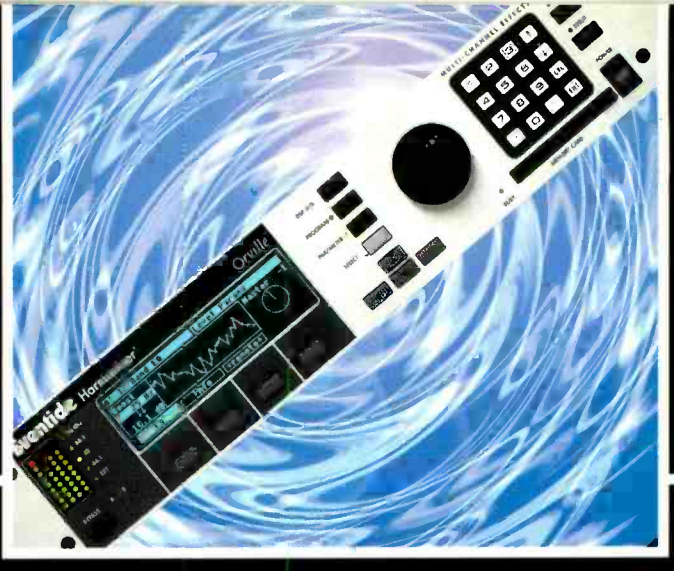
CELEBRATING FORTY YEARS

November 1999 $10.00 £4.00

Studio sound

THE INTERNATIONAL PROFESSIONAL AUDIO MAGAZINE
FOR RECORDING, POSTPRODUCTION AND BROADCAST



EXCLUSIVES

Eventide Orville
Digidesign Pro Tools v5.0
Crane Song Flamingo
Digidesign Digi 001
Steinberg Nuendo
Avalon Vt747sp
Sony DRE-S777
RTW 1024 Plus

WALKING WITH DINOSAURS

Living large in prehistory

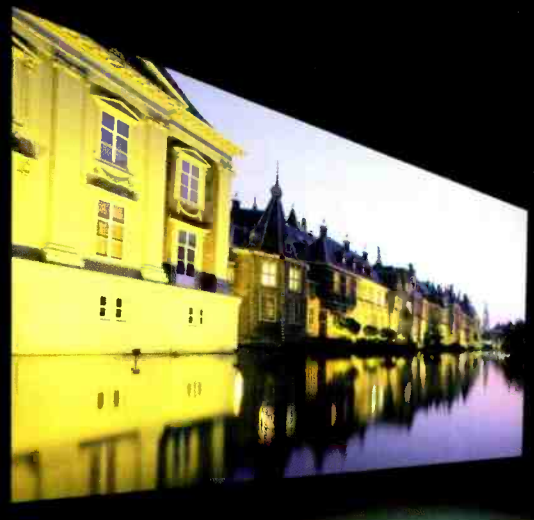
The MICK GLOSSOP Interview

BEARSVILLE STUDIOS & ATHENS MASTERING
WIN DRAWMER DS210 AND KT DN-360
COMPUTERS AND AUDIO
SSAIRAs NOMINATIONS

9 770144 594024 11

Libra Post multi-format digital post production console

LIBRA POST harnesses the power and functionality of AMS Neve's flagship DIGITAL FILM CONSOLE (DFC) for the wider world of video post production.



KEY FEATURES INCLUDE:

- 12-48 faders, up to 192 inputs
- Surround sound mixing to any format
- Multiple stem outputs up to 8 channels wide
- Dedicated 8-channel surround monitor panel with matrix/ processing inserts
- Encore™ Total Dynamic Automation – shared with DFC
- Automated joystick panning
- 96kHz-ready processing platform
- Optional multi-machine control
- Optional 24-bit hard disk recording/editing

Digital First

AMS NEVE

HEAD OFFICE – AMS Neve plc · Billington Road · Burnley · Lancs BB11 5UB · England · Tel: +44 (0) 1282 45701 Fax: +44 (0) 1282 417282 · *LONDON* – Tel: 0171 916 2828 · Fax: 0171 916 2827
GERMANY – Tel: 61 31 9 42 520 · Fax: 61 31 9 42 5210 · *NEW YORK* – Tel: (212) 965 1400 · Fax: (212) 965 3739
HOLLYWOOD – Tel: (818) 753 8789 · Fax: (818) 623 4839 · *TORONTO* – Tel: (416) 365 3363 · Fax: (416) 365 1044
e-mail: enquiry@ams-neve.com – http://www.ams-neve.com

10 **Editorial**
On the Millennium and angels

12 **Soundings**
Professional audio, post and broadcast news

14 **World Events**
Updating the audio professional's events calendar

40 **SSAIRAwards**
First call for nominations

56 **Competition**
Win Drawmer DS210 gate and Klark Teknik DN-360 graphic EQ

REVIEWS

16 **Eventide Orville**
Exclusive: The latest in multiple effects processing

18 **Sony DRE-S777**
Exclusive: Putting real-world reverberation in a box

22 **Crane Song Flamingo**
Exclusive: Microphone preamp running clean or dirty

24 **Digidesign Pro Tools v5.0 & Digi 001**
Preview: Latest version of Pro Tools and hard-disk recorder

26 **Royer Speiden SF-12**
Versatile American stereo ribbon microphone

28 **RTW 1024 Plus**
Exclusive: A small versatile portable audio signal monitor

30 **Neumann Series 180**
The KM84 capsule meets 100 Series electronics

32 **Steinberg Nuendo**
Preview: First look at a new flagship workstation

34 **Avalon Vt747sp**
Exclusive: High-end American stereo compressor and EQ

36 **Maycom Easycorder**
Solid-state audio recorder update

38 **Alesis M1 Active**
The definitive loudspeaker review

FEATURES

42 **Interview: Mick Glossop**
Thinking and feeling in the studio

50 **Postproduction: Walking the Dinosaur**
Living large in prehistory

62 **Roundup: CD-R**
Recordable media and machines

68 **Celebrating 40 Years: Computers in Audio**
The evolution of hi-tech sound

76 **Broadcast: The Ryder Cup**
On the fairways and airwaves

82 **Facility: Athens Mastering**
The Greek mastering model

89 **Facility: Bearsville**
The legend of the New York Bear

COMMENT

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

107 **Broadcast**
Feet to the floor and ears to the ground at IBC

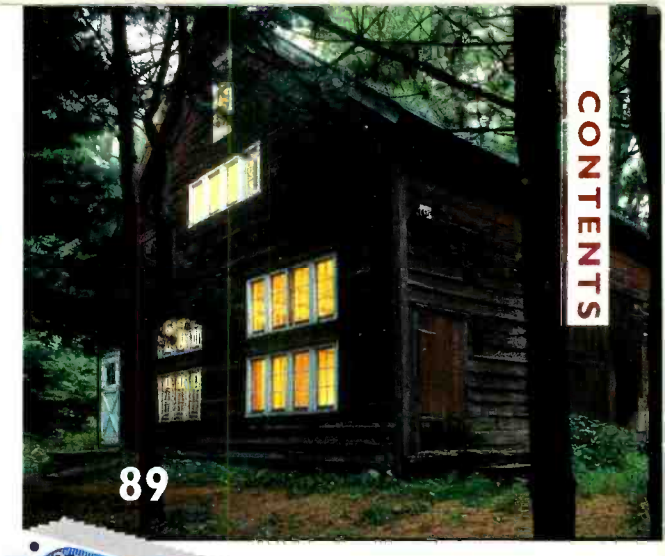
110 **Open mic**
Breathing longer life into your studio equipment

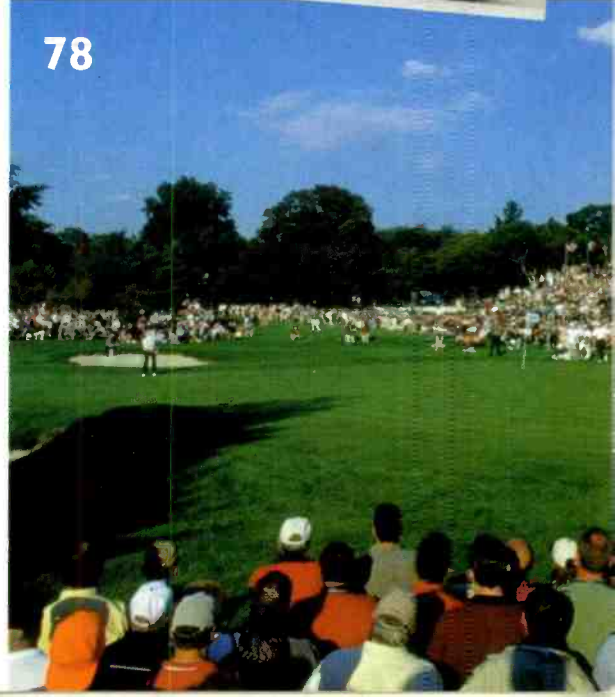
TECHNOLOGY

58 **Masterclass: Studer A80-A100**
Exorcising ghosts from the machine

64 **DVD**
The versatile disc

108 **Dr John**
Understanding directivity





R-1 MULTI-TRACK RECORDER

Version 2.0

- 24-bit/96kHz
- 12, 24, 48, 96 tracks
- Reel Feel remote
- high speed incremental backup
- analog, AES/EBU, or MADI interfaces
- fast lockup and machine control

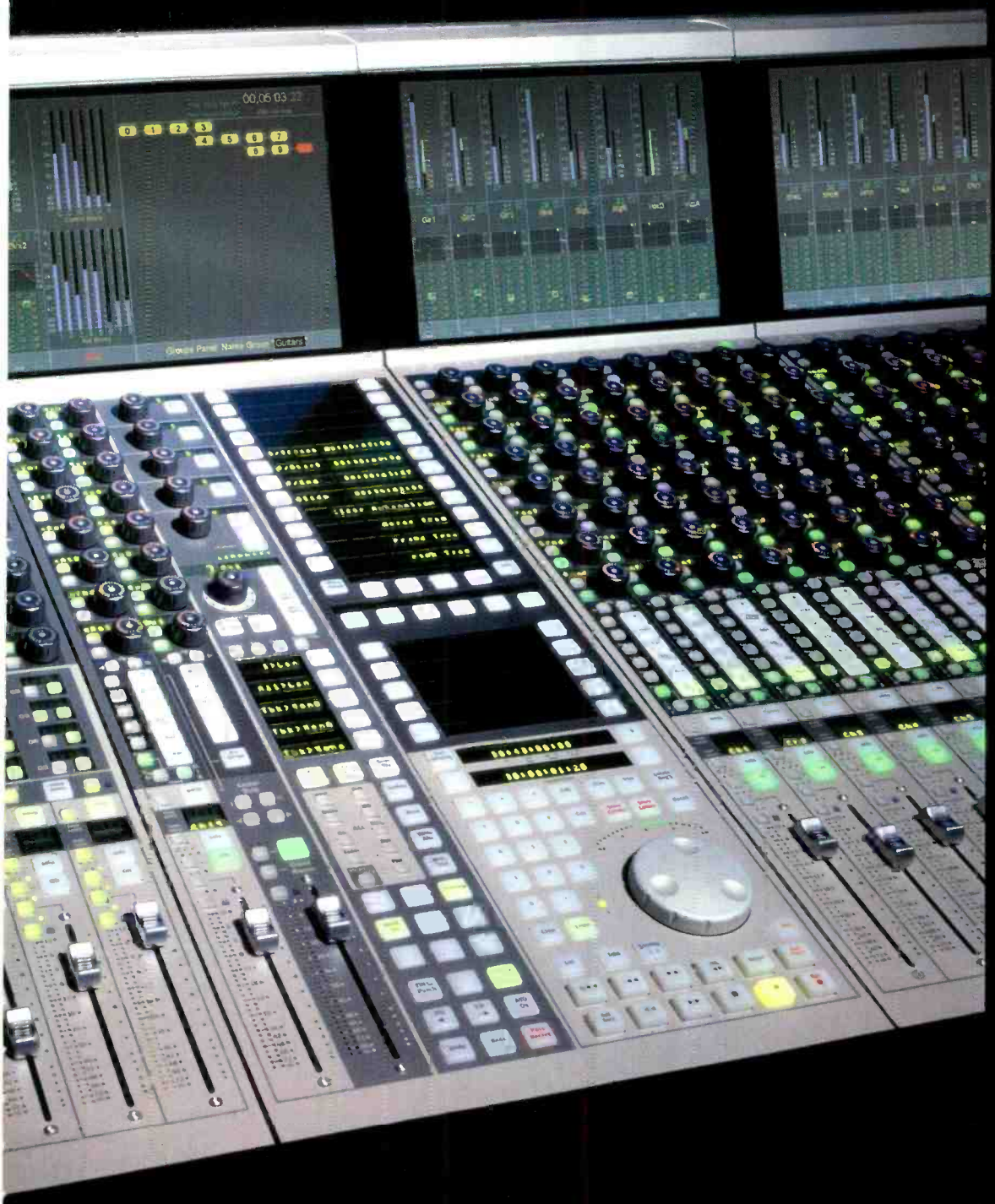
www.euphonix.com

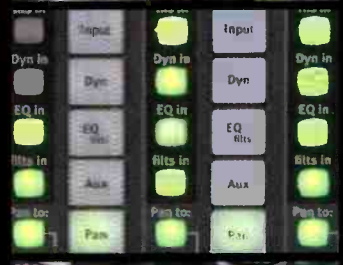
24-bit/96kHz

recording and mixing systems
that work the way you do

SYSTEM 5 DIGITAL

the high performance digital audio console





Five reasons to go digital with System 5:

- **24bit/96kHz** signal path and recording via MADI, AES/EBU, or analog
- Fast, fun, traditional style control surface with **total automation** and snapshot recall
- **World class** mic preamps, EQ, filters and dynamics, with up to 48 grp, 48 mix, and 24 aux buses
- Powerful **multi-format**, multi-stem panning with integrated full-featured monitor
- **Fault tolerant** architecture

Euphonix

HIGH PERFORMANCE AUDIO SYSTEMS

Imagine being able to work

With Rocket Network™ Internet Recording Studios artists, producers, and engineers can meet and produce professional-quality audio online.

Your voice-over talent is in Sydney. Your favorite engineer is in New York. You're in London. With Rocket Network you can all work together from any location as if you were in the same studio, saving you valuable time and money.

Precise control, global reach, and stellar creative possiblities—Rocket Network can take your work to a whole new level.

All rights reserved © Rocket Network, Inc. 1999.

with anyone, anywhere, anytime.

Register for a free trial at

www.rocketnetwork.com

rocket NETWORK™

Internet Recording Studios

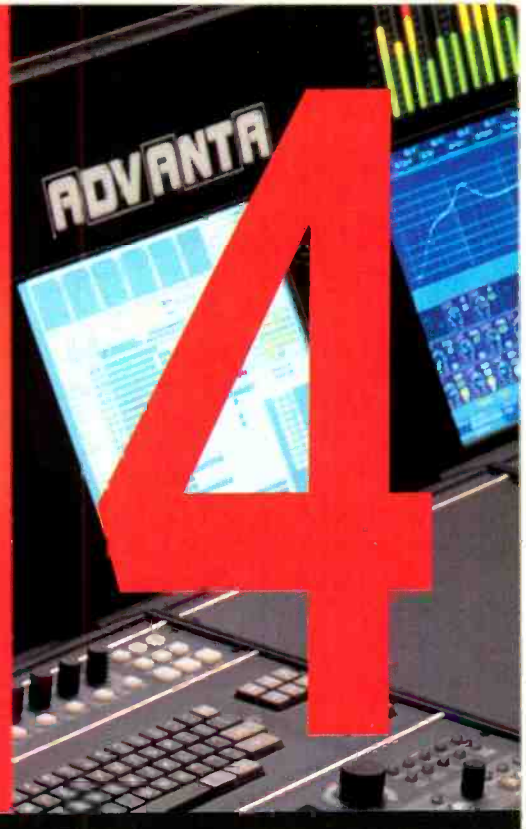
ADVANTA

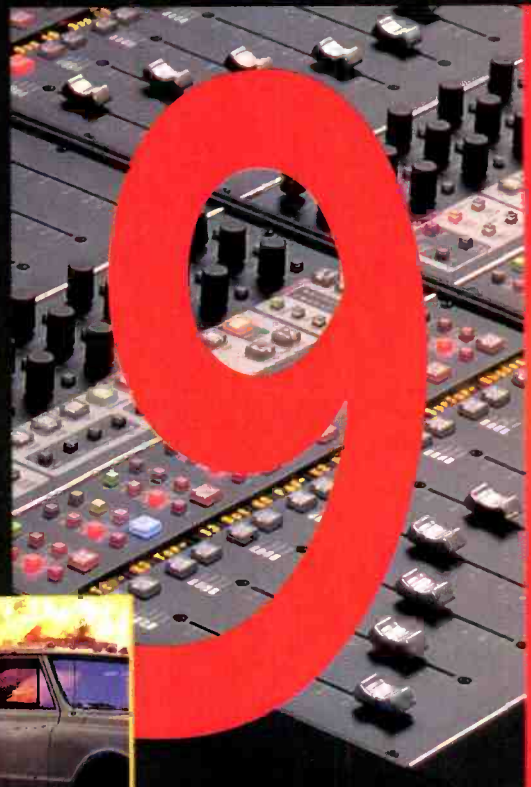
The Digital Advantage

The Future of Audio Production.

The ADVANTA Series Large-Format Digital Production System is more than a mixing console. Four years in development, ADVANTA delivers on the promise of digital – with outstanding *Sonic Quality*, frame-accurate *Dynamic Recall/Reset* of every parameter, comprehensive *Assignability* to reconfigure the entire system to meet your precise requirements, *Scalability*, and full *Connectivity* with other components that complete the all-digital studio.

24 Bit kHz 96





ADVANTA is targeted at a wide spectrum of applications – from music recording, through broadcast production, to film and TV post.

Novastar Studios, Los Angeles

OTARI

DIGITAL'S NEW STANDARD

www.otari.com

Otari Corporation, USA Tel: 800/877-0577 +1-818/594-5908 Email: sales@otari.com • Otari, Inc., Japan Tel: +81/424-81-8626 Email: salesinfo@otari.co.jp
Otaritec Corp., Japan Te . +81/3-3332-3211 Email: sales@otaritec.co.jp • Otari Singapore Pte. Ltd., Tel: +65/284-7211 Email: otarisp@singnet.com.sg
Otari Europe GmbH Tel: +49/2159-50861 Email: euro@otari.de
R&D in cooperation with Sanyo Kogyo, a member of the Otari Group

A magician's touch

HOW WILL YOU BE CELEBRATING the new millennium? Are you the type that will enjoy the turn of the century party mania or will you enjoy your swim against the tide of popular hysteria, maintaining that the turn to 2001 is in fact the date of symbolic importance?

Which ever way you look at it, we have developed an aptitude for using any opportunity to draw a line under our lives and to seize the promise of a new start. This is peculiar because change is continual and only the rate of change gives any indication that something may be up. There can be few surprises awaiting us on January 1, everything is already in place, and punctuating this occasion with a fresh beginning is purely artificial. It is a convenient way of creating a time reference to record a state of mind. We need occasions to log memories.

I feel less comfortable in predicting what 2001 will hold than 2000 simply because it is far enough away for a technology, or application of technology, to emerge, be acknowledged and to take hold causing everyone to rethink. So many potential candidates exist and so many potential routes to evolution are bubbling away on back-burners awaiting the magician's touch of commercial greatness that only the reckless or the biased can feel truly at ease with—the black art of prediction.

What is, however, becoming apparent in this audio universe is that the good and sensible technology idea seems to hold less credence these days than the calculated commercial all-or-nothing endeavour. At the end of this millennium we are being driven by forces that owe less to matters of audio for audio's sake than to those of mass acceptance. Individuality is being lost, despite the fact that users regularly request specific solutions to their specific needs. Currently, many of them still get it.Whether 2001 will see this balance maintained or redressed will be a question for the reckless or biased.

Zenon Schoepe, executive editor

Angel dust

LOVE YOU, ANGEL. Love what you do; love what you are... London's Angel Studios embodies much of the tradition of the music recording studio. Readying for its 20th anniversary, it is sited discreetly in a converted church—complete with large live rooms and an imposing pipe organ restored by the son of the man who built it—in central London, from where it plays on its tradition of excellence and expertise. Apart from younger and more ambitious studios with an anxious eye on The Next Big Thing, Angel commands an enviable trade in film, television, cast and library music recording, moving in the same circles as London's orchestral recording giants—Abbey Road, CTS and Air Lyndhurst. Recently, the studio has spent a small fortune on keeping up to date in the equipment stakes, but has remained quite true to its brief. In short, Angel represents the old order with no apology for its past and no fear for its future. It's a philosophical thing.

The Angel model fits well with another I was introduced to recently. Someone learned, benevolent and enabled by the BBC observed that, in contrast to the Christian order (and others), the Hindu Book is used by its advocates as a source of inspiration rather than a dictate. It was a new idea to me—I'm more familiar with religious zealots arguing futile details of the Bible Story than trying to draw more philosophical lessons from it. But I've always been attracted to elegant philosophy—and anything that looks like a model...

When technological progress is slow, it is tempting to regard the lack of new equipment as an indictment on our industry. When there's new equipment in every trade show aisle, it's easy to forget that the artistic considerations of a project are the most important. As a reminder of just how important a balanced philosophy is, my visit to Angel was most timely. A comfortable proportion of these considerations seem only to belong to the realm of angels. But I now know where they live...

Thank you, Angel, see you soon.

Tim Goodyer, editor

Studio Sound

Incorporating Broadcast Engineering

November 1999. Vol 41. No 11. ISSN 0144 5944

Miller Freeman Entertainment Group, A division of Miller Freeman UK Ltd, 4th Floor, 8 Montague Close, London Bridge, London SE1 9UR, UK.

Tel: **+44 171 940 8500**
Fax: **+44 171 407 7102**
Email: **studiosound@unmf.com**
Net: **www.prostudio.com/studiosound**

Editorial

Executive Editor: **Zenon Schoepe**
Email: **studiosound@unmf.com**
Direct line: **+44 171 940 8513**
Editor: **Tim Goodyer**
Email: **studiosound@unmf.com**
Direct line: **+44 171 940 8578**
Production Editor: **Peter Stanbury**
Email: **pstanbury@unmf.com**
Direct line: **+44 171 940 8523**
Secretary: **Eileen Sullivan**
Email: **esullivan@unmf.com**
Direct line: **+44 171 940 8524**
Consultants: **Francis Rumsey; John Watkinson**
Columnists: **Dan Daley; Barry Fox; Kevin Hilton**
Regular Contributors: **Jim Betteridge; Richard Buskin; Simon Croft; Ben Duncan; Dave Foister; Bill Foster; Tim Frost; Yasmin Hashmi; Neil Hillman; Keith Holland; Rob James; Caroline Moss; Philip Newell; Terry Nelson; Stella Plumbridge; Martin Polon; George Shilling; Patrick Stapley; Simon Trask**

Advertisement Sales

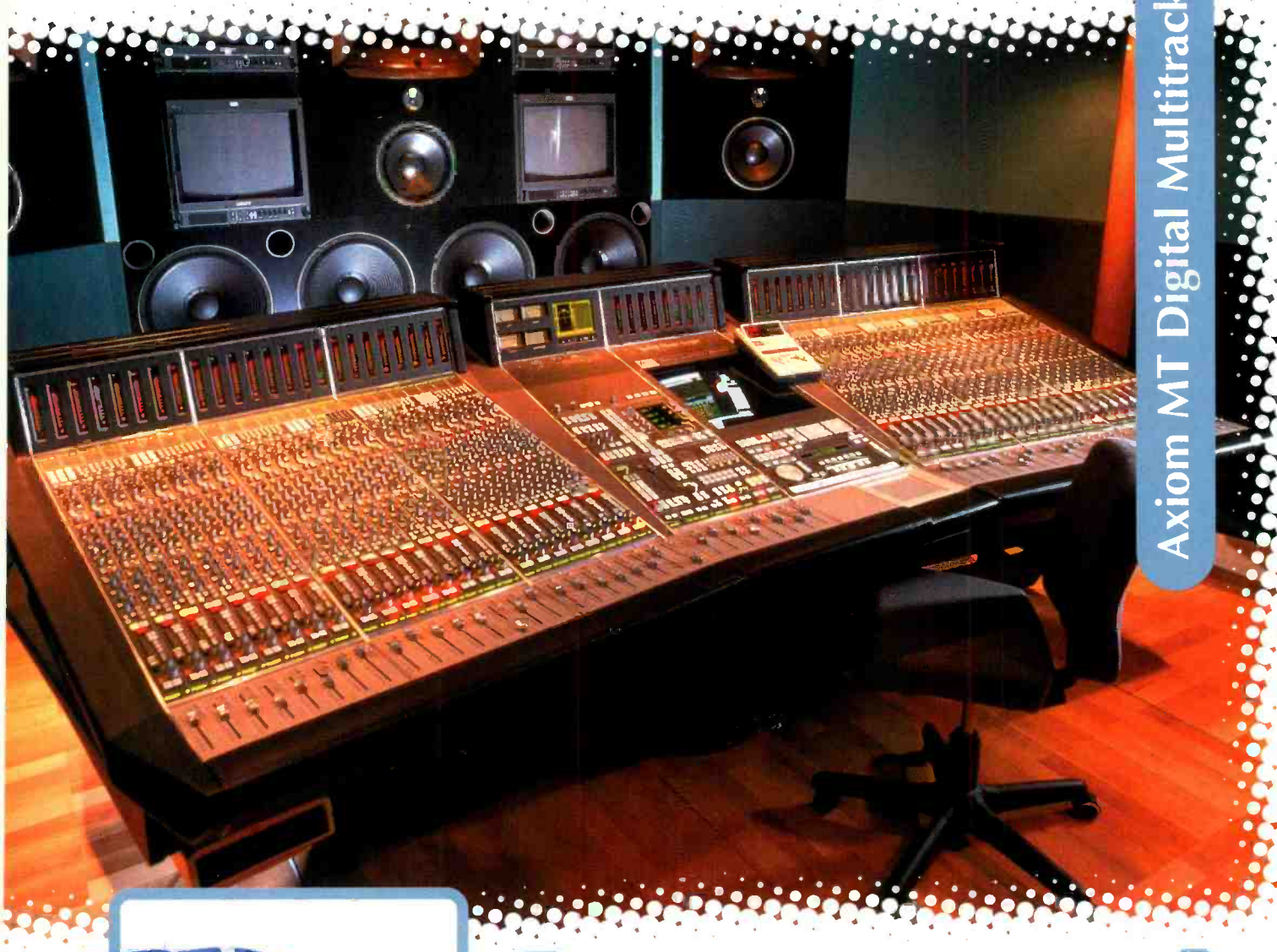
Group Sales Manager: **Chris Baillie**
Email: **cbaillie@unmf.com**
Direct line: **+44 171 940 8517**
Deputy Ad Manager: **Phil Bourne**
Email: **pbourne@unmf.com**
Direct line: **+44 171 940 8542**
Classified Sales: **Andrew Lynn**
Email: **alynn@unmf.com**
Direct line: **+44 171 940 8518**
Advertisement Production: **Denise Walshe**
Email: **dwalshe@unmf.com**
Direct line: **+44 171 940 8539**

Publishing Editor: **Joe Hosken**
Direct line: **+44 171 940 8602**
Circulation Manager: **Caroline Chamberlain**
Direct line: **+44 171 940 8579**
PA to the Publisher: **Lianne Davey**
Managing Director: **Doug Shuard**
Publisher: **Steve Haysom**

Great Mobiles Of The World

le Voyageur V1

Axiom MT Digital Multitrack Console



After considering a number of consoles, leading French mobile recording operation Le Voyageur has recently installed an MT digital multitrack console in its new, state-of-the-art truck, Le Voyageur 1. "We finally picked the MT because it was very similar in its way to the SL 9000 J Series, which all engineers around the world know very well already."

Yves Jaget, Le Voyageur Mobiles.

Le Voyageur, 56 Avenue de la Pyramide, Z.I. Paris Nord II, B.P. 50058, 95947 Roissy CDG Cedex Phone: +33 (0)1 48 63 22 02

Solid State Logic

Axiom MT

International Headquarters

Begbroke, Oxford, OX5 1RU, England

Tel: +44 (0)1865 842300

Fax: +44 (0)1865 842118

E-mail: sales@solid-state-logic.com

http://www.solid-state-logic.com

New York	Los Angeles	Tokyo	Paris	Milan	Toronto	Singapore
+1 (1)212 315 1111	+1 (1)323 463 4444	+81 (0)3 5474 1144	+33 (0)1 3460 4666	+39 039 2328 094	+1 (1)905 655 7792	+65 (0)438 2272

■ London's Videosonics is to upgrade all of its 14 AudioFiles to AudioFile SC systems. Ten will be 32-track systems, with the remaining four being 24-track. The 32-track systems will be installed in the facility's mixing theatre and the 24-track systems into the sound design rooms where they will work on feature films and TV dramas including Jimmy Grimble, *In a Land of Plenty* and *Millennium Chillers* for Channel 4. Elsewhere in the Big Smoke, the Grand Central Sound post operation is to upgrade its four AudioFiles to AudioFile SC. Out west, Bristol-based Broadcast Film & Video has ordered two 32-track AudioFile SCs and will upgrade two existing M16 systems to AudioFile SC16s. Broadcast Film & Video has also ordered AMS Neve's StarNet audio editor networking. The AudioFile SCs will be installed into dubbing theatres at two sites with StarNet enabling networking across all four systems.

Videosonics, UK.
Tel: +44 20 7482 2855.
Grand Central, UK.
Tel: +44 207 306 5600.
AMS Neve, UK.
Tel: +44 1282 457011.

■ Brasil's TV Globo has ordered two SSL Aysis Air digital broadcast consoles and a Hub Router system for its revamped Studio 3. Uniquely equipped to monitor audience figures and modify programme content accordingly, San Paulo-based TV Globo will use the new system on a variety of broadcasts including the Jo Soares daily show recently won from a rival broadcaster.

SSL, UK. Tel: +44 1865 842300.

■ Los Angeles-based postproduction facility, Intersound, took advantage of the recent NY AES to place an order for a 32-fader postproduction version of the Euphonix System 5 digital console launched at the convention, as did LDS Motion Picture Studio, who have ordered a System 5 for surround sound mixing of feature films. Meanwhile LA's BBP Recording has opened a new TV post room equipped with a Euphonix CS3000 console and Fairlight MFX3 Plus workstation. Known for radio and TV commercials, BBP's new Studio B shares server access to all sessions and sound effects with all the facility's rooms. Hollywood's Sony Pictures, meanwhile, has ordered the largest SSL Avant console to date. The 128-channel, 3-position digital film console will go into the new Stage 4 all-digital dubbing theatre along with a DADR-5000 disk recorder. The facility has also upgraded 24 WaveFrame workstations located in editing suites to v6.5 software with which they will continue to handle assignments.

BBP, US. Tel: 1 310 826 8330.
Euphonix, US. Tel: +1 650 855 0400.
Fairlight, US. Tel: +1 213 460 4884.
SSL, UK. Tel: +44 1865 842300.
WaveFrame, US.
Tel: +1 510 654 8300.

■ Portuguese state broadcaster, RTP, has taken its fifth Otari Status Elite analogue console. The new 48-frame desk will go into RTP's Oporto studios and complement Status and Concept One consoles already in use with the broadcaster. It will be used on national morning news and breakfast programming.

Otari, Germany.
Tel: +49 21 59 50861.

■ Texan Sound recording studio Sound Ideas in Carrollton has installed an 84-input D&R Cinemix multichannel console in pursuit of its Christian music clients. The console has 32 dual-path mono mic-line input modules and 5 dual stereo return modules to drive its DA-88 and PCM800 MDM machines.

Sound Ideas, US. Tel: +1 972 306 7844.
D&R, The Netherlands.
Tel: +31 294 418014.

■ New Jersey-based Trax East Recording Studio has purchased a Neotek Elite II console fitted with the Martinsound Audiomate moving-fader automation system. The Elite is has 32 in-line channels and includes motorised faders on both the input paths, providing 64 channels of automation. Designed in-house, monitoring options include Urei, KRK, Genelec and JBL systems and recorders comprise Otari analogue and Tascam digital machines. The studio offers an 8-track Pro Tools system as well as vintage Neve and API units. Clients include Atlantic, Geffen, Island, Capitol, IRS and Alternative Tentacles labels.

Trax East Recording Studio.
Tel: +1 732 254 9400.
Martinsound, US.
Tel: +1 800 582 3555.

■ The BBC's Elstree Centre has installed a 16-channel Calrec C2 analogue production console for use on production of the Eastenders soap opera. North of the Scottish border, Grampian Television has ordered a C2 to replace the Neve 51-series desk in one of its mobile units. The new console will be commissioned in June 2000 and be blooded on a new series of the *Scottish Woman* live topical debate programme.

Calrec Audio, UK.
Tel: +44 1422 842159.

■ Wiltshire-based Real World Studios has recently purchased a selection of Audio-Technica equipment including AT4050 condenser mics, AT4060 valve mics and ATHM40FS headphones. The purchase follows an intensive evaluation period during which the valve 4060 scored particularly well on vocals and double bass.

Audio-Technica, UK.
Tel: +44 113 277 1441.

■ Darwin's largest Rental company, Top End Sounds, has taken a number of ARX LSP-1 and LSP-2 speaker processors for their ARX 212 and 118-based ARX Concert Systems. The new processors replace 12-year-old systems punished on the Australian circuit. The Dutch Heuvelman Sound & Vision, sound reinforcement and large venue video equipment specialist has bought ten Klark Teknik DN360 dual-channel 30-band third-octave graphic equalisers to add to its existing stock. With 12 offices in Germany, Belgium and Holland, Heuvelman is one of Europe's largest rent, sale and installation companies for video and sound systems.

US-based Logic Systems Sound and Lighting has purchased the first Midas Heritage 2000 series console to be delivered to the United States. The Heritage 2000 adds to Logic Systems' array of Midas consoles comprising a Midas XL200, an XL250, plus a DDA CS12M.

ARX, Australia.
Tel: +61 3 9555 7859.
Heuvelman, The Netherlands.
Tel: +31 346 573200.
Klark Teknik Group, UK.
Tel: +44 1562 741515.

▶ US: The 107th AES Convention, held in New York, marked a new high in confidence for the pro-audio business. Playing host to a busy conference schedule, the CEDAR Awards and over 20,000 visitors, the convention was notable for launches including those of the Euphonix System 5 digital console, SSL 24-bit MixTrack, AMS Neve AudioFile SC, Fairlight Merlin recorder, Mackie HR24-96 recorder, Tascam MX2424 recorder, Westlake Lc5.75 monitor and more... The second showing of CEDAR's awards favoured Mexico's 201 Studios and NY's BMG Studios for CD Remastering from Modern Recordings, Michael Weise for his work on Akira Kurasawa's *Seven Samurai* for Postproduction of a Film Soundtrack, Ted Kendall for his restoration work on The Goons' *The Silent Bugler* and Norman Perle for his forensic work at the National Audio Forensic Laboratory (USA). The mood of visitors and exhibitors alike was upbeat with only overworked journalists alarmed at the renewed activity and consequent legwork. AES moves back to Paris on 19th–22nd February and then to Los Angeles on 22nd–25th September for next year's conferences.

IBC Report

The Netherlands: Trading the traditional rain for sunshine, this year's IBC saw some 38,000 visitors treading the aisles of hot exhibition halls at the RAI centre. As in previous years, audio equipment exhibitors had the option of subscribing to the audio hall (Hall 8) or sleeping with the enemy. And as in previous years, both options were taken and vigorously defended by their protagonists. Less a matter for debate was the standard of business which appears to have been consistently good, supporting the organisers' reports of 38,124 visitors from 121 countries with 700 exhibitors occupying nine halls of the Amsterdam RAI.

'At the close of the show, 381 companies had already booked almost 28,000 square metres for IBC2000. On average each company has booked 7% more space than they used at IBC99,' said IBC Exhibition Chairman Bob van der Leeden.

Hot topics this year were Business Opportunities in DTV, and Internet TV. Sessions on Metadata, and MPEG-4 and MPEG-7 proved popular and the IBC Keynote address by Tony Ball CEO and MD of BSkyB attracted a crowd of 650. The fifth IBC Wide screen Programme Festival also continued to grow in popularity. Reflecting the success of digital TV in the UK this year, Channel 4 picked up several prizes including the Golden Rembrandt for best programme.

IBC2000, the 21st IBC, will take place at the Amsterdam RAI from Friday 8th to Tuesday 12th September 2000.

▲ US: Dallas has become home to Luminous Sound Studios, the new studio of composer and film director Paul Loomis. The 2-room facility was designed by studio bau:tion and will handle post, music recording and advertising work. It offers a double-height main room with iso booths designed to be equally suited to classical and rock tracking sessions. Equipment includes an SSL SL6040E console with G+ automation, Genelec 1039A main monitoring, Sony APR-24 multitrack with Dolby SR, three Pro Tools 24 systems with Pro-Control, ADAT and DA-88 MDMs and Synclavier 9600 system.

▲ Italy: Milan-based postproduction facility, Nautilus Mastering, has completed installation of PMC monitoring throughout. The studio's three rooms: Blue, Yellow, & Green, cater for authoring and mastering requirements. The largest of the three rooms, the Blue Studio, has BB5/XBD in the favoured stacked, free standing, configuration with Bryston crossovers and power amplifiers. The Yellow Studio stereo mastering room has the IB1S monitor powered by a Bryston 4B-ST Pro on 33-inch custom stands. The final room in the Nautilus complex houses state-of-the-art digital editing, assembling, PQ encoding and authoring of DDP Exabyte masters for which the LB1 monitor is installed. PMC. Tel: +44 1707 393002.

Testing DVD-A

US: Sonic Solutions, Panasonic, Sonopress (BMG Storage Media), Sony Music, Universal Music and the Warner Music Group (WMG) have collaborated to create DVD-Audio test discs demonstrating high-resolution sound, graphics, and interactivity. Shown at the Internationale Funkausstellung 1999 show in Berlin, the venture marks renewed cooperation over the new format. 'Prior to these test discs, no-one really knew how DVD-Audio titles would be authored,' said Sonic Solutions president Bob Doris. 'Working with the major labels on the first DVD-Audio discs has been invaluable and will help us refine the production version of our system.'

'Preparing DVD-Audio titles is more challenging than traditional CD premastering,' added Al McPherson, VP of Technology at the Warner Music Group. 'Our first demonstration DVD-Audio disc contains hundreds of different elements—10 tracks with 6 channels at different sample rates, graphics, menus, slide shows and video. Preparing DVD-A titles requires complex tools that can handle all these elements, and working with Sonic will enable us to author titles that exploit the exciting new features supported by DVD-Audio.'

'Sony Music has begun production on a slate of DVD-Audio releases from a number of its top artists which will be available concurrent with the new format's launch,' commented Leslie Cohen, Vice President, New Business Development, Sony Music Entertainment. 'Sonic Solutions is the first company to develop the authoring tools for DVD-Audio, and following our joint success in producing these first test titles, we look forward to working closely with Sonic to take full advantage of DVD-Audio's capabilities as we help shape the future of this format.'

▲ US: New York based HBO Studio Productions has taken the first three AudioFile SC systems to go into the US along with one 48-fader frame DFC audio console. The DFC and one AudioFile SC will be housed in HBO's new 5.1 capable DFC Post Audio Suite, where it will be used to edit and mix a variety of projects including documentaries, sports and promotional programmes. HBO will interface the DFC console to the AudioFile SC through a MADI interface. The two remaining AudioFile SCs will be installed in suites at HBO Studio Productions. AMS Neve, UK. Tel: +44 1282 457011. Fax: +44 1282 471282.

Surround guide

US: Martinsound is offering a free guide revealing some of the mysteries of surround sound production in *The Secrets of Doing Surround Sound on Your Existing Console*. The guide offers tips on how to work around what may be perceived to be the shortcomings of the average stereo console to successfully produce surround-sound projects. It discusses the features that should be included in a good surround-sound monitor control system, and provides some basic advice on getting set up for a surround mixing session. It also looks at the most commonly used surround-sound formats, and even looks back at the history and development of multichannel sound.

With the mixing console probably the most expensive item of equipment in the control room, this guide offers suggestions on how to use an existing stereo console to produce surround sound mixes without modifications or custom electronics, simply by augmenting the console's monitor section with a monitor controller. Martinsound. Tel: +1 800 582 3555. Fax: +1 626 284 3092. Email: info@martinsound.com

▲ China: Beijing's Tian'anmen Square recently saw a vast concert commemorating the 100-day countdown to the return of Macao to the Chinese. The concert was performed in front of an invited audience of around 2,000 VIPs with thousands in the Square, and Central China Television broadcasting a 55-minute programme to some 200m listeners on the following evening.

The Beijing Symphony Orchestra joined the orchestra of the Central Opera House and the Beijing Film Orchestra on stage for the event, with a 400-strong adult choir, 150-strong children's choir in support. The performance also involved some of China's foremost musicians and singers including tenors Zheng Yong, Dai Yugiang and Ding Yi and pop superstars Xie Xiao Dong and Chen Ming.

With 19 grand pianos and 18 singers in tow, the total number of people on stage came to some 787 presenting a considerable challenge for Oxford Audio Training's John Gallen and Nigel Luby who had been called in to handle the broadcast and to record the event using the CCTV mobile. The exercise involved 108 mics, a Cadac J-type console for the FOH live sound and the mobile's 32-input Soundcraft desk for the recording. To augment this, a 24:8 Yamaha console was used for a brass and woodwind submix while the choir and 16 of the pianos were sub-mixed to stereo pairs on the Cadac, and sent back to the OB truck. In spite of teething troubles including running the whole setup from a mains extension lead run across the Square, Head of Sound Production at CCTV Zhu Wei Chong was delighted with the results and expects to involve the Oxford Audio Training team in future events.

November

2-3

24th Sound Broadcasting Equipment Show
NEC, Birmingham
Contact: Point Promotions.
Tel: +44 1398 323 700.
Email: info@pointproms.co.uk
Net: www.sbes.com

18-21

Reproduced Sound 15
Residential Weekend, Stratford Victoria Hotel, Stratford upon Avon, Warwickshire, UK.
Contact: Institute of Acoustics.
Tel: +44 1727 848195.
Fax: +44 1727 850553.
Email: acoustics@clus1.ulc.ac.uk

19-22

SMPTE Conference and exhibition
New York Marriott Marquis, New York, US.
Contact: Bryan Nella.
Tel: +1 914 761 1100.
Net: www.smpte.org

22-24

Messe Frankfurt
Trade exhibition and convention for audiovisual system installation ·
CMF, Ludwig-Erhard-Anlege 160327 Frankfurt
Contact: Metin Ergül
Tel: +49 69 7575 6130.
Email: metin.ergul@messefrankfurt.com

December

8-10

Convergence India 99
Pragati Maidan, New Delhi, India.
Contact: Exhibitions India.
Tel: +91 11 463 8680.
Fax: +91 11 462 3320.
Email: exhibitionsindia@vsnl.com
Net: www.exhibitionsindia.com

January 2000

24-27

Broadcast, Film and Audio, BFA 2000
Bombay Exhibition Centre, Mumbai, India.
Contact: Jasubhai Media.
Tel: +91 22 6542363.
Net:www.exicomindia.com.

February

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 Showground & 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

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

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

June

3-6

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

6-9

Broadcast Asia 2000, Cablesat 2000 and Professional Audio Technology 2000
Suntec Centre, Singapore.
Contact: Singapore Exhibition Services.
Tel: +65 338 4747.
Email: info@sesmontnet.com
Net:www.sesmontnet.com
UK contact: Overseas Exhibition Services.
Tel: +44 171 862 2080.
E-mail: singex@montnet.com.
Net: www.montnet.com

7-9

PLASA Light and Sound Shanghai 2000
Intex, Shanghai, China.
Contact: P&O Events.
Tel: +44 171 370 8231.
Fax: +44 171 370 8143.
Email: shanghai@eco.co.uk

13-15

ICCE 2000: International Conference on Consumer Electronics
Los Angeles Airport Marriott, 5855 West Century Boulevard, Los Angeles, California, USA.
Contact: Diane D Williams, Institute of Electrical and Electronics Engineers.
Tel: +1 716 392 3862.
Email: d.williams@ieee.org
Net: www.icce.org

August

23-26

BIRTV 2000
China International Exhibition Centre, Beijing, China.
Contact: P&O Events.
Tel: +44 171 370 8231.
Email: shanghai@eco.co.uk

t.c. electronic
ULTIMATE SOUND MACHINES

MAIN OFFICE:
TC ELECTRONIC A/S · SINDALSVEJ 34
DK-8240 RISSKOV · DENMARK
PHONE: + 45 8621 7599 · FAX: + 45 8621 7598
EMAIL· INFO@TCELECTRONIC.COM

USA:
TC ELECTRONIC INC. · 790-H HAMPSHIRE ROAD
WESTLAKE VILLAGE · CA 91361
PHONE: (805) 373 1828 · FAX: (805) 379 2648
EMAIL: INFOUS@TCELECTRONIC.COM

GERMANY:
TC ELECTRONIC GMBH · FLUGHAFENSTRASSE 52 B
D - 22335 HAMBURG
PHONE: +49(0)40 5310 8399 · FAX: +49(0)40 5310 8398
EMAIL: INFOD@TCELECTRONIC.COM

AUSTRIA:
TC ELECTRONIC · POSTFACH 20 · A-1124 WIEN
PHONE: 0800 20 16 52 · FAX: 0800 20 16 53
EMAIL: TCA@TCELECTRONIC.COM

SWITZERLAND:
TC ELECTRONIC · POSTFACH · CH-8030 ZÜRICH
PHONE: 0800 89 89 01 (CH/UK) · 0800 89 89 02 (I/F)
FAX: 0800 89 89 03
EMAIL· TCCH@TCELECTRONIC.COM

ASIA:
TC ELECTRONIC · ASIA · YOSHIDA BUILDING
NO. 201. 26-8 · MARUYAMA-CHO
SHIBUYA-KU · TOKYO 150 JAPAN
PHONE: +81 3 5456-4071 · FAX: +81 3 5456-4072
EMAIL: INFOASIA@TCELECTRONIC.COM

UK:
TC ELECTRONIC UK · P.O. BOX 25767
LONDON · SW19 6WE
PHONE: 0800 917 8926 · FAX: 0800 917 6510
EMAIL: TCUK@TCELECTRONIC.COM

TWO 0800 NUMBERS ARE AT YOUR DISPOSAL TO MAKE SURE THAT YOU RECEIVE TC ELECTRONIC'S RENOWNED CUSTOMER SUPPORT:
PHONE: 0800 917 8926 · FAX: 0800 917 6510
THESE LINES ARE OPEN FROM MONDAY TO FRIDAY FROM 8AM TO 5PM.

TC ELECTRONIC HAS APPOINTED CIMPLE SOLUTIONS PRO LTD. AS UK SERVICE CENTRE.
CONTACT CIMPLE ON 0181 9044141.

WWW:TCELECTRONIC:COM

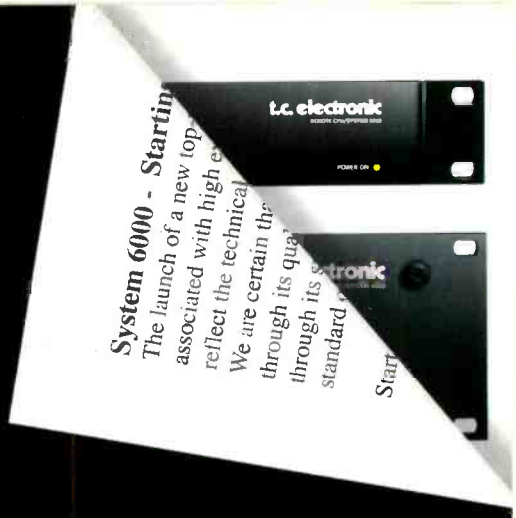
© Miller Freeman UK Ltd. 1999. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical including photocopying, recording or any information storage or retrieval system without the express prior written consent of the publisher. The contents of *Studio Sound and Broadcast Engineering* are subject to reproduction in information storage and retrieval systems. *Studio Sound and Broadcast Engineering* incorporates *Sound International* and *Beat Instrumental*. *Studio Sound and Broadcast Engineering* is published monthly. The magazine is available on a rigidly controlled requested basis, only to qualified personnel. The publisher may pass suitable reader addresses to other relevant suppliers. If you do not wish to receive sales information from other companies, please write to Circulation and subscription at the address below. **Subscription Rates. UK annual: £48.00. Europe: £65.00. Rest of the World: US$124.00.** Refunds on cancelled subscriptions will only be provided at the publisher's discretion, unless specifically guaranteed within the terms of the subscription offer. Circulation and subscription and address changes. UK: Miller Freeman UK Ltd, 109 Station Road, Sidcup, Kent DA15 7ET, UK. Controlled Circulation: Tel: +44 181 309 3617. Fax: +44 181 309 3681. Paid Subscriptions. Tel: +44 181 309 3842. Fax: +44 181 309 3661. US: Studio Sound and Broadcast Engineering Magazine, 2 Park Avenue, 18th Floor, New York NY 10016. US second class periodicals postage paid at Rahway, NJ. Origination by F E Burman Ltd, Crimscott Street London SE1 5TF. Printed in the UK by ET Heron, The Bentall Complex, Colchester Road, Heybridge, Maldon, Essex CM9 4NW, UK. Newstrade Distribution (UK) Seymour Distribution, 86 Newman Street, London W1P 3LD, UK. Tel: +44 171 396 8000. Fax: +44 171 396 8002.

ABC AUDIT BUREAU OF CIRCULATIONS
BUSINESS PRESS
PPA
BPA
Total average international circulation: 21,333 Jan-June 1999 BPA audited

un Miller Freeman
A United News & Media publication

TC ICON

Icon - /'aɪkɒn/ n 1 [An object acting as mediator between man and the ideal] 2 [A symbol having cultural significance and the capacity to excite or objectify a response]



SYSTEM 6000

Ultimate Multichannel Processing Platform

t.c. electronic

ULTIMATE SOUND MACHINES

TC ELECTRONIC A/S • SINDALSVEJ 34 • 8240 RISSKOV • DENMARK • PHONE: + 45 8742 7000 • FAX:+ 45 8742 7010
TC ELECTRONIC UK • P.O. BOX 25767 • LONDON • SW19 6WE • PHONE: 0800 917 8926 • FAX: 0800 917 6510
TCUK@TCELECTRONIC.COM • WWW.TCELECTRONIC.COM

Eventide Orville

The latest effects processor from American pioneer Eventide offers quality and complexity to the busy engineer. **Rob James** tries his busy hand

I REMEMBER my first encounter with a pitch-shifting effects processor. It was in the late seventies and I was still a humble assistant dubbing mixer working mainly in TV current affairs. We hired in a unit to disguise an interviewee's voice in an attempt to preserve anonymity. As usual we had to wait for the film to arrive from the cutting room and so there was plenty of time to experiment with the new toy. I was knocked out by what could be achieved using up and down shift with delay and feedback. Thanks to a director who cared about sound and was more creative than most, the Eventide H910 Harmonizer, for such it was, more than earned its hire fee. We used it not only for voice disguise but also to mangle real-world effects, in particular a venetian blind to work with semi-abstract graphics. Later, I often used harmonisers to pitch shift material shot at 24fps. For me, the chief virtue of the original Harmonizers was the ease and speed with which seriously wacky (for the time) effects could be created.

