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STUDIO SOUND

AND BROADCAST ENGINEERING

A TIMES HOUSE PUBLICATION

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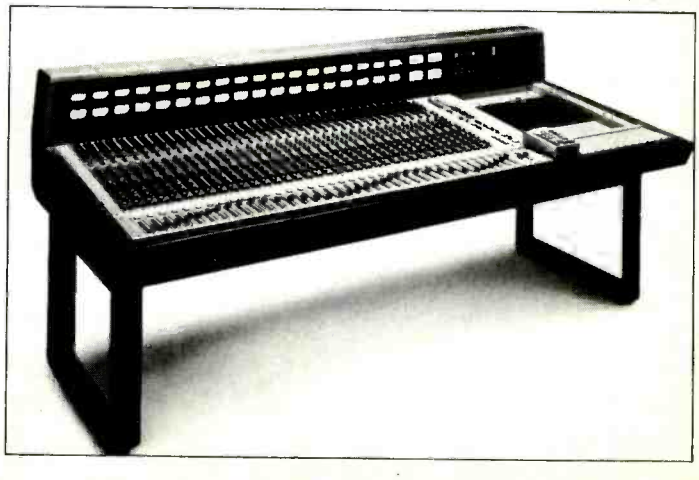

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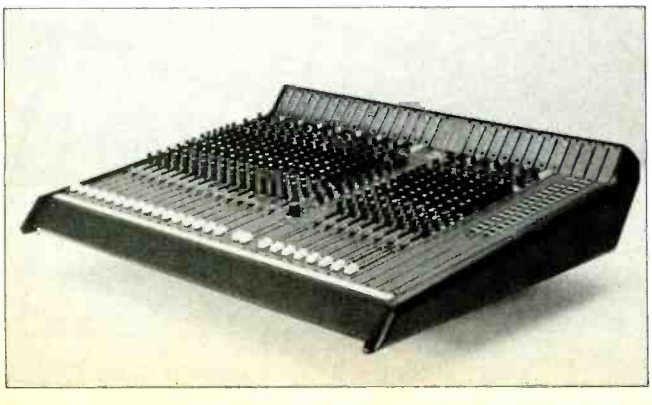

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May, 1988
Volume 30 Number 5
ISSN 0144 5944

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

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Tel: 01-686 2599
International tel: +44 1 686 2599
Telex: 947709
E-mail: 78:DGS1071
IMC: STUDIOSOUND-UK/US
Fax: 01-760 0973

CIRCULATION ENQUIRIES
Controlled circulation: Controlled Circulation Dept, Studio Sound, Link House Magazines Ltd, Central House, 27 Park Street, Croydon CRO 1YD, UK
Paid subscriptions: Subscription Dept, Studio Sound, Link House Magazines Ltd, 120-126 Lavender Avenue, Mitcham, Surrey CR4 3HP, UK
2nd class postage paid New York, NY: Postmaster please send address corrections to Studio Sound c/o Expediters of the Printed Word Ltd, 515 Madison Avenue, New York, NY 10022, USA

Printed in England

A LINK HOUSE PUBLICATION

Studio Sound and Broadcast Engineering incorporates Sound International and Beat Instrumental
Studio Sound is published on the second Friday of the month preceding the cover date. The magazine is available on a rigidly controlled requested basis, only to qualified personnel (see back page for terms)
Annual subscriptions are available for non-qualifying personnel or where more than two copies are required in a studio or small organisation as follows:
UK £24.00. Overseas surface mail: £30.50/$52. Overseas airmail: £52.50/$89.
USA Airspeeded: $70

ABC MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS
Total average net circulation of 16,666 per issue during 1987. UK: 6,073. Overseas: 10,593. (ABC audited)

EDITORIAL

As the less important memories of the Paris AES Convention fade and the body recovers from 'doing the show', I would like to consider a few of the discussion points raised during the first major trade show of the year. Paris will be remembered as a healthy busy show where there were more new products on show than at any time I can remember. True there was little that was earth shattering but certain trends were discernible.

Firstly if '87 was the year of the proposed digital editor, then '88 is going to reinforce this in triplicate. There are some that see such an approach to audio management as the total future and have fully given up on the multitrack and large console approach while others do not claim to be so bold. Whatever illusions some manufacturers have had about their potential market, will surely have been removed when they see that 98% of the visitors to their booth are relatively ill-informed on the editor/disk recording approach and are searching to see how such a product relates to their needs. While being able to differentiate between systems on cost and physical appearance, the only other questions you seem likely to hear are 'How much recording time and how many tracks?'

It is perhaps not really the manufacturers who are to blame. With software-based products, the design need never be finalised—it is possible to continue cramming more and more features into a product so that there is never such a thing as a quick demo or even the ability to fully get to grips with the manual before the next software release negates your learning. It has become obvious that the only way to understand complex products enough to decide whether you would wish to own them is to buy them first. You will just have to trust that the manufacturer knows what he is doing. Yes I did meet a few visitors who did know digital editors thoroughly and were able to fully compare competing systems but they were all owners of one system or another (or designers of one system or another).

There was an element of acceptance of DAT for pro use as a reality although there were fewer machines on display than might have been expected. I counted five different models and I did sense an element of disappointment amongst some that for a system that appears to offer great possibilities for pro use even in its domestic form should be so much more expensive in its pro form. The additional facilities that the pro models on display were offering did not seem to meet the more general needs expressed for a low cost system. If it is not already happening, there will be a repeat of the F1/1610 split approach to DAT.

Everyone has a point at which their rational understanding of a process is required to take such a leap beyond what would seem possible as to lead you to feel something magical is occurring. For me DMM CD mastering is such an item. I find it hard to comprehend how a mechanical device can cut a CD on a copper with the accuracy and the speed needed for the concept to work. Yet it was being demonstrated at the show and there have been CDs in commercial release that have used the DMM system. So what do I know?

What do I know is a very good point. Part of the reason for a magazine to be present at a show such as the AES is to look at all the exhibits and gain editorial information but let's look at some of the logistics involved. The Paris show had about 260 manufacturers taking part. The exhibition was open for a total of 28.5 hours giving a theoretical time per exhibitor of 6.57 minutes. This does not include walking between exhibits, waiting to ask your questions and any demo other than 'quick demos' which as we mentioned earlier are becoming less easy. Some manufacturer's booths are enormous—mini exhibitions in themselves—and so our task becomes even less possible. We have also not included the convention aspects of the show—the papers and the workshops and the task of general coverage become well nigh impossible. If I want general impressions I ask the visitor who has only had an afternoon to look around. There is something about a fresh mind with a purpose that can home in on the important aspects of a show while the weary feet, air condition-damaged respiratory system and over loaded brain of the visitor there for the duration finds that everything just levels to a sameness after a few days. But they say we have a choice!

Keith Spencer-Allen

Cover: a pre-production Soundtracs Eric Production Console installed at Pete Townshend's Eel Pie Studios. Design concepts for production units by Julian Abrams of Partners In Design of Milton Keynes, UK.

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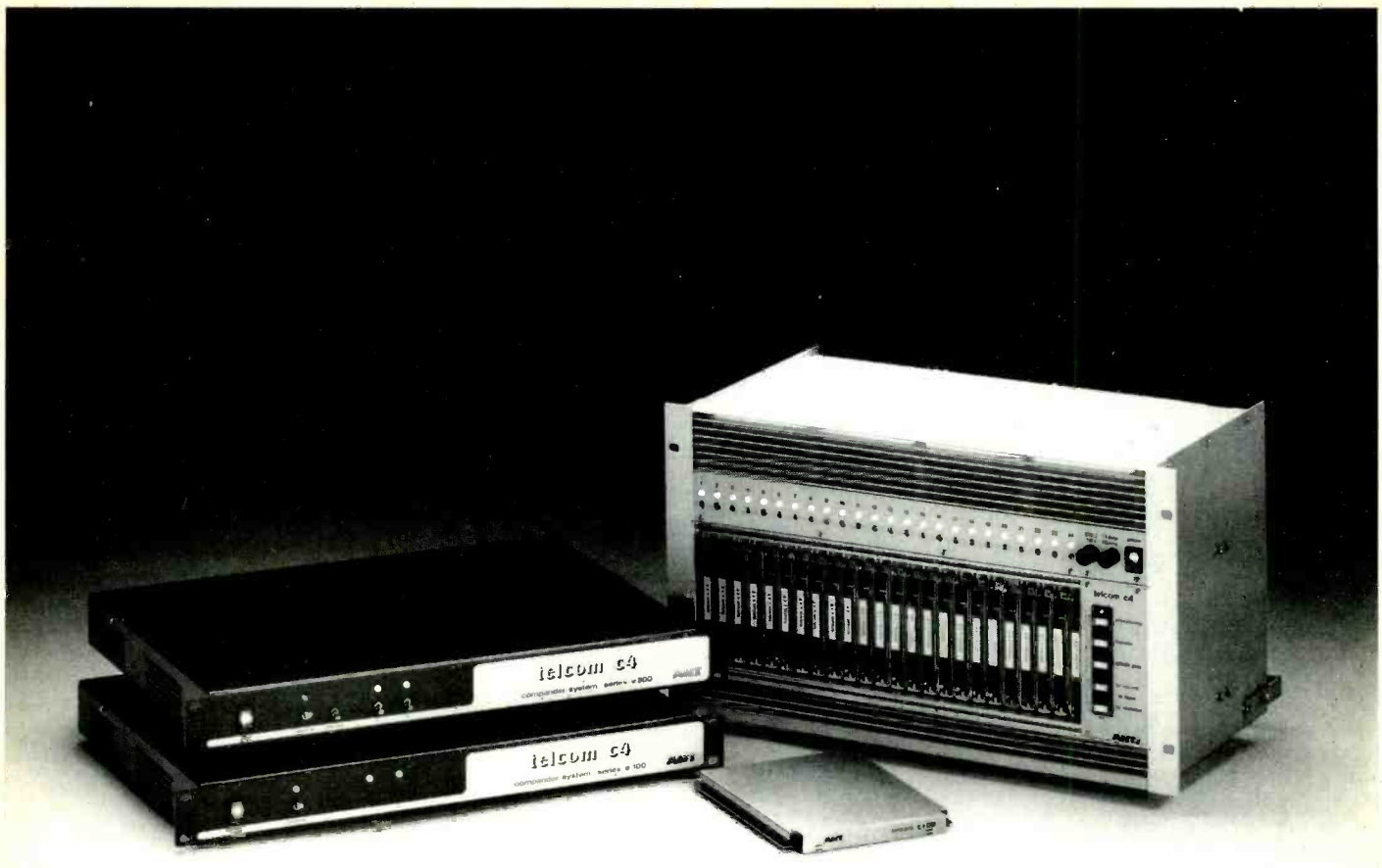

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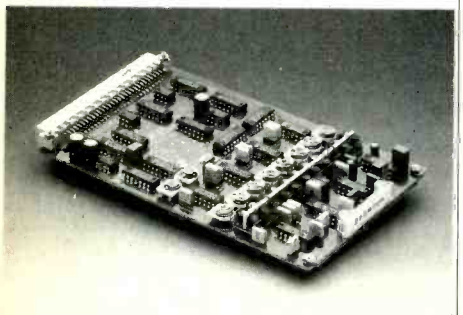

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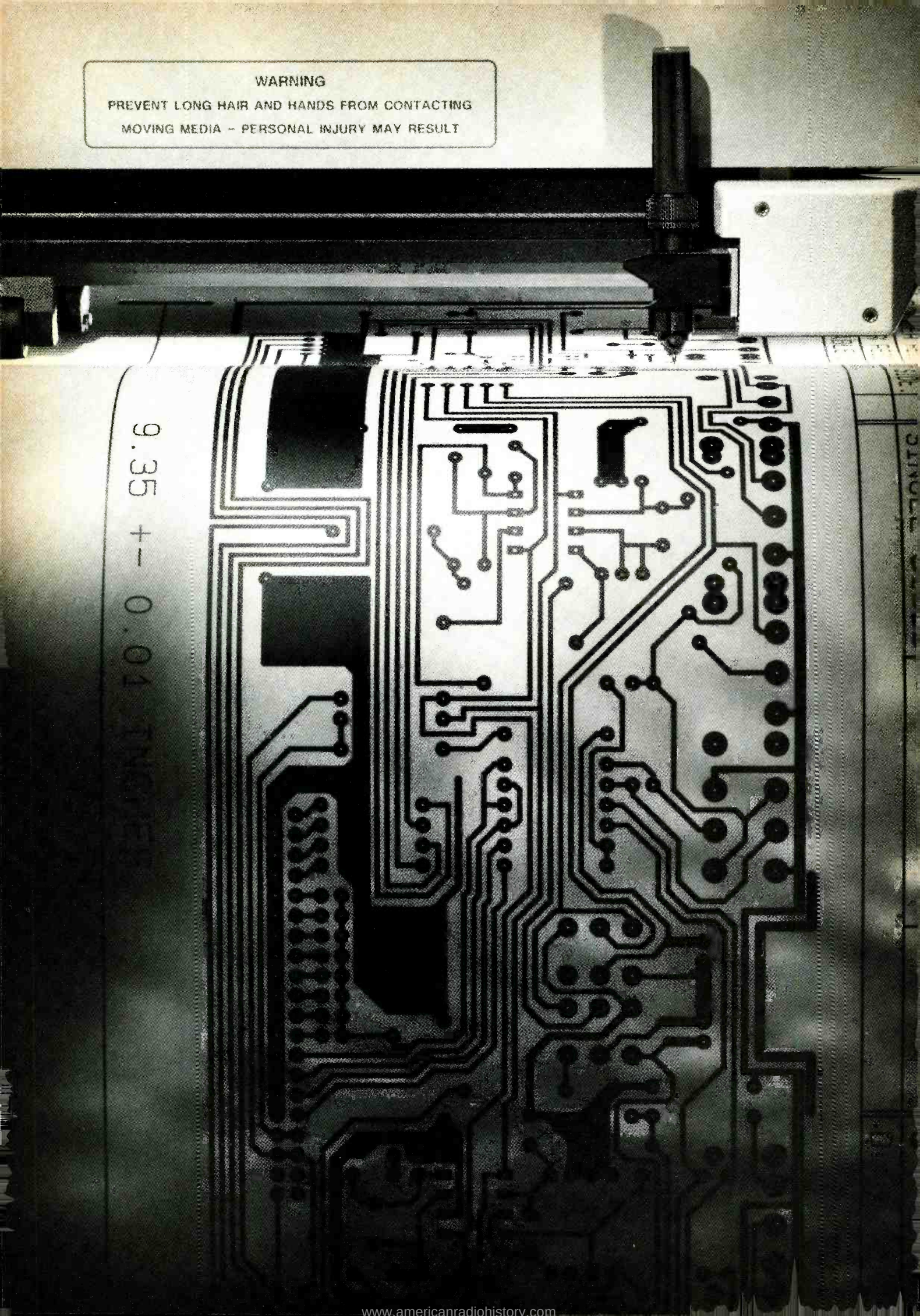

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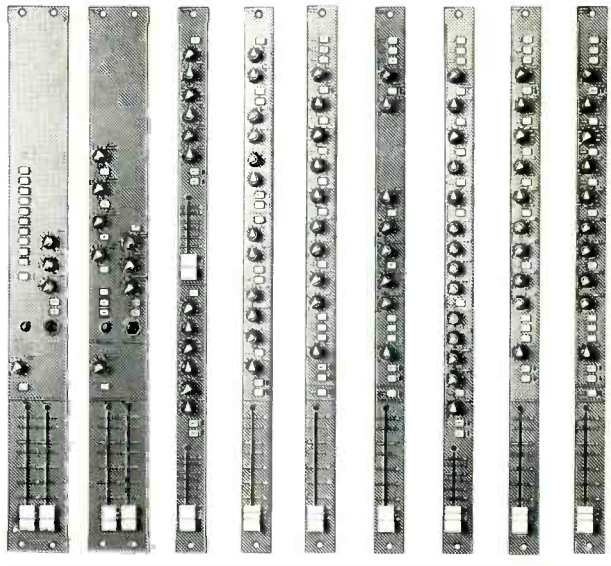

MODULE OPTIONS (LEFT TO RIGHT): MONITOR MASTER, MASTER, MONITOR OUTPUT, SUB GROUP, STEREO INPUT (REMOTE SWITCHING), BROADCAST INPUT, MONITOR INPUT, MONO INPUT, MONO INPUT (REMOTE SWITCHING).

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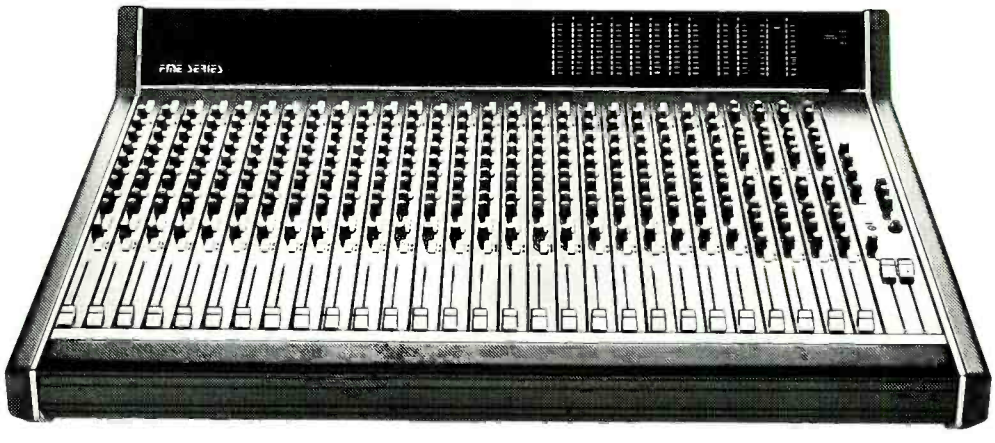

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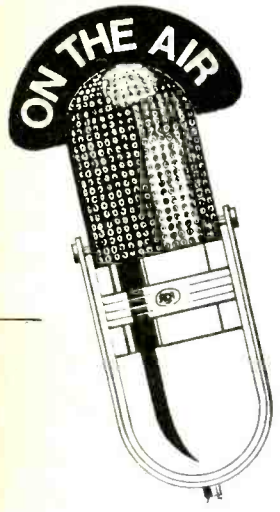

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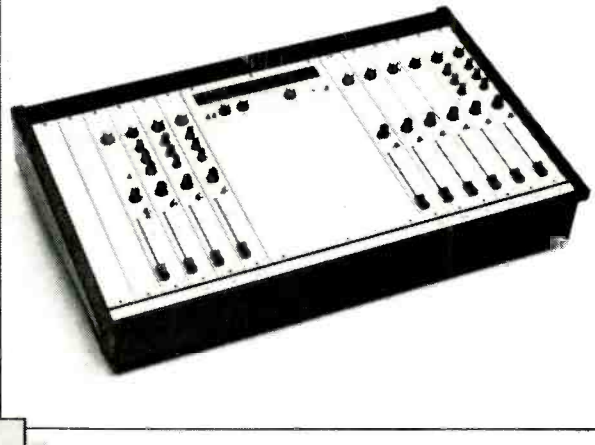

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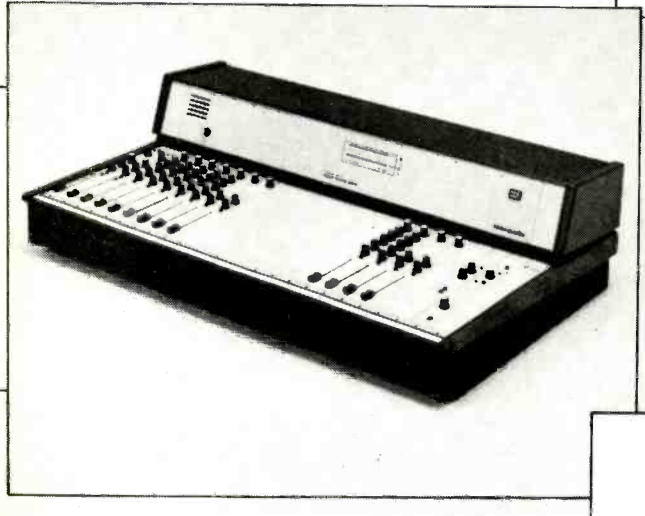

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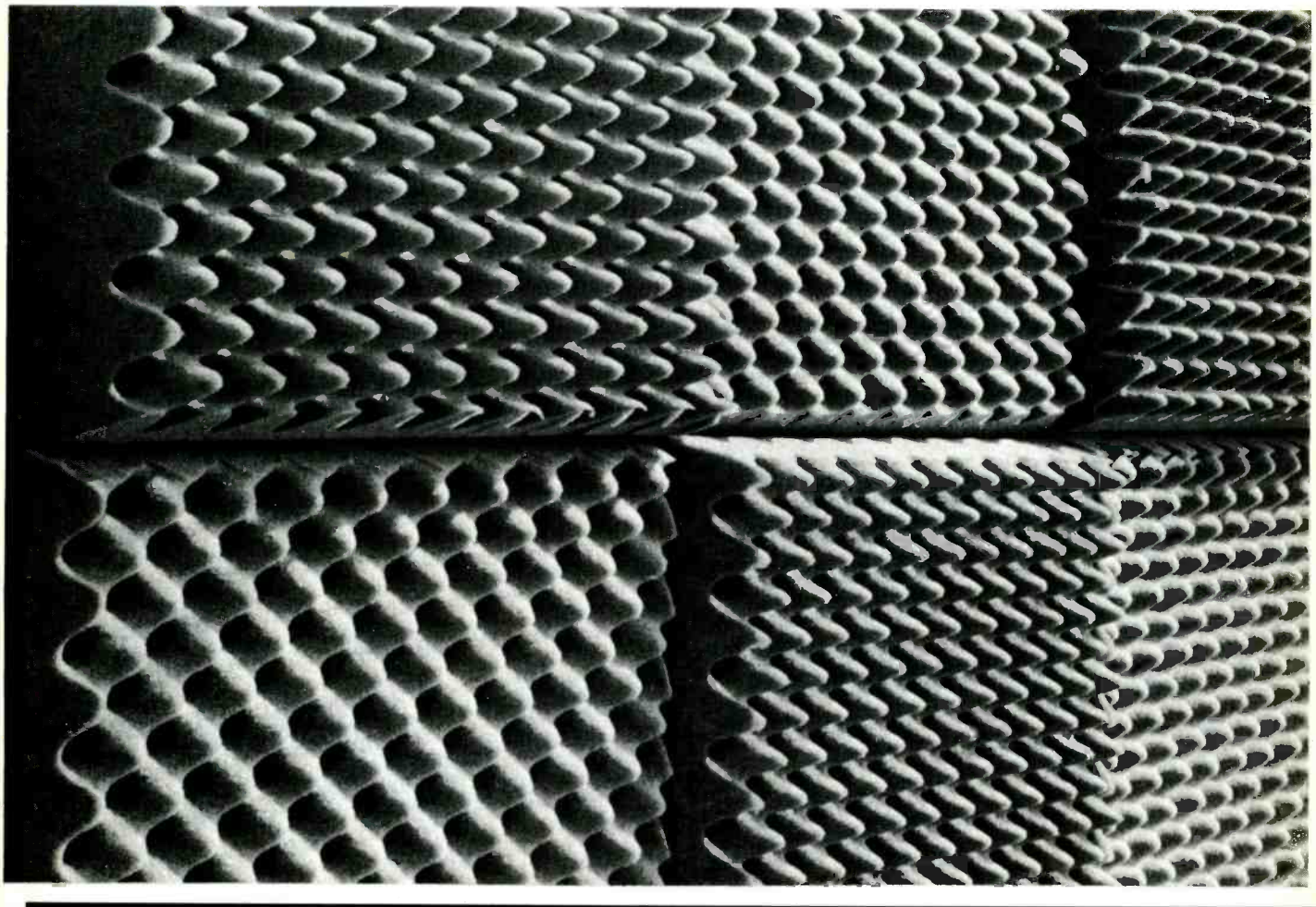

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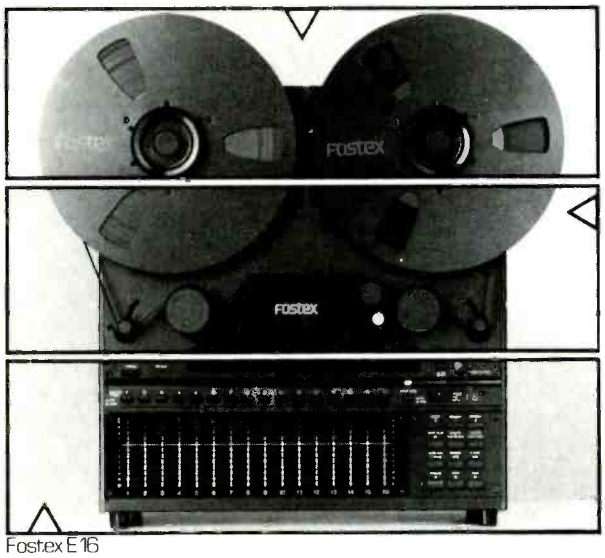
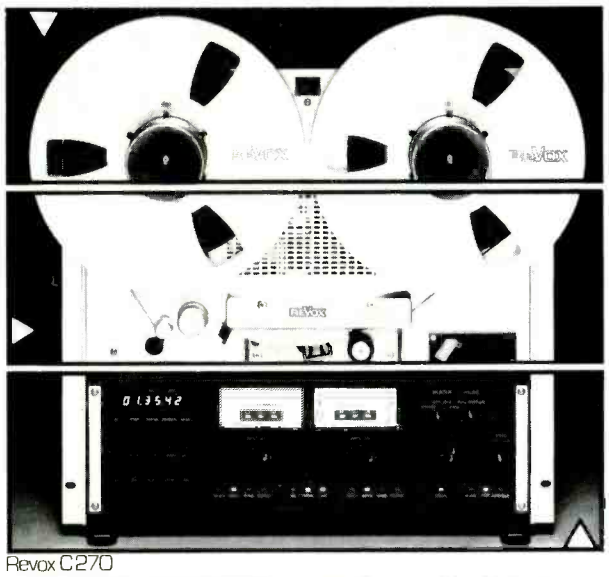


Fostex E16



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NEWS

MADI

A collaboration between Mitsubishi, Neve, Solid State Logic and Sony has resulted in a specification being submitted to the AES and EBU to propose a Multichannel Audio Digital Interface (MADI) standard. In a meeting last August the four companies agreed to establish a joint working group within the UK to produce a proposal for such a standard. It was felt the AES/EBU twin-channel format was a useful step but the increasing use of multichannel digital devices with the associated interface problems necessitated a multichannel interconnection standard.

The specification defines a method of point to point connection of two digital multichannel devices—which may be up to 50 m apart—by means of a simple coaxial cable terminated by BNC connectors. Up to 56 channels may be transmitted at a sampling frequency of 32 to 48 kHz with a resolution of 24 audio bits. Also included is the possibility of transmitting the full 28 bits of the AES/EBU twin-channel standard. Connection via fibre optic cable is envisaged for longer distances.

Synchronisation of the transmitted and received data is achieved by the use of an external signal and not via the communications channel.

Klark-Teknik buys Midas

Live sound console manufacturers Midas Audio Systems Ltd has been purchased by Klark-Teknik and Midas products are now being manufactured at KT's Kidderminster, UK factory. The nucleus of Midas' management has also been integrated and it is intended to maintain the Midas philosophy on design and production engineering.

KT are now marketing auditorium consoles under the Midas brand name and will be responsible for distribution and after sales service for all future Midas products. Funds have also been made available to continue the development of the *XL* system to enable regular production of purpose designed consoles for auditorium/theatre, concert sound and stage monitor applications.

Disctronics first CD-V venture

Australian company Disctronics have manufactured their first PAL commercial CD Video release for USSR music company Melodiya. Female rock vocalists The Bazykina Twins are shown in the video portion singing *Moscow Nights*, which was originally produced as a clip for Soviet TV and features a broad range of scenic visuals and spectacular effects.

The video footage and audio masters were sent to Disctronics' plant in Southwater, UK, and the edit was completed in London. The material was edited and mastered and the discs pressed in less than a week and the first commercial releases were presented at the MIDEM trade fair in Cannes, France.

Disctronics offers PAL and NTSC mastering through its plants in Southwater, UK, and Anaheim, USA, respectively, and CD-V production is already scheduled at these two locations. Releases will be scheduled to coincide with the March 15th hardware announcement to be made by Philips in London and Disctronics report delivery date requests for April and May from major and independent record companies.

Standards compliance

BSI Testing recently announced that manufacturers or suppliers could obtain independent backing for any claims of 'compliance with British Standards' they may be making by having their products successfully tested at BSI's own laboratories at Hemel Hempstead. A similar testing service is also available for verifying such claims made against other specifications such as International or European standards, trade association of manufacturers' specifications or other similar documents.

Products can be tested during development or as samples taken from the market place. Contact Ian Peplow. Tel: 0442 230442.

Sound & Communications Industries Federation

From the Association of Sound and Communications Engineers has been formed the Sound and Communications Industries Federation. Its objectives are to: unite associations, companies and individuals within the sound and communications industries; to promote the highest business and ethical standards among members and the industries generally; to raise and maintain technical standards.

The Federation comprises six associations to allow a broader base of protection and strength for members. It can act as a representative in consultation with government, local authorities, institutions, contemporary associations, the media, etc, at home and overseas. It is, for example, represented on technical committees of the British Standards Institution in the production of new and revised standards and codes of practice. Information can be provided on the range of products and services represented. Technical publications will be available for reference. Consultation will be ongoing with education organisations towards establishing related courses and the recognition of appropriate qualifications.

A monthly journal, an annual exhibition and a number of seminars are all further facilities offered by membership of the federation. For further information contact Sound & Communications Industries Federation, 4B High Street, Burnham, Slough, Berks SL1 7JH, UK. Tel: 06286 67633. Fax: 06286 65882.

Tape supply for Akai MG series

Akai Professional have undertaken to guarantee the supply of *MK-20* tapes until the year 2001. The tapes are exclusive to Akai and used in conjunction with their *MG-1212*, *MG-1214* and *MG-14D* recorders. To ensure supply a new tape manufacturing plant has been opened in Hong Kong dedicated to the production of *MK-20* tapes.

Electro-Voice co-sponsors World Expo '88

Sound reinforcement equipment from Electro-Voice will be supplied as part of the US Pavilion at World Expo '88 to be held in Brisbane, Australia, between April 30th and October 30th this year. World Expo '88 will be the world's first fair in the southern hemisphere in a century and is part of Australia's bi-centenary celebrations. Electro-Voice are among a number of other major US companies supporting the project.

The sound in the Pavilion will be heard via E-V equipment including 20 *S-200* loudspeakers, 21 *FM-1502* floor monitors, 10 *SH-1810* loudspeakers and various *N/DYM* microphones.

In addition to the US, 38 other international participants include the USSR, China, Japan, Britain, France, Germany, Italy, Greece, Spain and Canada.

'EASTMAN' PROFESSIONAL MAGNETIC TAPE. NOW SOUND TO MATCH OUR PICTURES.

Kodak, the world leader in film technology, has entered the sound stage, with the introduction of a range of professional magnetic audio tapes. So now film, video tape and audio tape can be ordered simultaneously.

The range includes 16mm and 35mm perforated tape and ¼ inch mastering tape, available in both standard and long play. (And of course the ¼ inch format incorporates industry standard leaders.)

The ¼ inch tape has been developed to achieve better print-through performance without sacrificing high output or wide dynamic range. Superb handling characteristics, from a smoother oxide coating, ensure less drop out and even spooling.

All this, backed by rigorous quality control, fast delivery and the exceptional service you'd expect from the Eastman name, put the new audio tape ahead.

But don't take our word for it, test the quality for yourself. Contact Kodak today for further information. You'll find the new 'Eastman' Professional Magnetic Tape from Kodak speaks for itself.

Kodak Limited, Motion Picture and Audiovisual Division, Kodak House, P.O. Box 66, Hemel Hempstead, Herts. HP1 1JU. Telephone: (0442) 62331.

Eastman
Professional Magnetic Tape from Kodak

Eastman and the Eastman device are trade marks.

NEWS

AMS new US office

AMS have opened a distribution and support office in the USA. The office will supply reps and dealers across the US and become the service centre for the full range of AMS and Calrec products.

In charge of AMS Industries will be Nigel Branwell who has been handling Calrec sales for some six years and has also been a dealer for AMS audio processors for three years.

AMS Industries Inc, 3827 Stone Way North, Seattle, WA 98103. Tel: (206) 633-1956. Fax: (206) 547-6890.

Change of address

• **Stirling Audio** have moved from Swiss Cottage to larger premises in Kilburn, London. The new building will include two fully equipped demo rooms, one of which will be dedicated to DDA consoles. Designed in consultation with the manufacturers and acoustically treated by Andy Munro, the room will demonstrate DDA consoles in a 'real world' environment. The second demo room will feature the rest of the products Stirling Audio distribute. The new building will also provide extended office space and warehousing facilities. It is felt the extra space will allow the company to strengthen their service operation and the Stirling Hire company. Stirling Audio Systems Ltd, Kimberley Road, Kilburn, London NW6, UK. Tel: 01-625 4515.

• **Audioscope** of Italy have moved: Audioscope Srl, Via Giulio Cesare Cordara, 32, 00179 Roma, Italy. Tel: 6 794 4889.

• **Tapetalk,** UK manufacturers of *The Box*, have changed their telephone number to 0908 274466.

In brief

• **Eighth House** are a new musicians' contact service operating in Scotland. The service aims to put musicians in touch with bands and vice versa, and to compile a library of musicians available for session work for the use of recording studios, radio stations, management and record companies. Eighth House, Ground Floor, 3 Clencairn Drive, Glasgow G41 4QP, UK. Tel: 041-423 6132.

• **Studio TimeLine**, the production co-ordination company, has recently launched Bulletin Board, a continuously updated equipment listing. Bulletin Board aims to provide a faster and cheaper method of buying and selling any studio item. The system is computerised and can be updated on a daily basis. Lists are published and mailed on a three-week turnround. The system is also linked via E-mail to the American dealer network. Studio TimeLine, Lamb House, Church Street, London W4 2PD, UK. Tel: 01-994 4433. MCI Mail: 343-3029.

Agencies

• **Tapetalk** manufacturers of *The Box*, have appointed two agents. UK: TAM, 13a Hamilton Way, London N3 1AN. Tel: 01-346 0033. Switzerland: Soundville Equipment, Grimselweg 5, 6005 Luzern. Tel: 41 44 98 44.

• Sellmark Electronics will now handle worldwide marketing of **Outboard Electronics'** *MF100-S* motorised fader. Sellmark Electronics, Rockwood House, Barn Hill, Stanley, Co Durham DH9 8AN, UK. Tel: 0207 282880. Fax: 0207 232023.

AES news

Here are details of some future AES (British Section) activities which should be of interest. The two-day Sound with Pictures Conference described below has caused much interest, both here and abroad.

• **Sound with Pictures: A two-day Conference May 17th and 18th.** In planning this we have recognised that with the imminent availability of both terrestrial and celestial stereo sound with television signals the time has come to bring together audio specialists, programme makers and planners to consider the requirements and effects of these developments. All of the papers at the conference have been invited from speakers who are well known in their respective fields and the range of topics covered is indicated by the titles of the five sessions.

The first session, *Studio Practice* takes a look at the practical aspects of acquiring the sound signal and the operations in post-production while *Storage and Transmission* focuses attention on various storage media in current use. In the evening there will be a buffet reception followed by what promises to be a fascinating presentation by Dick Mills on the work of the **BBC Radiophonic Workshop**. On the second day *The Home Front, the Receiver and the Listener* looks at the future from the consumer's point of view and also looks back to some of the early work which was carried out by Blumlein.

This is followed by two sessions, *The Bottom Line* and *Summing Up* which look at the commercial aspects and include experiences and demonstrations from two people involved in stereo production.

