827 owners can adjust their tape tensions internally within the operating software: ALIGNMENT /DECK/ T.TENS PLAY or ALIGNMENT/DECK/ TENS WIND 2-inch. The value will be

represented by a hex code, use either the jog shuttle or the arrow up-down keys to increase or decrease the given tension. Remembering to press store to write the new information to the master MPU. A800 owners can trim their tape tensions  $\pm 30g$  using the potentiometer on the command receiver. (Refer to section 3.5 in the user manual for more details.)

Before aligning tape tensions it is

always advisable to check the brake tensions and assess the quality of both the brake drum and the brake band. The braking action can be checked quickly by moving the reel adaptor backwards and forwards with a jerky motion; an audible click should be heard. If no braking action is felt (no audible click) then you should check the brake tension list below.

The brake band and brake drum should be disassembled and cleaned with a clean piece of cloth soaked in methylated spirit. The spirit should be absolutely free from oil and grease. To clean the brake band, it should be pressed firmly against a flat backing. The surfaces should be shiny after cleaning and be free of residual contaminants.

The edge of the brake drum should not be smooth, as it is the friction of the band onto the drum that enables the braking action to work. Mount an empty reel with approximately 2m-3m of tape onto the reel adaptor in the rewind direction. Hook a spring balance (0-500g) into the leading tape end and pull gradually for measuring (Wear Braking). Repeat this process for opposite direction (Play), and again for the take-up reel. Values should be as Table 2.

If it is necessary to adjust your brake tensions, a spanner should be used to increase or decrease the pull on the brake tension springs. If these figures still cannot be achieved, then these springs should be replaced (contact Studer representative for more details).

The compensating lever—or Gizmo as it is more widely known—is probably the single most important development in Studer's association with the 2-inch format. Initially developed in the mid eighties when high-level tapes were becoming more popular. Studio engineers found that they needed to >