Eventide is currently celebrating 25 years in the business and Orville is the latest and, perhaps, greatest in a long and illustrious product line. Over the years manufacturers of effects processors have followed three main paths to try to keep ahead of the opposition. The first and most obvious has been adding more and more features and presets. The second, and arguably the more important for most applications, is improvement of the fundamental quality of the audio and basic effects. Third is the advent of 'multiprocessors' with two or more processing engines used in series or parallel. Eventide has more than kept up on all three fronts.

Orville ships with over 800 presets and it has features undreamt of 25 years ago. The audio quality is first rate with 24-bit convertors and 96kHz working if required. Since 96kHz operation requires approximately twice the processing power of 48kHz, some programs are only available for the lower sampling rates. There are two main processing blocks imaginitively entitled 'A' and 'B' each with four channels and four channels of both digital and analogue I-O for a total of eight independent inputs and outputs.

Overloading a unit with features can be a trap unless the user-interface is kept simple and intuitive. Given one motto common to the majority of busy engineers, 'When all else fails, read the manual', for a real-world, no-nonsense test I always begin the review process by connecting audio, powering up and seeing what I can achieve. Having seen Orville's specifications I suspected I would not get very far. This is often the acid test of an effects unit. If an engineer likes what he or she hears during a quick audition then there is some chance they will make the time to explore the device properly and maybe even read the manual. If not, the attitude tends to be one of using what you know.

It was a pleasant surprise to discover instant gratification was perfectly possible once I had worked out you use the left and right cursor keys to scroll preset banks. There are up to 100 internal banks each of which can contain a maximum of 128 programs. Each program title is accompanied by two digits indicating the number of physical inputs and outputs. If there is a 'lightning flash' adjacent, the program can be run in high-speed mode—96kHz. Operating Orville using the factory presets is quite intuitive and modifying them is equally simple. An even more pleasant surprise is the organic quality of many of the sounds. With many effects units the presets are just too clinical and require a lot of effort to make them sit in a mix without calling undue attention to themselves. Not so with Orville. Certainly some of the synthesised sound effects like Steam Train and Flintlock are frivolous, but the kind of effects you actually buy a unit like this for are deadly serious. A further revelation is the reverbs. The last Eventide reverb I heard (years ago) was rather underwhelming. Orville is a completely different propo-

sition. It manages to provide a reasonable simulacrum of various classics, plates, springs, digital, and so on, but it is when it is not pretending to be something else that it really shines—clean, rich and soaring reverbs with superclean tails. Outside of one or two of the latest dedicated units this is one of the most classy reverbs I have encountered and I would seriously consider giving it rack space for the reverb programs alone. There is also a not inconsiderable bonus—a number of reverb presets have four outputs which is handy for surround work and saves a lot of messing about with delays. It is perfectly feasible to use both DSPs running the same program in order to obtain highly satisfying reverb across anything up to eight discrete outputs from a mono source. The same applies to many other effects. The richness and complexity that can be obtained with this approach needs to be heard to be believed.

As you might expect from a company that owns the trademark 'Harmonizer', there is a plethora of shifter effects here. Particularly impressive are the Ultra-Harmonizer types. It is some measure of the power of Orville that one of these uses only half of one DSP. By comparison it would use almost the whole DSP on an H4000.

Apart from the staples of shifting and reverb, dynamics, equalisers, filters, distorts, delays, panners, phasers, chorus, ring modulation are just a few chapter headings of what else is on offer. The samplers are worthy of mention as are the MIDI functions and the test tools and utilities. These include signal generators, oscilloscopes, a spectrum analyser, musicians calculator and much, more. Programs and banks can be changed via MIDI as can individual parameters such as modulation and triggers.

When you do get around to opening the manual, Orville's versatility and scope become even more apparent. The internal audio patching is almost totally flexible. Any permutation of physical I-O and DSP I-O seems possible and, if memory cards are used, there is no limit to the number of configurations that can be stored. The space available in internal memory for user-programs will allow between 30 and around a 100 depending on complexity. The number of external programs is limited by the number of memory cards you have. If the several hundred supplied presets do not do, or cannot be bent to do what you want then Orville has another trick up its sleeve.

Using the same paradigm first seen on the H4000, it is a user-programmable device. Each effects program is built up from a number of modules. Conceptually, the programming process is akin to a modular analogue synthesiser. Apart from patching the modules together to complete the audio path(s) there are control parameters and modulation signals to consider. There are two ways in which programming can be achieved. It is possible with patience, to construct and edit programs using the front-panel controls. The sequence of creating a patch goes like this: First load a suitable I-O configuration program from the Utilities bank. Pressing and holding the PARAMETER key brings up the Patch Editor screen, which at this point will only contain In and Out modules. Construction continues by adding a module, chosen from one of 16 groups, which are accessed by pressing the INSERT soft key. Once a module has been chosen and inserted the next step is to connect it using the CONNECT soft key which brings further options. This is all well and good with simple devices such as a delay or compressor, but becomes unwieldy when attempting to construct or edit programs containing dozens of modules, let alone attempting to design the user-interface menus to control them.

Fortunately there is a much better and easier approach. Eventide supply a PC program, called VSigfile which may be freely downloaded from their web site. The computer can communicate with Orville via RS232 or MIDI. VSigfile is a visual editor much like the editors available for various synthesisers. I have no doubt we shall see specialist Orville programmers and a thriving trade in Orville patches in the near future.

I was immediately at home with Orville and I am still discovering delights among the presets. My only concern is a noisy mains transformer on the review sample. This is a conventional, (not torroidal) item that seems to generate a lot of mechanical vibration. This is amplified by the flat panels of the case to an irritating buzz. Hopefully this is an isolated example. With a processor of this depth and complexity I can only hope to whet your appetite. To do it justice it really needs to be heard. This is the first multieffects unit I have encountered that did not leave me feeling vaguely dissatisfied. This is also the first time I have been able to discern any real difference between 48kHz and 96kHz processing. I won't attempt to quantify the effect, but it just sounds cleaner to my ears.

Orville is a massive toolbox for all manner of applications and once its virtues are appreciated it will be very hard to part with. You can approach it as a quick problem fixer or as a huge palette for painting an epic. Whether you simply use the internal presets or spend the time to get deeply into rolling your own programs, Orville will prove to be a rich source of creative inspiration. Classic stuff. ■

Contact
Eventide, US.
Tel: +1 201 641 1200.
Fax: +1 201 641 1640
UK: HHB Communications.
Tel: +44 20 8962 5000.
Net: www.hhb.co.uk

STORAGE AND INTERFACING

FOR A DEVICE of this complexity the silver and black front panel is surprisingly bare. Four LED bar graphs may be switched to display the analogue or digital inputs or outputs and also the ins and outs of the two DSP blocks. Five LEDs indicate the four internal sampling rates or external. The BYPASS key, essential on this type of device, is below the meters with status LEDs for DSP A and B. BYPASS requires a press and hold for a user-defined period (default 1s) to operate. The display is bright and legible with four soft keys below to select items in the bottom line of the display. The next block of keys will probably get the most use. At the top is the DSP AB which toggles the display and controls between the two DSP engines. A brief press on PROGRAM accesses the load, save and delete functions. Holding PROGRAM for one second gains access to the routeing storage area and holding for a further second gets you into the Setup storage area. PARAMETER accesses the variable parameters for the loaded Program. The chunky black knob is well up to the usual (high) Eventide standard and is used to change parameter values. The numeric keypad is predictably used to enter numeric data, but also provides a quick method of getting to specific programs —if you know the number. Below the pad is a slot that takes PCMCIA type I static RAM cards of up to 4Mb capacity that may be used to augment the internal memory or simply to keep favourite programs to hand. Orville cannot use 'flash' cards. The last two keys access the Levels menus for metering and levels and SETUP gets you into configuration and data dump utilities and the like. With the mains switch is off the unit is hard bypassed.

The rear panel carries four XLRs for AES-EBU I-O, another four deal with analogue outs. A further four rather neat dual sockets (XLR and jack) take analogue inputs. Two phonos handle SPDIF I-O which are alternatives to the AES-EBU connections for digital I-O 1/2. Control I-O is catered for by two 1/4-inch foot pedal jacks, a further relay jack that enables Orville to control external equipment via a pair of relays and the usual MIDI In Out and Thru. An unusual feature is the low voltage Remote Power in connector. Power connected here is sent down pins 6 & 7 of the MIDI in port to enable easy powering of a MIDI pedal board. A 9-pin D-sub RS232 serial port is provided to allow connection to a PC without using MIDI. The internal clock supports sampling rates of 44.1kHz, 48kHz, 88.2kHz and 96kHz. External clock is taken from digital in 1/2 and will accept from 30kHz to 50kHz and from 54kHz to 99kHz. Word-clock input on BNC is an optional extra. Provision has also been made for connecting user-supplied clocks or crystal oscillators directly to the mother board to cope with alternative sampling rates. Hardware sample-rate conversion is available as an option. If fitted this also provides hardware dither of the otherwise 24-bit output.

Sony DRE-S777

Combining reverb and sampling technologies enables us to apply real-world reverberation treatments within the studio. **Rob James** samples the goods

THE IDEA of superimposing the characteristics of a 'real' acoustic environment onto a dry signal is hardly a new one. It is not even confined to audio circles any more as certain manufacturers, notably Sony and Yamaha, now include it on home cinema equipment. And even these oft-derided facilities have hinted at more sophisticated and potentially useful processing such as presets based on impulse measurements of the Cary Grant and Kim Novak dubbing theatres and the scoring stage at Sony Columbia Studios in LA. There are also software packages employing impulse response modelling and convolution processing techniques such as SEK'D's Samplitude and Sonic Foundry's Sound Forge Acoustic Modeller plug-in.

The same techniques can be used to create previously unheard sounds by using unreal sounds for the impulse response samples. While the results obtained can be highly impressive there remains a snag—they are not yet truly real time due to the huge amount of computation required. So far as I am aware the Sony DRE-S777 is the first rackmount unit to attempt professional-quality sampling reverb in real time.

The underlying technology is the one of the fruits of some research undertaken by Sony Corporate R&D and the resultant silicon has already found its way into some of the consumer divisions products. The far more sophisticated S777 is the first professional application to use it. In appearance the unit is unlike any other I can think of. The front panel is a huge slab of what appears to be plastic, but could well be MDF finished in a dark red mottled wood effect reminiscent of motor car dashboard design. I wouldn't mind seeing this in the Merc, but at first sight it is an odd, arguably distinctive, finish to find on an effects unit.

Set into the panel are a push-button mains switch and satin chrome jog wheel. Above the CD-ROM drive is a PC card slot currently used with an adaptor to take a Memory Stick. This is a small solid-state storage device seen on various consumer and IT equipment. The large, green back-lit LCD screen has adjustable brightness and contrast, but is not the most legible example of the species. Four small, internally lit soft function keys sit below the screen. The only other button opens and closes the CD-ROM drawer. One thing to note about this box is its sheer size and weight. At over half a metre deep and

15kg fully loaded this needs a hefty and deep rack to support it. Sony supply optional slide mounting rails and brackets and I would strongly recommend their use. The unit arrives with feet attached for free-standing use.

At the rear, a standard DRE-S777 comes with AES-EBU digital in and out and one reverb engine under the bonnet which has a mono input and stereo output. Adding an optional DSP card adds another reverb engine and expands the options to; Stereo in and out or mono in with 4-channel output, mono in, stereo out at 96kHz sampling rate or split in 4-channel out—two mono inputs with independent stereo outputs. Optional A–D and D–A convertors are also available. One input card provides the maximum two channels while one or two output cards may be fitted for up to four channels or 2-channel 96kHz stereo working. The convertors are high-quality items with a quoted signal-to-noise ratio of 110dB which I have no problem believing. For versatility the unit also has a mode that allows it to act as a stereo A–D and stereo D–A. All audio connections are XLR. Possible configurations are Mono in Stereo Out, Mono In 4-channel out, Split Mono in 2 x Stereo out, Stereo in Stereo out or Stereo in Stereo out at 96kHz. Two BNCs cover wordclock in and out, two DINs, MIDI In and Out (although these are not implemented in v1 software) and a 9-pin sub-D, RS-232. The rear panel is dominated by an enormous finned heat sink that will lacerate unwary fingers or clothing.

Powering up the unit brings up a screen that advises 'Loading from CD-ROM This may take a few minutes'. If no CD-ROM or Memory Stick are present you are eventually prompted to insert them. The unit boots up in around three minutes with the same status as when the particular CD-ROM-Memory Stick combination were last used. I feel the use of the Memory Stick as a copy protection method is a little cumbersome, although I can see the virtue in keeping setup selections specific to the particular CD-ROM. Each memory stick has 99 locations for storing parameter settings. Seven used as defaults and the rest available for user storage. Nine cache memories keep programmes ready for immediate use.

The screen presents a graphic appropriate to the reverb source sample currently in use—for a Medium Hall you get a grand piano in the middle of a stage. Two meters on the left indicate input level of the active channel(s) with the active cache number adjacent. At the bottom of the graphic are Reverb mode, Direct-Reverb and sample type indicators. To the right is a graphic display of the microphone and speaker arrangement used to produce the sample. Below, two rows of text supplement the graphic information with sampling rate, programme name, a text version of the speaker and mic details and labels for the functions of soft keys F1–F4. Programme loading from cache memory is virtually instantaneous while loading all the caches from CD-ROM takes around a minute. For each type of reverb there will be a number of programmes. These differ according to the I-O configuration, and the number of speakers, mics and positions. Thus there may be six programs for Medium Hall A mono in, stereo out, but only one for Medium Hall A mono in, 4-channel out. I couldn't find a way of loading caches with different I-O modes, say 4-channel out mode in one cache and stereo out in another. Once a programme is loaded the only reverb controls are Reverb time and pre-delay, variable from 0–0.5s. The minimum Reverb time is 0.3s, maximum 6s. This is also dependent on the specific sample, as you might expect. Several of the samples supplied are limited to figures below the maximum. In practice this should not be a limitation since the DRE-S300 >

hot property

POST PRODUCTION

MUSIC RECORDING

FILM SOUNDTRACK

magmasters
soho - london

As one of the UK's leading audio post production centres, working on high-end television productions like "Trial & Retribution", "Grafters", "Bob Martin", "Madame Bovary" and blockbuster films "Star Wars", "Titanic" and "Deep Blue Sea", Magmasters Sound Studios started their transformation to go 'digital' just twelve months ago.

With the initial installation of two DPC-II digital consoles last year in Studios 1 & 2, a third DPC-II digital console has recently been installed in Studio 5 for Bob Jackson, specifically for TV documentary and Light Entertainment productions. Scott Jackson, Operations Manager for Magmasters, explains their commitment. "We looked at all the available options but the overriding decision was due to Soundtracs compatibility, ease of use and speed of operation".

DPC-II
digital production console

Soundtracs PLC. Blenheim Road . Longmead Business Park . Epsom . Surrey KT19 9XY . UK . Tel: (+44) 0208 388 5000 . Fax (+44) 0208 3E8 5050
Soundtracs USA Inc. 200 Sea Lane . Farmingdale . New York 11735 . USA . Tel: (+1) 516 249 1234 . Fax: (+1 516 249 4854
email: sales@soundtracs.com web: http://www.soundtracs.com

SOUNDTRACS

is all about real world, musical locations. Like all digital devices there is some inherent delay. Sony quote 370 words with analogue I-O and this did not prove problematic.

The remainder of the user tweaks are to be found under the Mixer menu. There are three pages which deal with the mixer, EQ and input trims. Scrolling up or down the menu lines with the jog dial also scrolls between pages when on the top or bottom line. Each channel has its own wet-dry mix and equaliser in 4-channel mode otherwise the controls are ganged appropriately. The EQ is 4-band, top and bottom shelving with two peaking mid bands each with a variable Q (0.1-4.0) with 12dB of boost or cut. The last main menu option is Setup where housekeeping is performed and various global settings established.

In operation the S777 does not disappoint. The supplied selection of programs based on seven sets of samples serve to whet the appetite.There is an uncanny sense of 'being there' about the Church and Medium Hall. Plate A reminds me strongly of the old EMTs of my youth. What a shame it can't reproduce the wonderful gong sound we used to get by kicking the case... I look forward to the rash of samples which will no doubt appear.

Surround capabilities are interesting —four channels of closely related reverb from a mono source. With the programmes supplied this will give LR front and rear with virtual centre. If you need a hard centre you'll have to work out your own salvation. Future programs will deal directly with LCRS format. For film work you could use two units with a mono point source to achieve 5-channel or even 7-channel reverb by loading appropriate mic and speaker placement versions of the particular programme on each unit. For more purist classical music applications, the DRE is designed to recreate reverb from a traditional concert setup where the orchestra is at the front of the hall. Using four machines a full surround reverb is possible with three inputs (LCR) and five outputs (see Diagram). When sounds are panned across the LCR dimension realistic surround reverb is produced. At a pinch this could be done with one unit by recording multiple passes. This raises the possibility of taking an existing stereo recording and treating it with sampled reverb from the original recording venue to produce a surround mix. Record companies dust off your back catalogues now.

The differences between the S777 and a conventional DSP reverb is analogous to the relationship between a synthesiser and a sampling keyboard. It is for this reason some owners of major venues which would be ideal candidates for sampling may well be nervous and see 777 as the new number of the beast. The argument runs like this: Why book Carnegie hall for a recording if you can record anywhere dry and superimpose the acoustic later? I believe they have little to worry about. Just as sampling keyboards have not replaced orchestras, sampling reverbs are unlikely to prove much of a threat. Rather, they add another tool to the armoury. In classical music editing for instance it will surely be preferable to use a sampled reverb of the original venue when doctoring recordings than to use a synthetic DSP modelling algorithm.

There is also the issue of classic kit. Not everyone has the space or cash to maintain a collection of plates, pedals or whatever. Many 'conventional' effects boxes make an admirable attempt to reproduce these, but don't quite hack it. Sampling and convolution processing make for a more credible alternative. One obvious question raised by this approach is, 'can users make their own samples?' The answer from Sony is encouraging although the loudspeakers used for reproduction of the test signals and the mics used for recording the samples will have a profound effect on the results as will the noise floor. The capability already exists in the hardware for the 777 to be used to generate the necessary signals, record and process samples using suitable reproduction equipment and mics. The unit is also said to be physically capable of recording multisamples and averaging them in order to minimise signal-to-noise ratios. The recordings would be stored on Memory Stick (Or given the slot exists, presumably PC cards). The main obstacle to implementation of these capabilities in a release version of the software is a commercial one. It has yet to be decided how to handle the thorny questions relating to rights and distribution of samples.

Sony is to be congratulated on making available, virtually on tap, a technology which was previously cumbersome and didn't quite live up to the promise. The keys to success are meticulous sample recording to minimise the influence of microphone and especially speaker characteristics and careful post processing. When this is achieved, the results are stunning. If the DRE-S777 is a portent of things to come, sampling reverbs may well become as commonplace as sampling keyboards. ■

Contact

Europe: Sony, Jays Close, Viables, Basingstoke, Hampshire RG22 4SB.
Tel: +44 1256 355011.
Fax: +44 1256 474585.
UK: HHB Communications, 73-75 Scrubbs Lane, London NW10 6QU.
Tel: +44 181 962 5000.
Fax: +44 181 962 5050.
Email: sales@hhb.co.uk
US: Sony, 3 Paragon Drive, Montvale, NJ 07645-1735.
Tel: +1 201 930 1000.
Fax: +1 201 930 4752.

Distributors Worldwide

Argentina ◩ DBA Systems SRL
Tel: 00541 545 6800 Fax:00541 545 3668

Australia ◔ Electric Factory
Tel: 00 61 3 9480 5988 Fax: 00 61 3 9484 6708

Austria ◩ TC Electronic Austria
Tel: 0043 800 201 652 Fax: 0043 800 201 653

Belgium ◔ EML
Tel: 00 32 11 23 23 55 Fax: 00 32 11 23 21 72

Brazil ◩ Proware Audio Innovations
Tel: 00 55 11 55852866 Fax: 00 55 11 5584 6586

Canada ◔ Sonotechnique PLJ Inc
(Toro.) Tel: 001 416 947 9112
Fax: 001 416 947 9369
(Mont.) Tel: 001 514 332 6868
Fax: 001 514 332 5537

Chile ◩ Clio Productora Musical
Tel: 0056 2 274 9621 Fax: 0056 2 294 9575

China/Hong Kong ◔ Digital Media Technology (DMT)
Tel: 00 852 2721 0343 Fax: 00 852 2366 6883

Croatia ◩ Slovenia, Bosnia, Macedonia & Serbia: Music Export (Germany)
Tel: 0049 89 746 12390 Fax: 0049 89 746 12392

Denmark ◔ New Musik AG
Tel: 00 45 86 190899 Fax: 00 45 86 193199

Finland ◩ Studiotec KY
Tel: 00 358 9 5123 5300 Fax: 00 358 9 5123 5355

France ◔ DM2J Audio Solution
Tel: 00 33 1 48 63 04 43 Fax: 00 33 1 48 63 18 09

Germany ◩ TC Electronic Deutschland GmbH
Tel: 00 49 40 531 08 399 Fax: 00 49 40 531 08 398

Greece ◔ Bon Studio
Tel: 00 30 1380 9605 Fax: 00 30 1382 7868

Holland ◩ The Netherlands: Total Audio
Tel: 0031 20 447 6447 Fax: 0031 20 447 6464

Iceland ◔ Exton
Tel: 00354 551 2555 Fax: 00354 562 6490

India ◩ R & S Electronics
Tel: 0091 22 636 9147 Fax: 0091 22 636 9691

Ireland ◔ CTI - Control Techniques
Tel: 00 3531 454 5400 Fax: 00 3531 454 5726

Israel ◩ Sontronics
Tel: 00 972 3 570 5223 Fax: 00 972 3 619 9297

Italy ◔ Grisby Music Professional
Tel: 00 39 0 71 710 8471 Fax: 00 39 0 71 710 8477

Japan ◩ All Access
Tel: 00 81 52 443 5537 Fax: 00 81 52 443 7738

Korea ◔ Best Logic Sound Co
Tel: 00 82 2 515 7385 Fax: 00 82 2 516 7385

Mexico ◩ Vari Internacional S.A. de C.V.
Tel: 00 525 604 6946 Fax: 00 525 605 9656

New Zealand ◔ Protel
Tel: 00 64 4 801 9494 Fax: 00 64 4 384 2112

Norway ◩ Lydrommet
Tel: 00 47 22 80 94 50 Fax: 00 47 2 80 94 60

Poland ◔ Hexagon Warszawa
Tel: 0048 22 44 66 99 Fax: 0048 22 44 83 55

Portugal ◩ Calus Tecnologias
Tel: 0035 12 208 4456 Fax: 0035 12 208 6009

Russia ◔ AT Trade
(Russia) Tel: 7 095 956 1105 Fax: 7 095 956 6882

Singapore ◩ Team 108 Technical Services Private Ltd
Tel: 00 65 748 9333 Fax: 00 65 747 7273

Southern Africa ◔ Powerhouse Electronics
Tel: 00 27 11 728 3102 Fax: 00 27 11 728 6789

Spain ◩ Media Sys.
Tel: 0034 93 426 6500 Fax: 0034 93 424 7337

Sri Lanka ◔ HiFi Centre Ltd
Tel: 00 94 1 580442 Fax: 00 94 1 503174

Sweden ◩ PolySonic
Tel: 00 46 31 7069050 Fax: 00 46 31 706 9110

Switzerland ◔ Bleuel Electronic AG
Tel: 00 41 1 751 7550 Fax: 00 41 1 750 5153

Taiwan ◩ Digital Media Technology (DMT)
Tel: 00 866 2 2516 4318 Fax: 00 866 2 2515 9881

Thailand ◔ KEC
Tel: 00 662 222 8613/4 Fax: 00 662 225 3173

Turkey ◩ Imaj Music Yapim VE Organizasyon Ticaret A.s.
Tel: 00 90 212 216 7180 Fax 00 90 212 216 7189

UK ◔ Focusrite Audio Engineering Ltd.
Tel: +44 (0)1494 462246 Fax: +44 (0)1494 459920

USA ◩ Group 1 Ltd.
(East) Tel: 00 1 516 249 1399
Fax: 00 1 516 753 1020
(West) Tel: 00 1 760 360 8511
Fax: 00 1 760 360 8031

Venezuela ◔ C&M Audio
Tel: 00582 263 8790 Fax: 00582 267 4319

Vietnam ◩ Vistar
Tel: 00 84 4 8 824 3058 Fax: 00 84 4 8 825 0099

www.focusrite.com

Packed

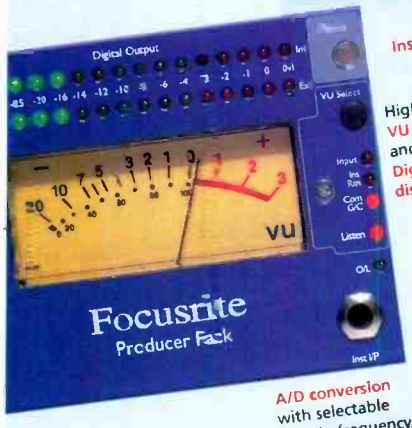
Classic Transformer coupled Mic- & Line preamplifiers and Instrument Pre-amp

High & Low pass Filters switchable to compressor or gate side-chain

Two fully-parametric mid bands of EQ, selectable to Compressor & Gate side-chains

High and Low-frequency shelving EQ with switched frequencies, selectable to Compressor & Gate side-chains

Multiband Limiter for distortion-free limiting. Sum enables External input to be mixed with internal signal path. Mute cuts the output.



High resolution VU meter and Digital output display

Insert send and return may be taken pre-EQ, between EQ and Dynamics or post-Dynamics

Compressor with ratio, attack speed, gain make-up, threshold and release-time controls gives sustained power tc, and control over, vocals and instruments alike

Gate Expander, an essential tool for eliminating background noise

De-esser, based on proprietary optical technology, removes sibilance from vocals imperceptibly

A/D conversion with selectable sample frequency, bit-rate and external clock selection including Super Clock

24/96 READY

Ever since our founder, Rupert Neve, designed the first Focusrite EQ and Dynamics modules they have been the choice of many successful recording engineers and producers.

The ISA 430 repackages these classic designs in one comprehensive unit. Versatile routing and access to the signal processing blocks means you can split the EQ and compressor into two separate signal paths for simultaneous use on two tracks. Or use them both together with the original classic transformer-coupled microphone preamp for the best Total Input Channel money can buy.

Cap it off with the AES/EBU 24 bit/96 kHz optional **Digital Output Stage**, which can also be used as an independent A/D Converter. This is the best of Focusrite signal processing packed into one unit. Hence we've dubbed the ISA 430 the "Producer Pack".

Ask for a demonstration before your next session.

"If you can't get the sound you want through this unit, then you have chosen the wrong Mic (or the wrong performer)."
David Mellor – Audio Media(UK) October '99

"This is a first rate piece of studio gear and is a perfect illustration of why high-end analogue is still the preferred choice for serious audio processing."
Paul White – Sound On Sound Magazine October '99

ISA 430 Producer Pack

£1995 ex.VAT
£2245 ex.VAT WITH DIGITAL OUTPUT

Focusrite
www.focusrite.com

Produced in the UK by Focusrite Audio Engineering Ltd. Phone: +44 (0)1494 462246 Fax: +44 (0)1494 459920 email: sales@focusrite.com

REVIEW

Crane Song Flamingo

A microphone preamp in the hand is worth two in the hide. **Dave Foister** prepares to go birding

THE PHENOMENAL GROWTH in the microphone preamp market has seen the emergence of three basic types. There are those that set themselves up as the ultimate pristine audiophile circuit; those that rely on some fairy dust-facility to create a unique character; and those that offer both, adding some kind of enhancement optionally to an essentially clean signal path. Crane Song's Flamingo falls into this last category, with not one but two subtle treatments available as additions to a high-quality preamp.

Crane Song's quality credentials, under designer David Hill, are well established. It is one of the high-aspiring companies that is dedicated to the use of discrete Class A circuitry whenever possible, and the Flamingo shares this attribute. It also shares the stylistic character of its stablemates, with a fairly plain, neatly legended silver panel set off by big turquoise knobs, a huge matching turquoise-power on indicator, and simple old-fashioned black toggle switches. Crane Song has sensibly avoided the which-way-is-on ambiguity of many US products by mounting

them sideways. But the dominant thing on the front of the Flamingo is a horizontal pair of bright LED meters reading the output level, complete with Clip LEDs, and this, perhaps, shows how simple the preamps are—two in 1U-high with half the space taken up with the metering.

And on the surface this is true. The two controls are for coarse gain and output level, the first being switched in 6dB increments and the second a continuous pot. The output control is a little confused in its labelling; it is actually marked ATTENUATION, but runs from 0 at the bottom to 10 at the top, which means that strictly it does the exact opposite of what it says. In the light of the extra functions of the Flamingo a little more calibration might have been useful, as we shall see.

The first of the two additional effects is simply marked SOUND, switched between Normal and Fat. This selects two quite separate signal paths, the first designed for accuracy and neutrality and the other designed to add valve-like distortion in very small amounts so as to thicken the sound in a predictable way. There is a warning that the switch may click and thump, as the circuitry to suppress this would have compromised the integrity of the Normal path. The Fat sound is clearly intended as a subtle enhancer for vocals and the like, and as such is an interesting and worthwhile effect. If not driven hard or with suitable material it can be hard to detect, but in the right circumstances it adds a distinct lift without obvious processing or added harshness.

The second extra is called Iron, which a moment's thought will suggest is intended to simulate a transformer input stage. The Flamingo is electronically balanced, but for situations where a touch of saturation in the lower frequencies is appropriate the Iron setting will deliver what's needed. The aim is to produce quite large amounts of distortion at very low frequencies, much more modest amounts around 120Hz up, and none at all above 400Hz. Like the Fat setting it is very subtle, and indeed in the absence of low frequency content really does nothing at all, but when the material is suitable it adds a little extra size and impact to the bottom end. Put the two together and you have the potential for adding significant extra body to, say, a big vocal, without doing anything too extreme tonally.

The point about the calibration is that both these effects are level-dependent—the harder you drive them, the more they show. The suggested—and obvious—way of getting more out of them is to increase the input gain, pushing more through the internal circuitry, and decrease the output level to compensate. The trouble is that the meters show the output after an uncalibrated attenuation control, so there is no way of judging how near the internal ceiling you are until something cracks—although there's enough headroom that overdriving it takes some doing.

Curiously, both the effects are switched into both channels simultaneously—you can't have one Fat and one Iron, or one clean and one with an effect. This is such a compromise on the potential flexibility of the Flamingo that I very much hope there's a good reason for it. On the other hand, each channel has its own phase reverse and phantom power switches, but no filters of any kind nor any pads as it can handle +18dBm as it stands.

For normal high-quality microphone amplification the FAT and IRON switches should be off, the Attenuation full up (unity gain) and the gain controlled purely by the coarse switch with perhaps a little trimming. Under these circumstances the Flamingo delivers a commendably quiet, clean and uncoloured sound, avoiding all the compromises that the effects switches work so hard to put back in. It thus neatly achieves its aim of providing the best of both worlds: straightforward quality amplification, plus the option of subtle and distinctive enhancement that would be hard to produce in another way. ■

Contacts
Crane Song, US.
Tel: +1 715 398 3627.
UK: Funky Junk.
Tel: +44 171 609 5479.
Email: sales@funky-junk.co.uk

NEW TECHNOLOGIES

Aphex mic pres

Aphex's 1160 discrete class-A mic valve dual channel preamp has 24-bit, 96kHz outputs and the company's MicLim circuit. The device delivers an EIN of -135dB, the MicLim circuit adds 20dB of headroom, amounting to a preamp that the company claims is virtually impossible to overload. The A–D convertor is scaled to clip at the same point as the preamp. Each channel

has a tuneable 30–195Hz low-cut filter, gain variable 21–B-65dB and a multitrim output trim, 20dB pad, polarity, test tone, phantom power, mute and clock source selection. Available later this year it will cost $1,995 (US). The manufacturer has also added the 1788R remote controller (pictured) for its 1788 8-channel remote mic pre. This can control 16 units for 128 channels and all functions can be accessed from the remote.
Aphex, US. Tel: +1 818 767 2929.

Tascam MD

Tascam, has introduced the MD301 MkII MD recorder designed for DJs, systems contractors and broadcasters. Features include 20-bit A–D and D–A convertors. Sample-rate conversion on digital inputs. Mono recording mode, front panel keyboard

connection via PS/2 type keyboard connector, and XLR and phono I-Os. The IF-PCI16 is a PCI card for Mac or Windows that comes bundled with E-Magic Logic Silver. With two TDIF ports and a DTRS sync port for optional remote control of DTRS machines it serves as a means of transferring DTRS material to a computer for editing or as a means of backing up computer originated material.
Tascam, US Tel: +1 323 726 0303.

Forget *everything* you thought you knew about digital mastering boxes.

DRAWMER

Masterflow

masterflow by drawmer

Every now and then something happens in audio that changes everything. Ivor Drawmer, the man who has designed some of the most loved analogue audio of our age, has turned his attention to digital. And the result is nothing short of stunning.

Elegant and warm, open and airy, subtle yet powerful. These previously "unattainable" analogue characteristics lie within Masterflow's awe inspiring potential. The Drawmer Masterflow DC2476 Mastering Processor reaches a whole new level of digital refinement.

Contact us now for details of your local Masterflow dealer.

DC2476 - 24 bit/96kHz digital mastering processor

- 24 bit A/D - D/A conversion
- 32, 44.1, 48, 88.2 or 96kHz in/out sample rate
- multi band 'Bootstrap' compression
- multi band expansion & limiting
- five band digital EQ ±18dB
- multi band variable tube modelling
- de-essing • autofade
- dynamic EQ with full band compressor
- gain normalisation for maximum loudness
- three band stereo width
- expert factory patches & user memory
- PCMCIA slot for parameter transfer
- word clock in/out • midi in, out & thru
- AES/EBU, SPDIF digital in/out • XLR analogue in/out

http://www.drawmer.com

DRAWMER
Charlotte Street Business Centre • Charlotte Street • Wakefield • West Yorkshire • WF1 1UH • ENGLAND
Tel: +44 (0) 1924 378669 • Fax: +44 (0) 1924 290460 • sales@drawmer.co.uk

Germany • TEAC Germany GmbH • Tel: 611-7158-0 • Fax: 611-7158-11 **Japan** • TEAC Japan • Tel: 0422-52-5081 • Fax: 0422-52-6783 **USA** • Transamerica Audio Group • Tel: 805-241-4443 • Fax: 805-241-7839

PREVIEW

Digidesign PT v5.0/Digi 001

The popular DAW has been enriched with post-biased features. **Zenon Schoepe** reports on developments

DIGIDESIGN targeted postproduction with its release at AES New York of Pro Tools v5.0 which introduces new software editing features, expanded OMF file interchange, and support for new hardware options that offer strengthened integration with Avid video. V5.0 runs on the Pro Tools|24 family for Mac OS and Windows NT with prices starting at $5995.

It is available as a free upgrade to those who bought Pro Tools|24, Pro Tools|24 MIX, or

Pro Tools|24 MIXplus systems after 19th April 1999 and as a $199 software upgrade to those who bought a TDM-based systems before then. It will also run on Power Macintosh G4.

Significantly, new continuous scrolling with playhead options have been added that keep the current play position visible during playback, and a Separate Edit and Timeline feature, that allows two distinct selection areas: one to maintain cursor position against picture, and the other to select the edit source.

The Grabber Tool now works in time-based, object-based or auto-separate modes to nudge, copy or move non-contiguous regions as a group, or to automatically create new regions by pulling out selected areas. Regions can now be snapped to picture by user-definable sync points. Trimmer Tool options have also been expanded, adding time-compression or time-expansion while trimming, and audio scrubbing during trimming. F-key shortcuts can now switch among editing tools and modes while single-stroke hot keys can perform commonly used editing commands.

V5.0 adds two hardware options for bringing Avid video into TDM-based Pro Tools systems. AVoption and AVoption|XL offer complete integration, conversion-free media compatibility, and audio/video sync. AV option is a two-card solution based on the ABVB hardware subsystem and can capture, import and play broadcast quality video from within Pro Tools sessions for resolutions up to AVR 77.

AVoption|XL is a two-card system with a breakout box that captures and plays back JFIF media in video compression ratios ranging from 15:1 to uncompressed. Based on the Meridien Avid hardware platform it permits Pro Tools users to import, capture and playback video files originally created on a Meridien-based Avid workstation, such as the Avid Media Composer XL series or Avid Symphony.

NEW TECHNOLOGIES

Minilyzer

Neutrik's palm-sized Minilyzer continuously measures audio levels as RMS or peak levels as absolute values or relative to a definable reference. Accurate frequency measurement with a resolution of 100ppm acts as the base for distortion measurement as THD+N. A set of audio weighting filters can be activated and a balance indicator monitors and displays signal balance. Results are displayed on a 100x64 pixel backlit LCD. Powered by 3 AA batteries. **Neutrik, US. Tel: +1 732 901 9488.**

oPal

DPR-944
2+2
Parametric
Compressor
& Gate

Also in the Opal Series

DPR-422
Dual Compressor/De-Esser

DPR-522
Advanced Dual Noise Gate

FCS-966
Constant Q Graphic Equaliser

Two Precision Noise Gates

Parametric key-filters for precision tuning

Easy-to-read status indication leds

One full-function dynamics processor

Sometimes you never seem to have the right combination of gates and compressors, and use up too much rack space trying to make the best of what you've got. Well, take a look at our DPR-944 Dynamics Processor - four independent channels to patch as you need.

Two high performance noise gates, with absolute precision gating of unwanted side-signals and easy-to-understand shut/open leds. Two full-function compressors with the sonic purity of BSS's proprietary subtractive compression technology, with unique "parametic compression"

BSS Audio A Division of Harman International Industries Ltd.
Cranborne House, Cranborne Road, Potters Bar, Herts, England EN6 3JN England
Tel: +44 (0)1707 660667 Fax: +44 (0)1707 660755 e-mail: info@bss.co.uk

Location mixer

The Cooper Sound CS208 location mixer updates the CS106/108 line and provides for eight or six input channels. Features include six buses, four main and two aux, two stereo tape returns, three individually assignable stereo headphone outputs and four PPM or vu meters. A new mic input amp is included, Jensen coupled transformer inputs and outputs are used throughout. All outputs are configured with XLR, TQD and DB9 connectors and all connectors are on the back of the mixer. Two remote start-stops support Nagra, Fostex and HHB machines.

Nagra Kudelski, UK. Tel: +44 1727 810002.

The two systems will be available by early next year.

Meanwhile, FilmFrame is a software module designed to work with a Digidesign AVoption- or AVoption I XL-equipped Pro Tools system, providing import, capture and playback of 24fps picture files created by an Avid Film Composer. It enables viewing of an accurate video conversion of original 24fps film footage and thus eliminates the need to work with 29.97fps or 25fps video.

DigiTranslator is an application that provides support for session interchange with Avid and other editing systems using OMFI and coincides with the introduction in v5.0 of PostConform, for Mac OS, as an EDL import/autoconform utility.

While upping the ante on its flagship product, Digidesign simultaneously refreshed its assault on the entry level with the Digi 001 DAW for Mac OS and Windows 98. This is powered by a host-based software version called Pro Tools LE.

Digi 001 is a plug-and-play 24-bit audio/MIDI DAW and includes a PCI card and a multichannel I-O breakout box. Features include 8 analogue audio inputs (two with microphone preamps, -26dB pads and 48V phantom power; the remainder with software adjustable gain), 8 analogue outputs, separate monitoring outputs, 2 channels of SPDIF I-O, and 8 channels of ADAT optical I-O for 18 simultaneous inputs and outputs. Digi 001 also includes MIDI In and Out, a headphones jack with volume control, and record punch-in footswitch.

Contact
Digidesign, UK.
Tel: +44 1753 658 496.
Net: www.digidesign.com

Pro Tools LE supports 24-tracks of 16-bit or 24-bit audio, and introduces the Real-Time AudioSuite plug-in architecture for real-time host-based mixing and effects processing. RTAS plug-ins are an extension to the AudioSuite file-based plug-in spec, and draw from the algorithms, automation capabilities, and functionality of their TDM counterparts. RTAS performance is dependent upon the processing power and RAM of the host CPU.

LE v5.0 includes a MIDI sequencer and flexible mixer routeing, with five sends and inserts per track, 16 internal mixing buses, and automation of all mixing and real-time plug-in parameters. It includes RTAS versions of several DigiRack plug-ins.

Digi 001 is available immediately for Mac OS for $995 (US) with Windows 98 support expected early next year.

The moves are important ones. V5.0 aligns Pro Tools decidedly with post and promises levels of picture integration with Avid systems that are as elegant as they are fast and convenient. Less easy to communicate are some of the on-going small tweaks to the operational and user-interface side of the system which give the impression of a substantial increase in speed in experienced hands. Post power users will undoubtedly appreciate this but then they have been included at their request.

Certainly worth investigation if you are part of the user-pool. ■

Two Compressors with *Dynamic* EQ

Parametric filter for frequency-selective compression

Comprehensive and easily understood metering

Precise side-chain tuning using the monitor function

OPAL DPR-944 – Dynamic EQ is addictive

This technique, where the VCA is placed in the side chain, not only eliminates potential noise and distortion, but means we can give you a unique tone-shaping ability that we call dynamic equalisation, as found on our successful DPR-901. Using the parametric subtract side-chain filter, you can effectively eliminate sibilance, microphone popping and proximity effects with ease, and tame instrument and voice tonal characteristics that vary with level. Only the frequencies of interest are compressed, the rest of the signal is untouched, unlike conventional compressors. Be warned, though. Dynamic EQ is addictive.

BSS Audio

BSS Audio USA
Harman Pro North America, Inc, 1449 Donelson Pike, Nashville, TN 37217 USA
Telephone: +1 (615) 360 0277 Fax: +1 (615) 360 0480

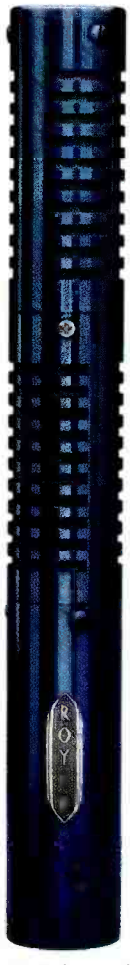
A Harman International Company

www.bss.co.uk

Royer Speiden SF-12

Putting two ribbons into a single microphone, Royer offers a modern stereo package. **Dave Foister** talks deadly accuracy

FOLLOWING MY RECENT LOOK at the few currently available ribbon microphones, a reader wrote to point out that the American Royer model I was enthusing about was not a new design but the latest in a line involving a company called Speiden. Quite by chance I recently encountered a Bang & Olufsen ribbon microphone believed to be from the fifties, and the physical similarities to the Royer were immediately obvious. Steve Lane from Royer's UK distributor Funky Junk confirmed that the Royers owe something to the B&O heritage, and indeed Funky Junk owns a 1970s stereo B&O ribbon that is even closer in appearance.



This all happened just as I took delivery of the Royer stereo model mentioned in the original overview, and whetted my appetite even further.

The Royer Speiden SF-12 is at first sight nothing more than a pair of the mono models bolted together, or at least two head parts sitting on one body. The business end of the mono microphone is a vertical cylinder with slots both sides, through which is just visible the long narrow ribbon. The SF-12 has two of these, although they are not exactly the same as the mono version; they incorporate a new lighter ribbon for improved transient response and even further HF extension.

The two ribbons are mounted one above the other and fixed permanently at 90° to form a classic Blumlein pair. If it seems odd that there should be no angle adjustment, where other microphones offer some degree of swivelling, it is important to remember the almost perfect figure-of-eight pattern exhibited by a ribbon. Two ribbons produce their best stereo image—theoretically and practically—at 90°. Indeed wider angles should be avoided at all costs as they introduce out-of-phase components at the edges of the target sound stage, as the back antiphase lobe of one microphone picks up the same sound as the front lobe of the other. At the same time, narrower angles achieve nothing more than a compromise of the stereo picture and a waste of the microphones' capabilities. The best way to control the stereo pickup of a Blumlein pair is to move it; often the best results are obtained when the 90° angle of the microphones points exactly at the edges of the orchestra or whatever is being recorded. Again, any wanted sounds creeping outside the 90° arc will start to introduce out-of-phase elements. For these reasons it is perfectly natural that Royer should have fixed the two microphones at the chosen angle.

The other option is to set the microphone up with one of the capsules facing forwards and the other sideways to give an MS pair. Many people seem to have the impression that MS requires a cardioid as the front microphone, but any polar pattern can be used (even omni), each giving different results. With a figure-of-eight M like this, equal amounts of M and S translates exactly to the 90° eights we began with, with the added advantage of stereo width manipulation that MS gives.

The Royer is beautifully built and finished in gun-metal grey and in fact the casing for the capsules is made of ingot iron and forms an integral part of the magnetic circuit. A badge with the Royer logo indicates the front and the model number appears on the top, but it is otherwise completely unadorned. At the base is 5-pin XLR for output, and a splitter lead is provided, helpfully labelled UPPER and LOWER to avoid the left-right confusion that would occur if the microphone were suspended upside down. It comes in an attractive wooden case.

The quoted performance figures are another reminder of what a good ribbon can achieve, with a frequency response whose flatness is rarely matched by any other type. The specs still show a top turnover frequency of 15kHz, but the new ribbons take that up to 20. The result is a sound that has all the warmth a ribbon is good at—the word velvety kept coming to mind—but not the HF limitations that might imply. The top end is bright and clear, making this one of the smoothest and most accurate microphones you're likely to find. The nature of the ribbon also means that this is maintained right the way round the polar pattern, which hugely enhances the SF-12's stereo imaging capabilities.

The traditional Achilles heel of ribbon specs is the low sensitivity, although the Royer's is almost in moving coil territory at 2.3mV per Pascal; set against this is the low source impedance that minimises interference pickup along the way. Essentially the Royer generates no noise, but requires a good clean preamp to give it the gain it needs without adding its own.

This is a very satisfying and rewarding microphone that can lend itself to a huge variety of applications, from drum overheads to single-point orchestral recording, in every case offering almost unbeatable stereo imaging and uniformity along with a delightfully open and accurate sound. If anything can put the ribbon back on the map the Royer is it. ■

Contact
Royer Labs,
821 N. Ford Street,
Burbank, CA 91505, US.
Tel: +1 818 760 8472.
Fax: +1 818 760 8864.

NEW TECHNOLOGIES

Summit EQ

Summit's EQ200 is a 4-band EQ in its Element 78 Series and features a digitally controlled class-A analogue path designed by Rupert Neve. It features switchable shelving or peaking filters for the high and low frequencies, sweepable low and high midrange frequencies, and high-pass and low-pass filters with a roll off of 12dB/octave. The EQ200 is controllable by a second unit of by the MPE200 mic pre/EQ and can control the EQ200S slave unit.
Summit Audio, US. Tel: +1 831 464 2448.

328 interfaces

Three interface boxes for the Spirit 328 are now available and connect to the console's TDIF ports. The AES-EBU interface has four AES-EBU I-Os on XLR, a consumer-pro switch, and error flag LEDs. The analogue

interface has eight phono I-Os while the Mic-Line interface has eight mic inputs, eight balanced line inputs, eight balanced outputs on jack and eight analogue inserts. Phantom power is included together with 100Hz high-pass filter and 4-segment metering per channel.
Spirit, UK. Tel: +44 1707 665000.

T-Comp

The T-Comp stereo valve compressor has balanced analogue I-O and a digital I-O can be retrofitted using the 24-bit 44.1/48kHz DI-Mod. Compression is controlled by a THAT VCA with soft knee character while

a FILTER button makes the gain reduction frequency responsive. Attack and release can be adjusted manually while an adaptive mode gives automatic programme dependent control.
MindPrint, Germany.
Tel: +49 6851 905220.

Munro MA1

The Munro MA1 is described as a versatile 3-way integrated active studio monitor that contains a 600W power amp with low frequency power from a class-D amp by Toccata in Denmark. Designed by the same team that developed the Dynaudio BM Active series of monitors the monitor is said to be well suited to multichannel applications and can be used as a ported or closed box system with switchable electronic alignment. The symmetrical cabinet offers consistently matched output for positioning in multispeaker environments. Bass is provide by a pair of Dynaudio 240mm drivers with a 76mm soft-dome covering the midrange. The tweeter is an Esotar T330.
Munro Associates, UK.
Tel: +44 171 403 3808.

>

marantz®

Professional

maximum security facility

At Marantz we take the safety of your recorded material very seriously. With that in mind we would like to introduce you to the new PMD650 Professional Portable MiniDisc Recorder.

With the PMD650, Marantz has taken all of the performance advantages of a miniature disk based digital recording format and built in all the features of a bullet proof field recorder.

SECURITY FEATURES

- Dual Level Mono recording
- SP and LP modes
- One Touch recording
- Level Sync autostart recording
- Pre-Record memory cache and audio buffer
- Pre-UTOC Write (saves all recordings on power down or failure)
- Time & Date Stamp on all recordings
- Mechanical disk eject mechanism

PERFORMANCE FEATURES

- Full complement of analogue and digital i/os
- Switchable 48v phantom power
- Integrated mic and speaker
- AA dry cell or rechargeable NiCd battery pack operation
- Automatic Noise Cancellation
- On-board editing

Marantz Professional Kingsbridge House Radbury Oaks 575-583 Bath Road Longford Middlesex UB7 0EH United Kingdom
Telephone +44 1753 686080 Fax +44 1753 686020 Internet: www.marantz.com

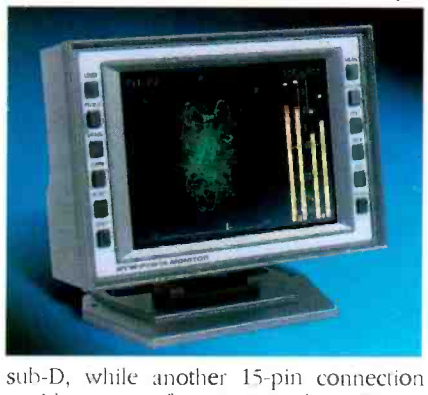
RTW 1024 Plus

With controversy continuing to confuse metering matters, RTW offers us the capable 1024+. **Rob James** takes its measure

TO OBSERVE HEISENBERG'S Uncertainty Principle, an audio meter should have no effect on the measured signal. Easy to say, but much harder to achieve, as audio engineers tell each other on a regular basis. In fact, the unremarkable matter of metering is often the subject of remarkable debate.

Presently, meter displays based around compact electro-luminescent or TFT screens with DSP processing are becoming increasingly popular. The information presented is limited only by the capabilities of the screen technology and the ingenuity of the designer. The RTW Porta Monitor 1064+ is a good example of the type. A 4-channel unit, the main screen combines four bar graphs and a correlation (phase) meter with a stereo vectorscope or 'goniometer'. The 1064+ also displays AES-EBU status, real-time analysis and surround information.