Time has been left for discussion panels and for individuals to meet and talk. The conference pack, lunches, evening buffet and refreshments are included in the conference fee of £100 for AES members and £145 for non-members (plus VAT).

• Future dates for the diary are **June 14th** when Peter Mapp will describe the sound system he was involved with at the Jockey Club in Hong Kong and **July 12th** when Laurie Fincham (KEF) will talk about loudspeaker systems.

Meetings start at 7.00pm (coffee at 6.30).

• All the meetings are held at the IBA, 70 Brompton Road, London SW3 1EY. Information about joining the AES and details on the above activities from **Heather Lane, AES British Section, Lent Rise Road, Burnham, Slough SL1 7NY. Tel: 06286 63725.**

QMS seminar held in Japan

Sound Inn Studios, Tokyo, was the location recently for a Quested Monitoring Systems seminar organised by Soundcraft Japan. Roger Quested took part by explaining the background and design philosophy of the monitors. More than 50 recording and broadcast engineers took part and an enthusiastic question and answer session is reported.

Sound Inn was recently refurbished and *Q412*s, the first Quested monitors in Japan, are installed in Control Room A. The room was designed for nearfield monitoring and the wider space behind the console will be used mainly when synthesiser overdubbing.

Agencies

• MCM Distribution have been appointed UK distributors for **Ultimate Support Systems'** range of stands. MCM Distribution, 9 Hatton Street, London NW8. Tel: 01-724 7104, 01-258 3454. Fax: 01-262 8215.

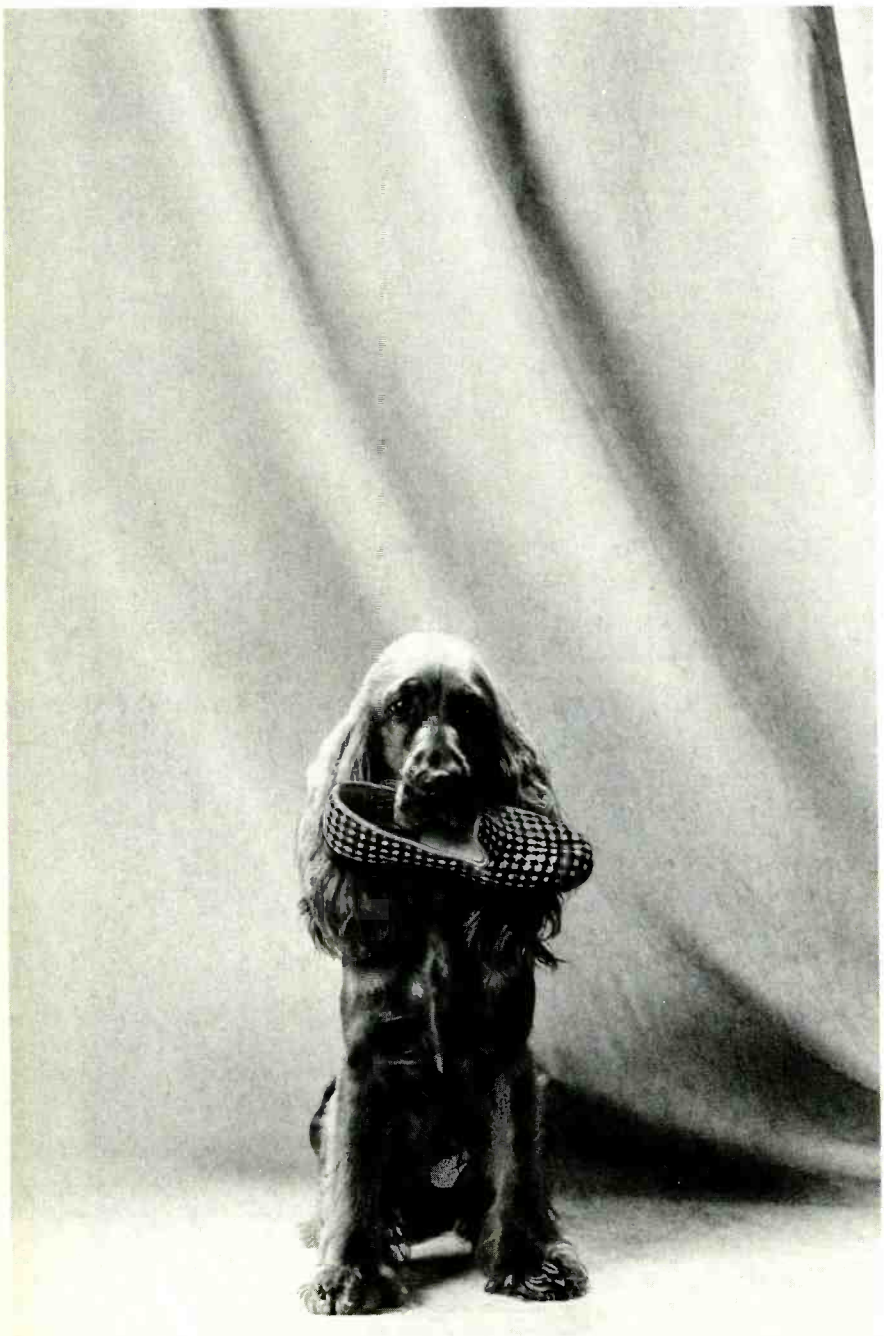
• **ATC** have named Syco Systems, London, UK, as distributors for their range of studio control monitors.

• **Bruel & Kjaer** have appointed Control Techniques Ireland Ltd sole distributor in Eire for the company's range of professional microphones. Control Techniques Ireland Ltd, Grand Canal House, Lower Rathmines Road, Dublin 6, Eire. Tel. 1 966866/1 966464.

• European dealers have been appointed by **Bruel & Kjaer** for their *4000* range of microphones. Lazare Electronic, 23 Rue Rabelais, 93400 St-Ouen, Paris, France, tel: 040 10 09 00, and Audio Sales, Neusiedler Strasse 19, A-2340 Moedling, Vienna, Austria, tel: 022 36 26 123. Audio FX have also added the *4011* cardioid to their range—this is the first time the mic has been available for rent in the UK.

• Music Lab are now distributing the **Annis** *Pocket Magnetometer* and *Han-D-Mag* in the UK.

WITH EVERYTHING WE'VE BUILT IN TO OUR NEW CENTRE, WE WON'T BE SURPRISED IF YOU TREAT US AS A HOME FROM HOME.



Our new **Kilburn** centre is something of an experience.

It's a spacious, **purpose-designed** environment, with the emphasis on giving you the chance to get used to the products on show.

We've put a great deal of thought into creating an unrivalled facility with an attention to detail that matches the standards of the equipment we sell.

Everything's been planned inch by inch around the products themselves.

So you'll find a dedicated **Mix Room** that's a fully-equipped working studio, **acoustically designed** by Munro Associates.

There's a second studio suite with three more complete and operational systems ready for demonstration, including the **latest generation** products.

Extensive service and workshop facilities have been built in too, to extend our legendary **back-up** even further.

But despite all these benefits, we can assure you that our **service** is just as personal, and our **deals** as reasonable, as ever.

London's most exciting pro-audio centre awaits you.

So come on over and have a browse around in Kilburn. And don't forget your slippers.

Stirling Audio, Kimberley Road, Kilburn, London NW6. Tel: 01 624 6000.

Stirling

NEWS

People

● Fred Ginsburg has joined **Audio Services Corp**, Los Angeles. Ginsburg will be involved in marketing and product development and help to structure a new facet of the company—education and training.

● **BSS Audio**, London, have appointed David Haydon international sales manager. Haydon joins from SSL where he had been technical liaison manager and broadcast sales manager. Prior to that, he was QA engineer and sales manager at Midas Audio Systems.

● Lisa Barton has been appointed manager of operations at **Inside Trak Studios** British Columbia, Canada. She has been with the company 3½ years.

● New marketing manager at **Amber Technology**, New South Wales, Australia, is David Hudson. A chartered electronics engineer, Hudson joins from EMI where he had been since 1978.

● After seven years as manager and engineer at the Utopia studio complex, Steve Angel has joined **HHB Hire & Sales**, London. Angel will help HHB achieve this year's growth objectives, which include expansion of the hire business and putting further impetus behind the CD edit suite and to this end will work closely with Richard Kershaw who is to spend more time developing market opportunities.

● Stewart Eales is the new technical supervisor at **Music Lab Hire**, London. His main responsibility will be maintenance of the rental stock but he will also provide back up for the sales department by supervising installations and quality control, and assessing new products.

Contracts

● Recent US **Otari** sales include an *MX-80* 32-track with optional 24-track headstack to Millbrook Sound Studios; six *MTR-90*s and six *EC101* internal synchronisers to The Burbank Studios; a fourth *MTR-90*, an *MTR-20Q* and *MTR-20S* to Post Logic; *MTR-90*s and *EC101*s to Interlock Studios and LA Studios; 24-track *MX-80*s to West Productions, Wax Masters, Zero Gravity Production and Village Recorders; four *CTM-10*s and two *CTM-10 RS*s to KOHZ; *MX-70* and *CB-120-B* timecode autolocator to KISW; *MX-80* to Starlight Recording; *MTR-10* to Radio KNBQ; and *MTR-12* to KJR Radio.

● Recent European **Mitsubishi** sales have included: *X-86*s to the BBC Engineering Training Centre, Evesham, UK; Palais des Congres, Marcadet, Top Master, Dyam, Miraval and TDF in France; RAI and Splash, Italy; Pro Musica, Rainbow, Bel and Norsk Musikkproduksjon, Norway; Sweet Silence, Denmark; ICP, Belgium; and the Cutting Room in Sweden. *X-850*s have been sold to Musica, Davout and Couleurs, France; Studio Flores, Splash and Studio Emme, Italy; and Bel and Rainbow, Norway.

● **Mitsubishi** report recent sales of *Westar/Superstar* consoles. In Austria, Tonstudio Heinz (Vienna) has taken delivery of a 28-channel desk with IDF fader system, MCP Studios a 28-channel *Westar* with *Compumix PC*, and Saltzburg Festpiele a 36-channel *Superstar* console with *IDF* and *Compumix IV*. Most recently, Brunway Studios in Hamburg, West Germany, has taken delivery of a 52-channel *Westar* with *Compumix PC* automation. A further 52-channel desk has been ordered by Paradise Studios in Munich.

● The first **SSL** *G* series console—the 500th *SL 4000* to be built—has been shipped to the new Summa Music Group facility in Los Angeles. The console is a 64-channel mainframe with 56 inputs, VU metering, *G* series computer and *Total Recall*.

● The first *SoundStation II* from **Digital Audio Research** has been sold to Finesplice, London.

● Sheffield Audio-Video Productions, Phoenix, MD, USA, have purchased a **Sony** *PCM 1630* digital processor and *DMR 4000* digital master recorder. These will complement their two *PCM 3324* digital multitracks and two *3202* 2-track recorders.

● Videosonics in London have recently had installed an **Alpha Audio** *BOSS* editing system with a number of software updates, and the latest software update to the AMS *AudioFile*.

Greene Street
First in New York

The first AMEK APC1000 installed in New York is at Greene Street. This is what they and their clients have to say:

"In the ten years since Greene Street's been in operation, equipment choices were made based on sonic quality, then on ease of operation, and finally, on client awareness. We're the first with the Amek APC 1000, and initial reaction, especially in a city where SSL has proliferated, is sceptical... that is, until the producer/engineer actually works with the desk. Then all pre-conceived notions fly out of the control room door and as you can see by reactions from some of the early users, the Amek APC1000 sets tomorrow's standard today." *Steve Loeb (President, Greene Street Recording and Producer - Love Bug Starski, Riot, Carol Lynn Townes)*

"Great flexibility, sweet sound, no compromise." *Arif Mardin*

"Yo, the dopest sh*t." *Russell Simmons (President, Def Jam Records & Producer of Run/DMC, Orin "Juice" Jones, Beastie Boys)*

"After a night on APC1000 all I could say was SS-what?" *T-Bone Wolk (Co-producer, Hall & Oates, Bananarama, Carly Simon, Daryl Hall)*

"Nothing sounds like it, nothing works like it, and why would anyone want to use anything else?" *John Robie (Producer - Boy George, UB40, Chaka Khan, New Order)*

"The only serious alternative." *Joe Mardin (Producer - Chaka Khan, New Man, Kenny Loggins)*

"I waited two years for the APC – after two weeks I couldn't imagine working on any other console." *Rod Hui (Producer - Shannon, Kurtis Blow, Riot, "Breakin" Soundtrack. Engineeered - Philip Glass, Bonnie Tyler. Run/DMC, James Brown, Bee Gees)*

All quotes supplied by GREENE STREET STUDIOS unsolicited by AMEK

APC1000

GML
GEORGE MASSENBURG LABS

Greene Street Recording Inc.,
112 Greene Street, New York, NY 10012.
Telephone: (212) 226 4278.

AMEK

EMPHASIS ON ENGINEERING

Head Office, Factory and Sales: AMEK Systems and Controls Limited, New Islington Mill, Regent Trading Estate, Oldfield Road, Salford M5 4SX, England. Telephone: 061-834 6747. Telex: 668127 AMEK G. Fax: 061-834-0593.

AMEK/TAC US Operations: 10815 Burbank Blvd, North Hollywood, CA 91601. Telephone: 818/508 9788. Telex: 662526 AMEK USA. Fax: 818/508 8619.

1985 1986

NEWS

Steinberg/Evenlode showroom

Steinberg Digital Audio is a new UK showroom for Steinberg soft- and hardware products. Located in the Holland Park area Steinberg's latest products can be purchased and demonstrated and regular clinics/tutorials hosted by UK and German staff are planned.

The showroom is a joint project between Steinberg of West Germany and Evenlode Soundworks, who are UK agents for Steinberg products. Chromatix, owned by Evenlode, has broadened its base into the broadcast, video and AV markets, and has been restructured and incorporated in Steinberg Digital Audio. All Steinberg product distribution and hot-line back up will continue to be handled by Evenlode Soundworks.

The SDA team will be headed by Andy Allen, formerly of Kingfisher Music, assisted by Phil Brown from Take Note.

Steinberg Digital Audio, 73 Princedale Road, London W11 4NS, UK. Tel: 01-229 2041/5139.

In brief

• **Yamaha's** *WX7* MIDI wind controller will be used by jazz musician Courtney Pine in future concerts. He has already used the *WX7* on his second album *Destiny's Song (and the Image of Pursuance).*

• **Soundcraft Electronics** have loaned *SAC2000, 600* and *200B* consoles to the BBC for use during the shooting of *Thin Air*, a programme based on a fictitious commercial radio station in the docklands.

• **Carlsbro Electronics**, manufacturer of amplification equipment, has added a further 8,000 ft to the factory at Kirkby-in-Ashfield, Notts, UK. The additional space has increased production and warehouse facilities by 50%.

• **Midi Music Studio** in Copenhagen, Denmark, has opened a new facility. Equipment includes Amek *G-2520* mixing console with *MasterMix*; Lyrec *TR 533* multitracks with ATC remote; Sony digital and analogue mastering; monitors from Westlake, UREI, JBL, Tannoy, Yamaha and Auratone; MIDI setup; Sycologic *M16*; Fairlight series *III*; and equipment for video dubbing. The studio was built in association with Lydteknisk Institut of Denmark.

• **Harman UK** can now supply the *ISA 115L40* outboard equaliser unit designed to retrofit the *SL 4000* mixing console and Focusrite's remote gain mic amps, *ISA116*.

• Harman UK now have supplies of **Bruel & Kjaer's** *4011* cardioid microphone.

• **Ampex** Golden Reel Awards have been received by US country & western artist George Strait for his *#7* album, Alabama for *The Touch*, and Italian Eros Ramozzoti for *Nuovi Eroi*. Charities nominated to receive the accompanying donation were The Jennifer Strait Memorial Foundation, the United Negro College Fund and Don Orione (an institute for abandoned children) respectively.

• London disc cutting and tape duplication facility **TAM Studios** have added R-DAT machines to their equipment list and can now offer duplication to and from this format.

• **Roland** have acquired 65% of the shares in Siel spa of Acquaviva, Italy. When production begins in April, it will be the first time that Roland keyboards have been produced outside Japan.

Axis Audio formed

Based in Stockport, UK, Axis Audio Systems is a new company formed by Tim Eastwood and Will Logan formerly of Audio Services. The company deals in new and secondhand pro-audio equipment and dealerships include Soundtracs, Bel, Akai, Teac/Tascam, Alesis, Beyer, Allen & Heath, Sennheiser, tc electronic, Revox, Tannoy, Neumann and HIT.

Axis' premises are above Strawberry Studios and feature a self-contained studio and demonstration area, and service facilities.

Axis Audio Systems, 3 Waterloo Road, Stockport, Cheshire SK1 3BD, UK. Tel: 061-474 7626. Fax: 061-474 7619.

PRS John Lennon Award

The Performing Right Society are providing funds of up to £6,000 this year to the winners of the PRS John Lennon Award. The award is for composers or songwriters of outstanding promise to undertake a course of specialised study for a period of at least one year. Although the course of tuition is not stipulated, it should be in a field suggested by Lennon's own musical achievements, such as composition, record production and advanced audio or audio/visual recording techniques.

The closing date for applications is April 29th and further information is available from Miss Lesley Bray, PRS, 29-33 Berners Street, London W1P 4AA, UK. Tel: 01-927 8322.

Literature received

• The 1988 edition of *The White Book* is now available. This is the fifth annual compilation of names and addresses of those involved in the production areas of live performance, recorded music, television, film, video, conferences and exhibitions, and details of service industries such as the media, travel, accommodation, merchandising, marketing, etc. The directory also contains an international section. *The White Book* costs £25 including postage and packing, and is available from White Book Sales, PO Box 55, Staines, Middlesex TW18 4UG, UK. Tel: 0784 64441.

• Now available from the **British Standards Institution** is BS 6840 Part 11 *Sound System Equipment: Specification for application of connectors for the interconnection of sound system components.* Copies are available from BSI Sales, Linford Wood, Milton Keynes MK14 6LE, UK, and costs £25.60 to non-members, £10.24 to BSI subscribers.

Courses and seminars

April 12th Satellite Television: A Larger Diet From Small Dishes, The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG.

April 15th to 17th Syn-Aud-Con Loudspeaker Designers Workshop, Atlanta, GA, USA. Tel: (812) 275-3853.

April 22nd to 23rd Syn-Aud-Con, New York City, USA.

April 27th Institute of Acoustics one-day meeting 'Inaudibility in the Assessment of Noise Nuisance,' Meadowbank Sports Centre, Edinburgh. Contact: Institute of Acoustics, 25 Chambers Street, Edinburgh EH1 1HU, UK. Closing date: April 13th.

May 3rd to 4th Syn-Aud-Con, Nashville, USA.

May 5th to 8th AES 6th International Conference: Sound Reinforcement, Opryland Hotel, Nashville, TN, USA. Conference Chairman: Ted Uzzle (Altec Lansing Corp). Tel: (405) 324-5311. Fax: (405) 324-8981.

May 17th to 18th Sound with Pictures (AES) to be held at Independent Broadcasting Authority, 70 Brompton Road, London SW1.

June 3rd to 5th Special Effects Seminar, Pinewood Studios, UK.

June 23rd to 24th Syn-Aud-Con, Toronto, Canada.

June 27th Institute of Acoustics one-day meeting 'More About Noise Control in Factory Buildings', University of Salford, Salford M5 4WT, UK.

June 28th to 29th Syn-Aud-Con, Syracuse, USA.

September 20th to 22nd Digital Processing of Signals in Communications, Institution of Electronic and Radio Engineers, Loughborough University of Technology, UK.

Contracts

● Recent **Soundcraft** installations in the USA have included: 28-input *600* console in Fantasy's new MIDI keyboard studio in Berkeley, CA; 32-input *600* patchbay console at Geof Benson Music, St Louis, MO; a *600* at Sea World, OH, for recording and sound reinforcement at their theme park; 24-channel *600* at South River Recording, Indianola, IA. *TS12* consoles have been purchased by Sound West Studios, Tacoma, WA; Hear Here, Ashville, NC; and Jay Howard Production Audio of Charlotte, VA. A *500* series 32-channel desk and two *200SR* consoles have been installed in the State Office Tower, Columbus, OH. Senate Media Services, St Paul, MN, have purchased a *200B* console and the Fairmont Hotel, San Jose, CA, three *200SR* 24-channel consoles.

● The Enterprise, Burbank, CA, USA, has upgraded its Cabin (Synclavier control room) with the **New England Digital** 8-track *Direct-To-Disk* system.

● Olympic Studios have just purchased six channels of **Focusrite** equalisation from Harman UK via HHB.

● Harman have recently supplied a pair of **UREI** *565T Little Dipper* filter sets to Abbey Road Studios. They will be installed in the new '78' transfer room currently being upgraded for stereo operation.

● Mcasso Music, UK, have purchased **Bruel & Kjaer** *4006* omnidirectional microphones for voiceover work. Abbey Road have ordered four for orchestral work.

● Dolby Labs' new screening room complex in San Francisco, CA, will be fitted with a **Harrison** *MR-4* series audio console. The private in-house studio will be used for audio training and demonstration, as well as music recording and screening room applications. Dolby felt that the major consideration in choosing the *MR-4* was its ability to be continually adapted to their needs. This system will allow them to easily monitor any film soundtrack format, as well as standard 2-channel music tracks.

● An **Apogee** linear phase anti-aliasing filter has been installed in the Sony *PCM 3324* at Sedic Studio in Japan. This is the first Apogee filter to be installed in a Japanese studio.

● PWL, UK, have ordered their fourth **Sony** *PCM-3324* digital multitrack recorder. The first two machines are shared by Stock, Aitken and Waterman and mix-master Phil Harding. The third machine will be moved to PWL's new studio at their Borough premises and the fourth machine will be installed at The Workhouse.

Maintenance engineer Mike Picking confirms all PWL studios will be equipped with Sony *PCM-2500* DAT recorders, which he feels will be especially useful with their Fairlight equipment.

Exhibitions and conventions

April 8th to 12th NAB, Las Vegas, USA.
April 14th to 16th ABTT Trade Show '88, Riverside Studios, London, UK.
April 25th to 28th Audio Visual '88, Wembley Exhibition Centre, UK.
May 18th to 20th ShowTech Berlin '88. Berlin Exhibition Grounds/International Congress Centre, Berlin, West Germany.
June 22nd to 24th APRS '88, Olympia 2, London, UK.
June 24th to 26th NAMM Expo, Georgia World Congress Center, Atlanta, GA, USA.
● **August 16th to 18th** 3rd Regional Convention, Melbourne Hilton Hotel, Melbourne, Australia. Convention Chairman: Brian Horman. Tel: 03-329-0162. Fax: 03-328-1424.
September 8th to 12th 22nd SIM-HI.FI-IVES, Milan Fair Pavilions, Milan, Italy.
September 23rd to 27th International Broadcasting Convention '88, Metropole Conference and Exhibition Centre, Brighton, UK.
September 29th to October 3rd International Broadcasting and Telecommunications Show, South Pavilion, Milan Trade Fair, Italy.
September 30th to October 9th BBC Radio Show, Earls Court, London, UK.
October 11th 13th Sound Broadcasting Equipment Show, Albany Hotel, Birmingham, UK. Admission by invitation. Contact: Point Promotions, tel: 0734 583086.
November 3rd to 6th 85th AES Convention, Los Angeles Convention Center and Los Angeles Hilton, Los Angeles, CA, USA.

1989

March 7th to 10th 86th AES Convention, Congress Centre Hamburg (CCH), AM Dammtor, D-2000 Hamburg, West Germany.
April 28th to May 2nd NAB, Las Vegas, USA.
June 17th to 23rd ITS Montreux, Switzerland.

1990

March 30th to April 3rd NAB, Atlanta, USA.

The Producers Story

When producer Barry Andrews came into the console buying market he chose the Soundtracs CP6800 for its sound, its flexibility, its computer facilities and its exceptional value for money.

A freelance producer of many successful years standing, Barry's recent work has included recording the Radio One Janice Long sessions featuring such varied talents as Howard Jones, China Chrisis and The Christians.

Towards the end of 1986 he became involved with major London publishing company, Peer Southern in Denmark Street. The company's recent chart successes include Walk Like an Egyptian by The Bangles and Freddie Mercury's The Great Pretender.

Barry Andrew's role at Peer Southern is that of Manager over the Professional, Creative department and Production company and to this end one of his first tasks was the complete rebuilding and re-equipping of the company's recording studio. The facility, now re-opened and hard at work, has the potential to grow and diversify into any of the many areas a music company may pursue in future years. This flexibility has been achieved with the installation of a Soundtracs CP6800 mixing console as the central piece of equipment.

Barry Andrews explained that, having worked extensively behind Radio One's SSL consoles he particularly wanted to find a desk within the company's budget which could offer wide ranging flexibility and quality of sound.

'The Soundtracs CP6800 is a wonderful desk. I had used a Soundtracs CM4400 previously at another studio and I really liked the sound. For this studio we really need the computer facilities such as automated patching, subgrouping and all the other excellent facilities the CP6800 offers. You can get a lot more complicated with your mixing when you have the help of the computer. It makes 12" mixes much easier; we do a lot of those here.

'I just love the flexibility of the console and I love the sound – it's wonderful. Also, if we want to get into video at a later date, we can do that with the CP6800 unlike other consoles which maybe out of date in a year's time.'

NEWS

Audio Kinetics Reflex

Reflex is a centrally controlled fader, muting and auxiliary switching automation system that is retrofitable to a console without any mechanical modification. The system is able to process 32 fader movements and mutes continuously and simultaneously with an upgrade to 64 channels retrofitable. Mix and editing data uses RAM and this reduces operating delays. Fader levels and mutes are processed separately and if fitted with the multiplexer option, each channel can automate 32 auxiliary switches. A 3.5 inch disk is used for storing up to 99 titles with 999 different mixes (mix size dependent) and is MS-DOS compatible. There is also provision for off-line mix editing, grouping, autofade and snapshot facilities.

Operation can be monitored on a high resolution colour monitor showing system status and configuration information. The computer is housed in a 2U rack mounting unit with integral disk storage. The system is controlled by a compact 45 key pad whose dimensions will allow integration into a console. The VCA card may be configured as eight mono or four stereo channels. A timecode generator is included for tape striping and there is also a RS422 port for external control as well as a MIDI port.

Reflex is a low cost system and does not replace *MasterMix* which is still a standard product. The system will be available by the time of publication.

Audio Kinetics Ltd, Kinetic Centre, Theobald Street, Borehamwood, Hertfordshire WD6 4PJ, UK. Tel: 01-953 8118.
USA: Audio Kinetics Inc, 4721 Laurel Canyon Boulevard, Suite 209, North Hollywood, CA 91607. Tel: (213) 980-5717.

Neutrik TT402 test set

Neutrik have recently introduced the *TT402* test set, which is an enhanced version of the *TP401* Audio Measuring System. In common with the *TP401*, the *TT402* measures level, noise, distortion (THD, IMD, DFD), wow and flutter, drift, rumble, crosstalk and frequency according to all the relevant standards. To enable the unit to be used for testing of transmission lines by broadcasters, etc, the *TT402* has the additional capabilities of measuring phase and level difference. Further the unit now has facilities for autoranging and the inclusion of a digital meter as an alternative to the analogue meter. In the same way as the *TP401*, the unit may be used as a stand alone device or can be integrated into automatic test systems with the appropriate computer and software. The *TT402* is currently in production.

On the connector side of the business Neutrik have increased the range of connector modules allowing more variety in user design configurations and adaptors. The *Speakon* loudspeaker-to-amplifier connector has been refined since its first appearance just over a year ago. Neutrik describe the interest in sales for the connector as encouraging.

Neutrik AG, FL-9494 Schaan, Liechtenstein. Tel: 075 2 96 66.
UK: Eardley Electronics Ltd, Eardley House, 182-184 Campden Hill Road, Kensington W8 7AS. Tel: 01-221 0606.
USA: Neutrik Products, 77 Selleck Street, Stamford, CT 06902. Tel: (203) 348-2121.

Studer DE 4003 electronic editor

Studer have introduced an electronic editing system to be known as the *DE 4003*. Its main application is digital tape mastering for CD working with the digital two-track *D820X* Twin DASH recorder. The editor controls two playback machines and one recorder with it being possible for one of the machines to be an analogue A820 machine. Studer have designed special filters for low speed cueing offering good audio quality easing search for cue points. The desired operating sequences and the required internal memory can be selected by the operator to save time and maintain audio quality. In all modes the operator monitors the off tape signal. The Studer and Philips PQ editor *LHH 3050* can be integrated into the audio editor making a system suitable for CD tape mastering. The *DE 4003* also has a built-in timecode generator.

Studer International AG, Althardstrasse 10, CH-8105 Regensdorf, Switzerland. Tel: (1) 840 29 60.
UK: FWO Bauch Ltd, 49 Theobald Street, Borehamwood, Herts WD6 4RZ. Tel: 01-953 0091.
USA: Studer Revox America Inc, 1425 Elm Hill Pike, Nashville, TN 37210. Tel: (615) 254-5651.

NEWS

New Mitsubishi digital products

Mitsubishi introduced two new digital mastering tape machines during the Paris AES. Although both machines had been previously announced as part of the original *X-86* launch so far neither have been available until now. The *X-86HS* is similar to the basic *X-86* but with the provision of 96/88.2 kHz sampling rates giving a possible audio response up to 40 kHz. Mitsubishi describe the machine as having less distortion in the 10 to 15 kHz range and with better resolution in HF areas. The *X-86HS* also records and replays at 48/44.1 kHz sampling rates and in this mode is fully compatible with the standard *X-86*.

The *X-86C* has been developed to offer full playback compatibility with *X-80* series format tapes so that digital recordings made on those machines can be replayed on machines that include the advances of the *X-86* series.

UK: Mitsubishi Pro Audio, Unit 13, Alban Park, Hatfield Road, St Albans, Herts AL4 0JJ. Tel: 0727 40584.

USA: Mitsubishi Pro Audio, 225 Parkside Drive, San Fernando, CA 91340. Tel: (818) 898-2341.

In brief

• **Clarity** have announced that their XLV effects automation interface will now automate the AMS *RMX-16*, Quantec *QRS* and the Yamaha *REV1* in addition to the established Lexicon *224XL* and *480L* interfaces.

• **Apogee Electronics Corporation** have announced that their *944S* and *944G* anti-aliasing/anti-imaging filters have been designed into the new AES/EBU sampling card from Fairlight Instruments. This card is an upgrade for the sampling input of the *Series III*.

• **Audio Kinetics** have recently released several new master cables and slave interfaces for the Pacer chase synchroniser. Master cables include the Sony *BVU-800*, 3M *M79*, Studer *B67*, Fostex *E2* and the National Panasonic *8500* and *9600*. Slave interfaces released are the Sony *BVU-800*, 3M *M79*, Studer *B67* and Fostex *E2*. The latest interface for the *Q.Lock* synchroniser is the JVC *PR600*.

• **Studer** has now added an optional noise reduction interface for the range of *A820* multitrack tape machines to accommodate *telcom c4e* noise reduction cards. Up to 24 may be fitted in an *A820* with all level settings under microprocessor control. Interfaces for Dolby cat 22 *A* type, *SR* cat 280, and *telcom c4* DM have been available for some time.

Otari MTR-100A multitrack

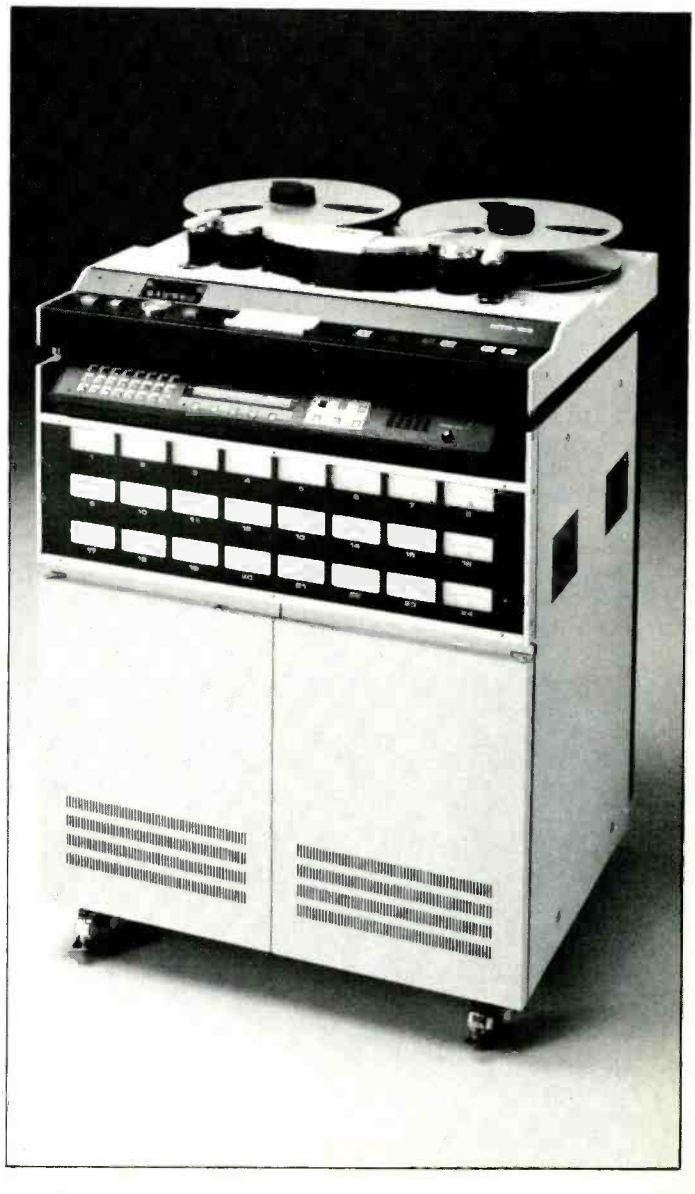
Otari have launched a new analogue multitrack series, the *MTR-100A*. Available in one inch 8-track, two inch 16-track, 16/24-track and 24-track versions, the main feature is its ability to automatically align audio functions—record EQ M/H, level, bias, phase compensation, reproduce EQ H/L and level, as well as the oscillator function and the amp mode select. This alignment is completed in less than 240 s. The unit has three available speeds—30/15/7.5 in/s and a presettable winding speed of 2 to 472 in/s. The transport is pinchroller less and Otari say that the design is easy for maintenance. There is ±50% varispeed control and selection of jog or shuttle by one button operation. A mini-autolocator function allows selectable indication of timer, timecode frame or tape speeds in in/s, search point, search cue points, search last play point, shuttle function, drop frame display, reverse play, erase and record, and library wind mode. The transport switch order is available in three variations.

Otari claim an improvement in frequency response by mounting the head amplifiers under the head assembly. Equalisation is NAB/IEC with 30 in/s AES and switching is possible from the alignment console using menu selection. There are a wide range of optional accessories including mixing console interface, second RS-232C and RS-422A serial I/O ports, autolocators and chase synchroniser, etc.

Otari Electric Co Ltd, 4-29-18 Minami-Ogikubo, Suginami-ku, Tokyo 167, Japan. Tel: (03) 331-5802.

UK: Otari Electric (UK) Ltd, 22 Church Street, Slough, Berkshire SL1 1PT. Tel: 0753 822381.

USA: Otari Corporation, 2 Davis Drive, Belmont, CA 94002. Tel: (415) 592-8311.



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Tel. 0273 479 411

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Germany: Eugen Beyer Eletroteknische Fabrik GmbH & Co., Theresienstrasse 8, Postfach 13 20, D-7100 Heilbronn Tel: (07131) 617-0 Telex 728771

NEWS

Ampex 478

The magnetic tape division of Ampex have launched a new mastering tape designated as *478*. It is a low print mastering tape intended for radio broadcast, film and video post-production facilities, and recording studios where low print mixdown is desired. A new back coating process allows improved quality of wind and packing allowing flangeless use and reducing problems such as edge damage. The tape will be available in CCIR and NAB reel formats in ¼ and ½ inch widths as well as in small reel sizes. Ampex say that they still see and regard *456* as the tape most suited for recording studio use where low printthrough may not be the highest priority.