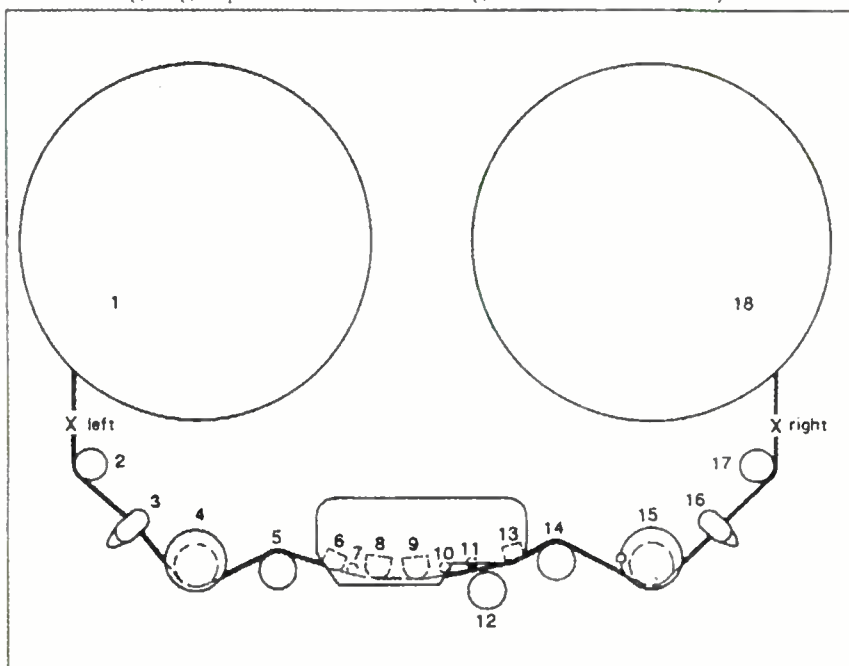
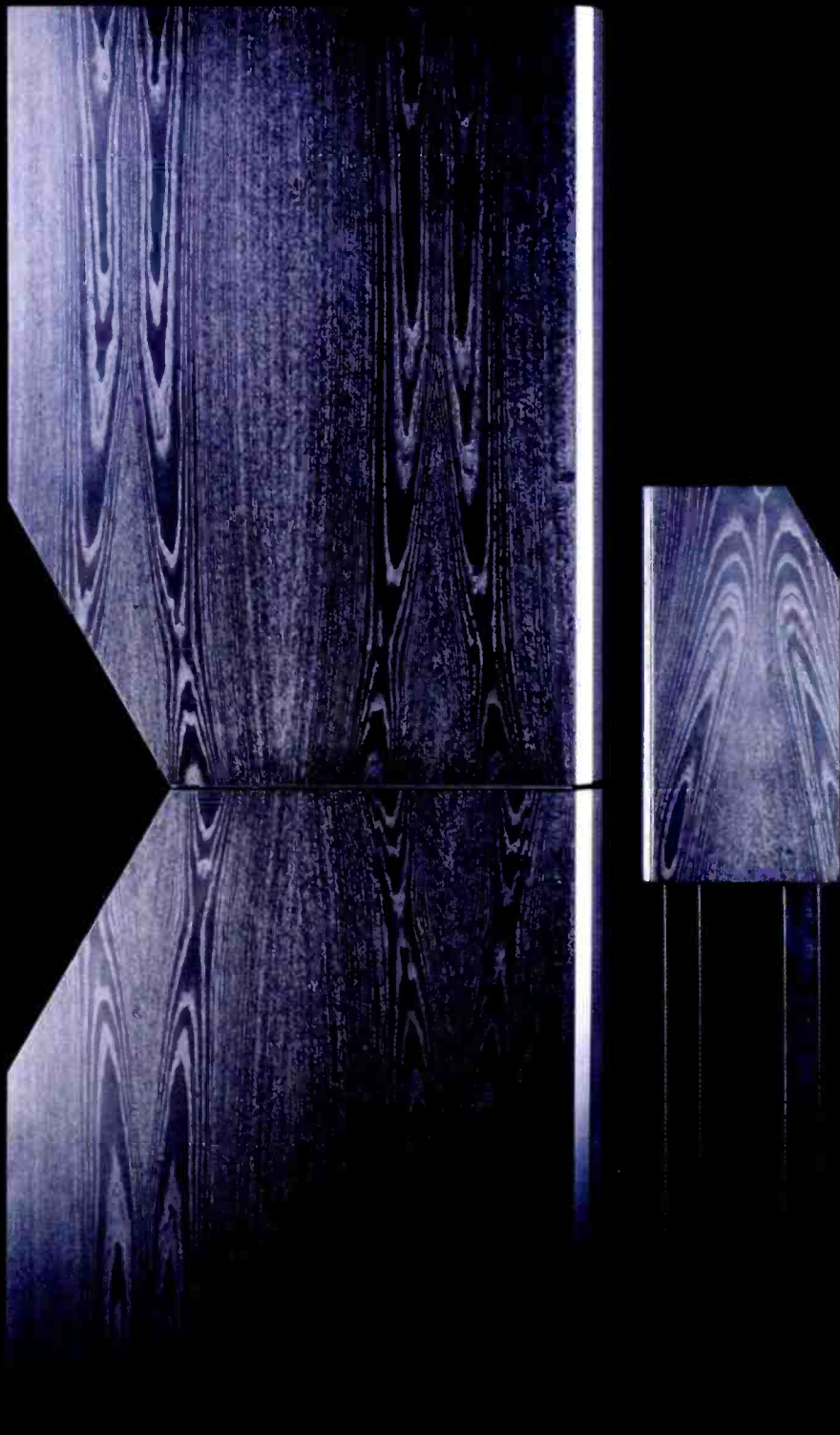


Fig. 1: Positions X and Y for checking Tape Tension





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The compensating lever—or Gizmo as it is more widely known—is probably the single most important development in Studer's association with the 2-inch format. To ensure an extended life span, the Gizmo is gold plated. To tell if your Gizmo is wearing thin, look closely to see if any of the gold plating has worn down, exposing the metal surface underneath. If your Gizmo is worn you should see a vertical line of silver all the way to the bottom

◀ re-shim their machines each time a producer wanted to change tape type as the tape path would change.