Audio connections are made via a 25-pin



sub-D, while another 15-pin connection enables remote function switching. Power supply is external but the low-voltage lead uses a locking connector, a definite plus. Two AES-EBU inputs and four balanced analogue inputs add to the 1024's versatility.

The unit stands on a heavy cast base and optional panels are available to build the meter into a console or rack. The TFT colour screen is visible from a considerable distance and, more to the point, well off the horizontal axis. At angles of up to 45° it remains perfectly legible. In the vertical plane the picture is less rosy, but this compromise is inherent to the screen technology.

Menu navigation is straightforward with only two layers. The top level is a circular list of setup options navigated via up-down soft keys. Next opens the selected page and then toggles available options on the list. esc returns you to the top level. It is easier to use than to describe.

Seven basic styles of bar graph cover all the popular types; Digital, referenced to dBFS, Nordic, Din and vu types together with both the ubiquitous British IIa, the less common IIb and a ZOOM 20 mode. User-options allow a choice of screen colours, headroom, span, and, in fact, every other parameter I have ever felt the need to alter and then some. Meters are generally designed to display peak levels, essential to avoid over or under modulation however this gives little clue to the perceived loudness of a signal. RTW has attempted to address this with an additional moving indicator on each bar graph. This gives a weighted display of the integrated energy content of the signal and appears to be better measure of perceived average loudness.

The horizontal Correlator bar graph indicates phase coherence of a stereo input. In-phase mono on L&R shows as full-scale deflection to the right or +1, antiphase FSD to the left or -1. For good mono compatibility the reading should remain positive.

Although there is the option of fixing the gain, the goniometer, the display is generally more useful if the auto-ranging option is chosen.

For those unfamiliar with the goniometer or audio vectorscope the principle is fairly simple and perhaps best illustrated by a symmetrical sine wave. Zero is in the centre of the screen. Applying the signal in phase on both L&R channels will result in a vertical line of equal length above and below zero. The same signal applied to left or right only results in a similar line but at a 45° angle left or right. If one channel is phase reversed a circle will result. More complex signals generate frisky wire wool. Good stereo gives a shape taller than it is wide.

The Real Time Analyser is a neat compromise between simplicity and utility. Thirty bands are shown with average or peak with three options for the integration time-constant. The display can span 15dB, 30dB or 45dB. Eight memories allow snapshots to be stored and recalled.

Basic surround functions are included. With discreet inputs the unit gives a display similar to the gonioscope. This gives a good indication of the position of a source in the sound field. It is also possible to display a Right Total, Left Total (Rt, Lt) signal either from an alternative input or mathematically derived internally. But there is no inbuilt matrix decoder so it is not possible to compare the discreet inputs with the decoded version of matrixed Lt,Rt on the surround vector display without using an external decoder and switching.

As a bonus the 1024+ also provides analysis of AES-EBU bit streams. This includes word width analysis and a count on the number of overs with a user selectable threshold.

The 1024+ Porta Monitor manages to cram a lot of useful functions into a small space. It is not as feature-rich as some of the alternatives, but this has the happy result of making it intuitive in use and easy to interpret. I understand RTW has a new unit capable of dealing with 5.1and 7.1 surround signals which I await with interest. Meanwhile this unit is accurate, versatile and easy on the eye. ■

Contact
RTW, D-50765 Koln, Elbeallee 19, Germany.
Tel: +49 221 709 130.
Fax: +49 221 709 13 32.

HHB 80-minute CD-R

Adding to its extensive Advanced Media Products range, HHB has introduced the CDR80 Silver (CD recordable) and CDRW80 (CD rewritable), the first professional 80-minute CD blanks. Launched at the NY AES, both discs are Orange Book compliant, achieving extra running time through reduced track pitch. In line with earlier HHB CD media, the phthalocyanine-based CDR80 Silver and CDRW80 have an expected life span in excess of 100 years and their intended applications include classical recording, archiving and library duties.
HHB, UK. Tel: +44 20 8962 5000.

EMO cable tester

The EMO E450 tests cables using 8-pole and 4-pole Speakon connectors, as well as 3-pin XLR and 1/4-inch mono and stereo jacks.

Once both ends of the cable are connected to the tester the test buttons are depressed and LEDs indicate continuity, cross connection, short circuit, or open circuit. For stability when checking heavy cables four holes are provided in the tester's base allowing it to be screwed securely to a workbench or other surface. Cut-outs on the rear allow EP connectors to be fitted. Kits for 5, 6 or 8-pin EP connectors may be factory fitted or purchased later for retrofitting.
EMO Systems, UK. Tel: +44 191 373 0787.

Leitch compression

Leitch has announced plans for a higher resolution audio compression system for its modular products which will enable compression at 16/20/24-bit resolution and 16/20/24-bit AES transport. The enhanced system will allow existing dual/single stereo AES infrastructures to increase channel capacity to between five and eight stereo signals without adding routeing levels, distribution amps or other equipment. With the Leitch audio compression users will be able to handle multilingual broadcasting, 5.1 surround and other multichannel applications. It also allows one VTR to record video with enough audio channels for surround sound. The technology has come about through newer and more powerful DSPs and improvements in the apt-X compression algorithm.
Leitch, Europe. Tel: +44 1483 591000.

StartREC 400

The Microboards StartRec 400 combines a digital audio editing system with multidrive duplication ability. Editing functions include

This superbly crafted new breed of advanced tube microphone pre-amplifier reaches far beyond mere technical excellence to deliver sound that is uniquely involving, compelling, and real. Our incredible new 2 channel Model 1100 gives you up to 20dB more headroom than conventional preamps, allowing you to record hotter tracks with the highest possible digital resolution. This unprecedented amount of headroom, combined with an EIN of -135dB, allows you to take more gain without the pain of overload distortion or noise.

MORE GAIN-NO PAIN

To achieve this amazing performance, we developed new proprietary circuitry - here's a taste...

- **Discrete Class A Bipolar PNP Solid State Front End**
- **Second Stage Reflected Plate Amplifier™ Tube Circuit**
- **Sweepable Low Frequency Cancellation Filter (LoCaF™)**
- **MicLim™ limiter on the microphone itself makes the 1100 virtually crash proof**
- **Drift Stabilized™ A/D Circuitry eliminates the need for high pass filtering in the digital domain**
- **Third Stage Reflected Plate Amplifier Tube Circuit Discrete Class A Impedance Balanced Output Stage**

MORE GAIN-NO PAIN

Compare this to any other mic preamp in the world - you'll quickly appreciate the benefits of 'More Gain with No Pain'.

For more information visit our web site or contact us for an in depth brochure.

APHEX SYSTEMS

Improving the way the world sounds℠

11068 Randall Street, Sun Valley, CA 91352 U.S.A.
818-767-2929 • Fax: 818-767-2641 • http://www.aphex.com

Aphex, Aphex Thermionics, Reflected Plate Amplifier, LoCaF, MicLim and Drift Stabilized A/D Circuitry are registered trademarks of Aphex Systems.

Neumann Series 100

Less glamourous than its more bulky brethren, the Neumann 'stick' has also been mimicked. **Dave Foister** pushes up the faders

SOME TIME BACK Neumann acknowledged the affection in which the modest and unassuming little KM84 was held by introducing the KM184. This is a non-modular cardioid microphone sharing the basic shape, size and capsule design of the original 84, but with 100 Series transformerless electronics. The pairing of capsule and electronics had effectively been available as part of the modular KM100 range, but the 184 with its simpler integrated construction offers the much-missed microphone at a more affordable price. Now more of the original range is available in the same updated form; the 184 is joined by the KM183 omni and the KM185 hypercardioid.

All are immediately recognisable as being based on the original KM80 range, although the actual construction is very different and even the dimensions are not quite the same. The KM80s were modular like the KM100s, with interchangeable heads on a common body, and, although the 180s share common electronics and differ only in the capsule assemblies, the heads are not readily interchangeable—they will unscrew but it is not intended that this should be done as a matter of routine. Distinguishing the three models is easy despite their identical size; not only is there an engraving of the polar pattern on each near the Neumann badge, but the slats in the head give it away, with two for the cardioid, one for the hypercardioid, and the usual blank unbroken sides for the omni.

Closer inspection reveals more differences from the 80 series, such as the absence of a pad switch. This, a little recessed slide that often needed something pointy stuck into it to move it, was the only facility the originals possessed, making the 180s even more simple; these really could be hung from the roof of a concert hall and left there. In fact this is not a short cut, as the 100 electronics can handle substantially higher SPLs than the 80 series, so the new range's upper limit is higher than the old one was with the pad in.

All come packaged in cardboard boxes, and, although the supplied accessories are unusually comprehensive a sturdier housing might be appreciated. There are cut-out slots for all the bits and pieces in the interior cardboard, but it is still destined for the bin after any attempt to use it to store the microphone in. When cheap imitations can be supplied in smart wooden boxes it seems a bit mean of Neumann to skimp on the packaging like this, unless market research has shown that most microphones just get chucked into the cupboard loose anyway.

The standard complement of components comprises not one but two stand-mounts and a foam windshield. One of the mounts is very similar to the basic plastic one provided for the original KM80s, while the other is a little larger and features a knurled locking screw to clamp it at the chosen angle. There are enough thread adaptor variations to fit them on to anything, and in case you need more options there is a typically huge range of accessories available, including cable suspension kits, double holders, shock mounts, wind screens—Neumann has always boasted one of the largest accessory catalogues in the business.

The appeal of the KM84 was its capability as a complete all-rounder. It had no distinguishing character that made it more suitable for some things than others; rather it produced a neutral convincing portrayal of almost anything, with an honesty that more than made up for a slight lack of extreme LF. I noted in my review of the 184 that the bottom end had been improved and extended, and the same is true for its companions. Particularly noteworthy in this respect is the omni 183, with a flatness of LF frequency response on paper that could only come from an omni—it shows no deviation right to the bottom of the scale. This shows powerfully in the studio, and makes it particularly appealing to those who know how to use omnis. By comparison the other two suffer slightly, but still exhibit a commendably full range. The tight pattern of the 185 is offset by a reduction in bottom compared with the 184, but it is still remarkably uncoloured for such a design. Any of these microphones is at least as versatile as the original, with the small yet significant performance improvement that today's market demands.

On paper the polar patterns of all three are incredibly consistent with frequency, the only significant deviation being at the extreme HF of the omni, which becomes almost hypercardioid at 16kHz. In practice this is not really a problem, and the off-axis pickup of all three is one of the things that sets them apart from the cheaper competition.

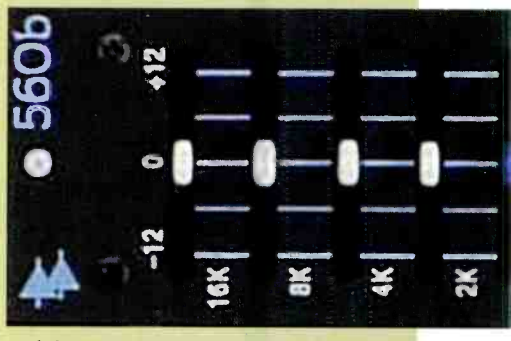
Because, let's be honest, there are almost as many KM84 wannabes out there as there are U87 lookalikes, but few come close to true emulation—the combination of smooth quality and versatility is hard to match. The Series 180 microphones remind us once again who's boss, and why it is Neumann that seems to inspire all the copies. It's good to see them back. ■

Contact
George Neumann Gmbh, Germany.
Tel: +49 30 4177 240.
Fax: +49 30 4177 2450.

move, divide, combine or delete audio tracks, add or erase any index or sub index and create track fade in or out. Digital audio sources can be imported via SPDIF or AES-EBU or analogue and an automatic CD format detection feature provides one button operation. Recording speeds can be adjusted to x2, x4 or x8 and eight CD recorders are supported for simultaneous disc creation.
Microboards, US. Tel: +1 612 556 1600.

API 560 graphic reissue

API has reissued its 560 10-band graphic EQ originally available in the 1960s. The sound quality has been retained but the unit fits into flexible, outboard, modular frames rather than directly into consoles as the original version did. The heart of the 12dB of boost-cut per band box is the 2520 opamp,



and frequency centres start at 31Hz and span ten octaves up to 16kHz. Other new reissues of the API 500 Series include the 525 compressor-limiter, the 512C mic pre and the 550b equaliser. Each small processor fits into the 500H (2-slot rack with PSU), 500b4 (4-slot lunchbox with PSU), or 500V (10-slot rack with outboard power).
ATI-API, US. Tel: +1 410 381 7879.

Jünger compact

Jünger's 4-channel A–D and D–A convertor b44 has 24-bit convertors and fitted with an SDI-interface for embedded audio processing it converts between analogue, digital AES-EBU and digital audio embedded in a serial digital video stream. Inputs and outputs can be linked using an internal routing matrix. Sample-rate convertors for adjustment of input sample rate and dither modules for adaptation of audio resolution are included. The modular processing system C8000 combines a selection of input and output interface cards with 2- or 4-channel audio processing DSP cards in a 3U rack frame. The functionality of the processing cards depends on the loaded DSP software from the Jünger Audio hardware processors. C8000 saves space and costs in remote controlled multichannel processing applications. New audio embedder/de-embedder cards will be launched.
Jünger Audio, Germany.
Tel: +49 30 6777 210.

Digital location mixer

The Cameo LRC location recording console is described as the first portable, digital location mixer. The desk includes a

If you are journeying into sound...

...you can now afford to Travel First Class

The journey starts with the latest E-MU® Ultra series of samplers. Your transport to sound really moves - with a superfast processor - and great software. High quality combinations that are truly excellent value. Quite simply the best samplers we've ever made.

High performance means refusing to compromise in design. Every component has been selected to provide the highest professional quality. User-friendly EOS software is your navigator to sounds that once took years of experience to achieve and allows amazing audio manipulation. Just try 'Beat Munging'! The enormous E-MU Sound Library lets you stretch fantastic filters to their limit, creating a full dynamic range which has to be experienced.

EOS is as flexible as you want, with three models that can each be expanded to the maximum specification. Choose your starting level and move on up when you're ready. And flexibility extends to existing E-6400, E-Synth, E4X and E4XT, too. All can be fully (and cost-effectively) upgraded to the full Ultra specification.

- Ultra Fast Processor
- All Outputs Balanced
- Largest Sound Library
- Easy, Intuitive O/S
- Cool New DSP Functions
- Powerful Sophisticated Filters
- Major File Formats Supported
- 48 Track Sequencer
- PC/Mac Editing Software

So what are you waiting for?

Call us now on +44 (0)131 653 6556

E-MU SYSTEMS

Suite 6, Adam Ferguson House, Eskmills Industrial Estate, Musselburgh, Scotland EH21 7PQ

© 1999 EMU-ENSONIQ. E-MU®, E-MU SYSTEMS, ENSONIQ®, the EMU ENSONIC logo, the E-MU SYSTEMS logo, the ENSONIC logo, E-6400 Ultra, E-Synth Ultra, E-4X Ultra and E-4XT Ultra are trademarks owned or licensed by E-MU ENSONIQ, registered in the United States as indicated by ®, and in numerous other countries worldwide. All other trademarks are property of their respective owners.

Steinberg Nuendo

Steinberg now has its higher end post-orientated DAW ready. **Zenon Schoepe** appraises the native stance

SHOWN FOR THE FIRST TIME some two years ago, Steinberg's flagship Nuendo 'Media Production System' has been a long time coming but will ship by the end of the year for $1,295 (US). What excited many at that first announcement was the revelation that it would run on SGI, something that was largely unheard of in audio at the time and something that communicated a sense of seriousness. Two years is a long time in audio and an eternity in computing and with the many computing changes that have occurred Nuendo now runs on Windows NT with a BeOS version planned.

Aimed at film, video and the interactive media sectors, Nuendo is a modular system that uses entirely native processing and is supported by a collection of hardware accessories. It will run to 128 tracks of digital audio, includes surround mixing, a video track, MIDI tracks plus the usual editing capability. VST

and DirectX plug-ins are supported which means that more than 200 are currently available. ASIO implementation supports sound cards from stereo I-O up to 48 I-Os and 24-bit, 96kHz resolution.

Steinberg makes much of the use of the computer host processor rather than additional DSP and argues that the use of DSP fixes flexibility at its creation. There are a number of manufacturers who would not agree with this tack but Steinberg is convinced that the strength is in the software. An advantage of the native approach is that the system is scalable through the sophistication of the host computer and projects can be started on a basic computer and transferred along a production chain that ends with mixing, mastering and completion on a state of the art processor.

Nuendo is object orientated and features drag and drop prominently, something that is well demonstrated in its handling of crossfades. These can be manipulated by dragging the audio clips or the crossfade region around and the process does not create an additional file. The system's attitude to Undos is interesting. Effects can be applied in real time, but audio clips can also be processed off-line and these have an edit history associated with them that can be edited and altered.

Alternatively audio can be permanently changed with a sample editor and this also boasts high levels of Undo.

Audio tracks are linked directly to mixer tracks which have 4-band EQ, 4 insert points for plug-ins, and 8 auxes per channel together with 8 global plug-in effects. Predictably the mixer is fully dynamically automated and can be controlled via external hardware remotes. The multichannel capability of the mixer is impressive within the context of its own environment and it is important to remind that the system has access to numerous surround-able plug-ins.

Nuendo chooses to employ 'speaker sets' which can be configured as presets for the various multichannel formats which can be switched between if necessary. Most interesting is the availability of multichannel mastering tools that understand the speaker sets approach and manage image shift and balance issues accordingly. The LFE channel is available as an individual routing destination, can be filtered and can be accessed from an aux on every mixer channel. Panning modes take the form of plug-in modules, which offer a choice for different applications, and leave the stage open for any future developments.

The system can sync to any time-code source that can be translated in to MTC, but is most elegant when run with Steinberg's TimeLockPro synchroniser which facilitates direct chase and lock to VITC and LTC and provides an ultra low jitter word-clock source. It can also handle AVI and MPEG video formats with preview thumbnail tracks and run frame synced to Nuendo audio. A current video file can be placed in to a window and switched on and off line and Nuendo supports dedicated video hardware like Miro DC30.

Networking is taken care of in host computer fashion allowing fast ethernet connection between multiple machines with remote access of a specified computer's sound storage across the network. Project archival causes the accessed files to be copied and stored within a project on the local computer.

Steinberg has really set out is stand with Nuendo and does a convincing job of arguing the case for native signal processing's true coming of age with this product and that things will only get better and faster.

It claims that a Nuendo running on an Intel Pentium III can play back 32 tracks comfortably from a single modern drive with effects and equalisers. Track replay capacity can be increased with parallel additional drives or a SCSI RAID disk array. A real leap in real-time audio processing power can be grasped with a dual Pentium system.

Reservations about Nuendo will almost certainly centre around just how convinced potential users are by the defence of the native processing issue as anyone who sits in front of the system for any length of time cannot deny Nuendo's abilities. It's a interesting and viable product.

Maybe this is the future, Steinberg clearly thinks that it is. Decide for yourself. ■

Contact
Steinberg, Germany.
Tel: +49 40 2 10 33 0.
Fax: +49 40 21 15 98

sunlight readable plasma display, 24-bit, 96kHz operation, compact design, effects, a graphical user-interface, DA98 GPI control, eight inputs, 6 outputs, remote machine control and wireless mic control.
Zaxcom, US. Tel: +1 201 652 7878.

Slant surround

EV has debuted the SL12-2V 15° slant surround cinema loudspeaker. The 2-way system has a high excursion 12-inch woofer and 1-inch compression driver HF on a 100°

x 90° horn with a claimed 70Hz–20kHz frequency response with switchable ISO 2969 roll-off.
EVI Audio, US. Tel: +1 616 695 6831.

Synclav v2.0

Synclavier Digital Corporation's Synclavier PowerPC v2.0 software package is a complete port of the original Synclavier real-time software that runs natively on Mac G3 and G4. It supports all the original options and voice cards but takes advantage of modern computer technology and networking. It supports 100MHz ethernet networking, 24-bit digital input and OMS MIDI integration.
Synclavier Digital Corp, US.
Tel: +1 978 744 0947.

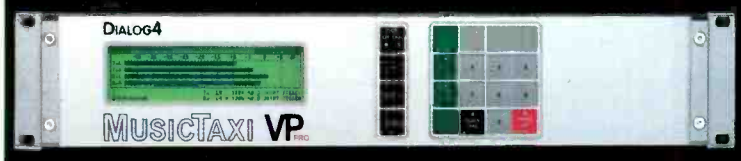
BitHeadz and Pro Tools

BitHeadz has implemented support for Digidesign's DirectConnect technology for Pro Tools. DirectConnect allows the main stereo mix and all 16 MIDI channel mixes from the Unity DS-1 sampler and the Retro AS-1 synthesiser to be routed directly into Pro Tools. With these fitted the user will be able to route 32 streams of audio to the TDM bus. BitHeadz also has plans to add DirectConnect to its other software instruments, Voodoo MIDI Drums, and Black and Whites Virtual Piano.
BitHeadz, US. Tel: +1 831 465 9898.

MultiMax upgrade

New software enhancements for the Martinsound MultiMax multichannel monitor controller are accessed through a new SPL

Choosing the right audio Codec.

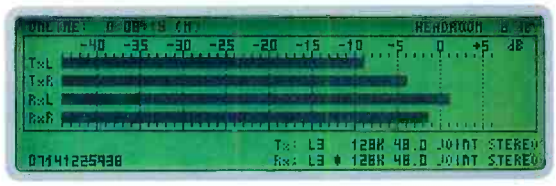


We are not American or British. We don't belong to a big industry corporation. So we have to work that little bit harder. We started 8 years ago with advanced MPEG integration into Audio Codecs and have dedicated ourselves to making them as user-friendly as possible. Our product know-how covers ISDN and satellite transmission, recording, editing and storage. Add our experience, research capabilities and production expertise and you have the legendary German Quality that keeps us one step ahead. For more information, call our UK distributor Charlie Day at THE UK OFFICE, Tel. +44 (0) 1442 870103, or contact our headquarters in Germany.

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 codces. 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.

DIALOG4®

DIALOG4 GmbH, Monreposstr. 55, D-71634 Ludwigsburg, Tel.-49-7141-22660, Fax-49-7141-22667 · http://www.dialog4.com · email: info@dialog4.com.

Avalon Vt747sp

Like good and evil, 'clean' and 'valve' sounds both have something to offer. **Dave Foister** finds a temptation at his fingertips

AVALON'S RANGE of distinctive signal processors continues to grow with the Vt747sp, a compressor with EQ intended for overall stereo treatment. The range is distinctive both in styling and in design approach, and the 747 shares both these characteristics with the 737 Direct Signal Path.

The cosmetic style comes from a thick aluminium front panel featuring a recessed panel, a bolted-on meter housing, and big metal knurled knobs. The layout is clear and well-labelled despite the flexibility on offer, which was just as well since the manual was not sent on by the previous loanees. One cosmetic niggle: the switches are back-lit transparent push-buttons, and the lights are so far back inside that they can make adjacent switches look as though they're on if you're not directly in front of them.

Avalon's distinctive electronic characteristic is the fondness for class-A operation and discrete solid-state circuitry. The 747 shares the 737's hybrid approach, building the compressor round a valve stage and opto-couplers while remaining solid-state elsewhere. This time the use of the valves is optional, selected by a switch marked TSP for Tube Signal Path, giving a useful facility to choose the character that best suits the job.

Avalon generally puts one or two unusual features in as well, and the compressor here is no exception. In some respects it's simple enough, with continuously variable Attack and Release times, click-stop pots for THRESHOLD and RATIO controls, and variable gain make up. The single huge vu meter in the middle shows the amount of gain reduction, and is augmented by a blue LED buried among the controls. The time parameters are completely uncalibrated, marked only from Slow to Fast, and are so forgiving that they could be signal-dependent, although Avalon does not say so. Everything else is calibrated in the expected way, although the Threshold is unusual in having most of its rotational range above zero and a relatively small arc below. This fits with its mixing-mastering role as subtle treatment of the upper reaches of the dynamics is more likely to be required than serious crunching of the lower level stuff. All of this is simplicity itself to set up, and the ranges of the controls are such that gentle unobtrusive smoothing is as easy as aggressive dynamic contouring.

> The use of the valves is optional, selected by a switch marked TSP for Tube Signal Path, giving a useful facility to choose the character that best suits the job

The extra element within the compressor section is a couple of swept EQ bands sitting in the side chain. These are labelled SIDE-CHAIN CONTOUR, and are broad filters with 15dB of boost and cut and overlapping frequency ranges. They can be switched in and out as a pair, and also allow for the signal through them to be monitored, although this can give rise to some initial confusion.

The key is that as they are controlling the contour of the threshold, increasing their gain settings raises the threshold within the band so that the compressor does less. Because of this, when the side chain is monitored, what looks like a pair of semi-parametrics seems to be working back to front, as turning the gain down to -15 turns the band up as heard via >

World class mixers by Alice

Available from our recognised distributors

Africa
Globecom
(21) 448 4521

Denmark
Interstage
(45) 3946 0000

Germany
Mediatron
(49) 8131 83050

Asia
Harvest Scientific & Technology Co Ltd.
(85) 2 24 98 1788

Ireland
Broadcast Technical Services
(35) 314 53 0555

Total Broadcast.
(35) 351 30 4740

The Netherlands
Audio Electronics Mattijsen
(31) 20 699 0480

Sony Benelux
(31) 20 658 1911

Paris
Digital Development Distributors
(33) 142 46 85 01

Spain
ASPA
(34) 91 694 3711

Sweden
Tranzicom
(46) 8 730 3710

For full details, telephone:
+44 (0)1342 833500
email: sales@alice.co.uk
website: www.alice.co.uk
Shop site: www.aliceshop.com

Alice®
Broadcast Solutions

Level-Range menu page in the setup directory. They include an SPL Display Range mode adjustable in 5dB increments and an extension of the level range by 30dB. A Wide Inputs Interlock mode permits all five 8-channel inputs to be selected in any combination, or in an interlocking mode.
Martinsound, US. Tel: +1 800 582 3555.

British channel

Joemeek has launched the VC6Q 'British' channel which combines a mic pre with, compressor and equaliser sections. The mic pre is a 5-stage design with phantom power, 20dB pad, phase reverse, overload indicator and front panel mounted passive instrument input. A full mono optical Joemeek compressor has compression control for threshold, fully variable slope and attack and release controls that run with gain

reduction metering. Equaliser is derived from the Meequalizer EQ unit with LF and HF shelf and a sweepable mid. Compressor and EQ sections can be bypassed.
Joemeek, UK. Tel: +44 1626 333948.

MotU 24I

Mark of the Unicorn has announced the 24i, a 24-input analogue audio interface for computers that will be sold as an expander for 2408 and 1224 hard-disk recording systems and as a complete core system for Mac OS and Windows 95/98. The 24i offers computer-based hard-disk recording in a cost-effective 1U 1-O unit with 24-bit convertors. Designed specifically for multitrack audio production entirely within a host computer, the single rack space 24i provides 24 balanced TRS inputs for simultaneous recording of 24 channels of 44.1 or 48kHz audio. For stereo monitoring, the unit's main outputs are supplied in 24-bit balanced TRS jack. 24-bit optical SPDIF and 24-bit RCA SPDIF. The 24i includes ASIO, Wave and Sound Manager drivers for compatibility with popular audio software and the core system ships with AudioDesk, MotU's sample-accurate audio workstation software for MacOS. MOTU has demonstrated new features for Digital Performer including adjustable PPQN resolution, beat-based effects automation, support for Apple Computer's new G4 processor and Velocity Engine, and a new MIDI Drum Editor window.
Musictrack, UK. Tel: +44 1767 313 447.

Installation voice processor

Symetrix has introduced a voice processor specifically tailored for installed sound applications. The single channel 527E Voice Processor combines a mic preamp with a compressor-limiter, an expander, high-pass and low-pass filters, and 3-band parametric EQ. The device accepts mic or line inputs with phantom power, push-button 15dB pad, a compressor-limiter and downward expander and the parametric bands deliver ±15dB of boost across overlapping the monitor path and makes the compressor work much harder in that range. I'm not sure why Avalon would have decided to do it that way, as most of us are used to simply boosting a frequency band in the side chain to make it compress more, but once you've got the hang of it it's okay, and the fact that the knobs seem at first sight to work backwards does not detract from the feature's presence.

There's more to come, also in the EQ area, but quite different from what the 737 offers. To the right of the meter is a 6-band graphic, with three bell-shaped mid bands, a shelving LF band and not one but two shelving bands, one mid-range at 5kHz and one up with the bats at 32kHz. Boost and cut is in single figures for all but the outer two bands, which run to ±16dB, although all are shown on the panel as ±3. Subtlety is the aim here, and it is indeed a very sweet and smooth EQ, just right for a little final tweak of a mix.

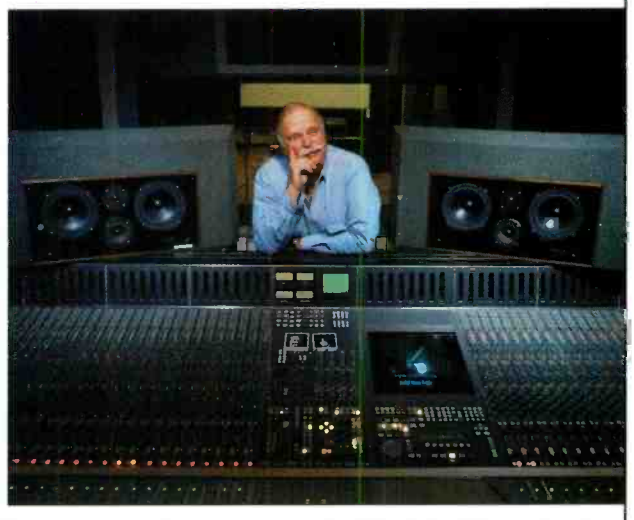
Contact
Avalon, US.
Tel: +1 949 492 2000.
UK: ASAP.
Tel: +44 171 231 9661.

As with other Avalon EQs, the apparently ultrasonic band is actually very useful for a little bit of shine or softness. Like the 737, the 747 has a switch for placing the graphic pre the compressor stage, adding further detailed tailoring possibilities. The final area of the panel contains a pair of red LED meters (so bright and fast that they look like flickering flames when they're running), an EQ in-out switch and a final output level control.

The sonic qualities of the 747 are impressive indeed, achieving the unlikely feat of two paths that both sound neutral and accurate and yet are different. The valve path adds a certain thickness and size to the sound while the other is the more open and transparent, yet both are quiet, flat and clean. The subtle difference, along with the flexibility and fine control of the ganged stereo processing, makes it a very desirable mastering compressor indeed. ■

"I'm Listening to Westlake"

When 5-time Grammy Award winner Bruce Swedien listens, everybody talks. And now they're talking about Westlake Monitors...



Experience audio monitoring the Westlake Way and join the hundreds of recording studios, broadcast facilities and independent professionals worldwide that depend upon the performance and reliability of their Westlake Monitors day in and day out.

WHEN YOU NEED TO HEAR EVERYTHING - YOU NEED TO LISTEN TO WESTLAKE

MANUFACTURING GROUP
2696 Lavery Court, Unit 18, Newbury Park, CA 91320
805-499-3686 FAX (805) 498-2571 • http://www.westlakeaudio.com

Westlake Audio

Dealer contacts:
Belgium: Trans European Music 322 466 5010 • **China:** GuanHua Glory AV System 86 10 6395 0197 • **France:** Eurocom Broadcast 33 1 6064 2121 • **Germany:** Digital/Audio GmbH 49 211 92005 0 • **Greece:** Akoustiki 30 1 823 8200 • **Hong Kong:** Hapworld SDL Ltd. 852 2898 9366 • **Israel:** dB Studios 9728 518 1451 • **Italy:** Synova s.r.l. 39 071 781 9811 • **Japan:** AVSeartron Corp. 81 424 67 0541 • **Netherlands:** Technical A/V Consultant 31 294 253010 • **Spain:** Fading S.A. 34 91 377 2400 • **Sweden:** POL-Teknik 46 8 708 7570 • **U.K.:** Larking Audio 44 01234 772244

Maycom Easycorder

Following up his earlier review, **Neil Hillman** presents a field test of Maycom's digital location recorder

INDULGE ME. I'm going to be rather smug about telling you how the Maycom Easycorder that has been a companion for the last two months and how I fared in the heat of competition. Under the guise of extended appraisal, the machine and I have become close friends and now I must return it to its foster home.

Before I do, however, I am going to introduce it to Matthew—my neighbour's 18 year-old sound-student son who is just starting out on the long and winding XLR road. Matthew has his first location-recording assignment: to produce a one minute edited montage that had to include a minimum of eight different identifiable spot effects or dialogue. In my time I chose to record buying 20 Rothmans King Size from the corner shop, he chose to stage a mugging—I leave you to draw your own conclusions on the youth of today. I chose to use the Maycom Easycorder; I made him use my original local radio ¼-inch machine: the one that rhymes with 'brewer'.

> It offers in its basic guise the cheapest entry into the solid-state recording market with onboard editing using internal memory and removable cards

To recap, the Easycorder (*Studio Sound*, September 1999) is a portable battery-mains powered digital audio recorder made in the Netherlands by Maycom, distributed in the UK by the Canford Audio group. It offers in its basic guise the cheapest entry into the solid-state recording market with onboard editing using both internal memory and removable PC cards. Its rivals in this competitive radio-journalist arena include the Nagra Ares-C, Mandozzi DART and Sonifex Courier—all proven and shipped kit and all managing to retain the immediate feel of traditional portable recorders. The Easycorder is smaller and lighter than the others named here, and less 'recorder-like' too, being almost akin to the Zaxcom Deva in feel. In use, it quickly inspires confidence not only with the ease in which the device may be configured to suit the host studio's system requirements but, equally importantly, in the quality of what is recorded. While not unique to Maycom, the useful Time Shift recording facility ensures that, through a looping RAM-buffer, the machine constantly records 20s–60s worth of material—depending on user-settings—before the RECORD button is pressed; ensuring tight 'in's' or clipped opening words are a thing of the past.

The layout of the Easycorder is straightforward enough, with 2-channel analogue male XLR mic-line balanced inputs and female XLR line balanced outputs mounted on the right-hand-side of the machine. In the absence of headphones, and when not in record, the in-built 1W speaker is sited to radiate from the machine's top surface. The left-hand side of the machine carries the digital connections with an AES-EBU input , twin phono sockets for SPDIF input and outputs, a 25-pin ECP port for transferring audio between the Easycorder and a notebook-desktop PC and a shutterless open slot to accept an external PC hard-disk or flashcard or the optional ISDN modem.

With the recording of our two montages dealt with easily enough by both the analogue and digital machines, the time taken editing our respective 'field-tapes' highlighted just how far technology has progressed, and making me look—unfairly, but satisfyingly—slick.

The down-side of the Easycorder editor is the lack of a scrub-wheel. While it takes only a short time to get into the Easycorder's method of selecting in and out points by pressing a MARK button—and then cutting or pasting—a flywheel arrangement gives more 'feel' when scrolling up and down an audio wave-form.

However, such features clearly come at an extra cost—so perhaps I'm expecting too much from an entry-level priced machine that almost offers as much as its costlier rivals, and pluckily stands up to the bigger boys. The Easycorder is a machine that is almost the ideal for a radio journalist—it comes in at the right price, it is robust and overall it is dependably reliable. But in my heart I know that the little luxuries of the Nagra, Mandozzi or Sonifex would become a source of envy within a short period of time. ■

Contact
Maycom, Dorpstraat 29, 6661 EG Elst, The Netherlands.
Tel: +31 481 377 740.
UK: Canford Audio, Crowther Road, Washington, Tyne & Wear NE38 0BW.
Tel: +44 191 418 1122.

NEW TECHNOLOGIES

< frequency ranges. The 527E also provides a cough switch.
Fuzion, UK. Tel: +44 1932 882222.

DevaLink

Synchro Arts' DevaLink provides transfer of location sound recorded on Zaxcom's Deva series portable hard-disk recorders directly into audio and video editing systems, including Pro Tools and Avid Media Composer. Transfers are fast, automatic, and save hours of work and audio is transferred with complete time-code information, either directly to the correct position on the time-line (for Pro Tools and Audio Vision) or as Masterclips in the audio bins (for Media Composer).
Synchro Arts, UK. Tel: +44 1372 811 934.

Wavewarp v1.1

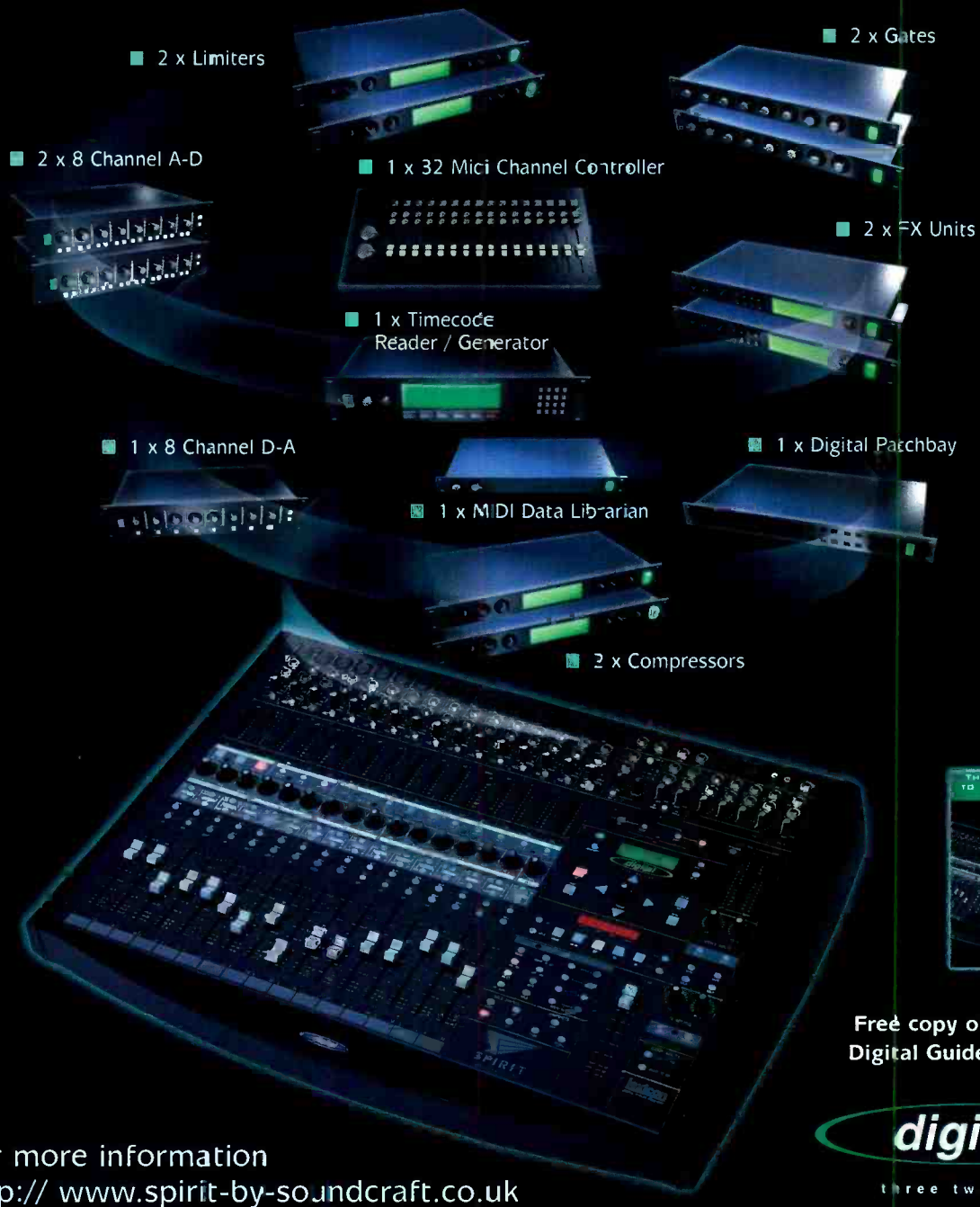
WaveWarp Version 1.1 is an object-orientated real-time audio effects tool for Windows with more than 250 modular components. DSP components run native on the PC under Windows 95/98/NT4.0 support all Windows-compatible soundcards (with WAV drivers) and multiple soundcards with multiple channels (for building surround-sound effects from scratch). A multirate engine supports on-the-fly sample-rate conversion between components. Audio effect components include filters, delays, mixers, de-noisers, spectral transformers, signal generators, reverbs, phasers, flangers, chorus, modulators, dynamic range controllers, oscilloscopes, spectrum analysers and more.
Net: www.soundslogical.com

Measurement preamp

AudioControl Industrial's 2-channel, measurement mic preamp the MP200 is compact and designed to work with computer soundcard-based measurement systems. It is battery powered for portable use and has switchable input gain, variable output pink noise generator. 94dB acoustic SPL reference light for calibrating computer programs and other level meters, and a calibrated mic. One channel is mic only while the other can be switched between mic and line levels.
AudioControl, US. Tel: +1 425 775 8461.

The Future at your Fingertips

Embrace new technology and move forward to a console which combines state of the art devices in a single unit with the most intuitive user interface in the audio industry to date. The Spirit 328 gives you control where it counts.



Free copy of the Spirit Digital Guide to Mixing

digital
three two eight

For more information
http:// www.spirit-by-soundcraft.co.uk
www.digital328.com email: spiritsupport@soundcraft.com

SPIRIT BY SOUNDCRAFT TEL: +44 (0)1707 665000. FAX: +44 (0)1707 665461

A Harman International Company

SPIRIT DIGITAL 328

Send me a brochure on Digital 328

The full Spirit Range

I would use Digital 328 for

DIGITAL MIXING CONSOLE

I read the following magazines

Name:

Address:

Postcode:

Please send me my free copy of Spirit Digital Guide to Mixing

SPIRIT BY SOUNDCRAFT HARMAN INTERNATIONAL INDUSTRIES LTD. CRANBORNE HOUSE SS
CRANBORNE ROAD, POTTERS BAR, HERTFORDSHIRE EN6 3JN, ENGLAND.

SPIRIT BY SOUNDCRAFT

Alesis M1 Active

For methodology see Studio Sound, April 1998, page 14.
See it on the Internet net-site:
www.prostudio.com/studiosound/apr198/r_tannoy.html

Studio Sound's 'bench test' loudspeaker reviews continue with the M1. **Keith Holland** reports

THE ALESIS M1 is a 2-way active loudspeaker consisting of a 165mm diameter carbon-fibre cone woofer, a 25mm soft-dome tweeter and built-in power amplifiers and crossover electronics. Both drivers are magnetically shielded. The power amplifiers are specified as 75W for the woofer and 25W for the tweeter and the crossover as an 8th-order filter set crossing over at 1500Hz, along with additional time-alignment circuitry and a high-pass protection filter. The cabinet is a ported design with dimensions of 380mm high by 215mm wide by 250mm deep, and each loudspeaker weighs 8.9kg. The back-panel contains a line input socket and input level control, along with an IEC-type mains socket and switch. The input socket can accept ¼-inch jack or XLR-type plugs that may be balanced or unbalanced. Sensibly, there is a pair of posts either side of the input socket and control to protect the latter from damage should the loudspeaker be placed on its back.

Fig.1 shows the on-axis frequency response and harmonic distortion performance for the M1. The response is seen to lie within ±2.5dB limits from 48Hz to 19kHz, which is a commendable result. The low-frequency roll-off is 6th-order, due to the use of a bass reflex port and a high-pass protection filter, with the -10dB point at about 40Hz. Harmonic distortion is low with the 2nd harmonic peaking to -34dB (2%) at 75Hz, but reducing to below -46dB (0.5%) above 100Hz; 3rd harmonic distortion remains below -46dB above 60Hz. The off-axis frequency responses are shown in Fig.5 for the horizontal, and Fig.6 for the vertical plane. The directivity is seen to be well controlled in both planes with a cross-over interference notch only evident in the 'downward' direction. High-frequency lobing is only evident at very high frequencies and at angles well away from the axis. The relatively low cross-over frequency in this design ensures that the mid-frequency narrowing, usually associated with very rigid diaphragms, is kept reasonably low at 5dB for 60° off-axis (horizontal).The time-domain performance of the M1 is shown in the step response, Fig.3; acoustic source position, Fig.2; power cepstrum, Fig.4; and waterfall plot, Fig.7; respectively. The step response indicates that there is a time-alignment problem between the drivers, with the peak in the mid frequency response delayed by about 1ms compared to the initial, high-frequency attack. This is further borne out by the movement of the acoustic source position to some 0.3m behind the loudspeaker at 1.8kHz. The waterfall plot shows very little 'ringing' at this frequency indicating that the delay is not due to resonant behaviour. Both the waterfall plot and the acoustic source position show the effect of the 6th-order low-frequency roll-off, with the low frequencies appearing to emanate from a position some 3m behind the loudspeaker. The power cepstrum shows very little activity due to the smooth and even on-axis frequency response, but there are low level echoes at about 100µs and 200µs.

Overall, the Alesis M1 Active is an impressive performer. The on-axis frequency response is commendably flat and the off-axis response and distortion performance are both good. The otherwise excellent performance is let down slightly by a peculiar mid-range phase response, which results in a group delay of about 1ms at about 2kHz. The limited number of experiments that have been carried out on the audibility of group delay indicate that this figure is close to the threshold of audibility. Questions concerning the audibility of phase at low frequencies have yet to be answered however, but a project has just begun at ISVR, University of Southampton, to investigate the audibility, or otherwise, of high-pass protection filters in loudspeakers; the results may aid the interpretation of the measurements presented in this series of reviews. ■

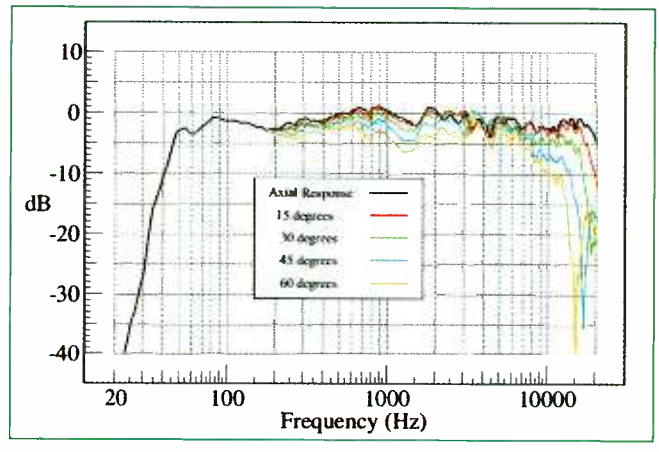


Fig.5: Horizontal directivity

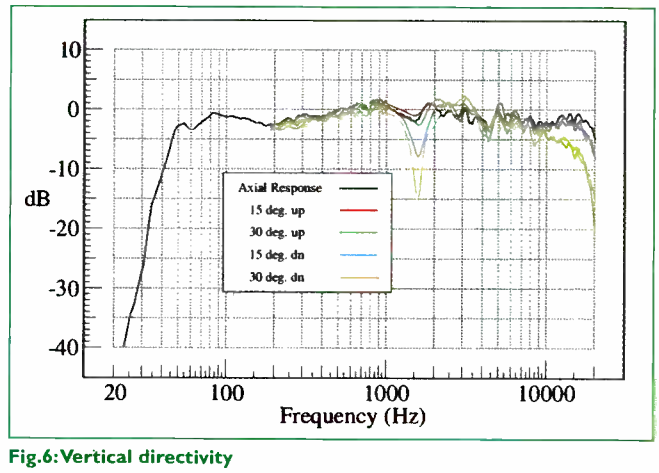


Fig.6: Vertical directivity

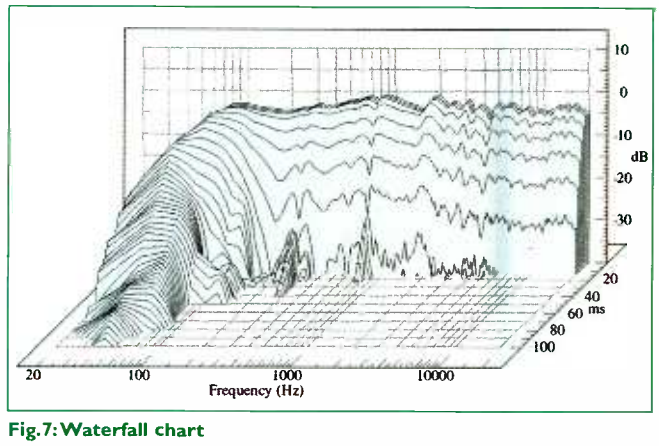


Fig.7: Waterfall chart

Contact
Alesis Studio Electronics,
US. Tel: +1 310 558 4530.
UK: Sound Technology.
Tel: +44 1462 480 000

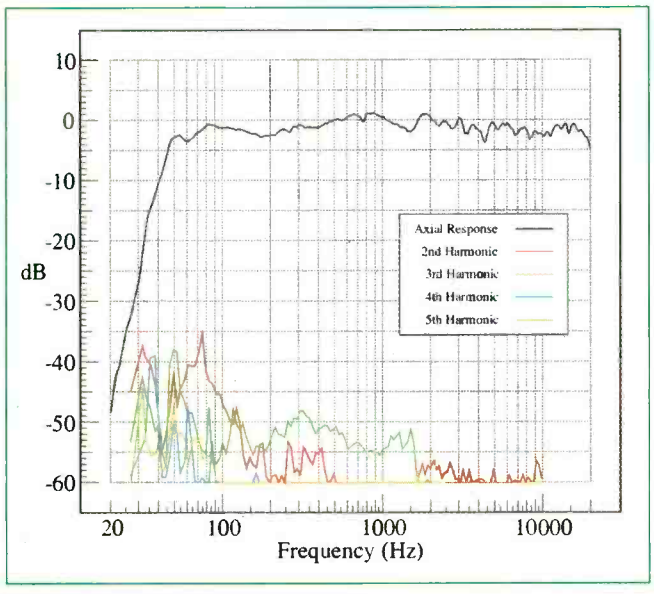


Fig.1: On-axis response and distortion

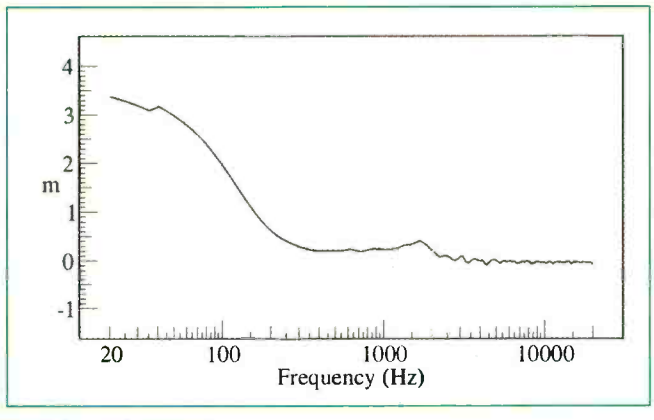


Fig 2: Acoustic source

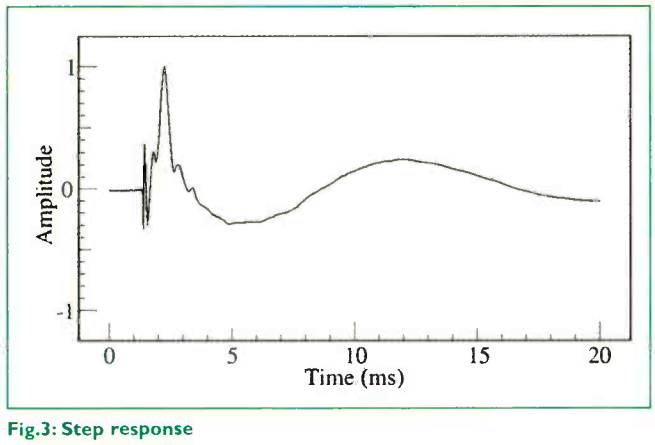


Fig.3: Step response

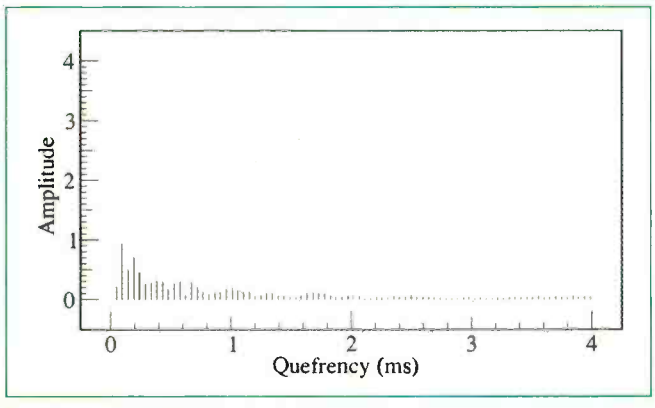
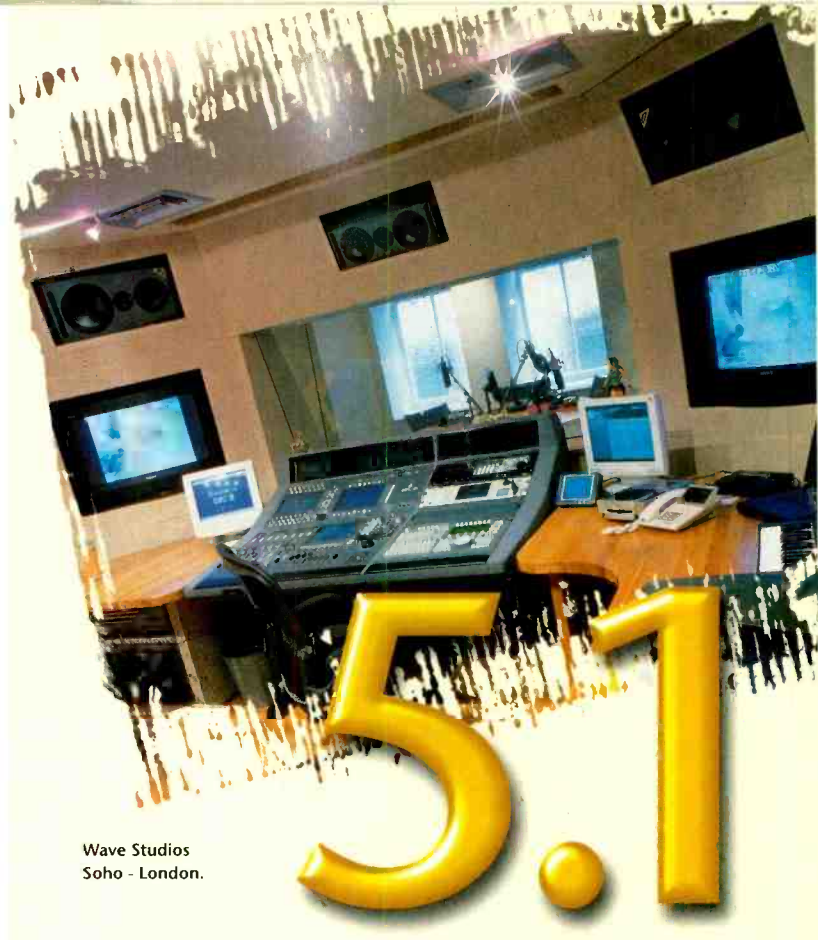
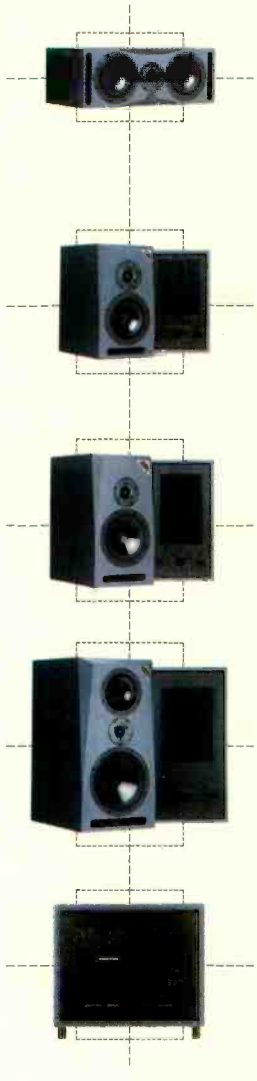


Fig.4: Power cepstrum



Wave Studios
Soho - London.

