

January 1992

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STUDIO SOUND

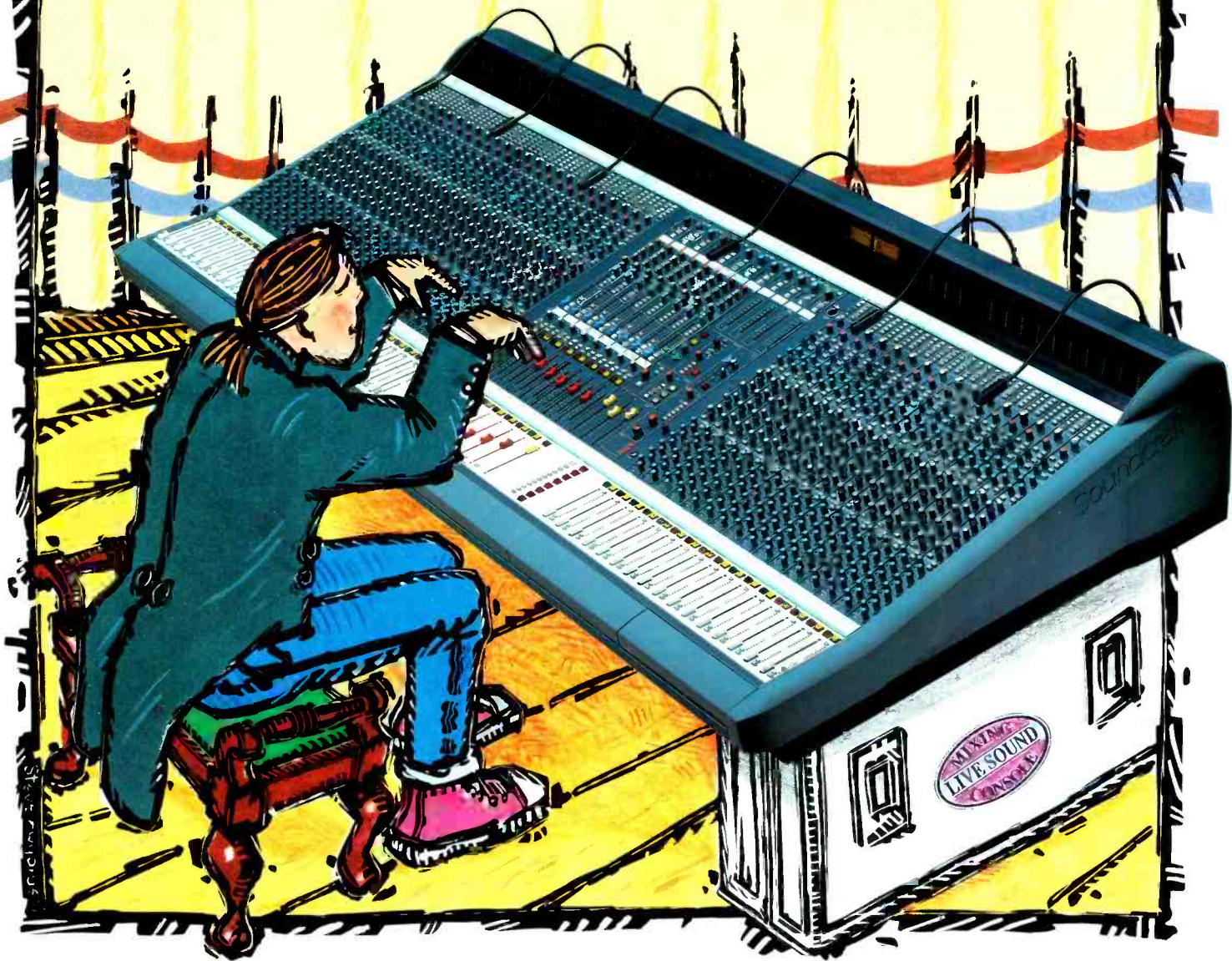
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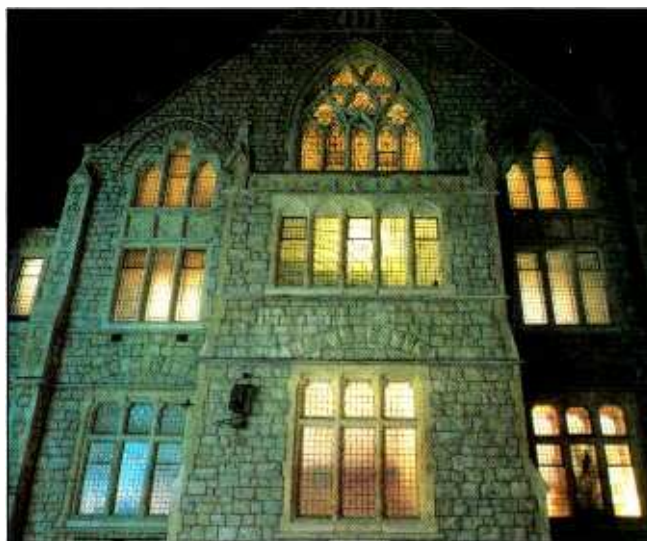
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STUDIO SOUND

AND BROADCAST ENGINEERING



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AND BROADCAST ENGINEERING

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EDITORIAL

Editor: Keith Spencer-Allen
Assistant Editor: Julian Mitchell
Production Editor: Peter Stanbury
Secretary: Mary Walsh
Consultant: Sam Wise
Columnists: Barry Fox, Martin Polon (US)

Regular Contributors:

Janet Angus	Mike Lethby
James Betteridge	David Mellor
Mike Collins	Terry Nelson
Ben Duncan	Francis Rumsey
Dave Foister	Zenon Schoepe
Yasmin Hashmi	Patrick Stapley

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CIRCULATION

Circulation and Development Manager:
Colin Enderson

Controlled Circulation Manager:
Maria Udy

Enquiries: See classified advertisement

Director: Doug Shuard
Publisher: Steve Haysom

EDITORIAL & ADVERTISING OFFICES

Spotlight Publications Ltd, 8th Floor, Ludgate House, 245 Blackfriars Road, London SE1 9UR, UK. Tel: 071-620 3636. Fax: 071-401 8036.

NEWSTRADE DISTRIBUTION (UK)

UMD, 1 Benwell Road, London N7 7AX, UK. Tel: 071-700 4600. Fax: 071-607 3352.

AMERICAN OFFICE

Publishing Services Manager: Fred Vega
Studio Sound, 2 Park Avenue, 18th Floor, New York, NY 10016, USA. Tel: (212) 779-1212. Fax: (212) 213-3484.

JAPAN & FAR EAST AGENT

Contact: Mikio Tsuchiya, Media Sales Japan, Inc, Tamuracho Bldg 3 3 14, Shimbashi, Minato-Ku, Tokyo, Japan. Tel: (03) 504-1925. Telex: J25666. Fax: (03) 595-1709.

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Lasered sound with pictures

While this column normally addresses itself to matters not tied to specific countries, this month I am turning to matters close to home.

This year will see the availability of at least three new consumer software formats — DCC, Mini Disc and CDI, which is not to mention the launch late last year of Commodore's CDTV. Multiple new formats are, of course, nothing new. Looking through reference materials will reveal that each time there has been a major advance in technology a number of new formats have been spawned. Just look how many variants there are now of the recorded optical disc in the years since the launch of the compact disc. In the past, a single format seemed to survive while the others just died off — largely due to deficiencies in their performance, practical operation or cost.

Today this is not the case. There is much to be said for each of the formats pending introduction and there are enough marketing dollars behind each of them to make them all succeed — at least to a significant degree. We will also see valiant efforts being made during 1992 to establish the laser video disc as a viable consumer medium in the UK. This format has an extraordinarily low profile with the average British consumer, surely due to the erratic and disastrous marketing that began in the early 80s and which still continues. Japanese electronics company Pioneer are working hard to bring about a change in this attitude but it does not promise to be easy.

In other countries the situation is far different. Japan for example has a successful laser disc market with complete floors of record stores set aside to display thousands of titles. In the US, while not exactly available everywhere, you can find several thousand titles of staggering variety.

In the UK, however, we have very little. The current UK software consists almost exclusively of the music software launched as part of Polygram's CDV promotion of three years ago. There is also the Decca series of operatic productions — all of which are very good but not exactly what is required to create mass market acceptance. Hardware is available only from Philips and Pioneer while in reality it is only the latter's machines that you see. The programme companies are reluctant to provide software if the sales are likely to be small but who will buy a machine if there is not a choice of software to play? Pioneer are now promoting hard as they have previously done in the US. Minimum pressing quantities for programme discs have been dropped and it would seem to suggest that there is little to stop the software companies from joining in, but for their apathy.

But why should we be concerning ourselves with a struggling consumer format? Well the first point would be that wherever the format has been fully exposed with full software back-up it has taken off. The UK has been treated so badly in this respect that we are barely off the starting block. More directly relevant to the recording industry is that we are talking about a high quality programme carrier of both pictures and audio. The picture quality is superior to VHS tape and the audio is CD standard, 16 bit 44.1kHz. Production of programme material for video disc would seem to be a potential source of studio work should the format establish itself in the UK.

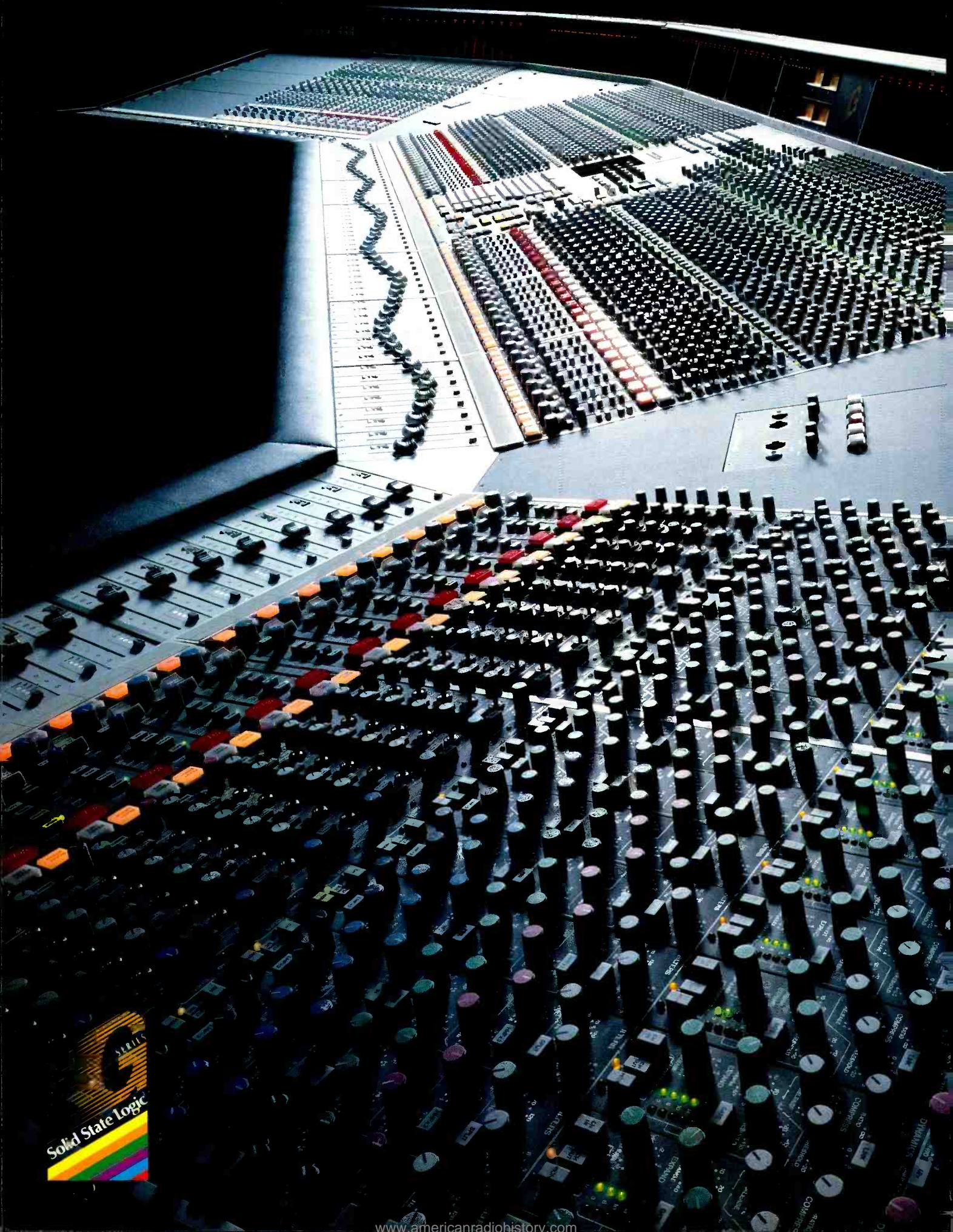
Of course music is not the only possibility. Feature films are perhaps the driving force of any video format. The increasing digitalisation of the cinema sound signal chain will be encouraged if there are a large number of consumers to hear digital soundtracks both in the theatre and at home. Look what effect CD had on the signal chain in studios. The case is the same.

The recording industry potentially has much to gain from supporting video disc in the coming year. It is a format that is proven (outside the UK), high quality and could bring work to the studio and sales to the manufacturer servicing the cinematic signal chain. I fear that the video disc will remain lost within the promotion that will surround this year's batch of new formats — none of which hold any real promise of growth for the recording industry. A great shame. □

Keith Spencer-Allen

Cover: Audio Precision Portable One Plus Test Set

D R E A M M A C



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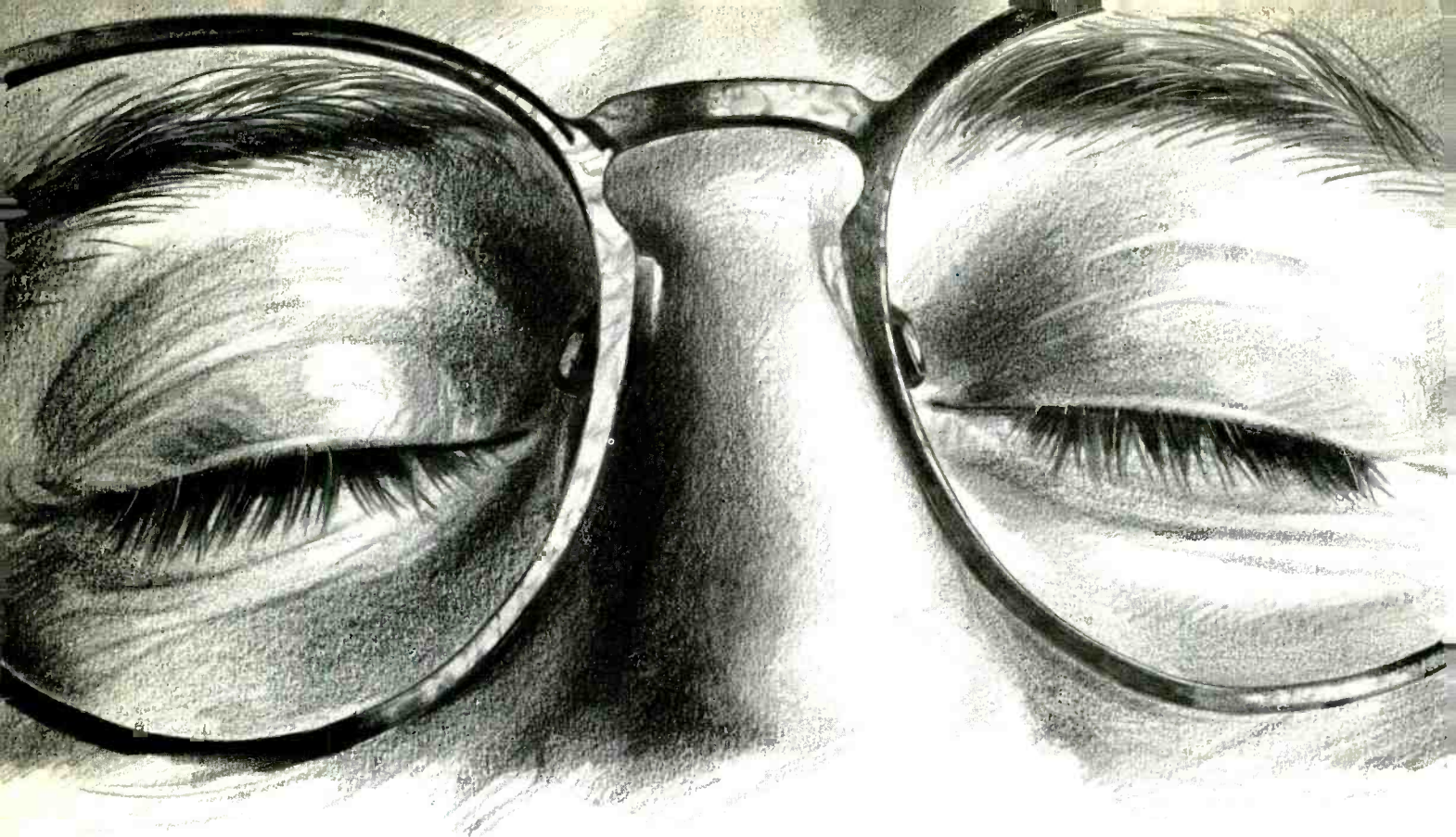
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International Headquarters:

Begbroke, Oxford, England OX5 1RU · Tel: (0865) 842300

Paris (1) 34 60 46 66 · Milan (2) 612 17 20 · Tokyo (3) 54 74 11 44

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Plus XXX Studios

Set up in 1980, Plus XXX is a large two-studio complex in the centre of Paris, and built in a three-storeyed building in rue des Annelets. On the ground floor, Studio 1 is a 100 m²/1,075 ft². room, with an isolation booth, featuring a number of different acoustics. The 25 m²/269 ft². control room is equipped with a SSL 4048 G console with Total Recall, Urei monitors and various outboard gear. To the right of the console is a large, air-conditioned machine room housing the tape machines; among which are a Sony 48-track and 24-track digital recorders, but also an Otari MTR-90 II 24-track analogue machine. Next to the studio is a private lounge, leisure or rest area for clients to relax between sessions.

On the first floor Plus XXX will soon be building a programming/production control room, fully equipped with MIDI and hard disk systems, that will be tie-linked up to Studio 1 and 2. Last year saw the redesign and refurbishment of control room 2. In fact, Plus XXX is the very first professional recording studio in France to have flush-mounted Genelec 1035 A main monitors. When asked about where and when he first heard of the Genelecs, owner Claude Sahakian recalls, "The first time I heard about the Genelec monitors was through Japanese clients who came here to the studio. I also saw a lot of advertising on them and read very good comments in the trade magazines. But the first time I really heard them in studio conditions was at Sound System, Olympic and Metropolis studios in London."

Claude Sahakian was totally convinced and hired Christian Malcurt, well-known French acoustician, to redesign the control room. Christian Malcurt who had been working at IRCAM and founded his own company, APIA, in 1986, was very keen on the project. Malcurt's credits include Studio 8 at IRCAM, Le Voyageur II mobile (see *Studio Sound* June 1991 issue), Eric Serra's (composer of "Le Grand Bleu" and "Atlantis" film music scores) XPlorer private studio and Studio du Manoir in France.

"Christian Malcurt has a real precise computerized 3-D acoustics



The recently redesigned Control room 2 at Plus XXX Studio in Paris

test system," says Claude Sahakian, "and what made me also willing to work with him was because I was deeply impressed by what he did in Le Voyageur II mobile studio." Malcurt worked on the acoustics and the result is a large well-appointed control room featuring LEDE-type acoustics. Due to too much reverberation near the monitors, the previous two sliding, double glass doors in front of the console had to be removed and a different concept used. Claude Sahakian, "the diffusers in the rear of the control room were still efficient, even with the redesign, so there was no need to have them replaced."

"The main change has been in the front part," says Christian Malcurt,

"in order to have a real absorbent treatment, mostly a low frequencies absorption, we decided to make bass traps in the front filled with high density Rockwool covered with acoustic foam and 'Texaa' fabric."

When you enter the 5.50 x 7.50 metres/18 x 25-foot control room 2, the SSL 4064 G console with *Total Recall* is the centerpiece. Directly behind the console is the large outboard rackmounting unit which also serves as a synth table. A Genelec S 30 mono monitor was placed in the front, between the two Genelec 1035 A and below the video monitor, and four Genelec 1019 monitors are mounted in the back of the control room for Dolby surround mixing.

Large live studio 2 is also fully provided with daylight from one opening in a wall and one in the ceiling. It is well decorated with columns and multi-reflection Italian-style fake doors. This studio is more often used for overdubs.

Plus XXX is a very enjoyable place to visit, and has a client list that includes Arthur Baker, Eurythmics, Gipsy Kings, Herbie Hancock, Hue & Cry, David MacNeil, Tick'nTide, and a number of top producers.

Guillaume J. Schouker

Plus XXX Studios 37, rue des Annelets 75019 Paris FRANCE.
Tel: (33.1) 42 02 21 02.
Fax: (33.1) 42 45 03 53.



SoundStation Sigma

Since its introduction just over four years ago, Digital Audio Research's disk-based editor, *SoundStation*, has undergone a continuous process of development and improvement. This has resulted in a range of system packages, each containing different options designed to suit specific applications and budgets. With the introduction of *SoundStation Sigma*, the company have combined all these options, with the exception of their automatic dialogue synchroniser, *WordFit*, into one cost effective package. An 8-channel *Sigma* system includes — a 386 processor; 8 intelligent AES/EBU I/Os; 4 analogue inputs and 8 analogue outputs; DSP with Segment Based EQ, gain and pan settings along with multichannel, fixed sample rate varispeed; 4 track-hours of hard disk storage; a 650 Mbyte rewritable optical disk; full timecode chase and machine control; time compression/expansion; waveform editing; and an AutoConform package for conforming audio to edited video using Edit Decision List data. The *Sigma* can also be supplied in 16 channels.

The DSP option was discussed in detail in last May's *Studio Sound*, but since then there have been some new developments. EQ'd Segments now include an icon, and EQ settings can be stored as snippets of audio and copied to Segments; these EQ 'Templates' may be used for a variety of applications such as setting-up regularly used effects like telephone voices, or to keep settings that deal with specific problems such as mains hum or video line whistle.

Multichannel varispeed is now operative providing high-quality reel-rock operations with scaled EQ characteristics to compensate the changes in speed; varispeed also

operates accurately across crossfade and edit points, and because it uses a FIR (Finite Impulse Response) algorithm, a constant sampling rate is achieved at the output, allowing direct digital connection to external devices.

Waveform editing is another feature new to *SoundStation*, allowing the user to zoom-in on single waveforms and edit or copy them — ideal for intricate surgery like removing clicks. Other recent improvements include simplifying the back-up operation of Reels to disk and the ability to continue working on the system whilst backing-up or restoring projects. The auto-locate function, which allows audio to locate to picture and vice-versa, is now considerably faster, and an AutoConform facility, featuring multitrack emulation using Sony protocol over RS422, has been introduced. The AutoConform system provides a fast automated process for transferring, tracklaying, and conforming audio to edited video using standard Edit Decision List formats such as CMX, Sony, GVG, etc. As audio events are loaded into the system, they will be automatically assembled to the proper destination timecodes and *SoundStation* channels; in addition 'handles' or invisible extensions are recorded at the head and tail of each piece of audio allowing it to be lengthened or crossfaded without the need for re-recording.

SoundStation Sigma is supplied with the familiar control console and touch-sensitive screen — the only differences are the inclusion of an EQ access button, and a new blue colour scheme with silver vernier and locator wheels.

Patrick Stapley

Bill Graham

The music world of the San Francisco Bay Area suffered a severe loss on the evening of Saturday 26th October when the helicopter that was carrying Bill Graham and his secretary, crashed into power lines during a flight between concert venues. All occupants were killed.

Bill Graham held an important place in the California/San Francisco music scene. Through his opening of the Fillmore ballrooms and promotion of West Coast rock music in the 60s and 70s he played an important part in the emergence of groups such as Santana, Jefferson Airplane, Quicksilver Messenger Service, etc etc. Especially affected were the Grateful Dead, to whom Graham had been a father figure for over 25 years.

A memorial service was quickly organised for the Sunday 27th October, and filled to overflowing with well-wishers and friends. Musical notables included Paul Kantner who recited some poetry and gave a short speech while Carlos Santana played a musical tribute.

Sound House BT Link

Although the facility of doing voice-overs via a telephone link is nothing new, or unique, the Sound House post-production studios of Edinburgh have taken it one step further.

Sound House work is mainly involved in technical work for film and advertising commercials and, in co-operation with British Telecom engineers, have set up link lines which carry, not only sound, but also time-code, enabling video machines to be rock and rolled by remote operation.

"What this means," explained owner David Balfe, "is that the actor or musician no longer needs to be in the same room as the video equipment, he can be thousands of miles away from our Edinburgh studios without having to use a vision line".

To prove the point Sound House recently hooked into a studio in New York to produce an AT & T Super Bowl commercial viewed by 78 million people.

David Hastilow

Agencies

● SSE Marketing have been appointed as the sole distributor of **Gentner** products for the UK and Ireland. SSE Marketing, Unit 2, 10 William Road, London. NW1 3EN. Tel: 071-387 1262. Fax: 071 388 0339.

● **Focusrite Audio Engineering** have announced the appointment of Hilton Sound Sarl, Paris, as exclusive distributor in France. Hilton Sound, 2 Villa Ghis, 92400 Courbevoie, Paris. Tel: (1) 46 67 0210 Fax: (1) 47 89 8171.

In-brief

● **New York, USA. Timeline and DigiDesign form alliance:**

Timeline has developed a video clock card, known as the *Pro Tools Interface*. The new product enables DigiDesign's Mac-based digital audio production system to operate with full multi-machine synchronisation in audio for video and music recording studios.

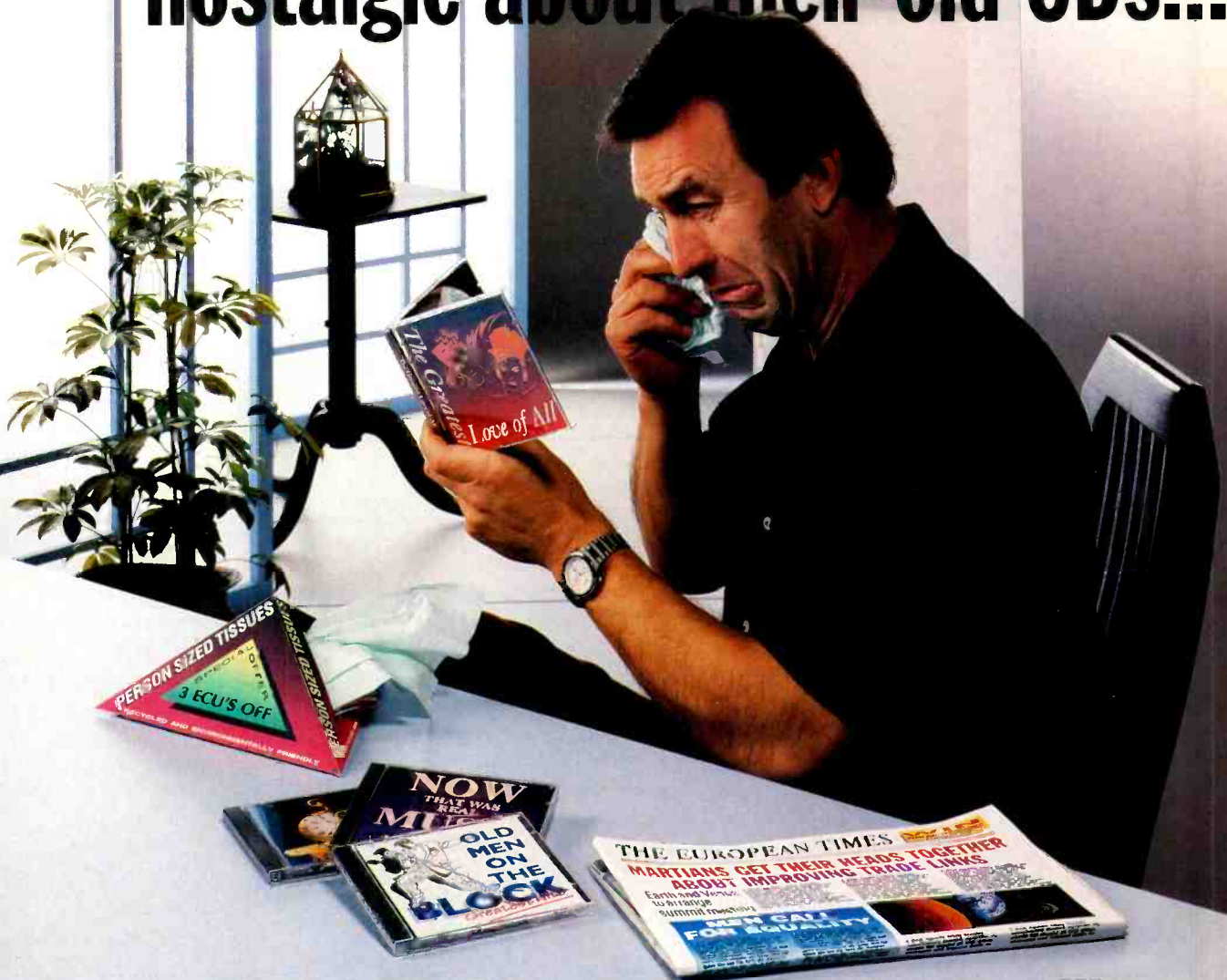
● **Hudson, MA. Adams-Smith awarded European timecode patent:** Adams-Smith has been granted a European patent for high-speed recovery of Vertical Interval Time Code (VITC). The patent covers most European countries and is further to ones the company already holds in both the US and Canada.