Ampex Corporation, Magnetic Tape Division, 401 Broadway, MS 22-02, Redwood City, CA 94063, USA. Tel: (415) 367-3809.
UK: Ampex (Great Britain) Ltd, Acre Road, Reading, Berks RG2 0QR. Tel: 0734 875200.

Raindirk 2400 Symphony mixing console

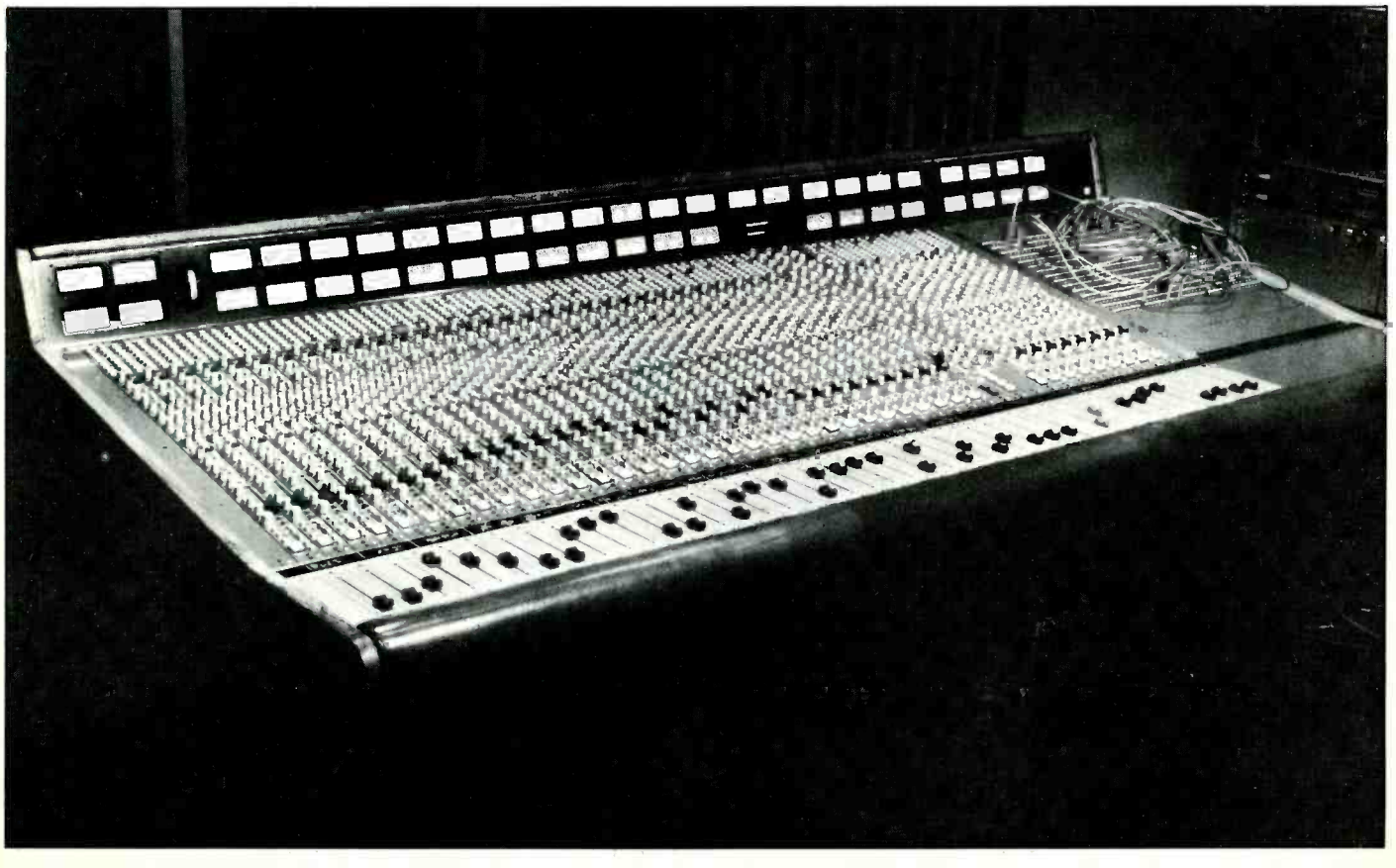
The *2400 Symphony* from British console manufacturer Raindirk is their first new model for some time. The *Symphony* is a 40-channel in-line console with 32 bus outputs and two separate stereo outputs. Console mode status may be selected by four master switches or locally on the modules. Channel features include channel and stereo bus routing; channel pan; direct to track select; group mix level; separate mic and line input levels with phantom power, 20 dB pad and phase reverse; four aux sends that may be pre/post and switched in pairs to a second set of aux buses; two stereo cue sends with pan, pre/post select and level; monitor fader level, pan, solo and mute buttons; master channel cut; two mute groups; solo; second stereo bus select; four local status buttons; and a safe solo button that removes the input section from the solo selection.

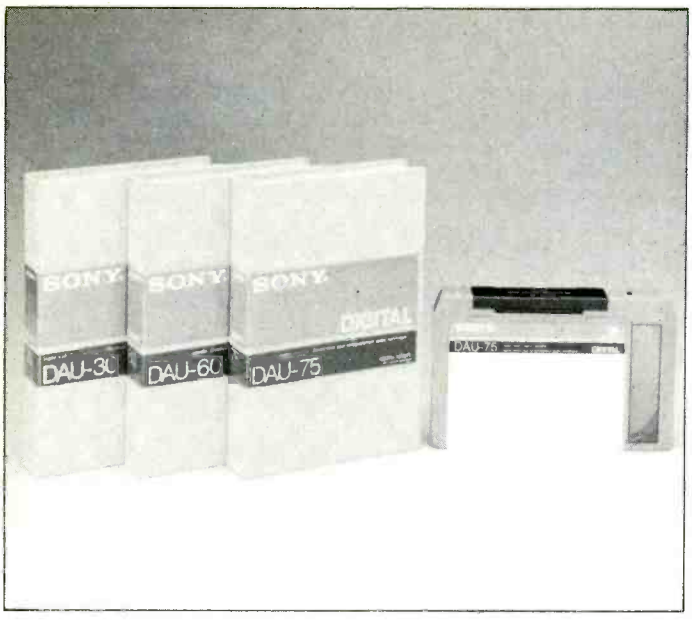
The equaliser is five bands—shelving treble and bass EQ at 8/16 kHz and 80/160 Hz respectively, and three mid range bands that are fully swept covering the range from 30 Hz to 16 kHz with a constant Q response. All turnovers are ±15 dB. Additionally there is a variable high pass filter variable from 30 to 330 Hz. The EQ may be switched into the monitor path if required although the HPF always remains in the main signal path.

The channel faders may be reversed locally or from the master module although the channel and monitor mutes and solo function remain dedicated. There is status selection to allow foldback of studio mics while the control room monitoring replays previous recordings. Any channel or monitor fader may be used as a sub mix master.

The *Symphony* has three echo returns with EQ, level and balance controls. There are comprehensive talkback facilities, internal oscillator and an integral patchbay with up to 600 points. Metering is VU as standard but PPMs and phase meters may be added as can distribution amplifiers for broadcast requirements. Two consoles have already been delivered—Temple Music and Elephant in London with a third about to be installed at BVR. *MasterMix* automation can be factory fitted to consoles if required.

Raindirk Audio, 33a Bridge Street, Downham Market, Norfolk PE38 9DW, UK. Tel: 0366 382165.
UK: The Home Service at SSE, Unit 2, 12 William Road, London NW1 3EN. Tel: 01-387 1262.





Sony AES launches

One of major AES Paris launches from Sony was the new digital editor, the *DAE-3000*. This unit offers significant advantages over the *1100* in that it can interface with a far wider range of machines. Provided with various options the *3000* can accommodate the DASH format with the *PCM-3402* and *PCM-3324*; U-matic recorders in the form of the *DMR-4000/2000* and *BVU-800* as well as the architecture of the *1610/1630* format. There is also apparently built-in design consideration for further digital products still under development. Principal features in the editing process include a six second, 16 bit full bandwidth stereo memory rehearsal function; a 'quick search' shuttle dial in addition to the jog dial that that reduces the time taken to identify edit points. It is now possible to have an immediate preview or audio edit without having to pre-load the memory with crossfade data from the tape itself. The digital fader function has been changed so that there is now a choice of offset scales while the balance level of each channel may be adjusted in 0.2 dB steps.

Using the correct interfaces it is possible for the editor to control up to four U-matics or three *3324*s as well as direct links to the *DAQ-1000* cue editor. The *3000* also has a SMPTE timecode generator and the ability to directly interface with the *DTA-2000* tape analyser as well as an *RS232* interface allowing future external control.

Pricing structure on the *DAE-3000* is similar to that of the *DAE-1100* and delivery is starting in the very near future.

It was announced that the *PCM-3402* 'double DASH' two-track is now in production following lengthy pre-production trials and that the availability of this machine coincides with the availability of the Studer 'double DASH' machine with which it is compatible.

The DAT portable *PCM 2000* was shown more openly ie, not behind glass as well as the established *PCM-2500*. A new microphone, the *ECM-979* was being presented as a suitable partner for the *PCM-2000*. This is an MS stereo mic with two newly designed back electret capsules and a new transducer. Sound pick-up is at right angles to the microphone axis.

Sony also launched a new control system to support the *CDK-006* compact disc autochanger comprising a main processor with an RS232 port and a detachable keyboard unit. The unbalanced audio from the autochanger is routed through the main processor so that audio balancing, level control and auto cueing can take place. The keyboard also has a numeric pad allowing CD timecodes to be entered. The keyboard also provides editing features as well as the control of fades. The system would be useful in managing a CD sound effects library fully in the digital domain.

Finally, Sony announced a new ¾ inch digital audio cassette, the DAU series. This is a high quality cassette for CD mastering. The tape has a newly developed flexible crosslinked binder system and carbon mirror back coating claimed to improve durability and provide a low CRC error rate. The cassette itself is manufactured from a new anti-static plastic material which assists in the improved error rate. The cassettes will be available in 30, 60 and 75 min playing times.

UK: Sony Broadcast Ltd, Belgrave House, Basing View, Basingstoke, Hants RG21 2LA. Tel: 0256 55011.
USA: Sony Corporation of America, Professional Audio Division, Sony Drive, Park Ridge, NJ 07656. Tel: (201) 930-1000.

NEWS

Akai Digital Multitrack

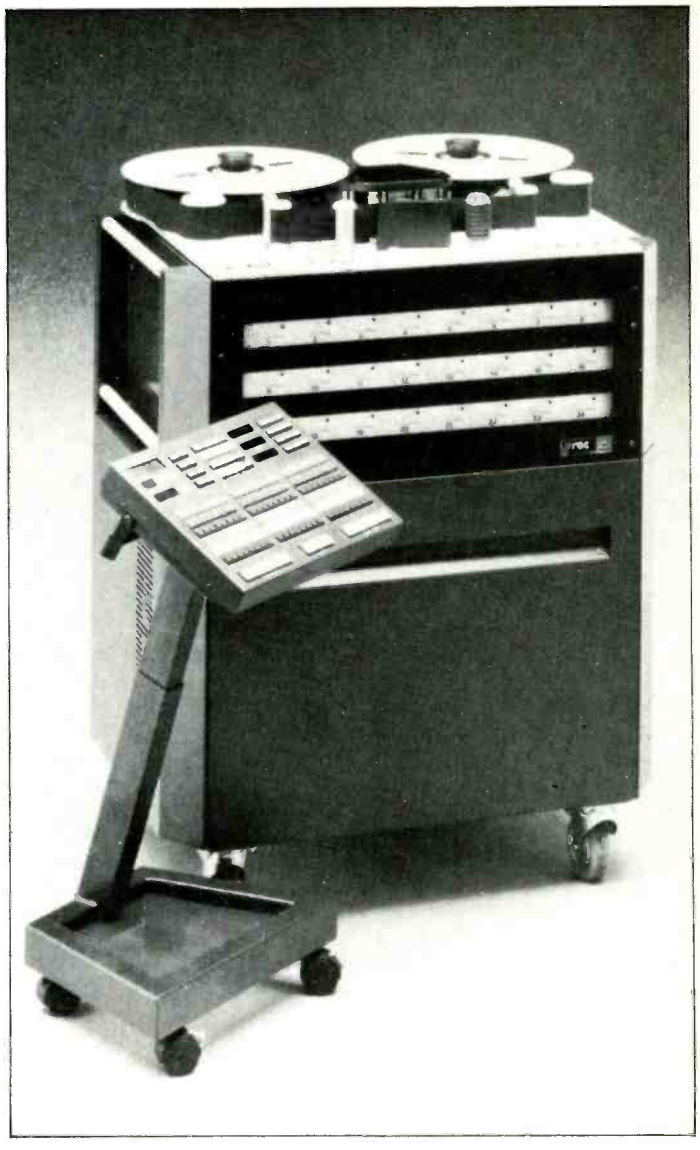
Akai gave their most public showing so far to the *DR-1200* PCM digital 12-track recorder, during the Paris AES. The *DR-1200* is based around the use of a standard 8 mm video cassette on which is recorded 12 digital PCM channels, 16 bit linear at 44.1 or 48 kHz. The recording format is referred to as ADAM (Akai Digital Audio Multitrack). Recording time is 17 minutes on a standard 90 minute video 8 cassette using a linear tape speed of 72.76 mm/s. There is also provision for an analogue sync of SMPTE channel.

The system is quite compact and is in three sections—deck, locator and level meter sections. It is possible for one locator unit to control up to three decks giving the possibility of 36-track recording. Both digital and analogue interfaces are provided.

Other features include a choice of eight crossfade times for punch in/out from 1.45 ms to 185.6 ms. There are various edit modes allowing programming of punch ins. A search mode allows scanning of a tape to find a point on the PCM subcode with 90 s being the worst length of time. It is possible to score certain information about the tape at the head as a table of contents.

In Akai's words, the *DR-1200* will form the nucleus of a system that they are developing which they see as fulfilling a need for a 'personal CD mastering system'.

UK: Akai, Pro Audio Division, Haslemere Heathrow Estate, Silver Jubilee Way, Parkway, Hounslow, Middx TW4 6NQ. Tel: 01-897 6388.



Lyrec updates

Lyrec have recently announced significant updates in a wide range of their products. The *TR533* MkII multitrack has been updated with new play and sync pre-amplifier stages resulting in lower noise; Dolby *HX Pro* has been made an option; new software allows the rehearsal of punch in/out timings under external control; a new accessory timecode-based events controller; improved monitor switching; a single command punch in/out function; two new software functions have been added to ATC—keyboard memory and memory keyboard transfers; and a new card to control repro/sync switching of the timecode track.

The *TR55* two-track mastering recorder is now available in a version with a centre track timecode. It uses an in-line head and software controlled setting to any recognised timecode standard. This machine will be known as the *TR55-2/TC*.

FRED, the editing transport now has a dump mode kit available. This contains a motorised pinch roller that plugs into the tape deck and allows the operator to dump unwanted tape. It follows all normal speed and varispeed variations. A simplified version of *FRED* has also been introduced that is minus the built-in scissors and fade in/out facility. Lyrec see this model being of interest to those who edit with razor blades or want to use the machine for playback only. It has also led to a saving of about 12% on price for this model. There is a glass fibre reinforced flight case available for *FRED* that is both dust and damp proof.

There have also been significant improvements to the Lyrec range of high speed duplication systems *P-2000* and *P-2500* and the duplication mastering machine *TR55-MM*.

Lyrec Manufacturing A/S, Hollandsvej 12, DK-2800 Lyngby, Denmark. Tel: (2) 876322.
UK: Lyrec (UK) Ltd, Ardhaven House, Old London Road, Milton Common, Oxford OX9 2JR. Tel: 08446 8866.
USA: Rupert Neve Inc, Berkshire Industrial Estate, Bethel, CT 06801. Tel: (203) 744-6230.

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Tel: (213) 460 63-55. Telex: 3717528 PAI.

Chytchen Labs CD/SMPTE sync

Chytchen Labs Inc have announced the Chytchen *Synch*, a compact disc player interface that allows hard lock of the CD player output to SMPTE timecode allowing the operator to drop sound effects or other audio from CD directly to the master tape. Chytchen say that the *Synch* does not use General Purpose Interface contact closures which they say have proven too inaccurate for professional post-production applications. The *Synch* engages in two-way communication with the edit control system for complete synchronisation and the CD player, the Technics *SL-P1200* appears on the system controller just like any other transport in the system and the player works just as any other transport. The operator enters in-points, out-points and off-sets in the same way. Chytchen claim that the accuracy of the synchronisation is limited only by the accuracy of the edit control system. Currently the *Synch* can be used with Adams-Smith, CMX, Cypher Shadow and other systems. There is currently a system in operation at Photomag Studios in New York.

Chytchen Labs Inc, 42 Lake Trail East, Wayne, NJ 07407, USA.

NEWS

Tascam new products

Tascam showed three new products in production form at the Paris AES. The first was the *M-700*, an in-line recording console with 40 in/out channels assignable to 32 group buses and with a quad mix bus. The master module allows instant console mode selection for record, record and mix, and mix. It also contains master controls for input defeat, fader reverse, group mute, and other functions. Three mute groups are available with independent assignment on each channel. Channel EQ is four band with HF and LF being peak/shelving selectable while the two mid-ranges are parametric.

Also includes variable HPF. The 12 aux buses may be used in mono or stereo configurations. Tascam have already sold 20 of these consoles in Japan to date.

Paris also saw the launch of the *ATR-60-16*, a one inch format 16-track tape machine. Features include easy access to all aspects of the calibration and maintenance of the machine with all trims being on the front panel with the transport raising for easy access to circuitry. Electronic features include gapless punch in/out and spot erase. Transport is two speed 7½ and 15 in/s and includes built-in dbx Type 1 noise reduction. Also available is optional *RC-65C* remote control unit and *AQ-65C* autolocator.

The final new product was the *DA-50* DAT recorder. This is a unit intended for 19 in rack mounting with professional operating levels and XLR connectors. It has twin A/D and D/A converters with two times oversampling on D/A. Slot-in type tape loading and 25 segment peak level meters with variable peak hold time. Display brightness switchable and unit includes wireless remote unit. Main functions include direct search, cue/review, music skip, 2-way repeat, start ID/skip ID, blank search, renumber function, auto record mute, and variable counter modes. Sampling frequencies are 48 kHz (rec/play), 44.1 kHz (play), 32 kHz (digital in, rec/play).

UK: Teac UK Ltd, 5 Marlin House, The Croxley Centre, Watford, Herts WD1 8YA. Tel: 0923 225235.

USA: Teac Corporation of America, 7733 Telegraph Road, Montebello, CA 90640. Tel: (213) 726-0303.

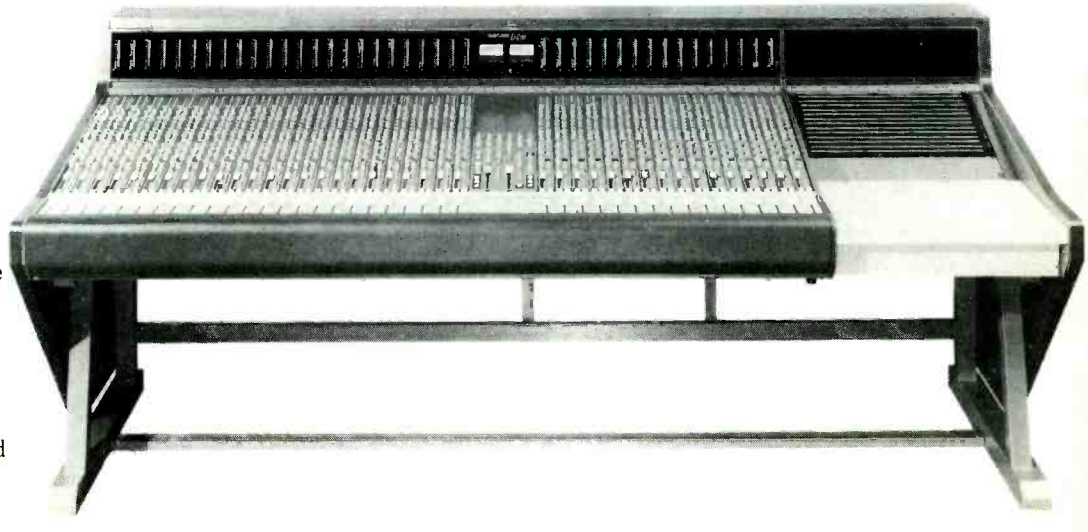
NED PostPro Direct-To-Disk

New England Digital have announced the introduction of an 8-track *Direct-To-Disk* digital multitrack recorder configured to meet the specialised needs of the film and video post-production industries. NED claim that the *PostPro* multitrack and editing system offers twice the recording time and twice the fidelity of competitive-based disk-systems but no figures have been released. The system also has the possibility of direct digital transfer to DASH, PD and AES/EBU interface standards. The system also includes a programmable remote box. Orders are being taken for the *PostPro* as well as for a 32-track disk-based multitrack recorder. Initial details on this product quote figures of 125 minutes of recording time per track at 50 kHz sampling rate. It will also incorporate full random access editing capability.

At the same time as these new product announcements, NED announced a price reduction of nearly 40% on the user cost of RAM for the Synclavier *Digital Audio System*. These reductions are due to economies of scale due to increased production last year. The recording time on the *Direct-to-Disk* systems has now been upgraded to 125 minutes per track at 50 kHz sampling. The list prices of the 4- and 8-track *Direct-to-Disk* systems have also been reduced.

New England Digital Corp, White River Junction, VT, USA. Tel: (802) 295-5800.

UK: Harman (Audio) UK Ltd, London. Tel: 01-202 4366.



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THE WHITE HOUSE

Jim Betteridge visits Suffolk and a 24-track studio complete with croquet lawn

Simon Phillips is best known as a drummer. As such he has worked with many of the top names in rock music, both live and in the studio, and at the time of writing he is rehearsing for Mick Jagger's forthcoming solo tour.

Simon's father was a jazz band leader in the '50s and so from an early age he spent a great deal of his time in and around recording studios. He played his first professional session for the BBC at the advanced age of 12.

In March 1982, Simon and his wife Sue moved into a large white 18th century Regency house in Bures, Suffolk, and started extensive renovation and redecoration work. In one corner of the house he had his own professional 24-track studio built—The White House—which he uses for his own production work as well as occasionally hiring it out.

Simon Phillips: "As a professional musician I've always been away from home a lot, either touring or working on recording projects. In 1982 I started producing and that's become an increasingly significant part of my work. As a musician playing on an album you don't spend that much time in the studio, you can come and go, but as a producer you're there virtually all the time, and so it's very important that the place not only sounds good and has the right equipment, but is also comfortable to be in for long periods of time. A lot of studios I've worked in, especially abroad, just don't meet those requirements. The rooms aren't properly designed acoustically, they're dark and dingy and often built down below ground with no natural light. So it seemed to make sense to build my own studio in the house to a good professional technical standard and with a nice airy ambience, so that I had the studio I wanted and didn't have to spend so much time away from home."

In previous years Simon had played on a number of sessions engineered by Roger Quested and had been impressed by a pair of Quested monitors. Thus Roger was called in to give technical advice.

"At that stage I was intending to buy some reasonably priced secondhand equipment and put something together on a fairly low budget but the more I discussed it with Roger the more it became apparent that I needed a really professional set-up. If you're intending to do albums and hire the facility out to clients you have to be certain that everything's going to work properly. I'm some way out of London and am not technical enough myself to handle serious maintenance, so it also needed to be reliable.

"Although this isn't really a commercial studio as such, as I'm away for several months of the year, it does need some work to make it viable. I've tried to strike a working compromise between standard and amount of equipment, and cost. I think many producers find this when they come to build their own studios: when you've been used to working in some of the best studios in the world with SSL or Neve consoles and five AMSs in the rack you can get a bit spoilt. When it's suddenly your studio and your bill, you have to look more closely at the alternatives to find the right balance between quality and cost. I always wanted a really good pair of monitors because it's via them that everything is judged, and so that's one of the reasons I called Roger in—he's not only an engineer and acoustician but also makes excellent monitors.

"Originally I thought I couldn't afford the Otari *MTR90* but after I'd used one for a session I knew it was the right machine: it's reliable, simple to use, it takes care of the tapes and it has modern feel compared with other machines in that price bracket. On the same basis I chose the *MTR12* stereo machine and have both ¼ and ½ inch heads for it. Personally, I always like to master at 30 in/s on ½ inch non-Dolby. Currently, I don't use any noise reduction for the multitrack either. I try to combat the noise by working at +6 dB (over 185 nWb/m), at 30 in/s, and I always make sure that everything's accurately lined up. At some point soon I would like to get 24 channels of Dolby *SR*. I've done an album with it and I think it's brilliant. A lot of studios are getting digital multitracks, but they're so very expensive and I think that a good analogue machine with *SR* is a strong alternative. It's obviously a matter of personal preference but I really like it.

"I use Ampex *456* because it's generally good tape and there don't seem to be any problems with shedding now, it's easy to get and I much prefer editing with it. I do a lot of my edits on the multitrack, because I don't like having to wait until I've mixed it to see if it works or not. Also you can be sure of getting a definite point to cut on; on a mix it can be more obscured.

"The desk (a TAC 36/24 *Matchless*) was somehow a little lower than the machines on the list of priorities. I wanted something fairly straightforward that could do the work and, above all, that sounded good. I talked to several people who'd worked with the *Matchless* and said it was very good; it had a patchbay, it was quite well appointed, and so I just dove in. I've done a few mods to it, for instance, when working 'in-line' and using the available auxiliary sends for foldback, there was no way to have echo sends on the monitor channels. So I had the switch that normally brings the EQ from the channel to the monitor, which I never used, bring the echo sends to the monitor. Another limitation was that there were no sockets on the patchbay for the eight group outputs, and so I had those added to allow me to use them during recording if necessary.

"Initially I had a little trouble mixing because I'd learnt on large computerised boards which made the most complex of mixes very easy but now I really love doing it manually. You

THE WHITE HOUSE

need two of you, but it's great to take two handfuls of faders each and actually do it live. Having done a section I play it back and maybe there'll be a couple of bars that weren't quite right, so I'll just go back, do those again and edit them in. That way of working might not be so appropriate for a busy commercial studio with a fast turnover of sessions but it works very well for a studio like this and I really enjoy doing it.

"After the Dolby *SR*, the desk will probably be the first thing to be changed when the money's there. Not that there's anything wrong with the *Matchless* but I'd just like something with a few more facilities. For instance, I'd like to have a separate patchbay mounted vertically in a rack because, firstly I think they get less muck falling down them and so they last longer, and secondly it's surprising how much strain it puts on your back over the course of a long session continually leaning over to plug things up."

Measuring approximately 18×15 ft (W×D) the feel of the control room falls comfortably between that of a hi-tech studio and an elegant living room. The general colour scheme is a combination of off-white and grey-blue, with the wall-mounted acoustic boxes covered in a colourful oriental chintz. In front and to the right of the console, behind some unobtrusive double glazing, are the original sash cord windows looking out across the extensive grounds of the house. In fact the windows are locked shut, their counterweights have been removed and the resulting space in the frame filled in to reduce sound transmission. The monitors have been flush mounted in a false wall fronted by plywood lightly stained blue-grey. Suspended above the desk is a wedge-shaped false ceiling containing mid and high frequency absorption, the details of which designer Roger Quested classified as top secret. The felt face of the ceiling is apparently acoustically transparent and has no specific function. Similarly, its shape is purely cosmetic helping to lend the room, which was once a living room, more the feel of a studio. The overall effect of all this is quite striking but very comfortable and relaxing to be in. I asked Roger about the nature of his acoustic design.

Roger Quested: "One of the major considerations here was space, and so there was no question of taking up 50% of the room with trapping. That's why all the acoustic boxes on the side and rear walls have been mounted above machine level preserving maximum floor space. It's not a dead room but it's well controlled. We don't have any overall policy about acoustic treatments, we like to take each project individually and work out something that's appropriate. Some designers will make all their studios look more or less the same but they'll sound quite different, whereas our studios tend to have their own individual look but are all acoustically compatible without the need for electronic equalisation.

"I find plain finished ply is generally a bit boring, and so for the monitor wall we spent some time looking for exterior ply that was both straight—as opposed to warped which much of it is—and which had an attractive grain. It's worked very well.

"Below the control room is another room that Simon uses as a drum store but which is also used to record guitar amps and things. We couldn't make the floor of the control room as heavy as we might have because the joists just wouldn't take the weight. We have reinforced them and put a layer of *Revac* under the carpet but that's about the limit. It actually acts quite positively as a very low frequency absorber."

Simon Phillips: "This is actually the oldest part of the house, and three of the walls were built as outside walls, although one of them has now been built onto. That means they have 13½ inches of old brick plus the plastering, which creates very good separation, and also I think those old materials have a very definite effect on the sound of the room. If it was all very hard, modern materials I think it would sound different. There is a total of 42 balanced lines running to different parts of the house, so it's possible to put a mic virtually anywhere, and that allows a variety of acoustics and also good separation for a number of musicians, if necessary."

Roger Quested: "The lights are all tungsten halogen rather than ordinary bulbs, because they give out a much more natural light. It mixes with the daylight, there's no orange pool created when you turn them on, so you're not so aware that it's getting dark; that you're working into the night."

Simon Phillips: "I tend to keep the control room quite bright, I'm not into low level mood lighting. I prefer to work in daylight hours but I've sometimes worked straight through the day and night and these lights help to maintain a continuity. The air conditioning helps with that too, it's reasonably quiet and is very effective in maintaining a constant, comfortable temperature."

Behind the engineer, nominally placed against the rear wall below the acoustic boxes, are two moveable 19 inch racks, each two units wide and 10 high. They're both on castors hard-wired into the patchbay via wandering multicores, allowing them to be placed virtually anywhere in the control room they're likely to be required. Standard auxiliary equipment includes an Advanced Audio Design DDL, an Ibanez *SDR-1000* digital

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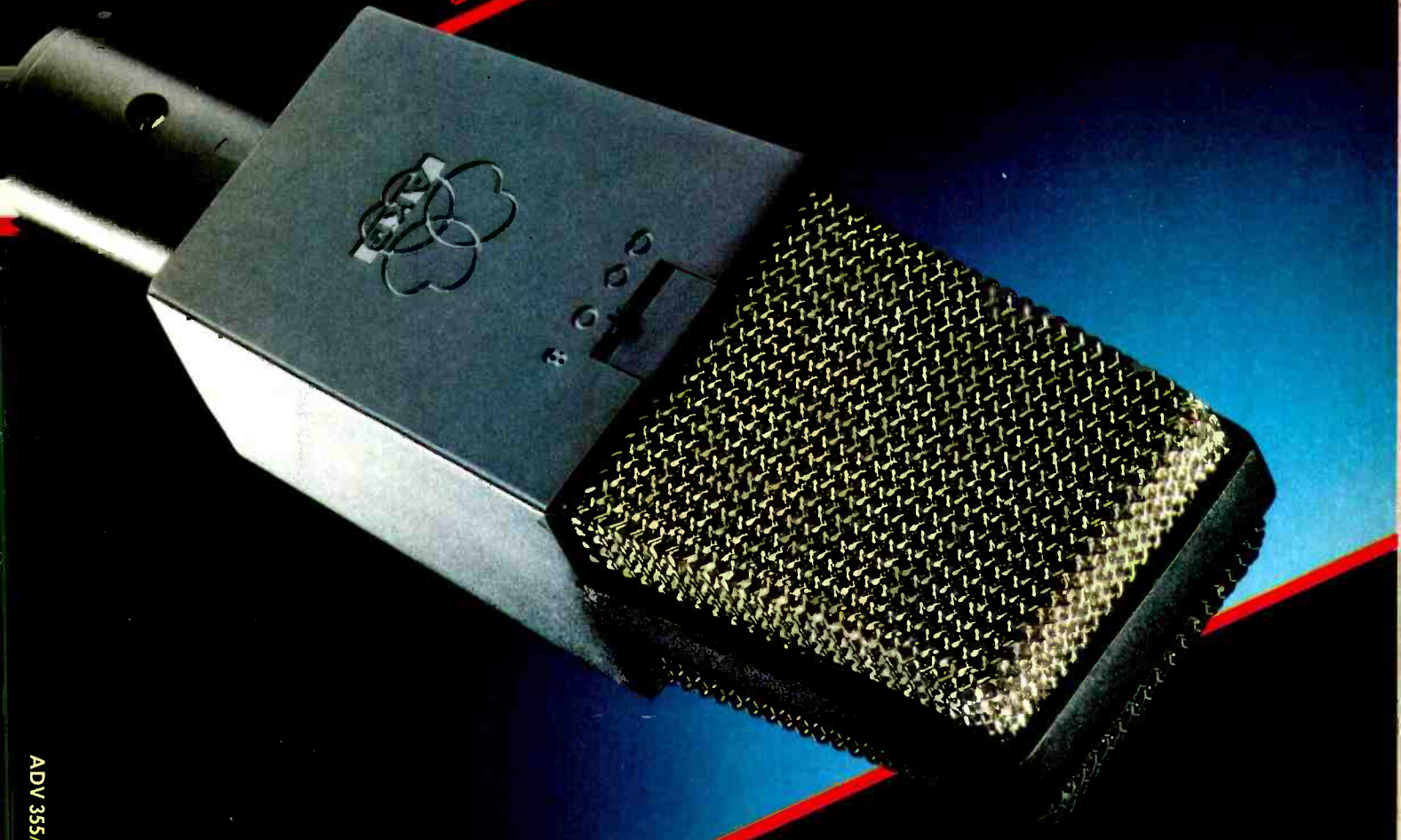

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THE WHITE HOUSE

reverb, a Roland *SRV-2000*, a Roland *SDE-3000*, Yamaha *REV7*, a dbx *160* compressor, two dbx *160X Over-Easy* compressors and a Drawmer dual noise gate. There are also a number of synths available: a Roland *JX10* synth, a Sequential *Prophet 2002* sampling synth, and from Yamaha *DX9* and *DX5* synths, an *RX11* drum machine and a *QX1* sequencer. The tops of the racks act as working surfaces for synths of all descriptions and there is another table top against the back of the desk allowing synth players to directly face the engineer/producer when they're playing, for easy communication.

"Racks always seem to be a bit of a problem to do really well. In this studio it would be nice to have them a little higher so you didn't have to bend down so much but then they'd take too much space up. Putting the racks to the side makes them more accessible but then you're forever walking around them to get anywhere. It always seems to be something of a compromise in any studio but the arrangement here is flexible and works quite well with all the in-house synths hard-wired in to keep things reasonably neat."

The studio room comes complete with Bluthner boudoir grand and is identical in shape and size to the control room, though it isn't part of Roger's acoustic design. Simon is experimenting with his own treatments: suspending angled wooden panels covered with a variety of more or less absorptive materials. There's a riser for the drums primarily to keep the mic stands and cables safe from being accidentally kicked out of position. Between the control room and the studio is a small room housing the amps, power supplies and crossovers etc, which also functions as a tape store and extra acoustical separation between the two main rooms. The bottom end of the Quested monitors are powered by a Hill *DX100*, the mids and highs by HH MOSFET *900*s and the Yamaha *NS100*s by an HH MOSFET *900*. Hard-wired through from the control room to the studio is a BSS *Q-Play* remote for the multitrack—a vital piece of equipment when Simon's working by himself: "Often I'm here on my own trying to get a drum sound, which isn't that easy. I find that by the time I've hit the drum and run into the control room, the meters have already gone down, so there's been a lot of guesswork involved. A 'peak hold' facility, such as they have on the SSL metering, would make things a lot easier but that isn't included on the *Matchless*. I find now that I can pretty well mic a kit up, set the levels and EQ on the desk and get it more or less right. The remote plugs into a multipin socket on the wall and not only controls the transport but also has an auto drop-in/out function with rehearse. So once I've made sure all the levels are right, I can complete a drum track without leaving this room.