Developed and patented by Studer, the compensating lever is found as standard on the A820 and the A827, and is available as a retrofit to the A80 and A800. The Gizmo is the last tape guide that is part of the head assembly. It sits on a pivot on both the X axis and Y axis and compensates for mechanical differences in tapes, also offering tape path stability never seen before on a 2-inch machine.

To ensure an extended life span, the Gizmo is gold plated. To tell if your Gizmo is wearing thin, look closely to see if any of the gold plating has worn down, exposing the metal surface underneath. If your Gizmo is worn you should see a vertical line of silver all the way to the bottom. A820 and A827 owners will also be aware of another gold plated tape guide known as the tape lifter pin (1.820.129.00). It is vital that

both the lifter pin and gizmo are in good condition, these parts are the most influential guides in the tape path. If any of the gold plating appears to be worn down, it is strongly advised that you replace the appropriate parts immediately. Machines with worn lifter pins and

gizmos are likely to experience tape riding and in extreme circumstances permanently damaged tape.

Next month we shall look at Studer heads, the differences between 316, 317 and 318 versions, maintenance and lapping. ■

Table 2		
A820/A827		
	Supply (Position X)	Take Up (Position Y)
Play	380g	450g
Wind	450g	
Stop Edit	350g	
Reverse Play	450g	
2-inch A800		
	Supply (Position X)	Take Up (Position Y)
Play (Inline erase head)	320g	400g
Play (Narrow headblock)	320g	400g

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Table 1	
A800	
Supply (Rewind)	1.5Kg
Supply (Play)	150g
Take Up (Rew)	1.5Kg
Take Up (Play)	150g
A820/A827	
Supply (Rew)	1.5Kg
Supply (Play)	500g
Take Up (Rew)	1.5Kg
Take Up (Play)	500g

# Headphones

Headphones are an essential tool in audio, but are not widely understood and are often misused. **John Watkinson** reckons it is time to start doing things properly

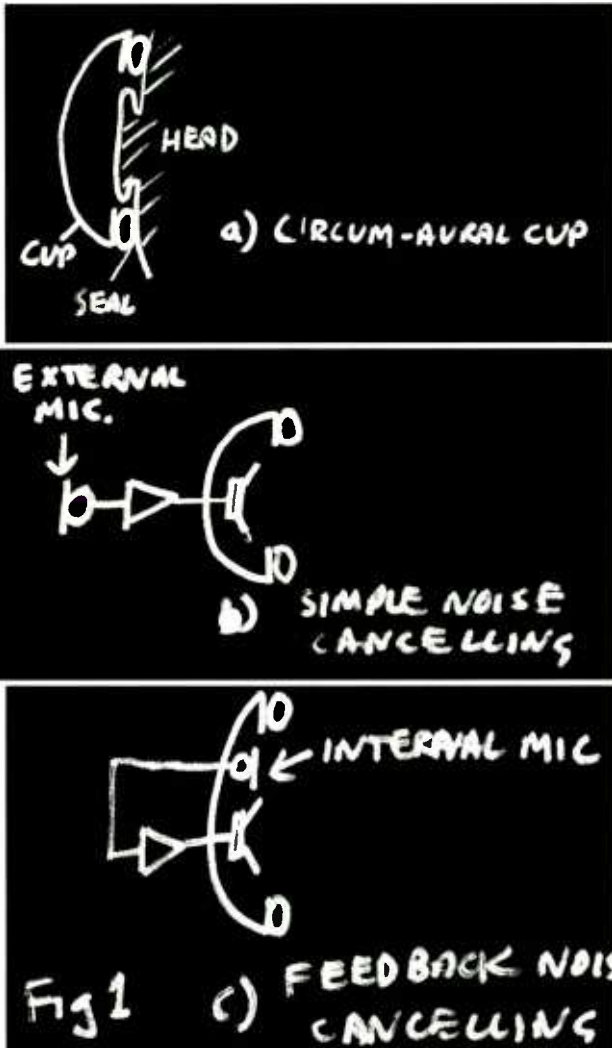


Fig. 1: Circum-aural headphones and noise-cancelling systems

**T**HERE ARE NUMEROUS applications for headphones and each requires a slightly different approach. In an area of noise hazard, such as the deck of an aircraft carrier, the headphones must protect the user's ears from external noise at the same time as allowing effective speech communication. The requirement is for intelligibility rather than fidelity. In professional use headphones are the only way of monitoring a signal in the presence of other sounds. In both cases the goal is to keep external sound out.