● **Begbroke, Oxford. Japanese award for SSL:** Foreign Secretary and local MP Douglas Hurd recently presented a special award for the company's exports to Japan. The award was presented to Takeo Asano, managing director of SSL in Japan.

● **London, UK. CD-R live:** A CD-R system has been used to record a CD live on television. The recording was made by Tam Studio for the BBC's Children In Need programme. The equipment used was a Yamaha YPDR601 which was set up using Audio Design's *Pro DAT* and *ProBox 3* to provide a digital input from the BBC's Studio's analogue stereo feed.

● **London, UK. Consultancy offers market research:** Digital audio consultancy Sypha are now offering a range of market research activities, including identifying suitable overseas distributors for digital audio and video products.

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Sony Broadcast
& Communications



Cinema Digital Sound for sale

The Optical Radiation Corporation, Azusa, California has made the decision to curtail their CDS programme.

They cite as the reason the present slump in the movie industry and the economics involved with the promotion and implementation of the technology.

CDS was introduced in June 1990 as a co-development project with the Eastman Kodak Company and allowed a 6-track discrete mix to be heard in both 70mm and 35mm

cinemas.

ORC have reduced both staff and resources to CDS, but intend to continue albeit with a reduced operation. ORC believe that the CDS technology will eventually be the digital format adopted by the film industry when other technologies fail to achieve its field-proven performance.

Armed with this belief ORC will look into other applications for CDS or possibly offer the technology for sale to business within the industry.

SPARS code to be retired

The Society of Professional Audio Recording Services (SPARS) has recommended that the SPARS Code be discontinued. The decision to retire the code was made during a meeting of the Board of Directors during the AES '91 convention.

The SPARS code was introduced in the mid-80's to help identify which portions of the recording process were digital and which were analogue. The code ADD on recorded product, for example, would indicate that the original recording was analogue and that it was mixed to a digital format and mastered digitally.

Skywalker Sound's Tom Scott commented on the board's decision,

"Just to label a step in the process as 'D' for digital and 'A' for analogue is no longer an indication of much of anything. Analogue is much better now and you can't say 'digital is digital' anymore. There are a lot of different storage media, sampling rates, conversions and compression techniques and devices, 14-bit, 16-bit and 20-bit word length, not to mention that recording, mixing and mastering consoles are still on the whole analogue. The code has been in danger of degenerating to simply a marketing device rather than a useful piece of information to the consumer."

Contracts

- **Euphonix**, Palo Alto, CA, have announced an order for two *CSII* digitally controlled audio mixing systems for use by Channel 7 Australia at the Olympic Games in Barcelona. Triad Productions have announced the installation of a *CSII* studio system in the main room of the 3 studio Triad complex.
- **Philip Drake Electronics**, Welwyn Garden, Herts, are supplying an *6000* series Talkback communications system for the new HQ of French broadcaster TF1.
- The French company **Audio Follow** has recently been awarded a contract to supply Radio France Internationale with four *DDO* Direct to disk Optical recorders. Six *DDOs* have also gone to Radio Monte Carlo.
- **Pro-Bel**, Reading, UK, has supplied three switch matrices to BBC Norwich as part of a major

refurbishment of the production control room and the central technical area.

- The Hard Company in Warsaw, Poland, one of the first companies in the country able to legally provide recording services, have chosen a package from UK distributor HHB Communications, including a **Soundcraft Sapphyre** console, **Tascam MSR24S** multitrack and **ATC SCM100A** monitoring.
- Another recent HHB sale was to the Technical Investigations radio department of the BBC who have bought a **Yamaha YPDR601** CD recorder for general assessment of the equipment throughout the organisation.
- Recent **Soundtracs** sales include two mixing consoles, an *In Line* with *Tracmix 2* and a *Quartz 32*, for Hot Nights studio in Fulham, London.
- **IPK Broadcast Systems** of Reading, UK, has recently completed the contract for the design, installation and commissioning of



Interface, a new series of modular mixing consoles, is the first product to be launched under the Mark IV 'multi-brand concept'.

The consoles will be marketed by Mark IV companies Altec Lansing, DDA, Dynacord and Electro-Voice; and have been jointly developed by DDA and Dynacord and will be manufactured by Dynacord in Germany.

Exhibitions and conventions

February 16th to 19th SIEL (The International Trade Show of equipment and technology for entertainment and leisure venues) Parc des Expositions, Paris.
March 17th to 20th SATIS 92,

Parc des Exhibitions, Paris.
March 24th to 27th AES 92nd Convention, Vienna, Austria.
April 11th to 14th NAB Convention, Las Vegas, USA.

18 general purpose videotape cubicles for the BBC's new post-production centre, Stage V of the development of BBC TV Centre in Wood Lane, W12.

- School of Audio Engineering has ordered ten **Neve VR** audio consoles for their various colleges. The first college to receive a *VR* was the Singapore branch followed by the Frankfurt and London offices.
- There are already orders for 70 **Dolby SR.D** digital cinema processor units.
- **MTC Japan** have announced the installation of a **Soundtracs Quartz 48** console into the studio of Hiroshi Sato.
- **Harris Grant Associates** has been awarded the contract to build two new mixing and editing suites in Sony Classical Production's Manhattan engineering facility in New York.
- Italian Broadcast Radio has placed an order with **Otari** distributors TDS for 71 *MTR15D*

2-track master recorders.

- The first **Amek Hendrix** desk to be installed in the UK was at Mad Hat Studios in Stafford and is being used to record the debut *Adventure Babies* album.
- An **AMS Virtual Console System** has been ordered by BBC Radio for the Maida Vale studios in London.
- Three **Sonic Solutions** Editing Systems have gone to the BBC, in three different departments; BBC Transcription service; BBC Radiophonic Workshop; and to BBC Radio Studio Operations.
- A new **Raindirk Symphony 36/32** channel desk has been installed into Eurosound's Mobile 1 after proving reliability at Pavarotti's concert in London's Hyde Park.
- The Tape Gallery in London is now one of the world's largest users of **NED** products having just opened a fourth studio based upon *Synclavier* sound design and the *PostPro* hard disk recorder/editor.



When they build a speaker in the Cotswolds, they make sure it will be heard in New York.

Like the surrounding Gloucestershire countryside, the people of the Cotswolds are famous for their silence. But occasionally something comes along that is just too good to keep quiet about. Like ATC loudspeakers.

Their exquisite performance has set tongues wagging from Tokyo – where they have won numerous awards – to New York, where world-famous audio professionals choose to listen to them every day.

So why all this excitement about ATC professional monitors? Is it that they are hand-built to extraordinary standards, or because of their unique ability to deliver clarity and detail at any sound level? One thing is certainly clear, the revolutionary soft-dome midrange driver manufactured by ATC is the envy of monitor designers worldwide.

The ATC range is comprehensive. There

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ATC loudspeakers can be auditioned at HNB and a network of leading distributors worldwide. Once you've heard them, you won't stop talking about them either.



Another "8in1" Swiss Tool



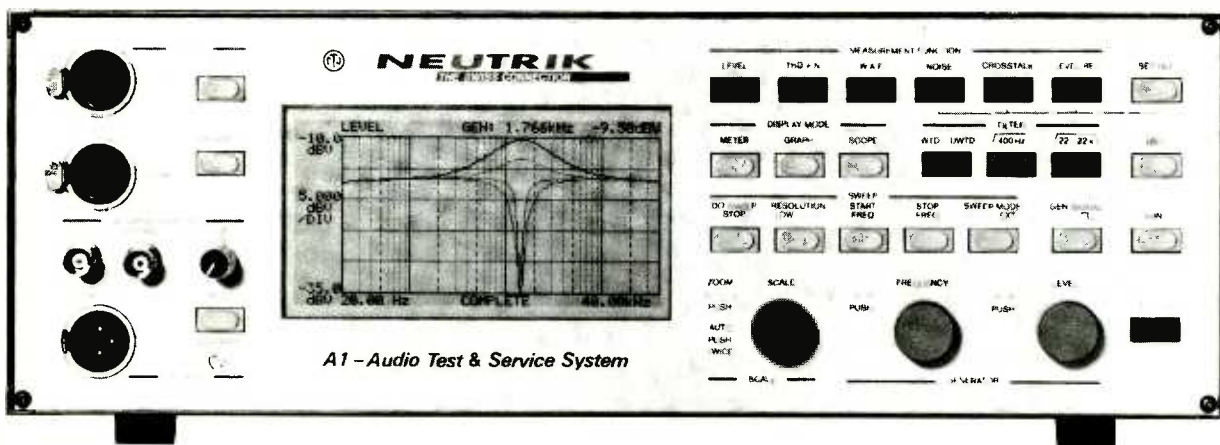
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The Sound of Hercules

Late last year saw the official commissioning of the newly-installed digital sound operation at Bayerischer Rundfunk, the Bavarian Broadcasting Service in Munich, featuring a live concert from its Hercules Hall as part of the ARD International Music Competition.

By using their new Neve DSP console, BR are able for the first time to process digital sound signals right through to final transmission or recording.

Their system was set-up over a about two years, and cost DM4.5 million (approx £1.5 million), including construction. The project included the control room re-design, a sound media room, a broadcast area, and connection for television and audio OB vehicles.



1: Delivering the tons of equipment through a second-storey window, directly into the venerable chambers of the former Royal Residence.

2: DSP technology goes airborne.

3: Neve's DSP console featured 48 mic inputs, 60 analogue I/Os and 32 digital I/Os.

4: All the audio signals are linked into one central tag block in the equipment room and via a patchboard in the sound control room and audio console.

5: All the monitoring and control devices are laid out in the optimum audio and visual range for the sound engineer. The best possible view of the stage and the Hercules Hall is also provided.

Nimbus Records Ambisonics seminar

Perhaps prompted by the recent resurgence of interest in ideas concerning surround sound and enhanced stereo, Nimbus Records recently presented a one-day seminar at Abbey Road to reintroduce an invited audience to the capabilities of Ambisonics. Speakers from a wide spectrum of involvement reminded listeners of the background and principles involved in Ambisonics and its associated UHJ encoding system, and discussed the current state of play and ideas for the future.

Nimbus themselves have been recording and issuing their own recordings in the Ambisonic format for the last twenty years. About a year ago they acquired the patents to Ambisonics and have been busy promoting a technology that they

clearly believe in. With Nimbus's Stuart Garman as host, illustrated presentations covered most aspects of Ambisonics. Roger Furness of Minim Electronics discussed Minim's encoding and decoding products, and introduced the new *E520* portable UHJ encoder designed to interface directly with the *AMS ST250* microphone. This was complemented by Mike Beville's run-down of the current products from Audio & Design, who have championed Ambisonics for some time. Nimbus producer "Crack" Downes gave an insight into Nimbus's philosophy and the part their Ambisonic approach plays in it, while Richard Elen discussed the other side of the coin, Ambisonic multitrack mixing using *A&D Transcoders* and *Pan-Rotate* units. He also demonstrated

dramatically the stereo compatibility of undecoded UHJ recordings, which appeared to rival some super-stereo systems by providing remarkable depth and stereo space without sacrificing clear localisation. This perhaps made the biggest impact of the day.

Two cars in the Abbey Road car park were fitted with Troy Ambisonic in-car systems which were demonstrated during lunch with impressive results. Also on show was the Mitsubishi *DA-P7000*, a new domestic control centre featuring digital Ambisonic decoding among a host of other functions including Dolby *Surround* decoding. More domestic Ambisonic products are expected shortly.

After the presentations Richard Elen was on hand in the control room

to demonstrate practically the processes involved in Ambisonic mixing, which came across as surprisingly simple and very effective.

The day however got off on the wrong foot when it immediately became apparent that the demonstration replay system was for various reasons not giving off its best, and although adjustments were red-facedly made the old Ambisonic hands (of whom most were present) felt that the demonstrations never really did the system justice. Despite this, reactions were very favourable, discussion and ideas flowed freely during breaks, and it seemed that most people left with very positive views. Perhaps Ambisonics can be considered to have been relaunched.

Dave Foister

Trends in sound reinforcement

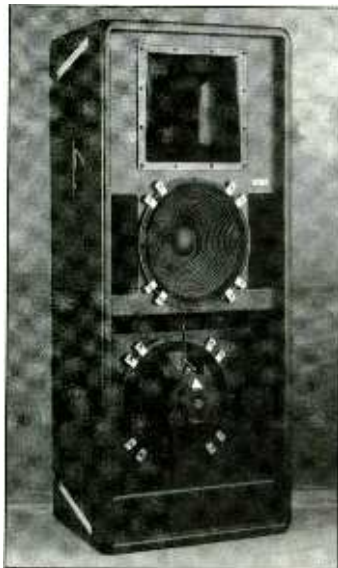
At the risk of repeating oneself every year, the sound reinforcement industry seems to be moving from strength to strength. Despite the current financial climate the general mood of the industry is noticeably more optimistic than it has been for some time.

Though a long-established activity, sound reinforcement is still in the process of catching up with much of the surrounding technology in touring and fixed installations (such as lighting systems), so it is logical that there is a continuing pace of development. Innovations cover a wide range of territories and applications.

Loudspeakers

Loudspeaker enclosures come in a variety of shapes and philosophies, not the least being economical truck packing and 'arrayability'. However, a 'no-compromise' enclosure may actually do far more than a whole stack of 'boxes' and a trapezoidal cabinet design does not necessarily guarantee the desired results for a proper loudspeaker array with minimum phase interference and heavy lobing.

The major manufacturers have been doing quite a bit of in-depth field testing and have come up with valuable data on the best way to 'stack and splay' and though designs obviously have to take into account certain constraints, just being loud is no longer considered good enough.



One of the latest additions to the range of PA cabinets is the new line from **TAD/Pioneer**, which managed studio monitor quality in a demo room with no external processing other than an electronic crossover for those models not using internal passive networks.

The new range features 2-way operation, together with an optional subwoofer, with either 15 inch (38 cm) or 18 inch (46 cm) bass speakers

and a specially designed offset horn to provide even coverage by combining medium and long throw characteristics. An exceptional bass response is helped by coupling acoustically the two LF drivers.

Low frequency response in speaker systems is fashionable nowadays and **EAW** have released the **SB330** subwoofer, which is designed to integrate neatly with the **KF300** range for easy arraying. **ELF** from **Bag End** also features a small enclosure LF system with dedicated electronics that is quite interesting.

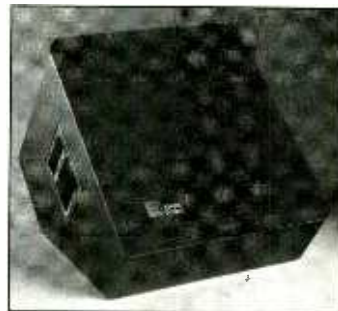
A new range of loudspeakers from **Nordschow/Wright** uses forced-air cooling. On show was the **NW-1800** 18 inch driver that uses 4 inch edgewound copper coils and features a maximum thermal power of 1000 W.

Martin Audio, **EAW** and **Meyer Sound** introduced new models of monitor loudspeakers, all of which laid the accent on uniform frequency response, high power and even dispersion to the performer.

The **Martin LE 700** is a bi-amped wedge featuring a new horn with Differential Dispersion Technology (basically short throw at the top and long throw at the bottom), which allows the performer greater freedom of movement without drastic changes in the soundfield, thus reducing the risk of feedback.

The **EAW SM200** high definition monitor can be bi-amped or run with an internal passive crossover.

Designed for low profile and high dispersion, the vented enclosure features a 12 inch (30 cm) LF driver and a 2 inch compression driver with a carbon fibre diaphragm coupled to an **EAW WGP** high frequency subsystem, which provided a 100° conical coverage pattern.



Meyer's USM-1 and **S-1** control electronics unit provide high-power stage monitoring with a flat frequency response. The 2-way enclosure features a 15 inch woofer and 2 inch HF driver coupled to a 70° horn.

Processors

Loudspeaker systems using dedicated processors form an active part of the market, though it is interesting how nearly everyone is at pains to point out that you can't hear the processor working. The **Yamaha S1520S** is no exception; a 2-way system with an 18 bit 'intelligent controller' featuring time delay, compression and a parametric EQ for different throw and array applications. ▷

Yamaha previews PM4000

In a live 'hands-on' session at **Nomis Studios** on 12 December, **Yamaha** unveiled its long-awaited **PM4000 SR** console to UK-based PA firms, sound engineers and the audio press.

Its sole working prototype, a 24-channel model (32, 40 and 48 input frames will also be available), was demonstrated using digital tapes and sampled sounds triggered live from a drum kit.

The **PM4000** will enter production in May with initial deliveries due around July. A **Yamaha UK** spokesman said the UK list price was "under negotiation" with Japan. The projected £40k 'upper limit', based on US pricing, is expected to be reduced to ensure the desk's competitiveness

in the UK.

Major advantages over its predecessor include a new 4-band fully parametric channel EQ offering better control. This and other electronic revisions are aimed at enhancing overall sound quality — the **PM3000's** weakest point.

The familiar layout has been retained, along with programmable mutes, VCA grouping (now with VCA Mutes as well as Group Mutes) and the 8-way matrix. **Yamaha** claim the VCAs' sonic performance is greatly improved, while all assignment functions use mechanical latching switches for reliability.

External differences include narrower channel strips: a

48-channel **PM4000** is little wider than a 40-input **PM3000**; apparently without compromising workability.

A new input head amp now places gain trim on a single 50 dB pot with a -30 dB pad, and there's a welcome 6-segment pre/post fader input LED meter above each channel fader. The EQ is 4-band fully parametric with peak or shelving high and low bands and a variable high-pass filter.

Each channel's signal can be extracted from either balanced insert or direct output points. The eight mono aux sends are now supplemented by two stereo sends, also individually selectable as pre/post. Another switch converts their stereo level and pan controls

into separate mono sends — giving a total of twelve auxiliary sends.

Instead of auxiliary inputs four stereo input channels are provided, functionally identical to the mono inputs but with left/right, stereo/mono summed input selection and no insert pre/post EQ switch or direct outputs.

Further enhancements include an expanded monitor section, and the provision of variable forced-air cooling.

A 22-mix/52 input **PM4000M** monitor version is scheduled to follow in six months.

Mike Lethby

JBL also finally joined the club with the introduction of the 4892 compact 2-way system, which is designed to be used in conjunction with the ES52000 controller. The trapezoidal enclosure features integral flying hardware (SAFE) and 14 inch (35.5 cm) and 1.5 inch (3.8 cm) LF and HF Neodymium drivers, the latter coupled to a 45° bi-radial horn.

However, it is probably that the 'to process-or-not-to-process' arguments have had a direct influence on the accelerated development of the once-humble crossover to processor status. Previously a frequency dividing network, the electronic crossover now performs a quantity of functions as well as just dividing the signal into different frequency bands and flexibility has been further increased by the introduction of units working in the digital domain.

The **Adamson DSPX 4000** is a dedicated controller for their systems and features 18 bit processing with FIR filters for minimum phase and linear phase response characteristics. Crossover filters are 100 dB/octave. The system hardware allows every aspect of the system parameters to be controlled and also includes a DSP spectrum analyser with displays for the input, room and difference response curves.

The **JBL ES52000** digital controller is not presented as a dedicated controller but comes pre-programmed for **JBL Concert**, **Sound Power** and **SR** series loudspeakers. The main features include stereo 2-way operation or up to mono 4-way, FIR filters with up to 100 dB/octave slopes, system EQ filters, transducer alignment delays, digital limiters, 18 bit converters and no sensing cables required for the power amplifiers.

The **Yamaha D2040** digital channel divider features left and right channels with four outputs per channel, each channel with independent filter, delay and 2-band EQ characteristics. The unit can store up to 15 complete setups and employs 19 bit A/D converters and 20 bit D/A converters. A novel feature is the use of motorised analogue output attenuators for quieter operation. The **D2040** will also accept digital signals via AES/EBU or Yamaha Y2 format inputs.

Peavey introduced the **CEX-4L** digital controller with an amazing array of functions at an even more amazing price. These include 4-way mono or 2-way stereo operation, 48 kHz sampling rate, selectable filter types, pre-delay on inputs and alignment delay on outputs, DD1

mode with LF and HF filters on each output, horn equalisation and system EQ, limiters for each output and storage for 50 complete setups.

Two new features for **TOA's SAORI** system are the **IS-110DL** long delay DCD module and a PC control software program.

The new module has all the functions of **IS-100D** modules plus an extended delay time of up to 1.365 seconds, a noise gate, grouping of digital delays for grouped offsets and separate horn EQ for each output for multiple horn arrays.

The PC control program allows remote control of the **SAORI** for setting up and storing system parameters. Files can also be prepared off-site and loaded into the unit at a later date.

Back in analogue, **BSS** have introduced the **FDS-318** multi-mode variable crossover, which uses PROM-based digital control of signal routing and parameter selection. The crossover provides various stereo 4-way and 3-way functions together with up to three different bi-amp modes, each mode having special selectable CD horn EQ characteristics. Other features include balances inputs and outputs, individual mute and polarity switches and 24 dB/octave Linkwitz-Riley filters.

Digital delay lines are being increasingly used at large events and the use of video projection screens has brought the problem of lip-sync under scrutiny. The **Eventide BD1002** video delay provides up to 20 seconds of full bandwidth video and audio delay and has already been used for large-scale events.

Among a plethora of new products, **Peavey** also released the **IDL 1000** multi-tap delay line featuring two inputs and three outputs, which allows alignment of either delay clusters or individual components within an array. Maximum delay is 1.3 seconds and the unit uses a 16 bit 64x oversampled delta-sigma converter. Delay settings can be displayed in milliseconds, feet or metres.

Computer control over equalisers is becoming more and more common and **White Instruments** showed their new equaliser in the **4700** series, the **4710**, together with the **Pilot 447** software for IBM compatible computers to control a network of **4700/4710** equalisers through the RS-232 port.

The **4710** is a digitally controlled 6-octave equaliser with ISO filters from 25 Hz to 12.5 kHz and a %-

octave filter at 16 kHz. In addition, there are adjustable HP and LP filters, each one in eight steps.

The **Pilot 447** software provides remote control for up to 247 equalisers on one network and offers storage for 100 curves and 50 presets for up to 50 equalisers in one system via the **4702** interface card. Additional **4703** interface cards are required for larger networks.

The measurement of SR systems is becoming increasingly more complex and the straightforward use of a RTA with pink noise is almost becoming old hat.

The **Meyer SIM** analysis system was more akin to laboratory instrumentation and was only available for hire, together with a qualified operator. The system has since been upgraded and repackaged and is now available on the market as the **SIM System II**. The analysis package enables complex measurements to be made of sound systems and various software options are offered to suit different requirements.

The main measurement modes are: Frequency Response, which includes the Room+Speaker unequalised response, EQ, which is the equaliser response, and Resultant, which is the equalised system response; Spectrum, which provides 1/2-octave single-channel analysis and features a Feedback mode with special applications such as tuning up stage monitors; Delay Finder, which allows precise adjustments for delay times to satellite systems for proper integration with the main speaker system(s).

Cabling

Decidedly passive until very recently, the **Klotz** digital system has earned a certain amount of attention and this is now joined by fully operational fibre-optic systems from **Bec Technology** and **Lester Audio Laboratories**. Both systems can be configured up to 64 channels but differ in transmission lengths and final configurations.

The **Lester DAS 2000** is available as a 64x64 programmable matrix with optical splitting and routing and has a maximum transmission distance of 15,000 ft.

The **Bec Technology** can be configured with 64 channels each way and features a 2-way split and a link distance of 1000 ft.

Terry Nelson

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The Audio Dictionary

by Glenn D White

Compiling a dictionary of terms is difficult. Evaluating one is also quite difficult as you really can't just sit down and just read it through like a normal book but just dip in as if you were using it. To me the mark of a good publication such as this is that having solved your query you find yourself reading the following entry and learning something else new.

This is the second edition — revised and expanded — of *The Audio Dictionary* with over 500 new entries and over 100 pages longer

than the first edition published in 1987. According to the bio supplied, Glenn D White has been a freelance recording engineer for 25 years as well as working for the Boeing Company specialising in instrumentation for acoustic and vibration measurements. He also lectures at the University of Washington, Seattle.

What strikes you first is that this is a reference for Audio in its widest terms so it includes many musical references. Also it is not exclusively a

professional reference but much broader and will suit a wider user base. I could not find any definitions over which I would differ although an increase in cross referencing may be beneficial. For example the tension applied to tape to maintain contact with the tape head I have always referred to as Back Tension. In the Dictionary it is termed Hold Back Tension which is undoubtedly what it is but I would never have found it when looking. That minor point out of the way, there are some excellent examples of cross referencing of terms that differ between British and American practice such as Valve/Tube and Desk/Board together with details as to why these styles developed. To give an idea of the scope of the entries — there is over

one page devoted to Ambisonics, two thirds of a page to Disney's Fantasound and half a page on Dynaural (a 1940s noise reduction system). The entries are up-to-date with most of the new terms from digital audio and the practical terms such as EDL and SR — and I have learnt what a Top Hat is.

This is a book to be recommended to a wide range of readers. It is a concise and readable publication and that is unusual for a reference work.

Keith Spencer-Allen

Published by University of Washington Press, PO Box 50096, Seattle, WA 98145-5096, USA. Tel: (206) 543-4050. ISBN 0-295-97088-X, 426 pages, soft covers, \$19.95.

Stereo Microphone Techniques

by Bruce Bartlett

Despite having been applied as a technology since the 30s stereo has never been more important than it is today, and there is to be much growth in the future as it becomes the norm for all forms of broadcasting, TV and film. For those either new to stereo (ie many broadcast engineers) or those normally working in multitrack it can be difficult to find source information about techniques quickly and easily. In the introduction to this book Bartlett states that this is the first textbook written on stereo microphone techniques and it is most probably that he is right. There is, of course, so much more to write about

now in terms of techniques so the concept of a book such as this is fully justified.

Starting from outlining subjects such as polar pattern types, transducer types and basic microphone terminology. Bartlett then launches into an overview section covering basic stereo mic techniques — coincident, spaced and near-coincident — followed by stereo imaging theory including the effects of amplitude and time on images. The next three chapters really get down to the specific details of about 30 different techniques suitable for different applications each with diagrams where needed. These

chapters end with the results of research to show the strengths and weaknesses of most of these methods allowing the potential experimenter to decide what might realise his aims best before even starting.

The last chapters explain basic procedural techniques including mic placement and phase checking, stereo image troubleshooting (what's wrong and how to correct it), and then into a chapter on specific applications such as TV, radio and film, sound effects and sampling.

While I understand that the inclusion of a chapter on what commercial products are actually available has a function, models

change so rapidly that this chapter will be rapidly out-of-date unlike the rest of the book which is of enduring interest. The end of each chapter gives a comprehensive list of references allowing the reader to follow-up any specific topic in other materials.

As a single source for practical stereo microphone technique this is an ideal reference, particularly if there is ever the chance that you might be called upon to try something different in the area of true stereo recording. Storing a copy in your mic locker will definitely encourage a more adventurous approach to stereo miking.

Keith Spencer-Allen

Published by Focal Press, Butterworth-Heinemann. ISBN 0-240 80076-1 softcover, 180 pages £19.95.

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ES-BUS AND SERIAL CONTROL PROTOCOLS.

Such is the versatility of the SV-3900, it can be used equally successfully to record music or as a scientific research tool. You can, for example, interface it with a wide variety of digital devices – CD players, workstations, recorders. Or, alternatively, it can be networked with up to 31 other SV-3900 DAT machines. (To achieve this you can use either the RS-422 industry standard computer interface, or the optional SH-MK390 remote controller.)

Communication on ES-bus and P2 interface is two-way. All tape and transport modes and functions can be controlled by computer, which in turn can receive and act upon technical and diagnostic information imparted by the SV-3900. Absolute/program times, counter number, error rates and the sampling frequency setting can all be read by the control computer.

With suitable software, the potential applications are almost limitless.

You could for example compile an overnight radio broadcast by using pre-recorded material from one machine, library selections from another and then patch into network news broadcasts at the appropriate times. (It goes without saying of course that traditional eight track cartridges are a thing of the past.)

Other less obvious applications include sophisticated telephone call management, data capture and satellite radio broadcasting. And because any sort of digital information presented in IEC II or AES/EBU format can be handled, the SV-3900 can even be used as a data recorder for remote applications such as monitoring oil flow in pipelines (Information could be downloaded over the phone, or other network.)