"There's no visual contact between the rooms and I have run video cables in case we want a video link. In fact, most of the time the separation works well: you aren't always looking out over an unused studio when you're mixing and performers aren't under continual observation from the control room; they can really relax and look out of the window into the Japanese garden if they want."

How easy did Simon find the transition from drummer to producer/engineer?

"I've always been very inquisitive in the studio: the acoustics of the room, where the kit's positioned, what mics are being used, how they're being placed, and all that. Achieving a good sound isn't entirely a logical process but after a while a thread started to appear and I got a feel for what would and wouldn't work. I grew up listening to drums on record, trying to get my own kit to sound like them acoustically and wondering why I couldn't. It quickly became apparent that something quite mystical happens to the sound somewhere in its journey through the recording chain. An engineer can hear a kit in the studio while he's miking it up and feel a bit worried about how he's going to get a good sound out of it, and then he might go into the control room, throw the faders up and it sounds great. It's a matter of experience to know what will work on tape. I tend to use the same fairly live sound for both studio and stage work. I don't use any damping so there's loads of ring and everything and when people first hear it they're a little concerned. Once it reaches the control room, though, it normally sounds fine.

"I learnt a lot about engineering working with Mike Oldfield on his last three albums. He normally does everything himself and doesn't like to have too many people around, so I became co-engineer as well as co-producer and ended up doing the basic mixes for the album. It was a real crash course.

"Today, when I have a studio session, I'll generally send a mic list ahead of me, to make sure I have something I know will work. That doesn't mean I'm not into all kinds of experiment or any number of strange ideas from the engineer but if all else fails, I know the session will work well with what I've asked for. I don't like to use a lot of gates or anything, I prefer an open sound, and the mic list isn't at all complicated—just AKG *D25*s, *D12*s or E-V *RE20*s for the bass drums, a Shure *SM57* or maybe a Neumann *KM86* for the snare, an AKG *451* for hi-hats, Sennheiser *421*s for the toms, and a pair of Sanken *CU41*s or AKG *C414*s for overheads."

What about the commercial side of the studio?

"Everybody who's worked here has really liked it so we know that it can work well for the right kind of client. It's really a private studio that we occasionally let out."

Simon feels that, for the times he's away, the studio would probably need someone like a film writer who largely works alone with an engineer although recent clients have included Nick Kershaw, Jeff Beck and Madness. There's comfortable accommodation for up to four people.

"We do breakfast here and the local pub has a nice restaurant. Currently we're charging £600 a day, residential, inclusive of everything except materials."

That also includes the two acres of ground complete with tennis court and croquet lawn.□

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MIXING CONSOLES

A brief survey of mixing consoles suitable for music recording, model by model including the major features and console sizes. We have not included specifically portable units except where these fall within a wider product range. If there are any errors or omissions we would be pleased to hear from the manufacturer concerned for a later update.

ABAC Rustin

ABAC Automatic Mixing Console: assignable analogue console comprising modular audio unit and digital control surface. Inputs from 16 to 64 and all parameters from fader position, EQ, aux send levels and configuration can be programmed and stored in memory; up to eight complete setups in internal memory. Hard disk and digital cassette for external back-up. SMPTE and MIDI compatible automation.
Abac Rustin, Quarter 'La Chapelle' BP16, 04110 Reillanne, France.

ACES

Seca: in-line 24 bus recording console with channel configurations from 32 to 60. Digitally switched routing and console reset. Eight aux buses and 4-band EQ, fixed turnover HF/LF and two swept MF. Automation ready and ACES system under development.
B1816: compact 16 bus console.
Aces (UK) Ltd, Featherbed Lane, Shrewsbury, Shropshire SY1 4NJ, UK.
USA: Power Studio Supply, 13453 Hollo Oval, Strongsville, OH 44136. Tel: (216) 238-9426. Rock Studio Supply, 430 Kansas Street, Norman, OK 73069. Tel: (405) 329-8431.

Alice Soundtech

Soundtech Series A: range of portable music recording mixers with input channels from 4 to 24 into two. Three band EQ with shelving HF/LF and swept MF. Two aux sends, stereo limiters, VU or PPM, and optional stereo line inputs.
Alice Soundtech Ltd, Unit 1, Ashwyn Business Park, Marchants Way, Burgess Hill, West Sussex RH15 8QY, UK. Tel: 04446 48071.

Allen & Heath

Sigma: multitrack console with choice of modules allowing in-line or split operation with 24 output buses and input channels sizes from 16 to 56. Four band swept EQ with six aux sends. In-line version has patching and mutes under MIDI control. Options include integral patchbay, choice of metering and Audio Kinetics *Reflex* automation.
CMC: compact split operation consoles with 24 and 32 input channels with 16 output buses. Programmable mutes and routing which can be expanded with use of *CMR* option interfaced to Commodore 64 and SMPTE.
System 8 MkIII: split operation consoles with 16 and 24 input channels and 16 output buses. Three band EQ with shelving HF/LF and swept MF. Three aux sends.
Allen & Heath, 69 Ship Street, Brighton BN1 1AE, UK. Tel: 0273 24928.
USA: Allen & Heath USA, 5 Connair Road, Orange, CT 06477. Tel: (203) 795-3594.

Amek

Angela: in-line console with 28 to 65 channels. Four band EQ—semi-parametric, six aux sends, 24 output buses, and an automation option.
Classic: split type console designed for more broadcast orientated applications. Channel sizes from 32 to 64 with four band EQ—all sweepable. Range of modules including VCA fader option.
G2520: multitrack in-line console with channel sizes from 40 to 68. Four band parametric EQ, 24 output buses and eight aux buses. Fitted with VCA faders and digital subgrouping facility. GML automation option.
APC1000: in-line/split operation console with channel sizes from 32 to 128. Four band EQ—full parametric. Most channel switching centrally accessed, four or eight aux sends, setting recall of certain desk functions, optional dynamics, and choice of automation including GML.
Amek Systems & Controls Ltd, New Islington Mill, Regent Trading Estate, Oldfield Road, Salford M5 4SX, UK. Tel: 061-834 6747.
USA: Amek Consoles Inc, 10815 Burbank Boulevard, North Hollywood, CA 91601. Tel: (818) 508-9788.

Analog Digital Synergy

Synergy One: in-line digital console expandable to 64 channels. Features include electronic grouping, timecode-based automation, complete data recall and reset and four band parametric EQ.
Analog Digital Synergy Inc, 120 SW 21 Terrace, C 104, Fort Lauderdale, FL 33312, USA. Tel: (305) 791-1501.

ANT

TRS 800: available as mobile consoles with 14 or 26 channels or fixed installation with 26 to 50. Configuration of console depends on modules. Three band EQ semi-parametric. VCA fader option.
Digital Console: a fully modular digital console with assignable processing. Full memory storage of console parameters.
ANT Nachrichtentechnik GmbH, Lindener Strasse 15, D-3340 Wolfenbuttel, West Germany. Tel: 05331 83-0.
UK: ANT Telecommunications Ltd, 17 Liverpool Road, Slough, Berks SL1 4QZ. Tel: 0753 820242.
USA: ANT Telecommunications Inc, 211 Perry Parkway Suite 4, Gaithersburg, MD 20877. Tel: (301) 670-9777.

API

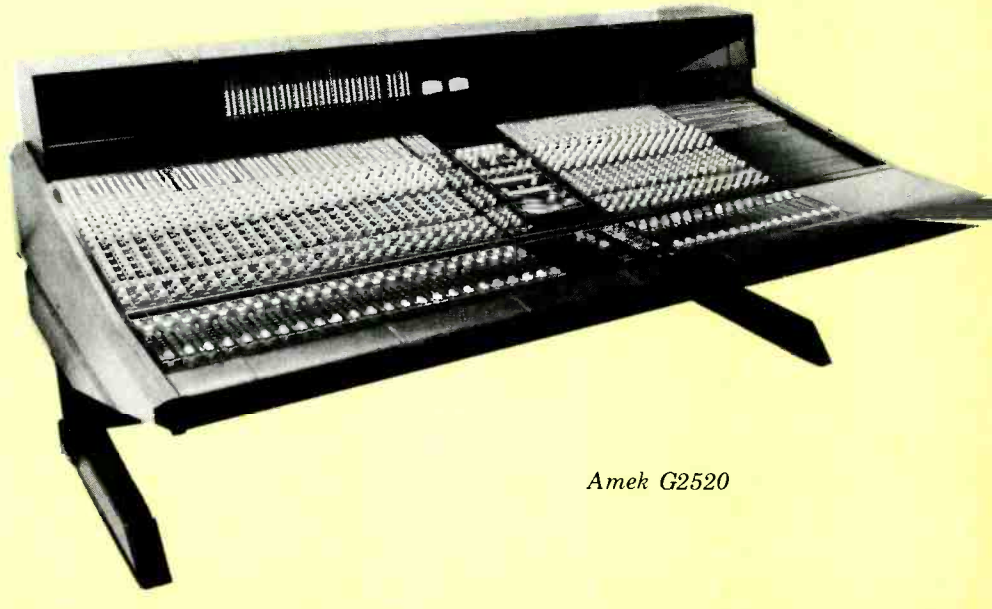
All models are custom. All discrete components with smallest channel size being 32 and largest being to customer need. Design can be in line or split or combination of both. EQ is standard three band *550A* or four band type or new *560B* graphic. All switch functions controllable by computer as well as motorised control of fader, echo sends and dynamics. Available with three stereo buses, eight to 12 sends and 32 buses.
API, 7951 Twist Lane, Springfield, VA 22153, USA. Tel: (703) 455-8188.
UK and Europe: Syco Systems, 20 Conduit Place, London W2. Tel: 01-724 2451.
USA: Studio Consultants Inc, New York. Tel: (212) 586-7376; Everything Audio, Los Angeles. Tel: (818) 842-4175; Westlake Audio, Los Angeles. Tel: (213) 851-9800. Milan Audio, 1470 Valley Vista Boulevard, Pekin, IL 61554, for Chicago, Nashville and mid-US.

Aries

Aries range: range of multitrack consoles with split operation and input channels from 16 to 24 channel.
Goutam Electronics Products Ltd, Unit 3b, 6/24 Southgate Road, London N1, UK. Tel: 01-249 5306.

Audio Arts

3224: in-line multitrack console with channel



Amek G2520

D&R Dayner

sizes from 24 to 56. Three band semi-parametric with 24 output buses.
SP-6: split operation eight bus console with inputs from 16 to 56. Three band semi-parametric EQ with other features including machine control and logic functions.
Wheatstone Corporation, 6720 Vip Parkway, Syracuse, NY 13211, USA. Tel: (315) 455-7740.

Cadac

CD1000: split operation console with number of channels to customer requirements. Four band parametric EQ with two upper bands both switchable shelving/bell to HF and two lower bands switchable shelving/bell to LF. Twenty four or 32 output buses. Wide range of options to requirements including *MasterMix* automation.
CD2000: portable console for classical recording in development.
Clive Green & Co Ltd, Britannia House, Leagrave Road, Luton, Beds LU3 1RJ, UK. Tel: 0582 411513.

Calrec

UA8000: multitrack console with 48 or 64 input channels and can be operated as in-line or split console. Four band semi-parametric EQ and 32 output groups. Full dynamic on each channel. Optional TASC automation.
Assignable Console: a computer controlled assignable console for broadcast orientated recording applications. RAM memory for up to 30 desk settings. Four band EQ and dynamics for each channel. All consoles built to client specification. Models up to 112 channels installed.
Calrec by AMS, Billington Road, Burnley BB11 5ES, UK. Tel: 0282 57011.
USA: AMS Industries Inc, 3827 Stone Way North, Seattle, WA 98103. Tel: (206) 633-1956.

D&R

700-3 series: available with 12 or 24 input channels with three band EQ–sweepable mid. Three aux sends.
Dayner: available in split or in-line formats with standard frame sizes of 21, 31, 42 and 59 channels although can be up to 84 channels. Uses floating subgroup system. Eight aux sends. Options include fader type and *C-Mix* automation.
4000 series: in-line console with 20, 30 and 40 modules. Four band EQ with sweepable mids. Six aux sends and eight sub groups. Automation ready for *SCORE* fader system or *C-Mix*.
8000 series: in-line console with 24 bus outputs and up to 56 input channels. Four band EQ and programmable mute system. Eight aux sends and may be optionally fitted with *SCORE* or *C-Mix* automation.
Stylyx: modular console system that may be built into system customised to individual needs including multitrack use. Includes automation module comprising a soft muting system that can be manually controlled, sequencer controlled or from timecode. Can also interface with MIDI systems.
D&R Electronica BV, Rijnkade 15B, 1382 GS WEESP, The Netherlands. Tel: 2940 18014.
UK: D&R (UK) Ltd, Malby House, 5 Fulmer Drive, Gerrards Cross, Bucks SL9 7HH. Tel: 0753 884319.
USA: D&R USA, 1720 Chip 'N' Dale Drive, Arlington, TX 76012. Tel: (871) 548-1677.

DDA

DCM232: in-line operation console with up to 56 channels and 32 output buses. Four band EQ. All channel switching functions can be stored in automation snapshot mode on floppy disk and recalled–manually, by events list or timecode. Split channel architecture.
AMR24: split operation console with 24 to 44 input channels. Four band EQ.
D series: split operation console with 16 to 40 channels. Four band EQ–sweepable MF.
S series: split operation console with 8 to 32 channels. Four band EQ–sweepable MF.
DDA, Unit 1, Inwood Business Park, Whitton Road, Hounslow, Middlesex TW3 2EB, UK. Tel: 01-570 7161.
USA: Klark-Teknik Electronics Inc, 30B Banfi Plaza North, Farmingdale, NY 11735. Tel: (516) 249-3660.

Digitec

UPS 6166: compact 16 input console with 4 groups and stereo output bus. Phantom power 12 and 48V. Choice of module types.
UPS 6500: split operation console with input channels from 24 to 48, 8 to 16 groups. Configuration and style of desk depends on module options. Fully parametric three band EQ with shelving option on HF/LF. VCA level control options and option for routing automation with memory.
Digital Processing System: fully software control digital mixing system with fully digital processing.
Digitec SA, 57 Boulevard de la Republique, 78401 Chatou Cedex, France. Tel: (1) 30 71 16 95.

Focusrite

Will shortly be delivering large multitrack

MIXING CONSOLES

consoles all custom built to client's specification. In production so far is 64/32 with 16 aux buses but larger possible. In-line/split operation with split point variable. Choice of two or four band EQ modules with logic to split into four separate parts with four destinations. Mic amp operates at line level therefore can be remote from console with low loss. Dynamics section with two separate inputs. GML automation fitted as option.
Focusrite Ltd, PO Box 38, Newmarket, Suffolk CB8 7EG, UK. Tel: 0638 730696.
USA: Focusrite US Ltd, 1100 Wheaton Oaks Court, Wheaton, IL 60187. Tel: (312) 653-1919.

Harrison

MR2: in-line console with frame sizes of 28 to 56 channels. Four band parametric EQ. Full status switching. Automation ready.
MR3: in-line console with 28 to 60 input channels. Three band parametric EQ. Console status switching.
MR4: in-line console with 16 to 60 channels. Three band EQ—semi-parametric. Versions for different applications.
Raven: in-line console with 24 to 36 channels. Three band EQ and 24 output buses.
Series Ten: virtual console with 32 to 64 dual function channels. Four band EQ with totally dynamic automation of all functions. Save and recall. Full dynamics on each signal path.
Harrison Systems Inc, PO Box 22964, Nashville, TN 37202, USA. Tel: (615) 834-1184.
UK: FWO Bauch Ltd, 49 Theobald Street, Borehamwood, Herts WD6 4RZ. Tel: 01-953 0091.

Hill

Remix: split operation console designed for 8- and 16-track application. Configured 24/8/16/2 with 4 band EQ.
Concept: split operation console with input channels from 24 to 48. Six band fixed turnover EQ. Optional *Sidetracker* automation.
Hill Audio Ltd, Hollingbourne House, Hollingbourne, Kent ME17 1QJ, UK. Tel: 062 780 555.
USA: Hill Audio Inc, 5002B N Royal Atlanta Drive, Tucker, GA 30084. Tel: (404) 934-1851.

Lafont

Producer Inline: in-line console with channel inputs from 24 to 48. Three band EQ with swept HF/LF and parametric MF. Twenty four channel bus. Options include record ready on each channel, automation ready or with *Optifile 2* automation. VCAs fitted as standard.
Producer Split: split operation console with channels from 48 to 56. Twenty four bus switchable between two 24 tracks. EQ 4-band with two parametric mid band and swept HF/LF. Other features as *Inline* but with addition of noise gates.
JP Lafont Audio Labs, Rue Lacuee 13, F-75012 Paris. France. Tel: (1) 43 42 41 59.

Mitsubishi

Westar: in-line multitrack console available in channel sizes from 20 to 52 inputs. Plug-in interchangeable equalisers, preamplifiers, VCAs and faders. Custom design variations possible for film post-production and broadcast applications. Optional *Compumix* automation.
SuperStar: in-line operation console with up to 72 inputs. Options include the *Intelligent Digital Fader* system, *Compumix IV* automated and high level of customisation possibilities.
UK: Mitsubishi Pro Audio Group, Unit 13, Alban Park, Hatfield Road, St Albans, Herts AL4 0JJ. Tel: 0727 40584.
USA: Mitsubishi Pro Audio Group, 225 Parkside Drive, San Fernando, CA 91340. Tel: (818) 898-2341.

Neotek

Elite: multitrack recording console using dual channel design—two audio paths which can operate independently, in parallel or in series. 28 to 64 channel inputs with four band semi-parametric EQ. MIDI Direct automation option.
Elan: in-line console with 28 or 36 channels. Four band semi-parametric EQ. MIDI Direct automation option.
Essence: console designed for multitrack effects lay-up, ADR and Foley recording. Available with 16, 24 or 32 monitor modules and 4 or 8 input modules. Four band semi-parametric EQ and MIDI Direct option.
Neotek Corporation, 1154 West Belmont Avenue, Chicago, IL 60657, USA. Tel: (312) 929-6099.

Neumann

Custom designed mixing consoles of all sizes and applications assembled from extensive range of modules. Options include 500 microprocessor controlled system for EQ setting storage and reset and fader level automation and storage.
Georg Neumann & Co GmbH, Badstrasse 14, Postfach 1180, D-7100 Heilbronn, West Germany. Tel: (0 71 31) 82275.
UK: FWO Bauch Ltd, 49 Theobald Street, Borehamwood, Herts WD6 4RZ. Tel: 01-953 0091.
USA: Gotham Audio Corporation, 741 Washington Street, New York, NY 10014. Tel: (212) 741-7411.

Neve

V series: in-line multitrack console with channel sizes from 36 to 96. Four band EQ and dynamics unit on each channel. Optional automation *NECAM 96*.
51 series: range of mixers up to 48 input channels for broadcast and post-production applications. Larger sizes have multitrack capability.
DSP: custom designed fully digital consoles with automation, assignability and resetting of all parameters. Up to 96 dual mic/line inputs and 48 output buses.
Neve Electronics International Ltd, Cambridge House, Melbourn, Royston, Herts SG8 6AU, UK. Tel: 0763 60776.
USA: Rupert Neve Inc, Berkshire Industrial Park, Bethel, CT 06801. Tel: (203) 744-6230.

Platinum

Level IV: in-line console with channel sizes of 22 to 38 inputs. Choice of input modules for 8- or 16-track applications. Four band EQ and six aux sends.
Regentport Ltd, 159 Park Road, Kingston, Surrey KT2 6DQ, UK. Tel: 01-549 9130.

Raindirk

2400 Symphony: in-line operation console with 40 channels, 32 tape output buses and two independent stereo buses. Five band EQ with switchable turnover shelving LF/HF and three swept MF bands. Four aux send controls switchable between two sets of aux buses. Optional PPM metering.
Raindirk Audio, 33a Bridge Street, Downham Market, Norfolk PE38 9DW, UK. Tel: 0366 382165.
UK: The Home Service (at SSE), Unit 2, William Road, London NW1 3EN. Tel: 01-387 1262.

SAJE

ULN/II: multitrack in-line operation console. Channel sizes of 32 to 64 with four band swept EQ and dynamics section. 32 output buses. Large number of options including EQ, automation system and floppy disk data storage synchronised to EBU/SMPTE code.
Memory: computer-assisted assignable and programmable console. Snapshot recall of console configurations. Up to 48 motorised faders and hard and floppy disk drives. Current software aimed mainly at live sound applications.
SAJE, 3 Rue Verte, 95100 Argenteuil, France. Tel: (1) 39 61 15 62.
UK: Executive Audio Ltd, 159 Park Road, Kingston, Surrey KT2 6DQ. Tel: 01-541 0180.

Sony

MXP-3000 series: in-line multitrack console with sizes of 20 and 36 channels. Choice of five plug-in EQ and input options. Can use 24 (*MXP-3036*) aux sends in mix mode. Automation system with infra red keyboard and optional hard disk mix data storage system.
Sony Corporation, PO Box 10, Tokyo Airport, Tokyo 149, Japan. Tel: (03) 448-2111.
UK: Sony Broadcast Ltd, Belgrave House, Basingstoke, Hants RG21 2LA. Tel: 0256 55011.
USA: Sony Corporation of America, Professional Audio Division, Sony Drive, Park Ridge, NJ 07656. Tel: (201) 930 1000.

Soundcraft

Series 200B: split operation console with input channels from 8 to 32. Four band semi-parametric EQ.
Series 600: split operation console with 16 to 40 input channels. Four band semi-parametric EQ. Automation interface.
Series 6000: split operation console with input channels from 16 to 56, four band semi-parametric EQ and automation ready.
TS12: in-line operation with channel sizes from 24 to 44, four band semi-parametric EQ, six aux sends and two programmable mute groups.
TS24: in-line console with channel sizes from 24

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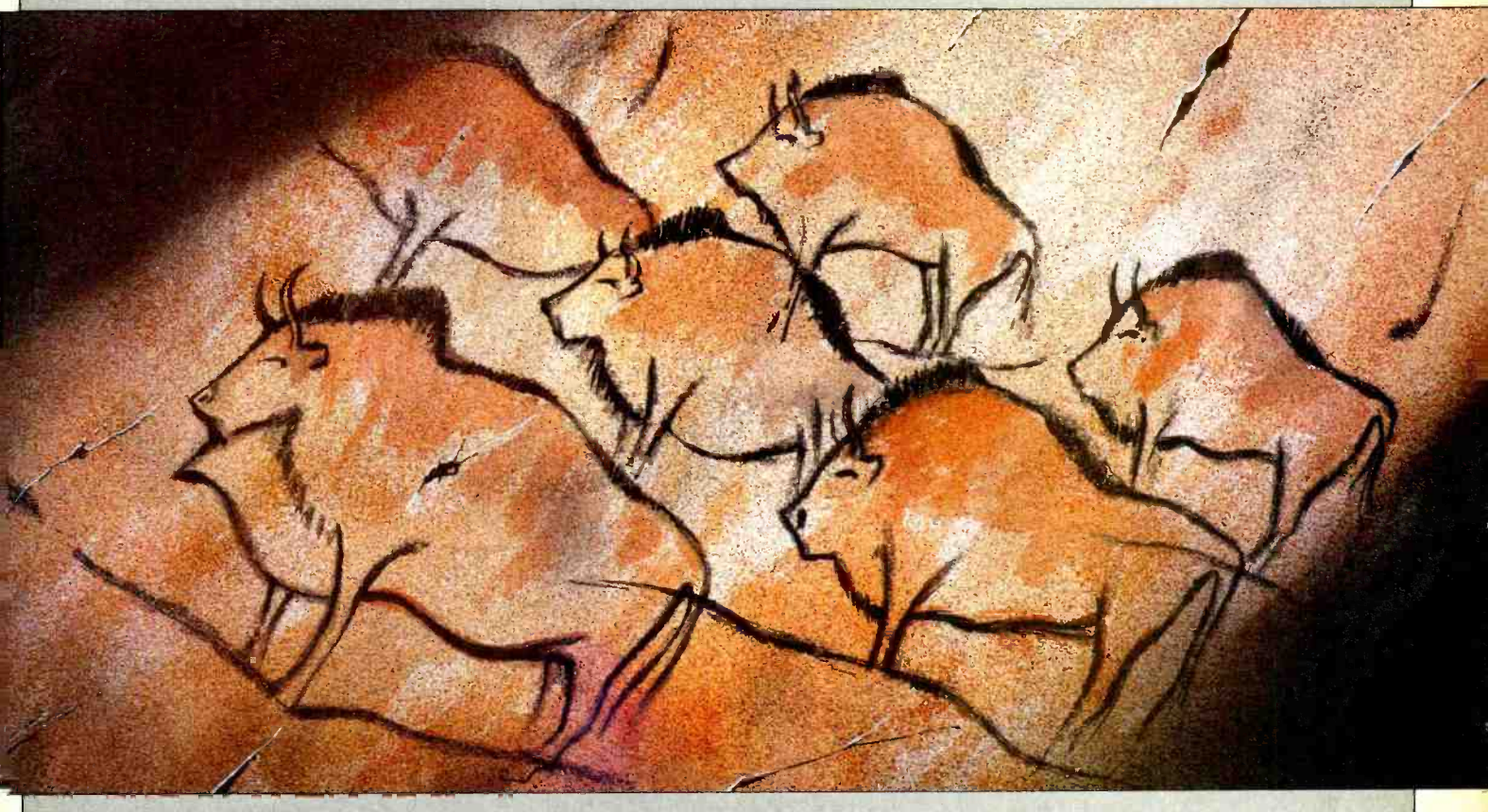

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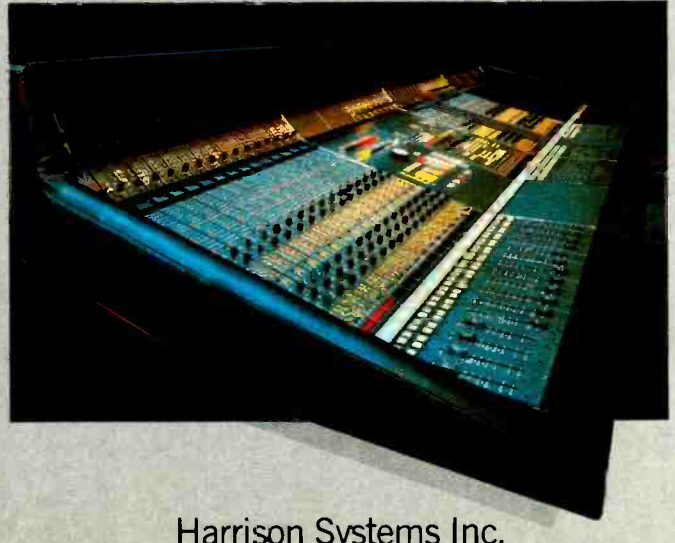

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MIXING CONSOLES

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USA: JBL Professional, PO Box 2200, 8500 Balboa Boulevard, Northridge, CA 91329. Tel: (818) 893-4351.

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T series: split operation console with 16 to 32 input channels. Three band EQ.
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IL24: in-line console with up to 28 channels and four band EQ.
IL32: in-line console with up to 36 channels and four band EQ.
CM4400 series: split operation console with up to 44 input channels. Three band EQ with digital routing. Optional automation allows control of mutes, routing, groups, masters and tape returns against timecode.
CP6800: split operation console with inputs up to 44 channels. Three band EQ and integral automation as optional on *CM4400*.
CMX series: split operation console with up to 38 input channels. Three band EQ and digital routing/muting. Optional automation with *CMS2* computer.
Eric series: split operation console with up to 48 input channels. Four band EQ and digital routing.
Soundtracs plc, 91 Ewell Road, Surbiton, Surrey KT6 6AH, UK. Tel: 01-399 3392.
UK: Studio Equipment Distribution, 27 Guildford Street, Luton, Beds. Tel: 0582 452495.
USA: AKG Acoustics Inc, 77 Selleck Street, Stamford, CT 06902. Tel: (203) 348-2121.

Sound Workshop

Series 34C: multitrack console in-line design. Channels from 12 to 96 in size with four band swept EQ and four band parametric option. Optional features include dual line input, machine control interface, Digital Creations DiskMix automation, VCA or moving fader level control. Custom configurations available.
Sound Workshop, Professional Audio Products Inc, 50 Werman Court, Plainview, NY 11803, USA. Tel: (516) 756-0140.

Solid State Logic

Series 4000G: in-line music recording console with input sizes from 24 to 72. Four band parametric EQ and dynamics on all channels. Machine control facilities and level/muting automation. Options include *Total Recall* computer, events controller and synchroniser.
Series 6000: similar to *4000* series but configured for video post-production work.
Series 5000: console principally designed for broadcast and film applications and due to modular cassette design may be configured into very wide range of sizes and applications. Automation includes all switch functions.
Solid State Logic, Begbroke, Oxford OX5 1RU, UK. Tel: 08675 4353.
USA: Solid State Logic, 320 West 46th Street, New York, NY 10036. Tel: (212) 315-1111; 6255 Sunset Boulevard, Los Angeles, CA 90028. Tel: (213) 463-4444.

Studer

900 series: split operation console with input channels from 16 to 40 with three or four band EQ. Optional dynamics, automation and integral machine control.
Studer International AG, Althardstrasse 10, CH-8105 Regensdorf, Switzerland. Tel: (1) 840 29 60.
UK: FWO Bauch Ltd, 49 Theobald Street, Borehamwood, Herts WD6 4RZ. Tel: 01-953 0091.
USA: Studer Revox America Inc, 1425 Elm Hill Pike, Nashville, TN 37210. Tel: (615) 254-5651.

Studiomaster

Series 1: split operation console with input channels from 16 to 32 with 3-band EQ.
Series 2: split operation console with input channels from 16 to 40 with 5-band EQ.
Series 3: split operation console with input channels from 4 to 40 with 3-band EQ.
Series 4: split operation console with input channels from 16 to 24 with 3-band EQ.
Series 5: split operation console with input channels from 16 to 32 with 3 band EQ.
MIXDOWN: split operation console with input channels from 16 to 32 with 3-band EQ.
UK: Studiomaster, Studiomaster House, Chaul End Lane, Luton, Beds LU4 8EZ. Tel: 0582 570242.
USA: Studiomaster Inc, 1340-G Dynamics Street, Anaheim, CA 92806. Tel: (714) 524-2227.

TAC

Scorpion: available in variety of configurations with input channels sizes from 8 to 40. Split operation with options for up to 32 monitors. Four band EQ—two swept MF with two frequency HF/LF. Optional automation interface.
Matchless: in-line console with input options from 16 to 40 channels. Full 24 bus outputs. Four band EQ—semi-parametric. Optional automation interface.
Total Audio Concepts Ltd, Unit 12, Bar Lane Industrial Park, Bar Lane, Basford, Nottingham NG6 0HU, UK. Tel: 0602 701002.
USA: Amek Consoles Inc, 10815 Burbank Boulevard, North Hollywood, CA 91601. Tel: (818) 508-9788.

Tascam

M-700: in-line multitrack console with 40 channels and 32 buses. Four band EQ with optional automation system.
M-600 series: split operation console with 4 band EQ and 24 to 32 input channels.
M-500 series: split operation console with three band EQ and input channels from 12 to 20.
M-300 series: split operation console with three band EQ and input channels from 8 to 20.
M-200 series: split operation console from 3 to 20 inputs with three band EQ.
Teac Corporation, 3-7-3, Naka-cho, Musashino, Tokyo, Japan. Tel: (0422) 53-1111.
UK: Teac UK Ltd, 5 Marlin House, The Croxley Centre, Watford, Herts WD1 8YA. Tel: 0923 225235.
USA: Teac Corporation of America, 7733 Telegraph Road, Montebello, CA 90640. Tel: (213) 726-0303.

Trident

Series 65: compact split operation console with frame sizes from 16 to 40 inputs with 4 or 8 output buses and 8- or 16-track monitor. Eight aux sends and four band EQ—fixed turnover HF/LF and two swept MF.
Series 80B: split operation console with frame sizes from 32 to 56 channels. Twenty four output buses. Four band EQ—two swept MF and switchable turnover HF/LF. Moving fader and VCA-based automation systems available.
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Di-An: digitally controlled analogue console with assignable EQ—four band parametric with four memories, dynamics section and routing. On board memories allows memorisation of complete console settings and resetting up to 512 times during single mix. Up to 24 aux sends per channel and moving fader or VCA automation option.
Trident Audio Developments Ltd, Trident House, Rodd Industrial Estate, Govett Avenue, Shepperton, Middlesex TW17 8AQ, UK. Tel: 0932 224665.
USA: Trident USA Inc, 308 North Stanley Avenue, Los Angeles, CA 90036.
Tel: (213) 933-7555.

Westec

LT 3000: multitrack console with channels from 14 to 56. In-line design. Four band EQ—two MF parametric and HF/LF swept. Automation (fader and mutes) including autolocator. Dynamics section and 16 bit DDL on each channel.
Westec Studiogerate GmbH, Riekbornweg 3, D-2000 Hamburg 61, West Germany.

Yamaha

DMP7: compact digital console 8/2 operation with three band parametric EQ, motorised faders, stereo compressor, internal effects system, memory and MIDI control capability. For large scale use four units may be digitally cascaded for 32-channel operation.
Yamaha, Hamamatsu, Japan.
UK: Yamaha-Kemble Music (UK) Ltd, Mount Avenue, Bletchley, Milton Keynes MK1 1JE. Tel: 0908 71771.
USA: Yamaha International Corp, PO Box 6600, Buena Park, CA 90620. Tel: (714) 522-9105.