An example of the opposite case is the problem of communicating with a TV cameraman in the presence of an open microphone. In this case the headphones must prevent their own internally produced sound from escaping. An audio enthusiast might want to use a headphone of this type to listen at night without disturbing others.

the wearer's head.

Circum-aural headphones are very effective but they are heavy and perspiration under the seals makes them uncomfortable after long periods. It would be beneficial to make the cups from a thermal conductor such as aluminium in order to prevent the seals becoming uncomfortably hot.

A further problem is that the effective seal of the cup around the ear raises the acoustic impedance and this means that sounds caused by muscle action and blood flow, which are normally inaudible, become obvious and some people find this irritating. This is known as the occlusion effect and is the same phenomenon that produces sound when a sea-shell is held to the ear.

As with loudspeakers, further advances in headphones can only be obtained using active technology. Noise-cancelling is the generic term for such

Keeping sound in or out requires a design that entirely surrounds the pinna with a rigid cup and a flexible seal to the side of the head as Fig. 1a shows. This is known as a circum-aural headphone. The seal is usually obtained using a partially filled vinyl bag containing silicone oil that will accommodate the irregularities of the wearer's head. Such a cup is mass controlled at high frequencies and attenuates very well. However, the attenuation of mass control falls at 6dB/octave. Essentially low frequencies can move the entire cup to and fro. This is possible because the seal is slightly compliant, but even if it were rigid the wearer's flesh is also compliant.

It is impossible to stop the cup vibration in sympathy with external sound at low frequency and the only way to increase attenuation is to make the cup heavy. The weight of the cups is taken by a soft band which rests across the top of

headphones. The audio input is simply added to the cancellation drive to the diaphragm. Of course, if there is no audio input, the result is an active ear-defender. Simple noise-cancelling headphones shown in Fig. 1b contain an external microphone and the signal from this is fed anti-phase to the headphone diaphragms. Systems of this type give limited cancellation because they are working open loop. However, it is easy to make the system stable and it is possible to reduce the weight of the headphones because the noise cancelling eliminates the need for heavy cups.

A higher attenuation performance can be obtained by having the microphone inside the cup and driving the diaphragm from it in such a way that any pressure sensed by the microphone is cancelled. This is shown in Fig. 1c. As this is a feedback technique the attenuation will be higher. It is also possible to minimise the occlusion effect with such an approach. Effectively the characteristics of the feedback system control the acoustic impedance inside the cup and makes the internal volume appear very large.

There are some difficulties with the approach. Firstly the signal processing needed must have a very low noise floor or it will be audible. Secondly it is difficult to stabilise the feedback loop. The problem is that when the headphones are taken off the coupling between the diaphragm and the microphone falls so much that the feedback loop is effectively broken. The system may go unstable and blast the wearer unless the condition is sensed and the loop is disabled. Thus in practice some kind of adaptive processing is needed.

In some cases effective sealing is not essential or even undesirable. Wearing circum-aural headphones around town while listening to a Walkman is positively dangerous as warning sounds and clues are shut out or masked by the audio. Many consumers find the occlusion effect oppressive and reject circum-aural headphones. In these cases, the supra-aural headphone is an alternative. Fig. 2 shows that with this construction the body of the headphone sits lightly upon the pinna with a layer of acoustically open foam between. This much lighter construction is more comfortable to wear and allows external sounds to be heard and eliminates the occlusion effect.

The down side is that it will also allow the sound produced by the headphones to leak out, to the possible irri-



ration of others. A further problem is that the imperfect seal of the supra-aural headphone makes reproduction of the lowest frequencies difficult. LF level is also dependent on how the headphones are worn as the degree of compression of the foam will affect the frequency response.