SURROUND YOURSELF WITH SPENDOR



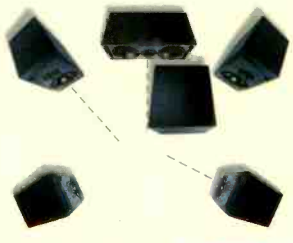
Spendor is consistently associated with the highest quality active monitoring systems as many of the World's top Broadcasters and Production facilities rely on Spendor for their ultimate reference.

Facilities such as the renowned Wave Studios in the Soho district of London.

Spendor also recognise that to confidently create and mix natural, well-balanced audio in the 5.1 format, requires a monitoring solution specifically designed for the task.

It is with this in mind that we have developed a new range of dedicated 5.1 monitor systems.

Regardless of room size and budget, these systems simplify the task of installing definitive surround monitoring for both purist audio and audio-for-video mixes.
Call now for a full color brochure.



SPENDOR

YOUR ULTIMATE REFERENCE

Studio sound 1999 WINNER

SPENDOR AUDIO SYSTEMS LTD
STATION ROAD INDUSTRIAL ESTATE
HAILSHAM • EAST SUSSEX • BN27 2ER
TEL:+44 (0) 1323 843474 • FAX: +44 (0) 1323 442254
web: http://www.spendor.mcmail.com
email: spendor@mcmail.com

2000 SSAIRA NOMINATIONS

THE THIRD SSAIRAs—the *Studio Sound* Audio Industry Recognition Awards is set. This follows the outstanding success of the last two year's awards in which the readers of *Studio Sound* voted for products in assorted categories.

In response to popular demand we expanded the number of category types last year to take in desktop duplicators, location-portable equipment, and plugins.

However, we first need to gather the nominations from which the winners will be selected. And quickly. This is where you come in...

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

To nominate a product simply fill in the form and post it or fax it to us or send your nominations via email by listing the category number followed by the product.

To be eligible, a product should have been released since the Munich AES Convention (held in May 1999) and obviously needs to conform to the description of a particular category.

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

With regard to the categories, it should be noted that, in the case of outboard equipment, this is described by function rather than product description—hence a 'voice channel' may legitimately be entered as a compressor if you feel it excels in this area. Not all the categories work this way, however, but all are explained in the table. There is also a special category in which you are invited to nominate equipment, people, initiatives or anything else that falls outside the other categories yet warrants acknowledgement.

Nominate only in the categories you feel comfortable with. Do it now!

1. Large scale console:	Analogue or digital, recording, broadcast, post or film.
2. Medium to small scale console:	The affordable end of the console business continues to see plenty of innovation.
3. Outboard dynamics:	A 'by-function' category covering any outboard featuring dynamic processing.
4. Outboard preamp:	A 'by-function' choice from outboard including microphone preamps.
5. Outboard equaliser:	Graphic, shelf or parametric.
6. Outboard Reverb:	The final 'by function' category addresses reverb processing.
7. Combined outboard device:	Some units thrive on the combination of their processes.
8. Monitors:	Never more important or prolific than for surround sound.
9. Microphones:	More choices than ever before.
10. Convertors:	A hot topic, today's convertors will shape tomorrow's recordings.
11. Audio editor:	Hardware or computer-based?
12. Audio recorder:	Your choice can draw from CD-R, MD, DAT, HD, or HR.
13. Desktop duplication:	Convenient and economical, your preference please!
14. Location-portable equipment:	Gear for guys on the move.
15. Plug-ins:	The list continues to grow but which is your favourite?
16. Special category:	Your opportunity to recognise anything or anyone that has benefited pro-audio. Think carefully and laterally.

NOMINATIONS can be made 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

SSAIRA FAX VOTE

NOMINATIONS

1 Large scale console

2 Medium to small scale console

3. Outboard dynamics

4 Outboard preamp

5 Outboard equaliser

6 Outboard reverb

7 Combined outboard device

8 Monitors

9. Microphone

10 Convertors

11 Audio editor

12 Audio recorder

13 Desktop duplication

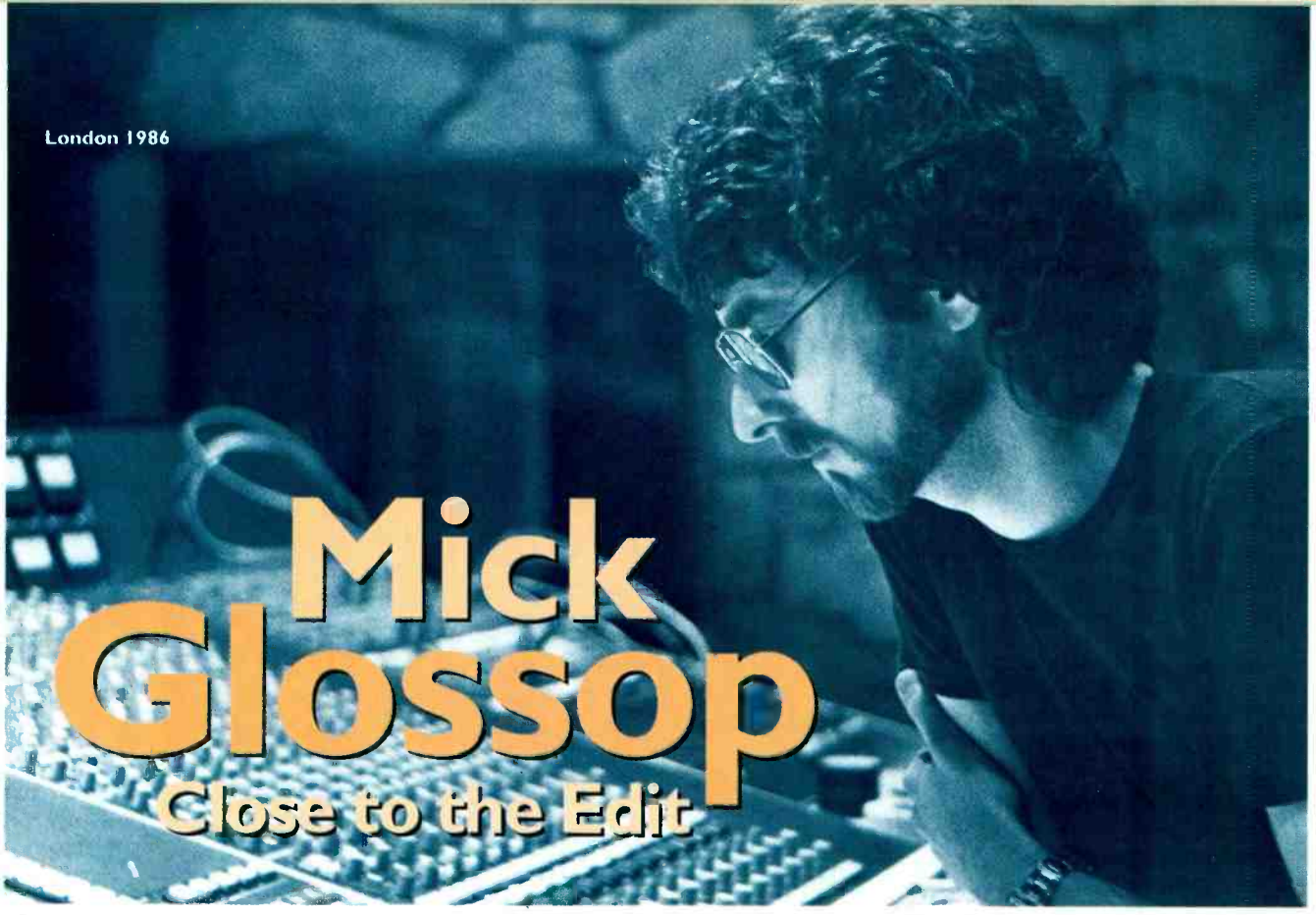
14 Location portable equipment

16 Plug-ins

17 Special category

NOMINATIONS

SSAIRA FAX: +44 171 407 7102



Mick Glossop

Close to the Edit

Trading perfection for performance and accuracy for atmosphere has seen Mick Glossop making some of the best records of three decades. **Richard Buskin** meets the thinking musician's producer

'AFTER YOU'VE BEEN involved in a process to achieve a particular performance for five or six hours, it's a great experience to finally capture that. Nevertheless, I also have to say that the word "capture" is used a lot to give credit to producers. I mean, producers are instrumental, I think, in terms of helping people to get there, but when you press Record you're basically sitting there listening. You're not doing much else.'

That may be open to question, yet what is in little doubt is that Mick Glossop is a producer and engineer for whom the essence of live performance has been a key feature of much of his work with artists ranging from Frank Zappa, Van Morrison, Tangerine Dream and Flesh for Lulu to Queen, Mott the Hoople, Mike Oldfield, Sinead O'Connor, The Skids, The Waterboys, The Wonder Stuff and The Men They Couldn't Hang.

'There's a link between human performance and imperfection,' he says, 'and you have to be very careful about the imperfections that you decide you're going to rub out with your little eraser.'

The 'little eraser' that Glossop is referring to is the editing process, and this is something he is extremely conscientious about.

'Spontaneity is something that refers to performance,' he says, 'and I think you can retain that as long as you're open enough and you keep the tape rolling and you give the artist the opportunity to do several takes. After you've achieved that you can then set about looking at what you've got, analysing it while at the same time being respectful with regard to what you've recorded.'

A case in point is Van Morrison, with whom Mick Glossop has collaborated on no less than 13 albums since kicking things off with the *Wavelength* project in 1977.

'I remember something that happened with his saxophone part on 'Celtic Swing',' says Glossop with regard to one of the singles on Van the Man's 1982 album, *Inarticulate Speech of the Heart*. 'He was playing a low note and it wouldn't speak properly. The key wouldn't seal, so we just got this kind of rushing air sound, but he carried on playing and he was really furious about it afterwards. "The bloody thing only got serviced the other day and it's still not working properly!" However, it was left on the record and a lot of people have since remarked about that, because it's a very interesting sound; the sound of the air blowing through the key of the sax. At the time Van was upset about it, but other people thought it should be left in because it was atmospheric, which is not something that he would normally do.

'He's very much a Take 1 person and he's certainly not obsessed with technique in the technical sense. He's very into the feel and he's had a big influence on me in that respect, and he usually okays quite a few things which other people would iron out, such as a guitar that might be slightly out of tune. If the performance has got the feel and the spontaneity and the creativity that it needs then he'll accept that. He'll always sacrifice technical considerations for atmosphere and expression and feel, and from that point of view it's very good working with him. There have been several performances and overdubs where he's initially said, "No, that's fine, that's great", and I've thought, "He's going to redo that in a couple of weeks. I'm sure he's going to replace that overdub". However, two weeks later we've put the tape up and I've listened to it and thought, "Well, that's actually okay, isn't it? It's not a problem." I'd been sucked into being too focussed and too microscopic about it, and therefore in terms of my other work it's a very good thing for me to work on his sessions every now and again, because it just sets things in perspective. He's constantly got his mind on the performance, and that's very healthy.'

From 1970 through to the end of that decade Mick Glossop was the beneficiary of a first-class apprenticeship courtesy of the time he spent on staff at Wessex Studios in North London, Nova Studios in Marble Arch, Studio Son Quebec in Montreal, The Manor in Oxfordshire and The Town House in West London. At Wessex he assisted on numerous live orchestral sessions as well as those with artists such as King Crimson, The Moody Blues, Georgie >

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:*** ≤10 dB SPL (A-weighted @ 1M). ***THD @ 90 dB SPL:*** <0.4% (100Hz - 10kHz @ 1M). ***Response ±2dB (1/3 oct. swept noise):*** 48Hz - 20kHz, 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, ∞ 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

NHT PRO

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

Glossop at Town House 2 in 1978

< Fame, Alan Price and Stevie Wonder, while as an engineer at Nova he learned a lot from working with Mike Weighell. 'What he taught me was a way of communicating with the producer and the artists, and learning that that was as important as getting the sound,' Glossop recalls. 'He also showed me that, as an engineer, it was possible to subtly influence what went on in a session.'

After spending four months recording and mixing the music of French-Canadian rock outfit Offenbach for a 1974 documentary movie, Glossop was then offered the job of chief recording engineer at Virgin Records' residential facility The Manor. This not only brought him into contact with a wide variety of major international artists, but also enhanced his technical know-how by way of his direct involvement in the studio's redesign, and it was during his his 4-year stint there that Glossop gained invaluable experience working alongside Mutt Lange.

'I engineered four or five projects with Mutt when he came over from South Africa in the late seventies, and he is the person who probably influenced me more than anyone else,' Glossop says. 'He was 100 per cent focused on what he was doing and his powers of concentration were fantastic. He'd be on top of things for 18 hours a day when everyone else was losing it, and so what he showed me was a level of dedication which I realised was necessary in order to achieve real success as a producer. Also, his encyclopaedic knowledge of production techniques was incredible, and that emphasised how important it is to do your research prior to working with a particular artist and then to cover every base. There wasn't one note or beat that went on any of his records that wasn't closely examined. Everything was there because it was supposed to be there.'

Which brings us back to the subject of deciding what imperfections to 'rub out with your little eraser'. After all, isn't the syllable-by-syllable approach also a threat to the kind of spontaneous feel that is associated with many of the artists whom Mick Glossop has produced and-or engineered?

'I'm a fairly spontaneous person,' comes his justification, 'and generally I find that the best decisions I make are the ones I make quickly. So, I try to balance the two aspects.'

Glossop also tries to keep the tape rolling in order to avoid missing out on any moments of artistic inspiration.

'The first time that I missed something with Van Morisson was at the Record Plant in Sausalito,' Glossop recalls. 'It was the second album that I did with him [*Into the Music*], as usual everything was live—live vocals, the band was playing live—and they all came into the control room to listen to playbacks for a couple of tracks. People were just hanging around chatting, and Van walked out into the studio and was tinkling around on the piano, and then he picked up his guitar and started tuning it. I was still talking to everybody else, and a couple of minutes later I looked out and he was strumming some idea or other. He was nowhere near his little recording area, but then the drummer wandered out there and he started playing along, followed by the piano player who started fingering a few notes in relation to what Van was doing. Well, this gradually evolved into a performance, and at that point I realised something was going on and we'd better put some tape on. Don't forget, we'd just been playing back a track and the master was still on there, and so we quickly spooled the tape off, put on a new reel and stuck the machine in Record but by that time they were already into the chorus of the song. Of course, because of the way that things work psychologically and musically, this ended up being the take, of which I hadn't recorded the first two minutes. I think they ended up having to do another take.

'As a result, ever since then I always have two tape machines, and if we're working with Dolbys—which is normally the case—I take wire leads from the back of the Dolby rack to both machines. That means there's always a tape machine ready to record. At the same time, quite often Van's songs will extend much longer than most people's—I mean, the longest live performance I recorded with him was about 32 or 33 minutes. You don't know how long it's going to be, so you have to have another machine that you can put in Record to catch the overlap instead of losing 15 seconds of the song.

'Van does do a lot of stream-of-consciousness-type songs, where instead of lyrics he'll have a page of words or phrases that he dips into and a lot of other stuff is off the top of his head. There's no structure and the >

HHB

CDR850 Compact Disc Recorder

INTERNATIONAL DISTRIBUTORS

AUSTRALIA: AWA LTD
Tel: 02 9669 3477 Fax: 02 9578 0140
Contact: Michael Guest
AUSTRIA: STUDER AUSTRIA GMBH
Tel: 01 865 1676 Fax: 01 865 167699
Contact: Reinhold Fliedl
BELGIUM: EML N.V.
Tel: 011 23 2355 Fax: 011 23 2172
Contact: Erik Gysen
BRAZIL: VISOM BRASIL
Tel: 021 493 7312 Fax: 021 493 9590
Contact: Carlos De Andrade
CANADA: HHB COMMUNICATIONS CANADA LTD
Tel: 416 867 9000 Fax: 416 867 1080
Contact: Dave Dysart
CZECH REPUBLIC: AUDIOPOLIS
Tel: 02 3332 2132 Fax: 02 3332 4172
Contact: Martin Vysusil
DENMARK: INTERSTAGE
Tel: 39 46 0000 Fax: 39 46 0040
Contact: Finn Juul
FINLAND: HEDCOM
Tel: 358 9 682 866 Fax: 358 9 682 8489
Contact: Jarmo Roivas
FRANCE: MILLE ET UN SONS
Tel: 1 46 67 0210 Fax: 1 47 89 8171
Contact: Didier Rupin
GERMANY: TRIUS VERTRIEB GMBH
Tel: 05451 940810 Fax: 05451 940819
Contact: Hubert Dierselhuis
GREECE: KEM ELECTRONICS
Tel: 01 674 8514 Fax: 01 674 6384
Contact: Thimios Kolikotsis
HOLLAND: TM AUDIO HOLLAND BV
Tel: 030 241 4070 Fax: 030 241 0002
Contact: Peter de Fouw
HONG KONG: DIGITAL MEDIA TECHNOLOGY
Tel: 2 721 0343 Fax: 2 366 6883
Contact: Wilson Choi
IRELAND: BIG BEAR SOUND LTD
Tel: 01 662 3411 Fax: 01 668 5253
Contact: Julian Douglas
ISRAEL: BAND-PRO FIM/VIDEO INC
Tel: 03 673 1891 Fax: 03 673 1894
Contact: Dfer Menashe
ITALY: AUDIO EQUIPMENT
Tel: 039 212 221 Fax: 039 214 0011
Contact: Donatella Quadrio
MALDIVES: ISLAND ACOUSTICS PTE LTD
Tel: 960 31 0032 Fax: 960 31 8264
Contact: Mohamed Habib
MEXICO: LOLA DE MEXICO
Tel: 525 250 6038 Fax: 525 250 6038
Contact: Carmen Juarez
NEW ZEALAND: SOUND TECHNIQUES
Tel: 09 846 3349 Fax: 09 846 3347
Contact: Stephen Buckland
NORWAY: LYDROMMET AS
Tel: 22 80 94 50 Fax: 22 80 94 60
Contact: Jarle Felin
PORTUGAL: ELECTROSOUND PORTUGESA
Tel: 01 417 0004 Fax: 01 418 8093
Contact: Carols Cunha
RUSSIA: A&T TRADE INC
Tel: 7 095 796 92 62 Fax: 7 095 796 92 64
Contact: Alexei Gorsky
SINGAPORE/ASIA: SENNHEISER ELECTRONIC ASIA
Tel: 065 273 5202 Fax: 065 2735038
Contact: Donn Ho
SOUTH AFRICA: E.M.S. LTD
Tel: 011 482 4470 Fax: 011 726 2552
Contact: Dennis Feldman
SPAIN: LEXON
Tel: 93 203 4804 Fax: 93 280 4029
Contact: Robert Serrat
SWEDEN: POL TEKNIK AB
Tel: 46 8 449 4440 Fax: 46 8 88 4533
Contact: Jarmo Masko
SWITZERLAND: DR. W.A. GUNTHER AG
Tel: 01 910 4141 Fax: 01 910 3544
Contact: Roland Bricchi
SYRIA: HAMZEH & PARTNERS CO
Tel: 11 333 3753 Fax: 11 373 1573
Contact: Khaled Hamzeh
TAIWAN: DMT TAIWAN
Tel: 02 516 4318 Fax: 02 515 9881
Contact: Honton Sze
TURKEY: SF DIS TICARET AS
Tel: 0212 227 9625 Fax: 0212 227 9654
Contact: Samim Mutluer
USA: HHB COMMUNICATIONS USA
Tel: 310 319 1111 Fax: 310 319 1311
Contact: David Beesley

HHB
FIRST WE LISTEN

HHB Communications Limited

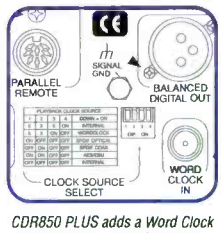
73-75 Scrubs Lane · London NW10 6QU · UK
Tel: 020 8962 5000 Fax: 020 8962 5050 E-Mail: sales@hhb.co.uk
Visit HHB on line at http://www.hhb.co.uk

COOL FRONT. SERIOUS BACK.

HHB CDR850 CD RECORDER

One look at the back panel and it's easy to see why the HHB CDR850 leaves other CD recorders where they belong: in the bedroom! XLR and RCA analogue inputs and outputs, an AES/EBU digital input, optical and coaxial SPDIF digital I/Os and parallel remote control, the CDR850's comprehensive connectivity perfectly complements its class leading sound quality and ease of use.

And if you work entirely in the digital domain, the new CDR850 PLUS adds a Word Clock input and a balanced digital output to the CDR850's already very impressive spec.



CDR850 PLUS adds a Word Clock input and balanced digital out.

Before you buy a CD recorder, it pays to check around the back. See both sides of the HHB CDR850 at your nearest dealer.

A full range of HHB high performance CD-Recordable media includes the world's first fully Orange Book compatible 80 minute CD-R and CD-RW discs, plus 74 minute Silver, Gold, Printable, Bulk Packaged and Re-Writable discs.

HHB Communications Ltd · 73-75 Scrubs Lane, London NW10 6QU, UK
Tel: 020 8962 5000 · Fax: 020 8962 5050 · E-Mail: sales@hhb.co.uk

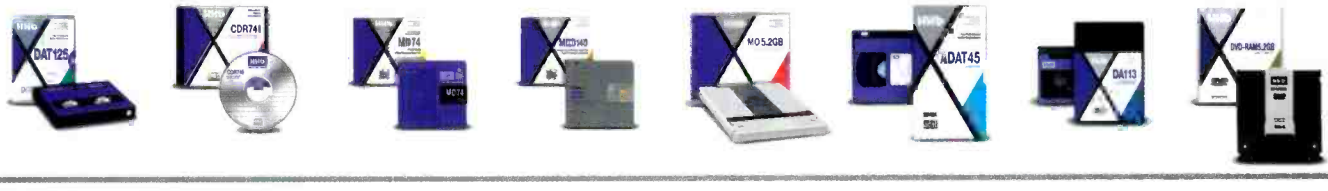
HHB Communications USA LLC · 1410 Centinela Avenue, Los Angeles, CA 90025-2501, USA
Tel: 310 319 1111 · Fax: 310 319 1311 · E-Mail: sales@hhbusa.com

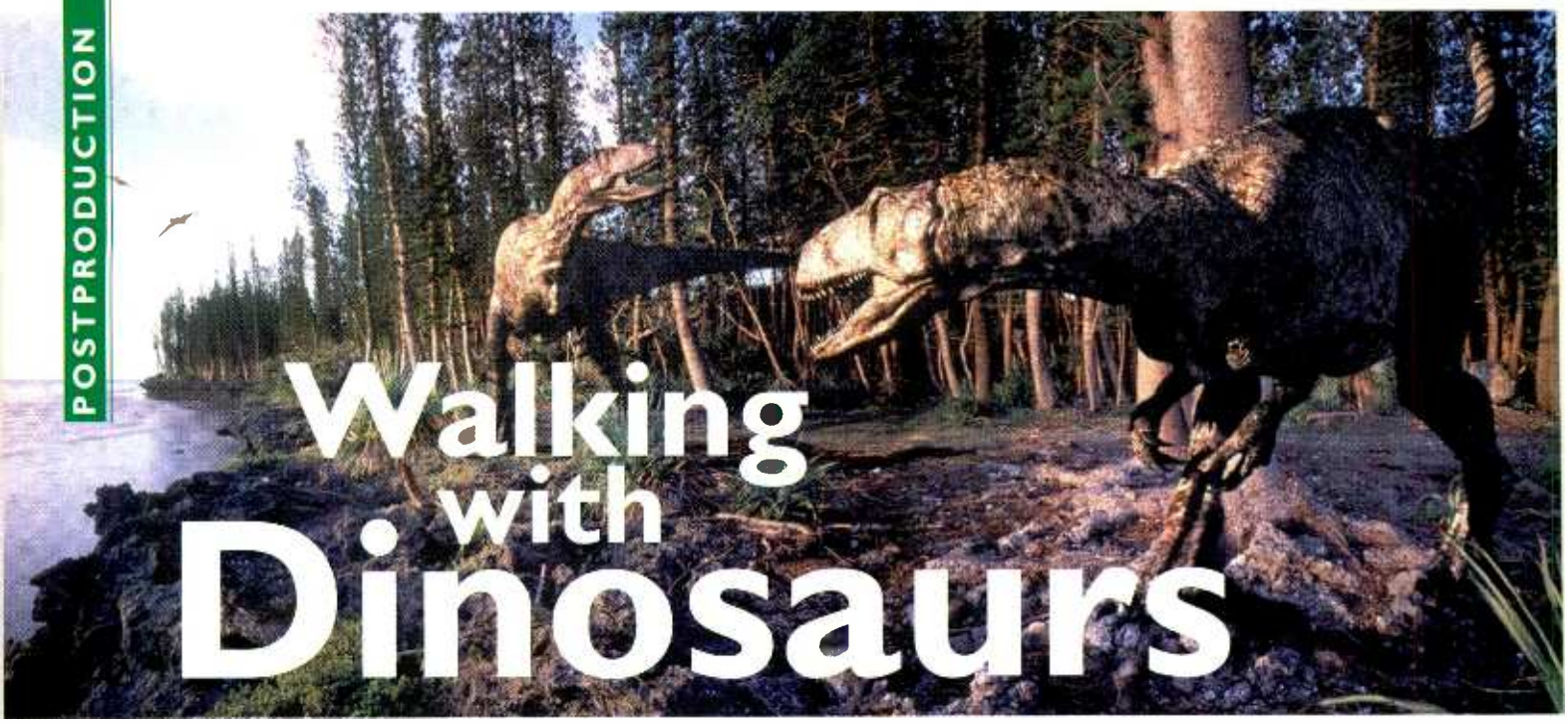
HHB Communications Canada Ltd · 260 King Street East, Toronto, Ontario M5A 4L5, Canada
Tel: 416 867 9000 · Fax: 416 867 1080 · E-Mail: sales@hhbcanada.com

http://www.hhb.co.uk

FIRST WE LISTEN

Don't forget to record on the best: HHB Advanced Media Products





Walking with Dinosaurs

Posting effects for the creaks, grunts and groans of creatures that no-one has ever heard is a tall order. **Kevin Hilton** hears the patter of rather large feet

THE NATURAL HISTORY documentary is a well established and much-loved part of television schedules. Whether it be sweet meercats all looking in the same direction at nothing in particular or cheetahs chasing down a Thompson's gazelles and then ripping it apart for the cameras, it has produced hours of screen time and forged the careers of many naturalists and film makers. With ever more screen hours to fill, particularly with dedicated channels like Discovery, the danger must be repetition. So, where to go for something fresh?

Producers Tim Haines and Jasper James decided to go back 220 million years and make a natural history documentary about creatures that, hitherto, had only hit the screens in dubious Hammer films or, most famously and lucratively, *Jurassic Park* and *Godzilla*. *Walking with Dinosaurs*, made for BBC Science but with a huge potential for world-wide sales, is a series of six 30-minute programmes that aims to blend scientific fact with scare-ya-silly, rip-yer-throat-out entertainment value.

Sound is a big element in any natural history programme: the thrumming of the African undergrowth as a lion stalks it prey; cries of birds in the rain forest; sea-lions roaring during the mating season. All these can be recorded on location, sourced from CD effects libraries or, in the case of Foley sounds (animals moving, digging, fighting), simulated by a human technician back at the studio.

It is, to state the blindingly obvious, a tougher task when dealing with creatures that died out 65 million years ago. Everybody probably thinks they know what a Tyrannosaurus-rex sounds like, thanks to Michael Crichton and Steven Spielberg, but it is more likely that what shook audiences during *Jurassic Park* was what struck sound designer Gary Rydstrom as dramatic and scary. And the Academy of Motion Picture Arts and Sciences thought so too.

For *Walking with Dinosaurs*, the brief was for something that sounded convincing, based on the best guesses of palaeontologists. It was speculation —as was the colour of animals recreated by computer animation and animatronics—but the sound designers were advised by the scientists and worked according to factors like the size and shape of the dinosaurs' heads, the length of their necks and the fact that these creatures did not possess lips or cheeks.

Sound design—creating, recording, editing and track-laying the effects—for the series was handled by Andy Sherriff and Simon Gotel of independent record and music production company Adelphoi. Founded by songwriters and producers Charles Hodgkinson and Kirk Zavieh in 1994, Adelphoi represents and produces other composers, while running a number of labels, notably for the dance market. Its television, channel branding, corporate communications and new media division, headed by Sophie Taylor, deals with music production and sound design. This has worked on projects for Channel 4 Television, BSkyB, The Discovery Channel (promos and theme music for programmes) and the pan-Scandinavia Viasat network.

Like the company's founders, Sherriff and Gotel came from musical background, playing in various bands, but found themselves moving towards a more technological style. 'We got into dance music,' explains Sherriff, 'and that is more technically-based. As we got into it, we found it was more like sound design than straight music.' Gotel agrees, describing the process as 'sound filtering'.

The pair's shift towards the technical continued with work on short-form promos and MIDI-teching for touring bands whose experience with such equipment was not huge and who needed back-up. While Sherriff and Gotel have built up their experience working on promos and commercials, they admit that *Walking with Dinosaurs* is the first pure sound design project of a significant size.

Despite having worked on a nature documentary for Discovery, Sherriff and Gotel knew that they were entering a new realm with this production. 'All the sounds for this were organic, not metallic,' observes Gotel. 'That really stretched our imaginations.' Sherriff adds, 'This sort of sound design would be easier if it were a science fiction production —you can get away with the more obvious effects. Although the landscape depicted is very different, it's not really an alien environment; so we worked to make the sounds convincing, believable. This is not *Jurassic Park*.'

Further constraints were put on Adelphoi by the very nature of the ecosystems that existed during the various phases of the prehistoric age. 'These are all natural sounds but what exists today is very different to what existed then,' explains Sophie Taylor. 'Andy and Simon had the problem that they couldn't go out and record a present day forest and just hope that it would sound

like a prehistoric forest.'

Walking with Dinosaurs starts 230 million years ago, during the Late Triassic period, when the dinosaurs familiar to the majority of people did not exist. Dr Jo Wright, a palaeontologist who was a scientific adviser on the series, wrote in the BBC Online's backgrounder to the programmes: 'When dinosaurs first appeared about 230 million years ago, the world was very different to as we now know it. There were very few representatives of any animal groups alive today—no mammals, birds or lizards (although there were some lizard-like reptiles). The difference was also apparent in the plant kingdom. There were no flowering plants, which includes most of the common trees and shrubs today. The trees would not look very familiar to us, although some were relatives of modern day ferns and podocarps. Plant life would have seemed very drab, just green and brown in colour. There was no grass, instead, low ground cover would have been ferns and mosses.'

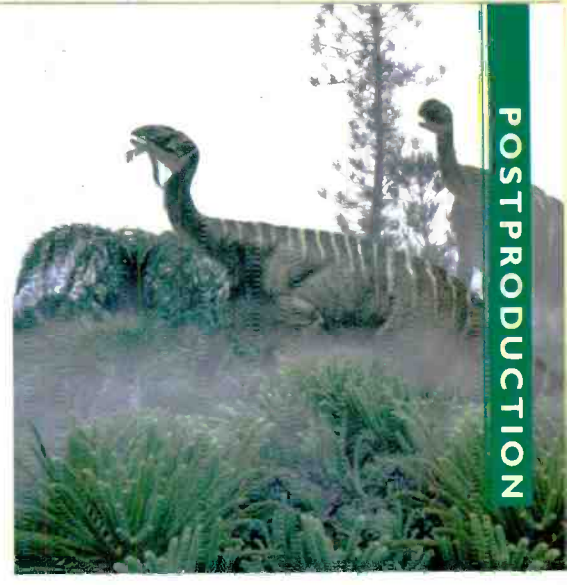
This meant that Sherriff and Gotel had to be very careful about where they recorded background atmospheres. Locations included Devon, Scotland and Dubai, where general sounds of vegetation (leaves rustling, branches snapping) were recorded. Care had to be taken to ensure that no obvious human or modern noises (people talking, cars, aeroplanes) were picked up but, perhaps less obviously, there could be no bird song or cries.

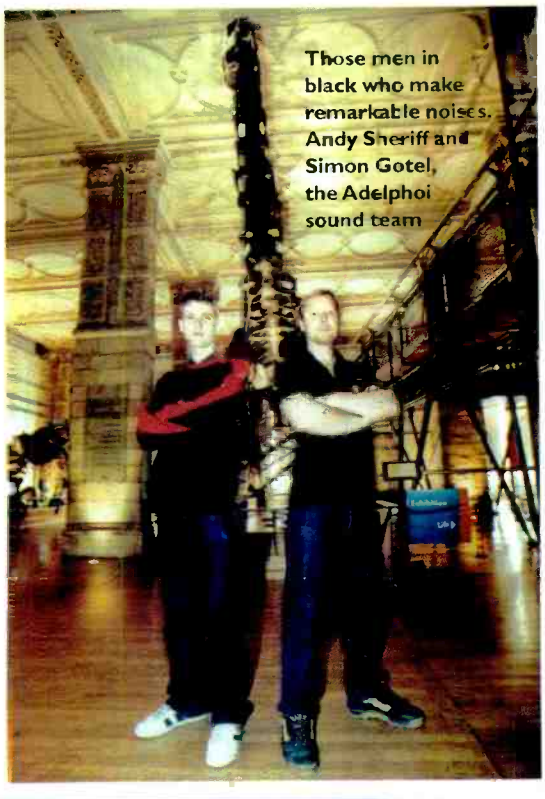
Flying creatures existed during the earliest times, but there were no birds in the periods featured during Episodes 1 to 4 of *Walking with Dinosaurs*. The prehistoric ancestors of today's birds appear in the last two editions but there was still not scope for bird song. 'We weren't allowed birds in those first four programmes,' comments Sherriff, 'and the insects we were allowed—like the giant dragonflies—were unique to the time and sounded very different to today's insect life. When birds did start to evolve, they did not have song boxes and were much bigger than modern birds.'

Such fine points were discussed with the various scientific advisers to the series, including a palaeontologist based in Japan who is recognised as an expert on dinosaur sounds. 'Initially we visited palaeontologists in Cambridge, who were advising on the series in general, and went to the Natural History Museum in London,' says Sherriff. 'They were also helping the animators and model makers in deciding the skin colour of the creatures, which, in some cases, could be as speculative as the sounds. But we were trying to make logical guesses.'

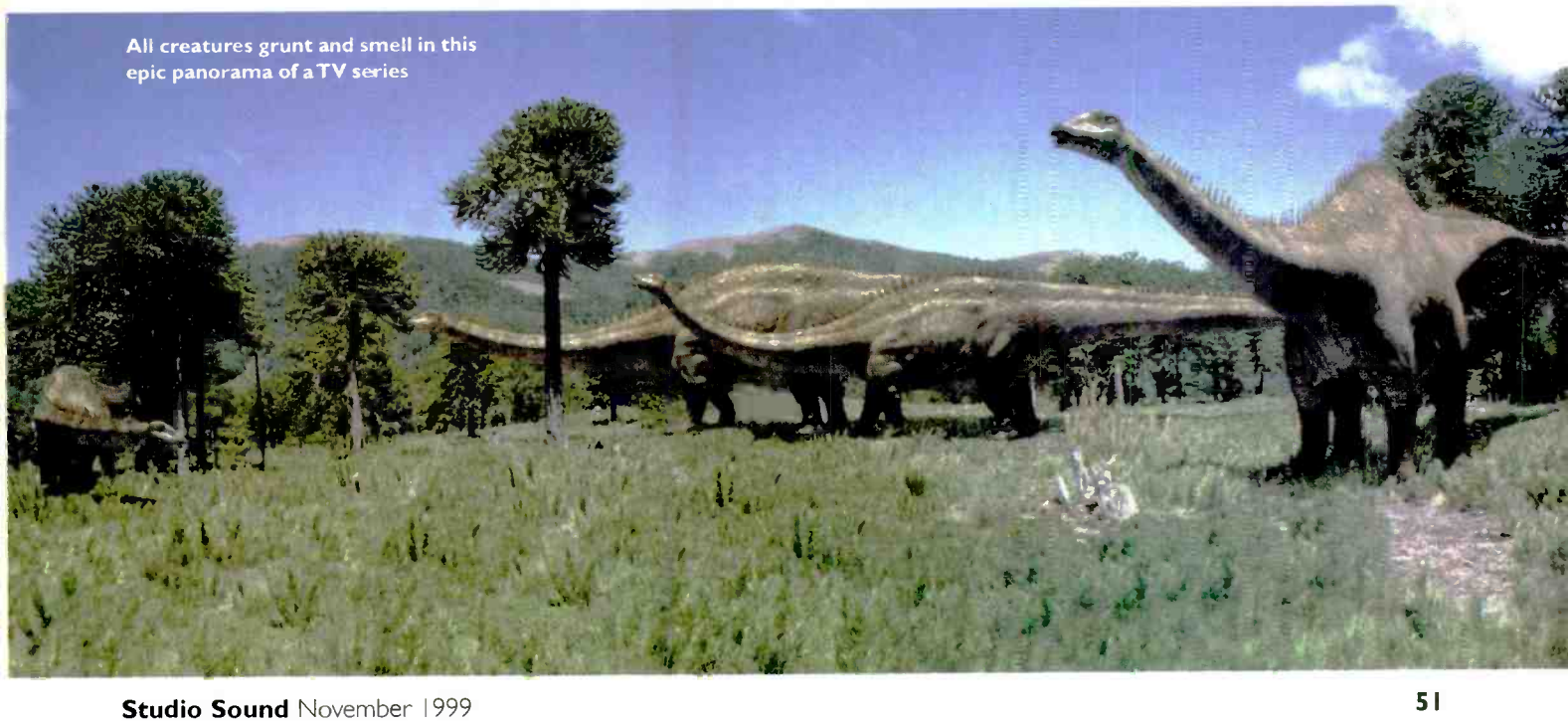
While some modern creatures could be used as a basis, Adelphoi were conscious of the fact that animals bearing a resemblance to modern mammals did not necessarily sound like their counterparts today. The team says the cynodont, a dog-like creature that appears in the opening programme, took some time to get right because it was in fact reptilian. In much the same way, familiar dinosaurs—including T-rex and the 30 metre long, whip-tailed diplodocus—could not be the prehistoric equivalent of the pantomime villain. 'We had to rethink things to a degree,' explains Sherriff, 'because something like the T-rex would not have been the successful hunter it is believed to have been if it had made a lot of noise. So we had quiet predators.'

Sherriff and Gotel had extensive meeting with producers Tim Haines and Jasper James to discuss the details of each episode. *Walking with Dinosaurs* follows the natural history >

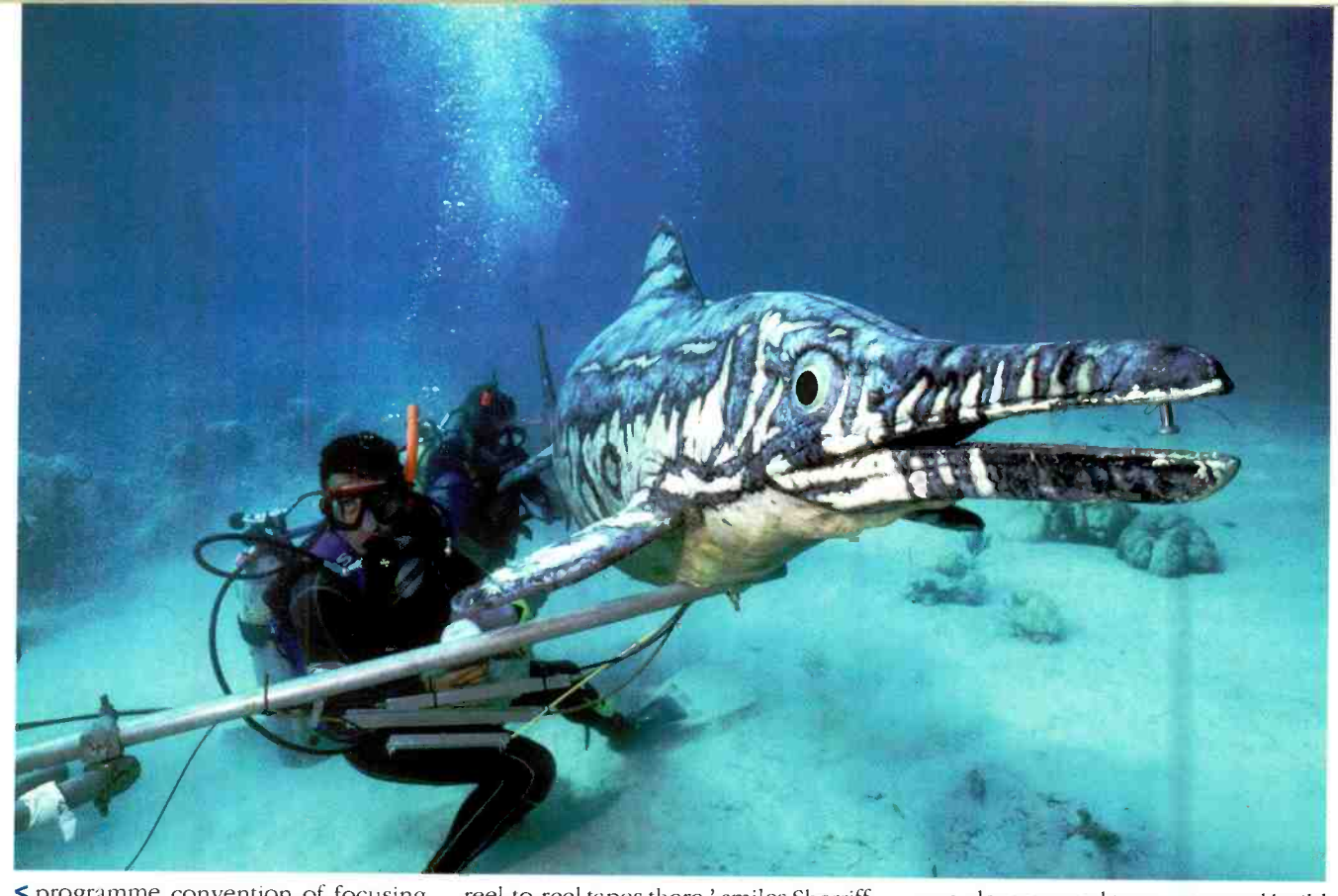




Those men in black who make remarkable noises. Andy Sheriff and Simon Gotel, the Adelphoi sound team



All creatures grunt and smell in this epic panorama of a TV series



< programme convention of focusing on a whole season or year in the lives of a number of creatures. To this end, a series of noises had to be created to illustrate different activities. 'This was one of the main differences between what we were doing and what a movie sound designer would do,' says Sherriff. 'We had to come up with a range of sounds for each animal: caring for their young, crying in pain, defensive, attacking. Attaching only one sound to an animal is easier; it's more difficult to describe a number of moods.'

Work began on the sound design a year ago, with the last six months of the process being particularly intensive. In addition to the location Foley recordings—laid down onto either DAT or MiniDisc—the Adelphoi team had access to the sound library of the BBC's renowned Natural History department in Bristol. 'We sorted through stacks of reel-to-reel tapes there,' smiles Sherriff. 'Although we did use some of these natural sounds, they were not dynamically that great. If we time-stretched them or pitched them down, they would become less dynamic and we wanted to get away from the old slowing down a lion's roar approach.'

Much of the design was sample based, generated on the Akai S3000 and the recently released S6000 samplers; the last device coming, Sherriff says, 'hot out of the factory.' He adds this meant there were a few operational problems but that these have now been cured. 'The S3000 was best for time-stretching, it gave us more control,' he says. 'But we couldn't have done this project without the S6000 because of the amount of memory it has. We could take WAV files and dump them directly into it from the SoundScape.'

The SoundScape hard-disk editor-recorder was used to prepare and build up the layers necessary, not only for each sequence but, in some cases, for each specific effect. The long bodied, small-headed diplodocus, for example, was a three-stage process, as the sound was envisaged to build through the body up to its mouth. Gotel says that some of the effects required a lot of layering and morphing to produce a final, single sound. Sherriff adds, 'Nearly every sound had something natural in it, although some of the roars featured an industrial element, like a car skidding, put through a 1960s Colour Sound distortion pedal.'

Some of these natural sounds occasionally included humans doing 'impressions' of some of the dinosaurs. People also filled in during some of the Foley sessions, particularly to simulate the sound of the larger creatures moving. 'On some of the location trips >

EAR Yoshino 660 compressor limiter
not your **fairweather** friend!