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Maximum Level	7.75V r.m.s. on secondary	7.75V r.m.s. on 600Ω	on 5kΩ 3.4V r.m.s. at 30Hz	26dBm at 30Hz	2.3V r.m.s. at 30Hz	$0.6V_{p-p}$ on Py	2.0V r.m.s. on Py at 30Hz
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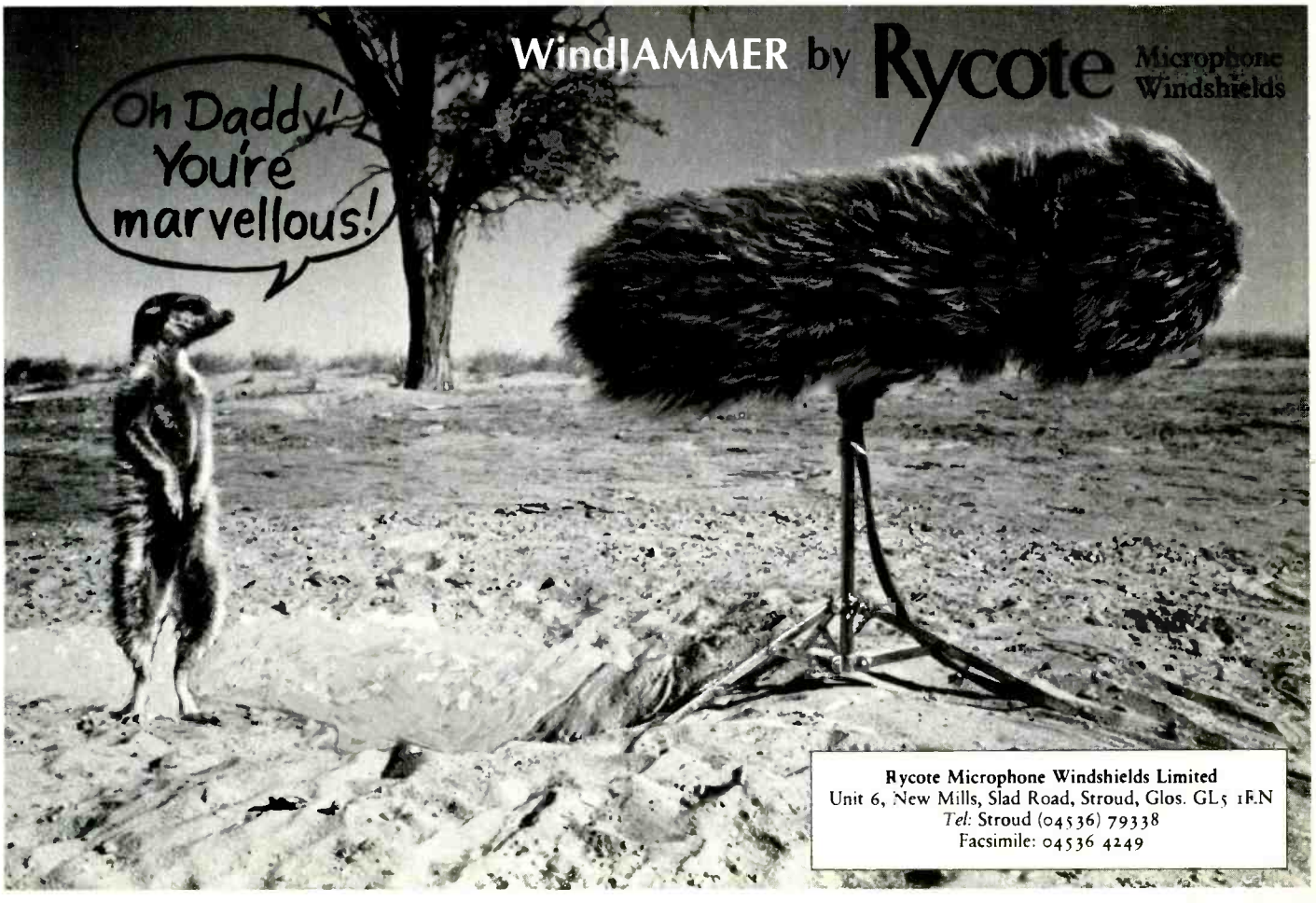

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Digital taping may wipe out compact discs

DIGITAL AUDIO TAPES

The tiny challenger

By Carla Rapoport in Tokyo and David Thomas in London

Actual size

ICD 08120

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VOLUME 99 NO. 41

Sony's DAT f Raises Ire Of

BY PETER JONES

LONDON Leading members of the European Parliament are expressing deep concern over the decision by Sony to market DAT recorders in Europe later this year.

The officials are stressing the potential damage, as they view it, to the European music industry of widespread use of DAT equipment to copy recordings. One British EMP, James Moorhouse of the European Democrats, says that 400,000 jobs in the industry could be at risk. He is seeking a European Commission statement telling Japan that the launch of DAT in the European Economic Community would "not be tolerated before protection is afforded copyright own-

Fa

From its very conception, Digital Audio Tape has been the subject of hype and controversy.

Much of the hysteria has stemmed from the use in which some consumers may choose to put DAT equipment.

Be that as it may, HHB has always believed that digits point the way forward in both professional and consumer audio.

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Professional format DAT equipment can record and playback on 48 KHz or 44.1 KHz.

i o n.

Hopes rise of accord on digital audio tape

By David Thomas

EXPERTS have risen in Europe and the US about the chances of a voluntary agreement with the Japanese electronics industry on the introduction of digital audio tape, a new sound system developed by the Japanese which could worry the music industry.

The Western music industry believes that an early introduction of digital audio tape could damage the sales of compact discs and increase the reproduction of high quality pirated material.

However, the Electronics Industry Association of Japan (EIAJ) has agreed to discuss these problems with the International Federation of Phonograms and Videograms Producers, the international trade association representing 600 record companies, in Vancouver, Canada in December.

Leading figures in the western music industry had accused the EIAJ of failing to respond to their request for talks.

They believe that agreement to the meeting is a further sign that DAT is now unlikely to be introduced by the Japanese before next spring at the earliest.

They also think that the interest shown by the European Commission in the issue has helped persuade the EIAJ to agree to the meeting.

Commission officials have been considering bleak for legislation requiring DAT machines and tapes to be fitted with anti-copying devices, known as a spoiler.

The Commission has also studied the possibility of levies on blank DAT tapes and targets on imported DAT recorders.

(Continued on page 100)

Japanese likely to launch digital tape despite outcry

BY CARLA RAPOPORT IN TOKYO AND DAVID THOMAS IN LONDON

JAPAN AND its Western trading partners are heading for a trade dispute after the Japanese bluntly refused to change a new audio system which the music industry thinks threatens its survival.

The Japanese now look certain to launch the digital audio tape system next year, but the Western music industry will press the US Government and the European Commission for laws forcing the safeguards it wants.

The system will allow music reproduction on a par with compact discs. The Western music industry fears that compact discs will be copied onto the digital tapes unless they carry a "spoiler" to prevent this.

The industry believes that combined compact disc-DAT players, which the Japanese have already exhibited, will encourage consumers to tape off compact discs with out paying royalties, undermining its copyright earnings.

Senior executives from both sides met in Vancouver, Canada, this week to solve the problem. However, the meeting broke down after the Japanese rejected the demands.

For the music industry, Mr Nesuhi Ertegun, head of Warner Brothers Records, told the meeting that because of the copying problem, "DAT is clearly an enormous threat to the survival of the music industry."

He argued that it was in consumers' long-term interests that copyrights should be protected. "It is false to assume that the consumers should get whatever they want."

He asked the Japanese to support the music industry's quest for US and European legislation requiring DAT machines and tapes to be fitted with an anti-copying device.

However, the Japanese rejected the request, saying an anti-copying device would "destroy the major functions of this promising product."

They told the meeting: "We strongly believe that it is a duty of the hardware industry to let the consumer enjoy the result of this epoch-making new technology as soon as possible."

The Japanese said they opposed commercial piracy and would co-operate with the music industry to stamp it out, their sole concession in the Vancouver talks.

Mr Schoichi Saba, chairman of Toshiba, said home taping was "quite different and should be distinguished from piracy."

The music industry will take up the Japanese offer of a campaign against commercial piracy, but thinks that leaves the main issue of home taping unaffected.

DAT machines are expected to be launched in Japan in the next few months. The music industry fears they may be sold overseas as early as next April.

It reacted to the breakdown of the talks by promising "aggressive music - industry initiatives in the US Congress and the EEC to secure implementing legislation."

The Recording Industry Association of America, the US music trade association, will try to get a bill introduced into the next session of Congress imposing a 5% per cent duty on all imported DAT machines with out a spoiler.

The International Federation of Phonogram and Videogram Producers, the international music trade association, will press for speedy European legislation requiring all imported machines to have a spoiler and for tariffs on machines as an interim measure.

The federation, which has also

Continued on Back Page

TECHNOLOGY
Michael Cross

Don't panic over DAT

THE record industry's campaign against digital audio tape (DAT) are beginning to remind a little [illegible]. The latest is software from the British Phonographic Industry (BPI), under the usual warning about the new taping technology. But it also points out that the record business is on a [illegible] during their all time [illegible] the early 1970s.

The businesses of the industry's revival from the slump of the early 1980s is the compact disc. Some 5.4 million compact discs were shipped in 1986, the previous year, compared with 1.1 million in 1983. At the present rate, sales of compact discs will overtake those of LP records in the next few years.

This boom, the producers worry, is under threat from digital audio tape, which allows anyone with a £1,000 player to make near perfect copies of records. The producers does not mention the fact that digital tape recorders may be unattractive to many consumers. They are bigger and more complicated than CD machines and will be more expensive for the foreseeable future. Digital tape is also difficult and expensive to make. And unlike compact discs, digital tapes gradually wear out with use.

The BPI says that digital audio tape will encourage piracy. But the organisation's figures for sales of ordinary cassettes suggest that the music business can

Japanese companies ready to sell digital audio tape systems

BY CARLA RAPOPORT IN TOKYO

THE JAPANESE launch of a controversial audio technology, digital audio tape (DAT), is gathering pace as Matsushita Electric and Sony, two heavyweights in the world consumer electronics industry, are set to unveil marketing plans for the product this week.

DAT, which will both record and play back music with almost perfect quality, has been attacked by the international music industry. It claims that the technology would undermine the industry by allowing music pirates to record copyrighted material such as compact discs, without penalty. As a result, it is seeking to modify the product or tax its sales heavily in the US and Europe.

Matsushita, which will announce its plans today, is expected to put DAT on sale in Japan on March 2, the same day which Aiwa, a medium-sized electronics company, has already said it will begin sales. Mitsubishi, the world's largest consumer electronics company (under the National, Panasonic and Technics brands), is notorious within the Japanese industry for being late or last into a new market. Its swiftness on DAT underlines the high expectations that Japanese companies have for the product, despite the controversy surrounding it overseas.

Sony, which is expected to make its marketing plans known tomorrow, is normally among the first to enter a new market. Both companies, along with Aiwa, are expected to limit sales to the Japanese market for the time being, but industry analysts expect that exports of the products will begin in the second half of this year.

The Sony and Mitsubishi machines are expected to have a copyguard device which will oblige the user to record compact discs through a conventional amplifier. This will reduce the quality of the finished tape, but industry executives say that the device can be easily removed by an audio shop clerk.

● Matsushita yesterday said it would manufacture audio hifi tuners and video tape recorders (VTR) in France. VTR production will start at Longwy, Lorraine, in August, creating about 60 jobs. Initial production will be 30,000 units a year. Production of hifi tuners has already begun, and will reach 54,000 units a year. The company stressed yesterday that it aimed to achieve a high rate of local component content.

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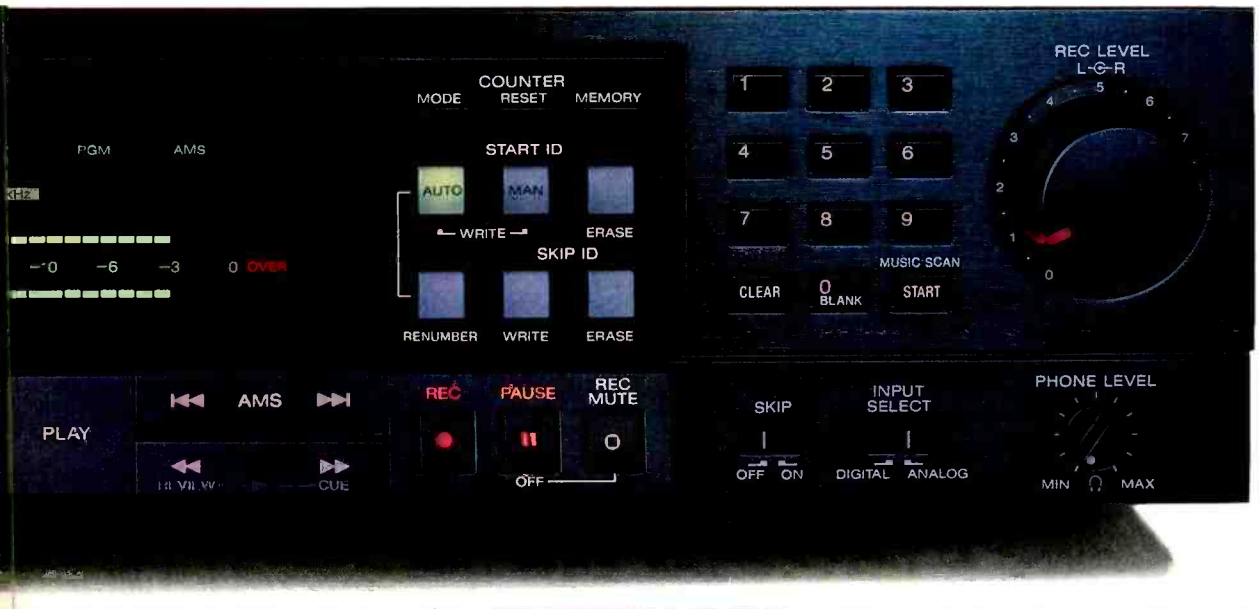

It's now available at HHB in the shape of the Sony PCM 2500.

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COPYCODE REPORT

The US National Bureau of Standards has delivered its report on Copycode. Barry Fox looks at their conclusions

The 80-page report on Copycode by the National Bureau of Standards, a wing of the US Department of Commerce, makes heavy–but nevertheless compulsive–reading. The technical tests implemented, the clarity of the report and its attention to detail destroys not just Copycode, but the credibility of CBS Labs, the IFPI and RIAA and the record industry spokesmen who have been claiming that the system is inaudible and effective.

As late as last December MCA, WEA and RCA were still pronouncing that Copycode was a winner. But in January the RIAA, getting advance wind of the NBS findings, started to cool on Copycode and talk about more realistic alternative anti-copy systems, which work in the digital domain to prevent cloning. The IFPI went silent too, fearing the worst.

The NBS found Copycode a loser on three counts. It does not always work, because some music treated with the system will copy perfectly while some untreated music will not copy. Simple circuitry can defeat the system. Worst of all, Copycode degrades the sound of music even when there is no attempt made at copying it.

Last year the US House of Representatives and Senate debated Bills (HR 1384 and S 506) calling for legislation to support the use of Copycode. The Home Recording Rights Coalition vehemently opposed the plan. After lengthy public hearings the US legislators asked the National Bureau of Standards to judge the technology. The NBS has experience with computer encryption but not consumer audio. Nevertheless the NBS has done a remarkable job, of which any hi-fi testing laboratory would be justifiably proud.

The RIAA acknowledges that the "start terms" of the NBS report means the Copycode is "no longer politically viable" but complains, without any apparent justification whatsoever, that there are "differences between the conclusions in the summary and findings in the report." The IFPI says it is "surprised" by the report. Having in mind the extent to which Copycode has been criticised over the last two years, this surprise is in itself surprising.

CBS developed Copycode in 1982, two years after the RIAA wrote to universities and research centres across the USA asking them to try to come up with a workable spoiler system. A notch is sucked out of the music waveform at 3.84 kHz; a recorder, compelled by law to incorporate a scanner circuit, senses the notch and refuses to make a tape copy.

The IFPI and RIAA adopted Copycode as their preferred solution to home taping. Along with CBS they have for two years been promising that the notch cannot be heard and that Copycode recorders switch off when asked to record notched music but work normally when there is no notch.

In its tests the NBS "frequently" noted the effect of the notch on harmonics and overtones of lower frequencies, on transients and on vibrato trills

"Even professional studio listeners have been unable to detect the presence or absence of the Copycode notch in carefully controlled listening tests," claimed the IFPI.

After belated, and restricted, demonstrations last year the audio industry rebelled. The IFPI responded by saying that criticism of Copycode "emanates from a very small, highly specialised group of people who have set themselves up as guardians of the purity of recordings."

CBS accused the press of "biased and inaccurate reportage."

Nesuhi Ertegun, president of the IFPI and chairman of WEA International, accused critics of making "false statements and contrived demonstrations."

He said it was "an organised plot" and objections were "baseless and prejudiced."

The HRRC demonstrated a 3.8 kHz filter to the US House of Representatives and Senate, and showed that it caused audible distortion. The RIAA and CBS accused the HRRC of building a faulty filter.

To resolve the resultant impasse the RIAA and the HRRC each pledged $75,000 for the NBS to make independent tests and deliver a judgement, which all agreed in advance would be binding.

CBS provided the NBS with two systems because the first proved faulty. When both were working, the NBS compared their performance. Although there were significant differences in performance, both worked on the same basic principle. The encoder sucks an 80 dB notch at 3840 Hz, which is equivalent to a reduction of less than 0.01% of the original amplitude at this frequency. It does this by bandpass filtering a narrow spike of signal at this frequency and subtracting it from the original.

The notch lies close to the top B and B-flat on a piano scale. At B-flat and B, there is still a reduction by 3 dB, equivalent to 71%. For young adults with normal hearing, notes the NBS, the ear is most sensitive at just these frequencies. In the IFPI's technical description of Copycode, as supplied by CBS, it was claimed that the ear was "not sensitive" to a notch at this frequency because of path length differences and random cancellations inside the ear.

In its tests the NBS "frequently" noted the effect of the notch on harmonics and overtones of lower frequencies, on transients and on vibrato trills. One encoder notched closer to B-flat than the other. The filters in both "rang" when excited by transients. The phase characteristic around the notch was found to "deviate drastically" causing "discontinuity".

The encoders were "dynamic", automatically switching in and out depending on the signal content. "Presumably," says the NBS, "this is intended to prevent notching of audio signals when they might be more noticeable." Here also there was discrepancy between the two decoders and even between the way each decoder worked when processing the same music more than once.

CBS provided a DAT recorder, with built-in Copycode sensor. This has three filters at 3300, 3800 and 4300 Hz, each with a ±5% spread to compensate for pitch and speed variations and distinguish between a naturally occurring notch and a Copycode notch. Squarewave and sawtooth signals fooled it into mistaking natural troughs for a Copycode notch.

Along with synthesised music, *Star Wars* and Mendelssohn's *Wedding March* were found to be particularly good at this with naturally occurring notches in non-coded material triggering the sensor. This happened with 16 different tracks from 10 different music CDs and 18% of the CDs tested were wrongly sensed.

The sensor was even less reliable at recognising genuine Copycode notching. For half the recorded tracks tested it failed to stop recording. Music processed by the two encoders performed differently. Also measurements showed a "very irregular phase response".

"If the encoder were to be introduced into the

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COPYCODE REPORT

music recording and reproduction process," says the NBS, "there would be no question but the frequency characteristics of the signal coming out of an amplifier in one's home would be degraded relative to the signal that was originally recorded prior to copy prevention coding."

With the help of Professor Irwin Pollack of the University of Michigan, and statisticians to analyse the results, the NBS ran listening tests. A total of 87 people listened, using loudspeakers and headphones, to music CDs and a Kurzweil synthesiser played by a professional musician in the NBS laboratory. Those listening on headphones heard most problems but a statistically significant number of all listeners heard subtle changes in timbre, trills and string section sound, and transient variation differences as the dynamic encoder switched itself in and out. The notch was most noticeable on synthesised music and CDs of Prokofiev.

NBS engineers then tried making circuits to defeat Copycode. They built five different designs, each costing no more than $100 in off-the-shelf circuitry.

The NBS rejected the technique of filling the notch with noise and then filtering it out again after recording. The five circuits constructed filled the notch and left it filled.

Wide band noise filtered to 3.84 kHz successfully fooled the sensor. So did filtering out some music signal from an octave below the notch and doubling it in frequency. So did modulating the level of the filtered noise to track the level of signal around the notch.

But these tricks could be heard working. Deriving the defeat signal from the music and modulating its level depending on the amount of music signal below the notch, fooled the sensor and proved "practically inaudible."

So did tracking the music signal level by measuring it on either side of the notch.

Summing up its devastating findings, the NBS concluded: "No, the system does not achieve its purpose."

Says Thomas Friel, chairman of the HRRC: "We testified before Congress time after time, saying, 'Copycode distorts music.' And the RIAA said, 'It does not, we would never propose anything that could distort music.'

"They even asked recording artists to testify for Copycode without ever listening to it themselves.

"The recording industry asked a lot of people to take things on faith. I would expect those people to be more reluctant the next time."

With Copycode out of the way and discredited, the hardware and software industries can now usefully try to reach agreement on a digital copy inhibit system that prevents digital cloning. Technically this is easy to achieve. One suggestion is that this should be linked to a tape tax or levy that is not distributed (inevitably expensively and unfairly) but is instead donated as a lump sum to a charity for the deaf and/or blind. This would effectively legalise analogue home taping, for which the NBS has shown there to be no technical solution.

The hidden problem is that the DAT standard is loose and deals only with essential features of the system like error correction and coding. Also the standard is only a recommendation and has no force of law.

This differs from the situation that existed with compact cassette and exists with compact disc. In each case (although Philips never collected royalties on compact cassette), Philips (and Philips plus Sony for compact disc) has set very tight standards and granted licences to manufacturers. These licences could be withdrawn from anyone who did not toe the line. For DAT there is no licence to withdraw and no-one is in charge. That is why pressure is growing for legislation to back the DAT standard, with import blocks on non-standard equipment.

Jan Timmer, head of consumer electronics at Philips, and previously head of Polygram, sums up the situation:

"There is a lot of talk about solutions to the problem of copying. But you cannot have a solution until everyone agrees. So far they are only proposals.

"If we can reach agreement on copyright between the hardware and software industries, it will be historic. It will be the first time that there has been any such agreement."□

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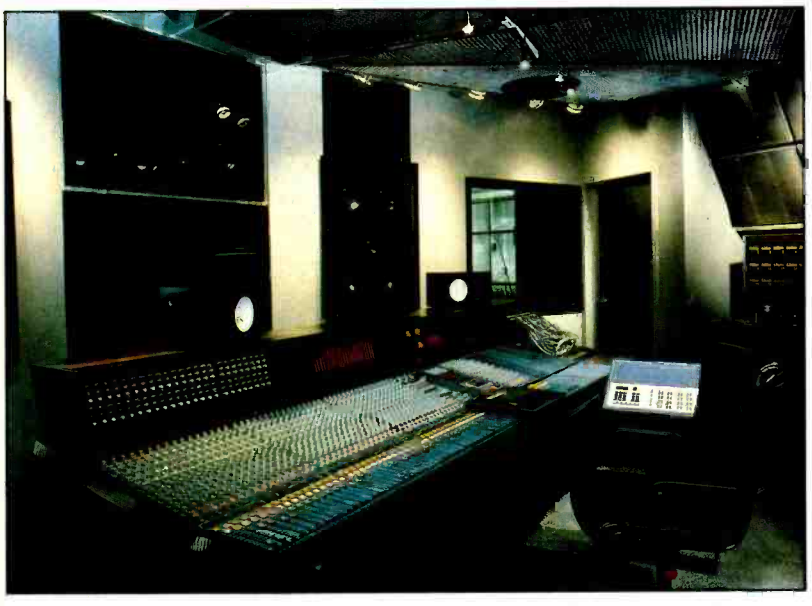
GREENE STREET

Terry Nelson visits a New York studio with an original approach



Greene Street, New York, is bounded on three sides by Greenwich Village, Tribeca and Little Italy. Once known as a rather run-down area for impoverished artists, this part of New York has been caught up in the whims of fashion and now become 'one of *the* places to be'. The neighbourhood has been designated a preservation area by New York City making it difficult for new buildings to be erected, however, having been in business there for over 10 years the studio is already well-established.

Owner Steve Loeb: "As I have been here for over 10 years I can't be forced out as an 'undesirable' business in a preservation area! Mind you, being in this neighbourhood now is really helpful for business and the cast iron facade of the building does add a certain charm to the place!

"When I first came to Greene Street, it was like creating an outpost in the wilderness. People thought I was slightly crazy setting up away from midtown where the core of the studios is. However, I liked the area—even if it was a bit derelict—and it was cheap! The smart move I made was to buy the basement area that the studio was in, which means that with the rise in value recently, the studio now has a lot of equity! My only regret now is that I wasn't able to buy the ground floor at the same time—however, this may be a future possibility."

Greene Street Recording, Inc, started out in 1974/5: "...with the first Neve in New York—I don't like to follow trends but to create them! The studio had to be out front from the rest of the pack and this same philosophy has been carried through to today with the new studio."

Among the first clients were the Philip Glass Ensemble, who also made several recordings in quad and pioneered quite a few techniques. Other work included commercials, rock and some early metal bands (mainly in-house productions for Steve).

"We always keep our ear to what we call street music, and I consider that our chief engineer, Rod, really made the first professional rap and street records with people such as Shannon."

Steve soon found that the studio was following an all-too-familiar pattern—it was getting very popular and he was being forced to go outside to do his own productions. "I spent quite a bit of time at The Ranch where they had an Amek *2500* console and it had such a really great sound that I decided that Amek would definitely be in the running for a console should I decide to build a second studio."

Once the decision was made to expand to two studios, Greene Street looked for a designer.

"We ultimately felt that we should commission a New York-based designer so that he would be readily available for on-site supervision—we didn't want someone just dropping in from time to time saying 'how's it going, guys' and flying off again. We also wanted a design that would be for 1987, not something from the past, and it had to incorporate Quested monitoring."

The contract was awarded to Benchmark Associates with Downtown Design and, "The outcome has been perfect. They gave us exactly what we wanted and we are very pleased with the result."

The other agonising choice facing studio owners is that of the console. "I felt that the 83rd AES was very much a console show with a lot of new products. The problem facing us was to get a console that was new yet was compatible with the demands from our clients. In many ways our choice was made up from a process of elimination and seeing what was left! SSL studios are two a penny in New York and we certainly didn't want to be just another studio. I also feel that somewhere along the line SSL took the decision that the automation system would take precedence over the sound and that it is this side of the console that has made it so popular. We would have loved a console from Focusrite but at present there is no possibility of recalling desk configurations. We obviously considered the Harrison *Series Ten* but the New York scene does not like Harrison consoles so that was out! I still had the sound of the Amek *2500* in mind so it seemed logical to look into the *APC 1000* and we found that it was just what we were looking for.

"It is very necessary as a studio owner to be open to change. You cannot have a closed mind or you will drop behind and I think it's fun to break all the rules now and then; it stops you from stagnating. When we were looking for a console for the new studio we had two basic criteria: at least the flexibility of an SSL plus outstanding sound quality. One way we could have gone was get an SSL board with a rack of Focusrite equalisers, though this seemed rather a silly way of doing things when starting from scratch.

"Another deciding factor was the inclusion of the GML moving fader automation system in the console, as this was also something that we were looking very closely at."

The Greene Street *APC 1000* is the first to be installed in New York and by now two video monitors should have been installed above the control room window and there should be some new items of outboard gear. The studio is certainly very pleased with their purchase and Steve is at pains to point out that it is "not a budget console!"

One of the restricting factors of the new studio was space and the new room is essentially for mixdowns. However, the room also backs on to the original studio so this can be shared between the two control rooms. The new room also has a small dedicated isolation room for vocals and overdubs.

The overall floor plan of the new control room can be likened to a lemon with a triangle cut out of each end. A noticeable feature is the lack of any absorptive surfaces apart from some surfacing on the ceiling.

The new Greene Street control room decoration is quite a bit different from the low-key atmosphere that tends to be the lot of many control rooms, and features a futuristic look with grey speckled Zolatone paint on the walls with a heavy silvered metal mesh covering the upper half of the rear wall. The ceiling slopes down gently from front to back and features trapezoid and triangular acoustic modules covered with black grille cloth to match the black finish of the monitors. The floor is fully floating and is surfaced with speckled grey flagstones. An array of spots around the edge of the ceiling permits a variety of 'mood lighting' to create the required atmosphere.

The majority of the wall surfaces are painted wood—thus hard—with the rear mesh fronting three central sections with RPG diffusors flanked on each side by glass fibre absorbent panels. The resultant sound is very bright and direct. The construction of the internal shell also seems to be giving a diaphragmatic effect and this may account for the lack of apparent low frequency absorption treatment.

The monitoring is Quested *412*s with ATC crossover and Yamaha power amplifiers, all the electronics are housed in an

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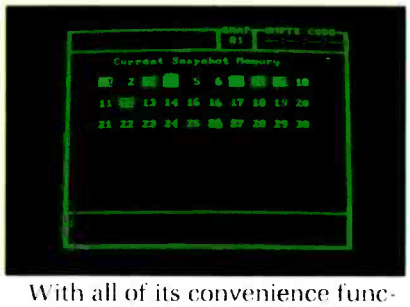

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equipment/service room next to the control room. Nearfield speakers are a choice of Auratones and Yamaha *NS-10*s.

Steve Loeb elaborated on the philosophy behind the control room. "Home studios have now reached the stage where they are a threat to what I would call the mid-level studios. It was therefore essential that our new room be right away from the kind of design and possibilities that these studios have. We spent a lot of time with the architects defining the kind of tight, punchy sound that we were after and that would be in character with the kind of work that we do here in Greene Street."

While on the subject of home studios, Steve also aired his concern at the distribution of professional audio equipment through music shops.

GREENE STREET

"I tend to view this as a threat to the pro-audio dealers and I wonder how this trend got started. My main concern is that we are in danger of having a situation where there will be more availability of products but less quality—both in some of the equipment itself and in the assistance offered by the stores—and is this what we really want? It's a difficult question to answer but one that ought to be considered."

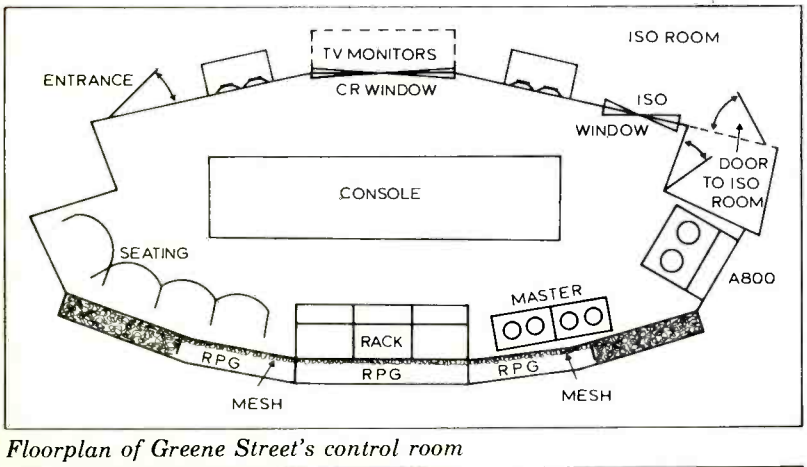
The Amek *APC 1000* is a 64-input module frame fitted with 40, thus giving a total of 80 inputs with 48 output buses and an expansion capability to 128 inputs! Other features include GML fader automation, 24 dynamics modules and sophisticated computer control with assignment, recall and reset systems. Particularly interesting is the Synchronous Reset feature, which allows mix (or console status) 'pages' to be filed in a particular sequence and called up through SMPTE timecode commands.

Recording centres around a Studer *A800 MkIII* multitrack with an *A80/2* for mastering and at the time of our visit an AEG *M20* machine was in for evaluation. Also due to be installed were several Sony *BVU* machines for both in-house and OB use as Greene Street are now beginning to do work for broadcast organisations as well as music recording.

The outboard equipment is installed in a triple rack featuring an angled upper section and this is placed in the rear behind the engineer's position. Equipment present included two tc electronic *TC-2290* processors, Lexicon *480Ls* and *PCM 42/60/70* effects units, a Valley rack with assorted modules, BSS *DPR* comp/limiter, Alesis *MidiVerb*, Publison *Infernal Machine*, Kahler *Human Clock* and Timeline *Lynx* synchroniser system. On the console was *The Box* stereo image display unit. This handy 'meter' gives very good visual indication of the stereo field—and its mono compatibility—and is starting to find its way into control rooms on both sides of the Atlantic.

The original studio was booked up all through the construction of the second and this helped to generate: "...alot of high level artist interest in the new room. People must have thought something special was going to come along as the new room was booked before it was opened and I'm still wondering when *I* can get in there."

The original studio will be staying as it is for the present as most people like the rather down-key atmosphere of the room. "It all looks a bit homemade but we get good sounds in here so why mess with a good thing?"



Floorplan of Greene Street's control room

Equipment includes a Trident *TSM 24/24* console, MCI *JH 24* multitrack and Studer *A820* ½ inch master recorder. Monitoring is UREI *813*s.

The studio, which is common to both control rooms, is large enough for rhythm sections and small groups and lets musicians "get that intimate basement feel into the music".

The new control room features an additional isolation booth for vocals and dubs, though it is large enough to take a 3-to-4-piece brass section without everybody feeling cramped. The decor is as per the control room with one end wall having mesh-covered absorption. The floor is polished parquet with an absorbent ceiling. The sound is again bright but without any resonance or ringing so vocals will tend to have presence without being coloured. Vision to and from the control room is also very good.

Steve Loeb made a few comments on how Greene Street was run. "We have our own staff engineers and they have built up a very faithful clientele. The studio is run very much on a group basis with everyone being expected to contribute ideas and make group decisions. This makes for a very creative atmosphere and because everyone feels concerned with the studio, this helps things along enormously.

"I am also totally committed to being behind the studio and thus my staff, which means they know I will stand behind them when there are problems. Though no studio likes to lose clients, it has to be faced that there are times when the best thing to do is show a client the door. I would much rather lose a difficult client than an engineer and this means that my staff know that I will back them up in difficult situations." (Although this seems to be on the rare side and clients such as Arif Mardin seemed happy.)

Loeb: "We are starting to move into the broadcast and commercial fields and I have found that there are service differences between the way they expect a studio to be run compared to, say, the record people. It may only be small things like coffee and doughnuts every half hour but they expect it to happen without any prompting and you have to get into that way of thinking. They also tend to run to much tighter schedules and if they say the session has to end at noon—then they mean 12.00 bang on the dot!"

And the engineer in all this?

"In many ways he has a harder time than with records, where he is usually part of a team and though there may be pressure, everyone is concerned about the final product and not too much about now. With the broadcast/commercials people everything is 'now' and the engineer often has to be an entertainer as well in order to keep things moving along and if there are any small snags, to keep them minimised and divert the client's attention while they are being fixed."

Greene Street will be adding personnel in the field of maintenance. "We used to do most of it ourselves and call in specialists when they were needed. However, now that we will be running two rooms around the clock, and with sophisticated equipment, there is no way we can do this without permanent maintenance staff. It may cost more on overheads but it could cost a damn sight more if we didn't have anybody and we had a serious breakdown at three o'clock in the morning!"

Now that the new studio is up and running, did Loeb have any plans for further expansion?

"I am thinking of acquiring the ground floor—there is a lot of space there and we could build a really nice A/V studio! I tend to feel that the recording business now takes in three types of operation: recording, real estate and leasing. There is no doubt that if you own your own premises you have a lot of equity—our new room being a prime example—and if you have space that you can lease out, this takes the strain off having to worry whether the studio is booked solid for the next year or so!"

Greene Street Recording have carved out a special niche for themselves in the New York recording scene due to a very individual way of looking at the business—and by putting it into practice! Strong personalities always get different reactions, sometimes positive, sometimes negative, but this all tends to make life interesting and there is no doubt that Greene Street are definitely reaping the benefits of the plus side. As they say, watch this space for future developments.□

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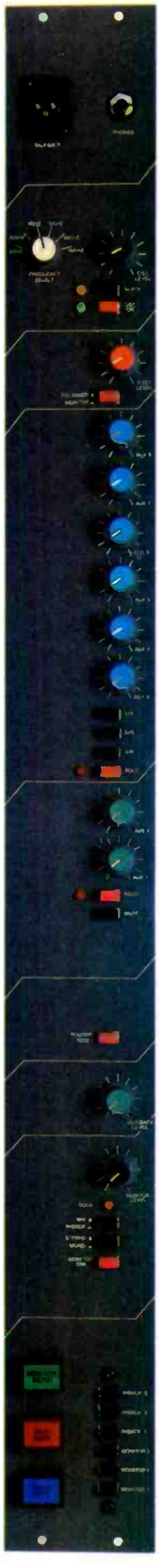

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LETTERS

I am Barbra Streisand's personal manager and I am currently producing a retrospective album package celebrating Ms Streisand's 25+ years in show business.

Since many of her early—and some foreign—concert, television and promotional appearances weren't officially recorded by representatives of Ms Streisand, I am seeking the co-operation of collectors and fans who might have access to privately recorded material.

I am also searching for pictures, programmes, reviews, interviews and ads to illustrate a booklet accompanying this audio or video (or kinescope) material.

Readers who have any information should write me. I would be most appreciative of any lead that might help us fill out this chronology.

Martin Erlichman, Martin Erlichman Productions Inc, Hollywood Center, 1040 North Las Palmas Avenue, Hollywood, CA 90038, USA. Tel: (213) 461-3466.