Analogue data logging is of course possible using balanced inputs between -14dBu and $+26\text{dBu}$ with $>92\text{dB}$ dynamic range.

ONE-BIT ADCs.

Naturally the SV-3900 also offers stunning audio performance. One-bit ADCs linked to 64X oversampling anti-aliasing filters mean a complete absence of zero-cross distortion, and ensure total transparency and lucid detail at both high and low levels.

Similarly, the high resolution 4DAC system ensures low distortion and enhanced linearity at low levels on playback. Other useful touches include an error rate display (on-machine or output to the control computer) to keep you informed on the condition of tape and heads. A new tape transport system that allows access to any point on a two hour tape within 27 seconds. And, as you'd expect, sampling rates can be switched between 32, 44.1 and 48Khz.

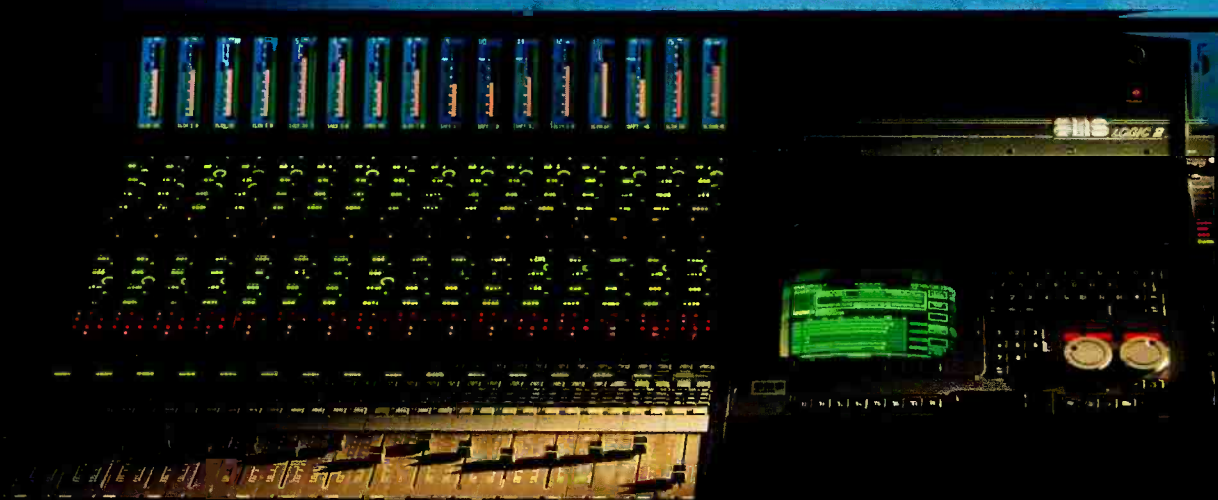
The list of features packed into this machine is truly remarkable. But go down to your Panasonic dealer and you'll find the most impressive feature of all is tied on with a piece of string. A price tag of around £1300.



Panasonic

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Digital audio workstations

At last year's SMPTE in Los Angeles and AES Convention in New York several new digital audio workstation systems were on show. There were new systems and updates to existing ones in all market areas. Read on for a summary of what's currently and imminently available.

Stereo systems

Sonic Solutions have now spread their interests to cover a range of markets including multichannel, CD mastering, networking and low-cost stereo recording/editing. Also new is their CD Printer (as opposed to writer), which can produce a 74 minute CD in half the time. The low-cost stereo editor with 0.5 Gbyte storage and CD Printer is aimed to retail at under \$20,000 (approx. £14,000) and Sonic maintain that premastering discs are now being accepted by CD pressing plants as masters.

The 56k system from **Turtle Beach** has done fairly well in the USA but has been little heard of so far in Europe. It is PC-based, provides EQ, realtime FFT and spectral displays and also allows non-realtime mixing of three stereo cues into one. In addition, it can perform sample rate conversion as well as time compression/expansion. A training video is included with the manual.

Digital Expressions were showing their Mac-based prototype hard disk workstation called *SoftSplice*. It is designed to be a low-cost system aimed at audio post editing off DAT and home recording and should be available by late 1992.

Although not present at either trade show, the ASR from **AQ Design** was found to be fully operational as confirmed during our visit to their headquarters in New York. It is based around the *CardD* from Digital Audio Labs and is aimed at low-cost post-production for video. All main operations occur on one screen and control is using alphanumeric keys rather than a mouse. Up to 32 cues can be assigned to alpha keys and these can be triggered manually or via an external MIDI device.

Four-channel systems

New from **Hybrid Arts** was *Adap IV*, which should be available by early 1992. This brings both RAM-based processing and disk-based recording under one operating system. It provides up to 32 editing tracks and will operate with an optional controller with programmable keys. Hybrid Arts pride themselves on being able to customise quickly the system's operational software according to customer requirements — one employee described the system as 'the Swiss Army knife of audio'.

Studer Editech were showing *Dyaxis* with higher accuracy synchronisation to timecode, recording to MO and enhanced *MacMix* software. This provides snapshot automation and the ability to apply individual EQ to cues within the Mix window.

Enhancements to the *DD1000* from **Akai** include the automatic generation of a cue list, realtime compression/expansion (with over 60 algorithms), external machine control and integrated operation with Akai's *S1100* sampler. The *DD1000* can trigger *S1100* events and the *S1100* can use the *DD1000*'s MO for library storage. Also shown was an

interface from Numisys called the *DDVE-1*, which allows the *DD1000* to be treated as the audio tracks of a VTR.

Lower cost multichannel systems

One of the most impressive low-cost multichannel systems was the *Audio Engine* from **Spectral Synthesis**. The system is based on Spectral's *Digital Studio*, which was one of the first to offer modularity to multichannel capabilities and will support up to 16 channels. Many improvements have been made and the system offers mixing, a soft patchbay, both tape and waveform displays and a directory of cues with various search facilities. One of the problems of systems that use multiple disks to provide additional channels is in clarifying whether a disk has reached its channel capacity even though the overall capacity of the system may not have been reached. Some systems solve this by assigning a group of editing tracks to each disk. Spectral guarantee at least four channels per disk and tackle the aforementioned problem by assigning a colour to each disk. Thus cues can be freely assigned to

any editing track as long as no more than four cues of the same colour are being asked to play at the same time.

Although the *Digital Studio* has done fairly well in the USA, its impact so far on the European market has been negligible. This could be attributed to the lack of publicity and/or the fact that the system is IBM AT/compatible-based (whereas Europeans tend to favour the Mac and Atari). However, the *Audio Engine* comes as a complete package including PC and at under \$30,000 (approx. £20,000) for a 16-channel system with over four hours of storage, the make of PC should be immaterial if all that is needed is a simple-to-use multichannel system.

Dawn from **Doremi**, on the other hand, has done better in Europe. The system is Mac-based but that doesn't explain why it has not done so well in the US, where the Mac has not proven to be any less popular than other makes of PC. However, the system may become more attractive to potential US customers now that it can support up to 24 channels with removable hard disks (each supporting eight channels). Other enhancements include a VITC interface, external machine control and the ability to display realtime video on-screen. In addition, picture edit decision lists can be read directly from diskette and routed to any channel with preset fades.

Digidesign's stand was consistently packed with people wanting to see the new 4-channel *ProTools*. This offers comprehensive recording and editing features and a time saving function that automatically creates cues from a recording consisting of audio and unwanted silences. 8- and 16-channel systems should be available by the beginning of 1992 but Digidesign already claim to be shipping around 300 systems per month and this seemed to be substantiated during a visit to their factory.

Another system that attracted much attention was the *DM-80* from **Roland**. This system is remarkable not so much for the functions it offers, but more because of its low price. It can be controlled by the *DM-80R* remote and/or a *Mac Plus* (or higher). Eight channels are supported and multiple systems can be stacked (in which case a Mac is essential). Level, EQ and pan can be controlled by either any MIDI controller or the optional *DM-80F*. The system demonstrated was capable of some basic editing ▷



The Audio Engine, low-cost multi channel system from Spectral Synthesis



Photograph: Andrew Cameron Concept and Design: Dave & Paul.

NEIL MCLELLAN

At the tender age of 23, Neil McLellan is already one of dance music's hottest properties. A multi-talented writer, programmer, engineer, and producer, Neil is the force behind some of the best-sounding dance records around. His inspiration is drawn from the rave

scene, the clubs of New York and London, and the music of Yello, George Clinton, and Frankie Knuckles. So he knows what makes people dance. And his mix ingredients are simple: the Neve U Series console and Flying Faders automation.

SELECTED HIT LIST:

- SAFFRON (new album) • MC KINKY - Too High • SOUND SYSTEMME (album)
- N.JOI - Adrenalin • SOUL FAMILY SENSATION - 747 • XPANSIONS - Move Your Body



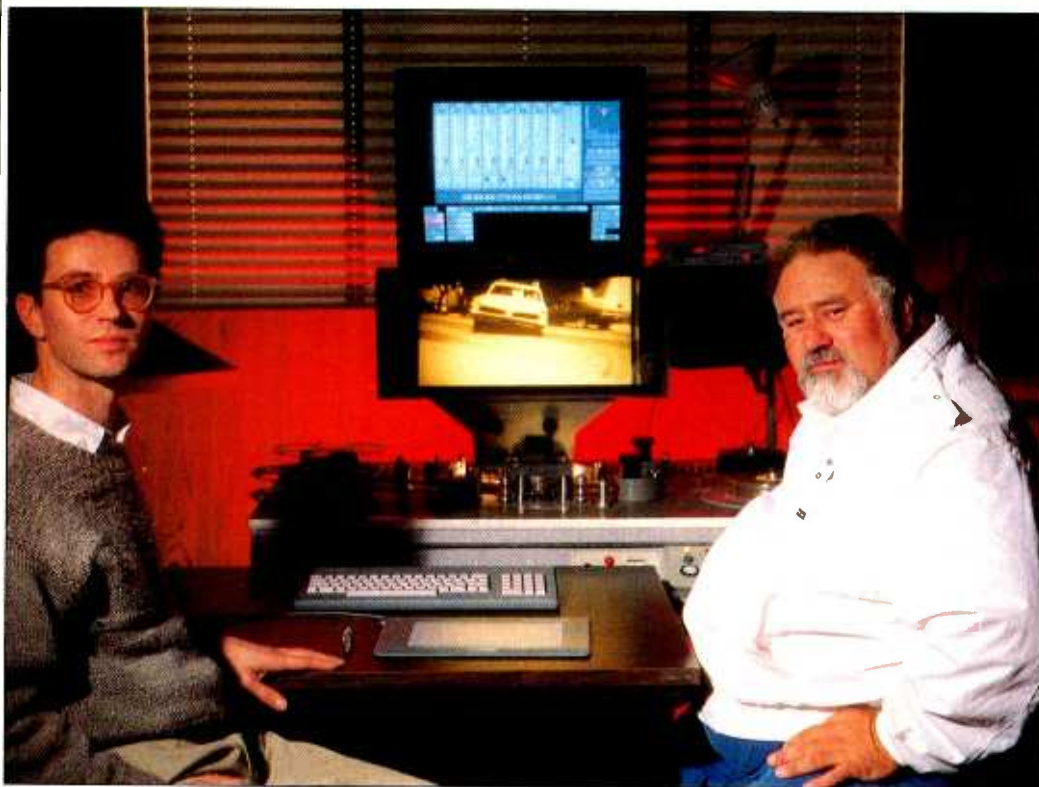
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THE BEAT CONTINUES



Neve Electronics International
Cambridge House, Melbourn,
Royston, Herts SG8 6AU.

Tel: 0763 260776. Fax: 0763 261886.



Operators, Albert Gasser (left) and Levis Edeman (right), with the ScreenSound editing system at the Hollywood Way facility, Burbank USA.

functions as well as simultaneous recording of four channels onto MO disk. It has some way to go in terms of the standard functions offered by most other low-cost multichannel systems but the optional controllers and the low base-price (which excludes *Mac*, *DM-80R* and *DM-80F*) will certainly generate interest.

Digigram were demonstrating *XTRACK*, which is a PC-based modular system supporting from two to eight channels. The system is simple to operate and will now chase-lock to video in less than 8 ms, 'wowing' with the video. In addition, multiple *XTRACK* systems can be chained to provide a greater number of channels.

Korg demonstrated *SoundLink* with fully automated digital level control, 200 snapshot automation for EQ and reverb and a 16-track MIDI sequencer. Cues to be saved in the library are re-recorded but although this sounds inefficient, it does in fact mean that cues are not lost if the audio from which they were created is deleted.

Steinberg were demonstrating a 4-channel *Topaz* based on *Cubase* audio sequencing software and using a Sony MO drive. The system will support up to eight channels and currently provides digital mixing (EQ and automation are planned). Also

being demonstrated was *Time Bandit*, which is a standalone product but can be imported into *Topaz* for realtime compression/expression. In addition, it will recognise the pitch of a cue and automatically construct a chord from it.

Augan have started shipping their optical-based *408 OMX*, which provides four channels per disk and allows continuous recording between two optical disk drives. Improvements include an electro-luminescent display, which is optional with the basic single disk system but is included with the extended two-disk system.

Higher cost multichannel systems

The *Sonic System* from **Sonic Solutions** now supports multichannel capabilities and Sonic have demonstrated a 24-channel system (although in theory the system is capable of supporting 48 channels). In addition, systems can be networked using 100 Mbit/s fibre-optic cable, which allows the

transfer of 60 to 100 simultaneous audio channels.

Another networking system, **SSL's** *ScreenSound* was shown controlling a KEM flat-bed film transport. This was made possible by an interface from JSK Engineering, which allows *ScreenSound* to control the KEM's transport while providing feedback to *ScreenSound* by converting frame-accurate tach pulses from the KEM to timecode. Paul Carden of Hollywood Way, who was demonstrating the system,

maintained that this type of configuration is useful for making last minute changes. The system now supports time compression/expansion and has the ability to automatically generate and checkerboard cues from pre-recorded material.

WaveFrame have reconfigured and renamed their *AudioFrame* and *CyberFrame* systems. Both systems are now available from the same hardware platform, which is called *WaveFrame 400* (with four spare slots) or *WaveFrame 1000* (with 10 slots). The design is still highly modular but now allows modules from both *AudioFrame* and *CyberFrame* to be integrated within one system. The *Pinc Link* realtime video system is used to provide the *WaveFrame* with an on-screen video display and machine control of the VTR is possible from the alphanumeric keyboard.

Fairlight ESP demonstrated the *MFx*, which now boasts 16 continuous channels from one hard disk and between four and six channels from a Panasonic MO. The editing screen has been improved with cue names and scrolling waveforms in segments and the facility for expanded display of up to four editing tracks.

Also from Australia was *Soundtracker* from **Soundfirm**. Aimed at audio post for film, the system was demonstrated by film editor Roger Savage (who helped design the system) but it may be necessary to change its name due to a dispute. Whatever it may be called in future, it appears simple to operate, providing up to 24 channels, digital mixing and film-style labelling and cue organisation.

NED demonstrated their *DSP* ▽



Otari's Prodisk-464 multitrack hard-disk based digital audio workstation

Serious users the world over are reaping the rewards that the DAT format brings: cost-efficiency, convenience, reliability and audio excellence. As you might expect from the world's No.1 DAT Centre, HHB has been working closely alongside the 'World Leader in Digital Audio' to build a DAT product range that really delivers the goods. And the briefest glance at our latest Sony DAT line-up is all it takes to see that there is a solution for every application, from the simplest audio recording to the most advanced audio-for-video post-production.



Even digital recording on the move can now be a serious business. There's the ultra-compact TCD-D3 DAT Walkman, combining low cost with a superb design and an impressive four hour recording capability. Consider the highly successful TCD-D10 portable family. As well as balanced XLRs, the rugged TCD-D10 PRO MkII adds 'absolute time' recording, with HHB offering the exclusive option of a +8v phantom power modification. We can even supply the original TCD-D10, modified



for DC recording. But as anyone will tell you, DAT excellence is not based on hardware performance alone.

That's why – following a period of exhaustive worldwide research – we've launched our own range of 'Professional Quality' DAT tapes. Available in the following lengths – 15, 30, 48, 62, 92 and 122 minutes – the HHB 'PQ Series' is the first tape range that really responds to all the requirements of the serious recording professional.



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DTC-750ES Low-Cost, Entry Level DAT

- Time & Date Record Feature • Long Play Mode
- SCMS equipped • Digital Fade In/Fade Out

DTC-1000ES PRO The Industry Standard

No-compromise first generation build quality • SCMS free • Switchable 44.1/48 kHz • Balanced XLR Inputs/Outputs (+4dB)

PCM-2700 Affordable 4/Head Technology

- Confidence monitoring/read-after-write • 44.1 kHz record/playback • Time & Date Record Feature • Balanced XLR Input/Output (+4dB) • IEC 958 Digital Port • Long play mode.





AMS Audiofile with Logic 1 console

Option, which provides realtime digital mixing and EQ for their range of *PostPro* systems. More emphasis has been put on *Mac*-based operating techniques (rather than proprietary) and the system allows multiple tracks to be scrubbed even if they consist of disk-based cues and RAM-based samples.

DAR's SoundStation Sigma made its US debut showing 8-channel varispeed with constant sampling rate, 8-channel audio scrub and segment-based digital level and EQ. The system also supports time compression/expansion, *WordFit*, autoconforming and optical backup. New developments include the ability to emulate the audio tracks of a VTR and 8-channel digital I/O, which will track changes in the incoming sampling rate.

ProDisk 464 made its US debut on the *Otari* stand and was operated using a *Mac* in conjunction with a tactile console with 24 faders and other controls. The system is designed to operate as both a linear recorder and random-access editor and currently supports snapshot automation, with full automation, EQ and time compression/expansion planned.

AMS generated a great deal of interest in their *Logic* consoles and demonstrated a 16-channel *AudioFile Plus* used in conjunction with a fully automated *Logic 1*. This provides *AudioFile* with digital mixing, EQ, compression, expansion, limiting and gating and future plans includes segment-based mixing. Enhancements to *AudioFile* include

the ability to read CMX-type EDL diskettes directly and to control where and how source audio is recorded. A useful feature is that if there is a gap of more than 5 seconds after the last cue, *AudioFile* will take control of the external machine and fast forward it to the next edit location.

Cart replacement

DAMS was on the Wheatstone stand and was demonstrated using Wheatstone's playback remote and mixing console. The system was shown replaying two stereo cues simultaneously with graphic bar displays showing how fast each was running out. *DAMS 11*, which will be manufactured by Wheatstone, will be called the 'Not So Hard Disk' in the USA and will support three stereo outputs and one stereo input simultaneously. It will also support *DAMSNET*, which is a realtime networking system that can be programmed to record the same material onto two separate *DAMS* systems.

A prototype of a PC-based 2-channel system called *AR-200* was demonstrated by *For.A*. It has a 32 kHz sampling rate but *For.A* also hope to offer rates of 44.1 kHz and 48 kHz as well as digital I/O. It has a simple remote that is very robust with keys similar to those of a cart machine. Operation of the system is straightforward allowing cues to be playlisted and playlists to be printed. Playlists can be password protected

and any alterations can be logged and printed. *For.A* aim to have the system ready by NAB.

The *AAM-800* was demonstrated by *Asaca Shibasoku* and is an optical-based system that can support up to 12 drives. It allows cues to be playlisted and has a remote to which up to 32 cues can be assigned for manual triggering. The system was shown interfaced to a portable PC.

Development systems

The *IRCAM* signal processing workstation is based on a Next computer and provides powerful realtime processing, filters, delay lines and sound analysis functions. The computer will support up to three processing cards running in parallel and disk-based recording capabilities are planned.

IRIS Indigo is a hardware platform and operating system from **Silicon Graphics**. This system is remarkable for its graphics, processing power and compact size. Its processor operates at 33 MHz, is capable of 30 MIPS and allows the system to transfer up to 40 million pixels/s. It currently uses an 8 bit colour monitor but this is to be upgraded. The system hardware,

including hard disk, RAM, digital interfaces, processing and built-in DAT backup is housed in a rack, which is only around 14 inches tall and 11 inches wide. The hard disk will support up to eight channels of audio and the system RAM can be expanded from 16 Mbytes to 96 Mbytes.

Other systems

Ediflex had their *Optiflex* system on show. This optical-based system is aimed at providing basic multichannel record and playback functions and will interface with conventional film dubbing equipment. Functions provided include track slide, loop and disks are interchangeable with the *AudiFlex* dialogue editing system.

Yasmin Hashmi

For details on over 70 systems, readers may be interested in the 2nd edition of the *Tapeless Directory*, published by Sypha.

For further information contact: Sypha, 216a Gipsy Rd, London SE27 9RB, UK. Tel: 081-761 1042. The directory is also available in the USA from the *Mix* Bookshelf.



WaveFrame's re-named and re-configured WaveFrame 400 and 1000 systems.

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Soundmaster System 6.0

Soundmaster have introduced *Version 6.0* of the *Syncro* operating system. New features include redesigned control screens, simultaneous control of up to eight audio/video tape machines, storage and recall of machine control characteristics from a library of 100 transport types, MultiSync monitor interfaces, and enables the

user to create customised system and machine set-ups. *Version 6.0* also will serve as a link to the *SYSTOR* disk-based multichannel digital audio workstation that is nearing completion.

Soundmaster USA Inc,
900 A Hampshire Road,
Westlake Village, CA 91361, USA.
Tel: (805) 494 45545.

TFE mic power supply

Television & Film Equipment have announced a universal mic power supply for portable use. The *TFE Micpower* will power P48, T12 and P12 mics and is equipped with front panel mic input *XLR*, switched three position LF cut and attenuators and battery low indicator. Housed in an extruded aluminium enclosure and is



fitted with a belt clip. It runs off two 9 volt cells.

Television & Film Equipment,
Treganna House, 12 Earle Place,
Canton, Cardiff CF5 1NZ, UK.
Tel: 0222 342907.

Akai DD1000 updates

Akai have introduced *Version 2* software for the *DD1000* optical disk recorder/editor. The principal new features include the implementation of *RS422* allowing interfacing with Sony video editors as a master or slave; a *TimeStretch* function that is either a realtime function or a higher quality slightly less than realtime mode that commits to disk with a range of 50% to 200%. Other features include a video lay-off function; a new method of making 50 cuts on the fly in the record mode and edits can be made manually or by using one of

54 preset calculations for specific recording type eg speech, vocal, perc etc. Also incorporated are user suggestions derived from customer feedback.

UK: Akai Digital, Pro-Audio Division, Haslemere Heathrow Estate, Silver Jubilee Way, Parkway, Hounslow, Middx TW4 6NQ.
Tel: 081 897 6388.

USA: Akai/International Music Co.,
1316 East Lancaster, Fort Worth,
Tx 76102.
Tel: (817) 336 5114.
Fax: (817) 8701 271

Lexicon Opus updates

Lexicon have implemented enhancements for the *Opus* digital audio mixer/recording system. *Version 3.0* includes both soft and hardware and adds machine automation capabilities allowing operational control of video recorders from the *Opus*. Overall operation of the *Opus* has also been streamlined with faster implementation of functions than before. Another improvement is the integration of audio and automation files — previously audio was stored on the hard disk and automation was recorded on a floppy disk so that

edits in the audio meant reautomating the complete production. Under *Version 3.0* edits are made in both files at the same time. The software also supports the *Opus* console automation package *Automix* and *CPEX*, the stereo time compression/expansion system with pitch shifting and sample rate conversion capabilities.

Lexicon Inc, 100 Beaver Street,
Waltham, MA 02154, USA.
Tel: (617) 736 0300.
UK: FWO Bauch Ltd, 49 Theobald Street, Borehamwood, Herts WD6 4RZ. Tel: 081 953 0091.

Koss portable electrostatic headphones

Koss have just introduced the 'world's first portable electrostatic headphone system', the *ESP/950*. The complete system comprises the *ESP/950* headphone the *E/90* energiser/amplifier, an AC adaptor, battery supply box and an eight foot extension cord. Koss say that the *E/90's* high efficiency switch mode power supply allows the unit to operate from a variety of power

sources. Claimed frequency response is 8 Hz to 35 kHz with a sensitivity level of 104 dB. Design is open type but optimised to isolate listener from ambient sound. The headband is adjustable and padded for extended wear. Battery life is greater than 30 hours.

UK: HW International, 3-5 Eden Grove, London N7 8EQ.
Tel: 071 607 2717.

Stellavox Stellamode DAC

Stellavox have announced the *Stellamode*, a new digital to analogue converter developed in collaboration with sister company Goldmund. *AES/EBU* or *SPDIF* inputs can be accepted with both analogue or *AES/EBU* outputs so that the unit can be placed in an *AES/EBU* loop without breaking the connection. Analogue outputs can be balanced or unbalanced with level selection of 0, +4 and +6 dB and polarity reverse. The *Stellamode* design has made two key areas of the circuitry, the digital interface and the converter filter as

molded plug-in modules that can be replaced by improved designs when available.

Stellavox, Digital Audio Technologies SA, Puits-Godet 20,
CH-2000 Neuchatel, Switzerland.
Tel: 038 244 400.

UK: HHB Communications Ltd, 73-75 Scrubs Lane, London NW10 6QU.
Tel: 081 960 2144.

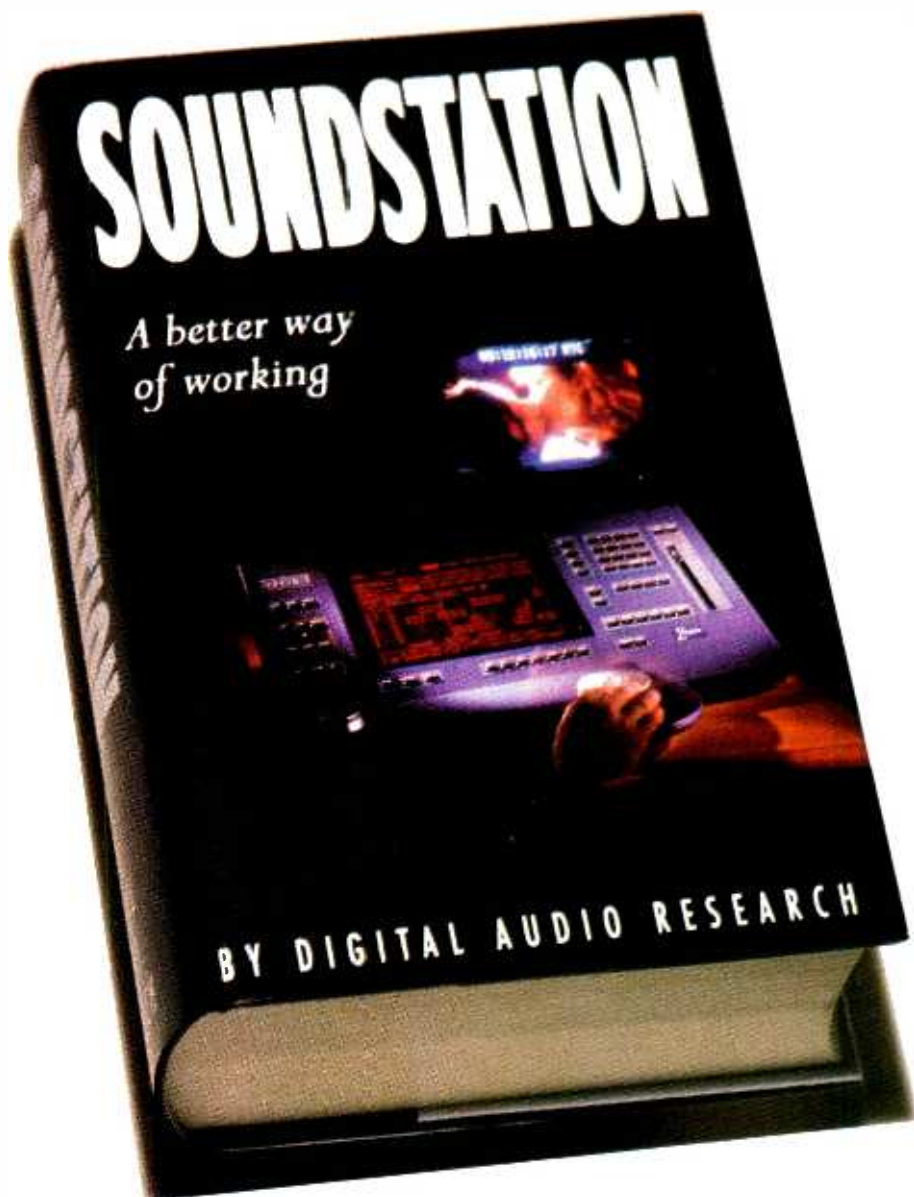
USA: Stellavox Digital Audio Tech.,
c/o 1AT 13897 J Willard Road,
Chantilly, VA 22021.
Tel: (703) 3781515.
Fax: (703) 3781517.

NEAL high speed copier

Lee James Electronics have introduced the *NEAL* copier system for copying audio cassettes at four times realtime. The system is described as simple to use with a typical system consisting of a master

with slave together with a double slave unit.