It is possible to make noise-cancelling supra-aural headphones using an external microphone and these are moderately effective at low frequencies, but phase errors mean that the noise-cancelling has to be disabled at high frequencies and there is then nothing to prevent high frequency noise entering the ear.

Headphone drive mechanisms are much the same as in loudspeakers and both moving coil and electrostatic designs are available. Electrostatic headphones work very well because of their minimal phase distortion and are quite light, but the cables needed for safe high voltage insulation tend to be bulky and a separate power unit is required. Consequently the majority of headphones rely on the moving-coil principle. As weight is an issue headphones adopted rare-earth magnets as soon as they were economic.

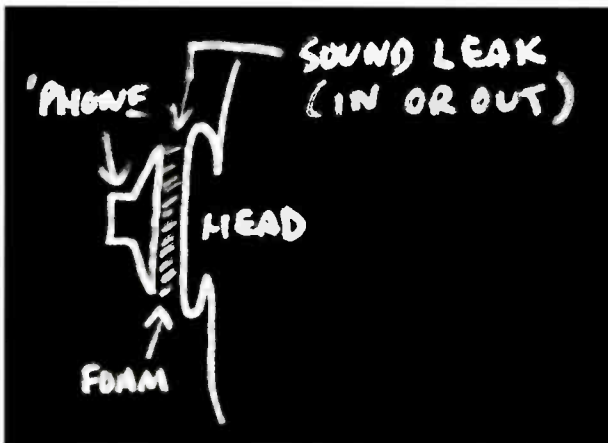


Fig.2: Supra-Aural headphone

While the mechanics of a headphone may be superficially similar to those of a loudspeaker, the acoustics are quite different. In the case of the loudspeaker the listener is in the far field, whereas with the headphone the listener is in the near field. The presence of the listener's head and pinnae are essential to the functioning of the headphone which sounds tinny and feeble if it is taken off. Headphone designers have to use dummy heads which simulate the acoustic conditions when the headphones are being worn in order to make meaningful tests.

In particular with a circum-aural headphone the transducer diaphragm is working into a small sealed pressure chamber in which there will be no standing waves below frequencies as high as several kHz. Under these conditions the pressure is proportional to diaphragm displacement and independent of

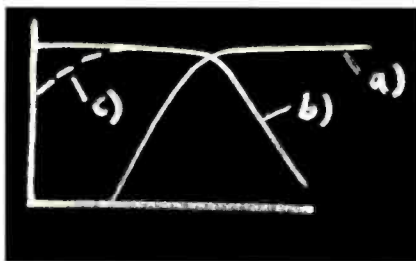


Fig.3: Frequency response of headphone

frequency whereas in a loudspeaker the pressure is proportional to the diaphragm acceleration. Consequently the frequency response of a headphone is tilted by 12dB/octave with respect to that of a loudspeaker. Fig.3a shows the mechanical response of a resonant diaphragm reaching a peak. When installed in a headphone the response is flat below resonance but falls at 12dB/octave above as shown in Fig.3b. Fortunately headphones do not need to be very efficient as they are radiating into such a small volume and heavy damping can be used to flatten the response.

The presence of air leaks in a circum-aural headphone or the deliberate introduction of leaks in supra-aural headphones results in a low-frequency roll-off as shown in Fig.3c. In traditional headphones, this is often compensated by the introduction of passive membranes which resonate to boost output. While this extends the frequency response it does nothing for the time response to transients. As with loudspeakers the optimum solution is to suppress the resonance electronically in an active system.

Headphones give the most realistic results when connected to a dummy head microphone. Such a microphone replicates the characteristics of the acoustic path from a forward sound path to the ears by measuring the sound waveform in an artificial ear canal. When this waveform is replicated in the ear canal by headphones, the realism is exceptional. However, signals from a dummy-head microphone sound dreadful when monitored on speakers and such signals are therefore uncommon.