Regarding Mr Fox's comments (*Studio Sound*, March 1988) about the dispute at TV-AM, as anyone with even a slight grasp of broadcasting operations will know, the dispute is not about 'five people operating a portable video camera,' that obviously only takes one person plus a sound recordist. Additional staff are required when the shoot becomes more than a news item but a feature, then a director, PA and lighting engineer *may* become necessary.

The company's refusal to discuss the matter led to a 24-hour protest in November 1987. After three months of being locked out of the studios, 229 staff including 34 sound technicians, have been sacked.

There has been considerable ignorance shown in the reporting of this matter in the press in general without our own 'magazine' making light of a very important issue for all those concerned with audio standards in broadcasting.

I hope you will be able to look at these events a little more seriously in the future.

C Braithwaite, Dartford, Kent, UK.

Barry Fox replies: I am sorry that sound engineers have been caught up in this dispute. I wonder if they realise how little their union, the ACTT, has done to inform the press on the engineers' point of view?

I have never received any information on the dispute, either direct or via any magazine for which I write. This is despite the fact that I have written several pieces about the ACTT's stance on direct broadcasting by satellite.

When I met Alan Sapper a year ago, at a press briefing on DBS—to which no-one had sent me an invitation— I made a point of suggesting that the ACTT should improve its lines of communication with the specialist press. But obviously the point was not taken. What Mr Braithwaite describes as 'our own magazine' *Studio Sound*, has heard nothing from the ACTT on TV-AM.

I have, perhaps, more sympathy than you imagine. As a freelance journalist I was instructed by the NUJ to stop conbributing to the *Times* and *Sunday Times* during the Wapping dispute. I stopped even though I thought the dispute was unwinnable and thus futile, and had been imposed on contributors by politicos who personally had nothing to lose.

I was pleased to see the editorial in the March issue return to that 'yawn' of a subject, training. I was, however, disappointed by your rather negative attitude to those organisations attempting to fill the void left by the (largely) non-existent efforts of the industry.

I must of course declare an interest. As a freelance consultant (ex-ILR) I am employed one day a week by one of those organisations (yes it's even run by one of those 'aliens' though he doesn't hail from Mars and has a list of technical qualifications that stretches half way across the page). Since I hold no particular brief for this particular school (and I might even be working for the opposition in a few months) I don't intend to name them.

I have to say that I am very impressed by the standard of training the students receive, the quality of equipment on which they work and the ease with which former students have obtained positions in both the recording and broadcasting field. It is far from the 'easiest thing in the world' to recruit students. On the contrary, asking people to pay thousands of pounds up front for a one year course has two effects. Only those really interested in learning will join, and having joined they insist on the highest level of tuition. They are far more responsive than a similar group of HND students I teach in the conventional higher education sector, and far more demanding.

Surely if it is true that there are '100x' applicants for 'x' jobs (a fact which I would dispute) completion of a worthwhile external training course is even more vital for any would-be entrant to the profession. With costs being cut to the bone and short-term profit the name of the game, what company is going to devote precious resources to training. Resources are, of course, the name of the game. Without the best in terms of both facilities and staff (and industry will not want to divert either from the business of making money) training is a waste of time.

I actually have practical experience of the total lack of industry interest in training. Before my

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LETTERS

current involvement with an existing training establishment I tried to go it alone by organising a technical training course for ILR. I arranged premises, equipment, accommodation and outside contributors from industry for a three-week training course aimed at ILR technical staff. Out of the whole country I received *one* nomination for a place. Most stations failed to even reply to my request for comments on training needs. I chose to target ILR because (a) there is no ILR technical training and (b) I worked for 10 years as an ILR chief engineer and member of the industry technical committee and so it was a field with which I was familiar.

No, Mr Spencer-Allen, the 'Industry' will never see training as important and it will always be left to outsiders to fill the vacuum. The fact that the establishments tend to be run by 'that strange group of people we identified as aliens a few years ago' is a condemnation of the lack of entrepreneurial ability in this country in general and the industry in particular rather than a reason for making a snide and thoroughly uncalled for insult that has no place in a magazine like *Studio Sound*. In these cut-throat days, any training school whose standards fall below the needs of industry will very rapidly cease trading. Having paid thousands of pounds for a training course makes students very very demanding.

Tim Mason, Sound Sense, 6 The Green, Duloe, Liskeard, Cornwall PL14 4PW, UK.

Editor's reply: *As I predicted within the March editorial, whenever we mention training as a topic there are more letters and comments than for any other subject. The shame is that very few of the letters that we receive have actually responded to the subject as we presented it and the aspects that we stressed as being important. In the case of Mr Mason, he describes my attitude as being negative to training while in fact if you look towards the latter half of the editorial, you will see that I have placed positive suggestions as to how the industry should respond to the training issue.*

I have no knowledge of the training course that Mr Mason refers to. It may very well be an excellent course and fully worth every penny that students are charged. However that is not my point. If the industry has very little interest in external training schemes and a correspondingly small interest in organising their own training schemes, their default does not mean that external schemes have their blessing. I take great exception to his suggestion that entry into the recording industry is easy if you have some 'training'. Most major studios may have one or two entry level vacancies per year. They will however be getting applications for those positions at the rate of perhaps two a day. This is no exaggeration as can be found from talking to any studio manager.

Accepting trainee students and implying that after the course they will stand any better chance of obtaining employment within the recording industry than someone who is not trained, is not ethical. I have yet to see any proof that studios are any more responsive to a 'trained' entrant than a basic applicant. Without doubt, if students are spending large sums of money upfront for a course they will be demanding, but it is odd if they have not done some prior research as to whether having done the course they will have any better chance of employment. I have seen the results of training by external organisations many times—my feelings were borne out at the NY AES Convention workshop referred to in the editorial where there were numerous attendees who had taken training courses asking why, after their training, they were unable to get jobs. It is not too difficult to obtain tapes of that workshop. To use students as some battering ram against industry attitudes is immoral and if this is entrepreneurial then I condemn that as well.

My concern is simple. The industry needs to organise itself as regards training either by working with selected external courses or by organisation of their own (preferable) or it will lose the enormous chance that it currently has. I see no snide remarks in what I said at all. In fact I may have been very close to the mark as I have had a very positive response from within the industry and maybe, just maybe, there is a change stirring from within.

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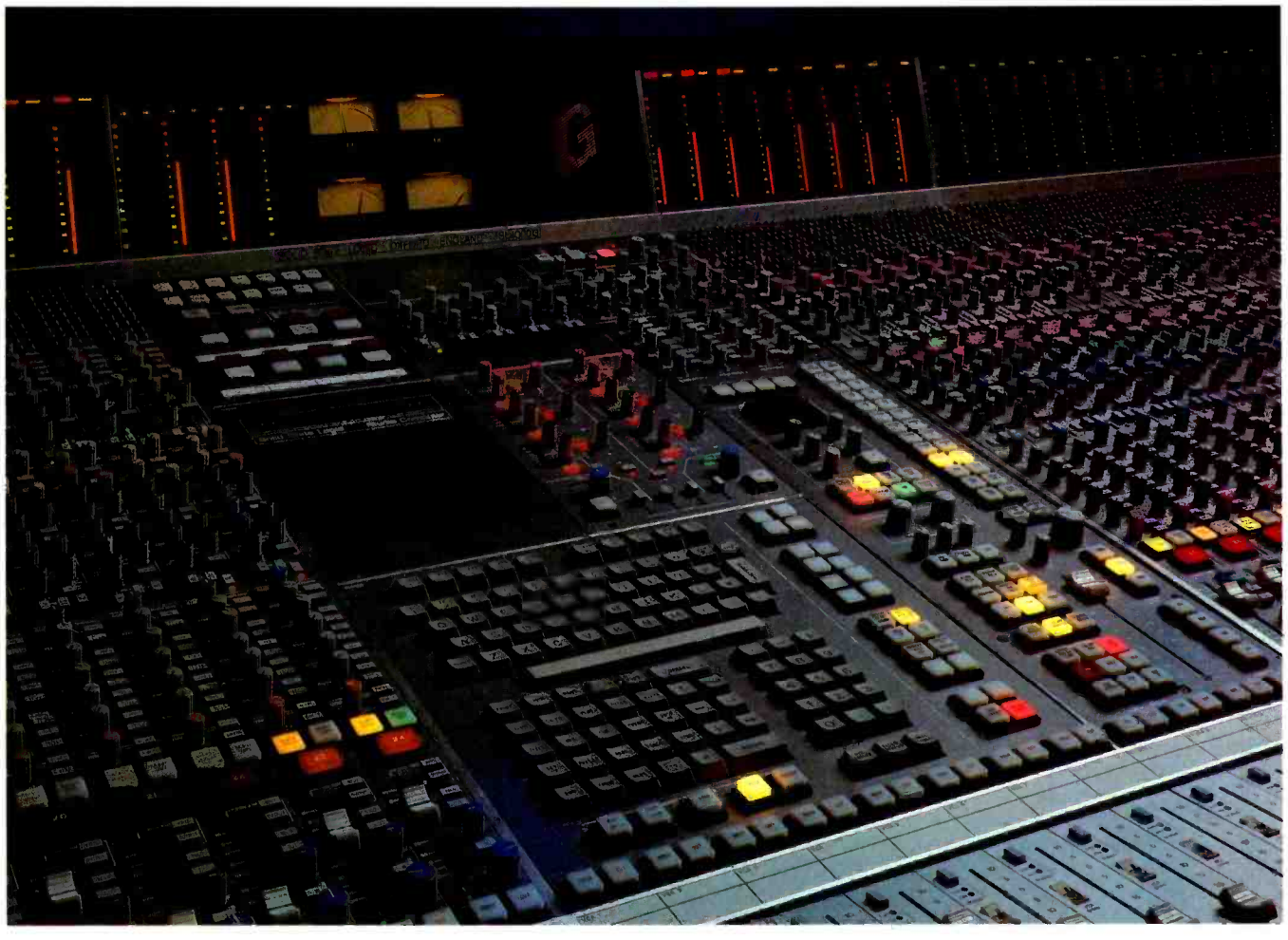

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THE ART IN CLASSICAL EDITING

Barry Hufker looks at the classical music editing technique of Elite Recordings

For about 20 years Marc Aubort and Joanna Nickrenz of Elite Recordings, New York, have been recording and producing records of contemporary and classical music together. Their work has taken them throughout the United States, Canada and Europe, earning them two Grammy awards and many nominations. Prior to their working together, Marc worked in Europe and the US for the Concert Hall label and Vanguard as a recording engineer and producer. He started Elite Recordings in July 1965 working as an independent for a variety of record labels. Joanna, who trained and performed as a classical pianist, joined him in 1969. Each year they record and produce an average of 30 records using techniques and procedures they have refined over the last two decades.

In their roles as producers, Marc and Joanna are responsible for every aspect of the finished recording, which they handle themselves. Marc determines the technical requirements of each project, together with Joanna who is responsible for keeping the session log and marking the score during the recording session. It is she who will do most of the post-session editing while Marc attends to the demands of running a business. Both respond to the musical needs of the recording session. Flexibility is a key part of their relationship, which thrives on a steady exchange of ideas.

Of all the elements necessary for a successful disc, editing is often the least discussed by recording engineers possibly because of its apparently simple nature. After all, what could be simpler than chopping out the 'bad' tape and pasting in the 'good'? The mechanics are fairly easy and can be taught to almost anyone. Yet Marc and Joanna can tell you that analogue or digital editing is a laborious and painstaking process. For them it begins at the recording session.

"Before the session there is very little one can do to prepare for editing. You don't know what you are going to be confronted with because of the artist and the performance, and how well they are prepared," said Joanna.

Throughout the recording session, an accurate written log is crucial for successful later editing of the various takes. As the pair must concentrate primarily on the performance, any note-taking must be done quickly, while still containing all the important information for each take. Over the course of several recording sessions writer's cramp can easily set in. To minimise arm movement, Marc installed a foot-operated talkback switch in his Studer mixer, for communicating with the artists in the hall, and developed his own shorthand. Comprised mostly of symbols and numbers, the shorthand is written on a long legal pad. Each page contains as much information as possible, reducing the amount of paper to be searched when hunting a take.

"When I came into this business in 1969 I was totally green," recalled Joanna. "Marc taught me his system and I have refined it for my own purposes, my own symbols, because you don't have time in a recording session to write it out in longhand. 'Take five is not together here.' I have seen producers do that and I think how the hell can they write that down while still listening to what is happening after that? I have seen producers get lost while writing one thing down and the musicians are playing three pages later."

Efficiency is even more greatly in demand during orchestral recording sessions because of high cost and strict union guidelines. These are in sharp contrast to chamber music sessions where there is almost a luxury of time—time for several complete takes of each piece, time to discuss, guide and encourage.

As Joanna explained, "In orchestral situations we like to have one complete run through of each movement, of a 4-movement symphony for example, tackling one movement at a time. The run through of the movement would be 'take 1', and while they are playing I am using my own shorthand. Let's say it is a complete take, this is Marc's shorthand: ∝/ω (Alpha/Omega, used to differentiate from rehearsal letters in the score), meaning the first take went from the beginning to the end. I have a symbol that tells me the orchestra was not together: 3/ . If, for example, the horn is flat I have a sign for that (↓), or if the balance between instruments is not right I have a symbol which reminds me to tell the conductor or player involved. By the time I am finished with take 1, I know where most of the problems are (**Fig. 1**).

"At the same time I read the timecode on the digital processor. Let's say take 1 started at 1 minute 10 seconds. I write it that way so I can find it later. (In analogue days timecode didn't concern us.) Take 2 started at the beginning but it had a false start so I indicate the false start with a slash 2/ . It went from the beginning to bar 3 2/-3. Take 3 had a long false start and the longer the false start the longer the symbol goes 3L ∝–, which on analogue is very useful. With a short slash I know I don't have to go very far. The quicker and more complete the shorthand the less you have to worry about at the session."

Most of the shorthand is in the score itself so that, "You could almost take the score and without hearing anything you could map out an edited score which would be approximately 70% accurate."

As Marc explains, numbering of the takes begins at one and continues in strict sequence up to the last take of the last musical selection. There is no deviation in the sequence when beginning to record the next piece. "Some people start a second reel, for example, and call the next take 'two hundred and one.' That becomes very confusing. If you want to go back to something previously recorded and want to correct something, then suddenly you might have the same take numbers. We start at one and may end at umpteenhundred but there is no question about it.

"What I don't see is how anybody can edit without having a log and markings in the score. We've seen producers who just sit there and listen—even make phone calls while the artist is playing and then say they are not 'covered' or are 'covered'. I can't see how they can do that," said Marc.

"There is no human being who can retain in his mind where a mistake was or where the ensemble

Marc Aubort

was off without marking the score," said Joanna. "By marking in the score, when I come to a problem in editing, I can look and immediately know takes 6 and 7 are no good at all but there's a possibility of three others because I've marked them in the score. This saves a tremendous amount of time instead of having to listen to every single take for a specific problem. I can automatically eliminate nine-tenths of them."

Limited by the amount of recording time allowed during an orchestral session, Marc and Joanna employ a method of 'overlapping'. Having recorded a complete run through of the piece in take 1, take 2 begins again at the beginning and continues until there is a problem in the same place as the first run through.

"Let's say I see in the score someone played a wrong note in the 20th bar. If that same person, or another, played a wrong note in the 20th bar (during take 1) we stop, go back again (to just before the 20th bar) until it is corrected. Then in the score I will put the number of the take with a little check so I know it's alright. There's a 90% chance of simply being able to splice in the corrected take a few notes or a note before the problem," said Joanna.

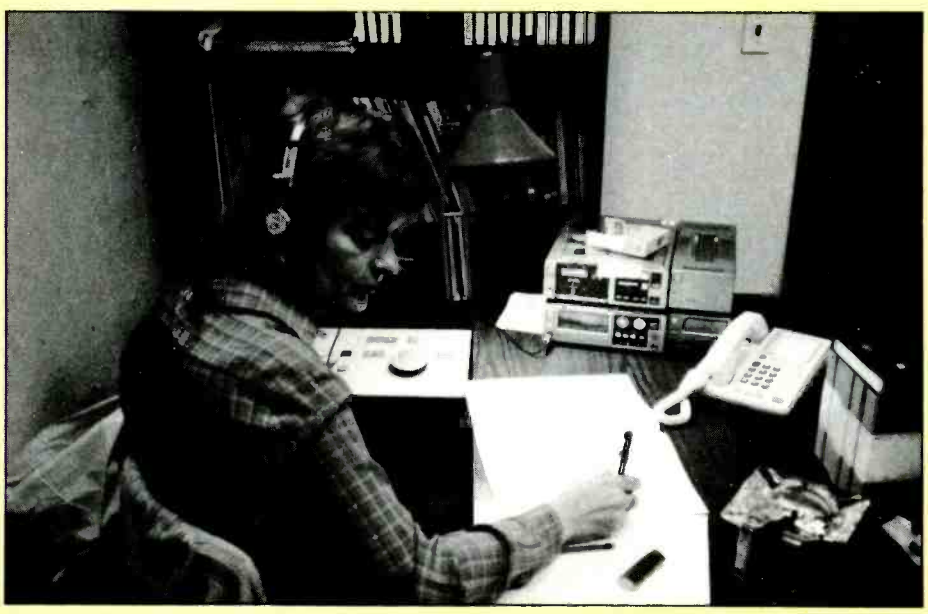
The following take will then pick up from that point and continue until the next problem. Because of overlapping, mistakes in a given take can sometimes be ignored if Joanna's score shows the section to be fine in another take. Precious time can be wasted, however, during a tense session when musicians unaware of this fact bring the take to a halt after playing a wrong note.

In the waning minutes of the session, the pair must decide the best use of the remaining time. "Sometimes you have to compromise and say 'well look, we'll give it another one or two shots and if it's not much better we have to go on'. That's when editing comes in: listening very, very carefully later and choosing the lesser of the evils," commented Joanna. "Sometimes, time pressures force you to go on to the next movement and I think 'if there is time I would like to go back and pick up something in the second movement'. After finishing the third movement, I may not have time to go back to the second. Instead I may have to get to something even more important in the third movement. With two minutes left that's a decision I have to make *now*. 'Am I going to kill myself later in the editing because I made the wrong choice?'

10-2		I				
1° 000 0/1	1	α -134	102⁷ 29	280 - W	56	150 - 188
8²	2	α - 135		II	51 2/7 57	167 - 277
16²	3	α - 64	105² 30	α - W	55° 58	176 - W
26³	4	54 - 72	14' 31	α - 31	02 03 55⁵ 59	300 - W
22'	5	67 - 72	15⁵ 32	α - 98	201³ 60	371 - W
22⁷	6	" - 105	20° 33	α - 26	2' 61	" - W
24⁴	7	99 - 109	22' 34	α - 46	2⁵ 62	263 - ?
25'	8	" - 126	24 4/3 35	18 - 46	207²	Room Sound
26 3/5	9	114 - 228	25⁵ 36	31 - 76		
31³	10	118 - 122	26 4/5 37	38 - 103		
32'	11	" - "	28° 38	- 107		
32⁴	12	" - 134	29' 39	58 - 79		
33⁴	13	" - 189 -	30² 40	68 - 75		
38 1/2	14	163 - 217	30⁴ 41	-		
40⁵	15	204 - 211	31' 42	58 - 74		
41⁵	16	" - 215	31⁵ 43	68 - 80		
42³	17	209 - W	32⁵ 44	75 - 92		
47⁵	18	" - 242	33⁴ 45	83 - 92		
49⁷	19	23 -	37' 46	" - ?		
50°	20	" - W	38' 47	" - 116		
55'	21	239 - 249	37² 48	89 - 98		
56°	22	" - "	38⅓ 49	" - 116		
57°	23	273 - "	39⁷ 50	96 - 117		
57³	24	" -	40² 51	" - 113		
58°	25	" - 268	42² 52	" - 131		
59⁷	26	258 - 283	44⁴ 53	116 - 177		
61 0/7	27	278 -	47³ 54	131 - 141		
62 4/7	28	280 -	48 2/6 55	141 -		

Sessional log

"Sometimes I could kick myself. Usually I've made the right choice. Let's face it. That's a lot of concentration, especially when you have two sessions (in the same day). It's brutal and one can make mistakes. You have a distraction. Someone around you is shuffling paper, the air conditioning goes on and they can't turn it off. It has a low rumble and I'm squeezing my headphones to my head to try to hear everything and I worry I may miss something because of that. We don't always know if those sounds are in the 'control room' or on stage. We don't have time to determine where the noise came from or stop to check the tape, so at times we must stop the orchestra and begin again to make sure we have a take without that noise."

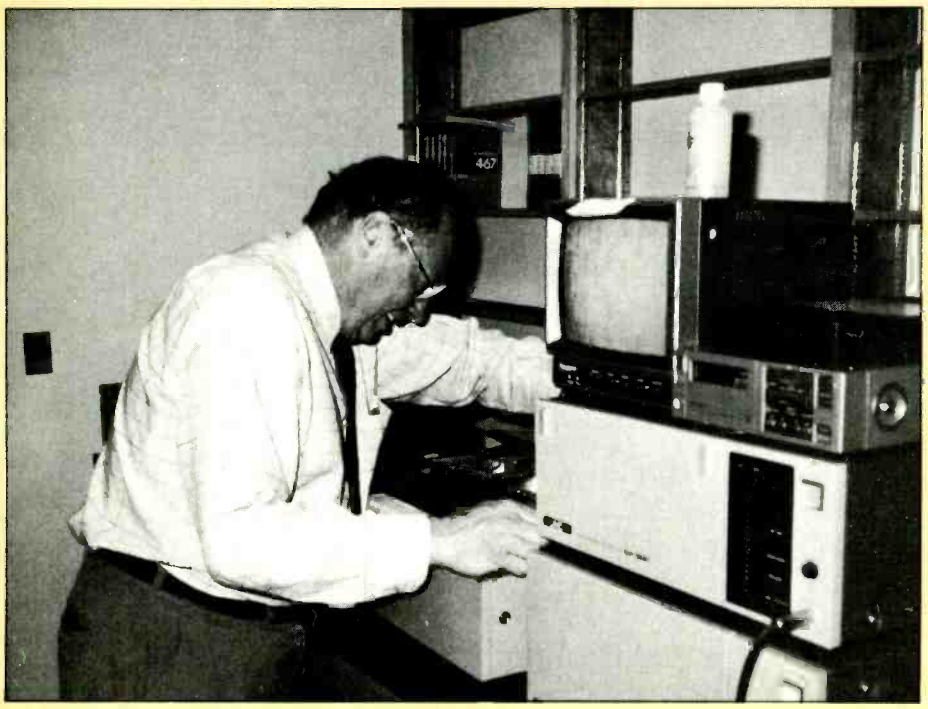


Joanna Nickrenz

Having finished the recording session, the carefully labelled tapes, scores and logs are brought back to New York for editing. There the tapes are meticulously re-examined before any editing takes place. As Joanna explains, "When I get back to New York it is really like going to the recording session again and I recheck my marks. I might listen to something six, seven, eight, ten times. The only way to do it is to map it out the best you can mentally, then cut it together to see how it works. Then I fine tune it. I'll re-mark the score heavily and, as I go, start mapping out the score. I will have notes to myself as I go along: 'cut in take 50 but compare take 1 before you do'. If you get into a situation where there is really not a great take of something, you look for a parallel passage because often in the score, music is repeated.

"As we are working at the recording session we are constantly thinking of that: 'that could be better but we know it's going to be repeated so let's see how the repeat is.' You have to keep thinking that way. We'll clone (digitally copy) even half a bar from another section where it did go well. Sometimes you are going to rely on being able to do that and it won't work because it was a

THE ART IN CLASSICAL EDITING



Aubort loading tape for an editing session

little faster when they did it the second time, after 50 takes it was a little softer or just the whole mood is different. During editing I constantly compare the takes that I think might be better (cross them out after I have done that), get to the end of the movement, go back and listen to the whole thing because often times you are zeroing in on one problem and fail to notice something you didn't hear before."

Located in New York at 6th Avenue and West 23rd Street, the tape review and editing happens in one of six rooms comprising the offices of Elite Recordings. To aid concentration, Joanna listens mainly over headphones, though during the long process she finds changing to speakers can offer a fresh perspective. "Often times, a splice you cannot hear on speakers is audible on headphones, and if you can hear it on headphones you'd better correct it," she says.

Analogue editing is done on an Ampex *350* open-reel tape recorder, which Marc feels is unsurpassed for that task, while digital editing is done on the U-matic video cassette-based JVC *900* system.

"It's actually changed because of digital. We used to record analogue and digital and then edit the analogue completely. Then we make an audio cassette of that edited tape for the artist to approve," said Marc.

"We started doing that in 1980 when we started our first digital recordings because of the enormous costs of digital editing at that time," added Joanna. "We were saving our clients' money by knowing in advance which takes we would use before we rented the digital editing equipment."

Working at the *350*, the takes are cut together using technique and insight gained from years of experience. Because various takes will be inserted into the master for comparison, it is imperative the splicing tape allows easy re-opening of the edits. Fresh Scotch *620* splicing tape secures each edit. A pair of editing scissors are used in preference to the expected single-edged razor blade. The tape is actually cut with scissors while both are held above the tape deck, each splice point being cut separately. A trained eye and experience make the procedure successful, both tape ends matched at the proper angle. The two tape ends are then placed in the editing block and joined.

"People sometimes assume because we use scissors that we don't need the *Editall* (splicing block), which is totally wrong," said Marc.

"But the advantage of cutting with scissors is that you can vary the angle. That's the whole idea behind it.

"For an electric noise you go at a very steep angle, for a smooth overlap you go at a very shallow angle. It's a question of transients. If you are cutting something with high transients, like a mallet striking a bronze bell and you cut at a shallow angle, you destroy the whole thing. If it's a flute passage for instance, then you've got to use a shallow angle."

In addition to cutting at angles to suit the music, Marc and Joanna are able to further conceal analogue edits by splicing *into* the initial musical attack. As Marc explains, "You keep the attack of the first instrument and 'rock' into the bulk of the sound. Then you cut between the attack and the bulk, but you have to keep the attack of the first instrument."

Useful for routine assembly of musical passages, this technique is invaluable for cleaning up greater difficulties, such as a poor attack. "Let's say the flute came in too early, then the oboe and then the rest," said Joanna. "Keep the attack of the flute, go forward to where your hear the oboe come in, eliminate what was between that and splice that together. Then go to where the rest of them came in. Eliminate the tape between that and put it together. If you have been able to preserve the music's rhythmic meter, you should have a clean attack!"

An experienced tape editor can use this 'trick' in reverse to cut backward into the decay following a note or chord. Such editing is useful for removing a noise from the end of an otherwise good take. "Let's say there is a noise in the overhang (decay) of one take, and the other take that you've got is either not together, or has a wrong note in the last chord but you're stuck with noise in the good chord," explained Marc. "You go to the good take with the noise and cut just before the unwanted sound. You then get the second take which you couldn't normally use and find where its overhang matches the first take. Then you cut the two together. It can be done but it's very tricky. The two takes have to have the same intensity of sound otherwise you get a 'bump'. For analogue editing you make a 'safety'

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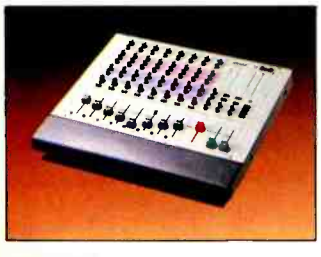

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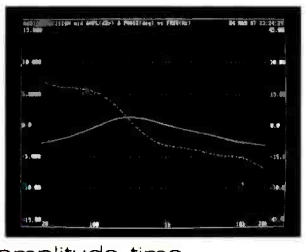

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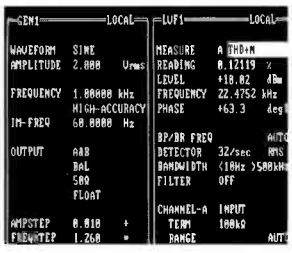

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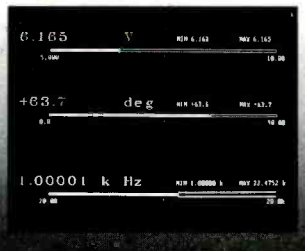

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THE ART IN CLASSICAL EDITING

(copy) before you do any cutting in case anything goes wrong."

A similar procedure can be employed when editing speech. Although a consonant may be easier to hear when searching for a place to cut, a mistake could result in a double attack of the consonant. Marc suggests instead cutting on the vowel following the consonant, where any error will be better masked.

Finally completed, the edited analogue master tape is copied to cassette and sent to the artist or conductor for approval. He may approve the tape as is or ask if there is a better take of a given portion that can be inserted. By searching their logs, Marc and Joanna can quickly provide an answer and any alternative takes.

"When you first work with an artist he has no idea what your taste is, " remarked Joanna. "When you've worked with an artist for a while he realises we are looking for the same thing he is. By the end of the first session, an artist should have trust in a producer and feel free of the worry of being 'covered'."

"We discourage musicians from coming to the editing session because they either listen for other things or suddenly want to jump from one take to another," added Marc. "You have a certain plan, a certain way of working. They don't know what you're after but you know the logical sequence of what you want to do. Any distraction at this point disturbs your concentration. So we put the tape together and send them an audio cassette for approval. After listening to the cassette, the artist may request changes or ask us to find 'a better take'."

Unlike analogue, digital editing does not require any actual tape cutting (*Unless you wish to take the risk. Ed.*) Instead, the desired musical takes are copied (cloned) from the original digital video cassettes to an assembled master cassette. Since tape is never destroyed, the tape editor is free to experiment as much as time and budget permit. Often aiding any experimentation is a 'rehearsal' function which uses random access memory to store a portion of the music so the edit may be auditioned without moving tape, before it is printed on the master tape. An electronic crossfade, similar in purpose to the angled splice of an analogue tape, smoothes the transition from one take to another.

Although they now have their own JVC digital editing system, for Joanna and Marc early experiences with digital editing proved not only expensive but also time-consuming and frustrating. Many of the techniques they had developed for analogue editing could be applied to digital editors but each of the major systems had limitations or idiosyncracies to be learned and overcome.

"The first time we did a digital recording we used the 3M system to tape the Los Angeles Chamber Orchestra," said Joanna. "Nonesuch Recording sent us out to Los Angeles to do the editing and the editor simply would not record the splices properly because at that time they only had 'butt' editing and hadn't developed a crossfader."

A further benefit of digital audio editors, according to the pair, is the inclusion of a digital fader in the Sony and JVC editors. This enables the operator to smooth out the audio level between two spliced passages, something that would be impossible to do in analogue without degrading the quality of the recording by copying the 'incoming' music and splicing it in. "Sometimes it just floors me," remarked Joanna. "Some of these splices I would never have attempted in analogue. But because of the fact that you know you cannot destroy the tape in digital you do try more sophisticated splices and it's incredible what you can do."

Nevertheless, whether working with analogue or digital there are always problem edits. The 'less than perfect' splice or 'audible edit' may be fixed by the proper choice of cutting angle or level correction but often the best solution is to shift the splice to the next best location in the score. Over-editing a performance can ruin the musical concept. A good tape editor should possess 'good ears' and superb musical taste. The work of a good tape editor should go unnoticed by the listener. Simply put, no performance should ever sound as if it has been edited.

"There are so many things to think about in editing," explained Joanna. "You have to be able to hear the whole fabric of what is going on. You have to think 'OK I want to get the cleanest performance but at the same time I want to retain the real performance—what Casals once called the rainbow'. That's tough. That's a very subtle thing. Remember 'performance' and don't let 'cleanliness' get in the way."

"Once I have mapped out something, even if it's put together, I'll listen to some early takes and, at times, eliminate some of the splices I had actually mapped out—in order to interfere the least possible with any kind of line or flow," adds Marc. "The better the artist, the more skilled, the more prepared the artist is, the harder the recording sessions and editing can be. This is a controversial statement but it's true, because you know you can extract the last 99% out of them. Whereas if somebody has his limitations, you know at a certain point there is no point going on: the artist has reached his limits, let's move on."

Extensive editing can actually work to the artist's detriment. "It can be the classic story," said Marc. "The artist, during live performance, has to live up to his reputation on records and sometimes cannot! The winner is the composer, whose music is presented in the best possible light."□

SURREY SOUND

Surrey Sound has recently changed ownership. The studio has been very successful during certain periods of its 15 year existence. Caroline Moss looks at how the new owner is settling in

When musician/singer/songwriter David Yorath was looking for premises for a new studio he found Surrey Sound was available. Yorath: "What appealed to me was that the place had been running as a successful studio for 15 years. Bands like to work in studios which have generated previous successes."

Just 25 years old, Yorath had been running his own pre-production suite, Solo Sound, from his home in Harrow, Middlesex, initially to facilitate his songwriting and before long was producing demo tapes. The studio's reputation spread and soon, aspiring young bands were coming to him to make their demos. The turning point came 2½ years ago when he gave up his full time job to run the place as a commercial venture.

As time progressed so did the professional quality of the artists coming to him. He worked with a wide variety of music, from rap to piano ballet music, but his policy was to work only with those artists in whose talent he had faith and as a result produced some independent records that did well within their field. However, after a while, the limitations of Solo Sound became obvious. As he could really only take on solo artists, due to the small space in which he worked, he was having to turn down 50% of the work being offered to him. This was coupled with the fact that the attraction of making demos was wearing thin and he wanted to be involved in the production of more serious projects.

"I wanted to be able to make the sort of records I could be proud of. Some of the demos I was turning out were almost good enough to be released as they were. In some cases, especially with more successful artists, I would make a suggestion only to be told, 'Oh, yes, we'll do it like that on the finished thing but it's not worth bothering with on the demo.' My personal belief is that if a job's worth doing, it's worth doing well but it was also annoying as I felt my more sophisticated equipment was not being used to its full capacity."

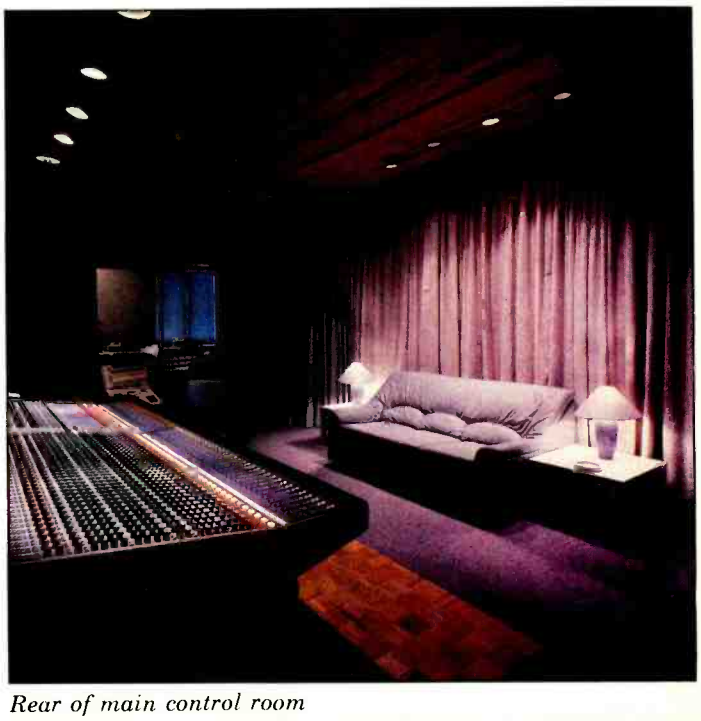
One of the first priorities when he moved into Surrey Sound was to find room for his pre-production suite. This was accomplished by knocking down a brick wall between two very small existing rooms, creating a separate studio that can be leased on its own or linked to the main studio via tie lines. Yorath believes it is not a good idea to concentrate on one particular end of the market but to cater for everyone across the board.