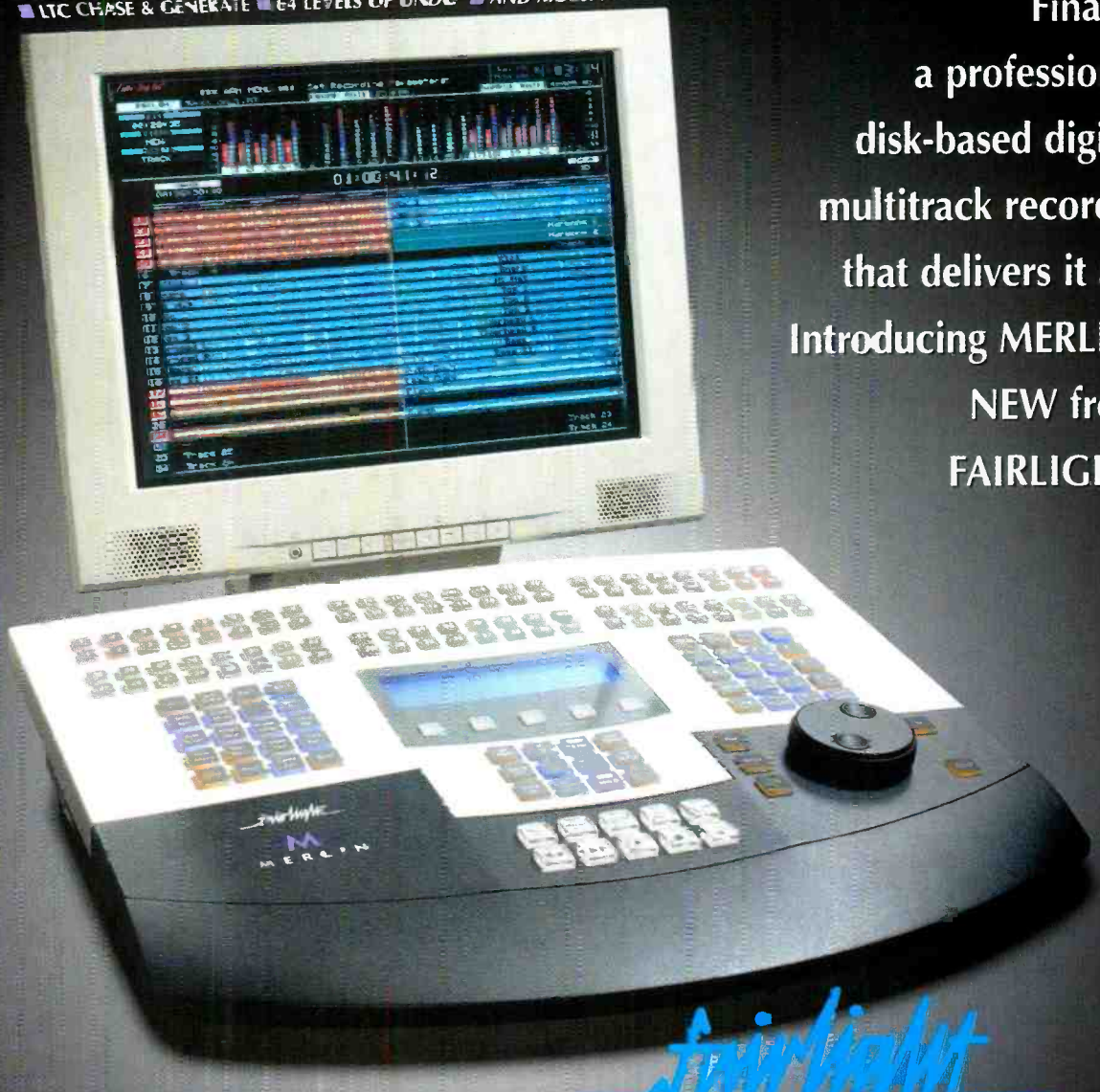
EAR Yoshino Ltd Tel: 44 1480 453791 Fax: 44 1480 432006
www.ear-yoshino.com E-mail earyoshino@aol.com

WE THOUGHT OF EVERYTHING

■ 24-BIT GAPLESS, SEAMLESS PUNCH IN/OUT ACROSS ALL 24 TRACKS TO A SINGLE HARD DISK ■ EXPANDABLE TO 48 TRACK CAPACITY & 96KHZ OPERATION ■ ALL-DIGITAL OR ANALOG-PLUS-DIGITAL I/O ■ NETWORKING ■ FILE EXCHANGE WITH MOST COMMON DAW FORMATS ■ SAMPLE RATE CONVERSION ON ALL INPUTS & OUTPUTS ■ LEGENDARY FAIRLIGHT SOUND QUALITY ■ POWERFUL EDITING FEATURES ■ SCROLLING HIGH RESOLUTION WAVEFORMS ■ TIMECODE OR FILM FOOTAGE REFERENCE ■ FUTURE UPGRADE FOR TEMPO REFERENCE & HIGH QUALITY VARISPEED ■ BUILT-IN MACHINE CONTROL ■ MIX 16, 24 & 24-BIT CLIPS IN THE SAME PROJECT ■ BACKGROUND BACKUP TO EXABYTE OR NETWORK FILE SERVER ■ DEDICATED ADR MODE ■ MULTI-TAKE COMPARE & COMPILE ■ ONE TOUCH LOCATE ■ GPO SYSTEM ■ SMART KEY RECORD MODES ■ 999 NAMED CUES ■ AUTOLOCATE FUNCTIONS ■ AUTO RECORD ■ MFX & FAME FILE COMPATIBILITY ■ SYNC TO AES, WORD CLOCK, TIMECODE OR VIDEO SOURCES ■ CHOICE OF TAPE OR NON-DESTRUCTIVE RECORD MODES ■ DEDICATED TRACK ARM KEYS ■ LTC CHASE & GENERATE ■ 64 LEVELS OF UNDO ■ AND MUCH MORE...

MERLIN

Finally, a professional disk-based digital multitrack recorder that delivers it all. Introducing MERLIN, NEW from FAIRLIGHT.



fairlight

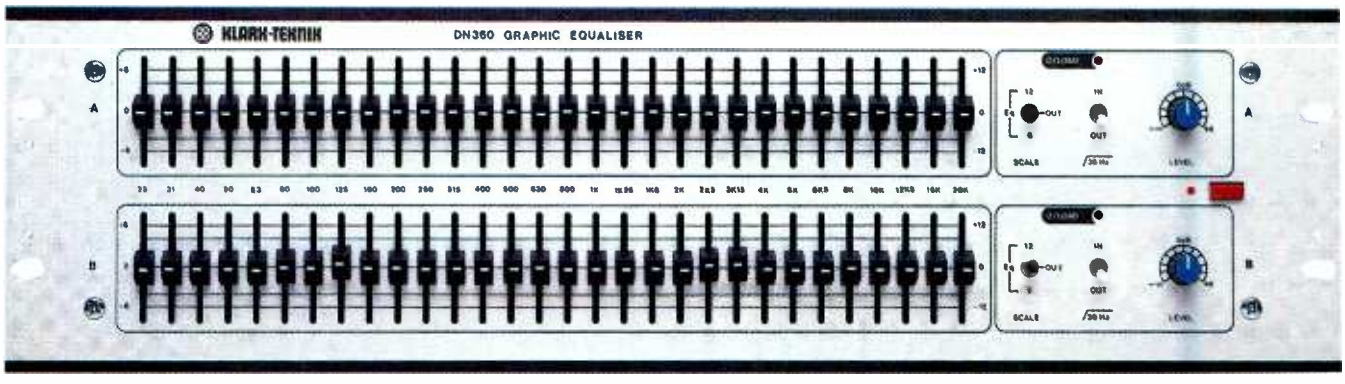
Work Smarter.

Call (0171) 267 3323

www.fairlightesp.com.au

Fairlight ESP Limited — Unit 12, Spectrum House, 32-34 Gordon House Road, London NW5 1LP
Los Angeles +1 (323) 465 0070 — New York +1 (212) 819 1289 — Sydney +61 (2) 8977 9999
Paris +33 (1) 4610 9292 — Berlin +49 (331) 721 2930 — Tokyo +81 (3) 5490 1515

DOUBLE RUBY



ABOUT TO ENJOY a limited chrome anniversary edition (pictured), KT's DN360 is an industry standard stereo graphic equaliser combining two third-octave channels over 30 ISO centre frequencies from 25Hz to 20kHz. Equalisation scale switching gives the choice of either high slider resolution (±6dB) or normal (±12dB). The 360's proprietary circuit designs use 'MELT' filters, incorporate electronically balanced inputs and LED overload indicators. A bypass function allows ready comparison between direct and equalised signals while low-cut 18dB/octave filters prevent subsonic components from overloading speakers or amplifiers.

THE KLARK TECHNIK DN-360 QUESTIONS

Q1 What anniversary is Klark Teknik celebrating this year?

Q2 What is the cut-boost on the DN360's sliders?

Q3 What is the model number of KT's loudspeaker processor?

CLOSING DATE: 7TH FEBRUARY 2000

ALTHOUGH THERE ARE two sets of questions to match the two prizes, you may enter either one or both sections of the competition as you see fit. All you have to do is to correctly answer the questions below and prepare to see red.

TO ENTER, you can either email your answers to ruby.competition@unmf.com, fax them (to +44 171 407 7102) or send them on a postcard to Ruby Competition, *Studio Sound*, Miller Freeman Entertainment, 8 Montague Close, London SE1 9UR, UK.
As long as you are a registered *Studio Sound* reader, you may enter any number of installments of the competition as long as you do so separately (multiple entries will be collected and used as confetti during *Studio Sound*'s Millennium party season), and include your Unique Reader Identification Number.

...include your Unique Reader Identification Number.

The Unique Reader Identification Number is the 9-digit number located in the middle of the top row of your *Studio Sound* address label.

REWARDS

STUDIO SOUND'S 40th BIRTHDAY celebration continues with two further star prizes: a classic Drawmer DS201 dual gate and a Klark Teknik DN-360 stereo graphic EQ. In common with the other prizes in this series, these are custom editions of current models finished in ruby red livery. In every remaining issue of the magazine until the end of the year, you will have the opportunity to win two items from the *Studio Sound* Ruby series listed below.

Drawmer's DS210 is possibly the most familiar sight in a recording studio —having transformed the gate from what had been a simple on-off device into a musical tool. The 201 was the first gate to offer frequency-conscious operation, and this and its key filters, comprehensive envelope control and fast attack time readily gained it 'industry standard' status throughout the world. Little of its design has changed over the years, and designer Ivor Drawmer claims it sells as well now as it did in the early 1980s.

THE DRAWMER DS201 QUESTIONS

Q1 When was the DS210 introduced?

Q2 What is the nature of the DS201's filters?

Q3 What was Drawmer's first digital dynamics processor?

Studio Sound

REWARDING RUBY PRIZES

AKG 535 stage condenser, C1000, and C3000 microphones
A&H 32-channel GS3000 console
CEDAR Series-X DHX Dehisser
Drawmer DS201 dual gate
EMO E520 Single DI box; E445 cable tester; E325 3-way mic splitter
Genelec 1029 monitors
Joemeek VC1 compressor
KT DN-360 graphic
Marantz CDR640 CD recorder
TL Audio C1 Classic compressor
Purple Audio MC76 compressor

Ongoing thanks are due to all those who have so readily contributed equipment, time and advice in the preparation of this competition.

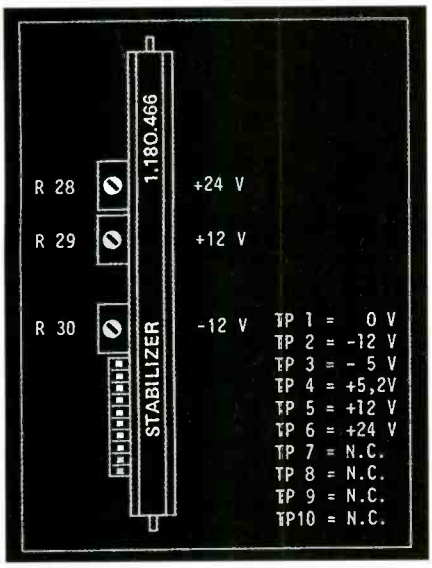


Fig.2: Test points and trimmer potentiometers on switching stabliser

< head for MkII/III. Record and reproduce heads in the A800 MkI are different from those on later models. The compound that makes up the head is much softer. For the MkII onwards, a new type of head was developed and the index number changed from 1.316.xxx.xx to 1.317.xxx.xx.

Be aware that heads that lose high frequencies may be relapped. However, once the core material is worn out, the head needs to be replaced. Heads with core material 1.316.xxx.xx may be easily replaced by 1.317.xxx.xx. For improved bass frequency response at 30ips, Studer offers a modification instruction. Details of all these can be obtained from Studer agents.

There are many electrical calibrations for the A800, all of which can be found in the service manual. However one important calibration that is often overlooked is the voltage stabiliser 1.180.465.xx or 1.180.466.xx. This PCB contains most of the voltage regulators for the machine, a deviation of 100mV on the 12V supply rail can cause a noticeable change in the tape tension, which may result in deterioration of the tape travel. These voltages should be checked on a regular basis and aligned according to the service manual.

MkI A800s suffered from intermittent wow and flutter. Normal causes for such wow and flutter are nearly always either capstan motor problems or misalignments of the tape tension settings. However many engineers reported that replacing the capstan motor and realigning the tape tension had little effect. After investigation, Studer found that the cause of this problem was mechanical wear on the potentiometer contained within the tape tension sensor. If a steady tape tension is maintained for a length of time, a flat spot appears on the carbon track of the potentiometer, and incorrect voltages are sent back through the operating system causing the tape tension sensor to read unstable tape tension values. To establish whether or not a machine is suffering from this problem, play a 1kHz tone from the machine and place your fingers gently on the base of the tape tension sensor. As you hear wow and flutter you should simultaneously feel a very small vibration coming from the tape tension sensor indicating that there is a high chance the machine is suffering from this problem.

Studer's solution is to replace the old style potentiometer (index 58.99.0110) with a contactless Hall effect potentiometer—a conversion kit is still available from Studer for Mk.I owners (index 21.180.149.00).

Be aware that there are different alignments required for A800 Mk.I and A800 Mk.II/III. (See Service Manual under the headlines 455 and 457 indicating the spooling motor controller: 1.180.455.xx, resp. 1.180.457.xx)

Fig.3 shows the potentiometer in circuit as a part of the tape tension sensor PCB 1.180.145.11. (diagram SI 101/86). To increase the reaction time of the spooling motor, the MkI spooling motor, power unit 1.180.500.xx has been replaced by the Mk.II version: 1.180.501.xx. Due to the faster motor reactions resulting transients caused an earlier failure of the power transistors (especially the one of the negative supply).

In 1991, Studer came up with a modification kit 1.180.093.00 for the 1.180.501.82 power stage, which contains first of all stronger power transistor and an additional power bypass circuit to overcome this problem. For earlier versions (1.180.501.00 / 81) it is recommend that the whole power stage be exchanged. The upgraded power units should have the index .83. If a machine has the index 1.180.501.83 already, then it has been modified previously. ■

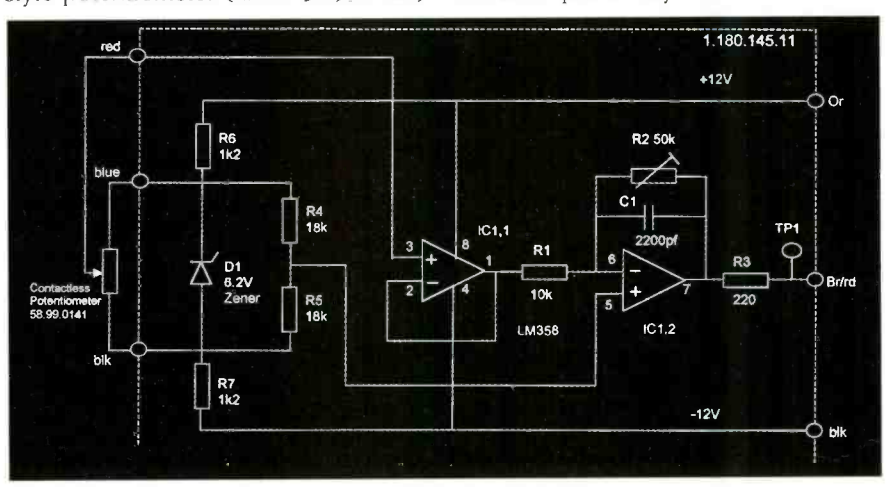


Fig.3: Potentiometer in tape sensor PCB arrangement

RAYCOM®
Web : www.raycom.co.uk
Tel : +44 (0)1789 400600
Fax : +44 (0)1789 400630
NEW
FULL DETAILS ON OUR WEBSITE
RAYCOM RTB3211 FULL DUPLEX BASE STATION
DEDICATED FOR BOTH OB & STUDIO USE
32 PC Programmable Full Duplex Channels of UHF Radio Talkback
0.5 - 5 Watts of RF power, Euro Approved in a Single 1U rack

DIGITAL RADIO
By Soundcraft

As radio enters the digital age, Soundcraft delivers a powerful, flexible and affordable digital mixing solution that's equally at home in self-operator and large broadcast studios alike.

The new RM1d is available in 6 - 24 fader configurations, and combines years of Soundcraft radio know-how with a sophisticated and comprehensive feature set to bring all the advantages of digital mixing for radio under a familiar and intuitive operating surface.

Unlike other digital radio consoles, you won't find a long list of expensive extras. Total flexibility in input and signal routing, on-board Eq and dynamics, Lexicon effects, sophisticated monitoring and metering – it's all included in the already very competitive price.

So for a straightforward, affordable solution to your digital mixing needs, call the radio experts: Soundcraft.

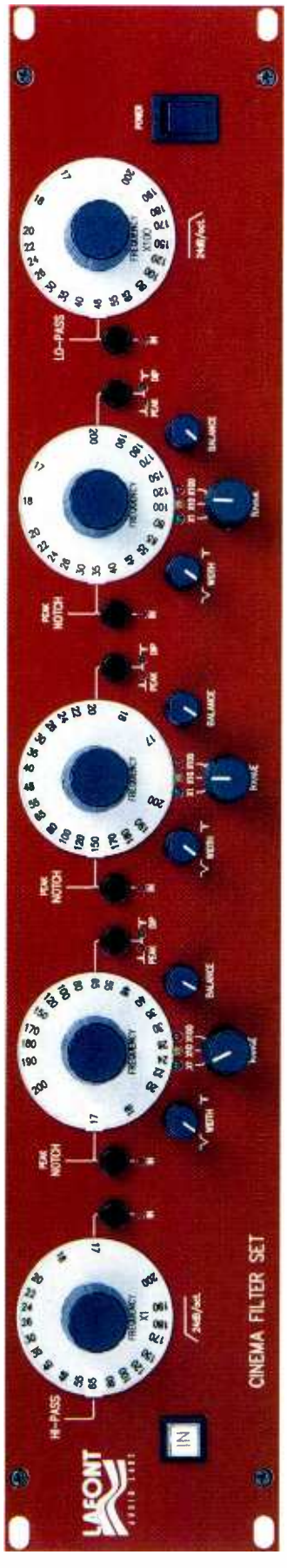
www.soundcraft.com

RM1d DIGITAL

Soundcraft +44 (0)1707 665000
info@soundcraft.com
Soundcraft US 1-888-251-8352
soundcraft-usa@harman.com

Soundcraft
A Harman International Company

sascom
WWW.SASCOM.COM PH: 905.469.8080 FAX: 905.469.1129 sales@sascom.com



LAFONT AUDIO LABS

The Write Stuff

In the year since *Studio Sound* looked last the recordable CD market, there has been a sea-change in the progress of do-it-yourself publishing and copying. **Tim Frost** puts it down to new drives, media and printers

DUPLICATING CD-Rs is still not everyone's favourite occupation, with cassette still winning many votes for the easiest short-run medium. But CD-R is becoming continually more accessible, as all the costs surrounding recordable CD have tumbled and the technology gets more rugged. Drive prices that started at £300 (UK) at the end of 1998 have now been halved. Blank media prices are down to a single Euro a piece, and the computing power needed to do the job properly continues to halve in price and double in power on a yearly basis.

What hasn't changed, however, is the need to have professional hardware and software to write the first master copy of a disc from the original tapes or files—the front end of the master tape-to-CD process.

Where these low-cost drives from LG, Mitsumi, Ricoh and even HP, Philips and Yamaha, work better than ever, they are designed primarily for the computer user who may be using it for IT applications and then also to copy tracks from existing CDs. The point here is a simple one—that consumer products are designed for consumer users. So while the programs such as Just!Audio, CD-Creator or HyCD offer a simple route to copy from CDs and LPs, they do not offer the flexibility and accuracy in terms of setting levels or track start points that a Sonic Solutions level of software can offer.

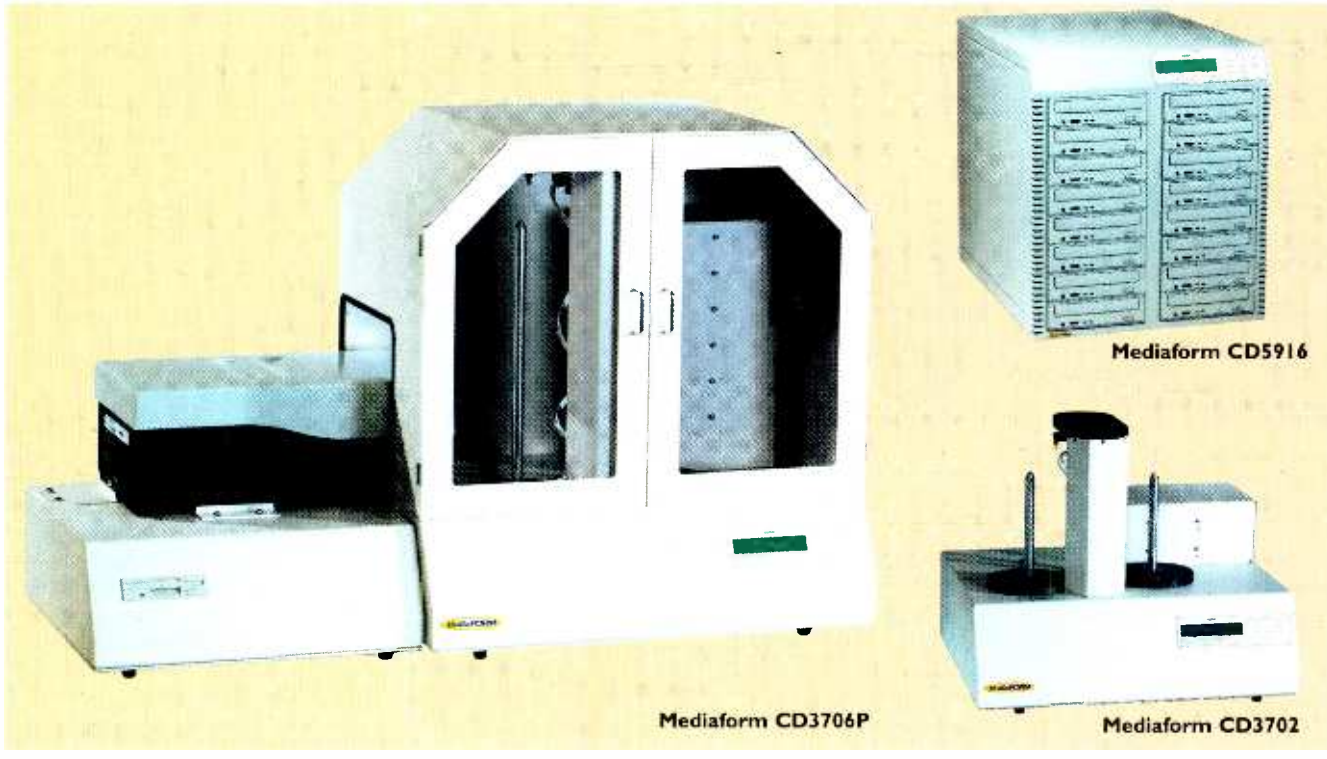
Also it should be self-evident that while some of these consumer packages also offer built-in hiss and scratch reduction—these are hardly up to the demands of commercial mastering.

There was a concern that as prices continue to drop and the desktop computing power increases to the point that it can bring bullet-proof CD-R creation to masses, that anyone—including the artists—will be able to create their own CDs ready for publishing. But the divide between real professional use systems and consumer packages remains as wide as ever. The studio packages offer more control and flexibility, and the consumer systems go for ease of use, with single-settings and uncalibrated sliders.

This applies with a vengeance to the difference between the stand-alone audio CD writers. Units such as the HHB CDR850+, Marantz CDR630/CDR640, Tascam CD-RW5000 or the Fostex CD200 are still absolute requirements for professional use, offering pro I-O and high-quality sample-rate conversion. The domestic recorders (mostly based around the Philips unit) are good examples of what can be done to bring new technology to the consumer. But their feature sets, such as simple noise reduction, auto-silence detect to separate LP tracks and, of course their requirement to use audio-only CDs, make them less appropriate for professional use.

Things are also changing with the discs themselves. Although still commonly referred to as gold discs, CD-Rs using gold for their internal reflective surface are disappearing. With gold at many times the price of silver, it is hardly surprising that disc manufacturers have worked hard to find a way of improving the performance of silver alloys to coat the discs. There has been no single major breakthrough, but manufacturers have fine-tuned silver alloys and the chemistry of the dyes so that the discs have the right reflectivity and do not suffer degradation from the corrosive effects of the dye.

The research has also led to discs being able to work with a wider range of write speeds. In the early days, discs



had to be fine-tuned to work specifically at 1x or 2x or 4x write speeds—a bit like having a tape that could record at only 7.5ips or 15ips. Now this has changed. Firstly, the dye and disc design offers a much wider window for write speeds—they can cope with wider range of exposure times to the drive's laser. Also the discs carry with them pre-written information on the best write strategy for that particular piece of media. Modern writers can read that data and change they way they work to guarantee the best write interface between disc and drive.

This general up-rating of the media has meant that the myths surrounding the superiority of either 'blue', 'green' or 'gold' discs have all but disappeared, as in general most media works on most writers and at most write speeds.

Disc quality is still an issue, especially with a wide range of media process with a 2-fold gap between the cheapest unbranded and the most expensive 'pro audio' branded discs. The issue of quality is not as easily defined as a question of whether it works or not. Even the cheapest discs will usually write. The difference is likely to be in their error rates, longevity and the disc's ability to play on less-than-perfect CD drives. If the blank disc is marginal because of wider tolerance windows used in low cost manufacturing, then as the disc deteriorates over time—as they will all do—then they are already that bit closer to becoming unreadable. And the same applies to their use on older or cheap players that may not be able to cope with marginal discs. The higher error rates will mean that the error correction on the player has to work harder, inevitably leading to degraded sonic performance. This leads to the fairly obvious conclusions which is either to use the higher quality discs all the time, or use cheap discs for immediate-use, mid-quality copies, and high-quality discs for quality demos, archive and premastering.

These developments in drive electronics and PC technology have taken the unreliability out of CD-R writing. Two years ago, getting perfect copies —just transferring finished masters from a CD or hard disk—could not be achieved with any guarantee of success. Data bottlenecks within the PC-based internal architecture—the infamous buffer underruns—conspired to make CD copying a very hit-or-miss affair.

The massive increase in power and memory of the PC has turned a process that stretched to computer to its limits, to one that it handles transparently. The ability to handle streaming data is now fully implemented in the latest generations of PC CPUs. With 128Mb of memory and 10Gb hard disks now standard, there are no memory limitations for the copying process and the availability of low-cost SCSI links ensures that anyone serious about burning discs can get the data to the drive reliably.

This all bodes well for duplication systems, as the technology has also dropped so dramatically in price. While it costs more for the case, the power supply, the robotics and the labour to put it all together, the price drop in the components themselves has had a big effect on the pricing of systems. This is especially true of the larger multidrive systems where the cost of individual CD-R burners are the most significant part of the package.

Developments in printing have also become more apparent over the year. More units are coming with a printer, so that the system produces finished copied and printed discs. As the technology to write discs has become standard, it is now time to look at the quality of presentation of the disc.

So where to next? As well as being seen more like standard studio equipment, tower and automated duplicators are now adding CD-RW capability. CD-RW is becoming more popular as temporary storage media—the discs are getting cheaper—around 8 Euro each—and most CD writers are also adding CD-RW capability. Apart from the higher cost, the two problems with using CD-RW as a replacement for CD-R are the fact that CD-RW generally writes at half the speed of CD-R and that few CD-Audio players can actually read the discs.

DVD is the new area of interest for duplicators. With DVD-Audio 'just around the corner', demos and trials will need to be cut in-house using DVD-R. Unlike CD, where the transfer from tape to disc should automatically produce a perfectly performing disc, the complex navigation and additional features of DVD-Audio and DVD-Video mean that the only bullet-proof way of making sure the disc is going to work is by making one and playing it. The DVD-R format has just been upgraded to 4.7Gb capacity and while this is still limited for multilayer DVD-Video discs, it will be ideal for most early DVD-Audio releases which are likely to be on single layer 4.7Gb DVD-5 discs. Lucky for the audio industry that the cost of DVD-R writers (sole proprietor, Pioneer) has just dropped from Euro 15k to under Euro 5k. And it is only a matter of time before the price takes another major hike downwards and they start getting slotted in stand-alone duplicators so that studios can meet that rush for DVD-Audio demos. ■

The fiction of DVD

Premastering audio for DVD Video releases involves a number of disciplines. DVD Video premastering engineer Andy Day talks **Simon Croft** through the process

THERE IS NO DOUBT that DVD Video is taking off in a big way. Even the first generation players are affordable and—despite the capital investment required to make them—so are the discs. Perhaps more importantly, there is a good selection of titles available and the catalogue is growing quickly. With film companies putting out their back catalogue as well as new releases, a new breed of premastering facility has sprung up to cope with the demand.

One of the first in Europe is based at Anvil Post Production, a UK facility with a 48-year track record of working on films including the *Star Wars* trilogy, *Superman* and *Aliens*, as well as upmarket television programmes. Open since April of this year, Anvil's DVD premastering room is run by Andy Day, who specified all the equipment. Day previously spent about eight years at Dolby Laboratories and before that was at SSL, so his technical grounding in Dolby Digital and multichannel mixing is substantial. He worked as a professional mix engineer before joining SSL and spent a year freelancing on television dubbing sessions, working on a large film library restoration project and acting as a consultant on surround-capable rooms, before joining Anvil.

Day says he 'had this list of equipment bubbling away for months' before striking a deal with Anvil, so the final specification came together very quickly. So did commissioning: the equipment was supplied by GearBox and installed by Anvil's in-house team in just three weeks. Anvil bought the equipment from GearBox because the company already supplied all its hire requirements and was prepared to loan alternatives for any items not available for delivery within deadline. Timing was actually very important: while the room was under construction, Day was already preparing the first job from a truck in the car park.

The heart of the setup is a Digidesign Pro Tools system and a Yamaha 02R desk. External monitor switching is handled by a Magtrax MusicBox system from Aspen Media, while routeing duties are taken care of by a DAIS from Audio Service. In contrast to the wall of THX speakers found in Anvil's main dubbing theatres, monitoring is provided by close-field PMC units. The room also has CEDAR De-Crackle and De-Hiss units for restoration, plus multitrack recorders including a Tascam DA-88, which come into play at the start and end of a project. The other vital requirement is the Dolby Digital encoder-decoder. Day either supplies the mastering house with pre-encoded material, or will supply a list of compression and dialogue normalisation levels for the AC-3 encoder—depending on the client's requirement. Precisely how the raw material comes into Anvil depends on a number of factors, including the age of the film and whether it has been remastered in the recent past. In an ideal world, there will be a 5.1 M&E available.

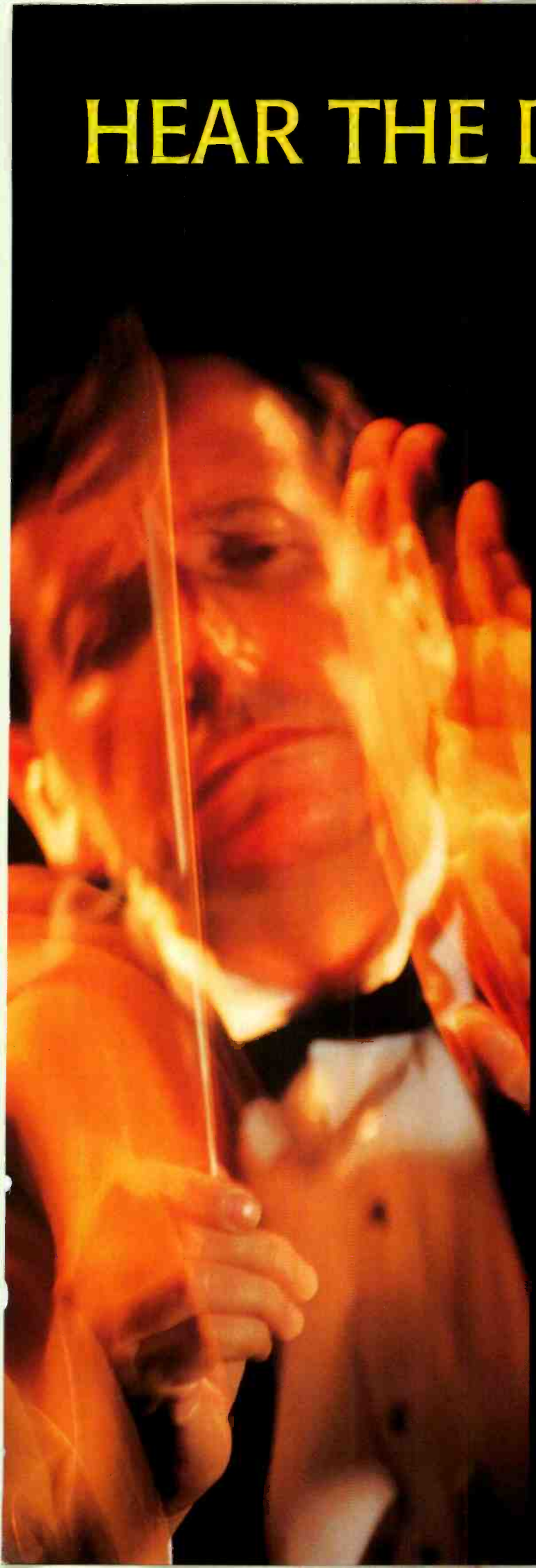
'The source elements in a simple case will be the 5.1 film Dolby Digital print master,' Day confirms. 'Because of the way films are mixed, they will all be in reels: Reel 1; Reel 2; Reel 3, and so on. Those isolated sections will all work when they are in sync with the picture.'

Day says that the actual format of this material could be 35mm mag, Tascam DA-88, Akai MO, or any of the current generation of digital dubbers. 'But it's always six audio channels—it's a case of conforming that to the picture because there will be a different number of frames on the DVD picture source.' Even if the source material is pristine, Day has to compensate for the transition from a theatrical release to a home theatre, hence his use of close-field monitoring to produce an idealised domestic environment.

On an older title, there may only be a mono soundtrack as source material. Day notes: 'In an ideal world, you would want to create a multichannel soundtrack. Obviously, that's not something you can do very easily.' There are two related complications here. One is that the mono soundtrack will be the dialogue and the M&E premixed. The >

Top: Andy Day stops working. Above. Left: Alan Snelling teapots with Ken Somerville, directors of Anvil. Below: Alan Snelling on the Avant console.

HEAR THE DIFFERENCE



The world of audio has just changed everything. Just as the CD revolutionized the music industry some fifteen years ago, DVD is shaking things up even more.

The New World of Audio

Most people think DVD is just about video, but it's the sound that brings the picture into focus and immerses you in the experience.

DVD's large storage capacity and high bandwidth make it perfect to deliver a wide range of new formats. With the advent of the new DVD-Audio specification, DVD now delivers even more: High Density Audio in surround, sampling rates as high as 192kHz, streaming lyrics in multiple languages, Smart Content automatic mixdown, extended program lengths, and more. The world of creative possibilities has exploded overnight.

DVD-Audio is changing the way music is experienced, how it is mastered and delivered. If you're a professional mastering engineer or studio, then you need to be ready with the creative tools and technology to start working with audio for DVD today.

Sonic Keeps You at the Forefront

In 1988 Sonic delivered the first non-linear system for professional audio editing and CD prep, SonicStudio™. Since then, we have kept our users at the leading edge of technology, helping to deliver the Oscar®, Grammy® and Emmy®-winning productions that set them apart.

In 1996 Sonic pioneered the world of DVD publishing with DVD Creator™, the industry's leading DVD-Video production system. Today, SonicStudio HD™ and DVD Creator are used to make DVDs by more facilities than all other companies combined. And now, Sonic integrates the best of both with the first-ever systems that enable you to master DVD-Audio.

Start with OneClick DVD™ – a powerful option for SonicStudio HD audio workstations that gives you the power to master DVD-Audio content, or set up a multi-workstation DVD-Audio workgroup – there's a system to match your individual application and budget needs, and you can add additional capability as you need it. In fact, you can easily expand your existing Sonic audio mastering suite to include multi-channel, High-Density DVD-Audio mastering today.

If you are premastering high quality audio sound tracks for cutting edge artists, or editing a symphony master in multi-channel 24-bit, 96kHz audio, Sonic Solutions delivers the professional audio solutions you're looking for.

Hear the Difference Today.

Visit us at www.sonic.com

Sonic Europe • 21 Warwick Street, 4th Floor, London W1R 5RB, UK
tel: 44.171.437.1100 • fax: 44.171.437.115[illegible] • email: info@europe.sonic.com

© 1999 Sonic Solutions. The Sonic Solutions logo, Sonic, Sonic Solutions, and SonicStudio HD, High-Density Audio, OneClick DVD and DVD Creator are trademarks of Sonic Solutions. All others are trademarks of their respective holders.

SONIC SOLUTIONS

< other is that Day is typically working with four dialogue tracks, in different European languages. Day believes that the requirement for multilingual releases gives Anvil a competitive edge over counterparts in Los Angeles—who are less used to foreign-language dubbing—and also ensures a consistency across territories. None the less, the process is not without its problems.

'There are a lot of issues there in terms of making sure you don't get phasing between sources,' Day acknowledges. 'It depends how the M&E has been created. There are easy ways using filtering and just splitting signals up, which is not that effective—but it puts stuff out of speakers.

'The preferred way is to have the M&E remade so that they get the original music tracks and restore those, then remake the Foley tracks to completely recreate the M&E. In those instances, you have a complete new piece of audio which you are combining with the mono track so you have less chance of phasing.'

In the end, there has to be a balance between the available budget and the expectations of the consumer. 'Most people who are listening just using the stereo outputs of their DVD player, really are not going to be that worried whether its mono or 5.1,' says Day. 'The users with the full-blown Dolby Digital 5.1 decoders, will obviously benefit if they are watching a feature in 5.1. Just having the sound come out of the centre would seem a little strange.'

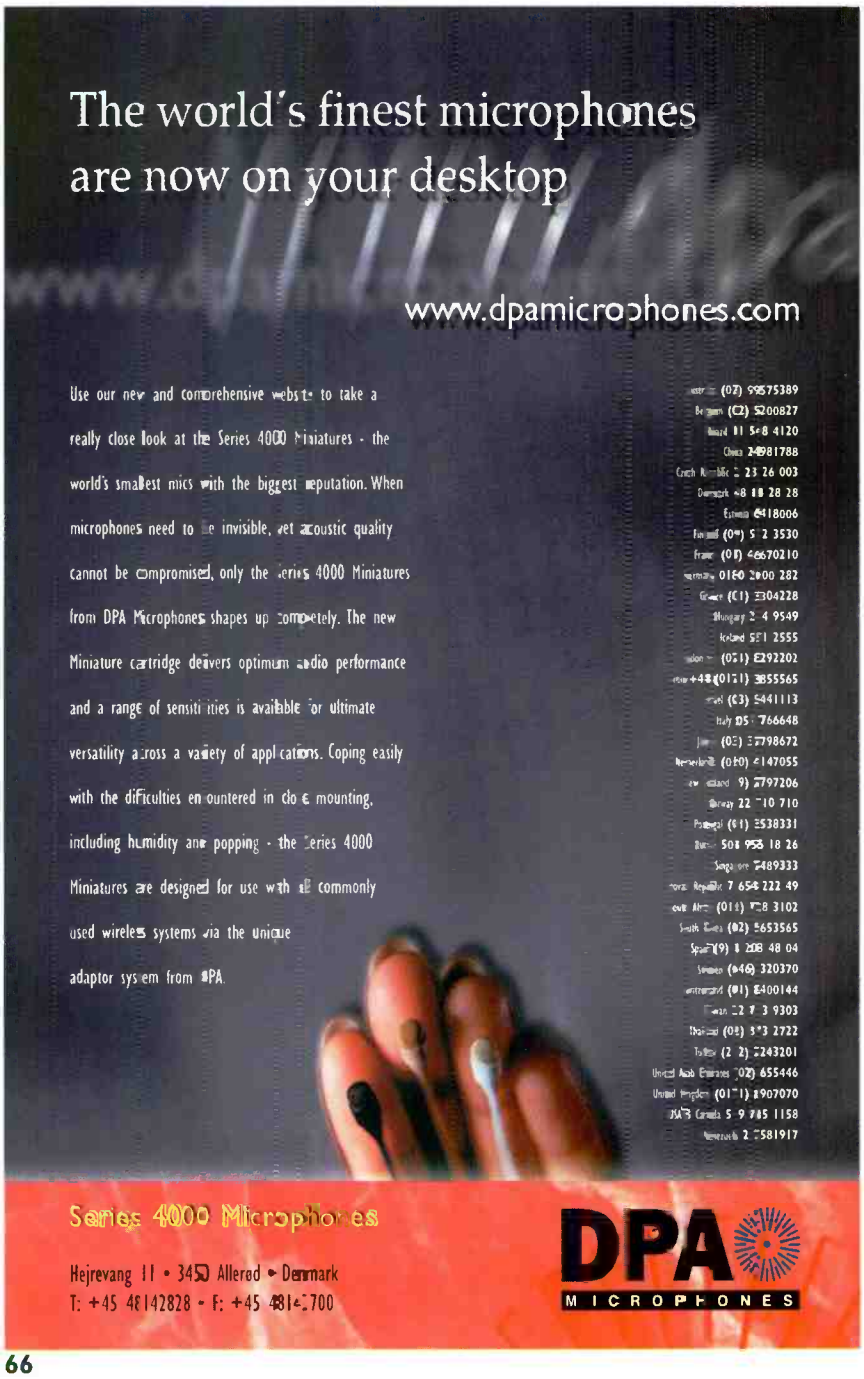
Removing optical noise from older material is an obvious application for the CEDAR modules. Day also uses the DiNr plug-in for Pro Tools. But film companies are also adding value to DVD Video releases by adding 'The Making of...' films and trailers.

'In the case of the trailer, you may find that it only exists as an LT-RT, yet the main feature is in 5.1,' Day explains. 'So the client may want you to match the audio quality. You may find that the trailer comes off a second-generation Beta and the audio quality is not that good, compared to the main feature. From a restoration point of view, there is a real requirement to quality match those two, just so the disc is more rounded,' he continues. 'Some of the discs out at the moment, you can tell someone has taken all the bits and thought, "we'll whack this lot on there". There's not much attention paid to the overall consistency.'

A subject which concerns the pre-mastering process is which audio formats to put on the disc. This is a slightly confusing area.

'You don't have to have a 5.1 soundtrack,' says Day. 'You do have to put a Dolby Digital soundtrack on there, but that can be a stereo Dolby Digital soundtrack—a 2.0. The thing about the Dolby Digital system is that within every player, there's a downmix chip,' he explains. 'If you give it a 5.1 soundtrack but you are only using the stereo outputs of your player, the downmix chip will take those 5.1 channels and downmix them into stereo format. You don't have to worry about creating a separate stereo mix.'

Day emphasises that this 'folding down' can be auditioned and controlled



Above: The machine room.
Right: Andy Day in the post studio.

during premastering, it's not just an automatic reduction.

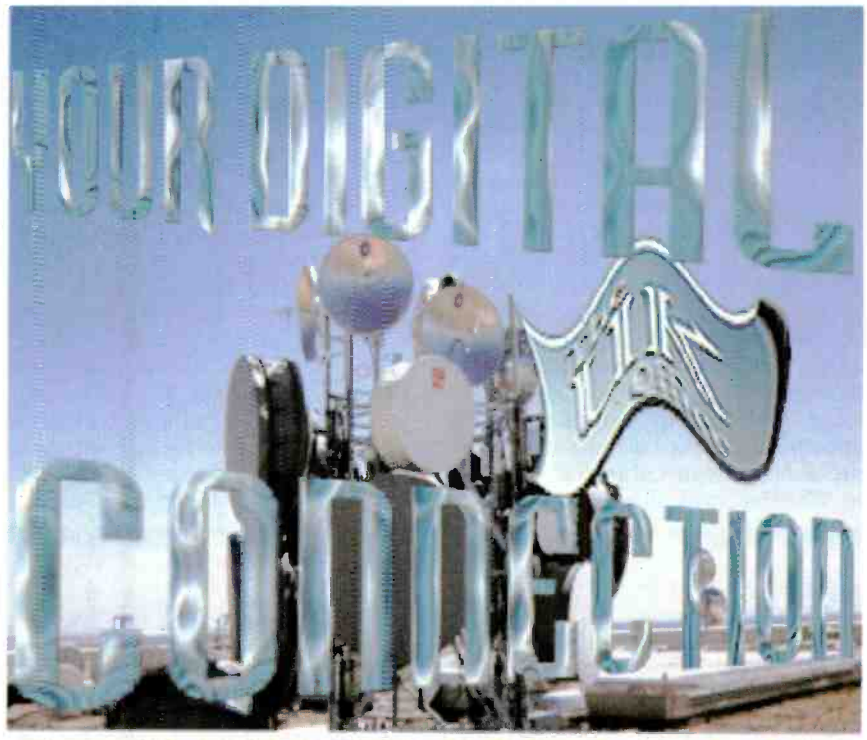
'The other thing is that it's ProLogic [Dolby Surround] compatible, to the point that if you then take your stereo output and feed it into your ProLogic decoder, which you might have built into your TV set, it sounds very similar to something that would have been made from an Lt-Rt track.

Because this article is about DVD Video, discussion about the DVD ROM and DVD Audio formats really belong somewhere else. But it is interesting to note that Day regards super-resolution DVD audio-only formats as unlikely to produce audible benefits in the domestic listening environment. Also, he does not believe that the compression used in Dolby Digital leads to a significant degradation of the source.

'If you were to be able to listen to a Tascam DA-88 against a Dolby Digital encoded signal, then you might hear differences but to be honest I don't think you will,' says Day. 'The coding's very good. Hundreds of people have listened to this over the years, either in its film form or DVD.'

In fact, music video is where Day and Anvil director Alan Snelling—who has enviable film music recording credits—see massive potential for DVD Video. I think that's something that has not been exploited at all,' says Snelling. 'I think on the music scene, not many people have heard it properly yet. And it's not just for rock and pop, even the classical concerts—the *Three Tenors* or something—if you put that into 5.1, it would be fantastic. It would be an event.'

'There are music titles out there, but they tend to be pull-offs from existing VHS releases,' says Day. 'I think the big fear for record companies is "Oh my God, we've got to go and remix it in 5.1". That would be an ideal situation but I think there is a realistic mid-way that gives you something beyond a stereo soundtrack but at a reasonable cost.' ■



Today's world is digital! And beyond the established and accepted benefits of storage, manipulation and quality, come a range of new possibilities to embrace, - and complications to overcome.

Our experience at The UK Office with complex wide area audio and data network design and specification, including ISDN & permanent circuits, as well as studio signal routing and clocking, means we can help you with the practical implementation of most of your digital interconnect requirements.

We do this with products from Aardvark, Dialog4, Glenayre, Intraplex and Z-Systems.

With more digits flying around the studio all the time **Aardvark** and **Z-Systems** provide the means to keep everything in perfect sync and under automated control.

Then, from simple studio to transmitter links to complex distribution of network programmes the **Intraplex** multiplexers are the gateway to telecoms E1 circuits, or **Glenayre** spread spectrum (licence free!) radios. While **Dialog4** ISDN codecs offer some unique features for dial-up links.

Make The UK Office *Your* Digital Connection

Now on-line at http://www.theukoffice.com

Aardvark · GLENAYRE · DIALOG4 · Intraplex · ZSYS

BERKHAMSTED HOUSE
121 HIGH STREET
BERKHAMSTED
HERTFORDSHIRE HP4 2DJ
TELEPHONE 01442 870103
FACSIMILE 01442 870148
E-MAIL tuko@theukoffice.com

The UK Office

A History of Computer Audio

Once it was hard to imagine the computer as a major part of audio, now it is hard to live without it. **Martin Polon** traces the rise of computers in audio

THE HISTORY OF COMPUTERS in audio is intertwined with the development of digital audio. The best way to keep an analysis both logical and chronological, is to use a timeline to analyse where we were, where we are and where we are going in computer audio.

During the first half of the 20th century, the development of computers in audio—or, if you prefer, audio in or on computers or computer manipulation of audio—like so many other technological developments in this century, began during World War II. While many digital computer audio experts, cite development work in the late sixties and early seventies as the logical beginning of both developmental tracks, there was fledgling research by the Bell Telephone labs into the forties on possible techniques to compress and otherwise change the analogue telephone signal to allow more conversations to be placed into finite copper line resources. The most impressive application of changes in the analogue transmission of audio vis-a-vis telecommunications circuits in WWII, was the leviathan of valve electronic racks for frequency inversion of radio-telephone signals used between Winston Churchill and Franklin Roosevelt intended to thwart the Nazi Abwehr. Designed by Bell Telephone Labs and manufactured by Mother Bell's Western Electric subsidiary and installed in London in the basement of the Selfridges Department store, the system connected what appeared to be a lavatory site within the subterranean Cabinet War Rooms in Whitehall with the White House in Washington, DC.

This was the tip of the iceberg as secret military research continued after WWII into the basics of digital transmission—even if that methodology sometimes carried a different name. Certainly, the highly secret and still operative US-UK ABC Treaty in the late forties mandated a broad range of co-operation and research into intercepting and transmitting various forms of audio communications—by the fledgling US NSA (National Security Agency) and the British GC&CS (Government Code and Cipher School). The British establishment (whose name was a sobriquet designed to hide the real work at the facility), had been instrumental in developing and using the first practical form of digital computer, Alan Turing's Bombe to break the Nazis Enigma codes—guaranteeing the Allied victory in World War II.

Another landmark to be considered on the path to digital and computer audio is Bell Labs' invention of the transistor in 1947. The transistor quickly replaced the valve with a device that could act as a switch and at much higher speeds and reliability. Once industry learned how to combine first hundreds, then thousands, then tens and hundreds of thousands of transistors within a single chip, the further development of the digital computer was a sure thing. Curiously, the circuits contained in Churchill's frequency invertor that was essentially the size of a large London pub, would soon be housed in a transistor chip that would fit quite >

Digidesign

1985 **DigiDrums.** The creative spark for Digidesign starts in a university dorm as founders Peter Gotcher and Evan Brooks create DigiDrums, drum chips for the Emu Drumulator

1987 Softsynth Mac and Softsynth Atari-additive/FM synthesis program

1988 Sound Tools I—the original sound accelerator card for Mac and Atari for stereo editing. AD-In—the two channel audio to digital interface for Sound Tools. Sound Designer Universal Mac-Universal sample edlting software

1989 Dat I-0—Digital I-O for the Sound Tools system; Audiomedia I—cost-effective 2-channel DSP card with analogue I-O

1990 Sound Tools Mac—a dedicated sound accelerator card for the SE and SE/30. MasterList Mac-Pre mastering software for nubus mac. Sound Tools Atari—a dedicated sound accelerator card for the Atari

1991 Pro DECK/EDIT—the original Pro Tools software for four channel recording and mixing. The original Pro Tools audio card 442 for nubus 442 Audio Interface I/O

1992 Pro Tools software version 2.0-is in fact the first Pro Tools software version and includes the first DAE (Digidesign Audio Engine); Audiomedia II a low cost card with digital and audio I-O ProMaster 20-a high resolution 20-bit I/O for Pro Tools

1993 DINR—Digidesign Intelligent Noise Reduction Software for broadband noise and hum removal. Session 8 PC software—eight-track recording-editing software

1994 a milestone in Digidesign product releases Hardware Pro Tools III—a totally redesigned nubus disk I-O card capable of sixteen tracks record-playback with advanced editing and mixing features. The release introduced TDM (Time Division Multiplexing) for real-time effects plug-ins. DSP Farm- a nubus DSP card for increased TDM processing. New Audio Interfaces 888, 882. D-Verb—Digidesign reverb TDM Plug-in TDM Core Software-Dynamics, EQ, Mixer and Mod Delay built into Pro Tools. Digidesign and Avid merge. AudioVision, based on Digidesign components but with an Avid software front end for post production and ADR, is given to Digidesign product development.