In practice, most headphone listening is done using audio signals intended for reproduction on loudspeakers. As these signals are fundamentally incompatible with the requirements of binaural hearing it is hardly surprising that the results are abysmal. What is surprising is that this abysmal status quo has lasted so long when the technology to remedy the situation is available. In the next article the problems and the solutions will be detailed. ■

# Advertisers Index

380 Systems .....	89
AKM .....	99
Alice Soundtech .....	83
Ambient Recording .....	84
Amek .....	23
AMS Neve .....	IFC
Aphex .....	49
Audio Ltd .....	77
Audio Service .....	88
Audio Technica .....	100
Audionics .....	104
Behringer .....	51
Beyerdynamic .....	BI 83
BSS Audio .....	61
Cedar .....	OBC
Cranesong .....	102
D&R .....	68
Dialog4 .....	57
Digidesign .....	39
Digital Audio Denmark .....	82
Dolby .....	105
Doremi .....	76
DPA Mics .....	109
Drawer .....	29
Earthworks .....	84
Emtec .....	103
Emu Ensoniq .....	33
Expotus .....	37
Fairlight .....	59
FAR .....	84
Focusrite .....	27&108
Furman Sound .....	112
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Grace Design .....	88
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HW Int. ....	BI,99
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Joe Meek .....	110
Kompass CD Multimedia .....	72
Lawo .....	92
Lectrosonics .....	55
Location Sound .....	126
Lydkraft .....	123
Mackie Designs .....	IBC
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Medlaform .....	96
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Spirit .....	43
SPL .....	45
SSL .....	5
Stagetech .....	62/63,64/65
Steinberg .....	79
Stirling/Pure Distribution .....	30
Studer .....	95
Studio Spares .....	BI 83
Summit .....	73
Tascam .....	70
tc electronics .....	13
TL Audio .....	10

# The Programmable Challenge

Bringing the integration of budget digital mixing systems to the high-end is a challenge we must force on manufacturers, argues independent producer-engineer **Mike Butcher**

**F**OR SOME TIME NOW, more and more of us have been making the switch to consoles with a total reset function. However, on the high-end pro models (generally consoles without built-in reverbs and effects) we still have to perform the tedious job of noting down all the outboard gear settings. We have all experienced the downside of this. Producer: 'The 480 doesn't sound the same as in the last mix!' Engineer (giving dark look to assistant): 'Oh yeah it does, at least that's what I remember, although maybe...'

But seriously, I find it more and more difficult to explain to young bands why in this supposedly state of the art, not so cheap studio, that it ain't that easy to reset all the effects that you set up through boredom while the guitarist tried to get his solo right, but that the band got really excited about when they heard the rough mix, when they had done the demos on a 02R any old hard-disk recorder with plug-ins and could recreate their magic moments of 'using the technology' anytime they wanted.

To cut a long story short, what I am proposing is that we all get together and put pressure on the pro-audio manufacturers to come up with a new standard interface to control both digital and analogue outboard equipment using a PC-MAC front end. Some people will say we have that already... plug-ins. I'm afraid I don't subscribe to this way of thinking. For instance some people don't hear the difference

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between a certain manufacturer's analogue EQ-dynamics and their supposedly equivalent TDM plug-in (good though it might be). I think this article is not for them. 'What high-end manufacturer is going to put his best algorithms in a plug-in where the code can be cracked, instead of in dedicated hardware where it is much more difficult to do so?' (This is a rephrasing of a quote from te electronics).

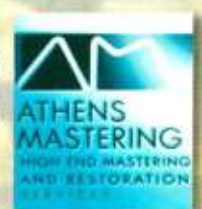
I would like to see future equipment, both digital and analogue under direct control of a computer. We can all quickly see the advantages: instant reset, chasing to time code, the possibility of putting the equipment in the machine room, (a big advantage in studio complexes with floating gear), personal presets and transfers of parameters to other studios. I think we can forget MIDI, it is old seventies technology and now we have USB and Firewire. A standard protocol just has to be decided. All studios have computers lying about, the processing would still take place in the individual device.