The pre-production equipment has been put together over the years and revolves around what Yorath considers to be the heart of the system, his Roland *MC500* microcomposer. It has become so invaluable that he has installed another one in the control room of the main studio to enable a disk to be transferable. The desk is a 32-channel Soundtracs and there are Tascam 8-track and stereo tape machines. A Roland *SBX 80* syncs everything to MIDI and CV gate to MIDI devices interface pre-MIDI equipment. There is a wide range of outboard gear and synthesisers including a Roland *MKB1000* MIDI mother keyboard.

As far as the rest of the studio goes, most changes have been cosmetic. New floorboards have been fitted throughout to replace old ones that creaked badly and this has greatly improved acoustics in the studio—a fact noted by several drummers. "The place was really run down when I bought it. A guy came here recently who remembered it when the walls were just plasterboard. This was about 10 years ago when people like Police and Siouxsie and the Banshees used to record here a lot. People seemed to like it then because it had a raw, rough air about it that complemented the music of the time."

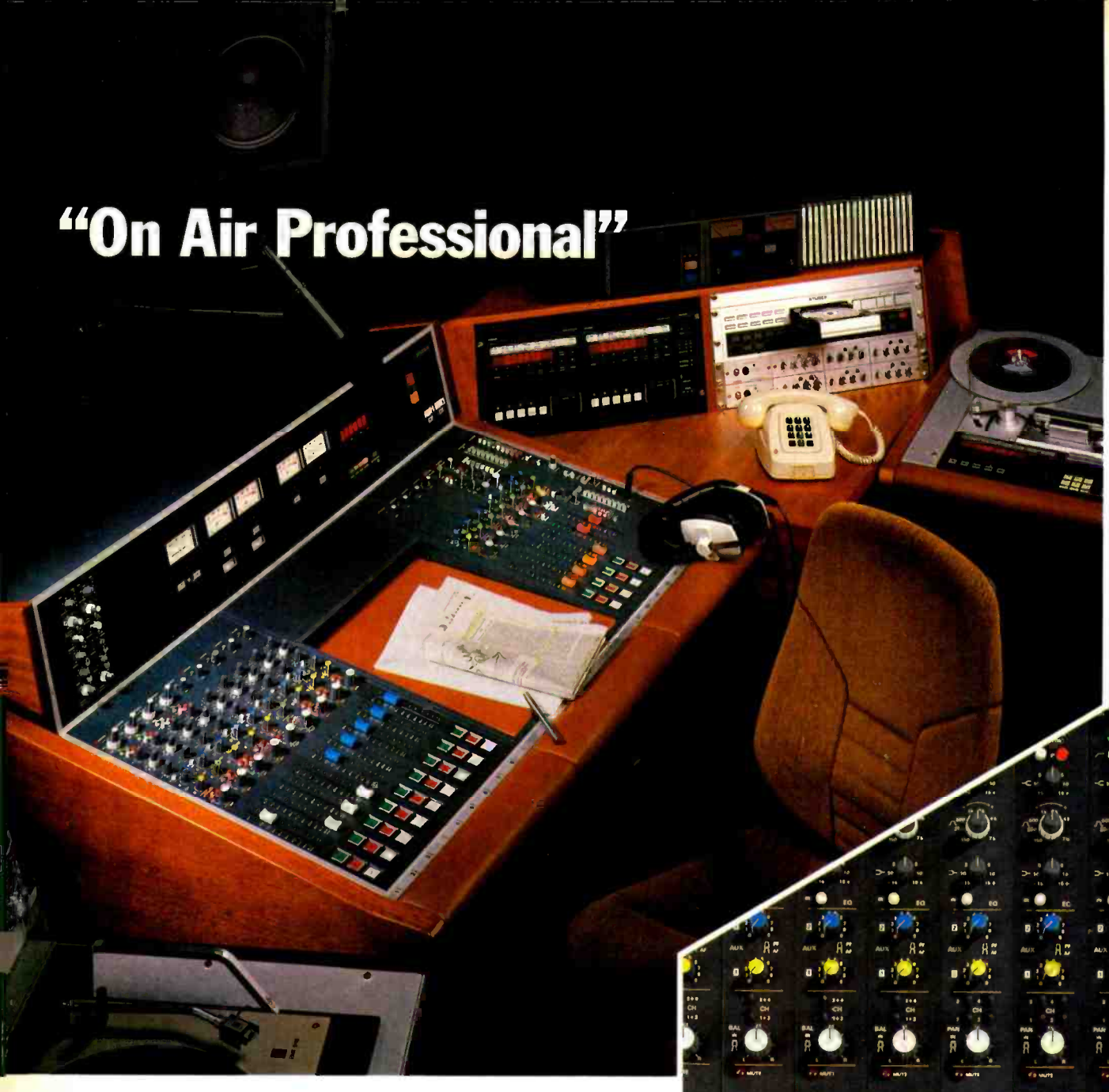
To lighten the control room, dark cork covering the back wall has gone to be replaced by light-coloured drapes, which have the

View across studio area



Rear of main control room

"On Air Professional"



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SURREY SOUND

Through control room to studio area

added advantage of deadening the wall. The colour scheme throughout the whole building has been changed to a restful but business-like grey.

Surrey Sound's existing equipment was sold with the studio and includes, to Yorath's great approval, an 8-month-old DDA *AMR* 36/24/48 console with 60 channels of *MasterMix*. He has added to the outboard gear with the new Lexicon *480L* digital reverb, Drawmer gates and compressors and a Bel stereo flanger, and is in the process of choosing new monitoring.

Yorath has brought to Surrey Sound the benefit of his past experience in video work. He has added music-to-picture facilities to the main studio in the form of a Sony U-matic video and *Profield* monitor, and SMPTE is generated in both studios, which have also been linked by closed circuit TV.

Says Yorath: "I reckon we have the most up to date non-digital 48-track facility outside London." Though, in fact, a digital session did take place when Trevor Horn brought in two Sony machines.

Some thoughtful touches have also been added: lunch is prepared on the premises and included in the daily rate; a chauffeur-driven car is instantly available, a big advantage in the heart of Surrey; and there is a comfortable relaxation room where artists can escape when they're not working in the studio.

Many schemes exist for the future of Surrey Sound. Yorath's main priority is to record a Top 10 single this year to put the studio back on the road to the successes it enjoyed in the '70s. He plans to attract successful bands by constant quality marketing and is determined not to let the studio become dated but to keep abreast of the times by regularly appraising and updating the image.

He is in the process of setting up a producer management company to establish a group of producers whom will become affiliated to Surrey Sound and will continue his own progression as a producer by working, as before, with artists in who he has faith. If all goes well with his independent productions, he has high hopes of starting up his own record label.□

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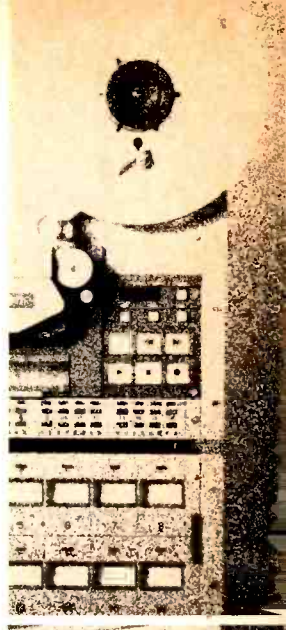

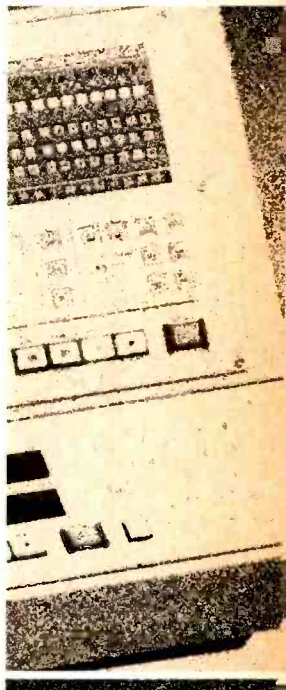

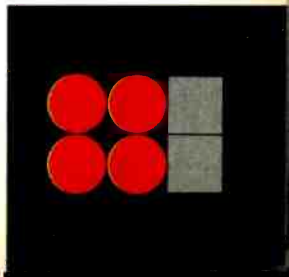

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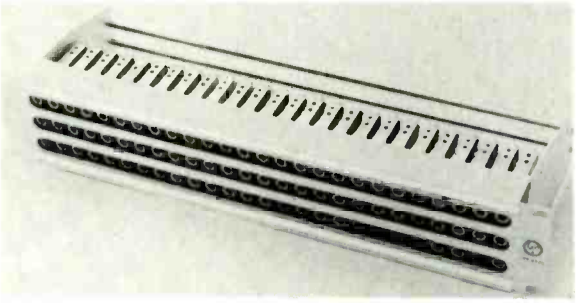

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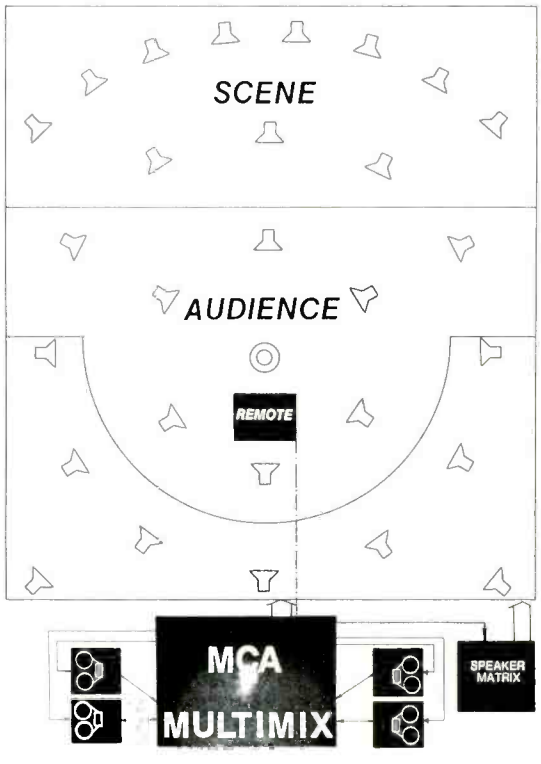

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GRAMOPHONE CENTENARY

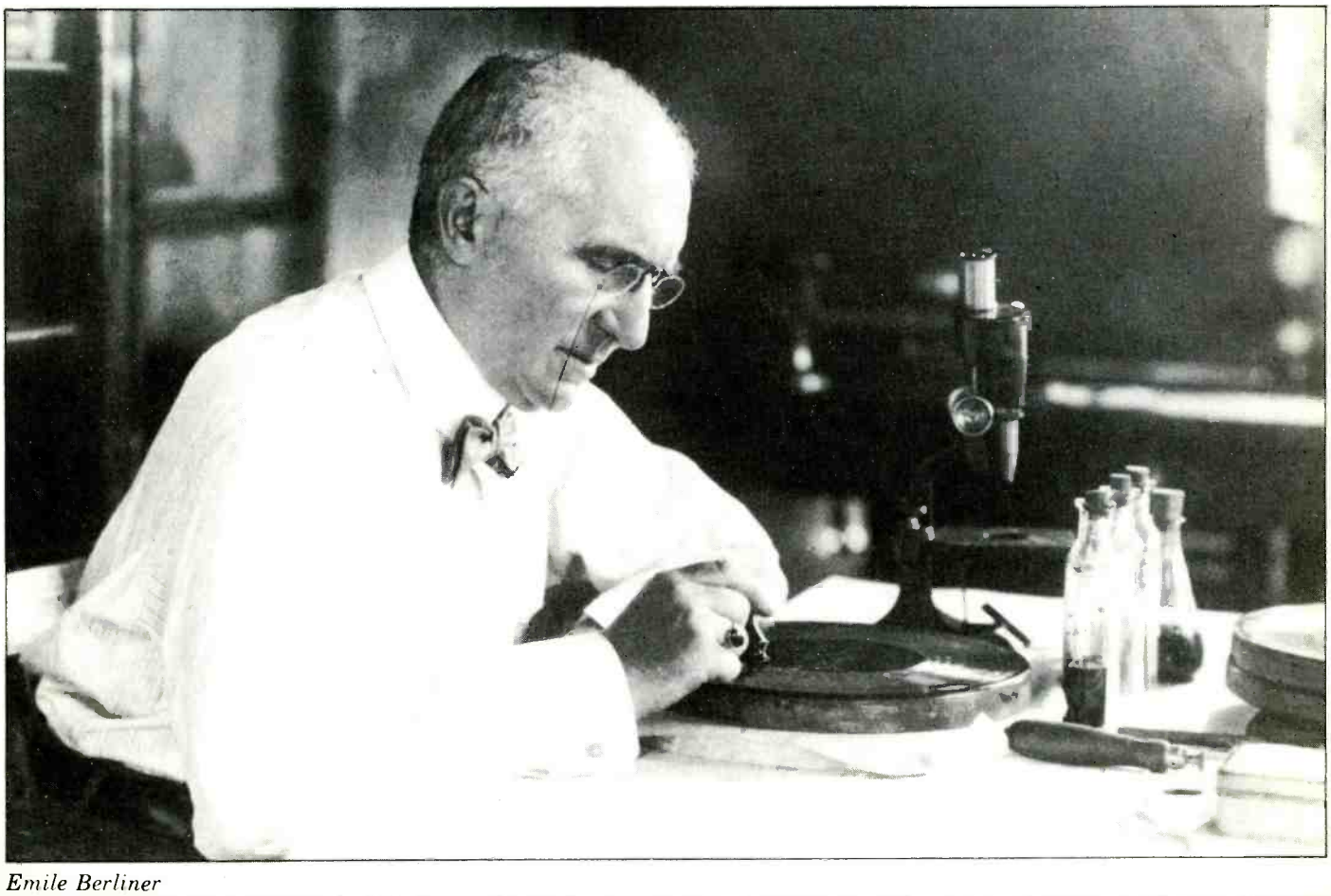
This year is the centenary of the first public demonstration of the gramophone and disc record. In this article, Oliver Berliner, grandson of inventor Emile Berliner, relates the background to his grandfather's achievements

A hundred years ago this month—May 16th, 1888 to be exact—a once-penniless immigrant stood before some 400 breathless people. They were a distinguished group of special invitees at the Franklin Institute, that venerable academy of American scientific achievement named after the country's 'first' scientist, Benjamin Franklin. Although the German-American inventor was by then no stranger to appearances before scientific groups, this time things were different.

A decade earlier 25-year-old Emile Berliner, born in the kingdom of Hannover and migrated to the 'New World' at age 19 to seek his fortune, had startled the world with what he'd expected to be an improved telephone to supplant the 1886 invention of Dr Alexander Graham Bell. But though he hadn't created a new telephone—and others were trying to do just that—he'd indeed solved the problem of Bell's telephone-transmitter, then the weak link in the voice transmission chain as it could carry current over only a few feet of wire. By injecting a direct-current voltage into a pair of loosely connecting contacts that pressed together in varying amounts in sympathy with the sounds emitted by the human voice (or anything else) he had created a device and a method whereby sounds would be converted to electrical impulses that could travel great distances.

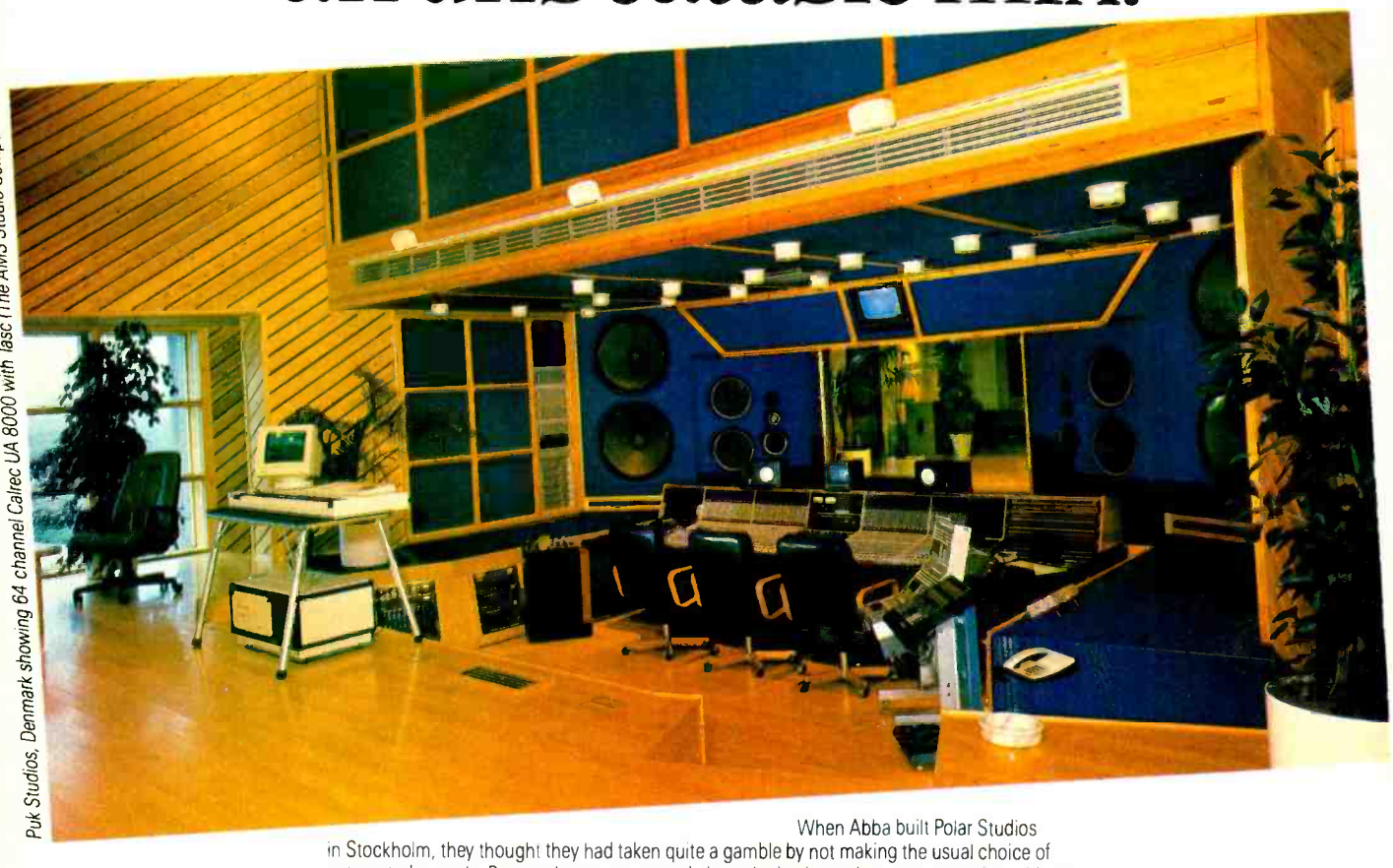
Later, using an added step-up transformer (the discovery of the great Croatian inventor Nicola Tesla) not only amplified the pulses but permitted transmission over even greater distances. For $50,000, a princely sum for a young man accustomed to earning $3.00 a week as a dry-goods clerk, the Bell System had bought Emile Berliner's microphone that would come to be used in all the world's telephones for the ensuing 100 years. (Had Mr Berliner taken AT&T stock, which he was offered, instead of cash, and had he reinvested all dividends his assets would have been worth at the time of the 1984 Bell System breakup one billion eighty-six million dollars.)

But behind the scenes of Bell's simple acquisition of the Berliner microphone were undercurrents of immense magnitude—events that would actually shape America. Thomas Edison, the land's most famous inventor, had patented a microphone of similar design that he'd sold to the then-powerful Western Union Telegraph Company, which promptly took action against Bell for infringement. But their lawyers



Emile Berliner

The UA8000 with TASC an unbeatable mix.



Puk Studios, Denmark showing 64 channel Calrec UA 8000 with Tasc (The AMS Studio Computer).

When Abba built Polar Studios in Stockholm, they thought they had taken quite a gamble by not making the usual choice of automated console. But word soon got around about the business they were attracting with the Calrec UA 8000.

When plans were being put together to build a 'no expense spared' studio complex in Denmark, members of the PUK team went to Sweden and spent time at Polar.

After exploring and listening to the Calrec console at Polar they knew a UA 8000 had to be the centre piece of their new studio.

When EMI Abbey Road heard rumours about the audio performance of the UA 8000, they did some in house tests. They were sufficiently impressed to send important members of their team to PUK Studios in Denmark. Just as history has been made at Abbey Road before, it is now being made on a Calrec UA 8000 with TASC (The AMS Studio Computer).

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The Queen's Award for Export Achievement to Edendeck Ltd 1984/85 and AMS Industries plc 1986. In July 1985 Edendeck Ltd became AMS Industries plc.

GRAMOPHONE CENTENARY

discovered that the Berliner patent preceeded Edison's by two weeks. Western Union acknowledged the Edison patent as worthless and agreed never to enter the telephone business. This concession proved to be no less than monumental, for it paved the way for Bell and its subsequent companies becoming the world's largest corporation while the Onion, as it came to be called, moved slowly down the long road to its present precarious financial condition.

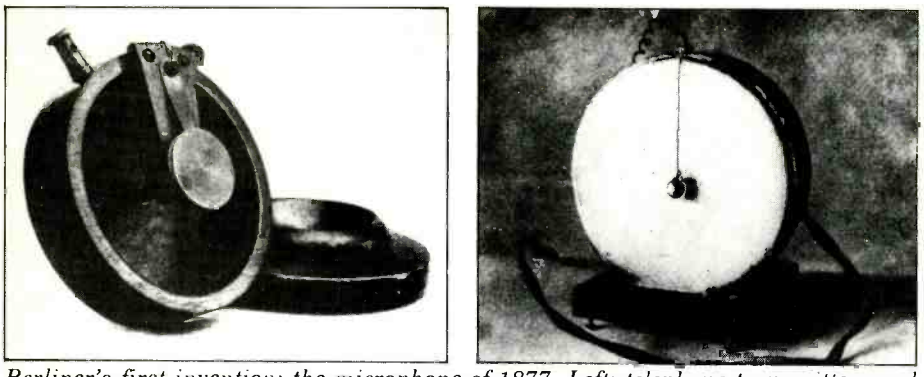
Little did Emile Berliner know that for a second time in his life he was to startle the world with a creation while bringing on the downfall of yet another invention of the 'wizard of Menlo Park', a man whom he'd never met yet with whom he was destined to clash in battles of astronomical proportions.

To look at that invention we must go back to 1856 when the Frenchman, Edouard Leon Scott de Martinville, introduced his sound-recording device, which he'd called a phonautograph, meaning sound writing (from the Greek), the original of which you'll find in the Smithsonian Institution museum in Washington. Scott's recorder employed a cylinder coated with a thin, soft, smokey substance such as lampblack. Sounds striking a diaphragm caused an attached stylus to vibrate, creating lines that waved sideways as they moved around the revolving cylinder as the stylus scraped away the black coating. Voila! The world's first sound recorder.

But could it play? This was the problem Edison was to address 20 years later. Simply put, by replacing the coating with, say, tinfoil, the stylus could indent a groove in the foil. Then that same cutting-head and stylus could be dropped back into the groove and, lo and behold, you could hear what you'd recorded. In 1877 Thomas Edison had invented sound reproduction. Not only that, if you removed the letters 'aut' from Scott's word you come up with the word phonograph. This word had been in use for years in relation to shorthand for secretaries: what the stenographers wrote down was called a phonograph.

The remarkability of Edison's invention coupled with the inventor's personal notoriety overshadowed a curious event taking place in Paris on April 13th, 1877. Another Frenchman, the poet Charles Cros, had deposited with the Academy of Sciences a paper describing how a disc, instead of a cylinder, could be the base for a recording. The paper was published on December 3rd but by then it was too late, for few paid attention as the world's eyes focussed on the American's invention. However, Edison had overlooked an important characteristic of the Scott (as well as the Cros) design. Scott required that the stylus undulate from side to side. Edison failed to incorporate this crucial requisite. His stylus vibrated up and down—the louder the sound the deeper the groove. Was Edison unaware of the dangers of 'hill and dale' recording, or had he left it to his model-maker assistant to build the machine that way without thinking? Had Edison more closely copied Scott his world might ultimately have turned very differently. As it was, Edison went to his grave stubbornly refusing to accept the fact that great distortion and low-frequency losses inevitably occur in a system that requires cutting deeper to record louder passages. The law is physical, not man-made. It cannot be successfully violated.

All this flashed through Emile Berliner's mind



Berliner's first invention: the microphone of 1877. Left: telephone transmitter used for the patent caveat of April 14th. Right: design of March 4th, which established the loose contact principle

there in the Franklin Institute's auditorium as he stood onstage to show his recorder, records and player for which the funds from the microphone sale had generously made possible the time to develop. He'd seen the phonautograph, the phonograph and the graphophone, the latter incorporating the ingenious 'floating stylus' invention of Charles Tainter and Dr Bell's cousin, Chichester, which ironically would soon come to haunt him and even to shatter his own dreams. He'd read of Cros' design and had long felt that the disc was superior to the cylinder. Yet despite it all, the disc had not been his primary goal for six months earlier he'd been issued a patent that was to rock the world, that would mean more to more people than his microphone ever would, and which would live for more than a century. Now he'd come to Philadelphia to tell the world about it.

What my grandfather had invented was a method of mass-producing records—cylinders or discs—from a single master. It was a simple process, even for cylinders but more so for discs. Make the (cylinder) recording on a substance removable in toto from the mandrill. The modulation must, of course, be lateral. Remove the cylinder, separating it at its seam and lay it flat. Apply an acid that will etch a groove where the coating had been scraped away by the cutting stylus. Emile Berliner called this 'etching the human voice'. And if the base were a disc, so much the better, for the process was obviously simpler. As it turned out, neither Emile Berliner nor anyone else ever had to bother making cylinders with this process.

With its groove in place, it was possible to play the recording over and over again. But there was something more you could do. You could electroplate the recording, remove the plated portion, which would be an opposite of the recording (hills where there'd been valleys), and with this matrix as a stamper you could press unlimited playable copies of quality virtually indistinguishable from the original. But were the stamper a disc rather than a flattened cylinder you'd need a high pressure press to stamp out copies and record presses hadn't been invented yet. Or had they? Why not press discs on a button-making machine? Why not, indeed. The Duranoid Company's machines could serve nicely. And they did, producing laboratory samples out of celluloid.

The United States patent of November 8th, 1887 makes no mention of the disc, itself. My grandfather had been fearful that he'd infringe on a Bell-Tainter design so he included description of a disc record in only his British and German patents of the same date. But his fears proved unfounded and now he stood in the Franklin Institute spotlight to tell the world for the first time of his disc record, his method of mass-production of unlimited copies of a single master, and his machine upon which to play them which he called the gramophone (from the Greek, meaning sound of letters).

Now, were you to believe that it was a pleasant, and profitable, downhill ride from that point on, it was far from it; the path was fraught with imminent peril. Chichester Bell and Charles Tainter's wax cylinder (patented May 4th, 1886) had come on the market under the aegis of the American Graphophone Company (which later became Columbia) in Philadelphia. Their cylinders were far superior to Edison's tinfoil product and the latter soon opted for the wax process, rendering the phonograph and the graphophone essentially identical in both format and name. Upon returning to his Washington home, flushed with success and enthusiasm generated in that heady atmosphere of Philadelphia, Berliner set his sights on perfecting the mass-production process before the time would

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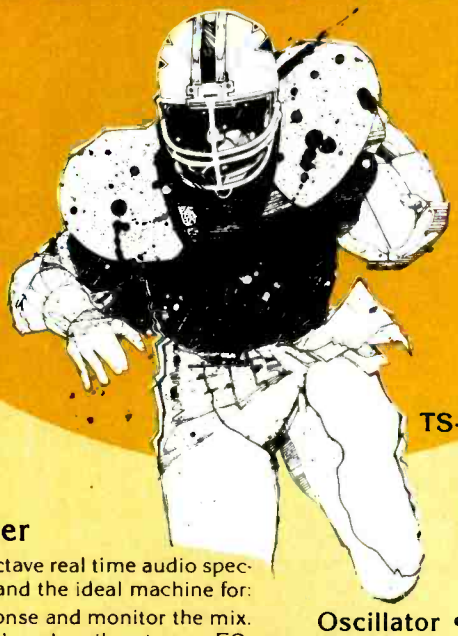

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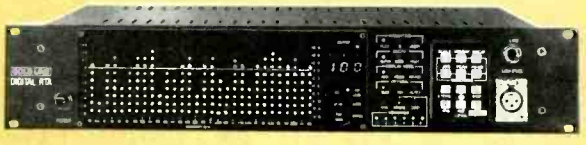

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GRAMOPHONE CENTENARY

come for public sale of gramophones and records, for he recognised that mass-production of inexpensive discs was to be the key to success in the record business. Not only would the consumer receive better quality, lower priced and easier to store 'software' but no longer would artists have to make innumerable masters for the very limited cylinder volume they'd produce. It took him four long years to do it.

In 1892 the Berliner Gramophone Company went into business in Philadelphia. This probably was because financial backers of the Gramophone Company were there and because one Max Levy, renowned inventor of the half-tone photo-printing process was there to assist in making perfect matrices for stamping out discs. The original (master) recordings were produced in Washington. The first hand-crank gramophones emerged in 1893. The first saleable discs were made of hard rubber—the celluloid samples from the button-making machines had had to be abandoned.

No single speed for the discs had been established. Although the Company suggested 70 rpm, masters were recorded at speeds considerably above and below this and the 78.26 rpm standard was not adopted until years later. Moreover, the playback speed problem was exacerbated by the user's inability to continually turn the gramophone's crank to rotate the turntable at any fixed speed, even if he knew what it was. To overcome this the Montross Company was engaged to design and manufacture Berliner gramophones incorporating a spring-wound motor. These proved unsatisfactory and only 2,000 of them were made.

Across the Delaware River in the town of Camden, New Jersey, was found Eldridge Reeves Johnson. In 1898 this brilliant and inventive machinist was commissioned to make a better gramophone. The result was to become the world-famous 'His Master's Voice' trademark model.

In late 1900 the Columbia Graphophone Company, desperate to get into disc manufacture, where it was obvious that the industry's future lay, decided that one way to break the Berliner patent exclusivity was to infer that Emile Berliner's patent infringed on the 'floating stylus' invention they'd acquired from Bell and Tainter. Their ingenious lawyer, Phillip Mauro, was able to obtain a court injunction stopping Berliner from making discs and players, the very products he'd created. All through the tedious trial period Columbia merrily went about producing cylinders and graphophones with little competition from the disc. Re-enter Eldridge Johnson, who persuaded the Berliner people to license him to make records and gramophones—with accountings to come later. Columbia quickly enjoined Johnson but he was able to have the injunction lifted, and his new Consolidated Talking Machine Company prospered during its short life.

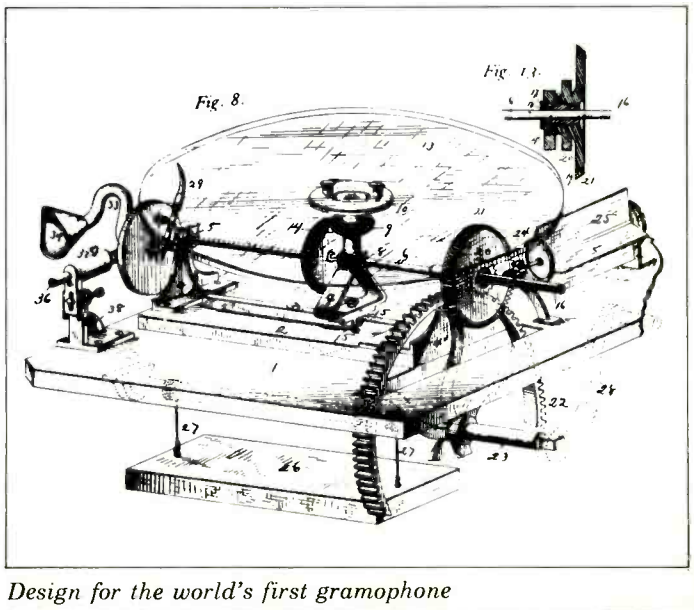
My grandfather went on to win the case. The court agreed that inasmuch as the floating stylus was propelled by the graphophone's feedscrew while the disc's pickup needle was propelled by the groove itself, the gramophone and the graphophone were totally different. Vindication for Emile Berliner, at last! But financial ruin, as well. To commemorate the legal victory, Johnson formed a new company in 1901 which he appropriately named the Victor Talking Machine Company. Shortly after 40% of the Victor shares were transferred to Emile Berliner and his financial backers in return for assignment to Victor of all Berliner patents and, of course, the His Master's Voice trademark.

Victor went on to become the world's largest record company. Columbia and others were licensed to use Berliner patents and enter the disc-record business, which it had aimed for for so long and so desperately. Shortly before Johnson sold his Victor shares in January 1927 and retired, his company was earning so much money that it felt compelled to declare an extra dividend for its shareholders. Eldridge Johnson's personal payment was $1 million, virtually tax-free. He bought a yacht, the Caroline, that required a crew of 30. This was used for sailing up and down the Delaware River and directors meetings took place on board. Edgar, Berliner's son and president of the Victor Talking Machine Company of Canada, liked to tell of the time the directors were lunching on board and one of the stewards passed cigars. Before they could light up Mr Johnson told them to put the cigars away for later and that the steward would pass some less-expensive cigars more suitable for smoking on deck where the meeting was to continue. These cheaper cigars were Corona Coronas, selling at the time for a princely dollar apiece!

In April 1929 the fledgling Radio Corporation of America, separated from its General Electric Company and Westinghouse ownership by government edict (GE bought back RCA in 1986), bought Victor. It wanted Victor's manufacturing facilities, distribution network and, yes, the His Master's Voice trademark, by now the world's most famous. Edgar Berliner received $1 million for his Victor stock and was named president of the new RCA Victor Company of Canada Ltd.

That same year I was born, the stock market crashed and Emile Berliner died. But his disc record, mass-production method and gramophone (misnamed phonograph in France and the Americas) live on.□

America's first disc player—Berliner's gramophone of 1903



Design for the world's first gramophone

MARTIN POLON'S PERSPECTIVE

Readers have assailed me with the fact that while it is interesting and even entertaining to consider a broad variety of factors that are problematical with the compact disc, wouldn't it be nice to take a look at all the positive things that are happening with our little silver platter and its multi-hued cousins? Well, it might not be nice but it could be interesting. The only thing is, people might start to consider me to be a kind of digital 'Rebecca of Sunny Brook Farm'—a veritable binary Polyanna as it were. Perish the thought. Me, the electroacoustical misanthrope of Link House, say something nice about CD? However...

The history of the compact disc has had little relevance to its current velocity in the business of music distribution. The system has grown from nowhere to a point where market penetration in the UK and Europe exceeds 10% of the consumer homes while figures in the US hover between 8% and 9%. Despite its theoretical design limitations of 22.05 kHz, the system has evolved to represent absolute state-of-the-art; as up to date now as it was upon introduction in the late '70s. Compact disc sales to date have been strong with catalogue rising from just over 400 titles available in 1983 to 8,000 titles plus available in 1988. The phrasing that is avoided by most record industry types is 'available at any one time' but that is another story for another time and column.

CD pressing facilities have expanded production capability as expected, except that some softness in the marketplace has been interpreted as a 'go slow' indication and the sources of venture/entrepreneurial capital have similarly scaled back the opening of new 'boutique' pressing plants. Larger plants are continuing to open, especially those that obtained firm financing prior to the October 19th world financial crash of 'Black Monday'. A new plant in Texas with capacity of 20 million discs in 1989 is typical of some of the ventures coming into the market. The joint venture between Mitsubishi and ElectroSound is known as Memory-Tech. The emergence of this and about 20 other new facilities worldwide is blamed by record industry analysts as the cause of a 25 to 50 million disc overcapacity from a total of 60 plants. Current demand is slated at 150 to 200 million units with 1988 capacity edging towards 275 million units from the 225 million mark.