1995 The year of the Plug-In: Development Partners program is well established and now includes over 100 software and hardware products.

1996 Pro Tools III—the Disk I/O card for PCI Mac capable of 16 track record-playback and expansion to 32 tracks with additional cards. Pro Tools Version 4.0 includes a long and enhanced feature list

1997 Pro Tools|24- the introduction of a redesigned 24-bit DSP audio card capable of 32 tracks (expandable to 64) with increased DSP power and support for Mac and Windows NT

1998 Pro Tools|24 MIX- a powerful new audio dsp card capable of 64-tracks and over 300% more DSP power than the Pro Tools|24 system. Pro Tools|24 MIXplus- the MIX core and new MIX Farm bundled for over 700% more DSP processing. ProControl—a tactile control surface for Pro Tools

1999 Pro Tools Version 5.0 launches with integrated MIDI sequencing, cross platform parity and DirectConnect TDM plug-ins. AVOption. Digi001—the new low cost plug and play system.

SADiE
digital precision
DDP CD-R 1630
www.sadie.com
the world's finest audio mastering workstations

< comfortably in your hand.

Between 1950 and 1960, the pioneering work done on high fidelity recording of audio on magnetic tape by Jack Mullin and the Ampex Corporation based on work done by AEG Telefunken, was to leave the realm of time delaying the like of the Bing Crosby Radio Show on the ABC radio network (so that Bing would have more time to play golf), and provide a medium to record data for the US military. Mullin, using modified Ampex audio recorders, equipped the naval missile research facility at Point Mugu, and at the Air Forces Rosamond Dry Lake-Edwards Air Force Base (both in Southern California), for data capture and telemetry at the beginning of the fifties.

Military research and development into digitising audio for radio transmission and reception continues, in the search for reliable and non-interceptable communications means.

The first significant paper on digital audio was published in the July 1961 *Journal of the Audio Engineering Society* by Schroeder & Logan on 'Colourless Artificial Reverberation'. In fact, successful commercial research in digital audio (as opposed to military) during this period was focused on replacing mechanical delay (metal plates), recorder delay (magnetic tape loops) and acoustic delay (long chambers with speakers and microphones) with flawless solid-state reverberation. Computers, though continuing to advance and shrink in size, were still physically much too large to even be considered for studio use, hampered by slow system buses, processor fields crippled by a minimal number of bits processed per cycle and slow cyclic rates that could not accommodate audio sampling in any size package that would be smaller than the recording studio building itself. Most important, the inherently small memory then available for computing functions, typically using storage cathode ray tubes or magnetically coated drums, was too slow and woefully inadequate for the task of storing recorded audio signals—with only the high-speed behemoth data-tape drives providing any capacity at all. In addition to memory concerns, price and size eliminated any possibility of computer audio usage.

The emergence of video tape recorders using moving heads as well as the movement of the tape to reach the speeds necessary to capture a video signal, provided a suitable platform for research into possibly capturing digital audio signals in a similar way. Companies such as 3M, Ampex, Decca, Denon, Mitsubishi, Philips, Sony and others were looking for a reliable and viable way to store digital audio.

During the early seventies, computer manipulation of digital audio began to take a different course from the pure development of digital audio. Digital audio development would continue through this decade, evolving into the standards agreements and physical technology of the CD at the beginning of the eighties. Digital recording of audio on tape became a reality through the seventies with the advent of professional recorders by 3M, Decca-London, Denon, Mitsubishi, Sony, Studer and others—some for proprietary use and some for commercial sale.

In an important parallel development, with much relevance to future computer audio developments, Dr Thomas Stockham created a digital-audio recording and editing system (Soundstream) using readily available computer storage tools. This was upgraded by the end of the seventies to the, then new, large, cumbersome, expensive computer hard disk drives and Stockham's digital editing systems were used successfully by many if not all of the major labels.

Those who were curious about controlling, equalising and otherwise manipulating audio via the computer began to recognise how components such as the, then fledgling, microprocessors could take advantage of evolving digital developments in musical instrument connection and control and of companion

DAR

1985 DAR officially formed, with its first product, the WordFit dialogue synchronisation system. The then current hard disk technology allowed only a few minutes of film dialogue to be recorded and processed at one time.

1987 DAR launched its first dedicated audio editor, SoundStation, state of the art hard-disk-based editing system.

1989 DAR was the first company to introduce removable media usage into its digital audio workstations, with the advent of magneto optical technology.

1995 DAR's introduces its first networking solution, using computer networks to provide peer to peer communications between audio workstations, together with large common audio servers.

1997 Media cost/capacity continues to reduce, to the point where computing products can now be used to provide a genuine alternative to standard tape recorder products. DAR's OMR8 Open Media Recorder is one of the first such products to hit the market, developing a true 8 capability on magneto optical technology.

1999 DAR launches the STORM editing system, involving a completely new hardware platform. This development makes a large number of channels available from a single disk store, supplying 64 audio tracks from a single disk bank and 16 channels of audio reliably across a computer network. AES31 comes into play, representing the move to a genuinely open standard. The new standard is a major breakthrough, combining a dedicated audio layer on the top of the core computer recording media—rather than a dedicated audio hardware approach.

developments in using computers for musical synthesis, synchronisation, sequencing and shaping.

In the late seventies, the combination of digital audio, higher sampling rates and quantisation technologies made possible a number of firsts: musical synthesisers followed quickly by actual computer keyboard control, storage and manipulation machines. Albeit these machines operated at a very minimal rate of storage (by today's standards) due to high per-byte storage costs at that time. These machines were actually the first digital-audio workstations, though a stretch of the definitions used today is necessary to include them in that category. They each developed with proprietary sampling rates, quantisation, microprocessors, bit rates for chip input and output, clock rates, system bus speeds, memory devices, capacity, and so on. Although there were fledgling interfaces for digital audio exchange, these machines essentially could only exchange work with similar machines from the same manager. One of the several successful incarnations of these early digital-computer audio devices was developed in 1975 as the Synclavier at Dartmouth College, New Hampshire; by Sydney Alonso, who specialised in developing the hardware designs, and Jon Appleton, the musical advisor to the project and Cameron Jones, who acted as the software consultant. The Synclavier emerged as a complete, self-contained digital music and effects synthesiser using an internal matrix of integrated circuits and microprocessors. A year later the New England Digital Corporation was formed, to develop, sell, and service the Synclavier. The device was quickly upgraded with a well-engineered push-button key system, with later models having an added video display unit and a full computer type QWERTY keyboard and even provision for a hard disk drive.

More or less simultaneously, in Australia, a company called Fairlight (named after the hydrofoil ferry that traversed the waterfront of Sydney harbour) was formed by Peter Vogel, an electronics designer, and Kim Ryrie, a synthesiser enthusiast. Vogel and Ryrie created there first product by merging designs of their own creation with a dual processor system using Motorola products that they licensed. Reworking what it had, Fairlight produced the QASAR M8. The QASAR was an 8-voice synthesiser, with a keyboard and a 2ft by 2ft by 4ft control and computer processing unit. To quote Fairlight's own description of the device, 'it was huge, it was heavy, it was complex, it was costly, and it was unsuitable for mass production and servicing'. Moreover, it did not sound particularly good.

However, later in the seventies, by upgrading the technology and software design, and using libraries of real sounds stored on 8-inch 500 kilobytes floppy disks containing 22 sounds each, the device emerged as a landmark machine for recording musicians to add a level of musical and sound-effect whimsy to their recordings. The upgraded CMI had a musical keypad, a video screen with an interactive light pen, an additional QWERTY keyboard, and a much smaller physical stature with a 1ft by 2ft by 3ft CPU. The machine opened technology doors never before available to studio engineers and-or artists. Limited only by its 200 or so kilobytes of RAM, a variable sampling rate maxing out at about 24kHz to a maximum frequency response slightly above 10kHz, its 8-bit dual processors (the Motorola 6800) and its 8-voice polyphony, the CMI was hailed for its capacity to emulate real instruments and was called an orchestra-in-a-box.

In 1979, Peter Vogel, demonstrating his system to Peter Gabriel during a recording session in England, excited Gabriel who then purchased a complete system at its, then, price of about $24,000 (US). Artists Thomas Dolby, Herbie Hancock, Joni Mitchell, Alan Parsons, Todd Rundgren, and Stevie Wonder soon followed. It might be fair to say that electronic composer Jan Hammer, who also bought the system, was influenced by the technologies in the Fairlight box in creating much of the stereo soundtracks for the landmark network TV shows from Michael Mann—*Miami Vice* and *Crime Story*.

Lexicon, another company instrumental in pushing the envelope of digital-computer audio technology, was founded by MIT Professor Dr Francis Lee who had developed a digital delay unit for medical heart monitoring. With engineer Chuck Bagnaschi, he started up the company as American Data Sciences in 1969. The name was changed to Lexicon in 1971, when it appeared that there would be a market for digital technology in language instruction. Based on suggestions from Barry Blesser, at the time a teaching assistant to Lee at MIT, an audio signal was sent through the system. The result was a 100ms digital audio delay line, impressive enough to attract the interest of Steven Temmer at Gotham Audio. Lexicon prospered and continued to research the applications of digital audio for the studio user and ultimately released its OPUS digital-audio workstation, in 1988. Over 100 OPUS users continue to be fully supported and remain profitable in their studio production businesses.

At the end of the seventies computer audio technology was evolving, but the crucial developments to using digital audio on computer would be the evolution of real standards for interconnection with the computer of various electronic music components necessary for the use of a studio-in-a-box, and the advancement in chip and moving magnetic surface memory capacity to allow virtually manipulative (RAM) storage and permanent storage (hard disk drive) of digital audio.

The first half of the eighties was the period of the most innovative developments in digital tools, which we still use today as the basis of computerised audio. First among these was >

SoundWare has provided digital audio and surround solutions since 1990

For order and active demonstration, check our web-site,

www.soundware.dk

surround control

for 02R, 03D, ProTools and more...

MULTIPLE SYSTEMS

dsp7 can be used with the digital production systems most widely used for surround control and automation. Check our web-site for an up-todate list.

MULTIPLE FORMATS

- 4:2:4 LCRS formats, eg. Dolby Surround
- 5.1 channel formats, eg. MPEG, DTS, Dolby Digital
- 7.1 channel formats, eg. SDDS

Retail Price: USD 550,-

SoundWare A/S • Vesterport 8 • DK-8000 Aarhus C • Denmark
Phone +45 8613 2400 • Fax +45 8613 2406

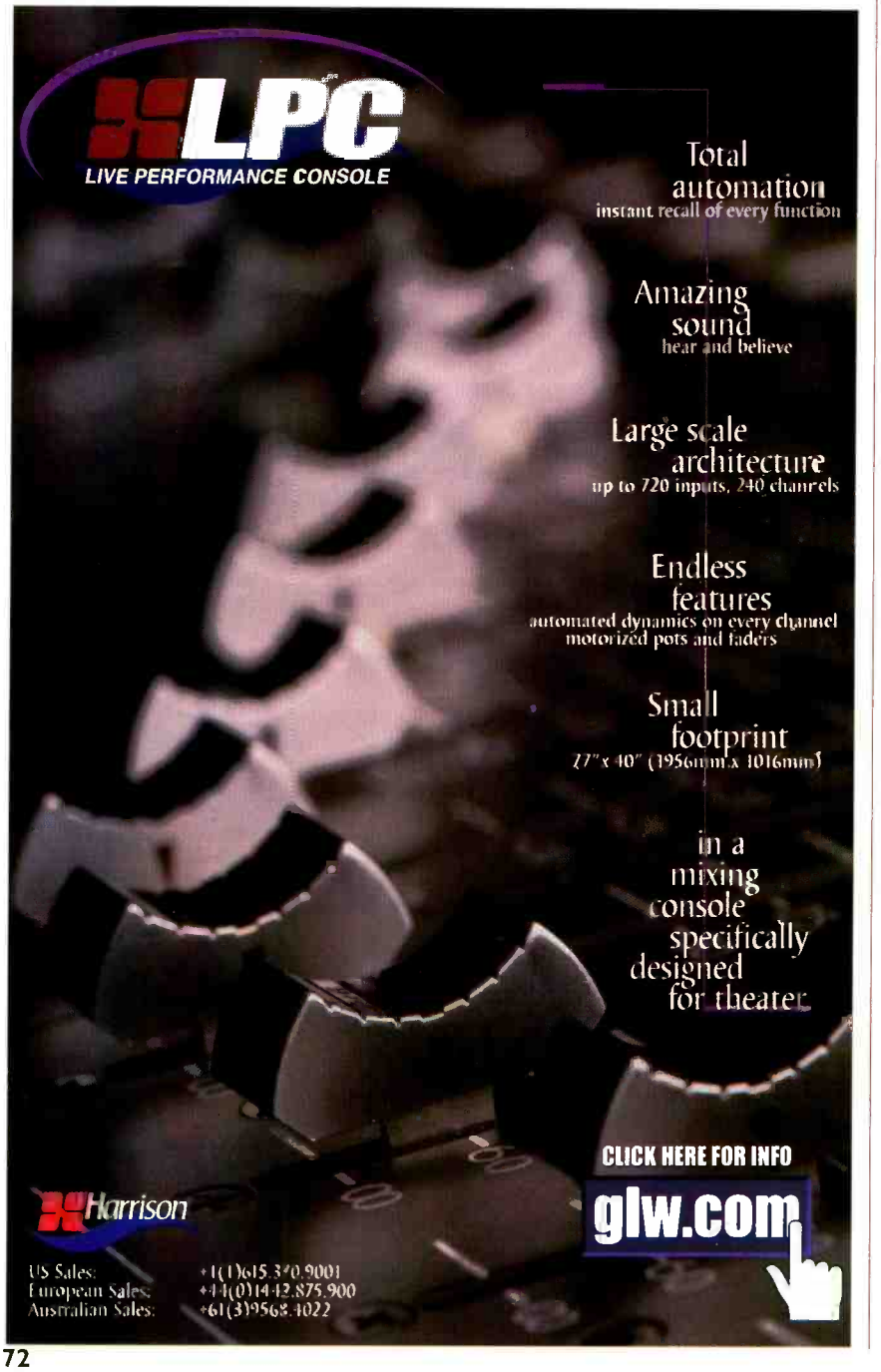
Features and specifications are subject to change without notice

< the landmark agreement for a standard of communications between an entire family of musical products and computers. Known as MIDI, or Musical Instrument Digital Interface, the protocol grew out of a paper on the Universal Synthesiser Interface (USI) presented to the AES in October of 1981 by Sequential Circuits (whose innovative staff later migrated to electronic music giants Korg and Yamaha).

By October of 1983, meetings between virtually all of the manufacturers of digital music electronics had produced the landmark MIDI 1.0 Detailed Specification. Since that time, other functions have been added such as MIDI Time Code in 1987. But MIDI has become so universal that no one wants to completely rewrite the specs due to the threat of making obsolete literally hundreds of thousands of items using the interface.

The interface itself, a serial data protocol sending one bit of pulsed information at a time (31,250 times per second) onto a 5V line, has remained a valid interface for computers (as well as for electronic musical instruments and devices) since its inception, because the chosen MIDI time increment of 31,250 is mathematically correct as a factor (1/32) of 1MHz or as multiples of multi-Megahertz clocking rates used by personal computers. However, Midi is asynchronous itself or if you prefer not clock-rate dependent on external sources and does not have to wait for external commands to fire or execute.

The dawn of the personal computer from the labours of a team of IBM engineers working in Florida in 1981 and the simultaneous birth of the digital operating system (DOS) that IBM ordered from Microsoft, meant that >



AMS Neve

Early 1980s AMS research alternative storage technology for their popular microprocessor controlled digital delay lines. The requirement for greater and greater audio delay times, combined with the ability to capture audio for playback later, leads to innovative experiments using emerging hard disk technology to store audio samples.

1984 AMS launches AudioFile, the world's first commercially available multitrack hard disk editor, at the AES Convention in Hamburg.

1985 First 'green screen' production model ships to TVS in the UK.

1987 The DSP option is introduced. The legendary tape-like 'ReelRock' feature wins acclaim from users.

1988 AMS launches the first integrated digital console and hard disk editor, the Logic 1. The console features the world's first total dynamic automation system.

1992 The impact of AudioFile on the television and film industries is recognised with an Emmy Award for Technical Excellence.

1993 The 'Spectra' controller with integral colour screen is launched. Version II software sets new standards for editing speed and flexibility, and helps establish AudioFile as the editor of choice for post facilities in Europe, the US and the developing Far East industry.

1994 AMS Neve is the first manufacturer to show OMF Interchange capabilities on proprietary hardware. At the NAB Convention, AMS Neve demonstrate a working OMFI, transferring a project from an Avid Media Composer to an AudioFile on a removable hard drive.

1996 A new 24-bit AudioFile platform starts shipping. System software is completely rewritten and offers a range of new features including an ADR package, 24 track playback from a single disk and an integrated multi-machine synchronisation system.

1998 Major new software features for AudioFile include waveform display, strip silence, and threshold recording. AMS Neve introduce the Media Toolbox, an off-line archiving and file translation workstation, enabling studios to increase billable time.

1999 AudioFile SC, a new high speed 32 track editor, is launched at the AES Convention in New York. The system is based on a fourth generation hardware platform, featuring direct connectivity to the StarNet editor network. 28 pre-launch orders are announced at the show.

R.Ed-Recorder ◆ Editor

See us at Digital Media World, London

16-18 November
Stand No. D910

2496

The Next Generation DAW from Soundscape™

- *32 tracks at 24 bit Resolution Per Unit (expandable to 256 tracks/24bit)*
- *Up to 96kHz Sample Rates*
- *26 Digital In's and 28 Digital Out's as standard (3 x TDIF, 2 in/4 out AES/EBU)*
- *2 in/4 out 2496 analogue XLR Card**
- *External High Res. AD/DA/ADAT/TDIF Break Out Boxes**
- *Over 50 Powerful Editing Tools*
- *16 Bus Custom Digital Mixing and Real Time Plug In's**
- *Punch In/Out "on the fly"*
- *RS422 Machine Control**
- *Full Motion Non Linear Video Playback (requires capture card*)*
- *VTC,SMPTE/LTC,Word/SuperClock™ Sync**
- *Hardware Control Surfaces* e.g. Mackie HUI™, JL Cooper, Motormix™ etc.*
- *Compatible with existing SSHDR1 Audio/Arrange Files*

** Optional extras may require additional hardware or software*

From £3995.00 + tax (Shipping August 1999)

R.Ed® recorder ◆ editor

www.soundscape-digital.com
Tel: +44 1222 540333 Fax: +44 1222 540332
email: sales@soundscape-digital.com

© COPYRIGHT 1993 TO 1999 BY SOUNDSCAPE DIGITAL TECHNOLOGY LTD. ALL RIGHTS RESERVED. SOUNDSCAPE IS A REGISTERED TRADE MARK OF SOUNDSCAPE DIGITAL TECHNOLOGY LTD. ANY OTHER TRADE MARKS MENTIONED ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS

< from that time on a standardised and recognisable permanent architecture and technological apparatus for small computers was now at hand. Begun initially with the Intel 8086 family of processors, without hard disks (which were still too expensive to use), using 5-inch floppy disks which really were floppy, and as little as 64 kilobytes of random access memory—these early PCs were memorable more for what they would become to the world of digital audio on computer than for what they were at the time. During the same time frame, computers from Atari, Commodore, Texas Instruments and others were evolving, some with significant audio and multimedia capabilities superior to the PC at the time—only to fall victim in one way or another to the growth and power of the PC in later years (with some hanging on into the late 1990s).

The release of the Macintosh computer by the Apple Computer company in 1984 catapulted Apple from being maker of the computer most used in schools to the originator of the heralded platform eventually most coveted for digital audio, video, multimedia and desk top publishing usage in the eighties and into the nineties. Where PCs were limited in their audio usage by the lack of first—sound cards—and then of quality sound cards with acceptable A–D and D–A convertors, Macs had sound capabilities built into their mother boards. Where early PCs had an inferior quality hard drive installed with little or no option of adding another hard drive, Macs could connect up to seven devices to and pioneered the usage of their, then, advanced SCSI (Small Computer System Interface) buses for the easy (most of time) interconnection of hard drives and other peripherals. With SCSI, the external devices were added to a series daisy chain of components—the user merely having to connect with large multipin SCSI connectors one to another.

One of the companies that prospered by centring on the Macintosh Computer platform for computer-digital audio recording and editing is Digidesign. The company established itself as one of the world's premiere digital platform-software combinations for professional postproduction and multimedia. Pro Tools, the company's digital audio production software would eventually be recognised as having more users in >

Fairlight

1975 Fairlight founded by Kim Ryrie and Peter Vogel

1976 QASAR M8 dual processor, 8-voice synthesiser with lightpen interface debuts

1978 CMI Series I the first graphics-based, digital sampling synthesiser introduced

1982 CMI Series II introduced, featuring first music sequencer and quantisation

1984 CMI Series IIX released, featuring MIDI implementation

1985 CMI Series III world's first 16-bit music sampler / sequencer

1985 VoiceTracker introduced

1989 MFX disk recorder for film post production introduced

1991 MFX2 released with scrolling waveforms and capable of playing 16 tracks from a single hard disk

1994 MFX3 launched—plays 24 tracks from a single hard disk

1995 MFX3plus introduced with new processor, new graphics and PCI bus

1996 MFX3plus released with new software, new hardware and new keyboard; FAME integrated production system and DaD digital dubber released

1997 MFX3plus, FAME and DaD enjoy rapid growth

1998 1000th MFX workstation sold DaDplus 24-bit digital audio dubber announced. Direct File Exchange alliance with Akai, Digidesign & Timeline/Waveframe MediaLink networking announced

1999 MFX3plus expansion to 48 tracks/96kHz announced; Merlin 24/48 track multitrack recorder introduced; FAME2 announced; 100th FAME sold; MediaLink dedicated; Fast Audio Server released; ViVid digital video recorder released; DaDView visual interface for DaDplus announced

Introducing

Pro Tools for Post

Advanced Editing + Avid Picture Options for Post Production

v5.0

Need a serious post solution? Pro Tools® means business. Version 5.0 delivers new post-centric editing features, AVoptions™* for Avid® video media integration, our DigiTranslator™* for dramatically improved file conversion and interchange, and 9 pin remote control with near instant lock. Whether your job is ADR recording, mixing, editing, or sound design, it can be done better, faster, and more cost effectively with Digidesign and Avid — the leaders in non-linear digital media.

And there's more networking; MIDI; ProControl™ to give you world class Pro Tools tracking, mixing, effects, and automation in a hands on environment; plus a mass of other options to increase your productivity and creativity.

For the whole story on Pro Tools v5.0 for post and music, call +44.1753.658.496, or visit our website at www.digidesign.com/pt5.

*AVoption (ABVB) available for MacOS only. AVoption!XL (Meridien) for MacOS expected early 2000; Windows NT support to follow. DigiTranslator and AVoptions purchased separately.

©7/99. Avid, AVoption, Digidesign, DigiTranslator, ProControl, and Pro Tools are trademarks or registered trademarks of Avid Technology, Inc, or its subsidiaries or divisions. All trademarks are the property of their respective holders. All features and specifications subject to change without notice.

Macintosh OS | Windows NT

The SBES Show, NEC
Stand 125
2/3 November

For More Information
+44.1753.653.322 ext496

www.digidesign.com

digidesign®

A division of Avid

studios and post facilities than any other system, and today the company claims more users than that of all other workstations combined.

Founded in the mid eighties by Peter Gotcher and Evan Brooks, the company began as a project to raise money for their band by programming drum chips. A series of successes led to the offering of the Sound Tools software in 1989 to the recording musician and recording studio trade. In effect, they had created the first tapeless recording studio! The company which eventually merged with Avid in 1995 was to proclaim sales of more than 150,000 systems.

Other notable players include AMS Neve, DAR, Augan, Soundscape, Studio Audio and Video's SADiE, and Akai.

No development has been more important to the growth of successful nonlinear editing and recording systems on personal computing platforms than the evolved AV hard disk and associated transfer circuitry. Successfully capturing AV data on a hard-disk drive requires altogether different performance characteristics than those used for daily computer usage. To successfully capture AV data, long strings of data going on and going off the drive in question must do so without any failure, corruption or other interruption!

All hard drives in general have risen in capacity so that early 1990 Macintosh computers like the LC series, which were bundled with 40Mb or 80Mb hard drives, can be contrasted with late 1999 iMacs sporting 13Gb hard drives—a difference of 325 times in capacity. But in addition to growing larger and faster, all modern high-capacity hard-disk drives have had to have become smarter and especially so high capacity AV drives.

Every hard drive in use on every computer must have the ability to perform a thermal calibration cycle. When a hard drive reacts to demand and the drives operating temperatures elevate, minute changes in the intimate relationship between the location of the data heads that read and record and the data platter surfaces itself occur. Through the calibration process, the drive can always find data in the specific location where it is expected, insuring optimal performance and data integrity. But, non-AV drives frequently employ a calibration cycle on a regular schedule dictated by the drive's controller, regardless of what the computer and the drive happen to be doing. This is not generally a problem with a computer data application, since the entry string will be cached. But for AV recording, a hard drive entering a thermal calibration cycle could miss essential audio recording data. So an AV drive will perform thermal calibration only when it is not actively recording audio information. Similarly, AV drives are set up to cache or internally buffer data requests for longer consecutive audio data strings rather than the short strings found in most computer data transactions.

Personal computers on the Windows system became much more competitive with the Macintosh for audio applications during this period. The operating system itself (Windows) became much more user and audio friendly. The advent of the Intel Pentium family of microprocessors saw many more audio hooks or features added. Sound boards became much more fidelity orientated with quality A–D and D–A adaptors used and many of the better sound boards supported SCSI peripheral interconnection as well. That begat PC studio audio-recording software from developers such as Cakewalk and Steinberg to name a few—whose products had the same range of features seen on audio recording software for the Macintosh!

All computers entered a period of true 16-bit functionality and even 32-bit processing became a reality. The coming of the next Millennium promises to see full 32-bit and even 64-bit processing as the norm. New desktop machines from Apple (the G4), promise computing power on the par of that offered by Cray super computers the size of family houses just a few years before. The challenge for computer audio-digital audio will be for developers on both platforms (PC and Macintosh) to rewrite and expand their software to take advantage of the new power and functionality available in the next century. ■

Studio Audio and Video

1991 Studio Audio and Video incorporated. SADiE classic cards designed

1992 Work started on SADiE v0.0; 1st showing of a prototype at CeBIT92 (Hannover) one month after programming started!; 1st UK showing of SADiE. 1st system sold

1993 SADiE v1 release - basic editing model, timecode support. 24-bit editing, no audio processing; 1st US sales - v1.75 introduced the Trim Window for much faster and more accurate editing

1994 v2.0 - added EQ, Dynamics, CD - PQ facilities

1995 v2.2 - automation, Support for Win95 OS

1996 v2.215 - final v2 release; v3.0 —complete rewrite, vastly more flexible system on both SADiE Classic and Octavia; Portia Integrated MJPEG Video system

1997 SADiE PlugIn architecture, CEDAR De-Noise, VocALign; SASCiA ATM network

1998 SADiE 24.96 released - 96k support; v3.6 adds multiple file formats, Mac disks, OMF, and more.

1999 SADiE Artemis released - much more processing power; v3.7 adds DirectX

Distributors

Australia Syncrotech Systems Design Pty. Ltd.
Tel. (02) 98 79 08 00 • Fax (02) 98 79 08 99

Austria C. Grothusen OHG
Tel. (0662) 4 33 68 80 • Fax (0662) 43 60 04

Belgium + Luxembourg A. Prévost S.A.
Tel. (02) 2 16 80 25 • Fax (02) 2 16 70 64

Canada T.C. Electronics Canada
Tel. (514) 457-4044 • Fax (514) 457-5524

Croatia cat audio d.o.o.
Tel./Fax (01) 230-3962 • Fax (01) 601-632

Czech + Slovak Republic AUDIOSALES S.R.O
Tel. (02) 2 32 60 03 • Fax (02) 2 32 58 88

Denmark Audio Visuelt Centrum A/S
Tel. (75 62) 45 77 • Fax (75 61) 46 99

Egypt Decibel Audio Equipment & Installations
Tel. (304) 79 90 • Fax (304) 85 10

France beyerdynamic france S.A.
Tél. (01) 44.09.93.93 • Fax (01) 44.09.82.33

Germany beyerdynamic GmbH.
Tel. (07131) 617-0 • Fax (07131) 604 59

Greece Bon Studio
Tel. (01) 3 80 96 05 • Fax (01) 3 84 57 55

Hungary AUDIOSALES Hungary KFT
Tel. (01) 214-9549 • Fax (01) 214-9549

Italy Audium S.R.L.
Tel. (02) 27 30 42 42 • Fax (02) 27 30 90 18

Japan MTC Japan Ltd.
Tel. (03) 5413-4611 • Fax (03) 5413-4619

Korea Young Nak So Ri Sa
Tel. (02) 5 14 45 67 • Fax (02) 5 14 01 93

Mexico Vari S.A.
Tel. (5) 6 04 69 46 • Fax (5) 6 04 16 14

New Zealand South Pacific Music Distrib.
Tel. (09) 4 43 12 33 • Fax (09) 4 43 25 29

Netherlands Electric Sound B.V.
Tel. (036) 5 36 65 55 • Fax (036) 5 36 87 42

Norway audiotron
Tel. (047) 22 87 15 50 • Fax (047) 22 38 41 28

Portugal
Auvid Cientifico Tel. (01) 4767360 • Fax (01) 47543 73
Ruvina Tel. (02) 3394868 • Fax (02) 33948 79

PR China, Hong Kong Dah Chong Hong Ltd.
Tel. (852) 28 08 61 11 • Fax (852) 28 73 39 11

Russia, MS MAX
Tel. (095) 234-0006 • Fax (095) 249-8034

Saudi Arabia Jeddah 21495
Tel. (02) 6 69 12 52 • Fax (02) 6 60 08 50

South Africa EMS Africa (Pty) Ltd.
Tel. (011) 4 82 44 70 • Fax (011) 7 26 25 52

Spain Media-Sys S.L.
Tel. (93) 4 26 65 00 • Fax (93) 4 24 73 37

Sweden KB Luthman Scandinavia
Tel. (08) 6 40 42 42 • Fax (08) 6 40 73 35

Switzerland Go Wild AG
Tel. (041) 7 20 05 20 • Fax (041) 7 20 05 25

Turkey ATEMPO Ltd.
Tel. (312) 4 35 31 31 • Fax (312) 4 34 47 27

USA beyerdynamic Inc.
Tel. (516) 293-3200 • Fax (516) 293-3288

for more information
Tel. (01444) 258258
Burgess Hill, RH15 9TN
e-mail: sales@beyerdynamic.co.uk
freephone 0800 374 994

beyerdynamic

DT 100– THE FIRST NAME IN STUDIO HEADPHONES...

More hit records and sound tracks have been mixed and monitored on beyerdynamic's range of studio headphones than any other headphones in the world.

Our range of headphones, specifically – the DT 100, are acknowledged by hit making musicians and by recording engineers for their accuracy and fidelity.

The first name in studio headphones –

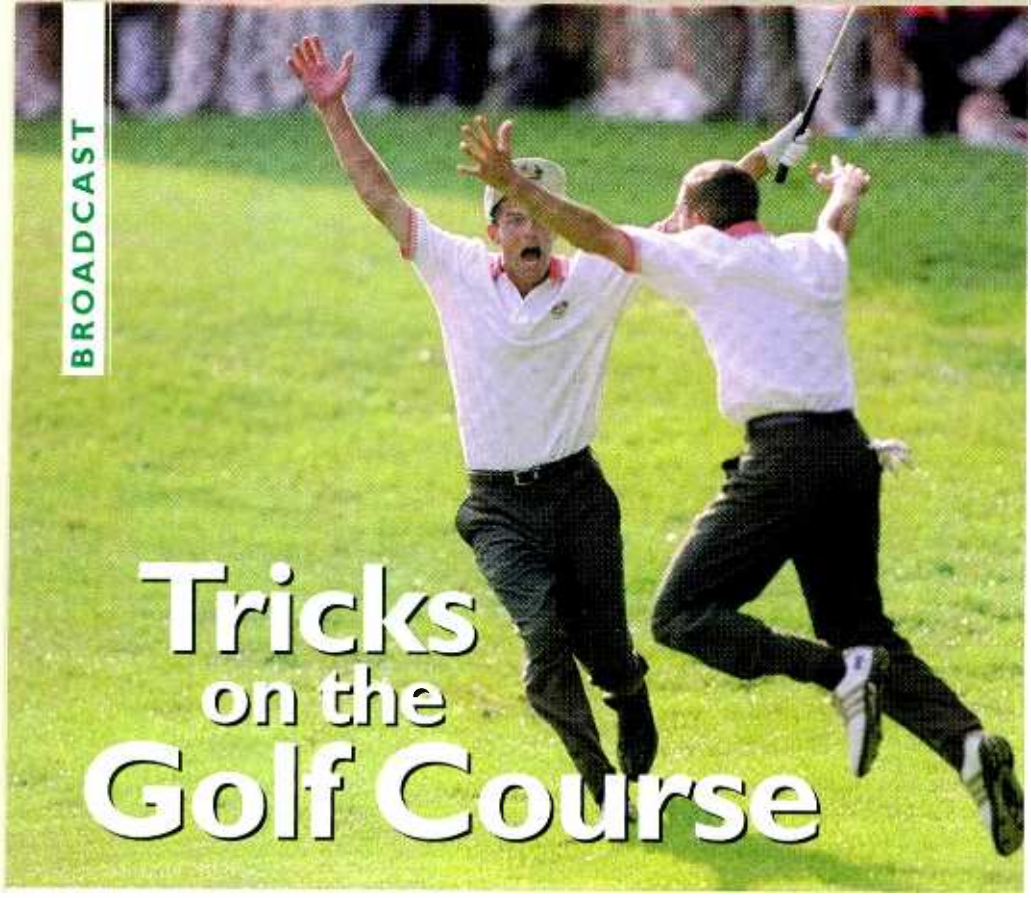
beyerdynamic... *Fidelity in Audio.*™

* Artists pictured wearing DT 100 headphone does not imply endorsement

DT 100, DT 150, DT 250, DT 770Pro & DT 990Pro– the most complete range of studio monitoring headphones available. Call today for a free colour brochure.

for more information
Tel. (01444) 258258 Burgess Hill, RH15 9TN
e-mail: sales@beyerdynamic.co.uk
freephone 0800 374994

beyerdynamic



Tricks on the Golf Course

Originally a sporting gesture, then the establishment of status, now a fiercely fought competition, the Ryder Cup has brought golf a long way. **Kevin Hilton** joins the club

WINSTON CHURCHILL described it as 'An ineffectual attempt to direct an uncontrollable sphere into an inaccessible hole with instruments ill-adapted for the purpose.' Robin Williams once said it was the only time 'a white man could dress like a black pimp and not look bad.' The silly trousers have gone, leaving the focus purely on the game of golf, one of the most lucrative in modern sport—a bold statement given the amount of money flying around in other sports.

The game's standing is reinforced by the amount of television coverage it receives and the amount of money broadcasters are prepared to pay for the rights to cover the big tournaments. Prime among these—and one of the highlights of the PGA (Professional Golfers' Association) Tour—is the Ryder Cup.

Where the other contests pitch individuals against individuals, the Ryder Cup introduces a strong dash of nationalism into the proceedings, as the 12 highest scoring American golfers of the season take on the 12 highest scoring Europeans. The match is made up of a series of singles, foursomes and fourballs, played over three days.

This year's tournament, the 33rd, has become notorious for the perceived gamesmanship and poor sportsmanship of the US team. There is, however, a history of such behaviour. The 1991 Cup has gone down in records as 'The War by the Shore', while the 1997 competition in Valderama ended with the European team charging onto the last hole in a similar way to this year's climax.

Such scenes were probably far from the mind of Samuel Ryder, the British seed merchant who unofficially financed tournaments between America and Britain in the early twenties, before eventually donating the trophy that bears his name in 1927. The tournament has been played every two years since, the venue alternating across the Atlantic. Until 1971, the Cup was contested only between the USA and the UK. Ireland teamed up with the British from 1973, with a pan-European team facing the Americans from 1979 onwards.

The Ryder Cup has turned golf into a national team sport in the same way as football or rugby. Competition has always been fierce, with each team talking themselves up even before a single spiked shoe touches the green. At the start of a Cup challenge during the 1940s, US captain Ben Hogan introduced his players simply by saying, 'Ladies and gentlemen, the best golfers in the world.' America has dominated the competition since its inception, but Europe won in both 1995 and 1997; the feeling was that this year, more than any other, honour was at stake.

This was reflected in the amount of television coverage. Golf has long been a mainstay of TV sport, despite many observers pointing out its unsuitability for such treatment. The 33rd Ryder Cup saw the tournament back in America, held at the Brookline Country Club in Massachusetts over the weekend of >

RYDER CUP PHOTOGRAPHS COURTESY OF SKY

HHB CIRCLE

STUDIO MONITORS

INTERNATIONAL DISTRIBUTORS

AUSTRALIA: AWA AUDIO PRODUCTS
Tel: 02 9669 3477 Fax: 02 9578 0140
Contact: Michael Guest

AUSTRIA: STUDER AUSTRIA GMBH
Tel: 01 865 1676 Fax: 01 865 167699
Contact: Reinhold Fliedl

BELGIUM: EML PRO AUDIO
Tel: 011 23 2355 Fax: 011 23 2172
Contact: Erik Gysen

BRAZIL: VISOM BRASIL
Tel: 021 493 7312 Fax: 021 493 9590
Contact: Carlos De Andrade

CANADA: HHB COMMUNICATIONS CANADA LTD
Tel: 416 867 9000 Fax: 416 867 1080
Contact: Dave Dysart

CZECH REPUBLIC: AUDIOPOLIS
Tel: 02 3332 2132 Fax: 02 3332 4172
Contact: Jan Adam

DENMARK: INTERSTAGE
Tel: 39 46 0000 Fax: 39 46 0040
Contact: Finn Juul

GERMANY: TRIUS VERTRIEB GMBH
Tel: 05451 940810 Fax: 05451 940819
Contact: Hubert Dierselhuis

GREECE: KEM ELECTRONICS
Tel: 01 674 8514 Fax: 01 674 6384
Contact: Thimios Kolikotsis

HOLLAND: TM AUDIO HOLLAND BV
Tel: 030 241 4070 Fax: 030 241 0002
Contact: Peter de Fouw

HONG KONG: DIGITAL MEDIA TECHNOLOGY
Tel: 2 721 0343 Fax: 2 366 6883
Contact: Wilson Choi

IRELAND: BIG BEAR SOUND LTD
Tel: 01 662 3411 Fax: 01 668 5253
Contact: Julian Douglas

ISRAEL: BANO-PRO FIM/VIDEO INC
Tel: 03 673 1891 Fax: 03 673 1894
Contact: Ofer Menashe

ITALY: AUDIO EQUIPMENT
Tel: 039 212 221 Fax: 039 214 0011
Contact: Donatella Quadrio

JAPAN: TIMELORD
Tel: 03 3794 5575 Fax: 03 3794 5605
Contact: Henry Dienne

MALDIVES: ISLAND ACOUSTICS PTE LTD
Tel: 960 31 0032 Fax: 960 31 8264
Contact: Mohamed Habib

MEXICO: LOLA DE MEXICO
Tel: 525 250 6038 Fax: 525 250 6038
Contact: Carmen Juarez

NEW ZEALAND: SOUND TECHNIQUES
Tel: 09 846 3349 Fax: 09 846 3347
Contact: Stephen Buckland

NORWAY: LYDROMMET AS
Tel: 22 80 94 50 Fax: 22 80 94 60
Contact: Jarle Felin

POLAND: DAVE s.c.
Tel: 22 826 4912 Fax: 22 827 4854
Contact: Bogdan Wojciechowski

PORTUGAL: ELECTROSOUND PORTUGESA
Tel: 01 417 0004 Fax: 01 418 8093
Contact: Carols Cunha

RUSSIA: A&T TRADE INC
Tel: 7 095 796 92 62 Fax: 7 095 796 92 64
Contact: Alexei Gorsky

SINGAPORE/ASIA: SENNHEISER ELECTRONIC ASIA
Tel: 065 273 5202 Fax: 065 2735038
Contact: Donn Ho

SOUTH AFRICA: E.M.S.
Tel: 011 482 4470 Fax: 011 726 2552
Contact: Dennis Feldman

SPAIN: LEXON
Tel: 93 203 4804 Fax: 93 280 4029
Contact: Robert Serrat

SWEDEN: POL TEKNIK AB
Tel: 46 8 449 4440 Fax: 46 8 88 4533
Contact: Jarmo Masko

SYRIA: HAMZEH & PARTNERS CO
Tel: 11 333 3753 Fax: 11 373 1573
Contact: Khaled Hamzeh

SWITZERLAND: DR. W.A. GUNTHER AG
Tel: 01 910 4141 Fax: 01 910 3544
Contact: Roland Bricchi

TAIWAN: DMT TAIWAN
Tel: 02 516 4318 Fax: 02 515 9881
Contact: Honton Sze

USA: HHB COMMUNICATIONS USA
Tel: 310 319 1111 Fax: 310 319 1311
Contact: David Beesley

HHB FIRST WE LISTEN

HHB Communications Limited

73-75 Scrubs Lane · London NW10 6QU · UK
Tel: 020 8962 5000 Fax: 020 8962 5050 E-Mail: sales@hhb.co.uk
Visit HHB on line at http://www.hhb.co.uk

COMPACT. POTENT. AFFORDABLE.
NOW YOU CAN HAVE IT ALL.

HHB CIRCLE Don't be fooled by their size. Standing just over 10 inches high, HHB's Circle 3 nearfield monitors deliver the characteristically accurate, involving and untiring sound that has made HHB Circle monitoring an industry standard with audio professionals the world over.

HHB Circle 5.1 system: Five active Circle 5s plus a Circle 1 powered sub.

Available in active and passive versions, HHB Circle 3s are ideal for precision monitoring applications in which space and budget may be restricted, but a big, powerful sound is still an absolute necessity.

Compact. Potent. Affordable.

Talk to an HHB Circle 3 dealer today and tell him you want it all.

HHB Communications Ltd · 73-75 Scrubs Lane, London NW10 6QU, UK
Tel: 020 8962 5000 · Fax: 020 8962 5050 · E-Mail: sales@hhb.co.uk

HHB Communications USA LLC · 1410 Centinela Avenue, Los Angeles, CA 90025-2501, USA
Tel: 310 319 1111 · Fax: 310 319 1311 · E-Mail: sales@hhbusa.com

HHB Communications Canada Ltd · 260 King Street East, Toronto, Ontario M5A 4L5, Canada
Tel: 416 867 9000 · Fax: 416 867 1080 · E-Mail: sales@hhbcanada.com

http://www.hhb.co.uk

HHB

FIRST WE LISTEN

Don't forget to record on the best: HHB Advanced Media Products

< the 24th to 26th September. The host broadcaster was NBC, but UK rights holder BSkyB decided to do more than just take the world feed and add basic continuity for its own output.

The satellite broadcaster has drawn criticism for its aggressive bidding to secure the big sporting events. But these criticisms have been tempered by admiration for the station's willingness to try something different, as shown by its coverage of the Cricket World Cup earlier in the year. Even before the tournament began, Sky Sports 1 ran a daily, hour-long 'countdown' starting on 20th September. Thursday's opening ceremony was carried live, building up for the real meat of the occasion on Friday, Saturday and Sunday.

Graphics made the big difference to the Cricket World Cup. The Ryder was taken further by employing the technology that everyone who works in or watches television is talking or thinking about—interactivity. On Sky Sports Extra, through SkyDigital (currently available, it is claimed, to 1.2 million subscribers), it was possible to access three different views of the match by selecting a preference on screen. This offered either NBC's US coverage, the score card or Sky's European coverage.

By selecting two of the options, it was possible to have picture-in-picture, with the game in progress as a small insert into the main score card. Given the

strong national feeling on both sides, the ability to flick between NBC and BSkyB provided an insight into how the two continents viewed the proceedings.

Sky built its own pine-floored studio at Brookline, embellishing the basic host feed with 20 cameras of its own, a 75-strong crew and roving reporters (including one-time Ryder Cup player Ronan Rafferty). Presenter David Livingston linked the live coverage and talked to the inevitable line-up of pundits. These included former golfers Tony Jacklin and Peter Oosterhaus, and, somewhat incongruously, Sky Sports' hyperactive football analyst Andy Gray.

The European version only was available on Sky Box Office and was free to all Sky subscribers, although this initially caused friction with UK digital terrestrial broadcaster ONdigital, which felt its customers were being denied access to the coverage. The situation was later settled in what the Sky Sports press office described as an 'amicable' fashion. Sky Sports 2 screened three hours of highlights a day, while all cable companies were offered the transmissions.

Interactive coverage was overseen by Piers Croton, executive producer at Sky Sports. A similar approach had been taken with the broadcaster's treatment of the UEFA Cup football championship. 'It's the only way to watch something like golf,' comments Croton, 'and it's a convenient tool. Interactivity provides an environment that pulls together the two different coverages and gives the viewer instant access to the score card, which is constantly updated.'

On switching to Sky Box Office, the viewer was greeted by a 'invitation logo'. Pressing this launched the application, presenting the main menu: red button for US coverage, green for the score board and yellow for European coverage. Another feature was the 'sports ticker', a news-flash style graphic that carried the latest news of the tournament along the bottom of the picture.

While Sky handled its own continuity and commentary, the European version of the coverage was produced for the broadcaster by a third-party production company. Some of the cameras used were shared with NBC, but not all, meaning that Sky could get the pictures it wanted. Although Sky is known for its use of surround sound on sports events, the sound-track in this case was straight stereo, something probably due

to the huge logistical task of getting signals back from five transmission sites.

BSkyB contracted NTL to provide broadcast transmission facilities for the Ryder Cup. Previously best known as the UK's commercial TV and radio transmission and satellite uplink provider, NTL is now positioning itself as a provider of cable, multimedia and Internet services. This contract follows on from Sky using the NTL/Williams Vyvx transatlantic fibre connection service for coverage of the US PGA Tournament during August. It marked a departure from using satellite uplinks, which had been the usual way to distribute sports events of this kind.

The Brookline feeds were carried on the AC-1 transatlantic fibre connection, using SDH technology. Full stream MPEG2 compression was employed, running at 12.5Mbp/s to provide broadcast quality pictures. Steve Holebrook, NTL's director of satellite and media services, commented, 'For such a high profile event, it is imperative that all aspects of the tournament, including its broadcast, run smoothly. We knew how important this transmission was to BSkyB and the AC-1 service is perfect for such events. It is protected with diverse fibres giving optimum reliability and the picture quality of the 12.5Mb/s premium service is outstanding.'

Interactivity was combined with the latest graphics, to produce an individual look. Using Pineapplehead software, the Sky course reader mapped all the greens and fairways at Brookline. These were then computer generated, enabling graphics designers to trace the flight of a ball within an instant of it being struck. A Sky Sports spokesman said of the transmissions, 'We had more coverage and more feeds to more people than before. This was the biggest ever presentation of the Ryder Cup and we couldn't have dreamed up doing it, particularly the three-on-one interactivity, two years ago.'

Europe probably dreamed of repeating its win of two years ago, but it was, controversially, not to be. The US—boasting a combination of audacious talent (Tiger Woods) and steady reliability (Mark O'Meara)—clawed their way back from being several games down at the start of the tournament. When Jason Leonard sunk a heroic putt at the 17th hole, his team mates invaded the green to congratulate him, even though Europe still had a shot to go.

European team captain Mark James was incensed, saying that his team, particularly Colin Montgomerie, had been insulted and harassed from the start of the tournament. While denying this, the Americans agreed that matters were getting out of hand. This is probably the kind of interactivity that golf does not need. ■

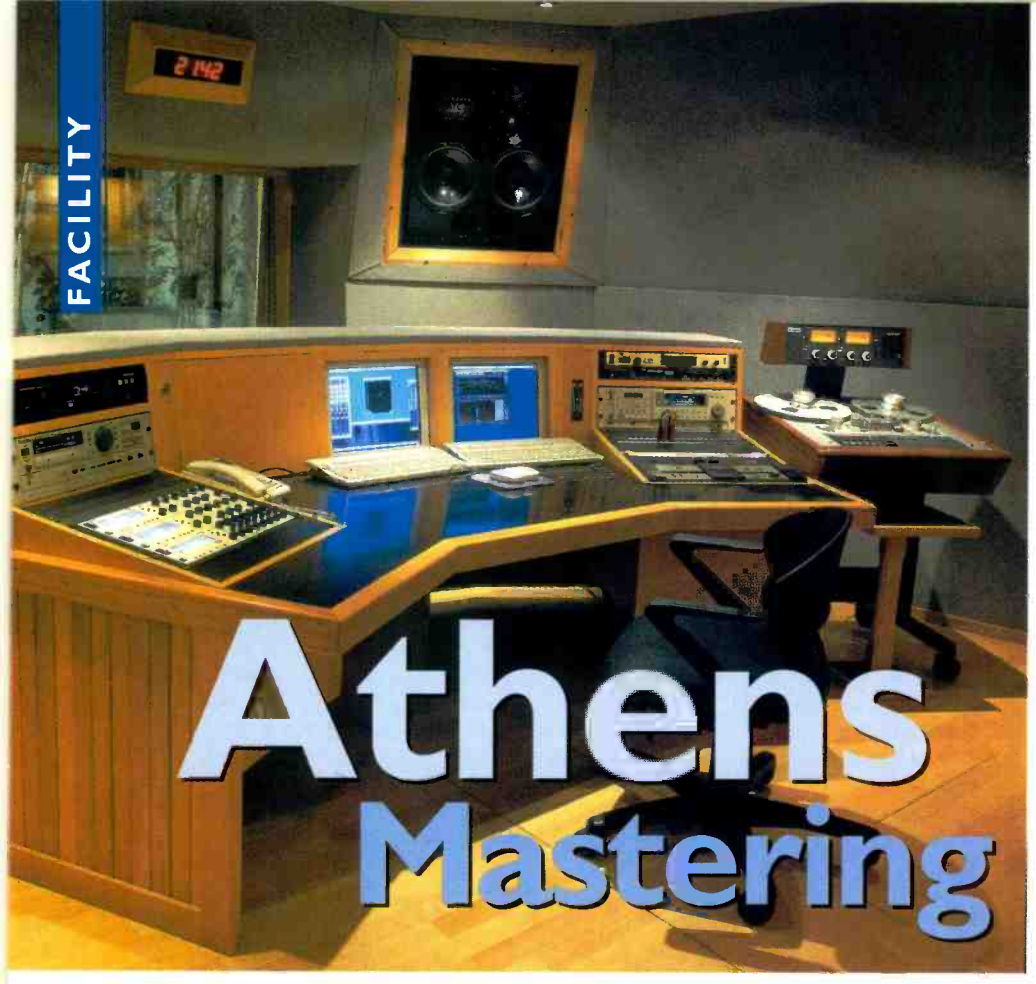
& CONTROL

THE BALANCE OF POWER

Introducing two, new powerful active monitor systems from GENELEC.
The GENELEC 1036A Large Control Room Monitor System brings NEW true weight to the phrase "20 Hz to 20 kHz".
The GENELEC 1034BC Center channel Active Monitor System brings NEW true meaning to the words "surround system integration".
Two systems defining a NEW true Balance of Power.