Lee James Electronics Ltd,
1 Hanlon Court, Royal Industrial Estate, Jarrow, Tyne & Wear NE32 3HR, UK. Tel: 091 489 9379.



"We chose the DAR because of its dedicated control surface, its fast learning curve, and the familiar way the system presents itself to experienced professionals."

*"Doc" Goldstein, Chief Engineer,
Universal Studios, Hollywood.*

"SOUNDSTATION gives more editing facility than any other system at any price."

*Ken Morrison, General Manager,
The Ocean Group, Vancouver.*

"The choice came down decidedly in favour of SOUNDSTATION as we reviewed other systems and talked to people in the industry."

*David Langridge, Senior Sound
Supervisor, Channel 4, London.*

TODAY'S BEST SELLER

The reviews are in. While other workstations were resting on their laurels, there's been a quiet explosion in SOUNDSTATION sales. Since the beginning of 1990, SOUNDSTATION sales have grown faster than any other digital audio workstation offering 8 and 16 channels. In fact, SOUNDSTATION is the hottest 8/16 channel workstation on the market today.

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Just touch the screen to execute routine editing functions or harness all the power of SOUNDSTATION's exclusive features: Advanced DSP functions like Audio Segment-based EQ, Stereo TimeWarp™ and WordFit™ for automatic dialogue synchronisation.

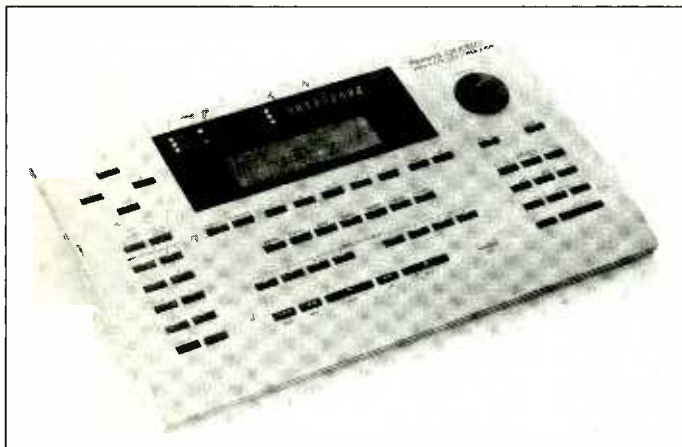
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2 Silverglade Business Park, Leatherhead Road,
Chessington Surrey KT9 2QL, England.
Tel. 0372 742848 Fax. 0372 743532



Roland DM-80 improves

Following its first showings in prototype form, the Roland *DM-80* Multi-track hard disk recording system has now been developed to be better suited to professional applications. The *DM-80* will now record simultaneously on four channels to one SCSI drive including onto a newly developed optical disk storage system. Recording capability is 18 minutes of track time at 44.1 kHz expandable up to nine hours using a maximum of six external drives. There is now an option of hardware or software remote controls. The software will run on any *Macintosh* which will have the ability to control up to four *DM-80-s* but all processing is performed within the *DM-80*.

An internal digital mixer allows automation of level, pan, EQ and auxes. All inputs are now balanced and the input sensitivity has changed from -10 dBm to +4dBm.

Downloading can be to hard drive, 8mm tape drive or Data DAT. Finally a video sync input has been added to the existing SMPTE and MIDI timecode facilities.

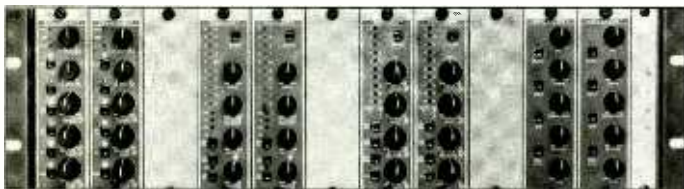
UK: Roland UK Ltd, Rye Close, Ancells Business Park, Fleet, Hants GU13 8UY.

Tel: 0252 816181.

US: Roland Corporation, 7200 Dominion Circle, Los Angeles, CA 90040-3647.

Tel: (213) 685 5141.

Fax: (213) 722 0911.



Aphex 9000 rack

Aphex have introduced the *9000* series of analogue signal processing devices designed to fit within a vertical rack system. The modules are fully compatible with the dbx *900* rack frame or may be used with the new *9000* Aphex rack that has an uprated power supply mounted outside of the rack therefore allowing the fitting of two more modules within the rack. The first modules are duplicated versions of the main Aphex range — the *9251 Aural Exciter*, the *9301 Compellor*, the *9611 Expander/Gate* and the *9651 Expressor*. Aphex say that the specification for these units are as

their full size equivalents. All in/outs are balanced.

The most recent addition is the *9901* parametric equaliser with three overlapping fully parametric bands with 15 dB gain on each band.

An unusual feature is the provision of a peak or shelving filter on each band. Aphex say that more modules are to follow.

Aphex Systems, 11068 Randall Street, Sun Valley, CA 91352, USA. Tel: (818) 767 2641.

UK: Stirling Audio, Kimberley Road, London NW6 7SF. Tel: 071 624 6000. Fax: 071 372 6370.

Neve VR Legend

Neve have launched a development of the *VR* known as the *VR Legend* that they describe as 'the ultimate in analogue console design'. Features include the use of the Formant Spectrum Equaliser with four overlapping ranges; the *Flying Faders* automation option and the use of oxygen-free copper cabling. The profile of the console has been modified to reduce the effect on the control room acoustics. Following recommendations by Tom Hidley, open areas have been introduced in the front and back of the console. The signal path has also been developed. The mic input has been redesigned to reduce distortion particularly at high level and a new mix card is claimed to reduce noise levels by 6 dB. There will also be a post production version of the *Legend* to allow monitor switching from stereo to LCRS with



provision to insert a Dolby *Stereo* processor to monitor a Dolby mix. **Neve Electronics International Ltd, Cambridge House, Royston, Herts SG8 6AU, UK.**

Tel: 0763 260776.

US: Siemens Audio Inc., 7 Parklawn Drive, Bethel, Connecticut, CT06801.

Tel: (203) 744 6230.

Fax: (203) 792 7863.

Hinton long haul MIDIZ

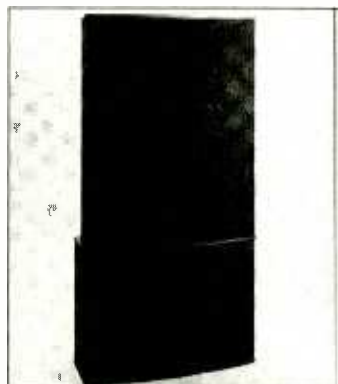
Hinton Instruments have introduced a dual MIDI Long Haul Converter for professional use. The *MIDIZ* is a system designed to overcome transmission problems in MIDI cables longer than the recommended lengths. *MIDIZ* is a 1U rack mount unit housing two MIDI-to-Long Haul and Long Haul-to-MIDI converters.

The unit is capable of driving MIDI data in audio grade twisted wire for over a 1000 metres and units may be used as repeaters for longer distances or in multi-point systems. The unit is optically isolated.

Hinton Instruments, Oldford, Nr Frome, Somerset BA11 2NN, UK. Tel: (0373) 51927.

Subwoofer for Quad ESL

Finish company Gradient have designed a subwoofer system for the Quad *ESL-63*. The *SW-63* system consists of an active crossover and two speaker units that also act as stands. Each of the units has two specially made 12 inch drivers arranged to give a dipole radiation pattern similar to that of the *ESL* itself. Bass level adjustment is available on the active crossover with a choice of balanced or unbalanced versions. The crossover frequency is 110 Hz with a -3 dB point at 28 Hz achieving 10 dB more SPL than the *ESL* speakers. The *SW-63* fits with both standard and the pro versions of the *ESL-63s*.

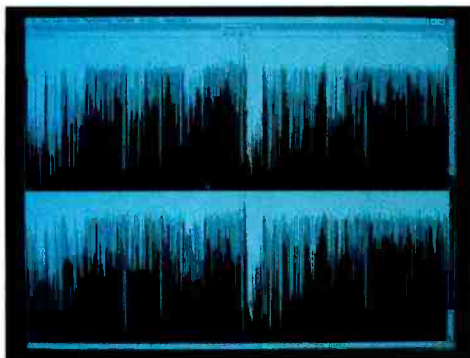
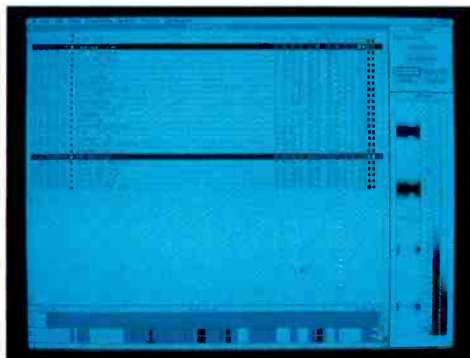
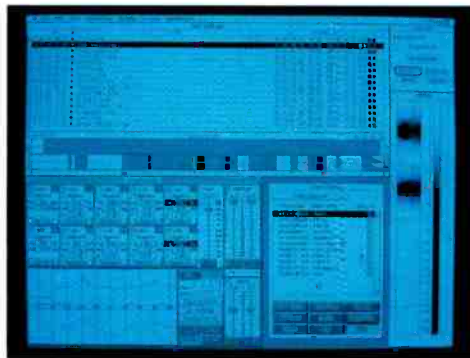


Gradient Ltd, Suksitehtankatu 2, SF-04420 Jarvenpaa, Finland.

Tel: 0 291 7875. Fax: 0 291 6730.

UK: KJ Leisuresound Ltd, 26 New Cavendish Street, London W1M 7LH. Tel: 071 486 8262. Fax: 071 487 3452.

USA: Quad USA, 111 South Drive, Barrington, IL 60010. Tel: (708) 526 1646. Fax: (708) 526 1669.



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GT Trio/Dual guitar amp

Every now and then a product surfaces that causes a real stir in the ranks of guitarists. The American Groove Tube's *Trio/Dual* vacuum tube (valve) preamp/power amp combination has been selling well in the US for some time while the rest of the world has been somewhat starved of it through the backlog of orders. Billed as 'as all things to all men' it promises much, as do many products in this rather whimsical sector of the market which clamours for vintage tone, flexibility and easy interaction with the ways of the modern guitarist's rig.

The *Trio* is a 3-channel switchable preamp and the *Dual* a 2-channel switchable power amp rated conservatively at 75 W a side (there's also a 120 W version) depending upon the exact nature of the valves that you choose to fit in it. And therein lies a very neat trick. Groove Tubes, as most players will know, are heavily into valves and have set something of a precedent in this established technology by specialising in selling fully tested and performance matched sets — the inclusion of which is something the company maintains is still surprisingly rare among many valve amp manufacturers. The whole Groove Tube replacement valve policy is that only correctly matched and selected combinations of valves will ever allow a player to get the best from an amp.

Not surprisingly, Groove Tube valves are used in the *Dual* and *Trio* and by changing valves there is a certain amount of leeway for find tuning to personal preference. The *Trio* uses five GT12AX7, which can be replaced with GT7025s if a brighter tone is required. The two channels of the *Dual* can be loaded individually with four different types of tube. GL6LCs give a Fender character while GTEL34s give a Marshall tone, GT6550s offer the qualities normally associated with American Marshalls of the 1970s while GTK88 duplicate the characteristics of the British equivalent of the GT6550 used in the Marshall *Major* amps. Add to this the fact that GT offer valves in 'strengths' from 1 to 10 — the higher the number the 'cleaner' the tube — and a choice of driver tubes in the power amp and the flexibility is clearly apparent.

The *Trio* and *Dual* are optimised to

work together and each has a footswitch for channel selection. MIDI can also be roped in to perform this function via an option on the *Trio* and sockets are also supplied for integrating with a switching system. Apart from a DI out from the *Dual* and the relevant inputs and outputs for connecting the units together, the back panel sockets are deliberately sparse for reasons of maintaining the integrity of the signal. Effects units therefore have to be patched between the two devices.

The *Dual* has a Volume and Presence pot per channel while the *Trio*'s Clean, Mean and Scream channels each have Gain, Bass, Middle, Treble and Volume pots. Basic but effective and optimised in gain structure for the tasks of mimicking clean Fender/Marshall tones, dirty Fender/Marshall tones or filthy Boogie-type characteristics respectively, again depending upon the user's choice of valves. This old-fashioned theme was extended in the review model to the inclusion of original pale brown Fender Tolex covering on the amp rack and the speaker cabs. A nice touch that is unlikely to be wasted on the true connoisseur.

In use

Clean gives a staggering pure sound which will simply not distort no matter how provoked from a well

endowed guitar. Even at full gain the timbre merely fills out giving a roundness to the tone, which is best described as wholesome. It is capable of very fine and understated jazz timbres with the EQ in this channel seemingly far more complex than in the other two channels which really is saying something. The level of interaction between the EQ bands is as it should be — very flexible — and while on the face of it the *Trio* looks like it could have all the hallmarks of a three sound amp, each channel has a distinctly different character and immediate and wide variability. The Clean channel's most striking quality is its sheer vibrancy and balance and I was surprised at just how complete a tone my rather old and favourite electric guitar actually had. I had simply never heard it ringing out quite so boldly before even though I've always suspected it was a good one.

The Mean channel specialises in the palette of overdriven sounds that elude all the rackmount wonders. It offers anything from the gentle velocity-sensitive onset of overdrive though decidedly raunchy to, with the gain right up, the sort of sounds you used to be able to get only when you could no longer hear the drummer. For many players the Mean channel is likely to suffice even for lead work and it has 'classic' stamped all over it. However, with the gain turned down you encounter the territory of thick rhythm, which is again rounded and very full with the EQ

allowing some of the unwanted bass to be removed comfortably without taking the clout out all together. Scream offers an incredible amount of gain and sound like every fuzz box or 1U guitar processor wishes it could, with the one simple distinction that is sound real — an important point that is perhaps too often overlooked. When recording acoustic piano it's good practice to keep popping into the room to remind yourself of the actual sound of the instrument before rushing back to the control room to carry out any adjustments. For the recording of electric guitar, this process has been somewhat lost with the advent of the all-singing, all dancing outboard guitar processor. The extra 20% that the *Trio/Dual* has over any outboard processor is the most important 20% of all because it represents the very nature of the electric guitar: the vibrancy and wholesale assault upon the senses that a decent amp working a speaker in free space elicits. Players will know that feeling well — in many cases it's the reason why they started playing in the first place — and to help with the conversion of engineers, the *Trio/Dual* does in fact offer the equivalent, by permutation, of nine preamp/poweramp combinations including many that are either impractical or not readily available in real life because you can mix input and output sections freely. And you can play both power amps simultaneously and increase the tonal flexibility further still by running different speaker cabs on each on the *Dual*'s outputs.

For session players it's a dream come true because of its diverse and compact nature — no need to bring old and treasured amps to the recording just in case they're needed because most of the options are covered in one way or another. The open-endedness and individuality imparted by the ability to swap valves appealed to me but the most lasting impression of the system was the realisation that I had been playing through rubbish for the best part of my life.

GT Electronics, 12866 Foothill Blvd, Sylmar, CA91342, USA.

Tel: (818) 361 4500

UK: Scott Cooper Marketing, 6 Ivy House Lane, Coseley, Bilston, West Midlands. Tel: 0902 674902.



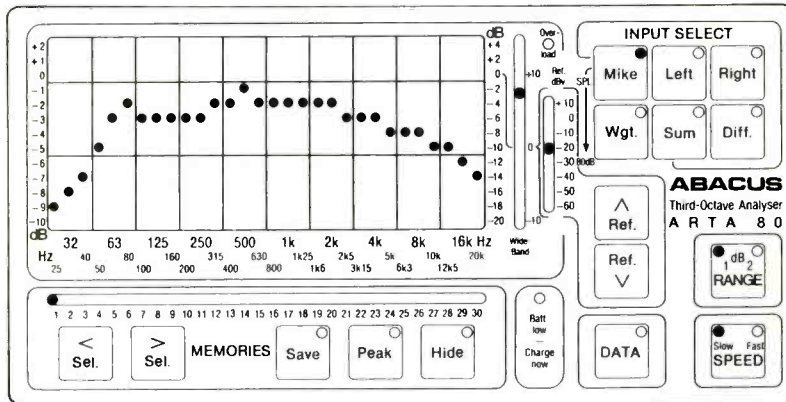
The GT Trio/Dual guitar amp, a session player's dream come true because of its diverse and compact nature.

Studio Sound's Music News is compiled by Zenon Schoepe

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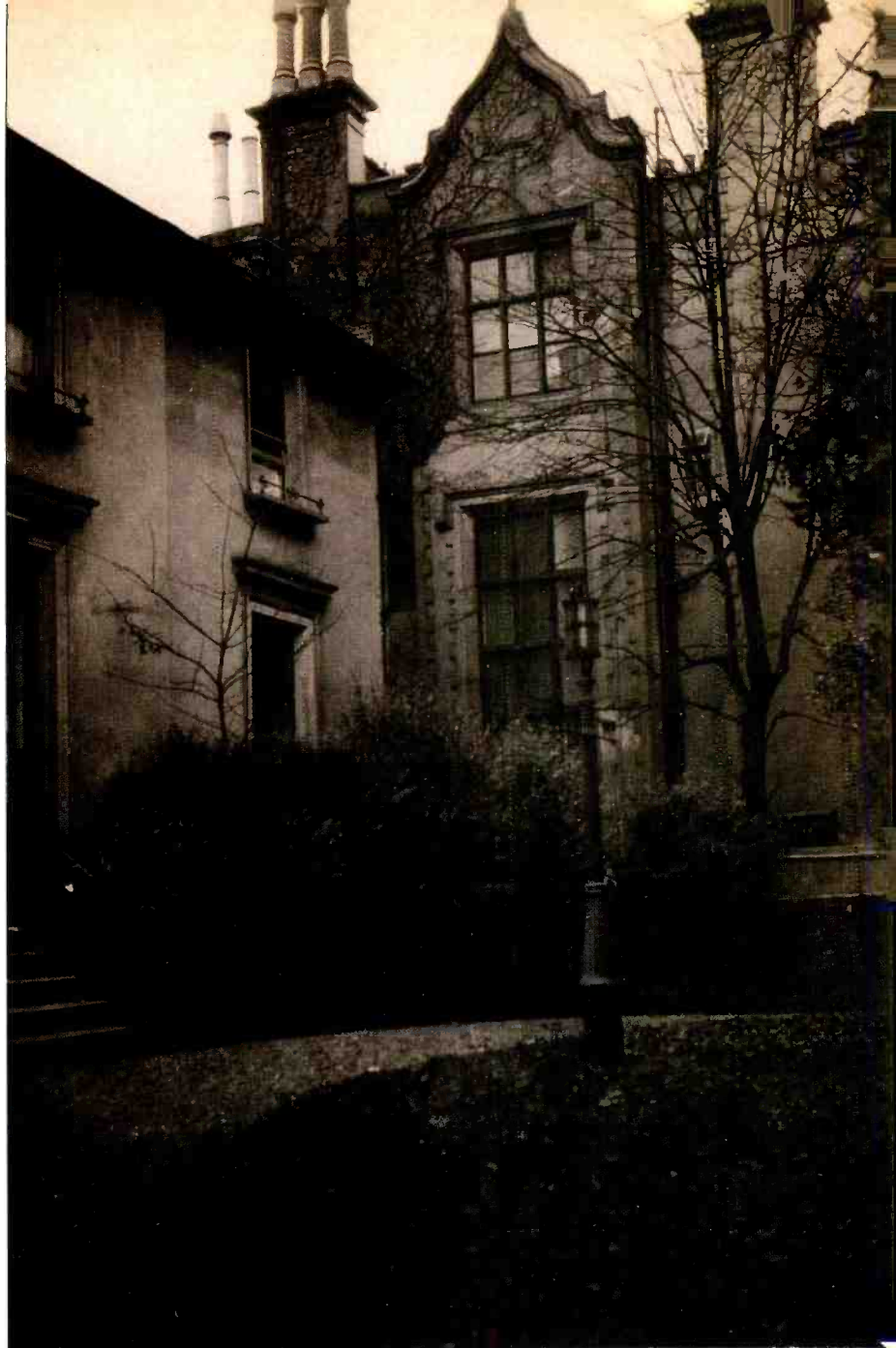
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HAUNTED ENGLISH STUDIOS

Patrick Stapley unearths some studio ghost stories, and wonders whether the spooks are good for business or just a sufferable evil



The house in Abbey Road as it was in the twenties, where John Maundy Gregory and the hapless Edith Rosse once lived together.

Britain has always been rich in stories of the supernatural: tales of ghosts, ghouls, poltergeists and things that go bump in the night, abound. It may, or may not, then come as a surprise to learn that many of the country's recording studios are reputedly haunted. I have to admit that on the face of it, headless knights and the latest in digital technology do appear something of an unlikely anachronism but when you consider the number of studios that have been built on historic sites and the amount of work that goes on through the night, it begins to be more understandable.

The first and perhaps most famous studio to have a ghost is Abbey Road. Built as a desirable, private residence in 1831, the property was converted into studios by The Gramophone Company 100 years later but in the 1920s it was home to the notorious John Maundy Gregory. Gregory was in the business of selling 'honours' for sizable sums, that he allegedly split with Lloyd George's government. A knighthood or even a baronetcy could be purchased in this way. The well known phrase, 'Lloyd George knew my father', was the stock reply used by sons and daughters when

asked about their father's newly acquired title. Gregory shared the house with Edith Rosse, a former music hall star, and together they masqueraded as husband and wife, until her suspicious death in the mid '20s. Under Gregory's orders, the body was buried at a Thames side graveyard that was particularly prone to flooding — a strange choice unless, of course, it was intended that the body should decompose quickly.



The deserted reception of Abbey Road Studios. It was in the early hours during one of his rounds that commissioner, Smythe, got the fright of his life.

Foul play was eventually suspected and the body was exhumed to undergo one of the longest post mortems in police history. No firm evidence was found connecting Gregory with her death but, nevertheless, he left the country in great haste never to return again — fuelling the widespread belief that he had poisoned her.

The White Lady and Edith Rosse are thought to be one and the same. The story that is most often told of the ghost dates back to the early '60s, just pre-dating the first Beatles recordings. In those days the studio didn't work late and at night the building would be deserted apart from the commissioner, whose duty it was to make periodical security checks. It was in the early hours during one of these rounds that the man, an ex-Hong Kong policeman called Smythe, got the fright of his life. The building has a number of long corridors intersected by the glass panelled swing doors; the commissioner was on the ground floor when he noticed the door in front of him shudder — a sign that the door further down the corridor had opened and closed causing a vacuum. The same thing happened again. Peering through the glass into the dimly lit passageway, he could just



Eurythmics studio, The Church. Churches often make perfect sites for recording studios but purchasers should beware. There may be hidden extras.

make out the next set of doors opening; through it came a figure dressed entirely in white. Transfixed, he stood back as the doors in front of him swung open, letting through a woman in a long flowing white dress; as she silently drifted past him, the temperature suddenly dropped, and as quickly as she'd appeared, the apparition vanished into the gloom. In the morning a very pale and shaky commissionaire handed in his resignation.

Although this is perhaps the best sighting of the White Lady, it is not the only one; other strange things have happened: doors opening and closing by themselves, rooms suddenly filling with a strong smell of perfume, and there is an alleged bloodstain that changes colour in one of the attic rooms.

Another unexplained event occurred a few years ago when technical engineer Brian Gibson was taking some night photographs of the front of the building. He noticed that a light had been left on in one of the upstairs offices and told the security man about it. The man immediately went up to investigate but when he unlocked the room the light was off. No one apart from the security man had access to keys, no one had been seen either going up or coming down, and the lights in the room were checked to be working perfectly normally. Gibson's photographs showed the light to be on.

Another long established London studio is Lansdowne. The building housing the studio was erected in 1902 by a South African diamond millionaire who, as a patron of the arts, wished to provide struggling painters with somewhere to work. A number of very high galleried rooms were built as artist's studios and it was in one of these that a painter fell to his death from the top of the ladder. According to Lansdowne's studio manager, Chris Dibble, the painter haunts the building including the basement recording studio.

Dibble: "You don't see him, you feel him. I don't really believe in all this stuff, but I was here one night when this thing was in the room. It was very late and I decided to stay the night as I had an

early session the next morning — everyone else had gone home. I'd just settled down on the control room couch in total darkness and total silence when I was aware of what felt like a warm hand being passed from the top of my head to my feet — as though someone was trying to feel what was lying there. I jumped up switched the lights on but there was nothing. I was terrified and spent the rest of the night trying to sleep under the piano with the lights on. From that day I've never slept in this studio."

Churches often make perfect sites for recording studios but purchasers should beware that they may also be taking on some hidden extras. The Eurythmics studio, simple called The Church, is one such establishment. Manager Worth Baker tells of an incident that occurred to him shortly after the studios opened.

"It was quite late and I was the last person in the building. I decided to call it a day, locked up and tried to set the alarm but it kept flashing up a fault code. I checked the code and it turned out to relate to a door in the belfry, which was really strange because no one ever goes up there. So I grabbed a torch and went back through the church, climbed up the metal ladder that takes you up into the tower and clambered into the belfry. Sure enough the small door that leads out to the roof was wide open. What was doubly strange was that this door should normally have tripped the alarm unless a special code was entered first, and at the time I was the only person who knew the code. Anyway, I closed the door, made sure the latch was engaged and the bolt was properly drawn across and went back down. I remember feeling a bit spooked walking back through the church, thinking this really doesn't make sense. I got back to the alarm box, keyed in the code and turned to walk out but once again it wouldn't set and flashed up a fault. I couldn't believe it — it was the belfry door again. I entered the code a second time but it wouldn't clear. Very uneasily I made my way back through the church and up into the tower. The door that I had carefully bolted minutes earlier was wide open

again."

Another ex-church that has trouble with its doors is the Angel studios in Islington. The church originally had a large crypt area that was used, among other things, to lay out bodies awaiting funerals — in fact when the church was purchased, a coffin barrow was found in the crypt. For the first years of the Angel's history, the crypt was used as a maintenance workshop, during this time the lights had a tendency to suddenly dim and flicker for no apparent reason. Exhaustive tests were carried out to try to locate the cause but nothing was found. One night the duty engineer was searching for the cause of the problem when a door beside him very slowly opened and closed — predictably nobody was there and there wasn't a breath of wind that could have moved it. The engineer beat a hasty retreat upstairs and steadfastly refused to work in the crypt for the next week. The area has now been made into another studio and so far there have been no strange reports.

Richard Branson's Town House III, previously owned by The Who, has a ghost called Bertha. The following is a cutting from a '70s daily newspaper, that appeared under the heading "Who is trying to spook Who?"



Since the days of the Who, Bertha has remained as active as ever — and in the last few months there have been stories of mysterious cold spots and noises coming from the attic as though someone (or something) heavy were jumping up and down.

Wessex studios is in a converted church hall that was once used as a finishing school for young ladies — ironic that in later years it should be used to record the Sex Pistols. The studio is also home to the ghost of a benevolent old Edwardian gentlemen who appears dressed in top hat and tails. The story goes that on a wall somewhere behind the acoustic treatment, is a commemorative plaque to him.

airforce make it 30

airforce music - 30th UK studio to choose the soundtracs quartz

Roger Dexter and Alan Bell, owners of Airforce Music have been producing music for Jingles and Station Idents for over 10 years and claim to have "More Music on More Stations" than any other UK radio production company. Roger and Alan decided that their new console was to have the highest audio specifications while being able to satisfy the demands put on it by their very busy, successful studio. Another consideration was to have a console that looked as good as it performed. In choosing the Quartz, the Directors of Airforce Music got just what they asked for.

Soundtracs Quartz consoles combine Broadcast Quality with modern facilities, offering multiple inputs enabling the use of masses of midi equipment and multiple effects - all within a compact frame. A Quartz 48 can accommodate 104 inputs all with programmable Midi muting.

There is no compromise with the Soundtracs Quartz, it was designed for 24 track recording and has 24 sub groups. ALL inputs can be Equalised and all have aux sends, in place solo and programmable Midi Muting. For maximum performance the Inputs, Outputs and Busses are electronically balanced ensuring low noise and superb crosstalk figures

Quartz versatile modules have dual inputs which allow the monitor inputs to be sub-grouped and controlled from the channel faders while mixing. Each module has an ingenious 4 sweepable band equaliser that can be used on both main and monitor inputs and even on the sub-group or split between the signal paths. There are 6 aux sends with programmable Midi muting on the masters. For extra versatility the Soundtracs Quartz can be fitted with Tracmix fader automation.

The Soundtracs Quartz represents the best there is in compact consoles and with its no compromise facilities you can be sure it is the right one for you, whether you are producing Jingles, Station Idents or tracks for your next album.

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Shrouded in darkness The Manor is situated a few miles out of Oxford and dates back to the 9th century. It is reputed to have a variety of ghosts.