There are other advantages too. When you buy a piece of equipment you also pay for the box it comes in—and the knobs. Why not also have a new universal rack where the manufacturers imply supply the device on a standard card. Do they really want to make one card for the Yamaha 02R and a different card for the Mackie D8B, and so on. They might not be too happy about this. After all they do charge for the design too, but they can design a nice front-end for the software, and in my opinion this has to happen if we are going to keep the pro side of the business intact and not follow the road of using equipment that isn't really pro audio. Various digital devices could also share the same D-A convertors, there could be a new universal controller built into the desk to control all this new gear, and life could be so simply if... ■

## High End Mastering AT AFFORDABLE PRICES



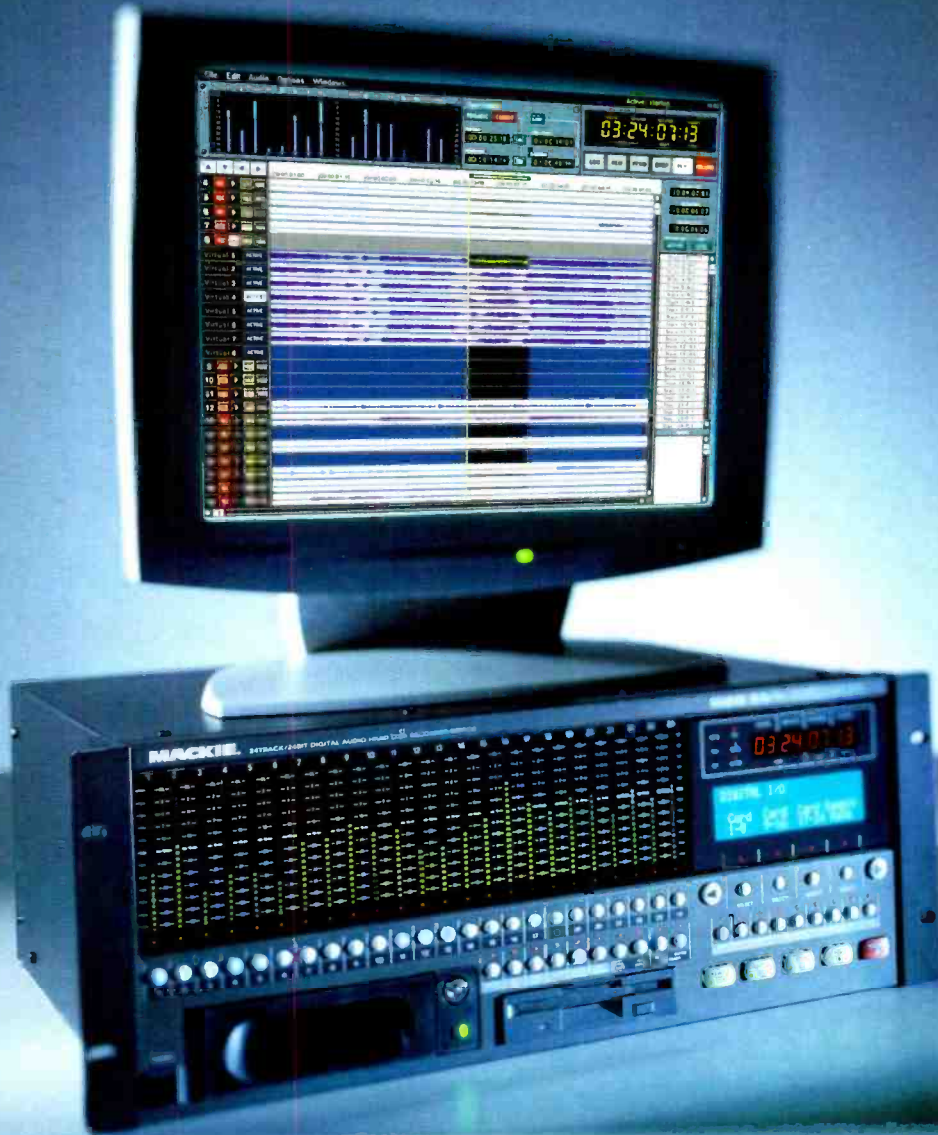
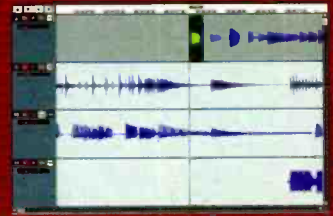
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