GENELEC®
ACTIVE MONITORING
The Whole Truth And Nothing But The Truth

International enquiries: Genelec, Olvitie 5, FIN-74100 Iisalmi, Finland, Phone +358-17-813311,Fax +358-17-812267 Web: http//www.genelec.com
In the U:S please contact: Genelec Inc. 7 Tech Circle, Natick MA 01763 Phone 508/652-0900 Fax 508/652-0909



Athens Mastering

Introducing a brand new concept to any market is usually difficult. **Zenon Schoepe** travels to the origin of modern civilisation to trace the country's origin of mastering

ESTABLISHED TWO YEARS AGO as the only non-CD plant-affiliated mastering studio in Greece, Athens Mastering has an agenda. It has slowly been the Greek record production industry to belie that mastering is the last stage of the production process and not the first stage of the replication process.

According to studio MD Themis Zafiropoulos he is dealing with a client base that is simply not used to regarding mastering as a legitimate independent entity or prepared to pay for it.

'Our customers have been used to paying half the price of what we ask to do the job,' he explains, 'and there's an argument that says we could never have a pricing structure high enough to justify the high standard of work that we provide.'

On the face of it, this situation bodes badly for long-term profitability but Zafiropoulos points out that these are early days and that they are not just attempting to break into an existing market so much as create the market from scratch. Besides there are higher issues at stake here and the battle is beginning to be won.

'We are in our second year and we are already well known, and artists and producers are now attempting to persuade the record companies to pay more for mastering,' he asserts. 'The situation was unavoidable in the first year because we're talking about the Greek market here. They didn't even know what mastering was and had the attitude of why should they be obliged to do it. For all those years they have managed without it using mastering that the CD plants had provided for them. These have included a mastering service within the package of getting the CD replicating job. However, that's not real mastering it's PQ encoding, perhaps some compression.

'This has to extend,' say chief mastering engineer Chris Hatzistamou beyond basic levelling and EQing because there is a creative element in what we do. In Greece the effect has been as if they have just discovered America. What you have to remember that there is no history of mastering in this country, it wasn't done with vinyl and it hasn't been done with CD. What they did was transfer and there was no sympathetic approach towards different styles of recording. As a consequence it is difficult to find people in Greece with experience in this area or an appreciation of it because there is no culture of mastering.'

The collaboration of Hatzistamou and Zafiropoulos led to the establishment of Athens Mastering as a 2-room facility with a feel, look and level of equipment that is comfortably international in standard and posture. Acoustic design was by Christian Marcurt of >

MASSIVE PASSIVE STEREO TUBE EQ

A PICTURE IS WORTH A THOUSAND WORDS...

Perhaps, but would photographs of our Variable Mu or VOXBOX have created their successes alone?

You have to hear this gear. You have to use this gear. Put your hands on the knobs and crank 'em.

Engineers who have already gotten hold of the MASSIVE PASSIVE have told us: "Why does it make everything sound so much better?", "It's organic and orgasmic.", "It's a f%#king powerhouse.", "It's unlike any other EQ.", "This is IT. The sound I've always dreamt of but couldn't ever get until now."

GOT THE PICTURE?

Craig 'HUTCH' Hutchison designed these monsters... The MASSIVE PASSIVE is a two channel, four band equalizer, with additional high pass and low pass filters. "Passive" refers to the tone shaping part of this clever new EQ design not using any active circuitry. Only metal film resistors, film capacitors and hand-wound inductors sculpt the sound, kinda like a Pultec EQ on hyper-steroids. Super-beefy, hugely-high-headroom Manley all-tube make-up gain amplifiers deliver your tunes into the next realm. You'll need to experience this.

Contact us for your nearest authorized MANLEY dealer.

MANLEY

MANLEY LABORATORIES, INC.
13880 MAGNOLIA AVE.
CHINO, CA. 91710 USA
TEL: (909) 627-4256
FAX: (909) 628-2482
emanley@manleylabs.com
http://www.manleylabs.com

< APIA in France who installed ATC SCM200 monitors with a subwoofer for the flagship Suite 1 which has daylight as part of the ground floor build. The construction process involved the prefabrication of the room in parts in France with transportation to the Greek capital for the build. Interior design was by Spyros Podaras.

Free-standing ATC SCM50s are used in the smaller Suite 2, which sports a similar but stripped down equipment list including Sonic Solutions and Weiss processing, and differentiates itself by not having an analogue processing path as it is only used for digital productions. It is used predominantly for editing, transfers and restoration and small mastering duties.

The two partners were in total agreement about the employment of Sonic Solutions as the workstation of choice, although CEDAR modules will be purchased in due course to supplement Sonic Solutions' NoNoise and to handle real-time processing on large restoration projects. The client base already includes most of the Greek record labels and independent producers with Zafiropoulos bringing in large quantities of classical projects through, and in connection with, his own activities.

'Mastering in Greece is made difficult because we have to handle so many different music types from traditional music to rock,' explains Hatzistamou. 'We don't have the luxury of being able to specialise like they can in the UK and the US. And let me tell you that the difference is enormous and in general the quality of the masters we get in is a little low with bad EQing, poor stereo sound stages, and thin sounds being quite common.'

'We have to perform quite a few miracles,' adds Zafiropoulos. 'There seems to be no appreciation of the importance of A–D convertors, for example.'

'There's also the problem that they're inclined to use DAT because they find it convenient when they would get

better results if they used analogue and many of them have perfectly good Otaris and Studers,' continues Hatzistamou. 'We're persuading them to go back to analogue and many are surprised at how much better it sounds. We've made even more progress as I've been trying to get them to go to ½-inch for the last year.

When we made that first master from ½-inch it was the first time I didn't want to go digital on the mastering. Themis and I have slightly different attitudes about these things, but then he was the first person in Greece to use F1 and Digidesign Sound Tools so he likes to work with digital and he had stopped using analogue a long time ago. Half-inch has changed his mind a little.'

As a consequence Athens Mastering is looking to bolster it analogue processing chain and with Avalon already in the racks more of the same is expected to follow. In the digital domain they employ Weiss processing with Hatzistamou saying that the permutations when combining multiple units are incredible and head and shoulders above its nearest competitors.

Despite the presence of a 24-bit, 96kHz system end-to-end, client interest in these sorts of buzz terms is, perhaps predictably, low. However, this does not stop the facility using it when dealing with ½-inch analogue masters, for example.

'The technology we have here is to add to the quality and standards of our own work,' says Hatzistamou. 'I believe we have a very clean signal chain here and from the first conversion we are working at high resolution all the way through. We've been very careful about dither, jitter and clock matters in general (they have Weiss Clockworks). I think this becomes obvious in the sound here and if we do have a problem here then it is when we need to dirty a sound up.

'Resolution is the key. To me it makes little sense to be working at the same resolution as CD at the mastering stage yet many systems only offer this.'

DVD Video has been well received in Greece, according to the partners, and while some producers have expressed an interest in working in multichannel, again these have not yet translated in to projects. Athens Mastering would tackle the monitoring issue with the addition of ATC SCM20s at the rear but in line with much popular thought remains unconvinced about the necessity of a centre channel for music production.

More work still needs to be done to alter the attitudes of record companies to the function of the mastering and restoration process, a matter that was illustrated recently when the facility embarked upon a large name remastering project. Requests for the original masters were met with indifference and replies stating that the CDs that already existed of the recordings should be adequate for their purposes. 'The quality of those CDs was dreadful but eventually I found some of the masters at Abbey Road,' says Hatzistamou. 'That sort of job always involves detective work.'

Then there are the problems associated with the proliferation of digital systems among musicians and engineers according to Hatzistamou. 'Many don't really know how digital works and the differences between the systems,' he explains. 'They only realise the limitations of the digital audio workstations they are using at home when they come here and the open minded ones get the point.'

As a consequence these informed and newly converted individuals then put pressure on the record companies to see the light. 'The role of the producer in Greece is different to what it is in England, for example,' he continues. 'The >

My dad is so enthusiastic about his new outboard device!
He spends so much time with it,
he doesn't want to come home.
That means I'm home alone
and I can run wild.

www.junger-audio.com

Good times...

The new premium series of
digital dynamics processors is out!

accent1
accent2

phone +49(30)6777210 fax +49(30)67772146 info@junger-audio.com
Jünger audio Studiotechnik GmbH, Rudower Chaussee 5 (Geb. 9.51), D - 12489 Berlin, Germany

meet the standard nobody else can match

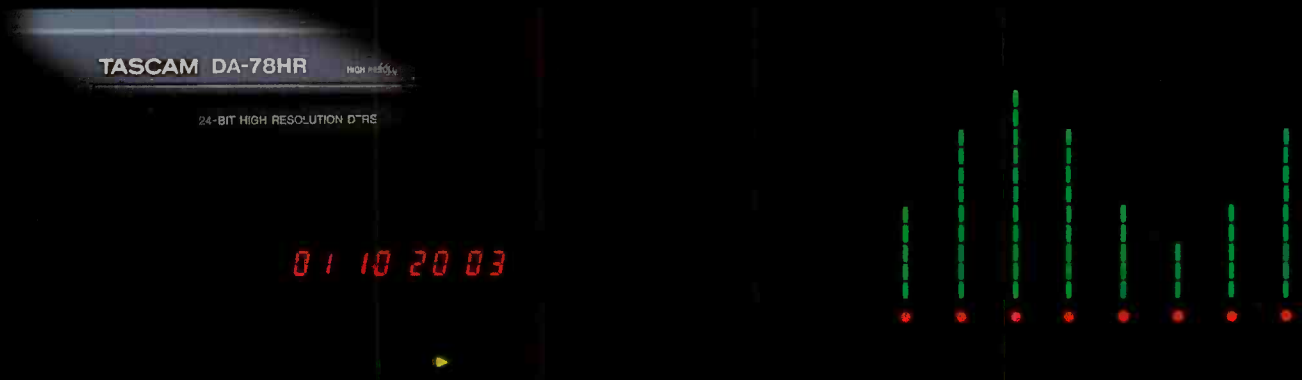
In the world of studio recording, video and film, 24-bit resolution audio is the new de facto standard – bringing recorded sound in-line with the absolute limits of human hearing and providing a 256 fold improvement in signal definition.

The DA-78HR takes TASCAM's market leading 8-track digital DTRS format into the 24-bit environment, providing affordable access to this new audio standard for recording studios, project studios and home recordists alike. The DA-78HR exploits the full potential of 24-bit audio recording to give major improvements in dynamic range and signal-to-noise performance. All analogue and digital circuitry is optimised to maximise the 24-bit sonic quality.

Other advanced performance features include on-board digital mixing – with level and pan control – and internal digital I/O patchbay, ensuring no loss of the 24-bit sound quality when copying or comp'ing tracks. Time Code I/O and on-board SMPTE synchroniser, MIDI IN/OUT/THRU, and Word Sync I/O enable the DA-78HR to operate readily within existing recording systems with other digital or analogue multitracks, digital mixers, DAWs or video decks. The DA-78HR also records locate points and punch in-out information onto tape, so that these can be recalled during later sessions.

The DA-78HR is backward compatible with 16-bit DTRS recording and locks seamlessly with any combination of up to 16 other DA-38, DA-88 or DA-98 recorders, to provide integrated digital recording systems of up to 128 tracks.

8-track 24-bit digital modular multitrack recorder DA78HR



The world's first 24-bit MDM is not only the world's most cost-effective professional 24-bit audio recorder, but also one of the finest digital multi-tracks ever produced.

TASCAM

a whole world of recording

TASCAM 5 Marlin House The Croxley Centre Watford Herts WD1 8YA
Brochure Hotline: 01923 819630 www.tascam.co.uk email:info@tascam.co.uk

< producers take care of the projects but because few of them are technically minded it is the engineer who makes decisions on sound. I'd go so far as to say that the creative part of the engineer-producer partnership in Greece is the sound engineer.'

Even so, the Athens Mastering rate card is a good 40% less an hour than you would pay in similarly well-equipped suites elsewhere in Europe. It also equates to substantially more than it would cost to use a recording studio in the city.

'This pricing issue is a big one because the Greek recording industry is well aware that it hasn't been making a lot of money in the last years and there's a mood swing towards a more business-like approach,' claims Hatzistamou. 'The point is that the record companies can come to a studio and tell them that they will give them, say, 20 projects over the next year at £20 (UK) an hour and they'll pay half in advance. It's difficult to resist but it destroys the industry.

'It's worth pointing out that the majority of Greek records that sell well in Greece are .generally what I would

describe as low quality recordings,' he continues. 'We have this popular music type here which is a mix of traditional Greek music and pop and quality is not the issue. I spoke to record companies involved and they're happy with us and what we do and we work with them but they told me not wait to for the hit records. They spend their money on the recording and they sell a lot but they do not send it for mastering because they believe it will sell anyway. On the other hand they will send us a recording for mastering that they will only sell 1000 copies of purely for the image of the record company. We'll get their jazz recordings, for example, because it is their quality statement.'

Good album sales in Greece equate to around 250,000 but they amount to only two albums per year backed up with a few at 100,000. The remainder and the majority come in at around 50,000 or even less than 10,000. Against this, album sales have been down about a third over the last year due to piracy and what seems to add up to a loss in consumer interest in the traditional-pop mix style music.

Despite the peculiarities of the Greek market and the seemingly Herculean task of educating his potential market, Hatzistamou is positive about prospects and has enormous faith in his country's ability to get its unique musical output and contribution up to what he describes as 'international standards'. The talent is there, Athens Mastering is attempting to put it and the country's industry more visibly on the map.

'We had to do what we've done here, we have pride in our work and we enjoy our work,' he states. 'There is a phrase that says that it is better to feel bad about something that you are doing than to feel regret about something you are not doing. It has gone well and we believe we can also offer an exceptional service to clients from outside Greece. We're on the very edge of Europe here but I believe that our high standards and our reasonable pricing makes it a viable alternative for those who care about the process of mastering. People like to go to LA to master their recordings in a relaxed and sunny environment and of course we can offer the same attractions and a good deal more.

'It's true that producers will experiment with different recording studios for a project but will usually trust only one mastering engineer to complete the process. The building of that sort of trust can take a long time but I believe we will get there. At present clients come here to work with me but our goal is for Athens Mastering to have a reputation as a name in mastering excellence on the international circuit,' he states.

'The inexperience of the Greek market to mastering means that when I do get a new client in I feel a need to play the magician for them. It's almost as if they think that once you've done your magic everything will be absolutely glorious. Of course, it's not like that but the pressure is on to make sure they get a good result and a good first experience for their money and I find that very stressful at times,' adds Hatzistamou. 'You shouldn't have to prove anything as long as everyone is happy but I have to control the urge to prove that I can be a magician. In mastering it is really important to be able to sit in your chair, listen to the tape and be able to say that it is very good as it is or that it just needs a little bit of something, and take the money. With clients new to mastering I feel I need to do something dramatic to justify taking the money.

'However, I am aware that this is a cultural thing and that attitudes will improve and I'm already seeing that with clients who used to sit in on the mastering from the beginning but now trust me enough to get on with it and simply come in towards the end. That's a big difference, that's progress and it makes me feel better because we have succeeded in creating an acceptance of the concept of mastering from the very beginning.' ■

Contact
Athens Mastering, 108
Zoodochou Pigis Str. 114 73
Athens, Greece.
Tel: +30 1 3836 232.
Fax: +30 1 3642 983.

HHB
ADVANCED MEDIA PRODUCTS

INTERNATIONAL DISTRIBUTORS

AUSTRALIA: AWA LTD
Tel: 02 9669 3477 Fax: 02 9578 0140
Contact: Michael Guest
AUSTRIA: STUDER AUSTRIA GMBH
Tel: 01 865 1676 Fax: 01 865 167699
Contact: Reinhold Filedl
BELGIUM: EML N.V.
Tel: 011 23 2355 Fax: 011 23 2172
Contact: Erik Gysen
BRAZIL: VISOM BRASIL
Tel: 021 493 7312 Fax: 021 493 9590
Contact: Carlos De Andrade
CANADA: HHB COMMUNICATIONS CANADA LTD
Tel: 416 867 9000 Fax: 416 867 1080
Contact: Dave Dysart
CZECH REPUBLIC: AUDIOPOLIS
Tel: 02 3332 2132 Fax: 02 3332 4172
Contact: Jan Adam
DENMARK: INTERSTAGE
Tel: 39 46 0000 Fax: 39 46 0040
Contact: Finn Juul
FINLAND: HEDCOM
Tel: 358 9 682 866 Fax: 358 9 682 8489
Contact: Jarmo Roivas
FRANCE: MILLE ET UN SONS
Tel: 1 46 67 0210 Fax: 1 47 89 8171
Contact: Didier Rupin
FRANCE: TRM
Tel: 1 41 18 9003 Fax: 1 41 18 7965
Contact: Henri-Dominique Saumon
GERMANY: TRIUS VERTRIEB GMBH
Tel: 05451 940810 Fax: 05451 940819
Contact: Hubert Dierselhuis
GREECE: KEM ELECTRONICS
Tel: 01 674 8514 Fax: 01 674 6384
Contact: Thimios Kolikotsis
HOLLAND: TM AUDIO HOLLAND BV
Tel: 030 241 4070 Fax: 030 241 0002
Contact: Peter de Fouw
HONG KONG: DIGITAL MEDIA TECHNOLOGY
Tel: 2 721 0343 Fax: 2 366 6883
Contact: Wilson Choi
IRELAND: BIG BEAR SOUND LTD
Tel: 01 662 3411 Fax: 01 668 5253
Contact: Julian Douglas
ISRAEL: BAND-PRO FILM/VIDEO INC
Tel: 03 673 1891 Fax: 03 673 1894
Contact: Ofer Menashe
ITALY: AUDIO EQUIPMENT
Tel: 039 212 221 Fax: 039 214 0011
Contact: Donatella Quadrio
JAPAN: SOUND HOUSE INC
Tel: 0476 22 9333 Fax: 0476 22 9334
Contact: Rick Nakajima
MALDIVES: ISLAND ACOUSTICS PTE LTD
Tel: 960 31 0032 Fax: 960 31 8264
Contact: Mohamed Habib
MEXICO: LOLA DE MEXICO
Tel: 525 250 6038 Fax: 525 250 6038
Contact: Carmen Juarez
NEW ZEALAND: SOUND TECHNIQUES
Tel: 09 846 3349 Fax: 09 846 3347
Contact: Stephen Buckland
NORWAY: LYDROMMET AS
Tel: 22 80 94 50 Fax: 22 80 94 60
Contact: Christian Wille
POLAND: DAVE S.C.
Tel: 22 826 4912 Fax: 01 418 8093
Contact: Bogdan Wojciechowski
PORTUGAL: ELECTROSOUND PORTUGESA
Tel: 01 417 0004 Fax: 01 418 8093
Contact: Carols Gunha
RUSSIA: A&T TRADE INC
Tel: 7 095 796 92 62 Fax: 7 095 796 92 64
Contact: Alexei Gorsky
SINGAPORE/ASIA: SENNHEISER ELECTRONIC ASIA
Tel: 065 273 5202 Fax: 065 2735038
Contact: Donn Ho
SOUTH AFRICA: E.M.S. LTD
Tel: 011 482 4470 Fax: 011 726 2552
Contact: Dennis Feldman
SPAIN: LEXON
Tel: 93 203 4804 Fax: 93 280 4029
Contact: Robert Serrat
SWEDEN: POL TEKNIK AB
Tel: 46 8 449 4440 Fax: 46 8 88 4533
Contact: Jarmo Masko
SWITZERLAND: DR. W.A. GUNTHER AG
Tel: 01 910 4141 Fax: 01 910 3544
Contact: Roland Bricchi
SYRIA: HAMZEH & PARTNERS CO
Tel: 11 333 3753 Fax: 11 373 1573
Contact: Khaled Hamzeh
TAIWAN: DMT TAIWAN
Tel: 02 516 4318 Fax: 02 515 9881
Contact: Honton Sze
TURKEY: SF DIS TICARET AS
Tel: 0212 227 9625 Fax: 0212 227 9654
Contact: Samim Mutluer
USA: HHB COMMUNICATIONS USA
Tel: 310 319 1111 Fax: 310 319 1311
Contact: David Beesley

HHB
FIRST WE LISTEN
HHB Communications Limited
73-75 Scrubs Lane · London NW10 6QU · UK
Tel: 020 8962 5000 Fax: 020 8962 5050 E-Mail: sales@hhb.co.uk
Visit HHB on line at http://www.hhb.co.uk

FROM THE PEOPLE WHO BROUGHT YOU THE WORLD'S MOST DEPENDABLE DAT TAPE.

It was more than five years ago that rigorous independent testing of 7 leading DAT tape brands led the respected pro audio journal Studio Sound to summarise: 'If it were my valuable recordings at risk, I know which tape I'd choose: HHB.' Since that time, we've applied precisely the same exacting standards of development, manufacturing and testing to create a complete range of digital recording media that sets the highest possible standards for performance and archival security across all major formats. HHB Advanced Media Products. Don't trust *your* valuable recordings to anything less.

New HHB CDR80 and CDRW80 discs, the world's first fully Orange Book compatible 80 minute CD-Recordable and Re-Writable media.

DAT Digital Audio Tape · COMPACT disc Recordable ReWritable · MiniDisc · MD DATA · MO REWRITABLE MAGNETO OPTICAL DISK · adat · DTRS DIGITAL TAPE RECORDING SYSTEM · DVD RAM

HHB Communications Ltd · 73-75 Scrubs Lane, London NW10 6QU, UK
Tel: 020 8962 5000 · Fax: 020 8962 5050 · E-Mail: sales@hhb.co.uk

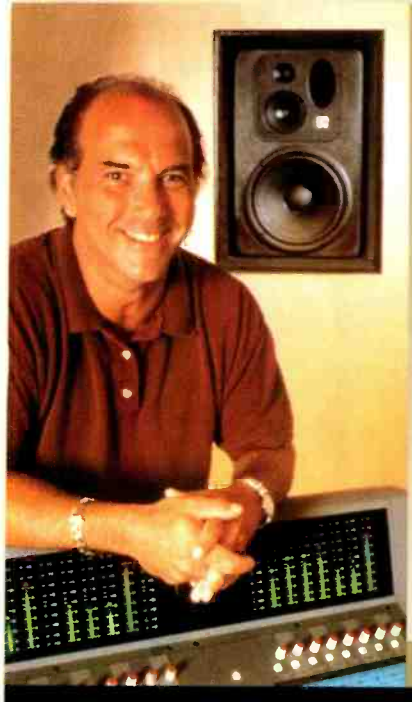
HHB Communications USA LLC · 1410 Centinela Avenue, Los Angeles, CA 90025-2501, USA
Tel: 310 319 1111 · Fax: 310 319 1311 · E-Mail: sales@hhbusa.com

HHB Communications Canada Ltd · 260 King Street East, Toronto, Ontario M5A 4L5, Canada
Tel: 416 867 9000 · Fax: 416 867 1080 · E-Mail: sales@hhbcanada.com

http://www.hhb.co.uk

HHB

FIRST WE LISTEN



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.*

"We've installed the first of our LSR 5.1 surround systems at East Side Audio and it's a great addition. The sound is extremely clear and is enjoyed by our mixers and our clients. Everyone is very pleased with the result."

New York

LSR. Profiles

The world's most noted recording professionals discuss the world's most advanced monitoring systems.

NO.1: New York / Los Angeles

David Kershenbaum is a Grammy Award winner who has been on the cutting-edge of music production for decades. His discography is a remarkable *'who's who'* of popular recording.

"Speakers have always been important to me and I've had many systems that I have really loved. When Kevin Smith told me about LSRs, I tried them and was amazed at the accurate, flat response and how the mixes translated so well compared to other monitoring systems. Now we're using them to track our new records and we'll use them to mix, as well."

Los Angeles

The World's Best Performing THX® Monitoring Systems Are Also The World's Most Applauded.

Since its introduction in 1997, the system-engineered JBL LSR Series has become a favorite choice of engineers, producers and performers, many of whom have also become its most loyal advocates. More important, this acceptance is found in every major geographic area of the recording industry; from Los Angeles and New York to Nashville and London.

LSR 32 LSR 28P LSR 12P

Monitors Whose Performance Profile Was Determined By Science, Not Opinion.

During a half century of building the most technically advanced studio monitors, JBL has developed a long list of working relationships with key recording professionals around the globe. As a direct result of this unique collaboration, these industry leaders have chosen JBL monitors more often than any other brand. Not once or twice, but consistently for decades. In fact, JBL monitors are a part of the history of recording itself. Consider as examples, the now fabled JBL 4200 and 4400 Series that, at their launch, actually defined an entirely new standard and new category of monitor. Such is the case now with the entire LSR line.

JBL PROFESSIONAL

HA Harman International Company

www.jblpro.com

© 1999 JBL Professional

Tracking the Bear

Founded by artist management genius Albert Grossman some three decades ago and unique among recording studios since, the Bearsville story is far from over. **Tim Goodyer** visits the Bear

UNRAVELLING THE HISTORY of Bearsville Studios is a tricky business. Had its founder and mentor Albert Grossman been alive today, it would be simple matter of placing a thousand anecdotes in chronological order. But his death in 1986 robbed the music business of one of its pioneers, not to mention characters. Instead, my history lesson is left to Albert's widow, Sally, co-studio managers Patti Merklin and Chris Laidlaw and English-born producer John Holbrook. Between them they know what went on, even if it takes a little discussion to agree the 'official' sequence of events. Yet somehow the uncertainty is in keeping with Bearsville's curious history as even the studio's neighbours remain in doubt as to which buildings actually house the recording areas after the making of nearly 30 years of rock history.

'I'm really glad you came,' says Sally as the group resolves another chapter of the story. 'We would never have had this conversation without you.'

The studio complex is in upstate New York; a collection of rustic buildings spread over several acres of woodland sufficiently close to and far from the madness of Manhattan to prompt Sally Grossman to comment, 'I always think that this studio may not have survived if it had been in a big city. Being out here has allowed us to be unique.'

The story began back in 1969 or 1970, Sally's not absolutely sure. It was Albert's intention that two studios serve the acts comprising his revolutionary artist management operation, that included Bob Dylan, The Band, Janis Joplin and Carly Simon among many others—although Dylan had left the stable before the studio was running. The studio concept grew from the fact that many of Grossman's artists were already living on the Bearsville site and their regular trips to New York's major studios seemed laborious and unnecessary. Later there was to be the Bearsville Records label too. 'It was some incredible thing that brought everybody together,' Sally muses. 'Everybody was living here. I remember the first board meeting and someone saying, "I'm sure within six months we'll have it all sorted out...". It was never going to be that simple.

Of the four studios now in operation, it was Studio B that first ran tape on Todd Rundgren's *Something Anything*, The Band's *Cahoots*, Van Morrison's *Street Choir* and the Jagger-Richards production of Peter Tosh's *Medicine Man* among others. The now exposed masonry was then damped with acoustic treatment and there was a customised Quad Eight console where the present Ultimation-equipped SSL 4064 G+ sits.

'Studio B has an interesting history in consoles,' John Holbrook confirms. 'the Quad Eight was a custom-built console with input strips built by Larry Dalstrom. The console had 20 inputs >

PHOTOGRAPH: STEPHEN GREEN ARMYTAGE

Turtle Creek Barn

Below. Left to right: John Holbrook, Patti Merklin, Sally Grossman and Chris Laidlaw, outside the barn

PHOTOGRAPH ABOVE: STEPHEN GREEN ARMYTAGE. PHOTOGRAPH LEFT: TIM GOODYER

< and at some point later on in the seventies it was extensively modified by Ted Rothstein with parametric equalisers and plasma metering. It made a few famous records, but I found that I could get a far better transient response by bypassing the board altogether. It was an interesting beast, but it was trying to make a silk purse out of a sow's ear and so the studio went to the first Neve 8068 in the early eighties. That was replaced in November 1985 by the SSL after Bob Clearmountain kept talking about SSL to Albert. That was the first automated console to appear in Bearsville and Clearmountain used it on quite a few projects—The Pretenders, Simple Minds, Bonnie Tyler. Larry Dalstrom also built our location truck, called Location Recorders, and that did some great stuff too including a Muddy Waters album playing with The Band.

'The recording area of Studio B was the John Storyk contribution,' he continues. 'It was a rustic look with lots of wood. It originally had these satin-covered pillows on the walls, in lurid colours. Remember, this is the mid seventies. It was a very strange mixture. At some point it was decided to put an isolation booth in and in the early eighties the walls were revised. Again Storyk was involved. He put sliding panels in to give it some variability, but it's still fairly dead.'

Studio A followed B into service sometime around 1981 and was first used by Holbrook who had joined the studio staff full time in 1976 having spent three years in and around it. The studio now houses the 40-input custom Neve 8088 made notorious for its part in recording Quadrophenia at The Who's Ramport Street studio, but Holbrook remembers its first days using a spare tape machine and a small Allen & Heath Syncon A console.

'By 1979-80 Studio A had become a store room for equipment,' Recounts Holbrook. 'All Todd's video equipment was there until they built a new building to house it. So I said that it would be great to get all the other equipment out and finish the studio.'

'Albert said he'd look at it later and you did it kinda surreptitiously...' Sally suggests.

'No, Albert knew about it,' Holbrook replies. 'He had to agree to get his gear out, but it was a makeshift thing to start with.'

A converted 100-year-old barn provided the third studio, appropriately called The Barn and originally a joint venture between Albert Grossman, The Band's Robbie Robertson and Garth Hudson.

'The Turtle Creek Barn was a rehearsal room, but we could hook the Location Recorders remote truck up to it if needed to use it as a studio,' Holbrook explains. 'Somebody put a Peavey AMR console in there around 1993 and people started cutting tracks in there. It was really a way of getting monitoring—people would use their own mic preamps to go to tape and the Peavey was an economical way of monitoring. The control room was added in about 1995 with an API desk. Dave Matthews was in at the time.' >

www.utravel.co.uk

Choosing your next holiday is now child's play

uTravel.co.uk

un Miller Freeman
A United News & Media company

PLUS

Win a pair of British Airways flights for the next 25 years

BRITISH AIRWAYS

Subject to terms and conditions available on entry

The live room in Studio A

Below. Left to right: John Holbrook, Patti Merklin with Sally Grossman

< More recently, Todd Rundgren's departure availed Bearsville of his Neotek Elite-equipped Utopia studio as Bearsville's budget fourth room.

'There is a story that Albert and John Taplan, who was the road manager for The Band at the time, ran into each other at the Woodstock festival,' Sally offers. 'John said, "Here's my Princeton buddy, John Storyk. Albert's building this studio...". I remember walking out the lines of the building with the surveyor before it went up.'

As a result, both studios A and B were originally designed by John Storyk, but George Augspurger modified Studio B's control room in 1983. 'The room was reshaped to take new Urei 813A monitors because Storyk had originally done this quadraphonic monitoring system,' Holbrook remembers. 'It was a weird-shaped room because it was originally built as an asymmetrical wedge shape. When the SSL went in and Augspurger came in they blew out the back wall to get more space.'

Holbrook himself designed the API Legacy-equipped control room in the Barn as well as being responsible for the blankets that, although originally intended to be a temporary measure, still serve as acoustic treatment on the walls of Studio A. In addition to this, the original project was another joint venture, this time between Grossman and Ampex.

'Although it wasn't conceived to be a commercial studio, Ampex decided in 1969 or something that they wanted to go into the record business,' Sally recalls. 'They made tape, why shouldn't they make records? But then after a year or so they decided they didn't want to be in the record business, and so Albert started a joint venture with Warner Brothers. My guess is that basically enabled Albert to put the building up.'

'Pretty much it was set up for the people who were associated with Albert who were working here,' adds Holbrook. 'It wasn't what you'd call outside clients. Then, in the mid seventies, the major proportion of stuff was for the Bearsville Records label because that was in full swing—people like Paul Butterfield, Jesse Winchester, and Todd. But as the seventies wore on, Bearsville Records was tapering off and so more outside clients like the Isley Brothers >

PHOTOGRAPH TOP LEFT: STEPHEN GREEN ARMYTAGE. PHOTOGRAPH TOP RIGHT: TIM GOODYER.

Professional, Multifunctional Audio Generator

Minirator MR1

Low Distortion Sinusoidal Signals
Frequency range 20Hz to 20 kHz in 3rd octave steps with typ. THD+N of <-72 dB and flatness of <±0.5dB.

Sweep Capabilities
Cyclic Sweep with selectable speed in the range of 50ms up to 5s per step, starting with 1kHz tone.

White / Pink Noise
Digitally synthesized Noise signal with low crest factor and high repetition rate. Flatness < 1dB typ.

Polarity Test Signal
Proprietary polarity test signal for polarity measurements with the forthcoming Minilyzer.

Wide Level Range
Output level adjustable from -76dBu to +6dBu in 2dB steps. Unit selectable in dBu, dBV or V.

Retractable XLR Connector / RCA Connector
Allows direct, balanced connections to the DUT as well as easy cable connections. For unbalanced connections a Phono jack (RCA) is integrated.

NEUTRIK AG
Liechtenstein
Tel: +423 237 24 24
Fax:+423 232 53 93

NEUTRIK (UK) Ltd.
Great Britain
Tel: +44 1983 811 441
Fax:+44 1983 811 439

NEUTRIK Instr.
Canada
Tel: +1 800 661 6388
Fax:+1 514 344 5221

NEUTRIK USA Inc.
USA
Tel: +1 732 901 9488
Fax:+1 732 901 9608

NEUTRIK Zürich AG
Switzerland
Tel: +41 1 734 0400
Fax:+41 1 734 3891

NEUTRIK Ltd Tokyo
Japan
Tel: +81 3 3663 4733
Fax:+81 3 3663 4796

NEUTRIK
CONNECTING THE WORLD

WE ARE SETTING STANDARDS

http://www.neutrik.com

SALESLINK

fax: +44(0)171 609 5483
email:saleslink@funky-junk.com

Saleslink is a professional service for buyers and sellers of high-end audio mixing consoles. Consoles are offered exclusively by Saleslink with the benefit of the best specialist technical and sales support available.

*** Three star consoles are all one previous owner only, and are less than ten years old. All *** consoles are serviced prior to shipping, and include crating, commissioning and a three month warranty on all work undertaken. Shipping and duty is not included.

** Two star consoles are sold with full owner history and are less than twelve years old. Technical reports are prepared, and options include servicing, shipping and commissioning.

* One star consoles are accurately described and extremely competitively priced. Technical reports are available, but the desks are 'sold as seen'. Shipping can be arranged, and servicing and commissioning may be possible.

Saleslink offers the simplest and safest way to purchase and install a top line console, supported by authorised service back-up and experienced, specialist technicians. Sellers receive a bespoke service by professionals with years of experience, an international profile and unrivalled reputation.

Call, fax or email for exclusive lists of Neve, SSL and other digital and analogue consoles

London Mark Thompson tel: +44 (0)171 609 1575
UK Peter Duncan tel: +44 (0)70 503 77389
France Pierre Valentin tel: +33 (0)1 47 93 08 88
Italy Paolo Orizio tel: +39 (0) 2 690 16 229

The Millenium bug ate my girlfriend

"I had toyed with the idea of going digital for a decade, more or less, so when the world stopped still for Blair's Millenium, it seemed a good way to fill the endless tedium of life, the universe and everything.
AND SO...out went my faithful, outdated and obsolete analogue recording equipment, and in came a truck-load of cardboard boxes; computers, converters, hardware, software, overware, underwear, cables, tables and vegetables (or at least a fruity apple or two).
Beam me up Spock, if it didn't look like the Starship Enterprise about to enter warp drive.
So I turned on, tuned in and...crashed. After a day or two on the software helpline, I got through to a very helpful voicemail message guiding me to a website of adverts and a starting point of a learning curve that has been moving in a gradual downwards direction ever since.
So now I'm three months in. Blair's still there, and I'm still here; desperately fiddling with digits, powering-up, backing-up and cracking-up. I've learned more than I ever wanted to know about computers, and forgotten most of what I ever knew about music (and certainly about soul...) BUT I do have two full minutes recorded (if I cut, paste and loop that should fill my first CD.)
AND I have a room full of digital equipment worth fully 10% of what it cost three months ago. SO,- if you want to be a REAL COOL DUDE, follow me into the digital domain. If you want to be an analogue square, then-
HEY, THAT'S COOL TOO.

GOING DIGITAL? digiBlah

Call Ashley Murdoch at Funky Junk/Digiblah he'll guide you through the maze and keep you working with a smile...

funky junk Ltd.

Europe's leading suppliers of ALL new & used recording equipment

Specialist digital sales & advice dept now open
Phone, Fax, e-mail for lists and details

t: 0171 609 5479 f: 0171 609 5483
sales@funky-junk.co.uk
www.funky-junk.co.uk

Studio B with its SSL 4064 G+ console

Below. Left to right: Co-studio managers, Chris Laidlaw and Patti Merklin with producer John Holbrook

< came in.

'There were many characters who came and went through the seventies and there was a concerted effort made to bring in outside business toward the end of the seventies—the Isleys, Peter Tosh, the Rolling Stones came in to rehearse. Bearsville Records was still going at that point with a bunch of artists.

'I'd hear these stories at the house,' Sally recalls of the studio's early heydays. 'There'd be these near collisions on Spear Road with the Isleys going down and Todd on his way up. That was the vibe in those days, when you didn't get stopped on the road and you'd be out late.'

In spite of its brevity, the arrangement with Ampex saw a number of records —including Jesse Winchester's debut —come out on the Ampex label. But it was the Bearsville label itself that put the studios on the map and Todd Rundgren's mainstream success that gave the impression it was his own label. 'Even today I can be in and someone will see the logo and assume that it's Todd's studio,' Sally confirms. 'because he was so strongly associated with the studio. But the Isleys made four records here, and those are records that are being sampled today.'

'Todd didn't do all his work at Bearsville,' adds Holbrook. 'First he had Secret Sound in New York and then he bought a house in Mink Hollow and put a studio in there. So most of his own stuff was done there, but he used Bearsville for Patti Smith and Meat Loaf—other productions that came in —major portions of *Bat out of Hell*, for instance, were done in Studio B.'

As a result of these and other less tangible events, Bearsville now commands a new roster of clients including the likes of rappers Nas, Will Smith and Slick Rick, and English eccentrics William Orbit and Tricky making it more commercially successful than ever before. Bridging the two eras artists such as Muddy Waters, Paul Butterfield, The Pretenders, REM, Natalie Merchant, Pat Metheny and Rush helped build the studio's reputation—and its mystique. Latterly Bearsville has extended its appeal to the urban R&B now keeping most of Manhattan's finest studios in business.

The thread that holds everything together is the unique atmosphere the >

PHOTOGRAPH TOP LEFT: STEPHEN GREEN ARMYTAGE. PHOTOGRAPH TOP RIGHT: TIM GOODYER.

A Dual Classic

TUBE-TECH CL 2A

The TUBE-TECH CL 2A is a dual opto compressor with the same features as two of the well renowned TUBE-TECH CL 1B, but only taking up two units of rackspace.

World wide representation:
Austria: (02) 236 26 123 **Australia:** (02) 9975 1360 **Belgium:** (011) 23 23 55 **Brazil:** (011) 604 8339
Czech Republic: (455) 622594**Denmark:** (43) 99 88 77 **Finland:** (90) 512 3530 **France:** (03) 87 74 80 90
Germany: (089) 609 7670 **Greece:** (1) 82 38 200 **Holland:** (010) 414 7055 **Hungary:** (01) 214 9449
Italy: (051) 766 648 **Japan:** (03) 5489 3281 **Korea:** (02)565 3565 **Norway:**(55) 951 975 **Poland:** (622) 446699
Portugal: (1) 353 8331 **Russia:** (095) 956 1826 **Slovak Republic:** (07) 214 051 **Singapore:** (225) 5115
Spain: (3) 319 5358 **Sweden:** (046) 32 03 70 **Switzerland:** (01) 840 0144 **Taiwan:** (2) 719 2388
Thailand: (226) 2301 5 **UK:** (1691) 6585 50 **USA:** (805) 373 1828

LYDKRAFT

Lydkraft Aps • Ved Damhussøen 38
DK 2720 Vanløse • DENMARK

DENON
Professional Audio Brand

The Next Generation

DN-M991R Professional MiniDisc Recorder

DENON introduce their new generation of Professional MiniDisc recorders, now the standard for Broadcast, Post Production, Theatres, Museums and Corporate Events.

NEW Key Features:
10 'Hot Start' memory, Varispeed, Programmable play, Qwerty keyword socket, Enhanced display, Stereo + Mono record, Undo, Improved search.

DENON Unique Features:
Pre-Utoc system, Cue points (5 per track)

FOR MORE INFORMATION PLEASE CONTACT IAN DOWNS, email: ian.downs@dial.pipex.com **Hayden Laboratories Ltd**

HAYDEN LABORATORIES LTD., CHILTERN HILL, CHALFONT-ST-PETER, BUCKS. SL9 9UG. TEL: 01753 888447 FAX: 01753 880109

MAGELLAN hardware

Unparalleled solutions for all your duplication requirements...at the touch of a button

- *Manual or Fully Automated Systems*
- *Various Finance Options*
- *Full Onsite Service Back-up*
- *Quality After Sales Service*
- *Printers*

Call 01256 681186 for details

UK Distributor:
Magellan Group plc, Concept House,
Bell Road, Basingstoke, Hampshire RG24 8BB
Phone: 01256 681186 Fax: 01256 681333

HW/SSadv/5

Call 01256 681186 for details or visit our newly launched web site

www.magellanplc.com

Turtle Creek Barn interior

SSL 4064 console in Studio B

<studio has acquired. Built originally on the reputation of Albert Grossman and his first artists, furthered by the records the studio has produced, and garnished with incidents such as the time the police pulled Eddie Offord over on suspicion of driving while under the influence only to have him walk the proverbial straight line on his hands, the studio's place in history is unlike any other. Throughout the mayhem, Bearsville's studios have consistently attracted a disparate collection of artists, each room offering something equally special and equally unique.

'I think certain rooms get certain reputations,' comments Merklin. 'People know Studio A as a drum room and they love the Barn because it's unconventional.' Certainly the pull of Studio A's drum sound was strong enough to get Rush out of their native Canada for the first time.

'I remember the first time REM came in 1987 or 1988 or whatever,' Sally continues. 'I immediately connected with Michael Stipe and their manager at the time, but they were in awe of Bearsville. And they did parts of three albums here. I'm not sure what it stands for, but people feel that they can concentrate here. They know it's a good studio, they know they won't get dozens of people coming in to their session...'

'Steve Lillywhite likes it because it's private,' Chris Laidlaw agrees, 'there aren't strange staff members walking around the corridor. It's a great retreat, there are no distractions, the equipment's great.'

'Cassandra Wilson hugged me because the control room hadn't interfered with the vibe she remembered from before,' Sally enthuses. 'She had been so worried that the studio would feel different from the last time she was here. John Bon Jovi comes up and really feels he's touching that other base —whatever it means to him, I don't know. People feel comfortable here, they make it their own.'

'If you want to get a bit cosmic about it, the vibrations that have been through those walls over the years carry quite a bit of weight in the music business,' concludes Holbrook.

Then there is the project studio—that semidomestic facility that was years off its conception when Albert Grossman >

PHOTOGRAPHS: STEPHEN GREEN ARMYTAGE

One name for all formats

QUANTEGY
Professional Media

Quantegy Europa Limited Unit 3 Commerce Park • Theale Berkshire RG7 4AB • Tel. 0118 - 930 2240 • Fax 0118 - 930 2235

Grace Design

HIGH FIDELITY.

microphone preamplifiers reveal all the subtlety and detail found in music.

MODEL 801 EIGHT CHANNEL

MODEL 201 TWO CHANNEL

GRACE design

UK - Music Lab Audio Distribution
Tel (0044) 0-1908 510-123 Fax (0044) 0-1908 511-123
Germany - Professional Audio
Tel 49-8331-9564-0 Fax 49-8331-48743
www.gracedesign.com

RICHMOND FILM SERVICES

Tel: +44 (0)181 940 6077 Fax: +44 (0)181 948 8326

THE HIRE COMPANY
OTHER HIRE COMPANIES HIRE FROM !

NAGRA-D

Only £60 per day

£240 per week

96 kHZ SAMPLING FREQUENCY NOW AVAILABLE!

2nd *Generation* Routing

CDR-1616
Digital Audio Matrix from DK-Audio

16 in/16 out digital audio matrix • Accepts AES/EBU and SPDIF input formats • Automatic output synchronization • »Click Free« switching • Any input to any output • DSP Array Technology • Sample Rate Converters on all inputs • Logic font panel control • Optional remote controls • Compact 19"-2U size • Multichannel PPM metering with MSD500C.

[...as easy as analogue]

DK-AUDIO

DK-AUDIO • Marielundvej 37D • DK-2730 Herlev • Denmark
Phone: +45 44 85 02 55 • Fax: +45 44 85 02 50
e-mail: info@dk-audio.com • www.dk-audio.com

TIMECODE ON THE ROAD

CLOCKIT

THE NAME FOR FRAME ACCURATE TIMECODE ALL DAY LONG!

- LOCKIT BOX ACL201 TIMECODE/VIDEOSYNC GENERATOR
- MASTERSLATE ACD 301 TIMECODE SLATE WITH RECEIVER
- CONTROLLER ACC 10 : CRYSTAL CALIBRATION MASTER CLOCK
- HHB SYNC MODUL : BUILT IN SYNC AND EVENT NUMBER

Seasons Greetings and Happy New Year 2000
to all friends, and thanks for ten years great support

UK FIRST SENSE
TEL 01225480994
FAX 422800
call Alan Cridford

AMBIENT RECORDING

KONRADINSTR. 3
D-81543 MÜNCHEN
TEL +49 89/6518535
FAX: 6518558
www.ambient.de
call Chris Price

< discussed his studio with John Storyk. 'So many people have asked if, with so many people having home studios today, that doesn't affect our business,' Sally concedes. 'The funny thing is that even the people who work at home on Pro Tools, they are more comfortable and the record company is more comfortable having the rerecording vocals in one of our rooms and doing a remix in another. There's something about having a reputation for having had good records made here that keeps people coming.

'It's a wonderful theory that you can do everything in your home, but we know about all the backup we have to do. It's very well going to someone's house to do the basic recording, but you need backup. We did a recording at Bob Clearmountain's house and John ended up running people to the station... There are all those things that you do that are intangible—you don't ever want to make the mistake of thinking you're contributing to the record—but you do want to give confidence to the record company and the producer that we're professional. I hate the term, but we're quite artist friendly; we do everything we can to help people make a good record.'

Given the importance of the studio's history in attracting custom, any changes are treated with reasonable caution—a policy that has proven itself on numerous occasions.

Yet Bearsville has managed to keep itself current, the most recent major update being the SSL 4064 console installed in Studio B in May 1998. 'There was discussion about the SSL j-series,' says Holbrook of the console choice, 'but it seemed like a lot to take on. Also it looked like a lot of studios in New York were going with the j-series so we went with the G-series to keep it current.'

Since then there has been talk of making structural changes to Studio B. 'There's been some talk about blowing the back wall out and adding some iso booths,' Laidlaw elaborates. 'We could do with getting some natural light in there, but it's not very high on the priority list.'

'I wanted to brighten it up both visually and acoustically,' Holbrook adds. 'For an average small studio it has a very high ceiling and it's lacking in air and reflections. In The Barn we could add a few more channels to the API that would be easy enough. But if it ain't broke, don't fix it, as they say.'

There's also been discussion about adding Pro Tools systems to bring Bearsville into the digital age.

'We've had ongoing discussions about Pro Tools but...' begins Holbrook. 'At the moment people bring it in if they need it but it doesn't seem that we need it unless we get a regular client who wants it.

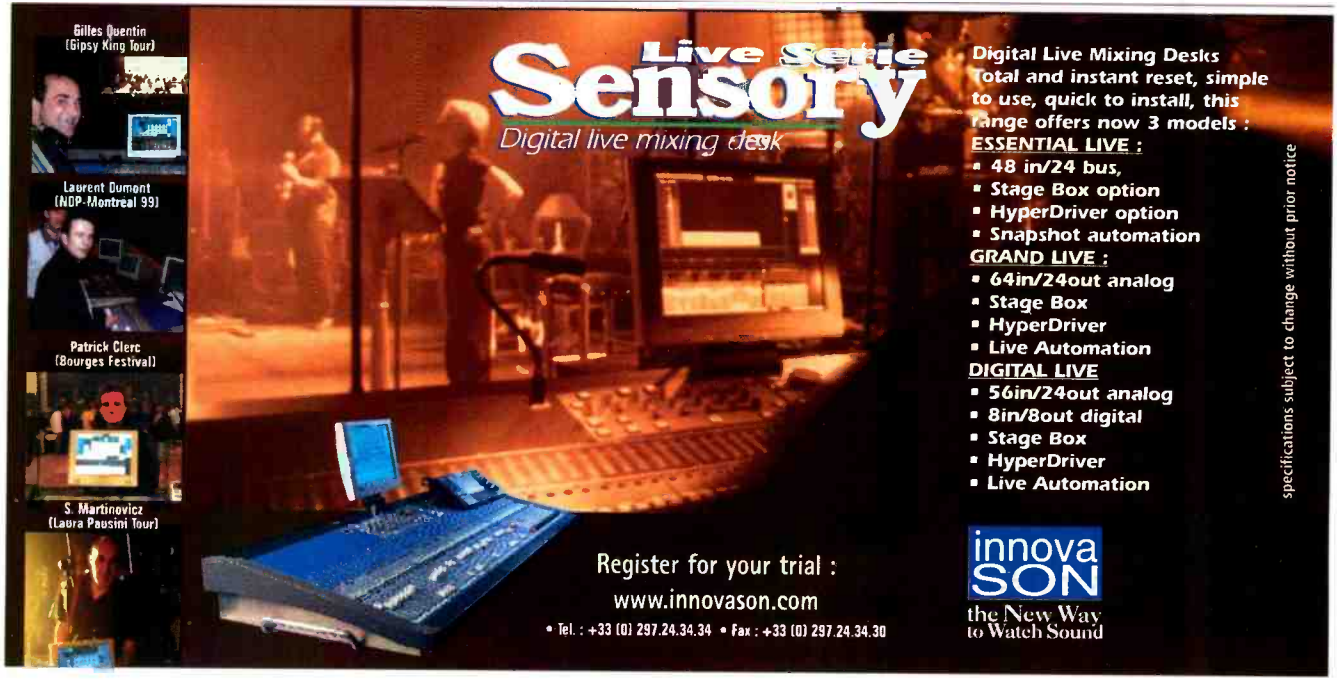
'We keep track of what people bring in with them and respond accordingly,' Merklin concurs.