Not so benevolent are the goings on at Sarm East. Supposedly built on a plague pit and sited in the heart of Jack The Ripper's London, this basement studio is a prime candidate for the supernatural. Things apparently move about by themselves, the piano has been heard playing in the empty studio, equipment becomes mysteriously disconnected, manhole covers have been found lifted and moved but most alarming of all are the three separate occasions where the studio has suffered floods. On each occasion the building was left checked, locked and alarmed; only to be found the next morning, swimming in water with every tap in the studio turned full on.

RAK studios, founded in the '70s by producer, Mickie Most, claim to have a ghost in their talkback system. To the bewilderment of producers and engineers, artists have been known to abruptly stop performing after an unfamiliar voice has spoken to them in the headphones. The studios' internal phone system also does some odd things and extensions have been known to ring just as someone walks past although there's nobody else in the building at the time. The studios have a locked attic area and a number of people who've been working late in the office below swear they've hear ghostly footsteps. . . .

Residential country studios are high on the haunted list; many are large historic houses with tales that go back hundreds of years. The Manor, situated a few miles outside Oxford, dates back to the 9th century, and is reputed to have a variety of ghosts. There is a cavalier who haunts the master bedroom, a lady in a bridal dress who wanders the grounds, a kindly housekeeper who will explain the layout of the house as it used to be when she was alive, and the spirit of a 'small person', that some think belongs to the wife of a former owner, Frank Gray, who was a local MP and well known eccentric.

Hook End Manor, built for the bishop of Reading in the 1400s, first became a studio when it was bought by Alvin Lee of Ten Years After; he subsequently sold the property to Pink Floyd's Dave Gilmour, whose wife had it exorcised twice, but judging from the experiences of its present owner, to little avail. Like The Manor, Hook End Manor has more than one ghost; the most common is that of a monk that walks the building,

Morrisey, who was recording there recently, claims he was woken at about 5.00 a.m. by hands pressing down hard on his chest — bent over him was the figure of a monk. On another occasion a client was rudely awoken as his window burst open and a stack of data disks, which he had put beside his bed, took off and flew around the room like demented bats. The most recent incident involved a group of Italian artists, one of whom claims he encountered the ghost of a Victorian lady who spoke to him. Unfortunately his English wasn't good enough to understand what she was saying but the effect was profound enough, and that night the Italians, rather uncomfortably, all crammed into one bedroom — the next day they cancelled the rest of their booking.

The 16th century Mill studio at Cookham, once owned by Jimmy Page, is haunted by a rustic gentlemen who smokes a pipe. Known as The Miller, he appears on a landing by the old mill wheel but can only be seen from the knees up because he stands on the original floor level. Sometimes all that gives him away is the faint smell of tobacco and people will innocently ask who it is that smokes a pipe.

Another country ghost is The Gardener at Ridge Farm studios who is said to haunt the old granary, now converted into bedrooms. On one occasion a client was preparing for bed when his door opened and in walked The Gardener complete with tools; assuming he'd mixed up rooms, the client collected his things and apologising profusely, moved next



Jacobs studios: The Georgian house in Surrey where guests are disinclined to stay for very long in the pool room. Shown far right on the ground floor.

door. In the morning, not only did he discover that he'd been in the right room all along, but that he'd relinquished it to the studio ghost.

Not far from Ridge Farm in the Surrey countryside is Jacobs studios. This Georgian house contains a room that has been changed from being a bedroom to a pool room because of people's reluctance to sleep in it: "It was always the last room to be taken and would more often than not end up being the roadie's", studio owner Andy Fernback told me. A woman dressed in blue haunts the room and her moaning has been heard by a number of people, although no one has been able to pinpoint exactly where the sound comes from. Pool is consequently not as popular at Jacobs as it is at other studios — even guests who know nothing about the ghost, seem disinclined to stay very long in the room. One such guest was Stevie Wonder, who was convinced the room held a definite 'presence'.

To end with I'd like to return to Abbey Road and relate an incident that occurred whilst I was working there in the early '80s. A day's booking had come in to record solo piano in the Penthouse studio and I was put on the session. Two people turned up for the recording — a pianist and an elderly lady who informed me that we were going to record some newly written pieces by Rachmaninov and Liszt. I was about to say that I didn't quite follow, when she explained how she was in spiritual contact with many of the great composers who communicated their music through her. We began recording and everything went fine until half way through the day, when all the studio talkback circuits went dead.

I called maintenance who were unable to fix it, so we spent the rest of the day communicating by sign language. When the session was over, the elderly lady, who remained remarkably quiet throughout the recording, came over to me and said how terribly sorry she was that the equipment had malfunctioned. I replied that on the contrary it should be me making the apology but she raised her hands in protest and said that if I tried it now it would probably be working perfectly normally, now He had gone.

"Who?" I asked.

"Why Liszt of course — he's been standing next to you for the last four hours."

I enquired rather weakly how he'd like the recording.

"He was *very* pleased," she replied, beaming at me.

"Oh that's good," I said pushing the talkback button and heard my voice reverberate in the studio.

I can't quite make my mind up whether having a studio ghost is a good or a bad thing. On one hand it's not so good if it damages property or scares away clients but on the other, there is a certain appeal to haunted buildings that may very well attract clients. It almost seems part of the package, when booking a studio like, say, The Manor, to have a few monks or cavaliers roaming the building at night. Whether you're a believer or an out and out sceptic, the topic does hold a certain fascination and I'm sure stories will continue to be exchanged in the dead of night by the glow of vu meters.

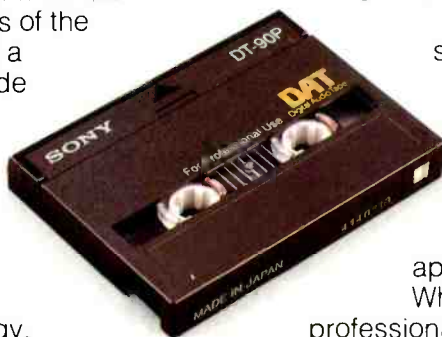


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Sony Broadcast
& Communications 

EQ Empirically — A Response

Dear sir, It is good to see an article ('EQ Empirically' by Keith Andrews & Tim Smith, *Studio Sound*, December 1991), that helps establish a dialogue between users and manufacturers. However, we at Solid State Logic feel that we must draw your readers attention to a few misconceptions raised in that article.

The major conclusion of the article was that "... the 'sound' of an equaliser is related to the amount of phase shift it causes. Also that Wien bridge filters, at least as used in the SSL E Series, apparently tend to cause greater amounts of phase shift than the state-variable type."

Whether or not phase shift is the major cause of equaliser 'sound' it is still very much a subject of debate. However, the second part of this statement is much more contentious. Any two-pole filter stage, be it Wien bridge, state-variable or whatever, should produce the same phase shift change with frequency (assuming the same amplitude response). If a stage produces an unexpected response, it is probably due to extra poles added for other reasons. For example, compensation added to improve stability may well disturb the high frequency phase response, or AC coupling may show up at the low frequency end.

So what causes the excessive phase shift in the graphs of the SSL E Series equaliser? On early SSL desks (up until about 1986) the high-pass and low-pass filter stages were taken 'out' of the equaliser path by setting them to frequencies outside the audio frequency range, however this was not enough to stop the massive phase shift visible in **Figs 1 and 5** in the article. If the measurements had been made on a post-1986 desk with endstop switches on the filter controls, or made in the monitor path with 'split' selected, then these plots would have looked as **Figs A, B** (measured on a current module with 'E Series' (82E242) equaliser). These curves look remarkably similar to those of the Amazon equaliser shown in **Figs 4 and 8** in December's article.

One point that needs to be stressed is that before measuring equaliser phase responses, the response with the equaliser set flat (not switched out) must be measured first, in order to ensure that the results are not being upset by the main signal path. If a large deviation in phase response

at the frequency extremes is found, then a frequency response test from 10 Hz to 50 kHz can be very revealing.

So are we saying that all equalisers sound the same? Absolutely not! And Keith Andrews picks up on one of the key reasons when he comments on his prototype equaliser "... it still felt somehow different because it was there at the touch of a button as opposed to having to be patched in, and instead of having big knobs it had tiny little knobs. The actual control layout can make an equaliser seem different.' To do a listening test on one equaliser setting is rarely productive. What is vitally important is *how easy it is to get the sound you want* — and this is all a function of control gearing and range, and the inter-reaction between controls.

Two equalisers with dissimilar circuitry can 'sound' the same if the control laws are the same, and two equalisers with identical circuitry can 'sound' totally different with different control laws — including larger or smaller knobs. This, in fact, is the major difference between the E and G Series mid-band stages, on the E Series the Q stays constant with varying boost, with the G Series the Q reduces with the boost. (Hence the low narrow Q on **Fig 2** which is taken at about 3/4 maximum boost. However, it is true that the G Series maximum Q is slightly less than the E Series, this is in order to keep stability at the higher gains.) The much wider bandwidth of the G Series equaliser at low gains is probably why it has been described as 'warmer' than the 'clinical' E Series. Incidentally, Keith Andrews is in error in saying that the frequency sweep range of the G Series is reduced, all SSL equalisers have the same sweep range (measured musically, i.e. as a ratio of the upper to lower frequency), although the ranges occur at different frequencies.

While it would be foolish of us to say definitively that Wien bridge and state-variable equalisers sound the same, in our own listening tests we have been unable to detect any difference between identically set up equalisers of each type. Our reasons for staying with the Wien bridge topology were because of the problems with achieving an acceptable noise/headroom compromise with the state-variable

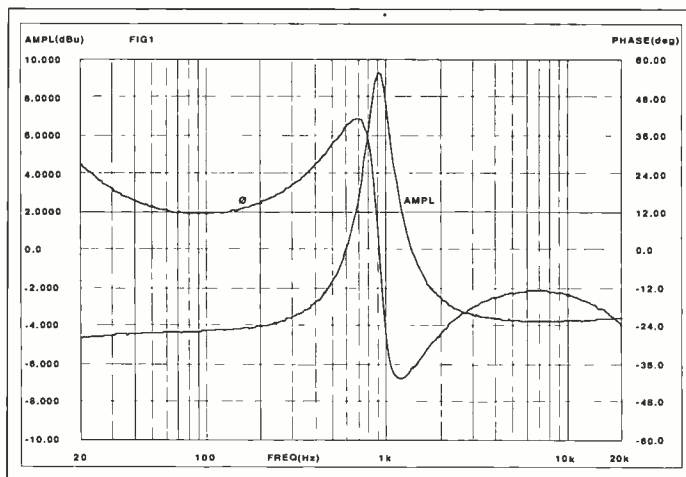


Fig. A: see text.

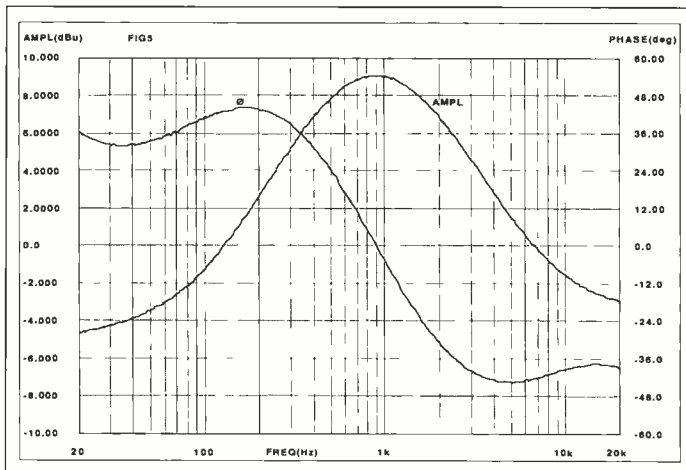


Fig. B: see text.

stage. And as for producing an equaliser to please everyone — writing as an analogue engineer, I reluctantly have to admit that this is unlikely to be achieved until a digital desk appears where the law of every control can be set individually band by band, and channel by channel!
Andy Millar, Analogue Design Engineer, SSL, Begbroke, Oxford, UK.

The Perfect Sphere

Dear Sir, We, at Schoeps, are impressed that Francis Rumsey discovered so many of the typical characteristics of the Schoeps *Sphere* within just one day. In fact, a shortform description from one of our customers says that this microphone combines the localisation of a coincident recording with the spaciousness and the good low end

response of spaced omnis.

This seems somewhat exaggerated and we agree with Mr Rumsey that coincident recordings are capable of even better point source localisation. However, except for the Blumlein system he uses as a comparison (unfortunately seldom used in other countries), coincident recordings show poor spaciousness if no additional microphones are used*. What we do claim is that the *Sphere* actually gives an optimum between localisation and spaciousness which even exhibits some depth as you confirmed. Furthermore, the bass is exceptional.

Where just spaciousness and sound are concerned, spaced omnis — like two of our *MK2S* — are always tempting. In a listening test, we found that approximately 60% of the listeners voted for the spaced omnis, but most of the other 40%, who preferred the *Sphere*, had been sitting in the centre where good localisation can be detected.

One point which we do not ▷



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understand at all is Mr Rumsey's remark about Schoeps *hardness*! In view of all the many audiophile CDs recorded with our microphones we should by now have heard this, but no comment like this has ever reached us! The terms we are familiar with are in general 'clean' or 'natural' as was recently said in a report about the same microphone.

There are two possible reasons, if the sound should ever tend toward hardness. The first maybe the *Sphere's* extraordinarily high sensitivity (that could cause overload

of some input stages), and the second may be that most Schoeps microphones need relatively high supplies of current (for good reasons). Although being well within the DIN and IEC standards, some studio equipment nevertheless underpowers and causes headroom problems in these circumstances.

The purpose of the hole at the front of the *Sphere*, with contains a LED is to ensure the correct forward orientation and powering of the microphone.

Finally we are pleased to explain

why the polar patterns of the *Sphere* are not identical in the horizontal and the vertical plane. This was necessary in order to fulfil the requirement that the same response exists for the stereo axis as for the diffuse soundfield. It is realised by special transducers which have two vertically-positioned openings.

**Yours faithfully, Jorg Wuttke,
Technical Director,
Schalltechnik Dr.-Ing, Schoeps
GmbH, Spitalstrasse 20, 7500
Karlsruhe 41, Germany.**

* This can be demonstrated by

recording in a totally randomised soundfield which does not allow any localisation but yet produces a "good centre image" when played back. The explanation is that the pressure components of (for example) two cardioids — one mounted above the other — captures the reverberant soundfield with such a high correlation that its reproduction resembles that of a mono one.

*Francis Rumsey replies.
I am glad that Mr Wuttke of Schoeps
agrees with many of my points
concerning stereo imaging. As I stated*

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OR A NEVE VRP 96,
YES, A ONCE-OFF ORIGINAL.**



in the review, a prototype Sphere became available from SSE (the UK distributors) at short notice for only a day, and thus we were only able to make some preliminary observations. SSE agreed, after consultation with Schoeps, that the Sphere reviewed was close enough to the production version for us to write about it.

Subjective terms such as 'hardness' are always open to interpretation, and what one person calls 'hard and clinical' another may call 'clean and natural'. I remember similar debates over the sound of Compact Discs.

Certainly the Sphere was not overloading the input stages of the mixer used during the tests, and we would have noticed if it had been clipping due to inadequate supply current.

On the model reviewed the hole at the front did not light up when powered. Although the promotional literature claims that the reproduced stereo image will be tilted by tilting the microphone in the vertical plane, our preliminary tests did not exhibit this effect (we specifically attempted to test this feature). If such effects

exist then they are certainly not marked and may only appear on particular types of programme material or in particular acoustic environments. As suggested in the review, more detailed tests would be required to examine these claims further.

Pricing?

Dear Sir, As an appreciative reader of *Studio Sound* and a 'beneficiary' of

your many equipment reviews and reports over the years, could I ask if you could add indicative prices to your review equipment specs?

A proposed selling price is certainly a valid part of a manufacturer's product specification and the publication of this indicator would further benefit readers in selecting gear that may be of use.

Yours sincerely, **PETER MUMME**, Intergrated Circus Productions, Christmas Hills, Victoria, Australia 3775

Continued on page 71



STUDIO THREE AZ000066 PHOTO © RITRIPIC/ISC 1

AND THEN, AFTER LUNCH, YOU CAN DO A COUPLE OF LIONS.

WHAT ON EARTH? FOLLOWED QUICKLY BY WHY THE BIG THREE DESKS DOMINATING THREE SUB SONIC CONTROL ROOMS RECIPROCATELY AIDED BY LEADING EDGE PROCESSING GEAR INCLUDING NEW TUBE TECHNOLOGY PLUGGED INTO THREE DISTINCTLY DIFFERENT AND RATHER LARGE STUDIOS? AND THEN, YOU COGITATE, WHAT IS THE LINK TO THE VERY PRIVATE, SELF CONTAINED LUXURY STUDIO VILLAGE? (ANSWER JUNGLE WALKWAYS AND BRIDGES OVER CASCADING WATERS) YES, BUT WHY IN THE UNSPOILT LUSH SOUTHERN AFRICAN VELD CLOSE TO THE WORLD'S BEST GAME PARKS? WHY EVER NOT



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CD Mastering room at Shinanomachi

CBS-Sony Studios

Zenon Schoepe visits Shinanomachi and Roppongi studios in Tokyo

Sony's contribution to the world of recording studios has been a considerable one. To many in audio and picture, its logo represents the very essence of digital in the 1990s — accessible, flexible and not nearly as expensive now as old expectation would have us believe. It is therefore interesting to see what the company has done with its own 'in-house' facility at Shinanomachi Studio and its more rental-oriented operation at Roppongi Studios in Tokyo. Given a free rein and the financial resources at its disposal, its choices and directions might just give some insight into what it is that makes Sony, as a manufacturer, tick.

This is particularly the case at Shinanomachi Studios because in addition to performing the functions of CBS-Sony's 'private' facility for recording its own artists, it is also in the enviable position of being Sony's real-life test bed and R&D studio, and such has been instrumental in the development of many digital products. It is also the birth place of Japanese CD recording and a wander around the storage vaults in the building reveals the first CD recording by the company — a collection of traditional Japanese koto music immortalised on October 9th, 1978.

Shinanomachi's five recording studios plus CD mastering and laser disc mastering complex enjoys a symbiotic relationship with the two studio premises of sister facility Roppongi, which in its capacity as rental studio also deals with Shinanomachi's overspill work.

Investigations into the Japanese audio industry's perception of

Shinanomachi's worth places it almost unanimously at the top of Japan's studio pile. Opened in 1978 — a year strongly associated with the widescale proliferation of rental studios in Japan — Shinanomachi occupies four floors and the basement of a rather unspectacular building constructed expressly for the purpose of housing recording studios. In line with many studios in Japan, the look and feel of the corridors and spaces outside the control room/studio areas has more in common with an office block than your average Western rock 'n' roll emporium — busy, quiet and understated.

Acoustic designer Tom Hidley designed and oversaw the whole studio construction operation in his Westlake days with a level of duplicity that is uncanny. Indeed so great is the similarity between the TAD-loaded monitor control rooms that at times it is hard not to believe that you have been taken around the back of the room and in again through a different door. The matter of confidently identifying individual control rooms is not helped by the fact that Shinanomachi, like Roppongi, is totally Neve equipped and always has been. Roppongi has the added distinction of housing the very first Neve in Japan — an 8024 back in 1973. Add to this Shinanomachi's practice of loading onboard racks with similar selections of equipment and the biggest clue as to which control room you are likely to be in can



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Late 1970's custom Neve in Shinanomachi Studio 2.



Roppongi live room B.



Studio B at Roppongi with diffractors above CBS-Sony SEM2W monitors.

be gleaned from the fader strips for *Necam 96* or *Flying Faders* automation. Coming from a country where diversity in studios is actively encouraged, the logic seems puzzling but in line with anything the Japanese do when they've sat down and thought about it, the result is adopted and adhered to wholeheartedly.

Yoshiro Suzuki, manager and chief engineer of the recording department explains: "It's our policy here. The same speakers, the same room, the same tape recorders and desks — everything as much the same as possible. You have to have consistency, sound is difficult enough without moving from one studio to another and having to cope with differences in bass, definition and reverbs. Here, if you record a track in one studio and move to another you get exactly the same balance and the same quality of sound going through the board. We need that here for the type of work we do, it's very important."

The studio handles jazz, popular, Japanese traditional and classical music with company acts from Japan and the US. With 80 staff, the recording section's 12 engineers and eight assistants all have qualifications in electronics from Tokyo colleges. Knowledge and experience of consoles and tape machines on its own would simply not make you a candidate for employment at Shinanomachi Studios, according to Suzuki.

The studios are arranged as three tracking and two mix rooms each with its own obligatory Sony 3348 plus additional *PCM3324s* and *Studer A800s*. Studios Three and One and Mix One run *Neve VR72s*, the last two with *Flying Faders* while a late 1970s 40-input *Neve* custom with 31105 EQs in Studio Two is the only legacy left from the original *Neve* desks installed before the refit with *V* series. Mix Two sports a *V 3* with *Necam 96*. Suzuki: "There is no difference in the type of work that goes through Mix One and Two because of the automation. All our rooms with *Flying Faders* were originally *GML* equipped. For many engineers *Necam 96* remains the most convenient of all the automation systems available but being able to offer a choice is important."

All the mix computers, including the rather noisy *Necam* system, are all locked in individual soundproofed booths in their relevant studios. As in the norm in many Japanese studios, mastering is to Sony 1630 and *DMR4000* alongside a *Studer A80*. The land that gave the world *DAT* seems less prepared to take it on itself.

CD Mastering

As the birthplace of Sony's CD recording, the 11 CD mastering rooms dotted throughout Shinanomachi's building are a sight to behold. The first of these was originally built as a cutting room but now the old Sony custom-built desk left over from those analogue days is put to use as little more than a table on which to stand the *DAE1100*. Alongside are a *DAL-1000* digital compressor, *1630s* and *DMR4000s* and a *K1105* digital console — Sony's involvement with digital desks started when it need one urgently for its CD mastering rooms. Like just about every other facility in Japan that deals with a stereo source, the *Neve 33609* compressor/limiter is also in evidence together with *AmpeX* and *Studer* open-reel analogues.

Again the level of similarity between rooms is startling but most interesting is the discovery of 20 bit recording in progress through a Sony *DES900* A/D converter onto a specially modified Sony 3402 open-reel digital. The studio has been using 20 bit recording for its own purposes since 1989 and in the current application it is being used in conjunction with a modified *Sonic Solutions* system for the production of 'super bit mapped' 16 bit CDs of classical music aimed exclusively at the Japanese market in the first instance.

Tetsuro Tomita, Shinanomachi's technical engineer, who describes himself as "a musician above all else" has been heavily involved with Sony's digital products most notably the design of premastering equipment and editors, and the *DAQ1000* PQ editing system. "I became involved with the development of digital sound processors because we were unhappy with the analogue equalisers and limiters we were using, so we developed a digital console. I'm still not satisfied with the sound of digital because the A/D and D/A converters are still the limitation. Once you're in the digital domain manipulation is relatively easy but it's the in and the out that is the problem. 20 bit is the way to go but everyone, and not just Sony, has plans for that."

Needless to say, Tomita has been watching what everyone else is up to and is very much in tune with what the smallest European or US companies have been attempting. A strange position to be in — at the very leading edge and to know what a company as influential as Sony has up its sleeve for the next decade. It is hardly surprising that he won't reveal his

knowledge but he admits to working currently on five new digital products which are audio and video related.

Laser disc

Karaoke is very big business in Japan and for the Japanese. As would be expected, CBS-Sony has a floor dedicated entirely to the production of what in many ways has become the most successful exportable aspect of Japanese culture. What also becomes apparent after a little probing is that Karaoke is not regarded nearly as lightly and jokingly in Japan as it is elsewhere in the world because it has very firm roots in the country's culture.

Enka, a style of music that easily enjoys the largest market share of recorded music in Japan, has strong links with traditional Japanese folk music — it is a modern interpretation of the torch song. Karaoke is yet another extension of this to the Japanese and offers every businessman the opportunity to partake of a little oral tradition. While the West's interpretation of karaoke concentrates on well-known chart material — Beatles, Frank Sinatra, Barry Manilow standards etc, the hard core Japanese original is anchored firmly in folk music. While undoubtedly providing entertainment for the Japanese audience and creative release for the singer, it has meaning in Japan and is not the bane of public places that it has become in the West.

With this importance in mind, CBS-Sony Shinanomachi is not surprisingly paying considerable attention to the all-digital incarnation of karaoke with two premastering rooms, two preview rooms and a VTR room all loaded with digital mixers, effects, recorders, vision effects units and mixers and a bank of D2s. Typically the quality aspect of the work being carried out is stressed by all involved.

Roppongi

In contrast with Shinanomachi's quiet corridors, Roppongi's two-studio complex has a far more worn-in feeling to it, gained presumably through its rental use by outside clients. A Sony 3348 and 3324 plus a Studer A80 are available in both rooms — Studio A's Neve VR72 with *Flying Faders* and B's V60 with *Necam 96* — and 70% of the work is of CBS-Sony extraction. US clients who have worked here include Michael Jackson and Stevie Wonder. Monitoring in both rooms is via CBS/Sony SEM2Ws and Studio B has 2D diffusers on the ceiling in front of its speakers to aid diffusion. A 20 bit armed Sony 3402 had recently been pressed into service on a direct-to-stereo orchestral recording in Studio B's large live area.

Roppongi engineers, Hirokazu Maejima, explains how the possession of real-estate demarcates the studio sector: "Space is a valuable commodity for a studio in Tokyo, if you have a large room then regardless of the type of equipment other studios may have you will always have an edge. That's something you can't compete against in Tokyo."

While acknowledging that Japanese engineers do have a great deal of experience in recording digitally, sessions for popular music, for example, are recorded almost exclusively on digital

— Maejima states that the one point that unifies all the world's engineers is ultimately the state of their country's economy.

"Japan's economy has cooled down a bit and we have inflation, while the studio fees are effectively going down. The industry in general has a problem with the very many small studios that have started up and as I understand it that's also a problem in Britain. In Japan we have a great gap between the multi-studio complexes owned by large companies and single control room studios — there is very little in the middle between the two. That demarcation is all down to money. Digital equipment is expensive but land is even more expensive and only the large corporations can afford to build and run large studios. The market has adjusted to this situation and there is no requirement for middle market studios." □

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John McKnight, of the Magnetic Reference Laboratory in Mountain View, California, echoes concern over the stability of tapes. As McKnight points out, the fact that urethane tapes react with moisture in the air and go sticky is neither new nor secret. It is just that the tape industry has done so little to publicise the fact that it might as well be new or secret.

It is now nearly ten years since Neal Bertram of Ampex and Edward Cuddihy of the Jet Propulsion Laboratory, Pasadena, wrote about it in the IEEE Transactions on Magnetics (September 1982). But what they wrote was heavy text, replete with mathematical formulae, tables and plots, all under the title "Kinetics of the Humid Ageing of Magnetic Recording Tape".

The synopsis reads, "Kinetic data were generated for measurements of acetone-extractable hydrolyzed binder products versus time for various humidity-temperature environments etc."

All the warnings the industry needed were probably there, but in such obscure language that it is hard to imagine any working engineer getting past the first few sentences, even if they ever saw the article in the first place.

Buried in the turgid text, however, is one bald statement: "It is clear that further studies of chemical hydrolysis are necessary to understand completely the degradation process."

Yes, the tape makers knew ten years ago that they had a very real problem on their hands. And they did next to nothing to warn their customers.

Later learned articles referred to heat treatment but failed to come anywhere close to explaining in plain terms that baking a sticky tape makes it fit to copy.

McKnight, who has been replacing reference tapes which have gone sticky says he has been haranguing all the tape manufacturers for at least five years. At first all they said was "Gee Mr McKnight, we've never had anyone complain about that before." Then they admitted there was a problem and they were working on it. Now they are talking about new formulations, as yet unavailable.

McKnight reckons that the tape makers are in a difficult position. They needed urethane to cope with the strain of rotary head recording and repeated multitrack overdubbing. Urethane is tough, but it turned out to suck up water from the air and shed sticky goo. McKnight describes the urethane binder problem as a "disaster". It seems inevitable that more and more people will now be taking tapes out of store and finding that they won't play.

For those who find they are afflicted, the guiding principle is this. If a tape gums up your recorder, don't keep on trying to run it. Contact the tape maker about baking to dry it for long enough to make a safety copy. Brute force attempts at getting a tape to play may well end up stripping the oxide off the base, and permanently ruining the recording.

By coincidence, 3M has just publicised the successful re-issue of material from forty-year old tapes owned by Ace Records. The tapes were of early 1950s R&B artists, such as Howling Wolf, Elmore James and B.B. King. Apart from some

Barry Fox

Were there early warnings of magnetic tape instability? Accuracy in print and further Churchill comment

adhesive ooze from old splicing tape, says 3M, there were no problems.

"Although magnetic media technology has progressed considerably over the last forty years" says Ted Carroll, Director of Ace Records, "these tapes provided us with usable recordings of more than acceptable quality."

All the old Ace tapes were on acetate base. How many urethane tapes will be playable forty years after they were made, or around twenty-five or thirty years from now? The awful thing is, no-one knows.

An audio publication recently charted the history of EMI and Abbey Road. The enterprising author has sold the article to five magazines around the world.

In it he tells how "by 1950, Alan Blumlein was perfecting the stereo system which he had been working on since 1931".

As Alan Blumlein died in June 1942 (making the 50th anniversary of his death this June) I wondered where the enterprising author had got his information. Had EMI misled him? If so, this would come as no surprise to those who have watched what happened after the electronics and music company was swallowed by Thorn.

It turns out that the absurd mistake comes from EMI's own official book about Abbey Road, written by Brian Southall and published in 1982. "In 1950 . . . Blumlein was putting the finishing touches to the stereo system he had begun work on in 1931" it reads. Abbey Road had supplied the book as historical source material covering the studio's first fifty years.

"Gee, we've never had anyone complain about that before"

Says the author of the article now sourced from the book: "None of the seven audio journalists I have spoken with knew this (that this year is the 50th anniversary of Blumlein's death); none of the five magazine editors who were publishing the article in their respective countries knew this; and,

according to Abbey Road, no-one has apparently picked up on the error in the book during the past nine years."

All of which explains why I go on bewailing the fact that the fiftieth anniversary of Alan Blumlein's death this June will almost certainly pass unmarked by the biography for which Francis Thomson has been collecting material for the past twenty years.

It also explains why I am still trying to push EMI into looking again at the authenticity of the classic recordings of Winston Churchill which the company now sells around the world.

In a recent issue I told how EMI Records had failed to offer any comment, or even return calls, when I raised the thorny question of whether some of these speeches had in fact been recorded by actor Norman Shelley. So I forced the issue by making a formal complaint to EMI's local Trading Standards Officer. The TSO was able to insist that EMI comment, but understandably (with both Shelley and Churchill dead) was reluctant to prosecute.

I have been suggesting that in the interests of historical accuracy EMI's sleeve notes should identify and date those recordings which are authenticated Churchilliana, and acknowledge doubt of pedigree where speeches cannot be authenticated.

I now have some news from EMI's legal department to pass on as promised:

"Decca have obtained an expert opinion on the matter. . . . Both Decca and EMI with the assistance of opinion from Peter Orr believe that allegations (of non-authenticity) are not fully substantiated."

Curiously EMI has not provided Decca's "expert opinion."

It was Decca who in 1983 misled the public by wrongly labelling its Churchill recordings (those now licensed to EMI) as being sourced from "radio transcriptions". It was only after I and the BBC raised this with Decca that the labelling was changed to the wording now used on the EMI releases. Decca's spoken word producer at the time was Peter Orr and in 1984 he wrote:

"I do not know whether Norman was Churchill or Churchill was Norman and I should be most grateful to be excused from playing any part in this, to me, quite baffling business."

These recordings are not Kylie Minogue hits. They are planks of British history and I have been very pleasantly surprised by response to the *Studio Sound* article. There is a world of difference between, on the one hand, a record company feeling confident that it is unlikely to be proved guilty in a prosecution, and on the other hand, acting responsibly to make the historical record as accurate as possible. And as witnessed by the Blumlein-beaver-away-on-stereo-in-1950 nonsense, EMI's track record on historical accuracy is hardly reassuring.

Quite simply, if EMI has gone back to the original Churchill master tapes and documentation, and found evidence of authenticity — why won't EMI release that evidence? Your guess is as good as mine.

At least we now have doubt and EMI's response on the public record. □

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S/S



Jonathan Ferdinand Horton walked at a rapid clip down the East Ferry Road. He passed through what appeared to be one of the worst cases of pea-soup fog that he had seen in London since the days of coal fires when he had been but a wee lad, and that was in 1952. The weather chilled him to the very bone, and he pulled his anorak closely around him to ward off the cold, damp and wet. Rain, wind, a lowering overcast sky and this was June! "How people elsewhere can dream of this London weather, I'll never know," he muttered to himself. When he was almost at the water's edge, he stopped to listen. "There are footsteps," he muttered out loud. Pausing briefly at Factory Place, to escape the worst of the now ferocious downpour, he made a decision. He had to push on. He had promised to be in Greenwich at two o'clock on the other side of the river and that was what he would do. It was a quarter to two now and he knew he had to be there. As to the man he believed to be following him, Horton's lips parted and flung an oath at his pursuer. "Damn you, catch me if you can, Moriarty."

He plunged forward into the storm, and into Ferry Street. He knew Island Gardens and he knew the Isle of Dogs. He had been raised here and it was not so different now for all the years that had passed. He reached Douglas Place, swung left and then right into the Manchester Road and ran like the very Devil was behind him. To look at Horton's face that may well have been the reality. Finally, he fled right down Grosvenor Wharf Road and cut back right again onto Saunders Ness Road. He dodged through a park and reached the entrance to the Greenwich pedestrian tunnel that led under the river Thames. He hoped his circuitous route had confused his pursuer. But the measured clatter of hob-nails on paving stones told him otherwise.

The pedestrian tunnel, through a Victorian convenience, had a lift down to the passageway and Horton entered it with a lurch. The gate closed just as a heavy-set man shrouded in tartan, reached it too late. Horton exited into the cool and dank interior of the tunnel at a fearful clip. Halfway through, he halted, panting, but the sound of the heavy footsteps on the stonework floor of the tunnel unnerved him. He ran furiously, reaching the Greenwich side only to find that this lift was locked due to "works in progress." He bounded up the stairs. Stopping for great gulps of cool air, he heard again the heavy boots down below.

The sound of the boots had been with him since he left the London Underground at the Bromley-by-Bow station, across the river. Reaching the top and turning out from the Greenwich portal of the tunnel, he pulled his watch from his pocket. He was proud of it. It had been his father's. Two o'clock. Nobody was in sight on this wet, gloomy afternoon. He could hear the heavy footfalls coming up the stairs. He could only see an elderly bookseller, bent from his load, in an archway of the fence for the Royal Naval College. Nowhere to be seen was the famous aquiline profile in deerstalker cap with the characteristic calabash protruding from the lips. Nowhere was there a sign of recognition. He was doomed!

Martin Polon

Our US columnist views the spectre of employee hearing damage

Horton fell to the ground, overcome by the strain of the moment. His burly follower appeared at the top of the stairs from the tunnel and approached the fallen man. Suddenly, improbably, the seedy frock coat and white hair of the bookseller were shed like a lizard's step into a new skin. "The Webley, Watson." A rotund, red-faced physician sprang into view from a nearby doorway. In his large hand was the British Army's most featured side-arm since the Crimea. The call "Lastrade!" was answered out of the Naval College gatehouse, by a tall, well-dressed and commanding man accompanied by four of the Metropolitan police forces' biggest and best. "Now we have you, Moriarty," exclaimed the great investigative crime-solver, choreographing the event as if it were some kind of fantastic criminal ballet.

J. F. Horton awoke to find four policeman, a chief inspector, a doctor with service in India and a private detective standing over him. To the side was his 'tail'. With some prodding from the police, the 'tail' spoke. "I swear I'm nothing but a poor bailiff of the court serving papers on this gent." The man pointed an accusing finger at Horton. "You people have no right getting in the way of the court's service," he sputtered on. Holmes seized the piece of paper from the man's fingers. "But you do not deny that your name is Moriarty?" "No, your worship," the man mocked. "I'm Jake Moriarty and I serve under Judge Grisson, the hanging judge!" Holmes read from the evidently legal document. "In the case of Nick Nickerson, plaintiff, versus Jonathan Ferdinand Horton, defendant, the court rules that the Baker Street Recording Rooms belonging to the defendant, shall be turned over to the plaintiff on the grounds of negligence causing irreversible hearing damage on the part of the plaintiff."

Holmes asked his now suspected client, "you mean that you did not check your new employees' hearing upon their joining your firm?" Horton sighed. "I just did not bother. The tests cost money and besides I felt it could not happen to me." Holmes winced that magnificent aquiline profile. "Ah, the liability of it all. Watson! Lastrade! I'm afraid that this time I am indeed wrong and Moriarty does win the day!" With that and a flourish of his deerstalker cap, materialised out of an inconspicuous kit bag, Holmes and entourage walked slowly away. Horton and his accuser left to face off in the square.

As we fade to black on this scene, the latest production from the Spotlight Players, we offer our most humble apologies to Messers. Holmes, Watson and, of course, Conan-Doyle. We find

ourselves facing a topic area this month that is anything but positive in contemplation, or in reality. Perhaps the little 'Holmesian' gesture above is a way to add a spoonful of sugar to the medicine as it goes down. We are about to view the spectre of employee hearing damage in the sound business and the concomitant threat of legal liability and action. It is a double-edged sword that cuts equally well all who would use it.

Welcome to the last decade of the twentieth century, and remember that there are nearly as many solicitors and attorneys in the Western World as there are experts on real and attempted 'coups' in the Soviet Union.

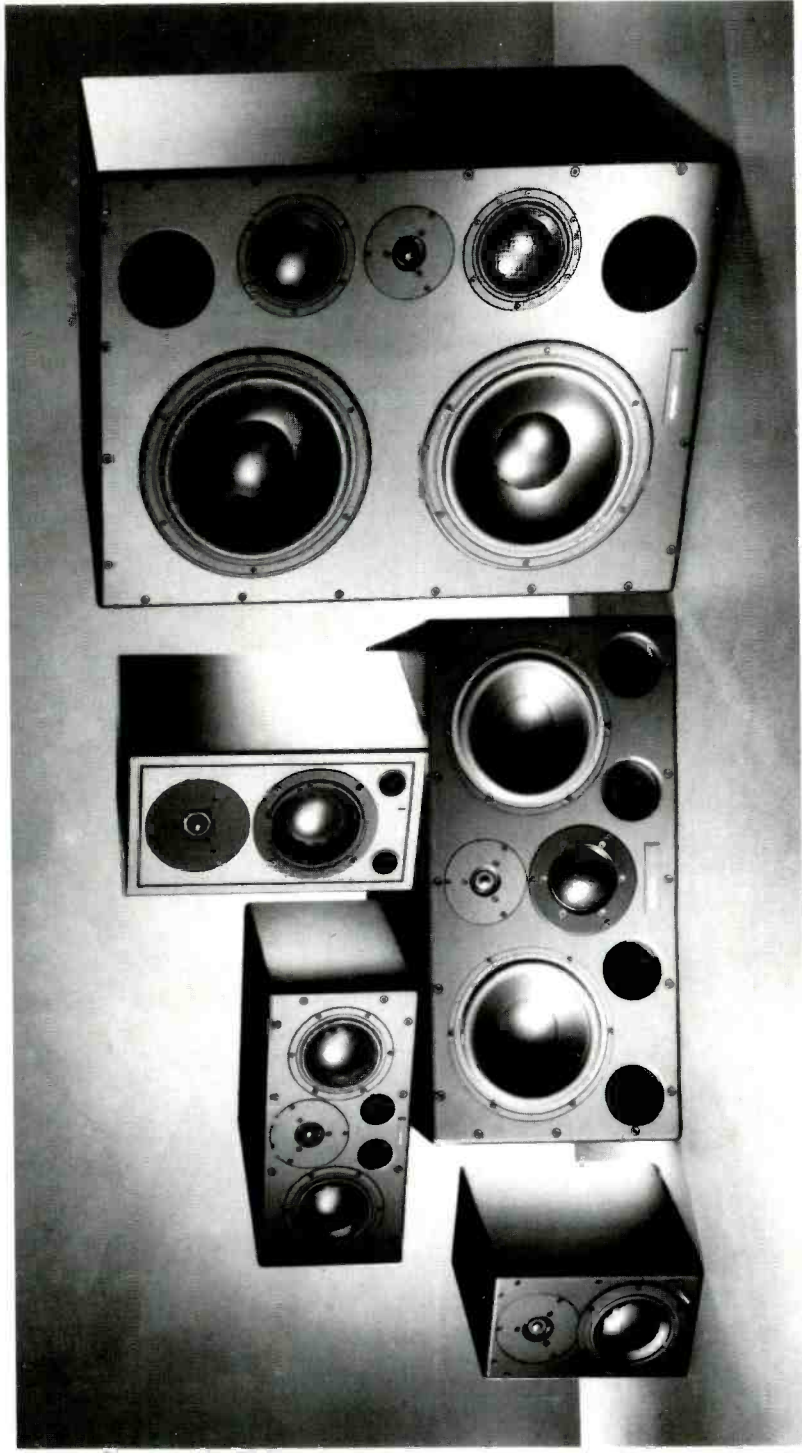
It is perplexing to consider this topic for detailed examination since some might argue that it could be seen as a guide for the unscrupulous, the unethical and the unkind. But, having seen the number of cases involving liability for hearing damage in audio employment take a quantum jump of late, it would appear that a look at the factors involved in this particular audio industry conundrum would be worthwhile. It is interesting to note that this audio industry commentator wrote one of his first articles on this topic approximately ten years ago, albeit for a different publication. The problem was emerging then and it is now more serious. You can ignore this problem but it will not go away!!

The audio industry in the past, was spared much of the dilemma of legal confrontation over hearing damage on the job. Whether the result of natural selection or just dumb luck; such actions rarely happened. Those who worked in audio, loved what they did and generally did not want to endanger their employment. Today, a number of historical precedents covering on-the-job hearing damage still operate — some more significantly than others.

1] There has been significant disagreement over the last several decades as to what constitutes dangerous levels and exposure times in the monitoring of amplified sound. There has always been the difficult connection to establish — especially to the audio community — between continued on-the-job exposure to amplified sound and hearing damage. Despite the macabre good fortune of several otologists in being able to participate in the autopsy of the odd touring rock musician or sound 'roadie', the body (no pun intended) of directly correlating medical evidence has been scant. Much of the evidence has had to be compiled analogously and by hypothesis from occupational health experiences in other industries.

2] Most if not all audio jobs rarely require continuous exposure to high-level amplified sound. Concerts are set-up, run and struck. Then the whole thing is repeated in another location all over again. Time intervenes. At the end of the tour, the whole kit and kaboodle returns to the shop. In the studio, sessions are set up, recorded and struck. Time intervenes. Then the whole thing is repeated again and again. That is the usual pattern in audio and in sharp contrast to the operator of a fifty ton drop forge in a steel foundry or the motorman on a New York City IRI train squealing around a curve. The lack of continuous exposure to high level sound has blunted or reduced the past ▷

New Year's Resolution



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criticism of the audio working environment by hearing safety specialists. Many audio engineers within the audio community play down the risk to audio practitioners. They cite the medically accepted explanation that high-level exposure over a limited time window interspersed with periods of little or no exposure poses much less of a threat of damage over the long time frame than continuous on-the-job exposure. To some extent, they may be selling themselves a bill of goods — similar to the cigarette smokers who believes that lung cancer only strikes those who smoke at least one pack a week more than they smoke themselves.

3) Many, if not most audio employees have resisted calling attention to a decline in their hearing acuity, if indeed their response is degraded. It would be like a fashion model who is allergic to certain fabrics. Her career would disappear in a hurry and so would the job opportunities for an audio operator who could not hear and/or was susceptible to further damage. In the past, people working in audio did not call attention to themselves, no matter what the dimension of the problem. They just turned the volume up.

4) Many audio practitioners maintain the illusion that their "hearing is as good as the day I mixed my first show." That that phenomenon is virtually impossible in the face of changes wrought by the ageing process, let alone high level sound exposure, does not seem to matter. To some extent, many older audio engineers are trying to stay 'current'. A women psycho-therapist who counsels ageing technical types in the electronic entertainment industry, labels the experience as follows. "I call it the 'penal-frequency range' syndrome. And I am not referring to one's ability to hear in prison."

5) The mechanism of the process to compensate those injured in the working environment, known in the United States as Workman's Compensation and similarly elsewhere, has built-in "no fault" and compensation limiting rules. Even if some kind of damage is established, the concept of returning the worker to the job and of stabilizing the size and scope of awards has limited and frequently discouraged use of the 'system'.

6) Many professionals have argued in the past that because the operator of an audio system is in control, he or she usually establishes the levels that the system is monitored at. This 'hand on the fader' syndrome is felt to eliminate or greatly decrease the responsibility of others for any damage that might occur. It has been felt that studio personnel should operate the monitoring equipment at so-called 'acceptable' levels or be responsible for the consequences of what they 'do' to themselves. Studio or concert administrations have relied on this concept frequently to avoid the placing of blame.

7) Historically, up to the mid-1970's, we simply did not have the large amplifiers capable of creating distortion-free energy at levels formerly reserved for the transmitters of clear channel AM radio stations. Today's monitoring and/or concert reinforcement speaker systems are capable of handling four times the power of yesterday's speakers, with significantly less distortion present at the higher levels. Cutting to the chase, we find

that in the past, you simply could not achieve the distortion-free sound levels we now justify under the heading of "Digital Dynamic Range."

8) Compared to other more obvious noise polluters and faced with woefully inadequate budgets, the government officials charged with enforcing noise safety standards in the workplace, tended to let the audio industry 'slide'. Yet they do deal with the steel foundry and main line rail maintenance yards before they start to regulate levels at Pandemonium Record Studios.

That was all then and this is all now, as they say in the trade. For the 1990's, the story reads somewhat differently. Begin with a new set of strictly enforceable and enforced codes for occupational health and safety on both sides of the Atlantic and add to this a general reluctance of both the legal community and the "league of injured" to accept these somewhat dubious mandates of the workplace compensation systems. Factor in a loss of pride in both the workplace in general and audio in particular. Recognize that an attractive settlement would allow for a particularly "very nice indeed" home and/or project studio to be built by the 'injured' party; not to mention a new cream coloured Mercedes runabout for the 'counsellor'! Mix in the past several generations of solid state power amplifiers that still may not be able to cut large screwdrivers in half, but are more than capable of destroying inner ear 'hair' cells. On top of all of this, or perhaps at

How many people can show they have the acoustical virginity of Rebecca of Sunny Brook Farm?

the root of it, is the realization of the medical community that they finally have nearly twenty years of good epidemiological data to make the following case: that significant, though intermittent, high level audio industry exposure does shift hearing response and level accuity off of the norm for the population as a whole.

You will note that it is not necessary here to delve into the wonderful world of science in terms of hearing and other whole body damage from high level sound. We do not have to meet "Mr. Wizard" here. We have done that before and we will do it again in this column. The issue at hand is that the basic practices of how we use and cope with the excesses of high level sound have changed. This brings us to the most effective way for those in the management and ownership of audio industry establishments to cope with this new, somewhat dubious future. What we are beginning to see is a careful pattern of protection. Protection against enforcement of strict EC and US codes. Protection against employees either damaging themselves or pretending to do so. Protection against employers who do not take care to provide adequate

safeguards and to document such provision. Protection against the unwarranted usage of the legal system.

When we began this opus, we indicated that the sword of damage and liability was double-edged and would damage both the swordsman and the victim alike. What we now have is a world where, increasingly, those who work with audio have to prove their hearing competence before the granting of employment and frequently during the course of it. At the root of all of this is the position a litigant must take before the court. Whether under the dubious protections of working place laws or attempting to strut out beyond such statutes, the 'injured' party must prove both innocence and purity. Good luck. How many audio people can show that they have the acoustical virginity of Rebecca of Sunny Brook Farm. A veteran trial lawyer put it thusly:

"When one enters the hallowed strictures . . . or is that structures . . . of the law, involving a case of injury in the workplace, the entire system is geared up to see a really pathetic blameless individual. The operator of a fifty ton press who got his head in the wrong place and is now inspecting refrigerators without really having to open the door. An open and shut case. On the other hand, take the case of the young man, in the very prime of life, whose shall we say 'male appliance' was caught by a sausage maker while he was being given 'mouth to mouth resuscitation' training by his supervisor Miss Dalli-Ance on top of the sausage prep table. This is certainly not the case of one who is without original sin. Now consider the impact on the court after seeing days and months and years of maimed and mangled individuals or the widows and widowers thereof, and in walks Smiling Jack of the Audio Industry with his counsel about to present the case of a 14 db notch at 4250 Hertz. Good Luck!"

Those in the audio industry in the future are very likely to encounter a repetitive audiology-based testing programme. This serves two purposes. First, it provides an initial baseline to protect employers from damage claims based on damage other than that occupationally caused. Secondly, it serves to monitor possible damage through the years from both on and off the job sources. What so many forget is that today's range of portable audio systems with earphones, home hi-fi systems, supersonic car audio installations, and boomboxes can be as damaging as any in-studio experience. Add to that lifestyle issues such as gun usage, either in or out of the military, the ownership or even an occasional ride on a motorcycle, the regular use of subway systems, air travel, etc. What we have is a bottom line issue where both the employed and the employer have a real incentive to protect hearing and prevent damage. And oh yes, the issue of litigation has done little else but to add another layer of precaution to our already smothered lives. We are already existing in a virtual cocoon of do's and don'ts. Almost all of the court cases that have been so far entered have been thrown out due to the impossibility of proving that someone in the audio community has lived their life with total isolation from the non-working place sources of damage indicated above. More on this issue to follow! □

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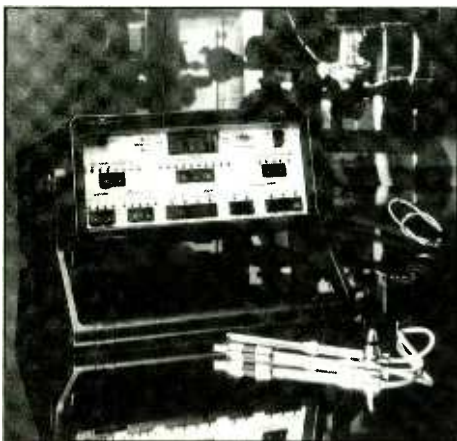


Test equipment news



▲ **Actferry surface conductivity meter:** static electricity can be a severe threat to electronics and awareness of materials likely to become charged is important where the close handling of components is possible. Actferry have introduced a portable surface conductivity test set with a capability to measure from 10^7 to 10^{13} ohms per square which is the resistivity range where static build-up can be a problem. The unit automatically measures resistance and relative humidity over the full range. Measurements are made via a hand held measuring head that has a flexible electrode that can conform to non-flat surfaces. Supplied with rechargeable internal batteries having a 20 hour life. Actferry Ltd, Welwyn, Herts, UK.

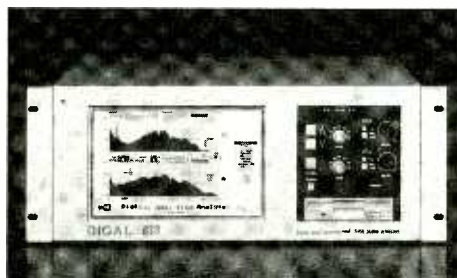
UK: Hiltek Ltd, Bredhurst Road, Detling, Maidstone, Kent ME14 3HB.
Tel: 0622 37472.



▲ **Bruel & Kjaer portable analyser:** Bruel & Kjaer have introduced a new portable sound intensity analyser to replace the Type 4433. The 4437 is an 'entry level' product and applications include sound power measurements in accordance with ISO/DIS 9614. The unit meets requirements for proposed IEC standards for sound intensity instrumentation, while having better performance than the 4433 in terms of dynamic range measurement speed and storage capacity. The 4437 can operate as a Type 1 sound level meter providing

linear or A-weighted 1/1 octave analysis, linear or exponential averaging with selectable averaging times, and storage of up to 140 displays. The memory can be subdivided into ten files allowing calculations to be made for ten separate sources. The analyser can be used with the 2318 graphics printer for printouts in the field. Mains or battery powered, it also has IEEE 488 and RS232C interfaces.

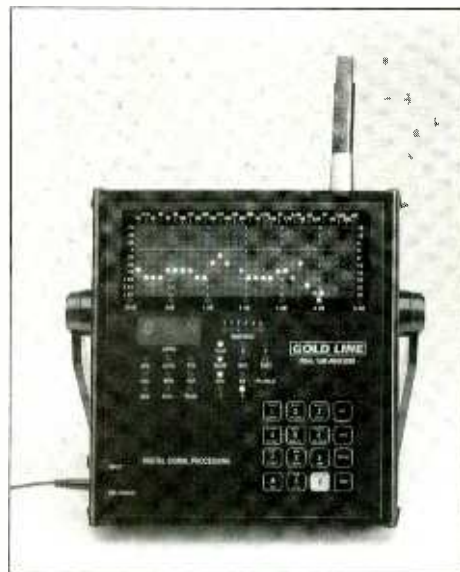
UK: Bruel & Kjaer (UK) Ltd, 92 Uxbridge Road, Harrow, Middlesex HA3 6BZ. Tel: 081 954 2366. USA: Bruel & Kjaer Inc, 185 Forest Street, Marlboro, MA 01752.
Tel: (508) 481 7000.



▲ **DIGAL 56:** the DIGAL 56 from Elettronica Montarbo is a digital dual channel realtime spectrum analyser. Its operating software allows a wide range of measurements to be made including 1/3-octave frequency analysis, FFT analysis, Frequency Transfer Function, Reverb time, sound level meter, time domain measurements and the generation of test signals. Data storage is on the internal hard disk or the floppy drive. The system is programmable and modular in structure with a range of options. Display of data is via the large front LCD panel and on an external colour monitor.

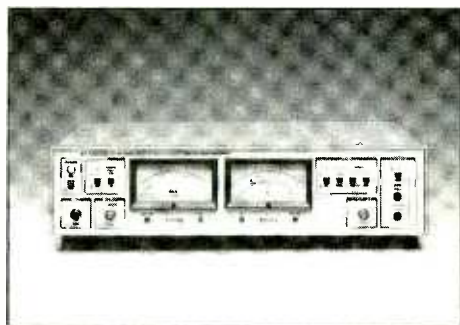
In the 1/3-octave frequency analysis mode, both linear and exponential averaging, peak hold and freeze capability are available with resolution up to 0.1 dB. Display may be one or two channels, or two channels and their difference simultaneously. A special software tool is available for detecting ambient response using a piece of music as a stimulus. One of the spectra can be delayed by an adjustable time period. Elettronica Montarbo SRL, Via G di Vittorio 13, 40057 Cadriano (Bologna), Italy.
Tel: 051 76 64 37

► **Gold Line spectrum analyser:** Gold Line have added a new spectrum analyser to their range of moderately priced test equipment. The DSP-30 is a 1/3-octave portable realtime analyser. The LED window has a 85 dB range with a SCROLL UP and DOWN function. The scale can be graduated in 1/4, 1/2, 1, 2, 3, 4 or 5 dB and there are three selectable modes — average response, peak reading



response and peak hold mode, and adjustable decay times. The DSP-30 operates at mic and line level — a microphone electret is provided. There are six memories that are expandable to 30 and there are summing and subtraction modes. Gold Line say that the 1/4 dB measurement scale will allow faster alignment of tape machines using standard test tapes. Selection of varying digital filter types is possible from the front panel to suit differing applications. Optional features include ports for printer, RS232, oscilloscope and CRT. Gold Line, Box 500, West Redding, CT 06896, USA. Tel: (203) 928 2588.

UK: SPL Sound Products, Newport, Gwent.
Tel: 0633 252957.



▲ **Leader Jitter Meter:** jitter is an unwanted variation in the absolute timing of a data bit stream. Leader have introduced a new model for measuring jitter, the LJM-1851. This measures jitter of the 3T bit (the fastest signal and most critical jitter component) in both unweighted and weighted modes. The unweighted mode has two ranges — 100 ns or 200 ns FSD. The weighted or sigma mode has 30 ns or 80 ns full scale ranges and measures jitter within plus or minus one standard deviation relative to the mean (3T) signal.

UK: Leader Instruments (Europe) Ltd, Raglan House, 8-24 Stoke Road, Slough, Berks SL2 5AG. Tel: 0753 538022.

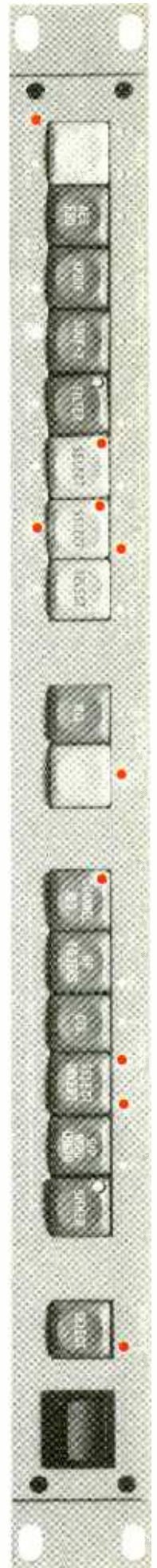
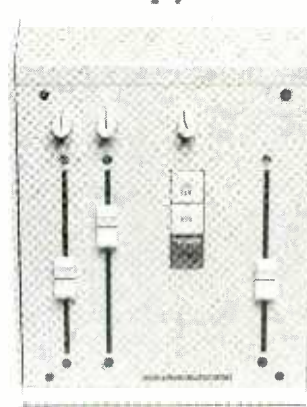
AT LAST. A MULTI-PURPOSE DIGITAL AUDIO PROBLEM-SOLVER THAT WON'T BREAK THE BANK.