With the past in the bag and the future comfortably under review, there's obviously still plenty of life in the Bear. And the studio's constantly changing list of clients, the mix of old blood and new hands who have explored the Bearsville story with me speaks well for the future.

'I'm so excited with the balance between the artists we used to attract and the new artists that are finding out about us,' Sally enthuses as we leave lunch to visit one of Bearsville's other attractions, Albert Grossman's Bearsville Theatre. 'I don't think we've ever really pushed Studio B,' she confides, 'and to tell you the truth I don't think we've fulfilled our potential with the SSL yet.' ■

Contact
Bearsville Studios.
Tel: +1 914 679 8900.
Fax: +1 914 679 4284.

PHOTOGRAPH: STEPHEN GREEN ARMYTAGE



CD DUPLICATION MADE EASY

Network Enabled cdDIRECTOR Publishing Systems
• 3703NT • 3706NT

Automated CD-R Duplication Systems
• CD-3702 • CD-3704
• CD-3706P

CD-R Duplication Tower Systems
• CD-5400L • CD-5900
• CD-5916

Automated CD-R Print Stations
• AP-1000 • AP-1300C

MediaFORM™

WORLD'S MOST ADVANCED CD DUPLICATORS

400 Eagleview Blvd., Suite 104 • Exton, PA, USA 19341
Phone: 610-458-9200 • Fax: 610-458-9554
Toll Free in the USA 800-220-1215
email: info@mediaform.com • web: http://www.mediaform.com

Totalsystems SPA-2

STEREO 8 CHANNEL PROFESSIONAL STUDIO PRE-AMP

CANFORD

Balanced & Unbalanced Inputs

Channels can be Selected Simultaneously

Individual L & R Input Gain Controls

"Sound was high quality, crisp and clear." The Mix

"A well thought out input select monitoring pre-amp." Audio Media

"If you need to interface several stereo units the SPA-2 is the machine for the job." The Mix

CROWTHER ROAD, WASHINGTON, TYNE & WEAR, NE38 0BW
TEL: +44 (0) 191 418 1000 FAX: +44 (0) 191 418 1001
E-MAIL:spa2ss@canford.co.uk

SOUNDTRACS PLC

Digital Audio Systems Customer Service Engineer

Soundtracs is emerging as a Digital systems supplier for the Broadcast/Post Production and Film markets. We require a Customer Service Engineer to provide in house and on site support both in the UK and in Europe. A history of the repair and installation of large digital audio systems with particular emphasis on digital audio interfacing and machine control is required. Experience with fault finding to component level and PC systems trouble shooting is vital.

Computer literacy for modem interchange, report writing and record keeping is similarly essential.

A qualified candidate is preferred. Based in Epsom, Surrey, travel is inevitable. A generous salary with a full benefit package to include Pension, Private Health and Share Options is offered.

Please forward your CV by EMail or Fax to Tony Crockett, Service Manager, Soundtracs Plc tony.crockett@soundtracs.co.uk or 0181 388 5050.

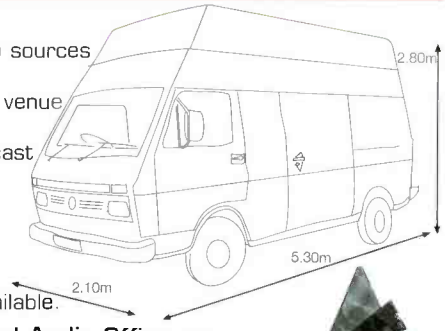
NO AGENCIES PLEASE.

MOBILE STUDIOS

The Best Little Big Van

Do You...

- Need to mix live music or multiple audio sources into your 4/5-camera OB vehicle
- Need to tracklay a band from outside a venue with limited parking facilities
- Need a mobile for a live internet broadcast
- Want no-comprimise quality but don't want to pay Big-Mobile prices?



Then You...

- Need the Total Audio Mobile - the most versatile and economical audio vehicle available.

For details and prices, phone the Total Audio Office on 01527 88 00 51, or Conrad Fletcher on 0973 303 679.

Big van facilities. Small van prices.

Total Audio Solutions Ltd: 3 Woden Court Bromsgrove B60 4AD. Tel 01527 880051 Fax 01527 880052

ZIPPER MOBILE STUDIO

sound recording on location

from winchester cathedral to wembley arena

over 20 years live recording experience

UK: 0181-450 4130

jay@zms.co.uk www.zms.co.uk

CLASSIC SOUND

SPECIALISTS IN LOCATION RECORDING

Film scoring/Live theatre/TV & Video sound
Using carry in equipment

NEVE CONSOLES/DIGITAL MULTITRACK/NEUMANN & SCHOEPS MICROPHONES/24 BITS/5.1 SURROUND OR STEREO

Call: 020 7624 5432 Fax: 020 7624 7890
E-mail: classicsoundltd@dial.pipex.com

WHERE ELSE COULD YOU FIND A 48-TRACK DIGITAL LIVE RECORDING FOR UNDER A 1.000 US$?

ANCIENNE AB BELGIQUE

THE RECORDING VENUE

WWW.ABCONCERTS.BE

FROM PAVAROTTI

Mix with the best with a choice of:

Digital
Remote Microphone Amplifiers
On Stage A to D Converters
Fibre Optic Digital Multicores
MADI Input to Multitrack Recorders

Classic Analogue
Neumann
Neve
Dolby
Studer

SOUND • MOVES
Steve Williams
The Oaks, Cross Lane,
Smallfield, Surrey, RH6 9SA
Voice 01342 844 190
Fax 01342 844 290
Email steve@sound-moves.com

Multitrack or straight to stereo. The high quality low cost option for recording and live broadcast.

TO RICKY MARTIN

SENSIBLE music group limited

http://www.sensible-music.co.uk

MOBILE RECORDING

whether:-

MONO, ANALOGUE or 96 TRACK DIGITAL, CASSETTE OR SONY 3348

using

Focusrite micamps, 24 Bit Pro tools etc

choose

THE SENSIBLE SOLUTION

NO Truck NO Parking NO Hassle

Phone 020 7700 9900 Fax 020 7700 4802
Email studios@sensible-music.co.uk

...as the crow flies...

quality mobile recording at realistic rates

for more details phone
Pete Freshney on 01258 817214

Sonica

Digital Recording Studios

Specialists in location recording of acoustic ensembles and choirs. Natural-sounding recordings with top level technology.

Please contact
Marco Olivotto/Hélène Blais
16 Via dell'Abetone
I-38068 Rovereto (TN)

Phone/Fax: +39-0464-436850
e-mail: sonica@seldati.it

---

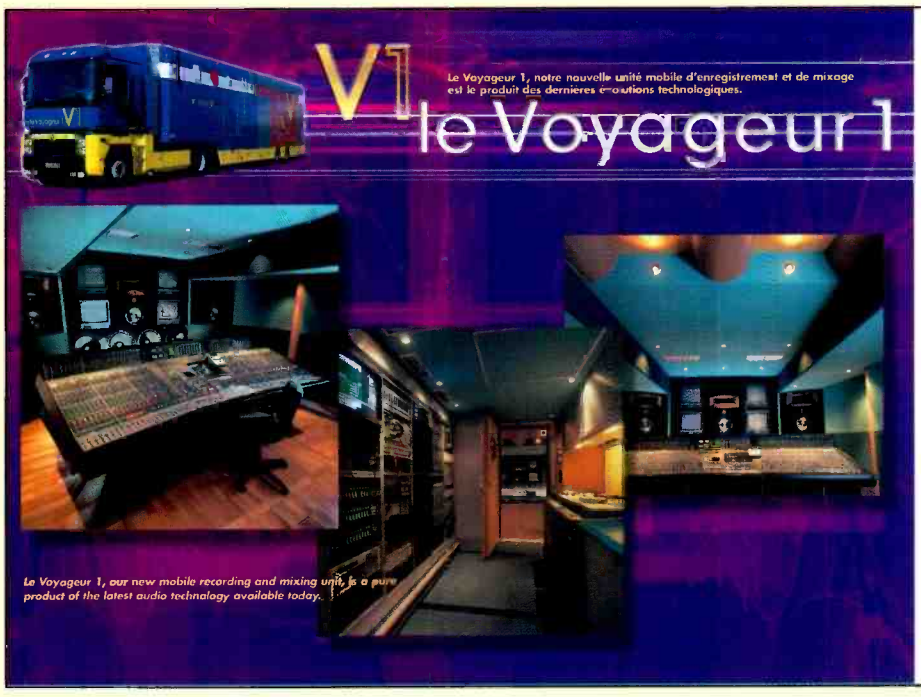
www. prostudio.com

Studi

To place an advertisement contact: Studio Sound (Classified),
Miller Freeman Entertainment Ltd.,
8 Montague Close, London SE1 9UR, UK
Tel: +44(0)171 940 8518 Fax: +44(0)171 407 7102
All box numbers reply to the above address

RATES: Recruitment **£38** per single column centimetre. All other sections **£33** (minimum 2cm x 1) Box number **£10** extra per insertion. Published monthly.

mobile studios



LE VOYAGEUR 1

SPECIFICATIONS

Digital SSL Axiom MT96 Input Desk.
5+1 TAD Custom Monitoring System

ADDRESS

56 Avenue De La Pyramide BP50058
Z1 Paris Nord 11
Tremblay EN
France 95947
Tel: +33 148 6300 18
Fax: +33 148 6383 40
http//www.levoyageur.com
E-mail: contact@levoyageur.com

situations vacant

DREAMHIRE

TECHNICAL MANAGER

The UK division of Dreamhire, the World's largest pro-audio rental company and part of the Zomba Group, is looking to appoint a TECHNICAL MANAGER to join their management team. This is a rare opportunity to work for one of the leaders in a rapidly changing field. This North London based position is crucial to the company's continued development in providing a service that is second to none for our clients across the UK and Europe.

The ideal candidate will have:

- Experience of a studio environment
- First class technical skills and experience in the pro-audio equipment field, including DAW's
- Experience of managing a team
- The ability to deal with multiple tasks simultaneously and to be able to prioritise. (A sense of humour will help!)
- Good communication skills and the ability to get on with staff and clients
- A flexible, pragmatic and innovative approach to solving problems under pressure.

We offer:

- A remuneration package commensurate with experience
- The opportunity to make a real difference to the performance and strategy of the company
- Dynamic, friendly working environment
- Possibility of career development within the Zomba Group

Interested candidates should mail or email a letter of application including current salary and salary expectations along with a CV to: Chris Roberts, Commercial Director, Dreamhire, 5, Chapmans Park, 378 High Road London NW10 2DY or chris.roberts@dreamhire.co.uk

Genex

DSP Programmers

Genex, a world leader in the design and manufacture of Digital Audio MO Disk Recorders, are seeking DSP programmers to expand their software team.

A minimum 18 months experience in the audio or video industries, with knowledge of the Motorola 56k series of DSP, together with real-time programming skills. A working knowledge of assembler, C, or C++ is essential.

Self-motivated, willing to work as part of a team with good communication skills, the successful candidate will receive a generous salary, and benefits.

Please send, fax, or e-mail your CV to:

Kevin Brown
Genex Research Ltd
Unit 8, Westmoreland House
Scrubs Lane
London NW10 6RE
Fax: 020 8357 3742
e-mail:kevin@genex.co.uk

products & services

Lockwood Audio

THE Authorised TANNOY Specialists

SPARES AND REPAIRS
SPEAKER BARGAINS GALORE
Phone: +44 (0)20 8864 8008
Fax: +44 (0)20 8864 3064

jbs records
MUSIC and SPEECH
REAL-TIME/HIGHER-SPEED Quality Cassette Duplication and Blanks from 1-1000.
Computer printed labels.
Solo, ¼" reel, Sony Betamax or R-DAT recording. Fast Security Delivery service.
FILTERBOND LTD, jbs records division
19 SADLERS WAY, HERTFORD, SG14 2DZ
01992-500101

classified

situations vacant

TECHNICAL AUTHOR

BSS Audio, a world leader in professional audio signal processing systems, requires a Technical Author with excellent creative, writing and technical skills.

You will be responsible for writing user guides, technical manuals, case studies, application notes and help files for a variety of audio products and software. You will generate the concepts in collaboration with our R+D team, engineers, and our sales team, who are all qualified sound engineers, and will turn these into finished items, with the assistance of a graphic designer.

You will have excellent writing skills and an ability to explain complex technical issues in clear, simple English. You must be able to learn new technical concepts quickly, and understand them thoroughly. Some knowledge of professional audio is essential; substantial experience in the audio world would be a big advantage.

The environment is that of a small, friendly company, where teamwork and enthusiasm are key. For the right person we offer a competitive remuneration package, which is negotiable dependent upon experience and qualification. Please apply in writing with a CV to:

Helen Thomas, BSS Audio, Cranborne House, Cranborne Road, Potters Bar, Herts, EN6 3JN
e-mail: *helen.thomas@harmanpro.com*
website: *http://www.bssaudio.com*

H A Harman International Company

CANFORD

Crowther Road, Washington
Tyne & Wear, NE38 0BW, UK
admin: 0191 418 1000
sales: 0191 418 1122 *fax:* 0191 418 1001

CANFORD GROUP is the foremost supplier of professional and audio/video equipment to industry. Due to continued expansion we are now looking to increase our sales force with the appointment of an additional

Sales Engineer. The successful applicant will report to the Senior Sales Engineer.

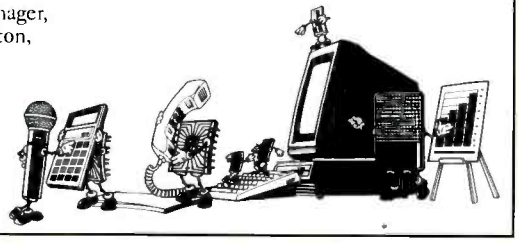
The ideal candidate will be:

- responsible for the management of key accounts
- home based, probably in the Midlands/South, with full IT support
- experienced within the audio/video or sound reinforcement area
- keen to develop and build a sales/customer support career with a progressive customer focussed organisation.

Interviews will be held at our European Headquarters in Washington, Tyne and Wear.

If you feel that you are the candidate that we are looking, for please forward a current CV, with a handwritten letter of introduction, indicating your current salary to:

Mrs Fiona McGee, Human Resource Manager,
Canford Group, Crowther Road, Washington,
Tyne and Wear, NE38 0BW.



products & services

5.1 MONITORING

Adgil Surround Sound Monitor System

- 5.1 or 7.1 from your Stereo Console
- 200+ Inputs by up to 8 Outputs
- Fully Programmable
- Mute, Dim, Mono, Solo & Cut Controls
- Pec / Direct Switching
- Use as Mixer for Stems & Sub-mixes
- Insert for Encoding / Decoding Matrices
- Modular, expandable design
- Noise -96dBu @ 22Hz to 22kHz
- 32 In by 8 Out System Under £3k

SYENCE the art of systems
Tel: +44(0) 171 371 7771
Fax: +44(0) 171 371 7779
email: sales@syence.co.uk

The Digital Village

Pro Tools and Outboard Specialists

New G4 in stock.
Call Gavin Beckwith -
London's leading Mac guru.

Avalon - Focusrite - Lexicon - Summit - TC Electronic - TLA - Eventide - Massenberg - Alan Smart - Neumann - Oram

Mackie d8b Main Dealer

Call Niki Melville-Rogers
0181 440 3440

AIR CONDITIONING & VENTILATION TO SOUND STUDIOS IS OUR SPECIALITY

We provide design only or design and installation for many well known clients. Whether it be for displacement free cooling, V.A.V., V.R.V., split, unitary or centralised
call Mike Hardy of
Ambthair Services Ltd on
01403 250306 or Fax 01403 211269
Web:http://www.ambthair.com
Email: cool@ambthair.com

products & services

AUDIO MOVES

Professional movers of studio equipment within the UK and Europe · Experienced, reliable, fully insured and always on time.
Call Graham Cook on 0181 450 9127 · (mobile: 0385 290754)
134 Cricklewood lane, London NW2 2DP · Fax: 0181 208 1979 · Storage facilities also available

HEAD TECHNOLOGY

NEW TAPE HEADS
Supplied for most makes,
Tape Head Re-Lapping/Re-Profiling.
Same day turn round.
HEAD TECHNOLOGY
11 Brittania Way, Stanwell, Staines,
Middx TW19 7HJ.
TEL: 01784 256046

mastering & duplication – equipment for sale

CD Mastering £50ph
CDR Duplication £2 each
Copy Masters and Editing
Real Time Cassette Copying
Free Glassmaster: 1000 CDs c.£650
CD-audio & CD-ROM
Printed labels & inlays
Every copy individually checked
Excellent quality & presentation
Best prices, ultra fast turnaround

RPM
Repeat Performance Mastering
6 Grand Union Centre
West Row
London W10 5AS
Tel. 0181 960 7222
Fax. 0181 968 1378
www.repeat-performance.co.uk

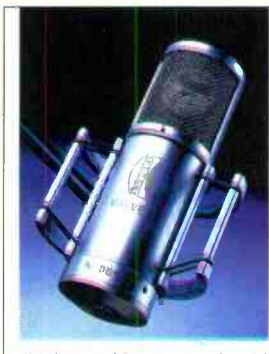
HILTONGROVE
MULTIMEDIA
where sound advice counts
The Hiltongrove Business Centre,
Hatherley Mews, Walthamstow,
London E17 4QP
3 Mins walk from Walthamstow Central
(Victoria Underground/ BR Main Line),
11 mins from M25
Tel: 020 8521 2424
Fax: 020 8521 4343
Email: info@hiltongrove.com
www.hiltongrove.com

- CD Mastering
- CD Manufacturing
- Audio Encryption
- 32 Bit Technology
- Sound Restoration
- CD ROM Multimedia
- Enhanced CDs
- Digital Video
- Cedar
- Graphic Design
- Short Run CDs
- Print

AUDIOCARE
Call or fax at: 33 16 1 04 03 69
Web: http://www.ata78.com.fr
We buy and sell.
STUDER.SSL.NEVE.
Just got in!
2 Studer 24/A820/SR/Locat/sync
1 Studer 24/A800 mk3/new heads
1 Studer 24/A827/4000 hrs/AL
1 Studer 8/A820/3500 hrs/remo
Harrison 10xB/96 in/TR/FlyingFad
SSL G+64 in with Ultimation
SSL 5000 Broadcast
Neve 5308/32/patchbay
2 Neumann U47 long body VF 14
2 Neumann U67 valve
1 Neumann M367 valve
1 Neumann SM69 Stéréo
6 Schoeps M221 valve
1 UREI LA4 and 1178
and much more . . .

QUALITY, CHEAP & QUICK!
500 CD ALBUMS: Only £699
500 12" SINGLES: Only £599
500 7" SINGLES: Only £475
500 CD SINGLES: Only £599
500 Cass ALBUMS: Only £450
PRICES BASED ON DAT MASTER & FINAL FILMS BEING SUPPLIED
NO HIDDEN CHARGES! ☆ NO EXTRA V.A.T!
FOR MORE CHEAP PACKAGE DEALS & FREE INFO PACK CALL DaT-2-DISC
tel:0181-536 0700 fax:0181-536 0703

Unit F11D, Parkhall Road Trading Estate
40 Martell Rd., Dulwich, London SE21 8EN
tel: 0181 265 6364, fax: 0181 265 6423
email: cannibal@dircon.co.uk
Cheapest prices in U.K.!!
300 CD Singles/Albums...£549
500 CD Singles/Albums...£585
1000 CD Singles/Albums...£750
Includes: All prices EX VAT
Films, CD's, Colour Booklets
or "J" Card from Camera Ready
Artwork, Glass Mastering,
Barcodes, Cellowrapping!
MUSIC MEDIA MANUFACTURERS



BRAUNER
Simply the Best
starting @ around £1,500
'Unbelievably clear and rich'
Bruce Swedien, Engineer - Michael Jackson / Quincy Jones
T +44 (0)208 943 4949
E louis@homeservice.u-net.com

COPYTRAX
MULTI MEDIA
CD Duplication
10 CDR's - £15.00
50 CDR's - £59.00
100 CDR's - £99.00
Call Sales 0800 3281386
Fast Turnaround

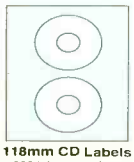
Duplication
Blanks & Accessories
CD's, Dat's, & Labels etc.
FREE ! Catalogue & Sample
Downsoft Ltd 01372 272422
Web: www.downsoft.co.uk

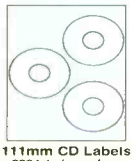
EUPHONIX CS 2000
M4-64 CONSOLE
FOR SALE £86,000
One owner/user - 2 years in use.
Mint condition!
64 faders (s/m), DSC, 192 inputs,
20 auxs, Hyper Surround,
16 dynamics with remote metering
(2xES 108), 48x12 Cube,
patchbays and cables.
Contact:
Robert + 47 90 58 74 70
or Truls + 47 90 19 53 06

FOR SALE
SSL 4056 G+ Special Edition.
52 mono/4 stereo channels/4 patchable VCAs
Total Recall/Ultimation/Motionworker.
Stereo LCD display/LCRS panning/Bargraphs.
Patchbay/Cablebay right.
Console commissioned April 1997.
Condition Immaculate.
Price: £165,000
Tel/Fax: +49 89 7918690. e-mail: zlunion@aol.com

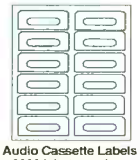
products & services

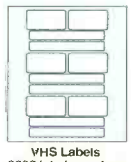
A4 LASER & INKJET PRINTER LABELS


118mm CD Labels
600 labels per box


111mm CD Labels
900 labels per box

3½" Floppy Disk
3000 labels per box


Audio Cassette Labels
3600 labels per box


VHS Labels
3600 labels per box

Tel: (01795) 428425 (24 hrs) Fax: (01795) 422365
Standard Box size: 300 Sheets
Superfast Labels Ltd
SELF ADHESIVE COMPUTER LABEL MANUFACTURERS
http://www.superfast.co.uk/label/
Units 15/16 Church Road Sittingbourne Kent ME10 3RS

classified

equipment for sale

NUMBER ONE FOR 'NEVE'

NEVE 8058 — Mk1 28/16/24 VU Metering Remote Patchbay 28 x 31102 Modules 28 x 32408 Modules 24 x 32404 Modules.

NEVE VI — 36 Frame Righthand Patchbay Plasma/VU Metering.

NEVE 8026 — Configured 24/8/16 Fitted 24 x 1073 Modules 1943/1 Group Modules VU Meters.

NEVE Melbourne — 12/4/2 With Righthand Patchbay, Choice of Two Consoles Fitted 33122A Modules and 33115 Modules.

MODULES — Available 1073/ 1089A/1066 Original Vintage Neve Modules.

SSL CONSOLES

SSL 4056G

Plasma Metering 56 x 611G Righthand Patchbay G+Upgrade Total Recall Video Switcher 2 x PSU With Auto Changeover YR 1989

SSL 4056G

Plasma Metering 50 x 611G Modules 6 x 611E Modules Righthand Patchbay Total Recall G Series Computer 2 x PSU With Auto Changeover YR 1991

AES PRO AUDIO

A UNITED KINGDOM BASED COMPANY

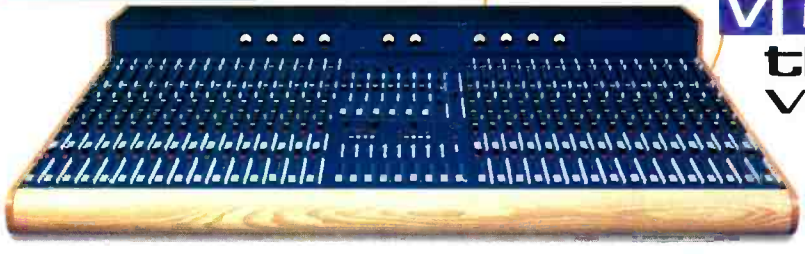
THE 'VINTAGE' NEVE SPECIALIST!!

all equipment is owned by A.E.S. Pro Audio we do not broker

We wish to purchase old NEVE consoles (worldwide)

Telephone: 01932 872672 Fax: 01932 874364
Telephone International: 44 1932 872672
Fax: International: 44 1932 874364
Website Address: AESPROAUDIO.COM
Email Address: aesaudio@intonet.co.uk

TL Audio® www.tlaudio.co.uk



console VTC

the classic valve console

TL Audio Limited, Sonic Touch, Iceni Court, Icknield Way, Letchworth, Herts SG6 1TN UK
Tel: +44 (0)1462 680888
Fax: +44 (0)1462 680999
email: info@tlaudio.co.uk

funky junk

London

505-507 Liverpool Road,
London N7 8NS.
Phone us: 0171 609 5479
Fax us: 0171 609 5483
email us: sales@funky-junk.co.uk

funky junk

Paris

Pierre Valentin
19, rue des Parisiens,
92600 ASNIERES, France
mob: 0(033) 616 72 1977
email us: pierre@funky-junk.com

funky junk

Milan

Paolo Orizio
via Pollaiulo, 15, 20159 Milano,
P.IVA 12886790158 Italy
mob: 0(039) 348 5840 840
email us: paolo@funky-junk.com

THE BEST PRO-AUDIO SALES AND SERVICE IS NOW EVEN CLOSER.

Call, fax or e-mail for latest new and used bargains.

www.funky-junk.co.uk

EQUIPMENT FOR SALE?

CALL ANDREW LYNN ON 44 171 940 8518

equipment for sale

TONY LARKING
PROFESSIONAL SALES LIMITED

WORLDWIDE DELIVERY

CALL OR FAX FOR OUR LATEST LIST OF USED EQUIPMENT OR VISIT OUR WEB SITE

WANTED!

NEVE • SSL • OTARI • STUDER

Tel: +44 (0)1462 680888
Fax: +44 (0)1462 680999
http://www.tlaudio.co.uk/used.htm
(WEB SITE IS UPDATED ON 1ST OF EACH MONTH)

OMNIRAX STUDIO FURNITURE

Omnirax provide a wide range of furniture solutions for today's popular analogue and digital mixers, keyboard workstations and midi systems. Models are available for Yamaha 02R and 03D, Mackie D8 and 24/32 analogue, Spirit 328, and Behringer mixers. Together with computer workstations for DigiDesign ProTools, ProControl and Otari Radar and most leading hard disk systems. Full technical brochure available on request.

musiclab audio distribution
Tel: 01908 510123
Fax: 01908 511123
www.omnirax.com
info@musiclab.co.uk

PRODUCT & BROCHURE SHOWCASE

FAXBACK +44 171 407 7102

Analogue Perfection

The Father of British EQ - John Oram

For information on John Oram's stunning range of Consoles and Rack equipment, return details or visit our Web site.

www.oram.co.uk
E-mail: saless@oram.co.uk

ORAM

ORAM PROFESSIONAL AUDIO
Tel: +44 (0)1474 815300
Fax: +44 (0)1474 815400

Microphone University

Do you want to learn more about microphones?

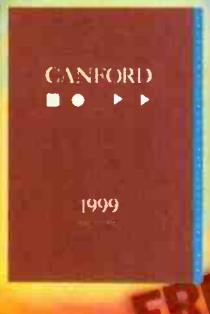
Visit the Microphone University on the Internet at:
www.dpamicrophones.com

The Microphone University features:
- General Microphone Techniques
- Application Guide
- Technical Corner

The Microphone University is offered to you by DPA Microphones - Manufacturer of the famous Series 4000 Microphones.

DPA MICROPHONES
Hejrevang 11
3450 Allerød, Denmark
Tel: +45 4814 2828
Fax: +45 4814 2700

THE source



Now featuring 14,000 + audio and video related products!

FREE

CANFORD
Tel: +44 (0) 191 418 1000
E-mail: ss@canforc.co.uk
www.canforc.co.uk

LM1 DIGITAL-ANALOGUE MONITOR & LG1 DIGITAL-ANALOGUE GENERATOR

- *Portable, battery powered*
- *Balanced digital and analogue inputs & outputs*
- *32k, 44.1 and 48k sampling, plus external lock*
- *Digital and analogue level monitoring on LM1*
- *Headphone output with volume control on LM1*
- *Channel ident & phase invert on LG1*
- *Highly stable, low distortion outputs on LG1*
- *Digital and analogue silence on LG1*

Lindos LINDOS ELECTRONICS
Saddlemakers Lane, Melton, Woodbridge
Suffolk IP12 1PP UK
Tel: +44 1394 380307 Fax: +44 01394 385156
email: info@lindos.co.uk

TO ADVERTISE CALL ANDREW LYNN ON 44 171 940 8518

OR FAX ON 44 171 407 7102

e-mail: alynn@unmf.com

US: The year analogue died

Touring the floor of this year's New York AES Convention invited an eerie feeling of impending change writes **Dan Daley**

IT IS OFTEN only in retrospect that the significance of certain events can be seen. From Archimedes' 'Eureka!' and the import of steam power 2,000 years later, through Edison's fumblings with wax cylinders, the knock-on implications of many episodes in human achievement are not felt for some time after their first appearance or discovery. And I think it may be the case that the recently concluded AES Convention in New York at the end of September will be a turning point in the evolution of how music is made. It was, I believe, the show at which the end of analogue was collectively, tacitly, acknowledged.

There were no announcements to this effect, only subtle clues and hints. But those were myriad and to this eye, definitive. Take the reaction of the mono-monickered Fletcher, owner of Mercenary Audio in Boston and long the ultimate poster boy for analogue technology. Upon being told about a particularly interesting new piece of analogue gear, Fletcher yawned and said, 'I used to care', adding that since the advent of 24-bit digital audio, the advantages that analogue conferred were diminishing rapidly. He sounded almost as though he were in recovery, relieved that codependency had been conquered.

Then there were the standard-bearers of analogue itself, the tape manufacturers. Neither Quantegy nor EMTec-BASF offered any new significant music recording products. Indeed, BASF's main thrust was to emphasise its self-appointed leadership position in how to maintain music from older analogue tapes and to stress its charitable efforts in rescuing Louis Armstrong's legacy from sticky-shed syndrome. When it comes to analogue, the tape companies are beginning to power down the machinery, shut off the lights and close the door behind them.

They'll certainly have less hardware upon which to base sales of their software: Studer made a point of showing off the last production line model of its 24-track decks, and Otari has already ceased making the MTR-90—the Saturday Night Special of multitracks.

Then there were the demographic clues. I'm not aware that AES tracks any statistics regarding the age of its constituency, but it was apparent from the show floor that it is getting a lot younger. This may be a personal perception, but it's inevitable that the pool of technical talent renew itself, and this year's show may have been a critical turning point in the course of demography. Certainly, the flocks of eager, sometimes Stepford-like students from Full Sail looked a lot younger this year, and they were joined by ranks of cohorts from SAE and other aggressively marketed academic entities. The fact that the audio schools are growing at such a fast clip tells us not only is new and differently abled blood necessary for the technology of music today, but the very fact that it is school-aged people that are increasingly manning the trenches reflects the fact that analogue's time has come. According to a recent university study here, over half of college students don't know who John Lennon was. For a generation for whom the Beatles are no longer a vital force, who were born after the last man had left the moon, who cannot recall a time without email, of what use is analogue? For them, it's the equivalent of Edison's wax cylinder, and of equal importance to Edison's own conception of it: quaint and faintly amusing.

There is even a place to inter analogue now: the Museum of Sound Recording has opened its doors in New York, and had at the show an exhibit dating back to some of the early wire recorders. Speaking of equivalents, this is like analogue having gone out and purchased its own burial plot. ('Something overlooking Manhattan, please. I made some of my best records there.')

Each of the many new hard-disk recording systems debuted at the show was

Europe: A CopyCode copy?

The evidence suggesting that DVD watermarking is following the ill-fated path of CopyCode mounts writes **Barry Fox**

'BITE YOUR TONGUE,' said David Leibowitz, President of Aris Technologies, when I suggested that the music industry's choice of MusiCode was looking like a rerun of the CopyCode farce.

Aris, the SDMI (Secure Digital Music Initiative) and 4C Entity (the DVD Forum's Copy Protection Technical Working Group, of IBM, Intel, Matsushita-Pansonic and Toshiba) seem blind to the fact that the issue is not about whether they are confident that a watermark should not spoil the sound of DVD-Audio; it is about what tests they can document to reassure those in the hi-fi and studio worlds who not unreasonably fear that altering the waveform of a music signal may create artefacts that are stripped bare by DVD-Audio's 192kHz/24-bit working.

The DVD-Video standard already embraces 96kHz/24-bit. The main selling point of DVD-Audio (and Super Audio CD) is that the sampling rate can be raised to 192kHz, with MLP (Meridian Lossless Packing) to extend uncompressed audio bandwidth to 100kHz. Technics is promoting its new range of hi-fi as 100kHz-ready. Out of eleven watermarking systems originally proposed, only four were fully tested by the SDMI/4C. Some of the others were withdrawn because their proponents were unhappy with the test procedures. The IFPI had previously tested them only with CD-quality material and never released the results. I have twice now asked the SDMI for more information on how the 4C tests were carried out. The first answer I got speaks for itself:

Said SDMI spokeswoman Joy Pedula: 'The major label studios and independent mastering houses employ expert listeners who have developed the skill of being able to detect subtle differences in audio with regard to quality impairment. These were the people used for evaluating the SDMI audio watermark. An expert listener or 'golden ear' typically develops his or her skill through years of repeated critical listening experiences. There is not a formal recognition process and we don't maintain a list of these people. I hope that this information is useful.'

Small wonder that the IFPI in London is believed to be talking to one of the UK music copyright bodies, PPL (Phonographic Performance Lits), about fresh independent tests.

MusiCode comes in a variety of flavours, the most basic being a 1-bit flag that signals the need for an SDMI compliance upgrade, with a 3-bit system that adds copy-once or copy-none control signals, right up to a 72-bit (or even bigger) payload which carries the kind of copyright information the music industry wants (such as ISRC coded identification of the music).

In its August announcement, Aris said the 4C Entity was selecting MusiCode for 'copy protection in DVD Audio', and 'applauded' 4C for 'its intensive and thorough evaluation' which led to MusiCode being 'selected' and thus allowing work 'to bring the benefits of DVD-Audio to the listening public'. In other Aris literature MusiCode is described as 'inaudible'. So when Aris refers to 'inaudibility ', is this in the context of 72-bit payloading, with DVD-Audio's 192kHz/24-bit operation?

> The hunt continues for golden ears who will admit that they took part in the tests and are happy with 4C's decision to select a system for DVD-Audio without testing it at 192/24

Aris says its own tests 'confirm inaudibility' but the company admits it has 'not internally evaluated at 192kHz/24' and cannot say for sure whether 4C tested at 192/24. Aris also says it cannot say what

another nail in the coffin lid of analogue. And considering the alarms raised earlier this year by the RIAA about America's musical heritage already decomposing in the vaults of record companies and studios, it might be a good thing to get analogue into the ground quickly.

Finally, there is the new millennium, a natural turning point in the affairs of men and technology. If there ever were a fitting point to lay old technologies to rest, this is it. Miami, the next big thing in music's peripatetic travels through the States, seems to have gotten that message, and I suspect it won't be long before New York and Los Angeles follow suit.

But if the demise of analogue teaches us anything, it is that nothing lasts forever. The newness of things wears thin now faster than ever, and even the promise of hard-disk technology will follow analogue into the dustbin of technological history, to paraphrase Ronald Reagan's eulogy of the Soviet Union. Perhaps sooner than we think, if the scientists toiling away in Eindhoven and Tokyo have anything to say about it.

So say a prayer for analogue, its memory is burned indelibly into the everyday language of music recording. Just as in America we still say we're 'dialling' the phone even though dial phones haven't been around for over 20 years, it is analogue that we honour every time we say 'roll tape,' even if we're pushing the buttons on a hard-disk recorder.

MusiCode payload 4C tested. If Aris knows so little about 4C's tests, how can Aris say with such certainty that 4C's evaluation was 'intensive and thorough'?

I again asked the SDMI for information and was promised a fuller response. After two weeks I had still heard nothing. In the meantime an authoritative source close to 4C has given some useful background which reinforces admissions made at the AES in New York.

4C worked with the Big Five music companies and it was the music companies who selected the material to be embedded, the test locations (LA, NY, Nashville, with both the music companies' own studios and outside mastering houses), and the actual participants. 4C knows the names of the studios and the number of participants in each location (a total of about 25 to 30). But 4C does not know the names of the participants. Only the music companies know these names and the tests were conducted under non-disclosure agreements. All the 4C listening tests were done at 96/24, except for one master that was 88.2/24. No test results from 192kHz were included in the analysis. The hunt continues for golden ears who will admit that they took part in the tests and are happy with 4C's decision to select a system for DVD-Audio without testing it at 192/24.

'I do not know a single person, golden ear or otherwise who has heard it, let alone has a good opinion' says Bob Ludwig. No hi-fi reviewers were involved either.

This is CopyCode all over again.

Everything and nothing

This year's IBC found itself facing a variety of difficult choices —reflecting the future of broadcasting itself writes **Kevin Hilton**

IBC WAS HOT THIS YEAR. That is to say that it was uncomfortably and unseasonably warm, not that it was a scorching exhibition. There was much to see during IBC 99; perhaps too much, which resulted in the situation of one technology being swamped by other, evolving technologies. The IBC has been positioning itself as a multimedia event for the past few years and such new technologies were everywhere: video streaming, Internet broadcasting and interactivity.

Despite this apparent plethora of goodies, there was a strange lack of movement. There was very little in the way of hard news and, underneath all the potential, there were few new products. Convergence—the buzz word that surfaced at least four years back—could be seen in solid form, but even now the evolving products appear premature. There was a severe lack of what could be termed traditional broadcasting product. The new hybrids were there, even though the means to make it all work—the transmission-distribution infrastructure—has yet to be fully implemented, particularly the promise of wide-band networks.

'In five years time, a programme-content creator can publish material directly to a server, which is leaving many of us struggling to determine a business model'

This gave the impression that both the broadcasting business and the IBC itself are in a state of flux. The potential is there—how quickly broadcasters and network-service providers adopt them is the key to how broadcasting will develop into the new millennium. Usually, only cynical commentators would come out and say such things. If those behind the products or the services do entertain such doubts, they would either keep them to themselves or only express them in private.

So it was unusual and refreshing for the CEO of a major company to address a press conference and admit that not only is the market bewildered right now, but that his organisation had not been doing well in recent times. Roger Henderson of Chyron told a selection of the press corps 'that like many in our industry, our results over the last 18 months have not been spectacular'. He added that many of the fundamental elements of the business had to be rethought, largely because of one thing: 'The transition to digital has presented many opportunities—but for opportunities read confusion and risk'.

The computing and telecoms newcomers are used to the new way of approaching a problem; broadcasting has had to deal with a variety of changes within a short space of time, not all of which have come off or survived. Henderson summed up this uncertainty by observing, 'The question is where to put the money. There is the thought that in five years time (or less), a programme-content creator can publish material directly to a server, which is leaving many of us struggling to determine a business model'.

This last comment proves that the language of broadcast is changing too. Content distribution-transmission, asset management and content creation mean everything and nothing at the same time, because they are too all-encompassing and buzz-wordy. Content creation is perhaps the worst, regardless of the fact that it is the title of a new stable companion to *Studio Sound*. Digital has reduced everything to mere data, so it is no longer a programme, it is content. Analogue never decharacterised material, although it was fundamentally just electrical impulses.

One of the promises of digital is extra content, or added value. IBC proved that high definition still fails to move the Europeans, but multimedia and interactivity is the thing. Hence the proliferation of video streaming and interactive dems. Companies like Liberate and OmniBase demonstration control over the whole chain from production to delivery, adding on distance learning, e-commerce and email. But many of these appear merely optional extras, something Stuart Collingwood of Liberate hinted at when he told me, 'Free surfing of the Internet on TV is not the killer app'. Collingwood's point is that there should be a range of integrated features, from email to screen grabs to chat to direct HTML access.

While perhaps not a killer app, surround sound, a genuine added value, continued to languish in the twilight world of IBC. Dolby promoted its links with German satellite channel ProSieben Media, which is broadcasting movies in 5.1, and demoed Dolby E. After heated exchanges with audio manufacturers last year, the IBC management committee attempted to give this area a higher profile. This included a mini-conference on surround sound organised by the Institute of Broadcast Sound. It appeared well attended, but one of the speakers observed with a wry smile that much of it was like preaching to the converted.

Change is evident, which has implications for broadcasters and the organisers of the IBC. Just as its rival, the ITS in Montreux, is rethinking its position, so the IBC will have to decide whether it is a broadcasting show with multimedia input or a multimedia exhibition with a bit of broadcasting. The two may have converged but for the time being, they are still different disciplines and it is important to remember that.

Time for a recone

Living with a new generation of studio equipment means learning more than the obvious lessons. **Ben Duncan** conducts life extension classes for studio electronics

RECENTLY, various manufacturers and suppliers of different sorts of Rolls-Royce league recording studio gear have had to deal with customers who have been taken aback when equipment has exhibited mass failures. A shocking development unless the fact that this has occurred only after over ten or more years of continuous use is taken into account. The fact is that while most moving parts wear quickly or at least in a way that the eye or ear can readily detect but most electronic parts aren't explicitly 'moving' yet they do still wear. This applies to everything in the studio that's electronic—from backline amps through digital wonder processors to PCs. It's well known that some electronic parts wear, because they can do so quickly such that it can be hard not to notice. These include valves—where rapid wear is widely associated with the better sounding instrument amps (like pre-1966 Fenders) and then to a lesser extent switches, relays and control pots.

For the rest of electronics there are three crucial differences. Firstly, the wear is usually slower. Then there is the fact that wear often is not detectable—you can't open a chip and say 'this has done 99,000 hours and will probably die soon'. Finally, wear varies widely. Hours alone don't determine 'closeness to expiry'. Frequent turning on and off can be more stressful to some electronic parts as continuous running is to others. For others, a ten-fold difference in lifespan is down to the fact that someone bothered to clean the cooling fan filters monthly. Conversely then, the use of common parts under shared conditions with shared powering, namely inside mix consoles, means that when parts reach their endpoints, it all happens pretty much at once. Heat is always the principal accelerator. Anything that runs hot is going to decay sooner rather than later.

Thus operators with breakdown contingency funds should be wary, that whereas smooth running for many years of particular equipment could be a sign of good design and careful use, the equipment must eventually enter rapid decay mode, and with increasing likelihood and severity, with passing time. Good news is that most reputable high-end analogue audio equipment can be 'reconed', and that this could work out less costly than buying new equipment—which, one gradually discovers, is not automatically better. Reconditioned gear will likely sound better than it did, better than 'new'. That's because the change in sonics due to part decay is so gradual you wouldn't notice the wear. Revamped gear lives long enough to gain a patina. And no one has to learn anything new—the last thing many creative people need today.

A new category of fast-wearing electronics that should be worrying the studio world, is anything made with surface-mount parts. A typical camcorder costing £1k/$1k contains over 100 electrolytic capacitors. It is not unusual for most of these to expire within two years, and repair is then utterly uneconomical—even if the failed capacitors' chemicals have not leached out and also eaten the PCB away. Some products made by pro-audio manufacturers are already at this disposable level. The message it sends is cynical. The next step is when last year's equipment no longer exists. In consumerland, expiry chips would already seem to be programmed to operate after the guarantee period has elapsed. At that stage, and after today's vintage gear has died from lack of spares, the recording industry will have handed over to large makers, the power to decide what equipment will be available for use this year.

Reconditioning worn equipment needs careful thought. As further breakdown is anathema in recording, the surest way is to replace everything that will have worn significantly, but this must be balanced against leaving well alone. The following example of a servicing cycle for all kinds of electronics that runs continuously, while never mentioned in most maker's manuals, will make sense to those who have practised the recovery of high-end analogue gear, above and beyond the mundane maintenance of the connectors, pots and switches. The first recone should be at about five to seven years. All electrolytic capacitors that run warm should be replaced. Also, strictly, all the bipolar transistors and any chips and certain other parts which run hot. There are signs for this. At about 14 years or double the 1st interval, the above is repeated. Also, other semiconductors which run at all hot should be changed. At about 21 years, or triple the first interval, this would be repeated. In addition, all the soldered joints would be remade to be sure. At about 28 years, the 7-year and 14-year services are both repeated. By now, certain other parts are best changed. This procedure is much less applicable to digital gear. Not much of today's digital electronics will be repairable after 14 years use or storage—even if you would want to. Not unless someone has stockpiled the specialist chips in a freezer, and has the tools to remake multilayer PCBs, and the soldering gear for yesteryear's chip carriers. Along with surface mounted miracles, digital technology is frankly bad for ecology—or recreating the sound of the nineties in thirty years time. ■

The first sound reinforcement speaker accurate enough to be called a studio monitor: SRM450 from Mackie Designs.

The stiffest, strongest, most elegant composite enclosure on the market. Unique asymmetrical trapezoidal design eliminates internal standing waves— and lets the SRM450 recline comfortably when used as a stage monitor. Handles on both sides AND top.

SRM450s couple their damped titanium compression drivers with the room via the same kind of multi-cell aperture used in the finest big-studio horns. This combination achieves more even horizontal and vertical dispersion than any other comparably-sized SR speaker.

Wide dispersion. Extreme output. High resolution. We started out to make the best active, composite speaker on the market. We ended up with a design that has such amazingly-flat frequency response and wide dispersion that it can be called a ***studio monitor***.

The SRM450's high end is crisp and airy. Midrange is detailed and natural without a trace of harshness. And the SRM450's tight, steel fisted bass simply blows away anything remotely close to its size or price range.

Monitor-quality wide dispersion. Small PA loudspeakers tend to beam mid and high frequencies out in a narrow "spotlight" of sound that "drills a hole" in the heads of listeners sitting directly in front of the speakers...but sounds dull and indistinct to listeners at the edges and back of the room. SRM450's even dispersion means you hear the same sound whether you're in front of the monitor— or far to one side or the other.

The SRM450 employs a *damped* titanium compression driver that has extremely linear response out to 20,000Hz. We couple it to a unique logarithmic multi-cell aperture with dispersion fins that distribute high frequencies far more evenly than "Constant Directivity" horns found in other compact PA speakers—up to 90° on the horizontal axis and 45° on the vertical axis. That means far better audibility.

To hear is to believe. If you're a technoid, call for a detailed brochure or log onto our web site for more details. If you're the impatient "show me" type, visit your Mackie dealer and audition the remarkable SRM450 SR *monitor*. It will forever change your opinion of active composite speakers.

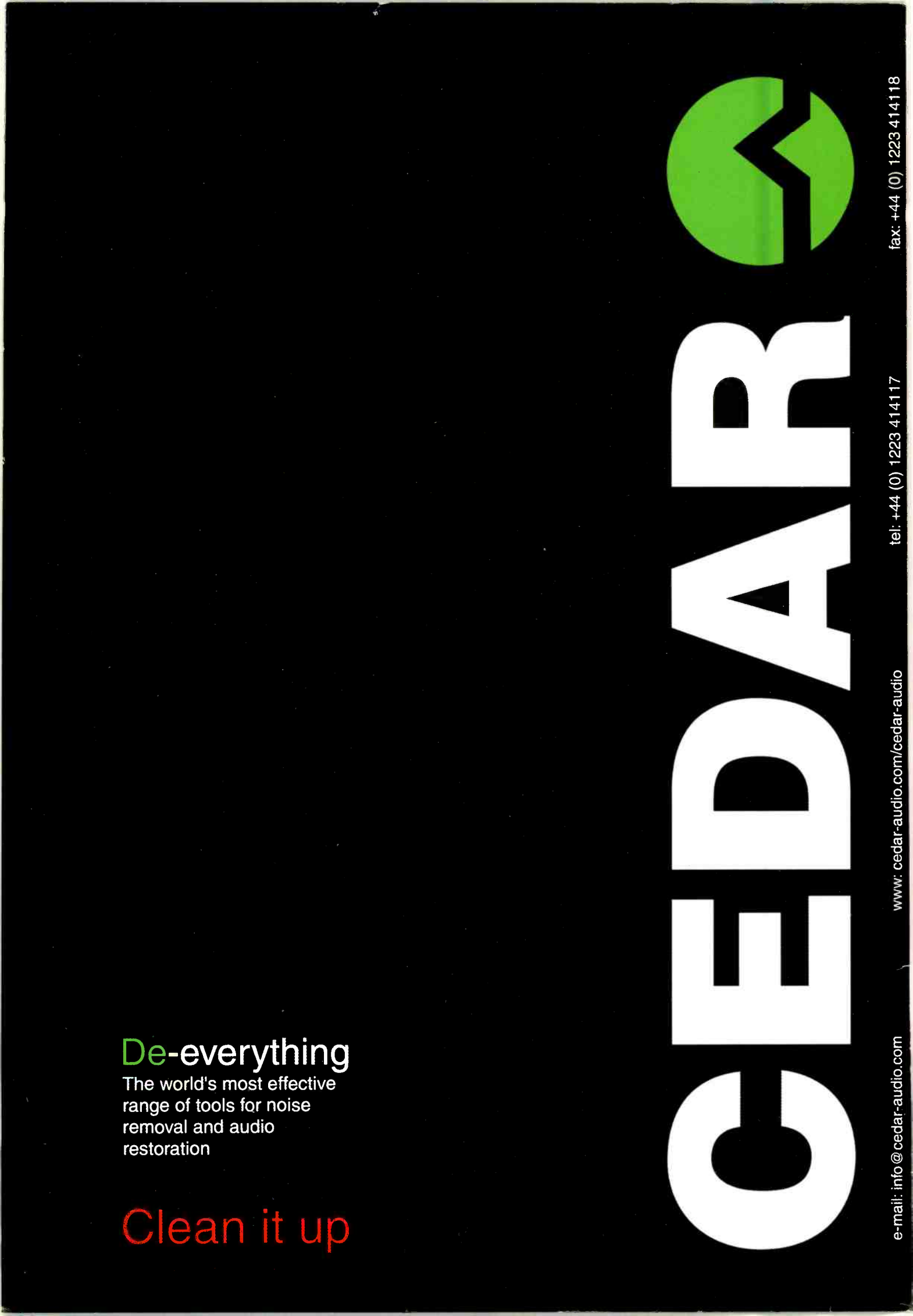
*MADE IN WOODINVILLE WA USA & REGGIO EMILIA ITALY BY GENUINE MACKOIDS

©1999 Mackie Designs. All rights reserved. "Mackie", the "Running Man" figure are registered trademarks of Mackie Designs Inc. FR Series is a trademark of Mackie Designs Inc.

- 2-way optimized active system with 400 watts of FR Series high-current amplification built in
- Damped titanium HF transducer
- Finned, exponential horn
- Servo-controlled LF transducer
- Bal./unbal. mic/line inputs
- Level-setting control with LED
- Contour EQ & infrasonic filter
- Pole mount on SRS1500a active subwoofer or tripod
- Flypoints on all sides
- Sideways reclinable as a high-definition floor monitor

MACKIE

UK: 0.1268.571.212
FRANCE 0.3.85.46.91.63
GERMANY 0.2572.96042.0
www.mackie.com



De-everything

The world's most effective range of tools for noise removal and audio restoration

Clean it up

e-mail: info@cedar-audio.com
www: cedar-audio.com/cedar-audio
tel: +44 (0) 1223 414117
fax: +44 (0) 1223 414118