Even in the most sophisticated digitally-equipped studio, transferring audio data within the digital domain can be fraught with problems. and not for the first time, it's taken application-led European design expertise to come up with a highly versatile solution. The FC1 from Audio Digital Technology.

The FC1 brings a new meaning to the phrase multi-purpose. Basic functions include format conversion and transfer between virtually any two channel, multi-track or hard disk digital recording system. But that's just part of the story. The device can not only add or strip emphasis from different incoming digital signals, but it's a natural link between digital recorders and the latest outboard processors.

Teamed with a useful remote unit option, the FC1 even provides digital level mixing and channel cross fading. Furthermore, all this takes place within a true 24 bit architecture, assuring the FC1 a sure place alongside tomorrow's recording technology.

Sheer practicality apart, the pleasant surprise about the FC1 and its remote partner is the cost, a fraction of what you might pay for technology that attempts to cover the same range of applications. If you're serious about digital audio and care about quality, contact ADT now and ask for further details.



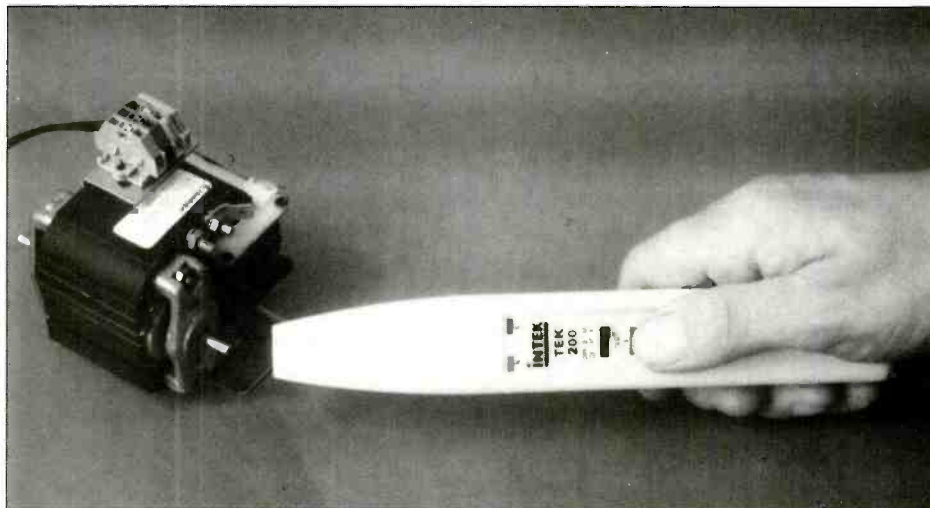
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▲ Magnetic field detection: the *Selectronix Type 200* is a "non-contact" test pen that gives visual and audible voltage warning and displays the polarity of magnetic fields. It is suitable for measuring conductors in the 100 to 600 volt range and for inductors, relays,

solenoids and transformers operating from low voltage AC/DC. The system also includes a 50 Hz self check facility sent to either voltage or magnetic sensor.
UK: Selectronix, Unit 5, Minerva House, Calleva Industrial Park, Aldermaston, Berks RG7 4QW. Tel: 0734 817387.



▲ Neutrik portability: when Neutrik launched the *A1 Audio Test & Service System* they stressed its portability. To increase the user's ability to realise this aspect Neutrik have introduced a soft carrying bag designed and made for the *A1*. Access to the controls is by pulling up the front cover while a compartment at the rear takes the connected mains cord and a side pocket holds accessories such as microphones, cables or an

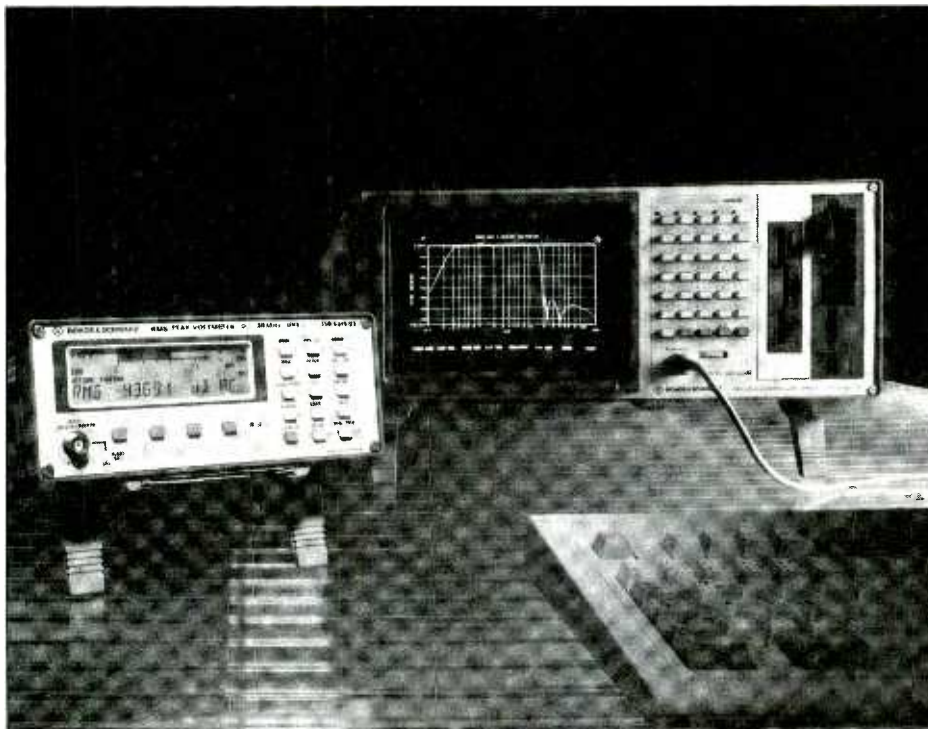
adaptor. The bag is suitable for hand or shoulder carrying. Neutrik AG, FL-9494 Schaan, Im Alten Riet 34, Liechtenstein. Tel: 075 2 96 66.

UK: Neutrik UK, Unit 2, Samuel White's Industrial Estate, Medina Road, Cowes, Isle of Wight PO31 7LP. Tel: 0903 299959.
USA: Neutrik USA Inc, 195-53 Lehigh Avenue, Lakewood, NJ 08701-4527. Tel: (201) 901 9488.



▲ **Mercer Digital Multimeters:** the Mercer Electronics division of Simpson Electric have started offering a range of low cost digital multimeters — two pocket-sized units with ½-inch digital displays, four hand-held units and the Digi-Clamp. The very small 9345

includes single rotary disc control and a protective cover that includes probes and the manual. The 9702 Digi-Clamp features a data hold function. Mercer Electronics, Simpson Electronic Company, 853 Dundee Avenue, Elgin, IL 60120-3090, USA. Tel: (708) 697 2265.



▲ **Rohde & Schwarz voltmeter:** Rohde & Schwarz have introduced a RMS/Peak voltmeter that has been tested to electromagnetic interference standards as set by the IEC and VDE. The URE 3 was designed to operate in high levels of EM with minimal effect and no permanent damage. Relevant

application areas include LF/audio engineering, digital storage, video engineering (particularly HDTV), audio and video tapes. UK: Rohde & Schwarz UK Ltd, Ancells Business Park, Fleet, Hants GU13 8UZ. Tel: 0252 811377.

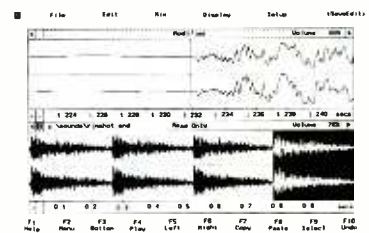
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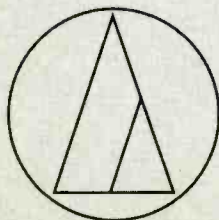
EUROPE

*The BBC
ITV Stations
The Barbican Centre
R.A.I. TV Italy
TV France
Norway National Broadcasting
Royal Dutch Shell Boardroom*



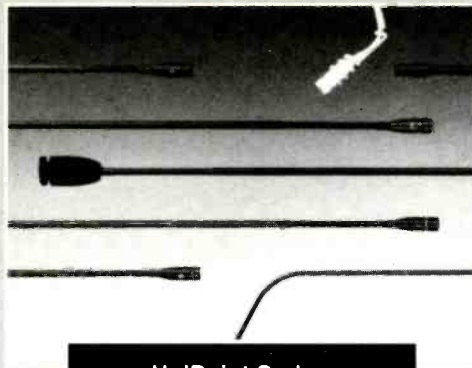
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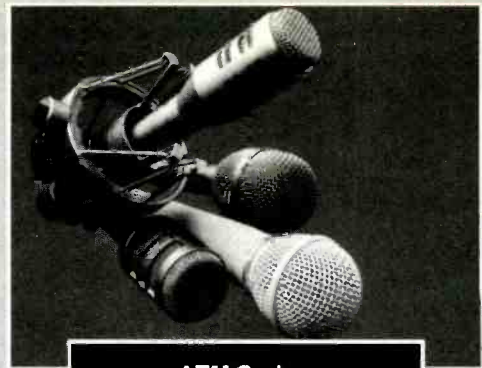


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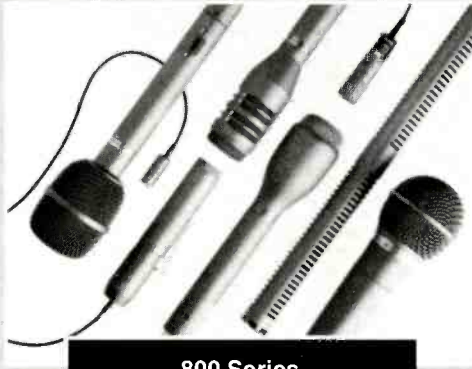
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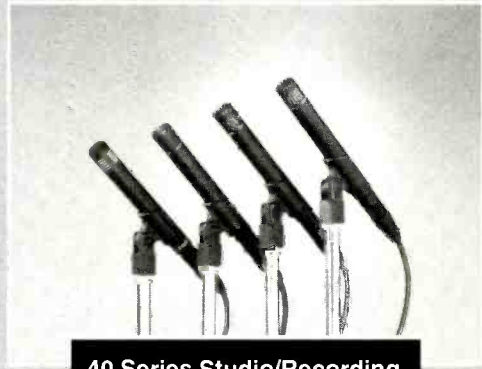
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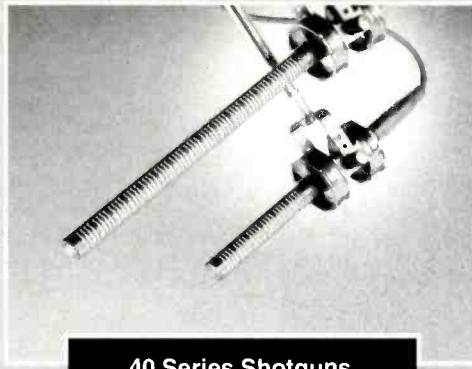
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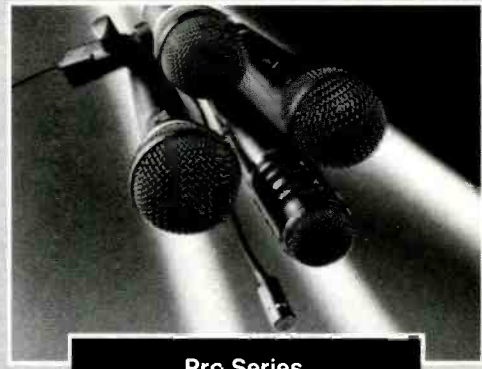
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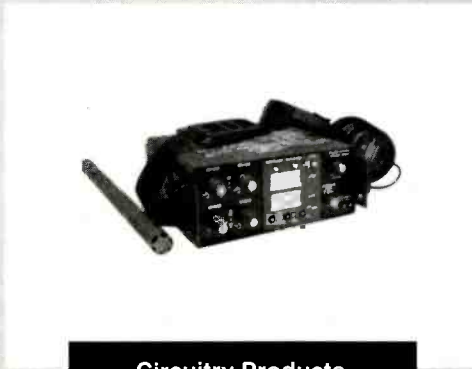
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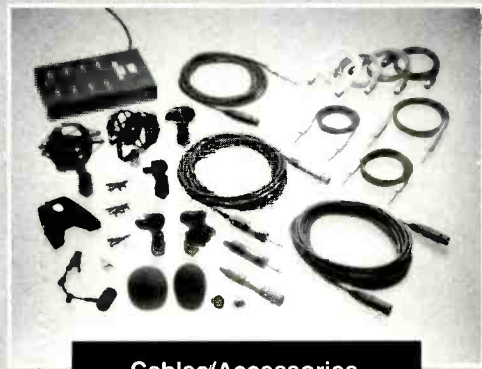
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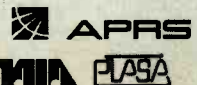


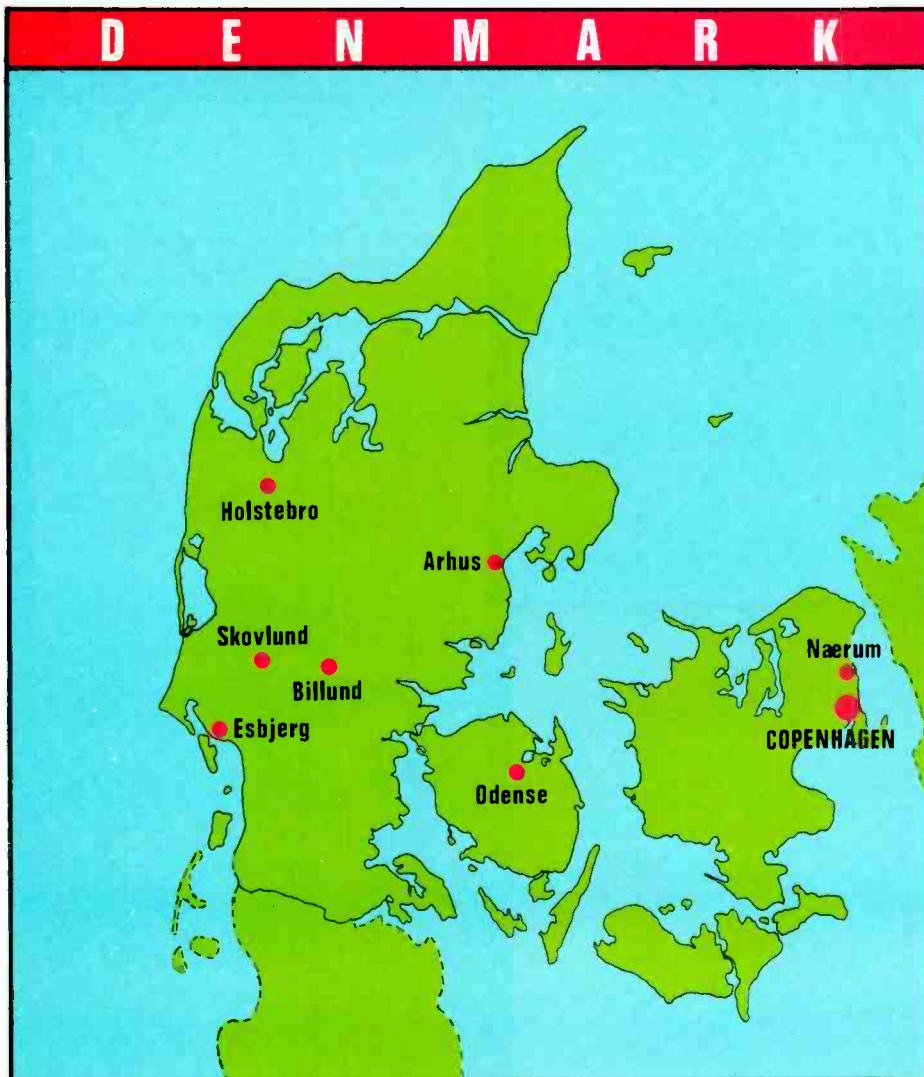
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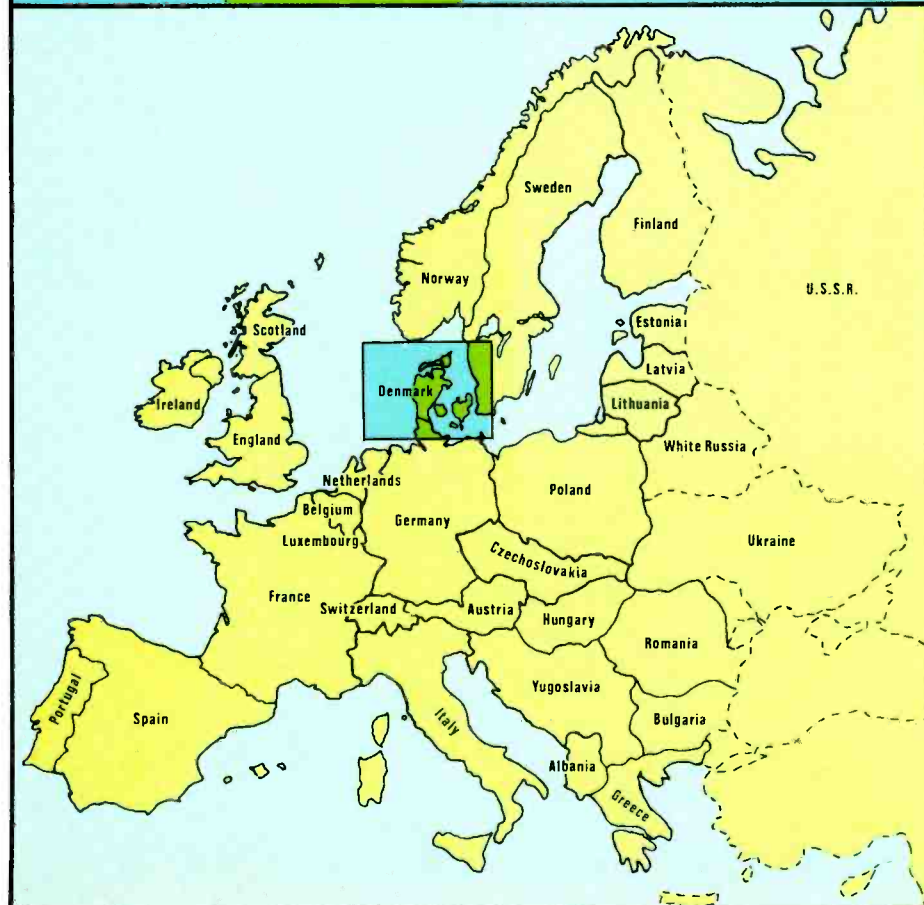
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GREAT DANES IN EUROPE

Studio Sound looks at recording in the European Market, beginning with Denmark. Report by Janet Angus.



For most Europeans who happen to live in one of the twelve countries that comprise the European Economic Community, 1992 has been given a special significance. The sheer weight of information and advice emanating from the respective governments about it being an event to prepare for has created an aura of low key anticipation. Without a doubt it will bring important changes that will effectively remove all barriers to the movement of money, goods and people between member countries. However, this all really happens in 1993 (or the dying seconds of 1992) but it is bound to be a gradual process of adaptation from that point in time — nothing so complex can really change overnight.

Over the last couple of years we have also seen immense changes in eastern Europe with the swift demolition of the Iron Curtain and the shaky emergence of fledgling democracies. Even Russia (a large chunk of which falls under the geographic definition of Europe) has been such a catalyst in much of this East European change and has now become as emeshed in change as its former satellites. Money and social organisation is preventing any rapid development in many of these instances but some showcase projects are under way that have certain recording industry implications. ▶

At the time of writing this we hear that seven European countries that comprise the European Free Trade Association (EFTA), ie all the western European countries not currently members of the EEC, have reached an agreement with the EEC to create a single economic market and remove all trade barriers creating free movement of goods, services, money and labour between EFTA and the EEC over the coming years. This will mean that all of Western Europe will be a single market with quoted figures of 40% of world GNP. The Eastern half of Europe is also keen to join but this will be some years away.

This brief geo-political snapshot of Europe at the present time shows the considerable potential impact that could lie ahead for the sound recording industry. The increased accessibility of all these European countries, together with the ease of movement of goods and money, means that projects will become far more mobile. There are good studios throughout Europe now not just in the major recording centres.

Having the above background to Europe we felt that it would be worthwhile taking a look at Europe in 1992. Taking the Greater Europe as our target, we have divided it into twelve defined areas and it is our intention to publish monthly reports over the next year. The amount and depth of information available will vary considerably from territory to territory as you might expect. Our aim is to give you some basic data about the country and the factors that impact its indigenous recording industry; a look at the recording facilities available and general availability of equipment and musicians.

Greater accessibility or ease of working within Europe is only of advantage if you can use it. So we will place a great deal of emphasis on practical information. The schedule for the year is as shown and we, of course, will welcome any input from readers to make this as comprehensive as possible.

SCHEDULE FOR YEAR

JANUARY	DENMARK
FEBRUARY	NETHERLANDS
MARCH	GREECE
APRIL	ITALY
MAY	BELGIUM/LUXEMBOURG
JUNE	SPAIN AND PORTUGAL
JULY	FRANCE
AUGUST	GERMANY
SEPTEMBER	UK AND EIRE
OCTOBER	EASTERN EUROPE
NOVEMBER	SCANDINAVIA
DECEMBER	AUSTRIA/SWITZ



Naerum is 17 kilometres from Copenhagen and the home of Bruel & Kjaer.

The country

Denmark comprises the northern part of the Jutland Peninsula, the Faero Islands and strictly speaking, Greenland, although the latter is more or less independent. The smallest Scandinavian kingdom, Denmark covers an area of 43,069 square kilometres excluding Greenland. The land is broken up into numerous islands giving it an exceptionally long coastline with many fjords and natural harbours. There are 483 islands in the main archipelago, 97 are inhabited. Its population numbers around 5.5 million.

Capital city Copenhagen is situated on Sjaeland, the largest island. Aarhus, the next largest city lies on the east coast of Jutland. Because of the nature of the country there are numerous ferries and bridges making travel between the islands simple.

Seventeen of the Faero Islands are inhabited and, in sharp contrast with the flat landscape of Jutland, originated from volcanic eruptions and are extremely mountainous; coasts are indented with deep-cut cliffs.

Climate

Jutland's weather, despite its west coast facing the North Sea, is influenced by the North Atlantic

Drift giving a mean temperature in February of 1 degree Celsius (34 degrees Fahrenheit), 12 degrees higher than average for the latitude. Winter traditionally sees a fair amount of snow, although this has not been the case during the last couple of years but if it does arrive the country is well prepared. Summer brings continental heat, with July seeing the warmest weather.

The Faero Islands on the other hand enjoy a typically oceanic climate with frequent fog and heavy rain (63 inches annually). Mean temperature in January is 3.2 degrees Celsius, in July 10.8 degrees Celsius.

International access

Denmark's location makes it extremely accessible from all over Europe by road and ferry; in addition there are daily direct international flights into Copenhagen, Aarhus and Billund (near LegoLand in western Jutland). Scandinavian Airways (SAS) operate direct flights from 21 countries including the UK and the USA.

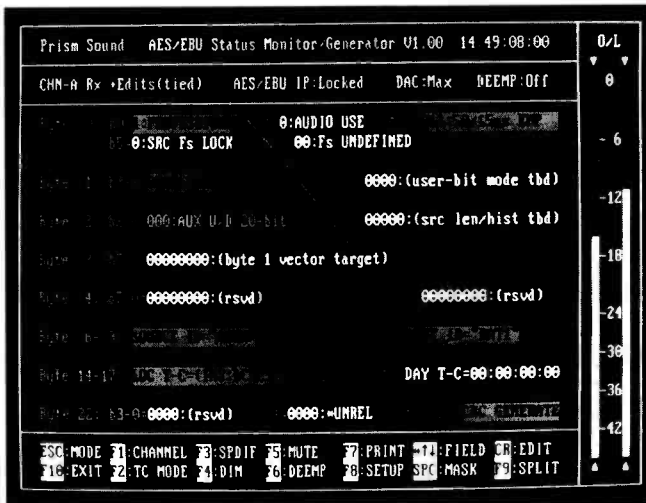
From the UK there are 53 flights a week from London Heathrow to Copenhagen with connections to all UK airports. SAS, Aer Lingus and British Airways also operate daily direct flights from Manchester to Copenhagen. There are also direct flights to Aberdeen. ►

DAS-90. The AES/EBU-SPDIF Channel Status Editor by Prism Sound

Digital Audio signals are not so easy to monitor as analogue signals; they cannot drive headphones or a level meter. They contain Channel Status data which can be as useful for some as it is problematic for others.

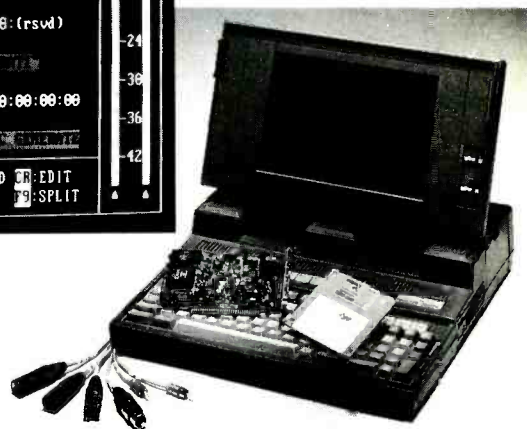


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DAS-90 AES/EBU-SPDIF CHANNEL STATUS EDITOR

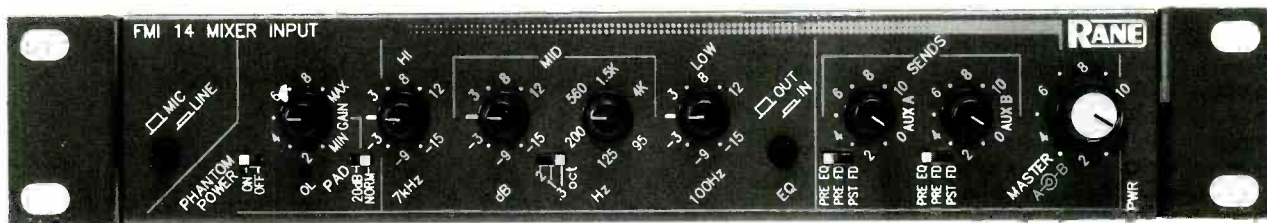
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The DAS-90 solves the problem of access to Channel Status, making possible its exploitation and solution of related problems. The DAS-90 also provides metering and monitoring.

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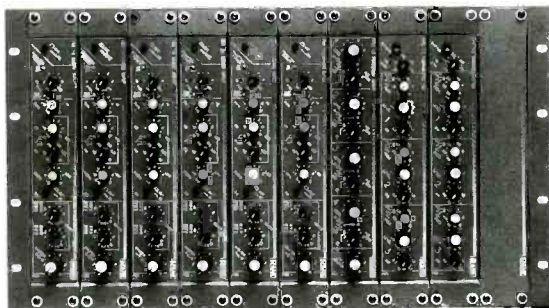


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Maersk Air fly from Gatwick to Billund and Copenhagen twice daily and also provide a service from Copenhagen to the Faero Islands. Other services include flight from Amsterdam, Brussels and Stockholm, all into Billund.

For the American traveller, SAS operates flights from Chicago (four per week), New York (seven per week), Los Angeles (five per week) and Seattle (four per week) all into Copenhagen, as well as once a week from Toronto.

One of the most pleasant ways to arrive in this seafaring country, however, is by ferry. DFDS ferries ply the North Sea between Harwich and Esbjerg every other day, and during the summer, twice a week from Newcastle. The crossing takes about 20 hours.

There are no real problems entering the country. Most nationalities will not require visas, and a simple Carnet is all that is required for your gear. Work permits are not required for recording studios, although if you intend gigging you will need one. The people are very friendly and easy going, and most speak excellent English, if not French and German too. There is therefore no difficulty in getting around. Road networks and ferriage are modern and efficient.

The recording industry

Although its population is small, Denmark has a thriving music industry with some 50 professional recording studios, and both concert and club venues in almost every town. Summer sees endless big free festivals all over the country. 50% of the music charts are Danish bands, and there are a number of Danish record companies. Several of the studios maintain strong links with individual record companies (eg Sweet Silence in Copenhagen

with Pladekompani; Medley Studios with Medley Records). This ensures a certain amount of work during these times of recession.

One area which is currently booming is audio post production, servicing the various television companies. Broadcasting has expanded in recent years.

In addition to the Government funded Danmarks Radio TV channel there is now TV2 which is still 50% State owned, but the other 50% is private industry. Satellite channels are also very popular.

Danmarks Radio also broadcast three national radio channels and eight regional stations. Local radio has been very popular during the past six or so years when "anyone with a 2-channel mixing console and half a record player could set up a local station". More control has now been imposed and a few of the local radio stations have become more professional and therefore successful.

TV2 is planning to broadcast in Dolby Surround from 1 January 1992. For its part, Danmarks Radio will be broadcasting in stereo from around the same time. There is plenty of work around for the post production houses. Sun Studios in Copenhagen have three post production studios working virtually round the clock. Norway is planning to launch its own TV2 TV channel with the aid of £15 million from Danish media company Gutenberghus (around 20% of the total investment). This will mean more work for Danish facilities houses.

The sound recording studios have been affected by a boom in home recording amongst the Danish bands. The Sony record company recently purchased a number of Yamaha DMR8s for use by its acts. Nevertheless of the 50 recording studios most are surviving a period of recession which Denmark, like so many European countries, has not escaped unscathed. Sadly, possibly one of the best known Danish residential facilities Puk Studio, recently ran into financial problems. On ►

DENMARK DATA

LANGUAGE: Danish. Interpreters are not needed as virtually everyone is able to communicate in at least one of English, French and German.

CURRENCY: Danish Kroner: DK6.3 = \$1; DK11 = £1.

CAPITAL: Copenhagen. Other major towns are Aarhus and Odense.

VISAS: Generally speaking these are not required except for visitors from a few Eastern and Middle Eastern countries including Pakistan, Iran and Iraq.

WORK PERMITS: Not required for bands recording in Danish studios. If the visit includes gigs however, permits must be obtained.

CARNETS: Carnets are required for the temporary importation of all recording equipment and musical instruments.

MAINS POWER: 220V, 50 Hz.

TV/VIDEO STANDARD: PAL G

RECORDING STUDIOS: Over 50 professional recording studios mainly centered around Copenhagen and Aarhus.

BROADCAST CENTRES: Danmarks Radio, Copenhagen; TV2, Odense.

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Tel: (031) 22 44 34

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SF-00381 Helsinki,
FINLAND.
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92182 Antony,
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Tel: (01) 4237 0102

Teac Deutschland GmbH
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6200 Wiesbaden-Erbenheim,
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Tel: (06121) 71580

Elina SA,
59/59A Tritis Septemvrious St.,
Athens 103,
GREECE.
Tel: (01) 8220 037

Greenlands Radio Centre,
PO Box 119,
3900 Godthab,
GREENLAND.
Tel: 299 21347

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Cinisello Balsamo, Milan,
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TASCAM



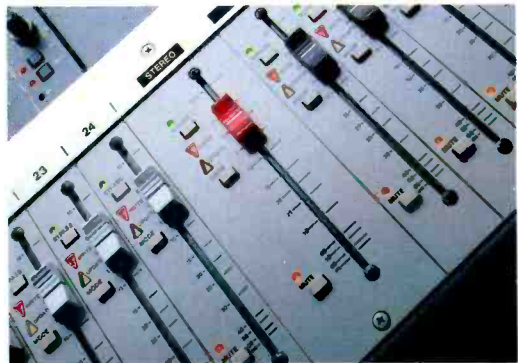
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The recent M-2500, M-3500 and M-700 have led a quiet revolution in console design which continues with the release of the automated M-3700 series.

Imagine a console that remembers every fader



movement and every automated switch movement in either realtime or snapshot mode.

Imagine a console which stores mixes onboard for instant access in theatre, concert, post production or recording situations.

Imagine a console which affords you the luxury of being able to experiment endlessly or fine-tune any mix without losing the inspiration of the original.

Imagine never again having to re-do an entire mix because of one mistake.

Imagine really being in total control.

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M-3700 £8750.00, M-3700-32 £9750.00 (All prices exclude VAT and are correct at time of going to press).

the other hand ARP Studios, a small Aarhus based facility, recently produced a track called *Get Serious* for Cut-'n-Move which reached the top 100 in the US charts.

Denmark is also home to a number of internationally known pro-audio manufacturers including Lyrec, tc Electronics, Dynaudio Acoustics, TubeTech, Bruel & Kjaer, RE Instruments and NTP Electronics. JBL also have a factory in Holstebro.

All major brands of professional recording tape are represented and readily available. Ampex and BASF are supplied by Steen Hauerbach and Interstage respectively; 3M comes direct from 3M Denmark, all are situated in the Copenhagen area.

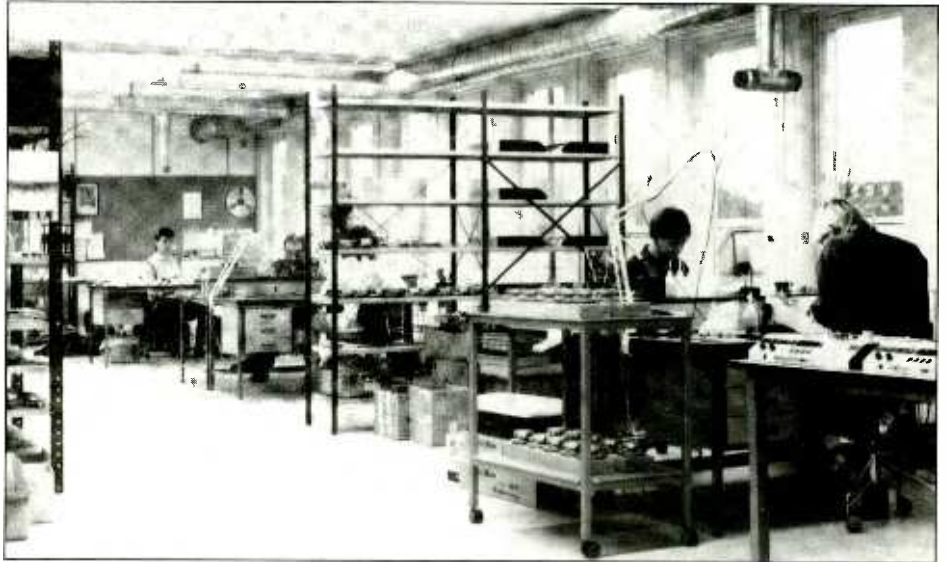
Equipment hire is not a problem as the numerous dealers will supply almost anything on a rental basis. All major manufacturers are represented by Danish agents. Similarly technical back up is efficient and readily available.

The Danish Musicians Union (DMF) is very active and can assist with any needs, be it fixers, musicians, backing vocalists etc. It also publishes a yearbook which lists all its members as well as facilities etc.

The Faero Islands, surprisingly with only a population 40,000, has two 24-track and four 16-track recording studios. Its local television station Sjonvarp (SVF) broadcasts five days a week with its own news programmes and children's television. The station has recently re-equipped its fourth editing suite with an Amek BC3 mixing console. Faero Islands' Radio has just spent some £7 million on a medium wave transmitter to enable its 150-200 fishing boats to receive programmes. Venue wise, there is the Nordichus cultural centre, funded by all the Scandinavian countries. So if you want to be different you know where to go to record your next album.

AB Music contracts

Danish Dolby representative AB Music, in Arhus, has completed a number of large contracts to supply Dolby *Surround* sound systems to television companies such as TV2 in Copenhagen and the regional TV mid-west station in Holstebro,



Lyrec's production line for FRED, the free editing tape system sited at Skovlund.

as well as several video post production companies including Basyfilm, Adaptor and Nordisk Film Copenhagen. Die Danske Film Studio in Lyngby near Copenhagen has been supplied with 24 tracks of Dolby SR — the first SR system in Denmark. This will be used in film post production applications.

AB Music is also agent for Amek/TAC and as such has won several recent contracts. Adapto post production studio in Copenhagen has taken delivery of a 48 frame Amek *Hendrix* mixing console in its Studio A. The fully automated inline desk is fitted with Amek's *Supertrue* system. Faero Islands' television station Sjonvarp (SVF) has re-equipped its fourth edit suite with an Amek BC3 console, and the cultural centre Nordic Hus has taken delivery of a TAC *Bullet* console.

new outside broadcast vehicle, the largest OB truck allowed on Danish roads. This has been part of a contract carried out by Ampex UK and Ampex Denmark to design and equip three new outside broadcast vehicles — two for television and one for radio. One of five Neotek consoles delivered to Danmarks Radio in 12 months, it was supplied modified to meet the Nordic N9 and N10 specifications in a compact mounting. The broadcasting corporation has also purchased four *Elite 332* consoles, the last two delivered in January.

Neotek/New Musik contracts

New Musik recently supplied a Neotek custom *Elite 324* mixing console to Danmarks Radio for its

● Focusrite Audio Engineering and DA Distribution ApS of Denmark have officially announced the signing of a dealer agreement for the Focusrite *Studio Console* and modular products. Contact Morten Sonndergaard, DA Distribution ApS, Gersonsvej 83, DK-2900 Hellerup, Denmark. Tel: (45) 31 610 755. Fax: (45) 31 652 449.

● BOP recording Studios in Bophutswana have taken delivery of 24 pairs of the DynaudioAcoustics C2 Classical Reference monitor for installation throughout the recording studios, villas and listening rooms. The C2s will be used as nearfield monitors in the studios and as reference playback sources throughout the villa complex, entertainment areas and listening rooms. Swedish Radio have installed C2s as their sole source of monitoring in their new classical music control room in Gothenburg.

● The BBC has recently bought 30 FREDs (Free-Editing system) for Network Radio based at Broadcasting House, London. Earlier this year the BBC World Service bought 13 new FREDs to add to the numerous machines already in use at Bush House.

● The score for David Kronenberg's latest production 'Naked Lunch', has recently been recorded at CTS studios in London using Bruel & Kjaer 4006s as the main overheads on all orchestral recordings.

10 OUTLET DISTRIBUTION AMPLIFIER 4



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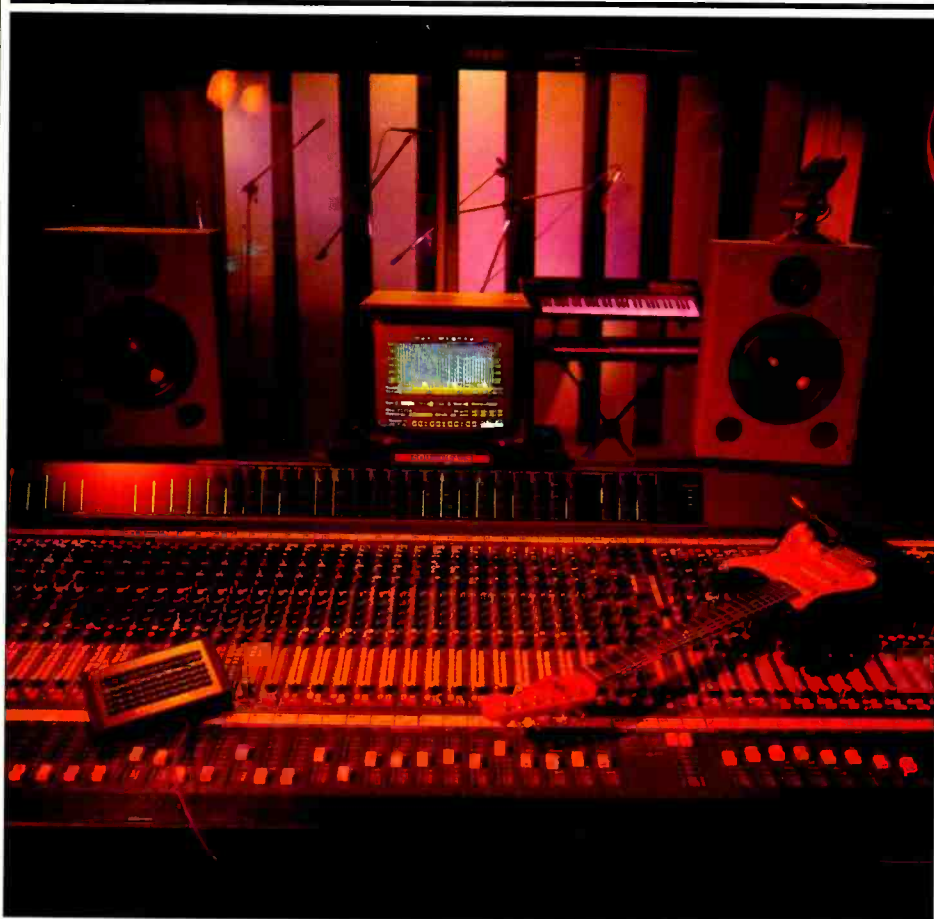
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Tracmix Automation

Version 2 of Tracmix automation from Soundtracs enhances the system considerably. Patrick Stapley reports



It is quite surprising to discover the kind of facilities now being offered by some of the lower cost automation systems. Not that long ago it would have been unheard of to have this degree of computer control installed in small or home studios, but now it's almost expected as part of the package — and is a further sobering reminder of how the industry is changing. The Soundtracs system, *Tracmix*, has been available for over four years, but it's only recently that the software has been fully updated; *Version 2* takes the system a considerable step forward both in terms of facilities and operation. In fact, Soundtracs appear committed to enhancing and popularising the system, and like other companies, have decided to allow the system to be retrofitted to other manufacturer's consoles — the very good news for the three hundred or so existing *Tracmix* users is that *Version 2* is supplied completely free of charge.

To look at the system, I visited producer Paul Fishman's home studio in London, where it has been installed in a Soundtracs *IL 3632* in-line console. Fishman is a well seasoned *Tracmix* user and many of the enhancements made on *Version 2* have come from his comments and suggestions.

The standard system comprises a dedicated multiprocessor computer containing 960 K of RAM and a single 3.5 inch floppy disk drive housed in a 3U 19 inch rackmount unit; a 60-key purpose built compact remote keyboard including QWERTY keys; one VCA card per channel daisy-chained in blocks of eight; and a colour monitor. Consoles with more than 32 channels will require an additional 32-channel processor, and the maximum number of channels *Tracmix* can support is 64. The system is extremely quick and easy to retrofit, with the VCA cards attaching directly to existing logarithmic faders including the main mix faders. Additional rotary level

controls such as effects returns can also be automated. Both faders and mutes are half frame accurate, and the fader has a 12 bit resolution providing an impressive 4096 linear steps. The VCAs are *2151s* which are automatically bypassed when the system is not in use.

The Keyboard is divided into two main areas — dedicated function keys at the top with alphanumeric keys below. Thirty-two of the lower keys also act as individual channel keys for functions like muting, status selection etc, and they can be shifted to provide control for channels 33-64. The compact design of the keyboard has the advantage of not getting in the way, but it also results in small keys and a relatively cramped operation.

One of the problems with screen-based systems is that the displays are not always easy to make out from the console. Although *Tracmix* is not perfect in this respect, its main screen is definitely easier to use than some due to its clear, uncluttered layout and good use of colour; also the system is not totally reliant on screen selection as it operates with dedicated keys; there is no mouse or tracker-ball. The main screen uses the now familiar bargraph/status box type of layout; the top half of the screen displays 32 bargraphs relating to the faders and their VCA positions (including main mix faders), below this are rows of boxes showing colour-coded status for the associated faders and mutes. To view channels higher than 32 the display must be scrolled across. The channel numbering takes a little getting used to, as double figured numbers are displayed without the first digit — so 25 becomes 5. This has been done to prevent overcrowding, and the trick here is to refer to the highlighted numbers which mark the start of each decade. Other details like mix title, start and end times, MIDI information, used memory, timecode type and readout are also permanently displayed at the bottom of the screen.

The main menu, which provides access to the various utilities, sub-menus, editing pages etc, is overlaid on the main screen by pressing the MENU key — it can only be selected when the automation is not running, as a safeguard against inputting system changes during automation, ie loading a mix half-way through an update. Some of the main functions such as group editing can be accessed ▶



A close-up of the Tracmix II screen.

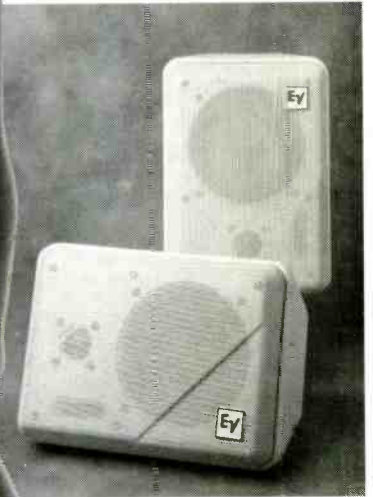
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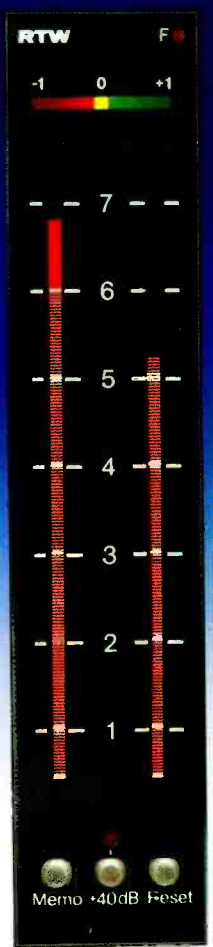
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directly from the keypad without referring to the main menu 'quick key' selection. This operates by using the SHIFT key along with a function key — ie SHIFT + GROUP.

Mixing

When the system is booted, the computer will ask for the time and date which are logged with subsequent saved mixes — a slight irritation here is that the procedure is not backed up and has to be repeated each time the program disk is loaded. *Tracmix* will generate and read four timecode standards: 24 frames, 25 frames, 30 frames, and 30 frames DF; the system can operate either as a slave to external code in the conventional way, or act as master running from internal code — the latter being useful in the 'tapeless studio'.

There are four colour-coded fader modes: Play (read only — green), Record (absolute write — red), Trim (relative offset — red and green), and Isolate (disconnected — white). All these are selected from the keyboard where they can be assigned to channels globally or specifically. When selections are made, coloured boxes will appear beneath the permanently displayed fader and mute status boxes, showing the pending status; this is pending because the fader will not assume selected status until the CONFIRM key is pressed. This acts both as a safeguard against inadvertent assignment, as well as allowing status drop-ins. Once the status has been confirmed the pending status boxes will disappear and the fader mode boxes will show the current fader status — checking these two displays, provides clear indication of actual and assigned fader status.

Mutes have three modes which are toggled from the MUTE ENABLE key and then attached to desired channels — Safe (read only), Record (absolute write; and Update (switches from Safe to Record as a change is made). Isolate status also affects the mutes. Like the fader display, the mutes also use coloured boxes to represent these modes, with an infilled box indicating that the channel is muted, and an edged box that it's open. The channel keys on the keyboard act as mute buttons while the mix is running — the existing console mutes and their LEDs are not connected to the computer and retain normal manual operation.

At the end of each pass, ie when the computer stops receiving timecode, the option will be given to keep or abort the mix. Keeping the mix will permanently overwrite the previous mix in RAM, and the computer will return all fader status, other than Isolate, to Play. This is inconvenient if for example a section is being built up in Trim mode, because the status has to be reset after each pass. Having made this point to Soundtracs, they have informed us that a Status Lock facility will be introduced in the near future. The mute status will default to Update unless switched to Play in which case it will remain safe.

Mixes are saved to disk in two ways — either periodically at the engineers discretion or automatically using the system's archiving function which saves the mix after a predetermined number of passes. When first saving a mix to floppy the computer will ask for a



Studio 1 at Hot Nights with Soundtracs Inline 4831 and Tracmix II

name; subsequent mixes can then be stored as versions of that mix name and will automatically be given an incremental number. The mix directory is arranged alphabetically, and mix files can be protected against deletion — unprotected files may be tagged and deleted in groups.

Individual mixes can also be examined in more detail showing the Time, Date, Size, Start/End Times, Frame Rate, and whether there are entries for Track Listing (64 entries), Notepad, Group Assignment, and MIDI Song Data. Each of the last four items relate collectively to all the versions archived under a particular mix title — so each time they are amended or added to, they will refer to the mix title as a whole and not the individual mixes stored under that title — this is not very satisfactory when referring back to earlier versions. To keep separate information with each version, a new mix title must be given for every save; a further complication is that notepad and tracklist details will only be saved with a new mix title if they've changed in some way — although this is correct for the notepad (if it's to refer to a specific mix) it's wrong for the tracklist which like the Group and MIDI entries, should be stored with

each mix irrespective of editing. The system does seem a little messy as it stands, and can cause confusion, it would perhaps be better if each version archived under a mix title could include unique information. (*Soundtracs have informed us the system now does this. Ed*)

Nulling

Faders can be manually or automatically nulled. As a fader is dropped into Record by the CONFIRM key it will do one of two things depending on the System set-up menu default — it will either drop immediately into write irrespective of the previous level (Crash Record Mode) or it will remain in Play until its current level matches the playback level. In this latter nulling mode the associated fader status box will display a red arrow pointing the fader in the null direction, once nulled the fader goes into Record and the status box turns red. Similarly, to return to Play a green arrow indicates the direction of the level match. The bargraph display also acts as a useful indicator — before the null-in point, the bar shows the mix

playback level and a horizontal marker shows the current fader level, once the fader matches and drops into record, the situation reverses with the bar showing the current fader level and the marker the previous mix level. If Autonull has been set, the fader will automatically ramp back to the previous mix level at a pre-programmed speed (0.99 frames) once the null-out command has been entered. This all sounds quite straightforward and as one would expect, but there is one drawback that Soundtracs are intending to improve: the command to null a fader back into Play is this — hit PLAY, followed by the channel number (plus SHIFT if above 32), and Confirm. If one were rewriting a short section or performing an intricate fader move just prior to the out point it would be difficult to concentrate fully on the task at hand while having to key all this in. To make life easier it is intended to dedicate the PLAY status key as a null-out controller — this will, of course, result in a global function. The null facility also operates when going from Trim to Play.

Off-Line Editing

Version 2 supports off-line mix editing and mute editing. Mix editing allows: mix Insertion and Joins between the current and saved mix, as well as insertion of sections of the current mix back into itself; Copying of one channel's data to other faders in the current mix; fader Trim between specified timecode points by as little as 0.1 dB; and Autofades either in infinity (default) or to a set level. All these functions are channel specific, and have programmable crossfade times entered in seconds and frames. A View Mix facility displays a graph of a fader's movement between selectable start and end times — these times can then be directly transferred to the various edit screens for setting up edit points. The system also offers a 'mark' facility whereby timecode positions can be 'grabbed' on the fly, for subsequent editing purposes.

The mute editing screen has room for up to eight selected channels at a time and provides a graphic display of muting activity against timecode. When the screen is accessed it will be centred around the current timecode position and can be scrolled up and down as necessary. From this screen mute events may be Trimmed, Deleted, Inserted, and Copied (note that copying mute and fader data between channels is carried out separately). Mutes are added either by entering On and Off times, or by entering On and Length times. In addition to the mute editor display, mutes can be viewed at a particular timecode point for the whole console via a scrollable display.

Groups

Tracmix offers up to eight VCA groups that affect both faders and mutes. The original group set-up screen in Version 1, that showed channels and groups in the form of a grid, has been replaced by a less elaborate display. Groups are now accessed individually allowing slaves and master to be attached/detached as necessary to the displayed

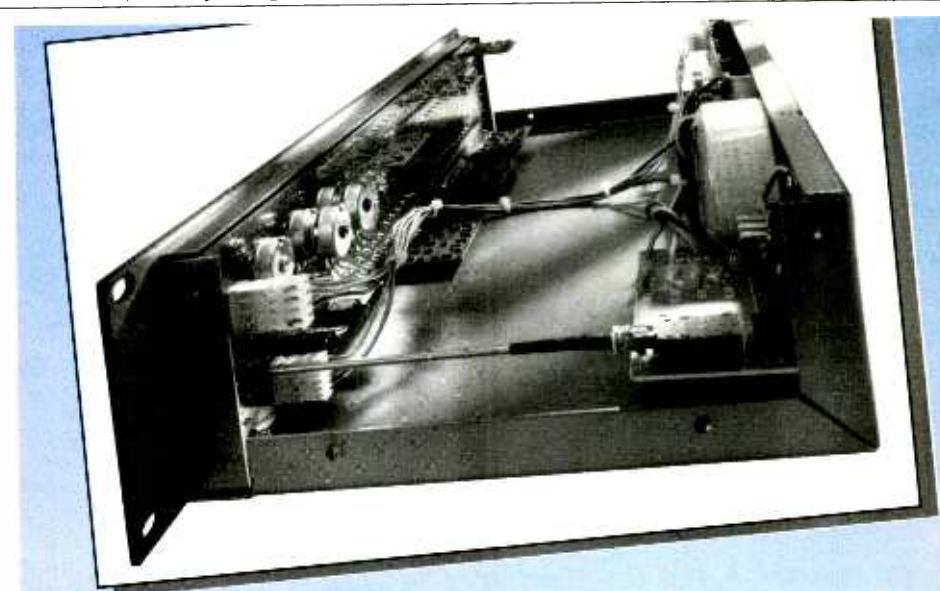
channels — an overall VCA 'grand master' can also be assigned. Group assignment may now be displayed on the main screen in place of the pending status line, and muted slaves are identified by a square insert in the top right-hand corner of a mute box.

There is no nesting facility available — ie each channel can only be assigned to one group. Slave movement is not written to the computer rather it is monitor based, so that if a group is disbanded the only dynamic data retained will be the group master — the System Set-up menu allows the user to choose how this is represented on the fader bargraph display, either showing just the group master moves, or incorporating the slave

movement. The group set-up is saved with the mix title. The grouping facility can also be used for non-automated applications, for instance groups may be used during track laying by having the automation switched on and the channels Isolated. One slight draw back is that muted slaves channels cannot be individually unmuted.

Other Matters

The system includes a basic MIDI sequencer, which generates MIDI clock, song pointers and start/stop commands. A MIDI song of up to 2560 bars can be created and edited from the MIDI ▶



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editor screen which displays and enters BPM and tempo changes bar by bar — a bar display is also available on the main screen, which some users may find more informative than timecode. MIDI patch and controller data are not presently supported.

To allow the system to tolerate timecode errors, a timecode drop out facility has been included that will jam sync over periods set between 1-99 frames; higher frame settings can cause timing errors, and, of course, the automation will run on by the set time after it is dropped.

Individual menus can be personalised by changing their component colours from a displayed palette, and like other system set-up parameters this information can be stored on the program disk to become the default. In fact this type of system configuration could play a major part in the way *Tracmix* evolves; by offering a range of options the system could be set up in various ways to suit different styles of working.

Mixes that have been recorded using *Version 1* software will automatically undergo a format conversion once loaded into the system. Also, an ID label function, that speeds up operation by preventing the computer unnecessarily re-reading files, can be attached to *Version 1* data discs.

Future Features

Apart from changes already mentioned to the null operation and the addition of a Status Lock facility, Soundtracs are in the process of adding a few additional features. These include a cue list, which will allow names to be used in commands rather than having to type in timecode — ie Ch 1, Vs 2, MID 8, etc; and a TRACKMIDI facility which records MIDI mutes from a MIDI console directly into the automation system. Development is also underway to provide a hard disk option. Other updates and additions are planned for the system, but will be announced at a later date.

Conclusion

With 'value for money' being uppermost in people's minds at the moment, systems like *Tracmix* do appear very attractive. As I intimated earlier, feature for feature, the low cost systems are hot on the heels of their pricey counterparts, and with the intense R&D effort presently being put into *Tracmix* and related products, Soundtracs must be a company to watch in this area for the future. *Version 2* of *Tracmix* offers a sizeable advance on the initial version making a positive improvement in practical operation for music recording while some features extend its application into video post-production use. During the preparation of this review Soundtracs have shown themselves attentive to criticism and have, or are about to, address points raised within this review and during the testing procedure. With any software-based product a 'listening' manufacturer should be a very powerful element in product choice. □

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Continued from page 43

Keith Spencer-Allen replies.

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This having been said we are sympathetic to your point and we would consider publishing a UK and a US price if they can be confirmed. We would welcome more comment on this matter prior to proceeding.

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While our computer system and any software loaded into it is constantly monitored by anti-virus software, this particular strain known as Michelangelo went undetected until very recently. The virus sits in the boot sector of your floppy or hard disk and does nothing until March 6th. Then it begins to write random characters to your disk. It's sad to know there are people in the world who spend their time writing such destructive garbage.

The virus enters your system when an infected diskette is in a disk drive on bootup regardless of whether it is bootable or not. It should not enter your system if you simply read from or write to the infected disk. However, once it is on your hard disk, it can copy itself onto a diskette accessed in any drive and therefore can be spread around quickly.

We highly recommend that you install anti-virus software. Until now we thought viruses were

somebody else's problem and would never affect us. Although we keep our computer isolated to keep it immune, we were sadly surprised.

The Michelangelo virus and hundreds of others can be detected with readily available software from Norton, Central Point and other companies. McAfee Associates provides virus detection and removal software which you can download and use free for five days from their computer bulletin board system (BBS). Their numbers are (408) 988 3832 (voice) and (408) 988 4004 (BBS). Please do yourself a favour and scan your system with one of these programs to be sure it is virus-free!

Since the Michelangelo virus resides on the boot sector of your hard disk, there is a way to easily

get rid of it if you own Microsoft DOS version 5.0. You can use FDISK with the undocumented option /MBR (for Master Boot Record) to refresh the master boot record thereby writing over the virus and eliminating it. This will work in most cases, but it is still important to scan your disk to be sure no viruses are present. This procedure will not remove the virus from your diskettes, if infected.

Please practice SAFE computing!
Sincerely, Michael Chamness,
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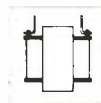
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