None of this takes into consideration the potential future effect of the giant Philips/Du Pont Optical plan to control 25% of all CD sales and generate sales in excess of $1 billion by the early '90s. The nearly 500 million dollars invested by the two partners will quickly create capacity approaching 100 million discs or better unless scaled back to meet current market conditions.

With the audio CD established very clearly in the retail marketplace, the norm has become CD players with pseudo 18 bit technology, four or eight times oversampling of the signal, 18 bit filtering, dual digital-to-analogue (D/A) converters, discrete and separate circuitry for all analogue and digital functions and the emergence of optical transmission as a desired form of passing the digital signal both internally and externally to the CD player. The 6-disc CD carousel has become a common device with increased capacity system reaching the market.

Even inexpensive CD players represent exceptional value for money since the requisite 6- or 8-chip sets have been reduced through integration to 2-chip or 4-chip sets. This has allowed prices to be lowered for players without significant loss of quality from top of the line units. What does differentiate the market is the number of search and recall features for various selections and the ability to exercise these functions via remote control. Some units will even remember a listener's preferences and store them for future use, *ad infinitum*. Despite all this, the most significant factor in the CD hardware marketplace is not what is happening but rather what is not happening. Manufacturers have resisted the concept of the 'plain vanilla' CD player, virtually stripped of any features or as the industry calls them—bells and whistles.

The remaining stumbling block to mass market acceptance is the large demographic of the over-30-year-old record user. Study after study confirms that the LP record player has been well accepted among this grouping and a CD player 'that just plays' could help to win more converts to the digital medium.

In fact, consumer resistance to CD hardware through the end of 1987 has been greater than anyone imagined, although the software sales are obviously acceptable to the record companies. The problem with hardware sales is that the world consumer electronics industry seems to be setting for itself unrealistic goals while marketing products that do not appeal to the large portion of the consumer mass market that has disdained the CD system. Concommitant with this, is the self-serving prophecy of the record companies whose major shipments still target the youth market with grudging recognition of the existence of the classical genre. Anything other than that seems to be in short supply on CD. Couple that with high CD retail prices, which seem to impact those not yet into the CD marketplace, more than the 10% who have already taken the plunge and add the surprising strength shown by the LP and you have the formula for the current problems of sluggish CD player sales. It is important to note that CD players are selling but not at a rate that will make the CD a household word by the year 1990. For 1988, there are expectations of sales ranging from no growth over the previous year's sales figures to about 8% growth. Even flat growth will still place millions of units into households around the world but not at a pace that will satisfy the makers and sellers of CD hardware.

Whether there will actually be long term saturation of the CD software market remains to be seen, despite industry fears to the contrary. The key to forward motion in CD sales, most analysts agree is the erosion of the now standardised $15 or £12 price tag for a major label CD. While certain major record labels such as Columbia and Warners have instituted two or three tier pricing of their CD lines, other labels have used lowered prices to 'purge' slow moving titles. The current efficiencies in CD production plus the current overabundance of pressing capacity has caused prices for a finished, labelled CD in a plastic 'jewel box' to drop from the $3 price tag seen two years ago to about half that price. One fear many label executives express is the lack of enthusiasm of record retailers for a cut. The theory is that the retailer does as well with the high tag price of the CD as does the record company and is reluctant to lose that profit premium. Further, it is felt that 'bargain' CDs would not give the dealer the same kind of increased retail floor traffic that giveaway cassettes and LPs generate. Nonetheless, most in the CD software industry feel that prices will drop by some percentage in 1988. Most record industry executives agree that the CD should drop to a $10 or £6 price point to really stoke the CD's retail fires but no one would predict when that would or could happen.

The newly introduced 3 inch compact disc format has shown signs of success that have exceeded most expectations, especially in terms of the moribund performance of the also recently introduced CD Video (CD-V). Developed jointly by the original 'parents' of CD, Philips and Sony, the CD-3 as it is now known has escaped the obvious limits of a pop music media originally envisioned for it as the 'CD single'. Instead, the CD-3 has emerged as a less expensive release medium that can accommodate four or five classical 'cuts' or half a dozen popular selections with its 20 minute capacity. Its initial usage has been to serve as a sampler tool for a number of labels, allowing an inexpensive selection of music to be made available to potential buyers. At least eight record labels at this point have or will have made use of the CD-3 in this way. These include Chrysalis, Columbia, DMP, Epic, Geffen, Motown, Telarc and Warner. Delos has other uses for the miniature CD, selecting the CD-3 format to release no less than 24 'Pocket Classics', each accommodating a complete performance on the disc. Delos expects to have nearly 60 of these miniature classic performances out by the end of 1988. A&M, Dunhill, Newport Classics and Rykodisc also have regular CD-3 discs on sale with specific performances. Other record companies are expected to follow as the $4 retail format continues to catch on. Some labels are even looking at laser etching of graphics on to the CD-3 to increase the attractiveness to prospective buyers and to counter the packaging problem the format currently presents without a standard pack like the larger CD's jewel box.

Although some labels express no interest now or in the future in the diminutive format, the only major drawback with the small CD disc is that it requires the use of an inexpensive adapter the CD-3 must be placed into, to allow playback on CD units manufactured prior to 1988. Most new CD machines do provide complete compatibility between full size CDs and the new smaller disc and by the end of this year all units sold should be completely compatible. Some pressing plant operators have expressed concern that if the present oversupply of CD pressing should evaporate, plants will have less interest in pressing the less profitable smaller discs. That seems unlikely to be an issue in the short term and it seems likely that facilities will come on

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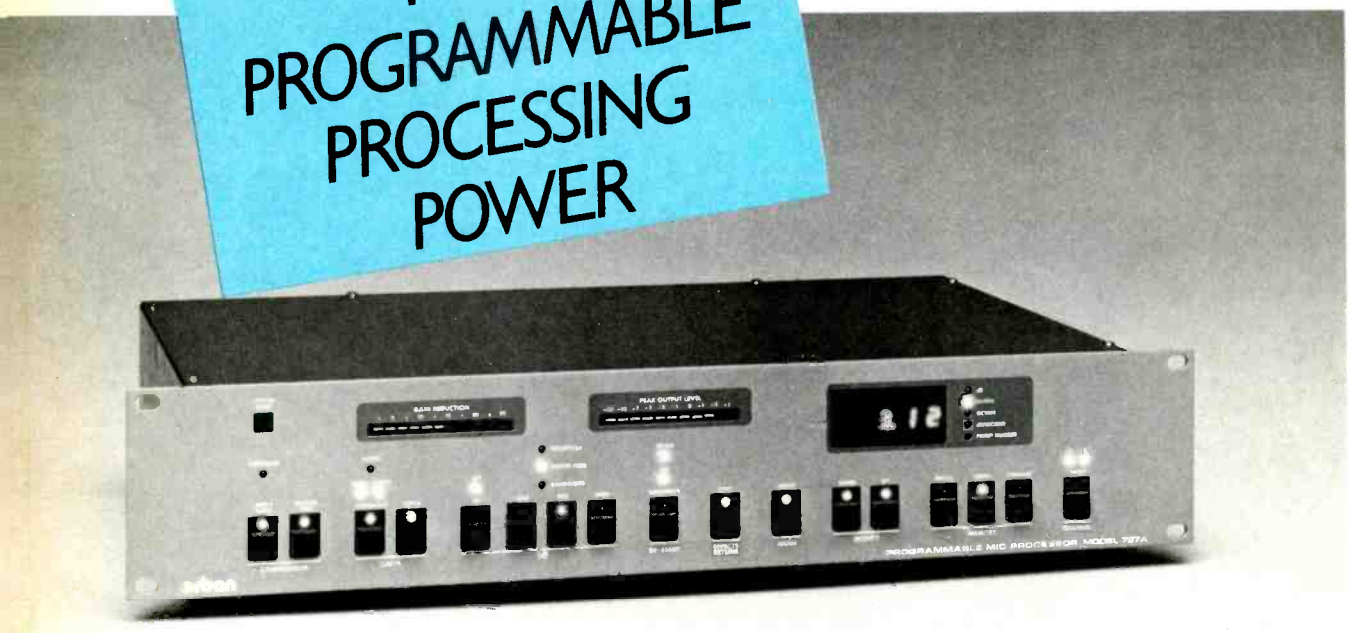

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3 SM96 Condenser

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6 869 Condenser

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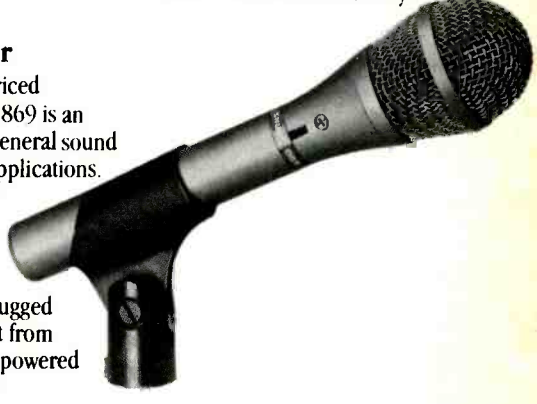

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MARTIN POLON'S PERSPECTIVE

line in the future to meet product demand.

At the same time that small CDs are attracting interest, at least one label is planning to release a kind of 'long play' CD. Rykodisc has plans to release at least one 80 minute CD, thus eclipsing the standard 74 minute length of the CD format. Most in the industry doubt that the 80 minute disc will achieve any real status since there are few discs now that use the full 74 minutes. The extra time could be a real selling edge where a two record set with its doubled price could be avoided by using a single 80 minute disc.

CD-V, the video extension of the audio compact disc was launched with a spectacular multi-million dollar campaign at the Summer Consumer Electronics Show (CES) in Chicago. Philips and PolyGram took a pivotal position in the launch of the gold coloured disc, which offers 20 minutes of digital audio and 5 minutes of video. The CD-V is clearly an ideal medium for music videos and other specialised entertainment but most record companies have declined to issue software in the format, leaving the elaborate Summer '86 campaign a bit of a false start. Despite all this, the launch has been at least partially successful for several hardware makers for putting life back into the full range of the CD-Laser products. CD-V players provide full playback compatibility for the 8 and 12 inch laser video discs, CD video discs, and for the conventional audio compact disc. Units offered in 1988 will also play the CD-3 format and some hardware makers are looking at merging 'changer' capacity with the CD-V hardware concept. The big unknown is whether the consumer will find enough value in a system that will have $1,000 hardware and $20 software. At this point, only Philips et al show interest and the Philips/Du Pont owned PDO plant in Hanover, West Germany remains one of the few pressing locations for the new medium.

CD-G, although clearly a fledgling concept at this time has some potential according to its supporters at one record company, Warner Brothers. The concept would provide distinct video graphics for the entire time span of a CD record album, up to and including 74 minutes. This compares favourably with the limited time capacity of the CD-V system. However, a subcode equipped CD player is needed along with a black box 'graphics tuner'. The graphics are not full motion video pictures but rather change every seven seconds in colour. Black and white graphics could change almost continuously. Warners plan to release as many as 50 graphics equipped releases to test the waters, sources said. Some consumer electronic manufacturers were not as upbeat, stating that despite testing the subcode for singalong lyrics in Karaoke systems, the concept had little to attract the consumer. There is some hope among record company visionaries that the CD-G system could become a form of video album cover for CD.

CD-ROM on the other hand has been moderately successful, despite its single focus on computer data storage without any major audio capability. Some CD-ROM drive makers such as Sony are providing CD audio compatibility as well. Players are now approaching the $800 mark at the low end of CD-ROM pricing structures with the potential for the less expensive models to mount internally in a personal computer in place of a floppy disk drive. New CD-ROM drives will be available in 1988 from Apple Computer, Amdek, Denon, Hitachi, Panasonic, Philips, Sony and Toshiba. The apparent adoption of a CD-ROM software file format standard will help to increase the availability of software for the emerging medium. The standard is known as ISO 9660 and is to be adopted by the International Standards Organisation (ISO).

CD-I could be considered the ideal format evolution for CD except for its lack of recording capability. It is an area subject to significant research and development work by a broad range of companies, concentrated mainly in the computer and consumer electronic industries. Philips, Sony, Matsushita and others have spent in excess of $100 million in research on CD-I systems. The potential for some CD-I formats to carry audio information would certainly allow increased flexibility in the interactive audio/video/data marketplace. NV Philips is demonstrating a true compact disc–Interactive (CD-I) system that integrates audio, video and text/data functions in a realtime, interactive format, which can display full motion video at 12 frames/s. A further extension to the power of CD-I is the use of barcodes on collateral materials, such as text or learning books and/or books that provide detailed written information concerning music being played, for example. Both Sony and Pioneer are reported to be studying the ways that barcode can add to the flexibility of CD usage, both in the CD-I format and for the conventional CD. The use of a scanner would allow a listener to pass the corner of a page in a handbook into the CD's control stream, positioning the disc to a specific point in a musical selection equivalent to the descriptive text on the page in question.

The recording CD represents the ultimate extension of the CD product category into the consumer marketplace. It is at once the ideal consumer electronics product replacing several recording and/or playback devices in the home. A single recording CD unit does away with the conventional LP record player, the CD player, the CD-V player, the CD-ROM unit for the computer, the CD-G unit and its TV set connection, the CD-I system (if that makes it to the market prior to the recording CD), the analogue cassette tape recorder, the digital DAT recorder, the laser videodisc, the VCR and the floppy disk and/or the hard disk storage combination for the computer. It is nothing more and nothing less than a recording optical disc with full erase and record utility sized and formatted to be compatible with the current compact disc technology. It can record and playback anything in the audio, video or data domain. It is the apocalyptic 'doomsday' machine that will replace all other similar units in the hands of the consumer. It could be viewed as a recording version of the CD-I system but because optical recording technology is being used, there is the potential to embrace very large capacity of half a gigabyte or more in a number of ways.

Such systems in the mass marketplace would accommodate an explosion of interactive applications. The ability to record would eliminate the weakness of interactive application found in the CD-I. With a recording optical disk system the taxpayer could sit down in front of the TV set and have a disk interrogate tax information which the taxpayer would enter into the disk. The completed disk would be sent in to the tax authorities. Similarly, students could undertake difficult courses of instruction with such a disk system, sending in their interim work every week or every month. The work would be reviewed and then returned with comments to be studied by the student.

There are only two problems that could interfere with the compact disc having a long and fruitful life in the entertainment and information and education marketplace. That is, however, if you assume that the DAT system will co-exist in the marketplace with the CD. The first problem posed in the future is this rapid planned obsolescence as innovation after innovation are flung at the consumer by the world consumer electronic industry. The consumer has become very comfortable with the 30-year life cycles we have seen for the 78, the LP and the Philips cassette. We can now look forward to the introduction of a major playback and/or record system creating obsolescence for all previous systems every five years. The unknown will be the reaction of the consumer to the foreshortened life cycle of the current range of the CD products. If the conventional CD is replaced by the beginning of the '90s with a consumer CD-I system and then replaced again in the mid '90s by a recording CD system only to be replaced again by a chip-based record ROM at the end of the '90s, the public is going to rebel. Product introduction must be handled in a very careful way and logical progression to avoid losing the confidence of the consumer.

The second issue is the current affection shown by the consumer for the CD's reputed quality. The CD was born on and grew with the concept of offering the quality of the master tape no matter how many times a CD was played. Now, we hear of record companies who are enamoured of saving a few extra cents. The quality of the polycarbonate, its purity, its integrity in shipment, the amount of moisture that is allowed to enter the material, temperature control during the pressing cycle, cooling, handling of the finished product, and the integrity of the packaging, all can affect the ultimate quality of the disc and all add to the cost of the finished product. So, too, does adequate quality control inspections. Return policies that keep the question of quality inviolate in the minds of the consumer are not inexpensive options either. Yet all are necessary to maintain what the consumer views as the very essence of the CD system.

Fortunately, CD returns for any reason are running in the 1% to 2% category in general, as opposed to the 6% to 7% category for the LP record. Many of the 'problem' CDs found in the marketplace suffer from labelling and packaging errors. Few CDs are actually defective in a technical sense, which is a real affirmation of the CD technology. The half a percent or so of the CDs that suffer at the hands of consumers convinced that the digital disc is indestructible are only following the lead that the record industry used to introduce the CD.

So there you have it. A look at the life and loves of the compact disc on this day in the year of our Lord, 1988. Will the rather prosaic CD marry up to the flashy, sexy CD-I? Will the digital outlaw DAT change the gentle CD's life beyond tolerance and could it destroy the CD altogether? Will the CD have an out-of-body experience and discover that it can record? Will CD-V live to see another spring? Will CD-G last long enough for Easter? Will CD-3 ever achieve acceptance as a full member of the CD family? For the answers to these and other interesting questions, stay tuned to these pages for this column.□

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BARRY FOX'S BUSINESS

In just three years, cellular radio telephones have become an essential tool of the music and recording industry. Around ¼ million people have signed up with either Cellnet or Vodafone since their services began in Jan 85.

Unlike America, where billing arrangements differ across the country so that a phone bought in one city cannot be used in another, a Cellnet or Vodafone cellphone will work almost anywhere in Britain. But they won't work on the European mainland where another ¾ million people use similar but incompatible systems.

In 1991 all that should change. There will be a two-tier service, national and pan-European. Whereas all the existing services work with analogue speech, the new pan-European service will be all-digital. A car phone or hand portable will work anywhere across Europe.

Sixteen nations have agreed on a standard technology so that, as Industry Minister John Butcher puts it, "People can make calls in Frankfurt, Florence or Frinton." The DTI is helping to fund research by Racal, Cellnet and GEC-Marconi into the new all-digital cellular telephone service, which will start operation in 1991. The system designers are having to grapple with problems already well-known to the digital recording industry.

The pan-European system uses military technology to convert speech into digital code and then hop frequencies in the 900 MHz UHF band, looking for spare channels. But whereas military speech-hopping radio telephones are made in batches of hundreds and cost well over £5,000, the pan-European phones will be mass-produced in millions and cost under £500.

The trick is to compress the digital code, so that intelligible speech is conveyed at a very slow data rate; 270.8 kbit/s. This will fit in a radio channel just 200 kHz wide.

All digital processing and error correction introduces delays, which is why the Mitsubishi PD machines shift the edit point slightly (BBC engineers estimated the shift to be around 25 ms). Drastic data compression introduces much longer time delays. Words spoken into the system must be dissected, converted into code, mathematically analysed to remove redundant information and then reconstructed again at the other end of the link.

The first pan-European specification would have meant a delay of 130 ms for each half of the conversation. So callers would have faced ¼-second reaction gaps, like those heard on satellite telephone links. Psychologically this is very disturbing, because one caller keeps interrupting the other, saying sorry and stopping.

British Telecom has now developed signal processing circuitry, which can reduce the total delay to less than $^{1}/_{10}$ s, which is below the threshold at which callers notice anything odd.

Now that the technical problems for pan-European cellular radio have been solved, an even bigger difficulty has to be faced. That is billing.

How will service operators in one country cope with roving rogues, who run up large call bills and then skip across the border? If anything kills pan-European cellular radio, it will be the complexity of billing.

The popular press has had a field day reporting on the chaotic end to the BPI awards at the Albert Hall. It's a shame such a nice idea had to turn sour. Like a band that plays well all night but is remembered only for bum notes in the last number, the BPI awards are being remembered for a disastrous ending. That's show business.

Rick Astley, winner of the best single of the year award, was left standing like 'Soft Ned' while a leering Rob Dickins, Chairman of the BPI, took it for him. An engineer who has worked with Rick Astley said, "It couldn't have been worse—because Rick Astley is such a genuinely nice guy. He's professional and although a newcomer he's already well liked. In that respect, he's like a young Cliff Richard."

Astley was snubbed, because the ceremony was running 7 minutes behind schedule, largely because Andrew Lloyd Webber and classical conductor Vernon Handley, had wasted time thanking everyone and their dog and the man from Pepsi had been gratuitously plugging Pepsi. Backstage, The Who, reunited for the event, were getting increasingly worried about getting on at all. Snubbing Astley got them on.

What had the great British public really rioting in the streets, was seeing just two numbers by The Who, with the second (*My Generation*) rolled over by running credits about who had master-minded the cocked-up event. To rub salt in viewers' wounds, The Who then launched into their third number, *Substitute*, and were almost immediately faded out for the *Nine O'Clock News*. "This sums up the BBC's attitude to music," said Mike Smith on radio the next day. "If it had been football they would have delayed the news."

By miserable irony, the last time The Who reunited—for *Live Aid* in 1985—a chunk of their set was lost by power failure because the BBC had taken the chance of relying on a dodgy 3-phase mains feed at Wembley.

First surprise, confirmed by the BPI and BBC, is that The Who were only contracted to play two numbers for BBC transmission, with a third for the Albert Hall audience to be taped by the BPI for overseas transmission. The Who had in fact rehearsed four numbers.

Second surprise, confirmed by the BBC and BPI, is that it was agreed in advance to roll the credits over the second of The Who's numbers. This is why most of the major credits came at the beginning of the show. But it is hard to imagine a better way of infuriating an audience, than rolling credits over such an important musical performance. The BBC and BPI also both confirm that everyone knew the *Nine O'Clock News* could not be shifted. It only gets delayed, for instance for international football extra time, if there has been prior agreement—and there was none. "Programmes can't just ask for the news to be delayed on spec, when they find they are over-running," says the Beeb.

The BPI had been offered a later evening slot, with freedom to over-run, but wanted the early evening slot to catch a young audience. But how could such an event over-run so badly, when the TV companies are already so skilled in the art of cutting off juicy interviews in their prime, just to keep a programme to time?

According to the BPI, live timing was the BBC's responsibility. The BPI produced the show, built the set, arranged the sound and lighting—and then handed over to BBC producer Michael Hurll at rehearsals on the Sunday afternoon before the Monday night transmission. The script was meticulously timed, with buffers—short films about the record industry built in to be jettisoned if time ran short. It did and they were. The BPI says that when the show started Michael Hurll was locked away in a 'scanner' control truck outside the Albert Hall and the BPI had no way of contacting him. So they couldn't press the right panic buttons.

Not so, says the BBC. There is a limit to what you can scrap, because some of the links are there to cover re-setting the stage.

Also, says the BBC, Hurll was not incommunicado. The floor manager backstage was in constant contact with him. The BPI had only to talk to him.

The BBC admits it was a mistake in the Presentation Suite at TV Centre that let the first few seconds of The Who's last number go out on TV, thereby whetting millions of appetites.

The BPI and BBC do agree on one thing. Lessons have been learned for next year. And the really good news is that the full performance, including all The Who's numbers, is safely on tape and already sold to satellite channels round the world, eg Music Box for Europe. The BPI has its own digital audio soundtrack, taped by Advision. This will be used for the satellite broadcasts. So unlike the *Live Aid* debacle, the missing music is not lost for ever.

Plans are already afoot for a similar ceremony next year. Let's hope that by then the BPI's publicity people will have done some homework on the technical capital to be made out of the event. This year little or no effort was made in advance of the event to publicise the fact that the awards were being simulcast in stereo with Radio One, and transmitted in digital stereo in the London area using the BBC's Nicam system. It was the golden opportunity to tell people how to listen in stereo, either by arranging stereo radio speakers or getting hold of a Nicam video recorder, as now sold by JVC and Ferguson. For an industry that relies on technology, the record industry continues with remarkable adeptness to miss tricks.□

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REVIEW

Dave Foister reviews the Akai Professional Digital Patchbay System

It's interesting, yet hardly surprising, how quickly MIDI users got tired of re-plugging cables between devices. More interesting is the fact that the first solution was not a telephone-switchboard tangle of a jackfield but a permanently connected matrix switcher, which was soon brought under software control with memorised preset configurations. It is perhaps surprising that the concept had not been seriously used for audio signal patching outside the built-in routing matrices in some consoles. Audio equivalents of the MIDI patchers are now available, however, and a good example is the system from Akai Professional.

The Akai Digital Patchbay System comprises a controller (the *PG1000*), a colour monitor, and the patcher itself, an anonymous black box with nothing on it but sockets, which can be either the *DP3200*, with 32 audio ins and 32 outs, or the *DP2000*, with 16 into 16 audios and 16 into 16 video feeds. Audio connections are made to a stage box on the end of a substantial multicore; the box can be fitted with *XLR*s or ¼ in jacks and each feed can be individually selected as balanced or unbalanced using internal jumpers. Video connections are on BNCs on the box itself, and include a Genlock input for accurate synced switching.

All the signal patching and the data processing and storage happens inside the DP box but is controlled from the remote keyboard and monitor, connected by a long cable with 4-pin *XLR*s. This shows the full status of the currently selected patch (what is connected where) and allows changes to be made on-screen and stored in memory. The memory capacity is quite large; preset patches are stored in banks of 10 and there are 64 banks. Banks can be assigned names to aid access, and while changing banks takes you through menu screens to select a new one, changing patches within a bank is simply done by stepping through them with a Step button; the numbers wrap round so that the next step after 10 is number 1 in the same bank, not the next bank.

Setting up a new patch starts with selecting a preset slot for it to go into, and selecting Pattern Edit mode, whereupon the screen changes from blue to green—colour is well used by the software to remind you where you are. The selected preset could be an empty slot, an unwanted patch, or a patch requiring a few changes. Where a new patch is to be similar to an existing one the old patch can be copied into the new slot and then edited; this is useful for setting up sequences of patches, say for a mix, where some connections have to remain unchanged while others are reconfigured.

Each signal is shown on the screen in its own box and may be labelled with a name of up to six characters. Connecting input 1 to output 32 simply involves pressing 1 on the dual-purpose keypad (which doubles as a QWERTY keyboard and a channel selector marked 1-32), then the In key, then key 32. The first step highlights the selected source, and the last causes the number 32 to appear in box 1 along with its label, joined to the number 1 label by an arrow head. It also makes number 1 appear in box 32, joined by an upwards arrow, which means that you can see at a glance not only where signal 1 is going but also what output 32 is receiving—both ends of the patch. Any source can be routed to any number of outputs and since the unit is fully buffered, this allows it to be used as a very versatile distribution amplifier; this applies as much to the video side as to the audio. Only one of a given source's destinations can be shown at a time but in Edit mode all destinations can be scanned using the large dial. The system appears to be effectively transparent, introducing no noticeable side-effects, and switching of patches is of course silent; unchanged connections remain completely undisturbed when others change. In addition it has to score over traditional patching in having no moving parts and no patch cables to hang around untidily, getting damaged, tarnished and lost.

In addition to manually stepping through the patches, several other methods of effecting changes are available. Patches can be called via MIDI, via RS232, or by a straightforward external trigger but the most important aspect is the *PG1000*'s built-in SMPTE reader and generator. Patch changes can be preset to occur at any timecode location, and in SMPTE read mode the display not only shows when the next change is due but flashes red when it actually happens. The inclusion of a SMPTE generator is a real bonus, and of course part of the patcher itself would make an ideal timecode distribution system.

The *PG1000* is capable of controlling up to four *DP3200* or *DP2000* patchers, in any combination. Each DP box must be addressed individually to have its patterns edited but once programming is complete all four will step through presets and change banks simultaneously. An optional 3½ inch disk drive allows storage of the memory contents, although if the *PG1000* were rackmounted or flush mounted in a console, as it is clearly intended to be, the drive would be inaccessible.

New software to be released shortly improves further on the display. The present version of the screen uses only one box and one label per input/output pair, which makes it impractical to use, say, input 1 and output 1 for two different devices. They would have to be used, for example, as the in and out of one channel of a tape

machine. The new software shows all the inputs at the top half of the screen and all the outputs, separately and with independent labelling, at the bottom, which means the sources and destinations can be completely separate devices. In addition, quick identification of signal paths is made easier by the use of highlighting; a highlight cursor block can be moved very quickly round the inputs display using the dial, and whichever channel it is placed on has all its connected outputs highlighted. Software revisions of this kind are extremely simple to fit, since the software resides on a credit card-type ROM in a slot on the front of the *PG1000*.

The computer world is familiar with the concept of the WIBNI (Wouldn't It Be Nice If...); it refers to the exasperating suggestions made to programmers by users about how their software might be improved, and reinforces the maxim that a program is never finished, only executable. I have some WIBNIs about the *PG1000* software. Firstly, some means of changing to a new patch besides stepping through all the intermediate ones would be very useful; the ability to step backwards as well as forwards would be nice, but better still would be direct access to a selected numbered patch. Secondly, 'off-line' editing of patches would be a tremendous advantage. As it stands, you can only edit the patch currently in use; you can't program ahead without disturbing current settings, which rules out presetting changes while there are signals passing through the device. Failing an off-line editor, some facility for previewing patches before selecting them would make the whole preset concept more generally usable. I would also like to see the facility to link pairs of channels so that stereo patches can be made more quickly. I understand some of these ideas are already under discussion at Akai.

Having said all that, I would have no hesitation in installing the Akai system in my own facility. The market for a unit like this is perhaps not immediately obvious, and it would certainly be far more useful in some applications than in others. A sizeable part of my work centres round a copying facility, making transfers between several formats of audio and video machines on equipment also used for recording live concerts, often doing several jobs simultaneously. Keeping track of all this and reconfiguring for new jobs makes any task more time-consuming than it need be but using the Akai patchbay almost eliminates the problems. I can also see it finding extensive use in live situations for fast, repeatable resets, and indeed George Michael has one in his current touring rig.

Its application in the conventional recording studio may require a little more imagination but it could be nonetheless useful for that; for example it could help make more extensive use of a limited number of aux sends and/or outboard devices by automatically re-patching them at preset points during a mix. Multi-purpose control rooms in public venues could use it to provide a complete switchover between, say, recording and PA states. The potential is there not only to save a lot of time on a lot of jobs but to make previously impossible changeovers simple—up to 128 audio connections reconfigured at the touch of a button.

I see the Akai system as an already exciting product that would benefit from further development. Its power and usefulness now are impressive; with still better software they would be formidable. Fortunately prospective purchasers can happily go ahead and get one now since fitting future updates is a simple job.□

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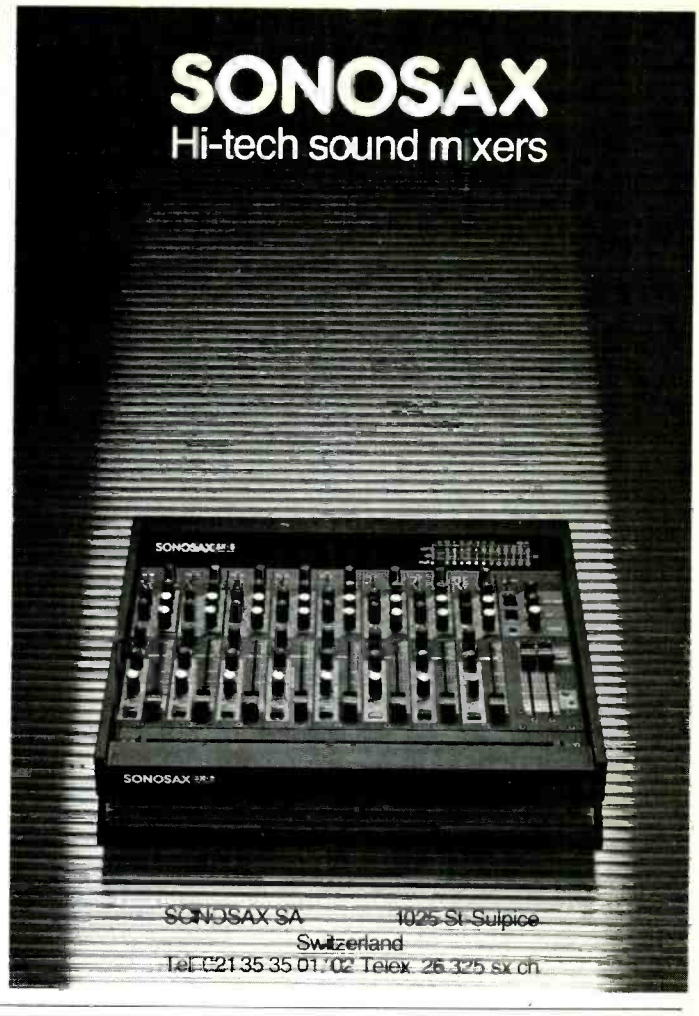

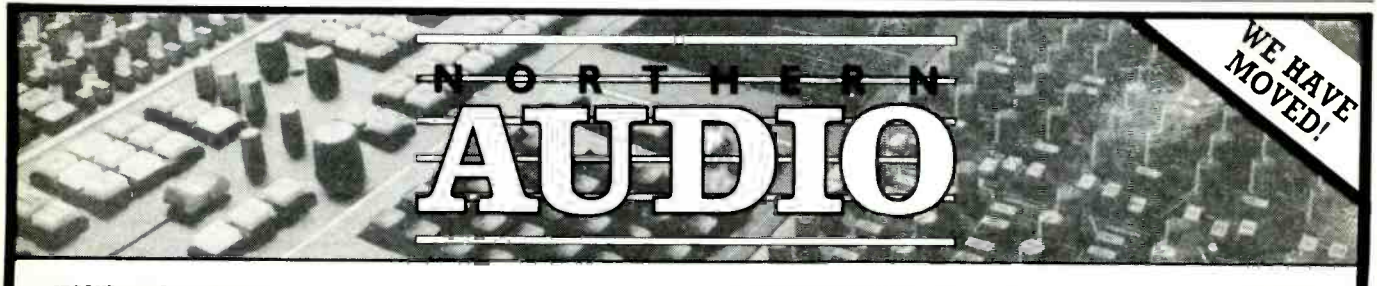

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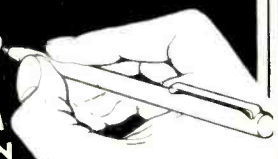

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Our continuing expansion has created a vacancy for a

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As a member of the SSL Project Engineering team, you will provide technical support and liaison between our sales engineers, clients, production staff and installation teams. This position involves both console systems and complete project specification and execution. You must possess a keen understanding of audio production requirements, a background in practical audio electronics, and an eye for detail.

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This is an exciting opportunity to work in a unique charity-backed project running a commercial 24-track studio together with rehearsal, club facilities and vocational training in music and recording. Applicants will be expected to have experience as an engineer in a professional 24-track studio, a strong creative flair and the ability to be self motivated. Teaching experience and the ability to maintain and repair equipment an advantage but not essential. Salary negotiable and sessional in the range circa £12,000 pa.
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318 SUMMER LANE, BIRMINGHAM B19 3RL
DEADLINE 30th APRIL

CLASSIFIEDS

Situations Vacant

We have two vacancies currently in our Dubbing Theatre based at our Television Centre in Bristol.

Dubbing Mixer

(Ref: 643/SS)

We are looking for an experienced mixer whose work will involve the mix-down of a broad spectrum of film and video productions, covering international dramas as well as local current affairs. Applicants should have the personality and experience to establish a good rapport with production staff.

Dubbing Technician

(Ref: 671/SS)

The successful applicant will spend a major part of his/her time assisting the mixers in the theatre as well as the operation of sound transfer and multitrack equipment. Some experience of sound dubbing is essential.

Suitably qualified candidates should write for an application form enclosing a self-addressed envelope and quoting the relevant reference to the Personnel Manager, HTV Limited, The Television Centre, Bristol BS4 3HG.

We are an equal opportunities employer and we welcome all applications irrespective of sex, ethnic origin, disability or marital status.

HTV

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SOUND RECORDING & PRODUCTION TRAINING

ADVANCED SOUND RECORDING & PRODUCTION

One year full-time DIPLOMA Course in Modern 24-track studio and 32/48-track digital studio

Digital audio concepts: DASH & PD formats: analogue/digital recording, processing, mixing & editing: automation & synchronisation: MIDI & SMPTE timecode; computerised sound mixing consoles, analogue/digital sound synthesis & sampling: working with various bands & individual artists: music writing, song & orchestral arrangements, radio jingles & commercials; TV/film sound tracks; local radio operation; introduction to pop promo production; business practice in music industry.

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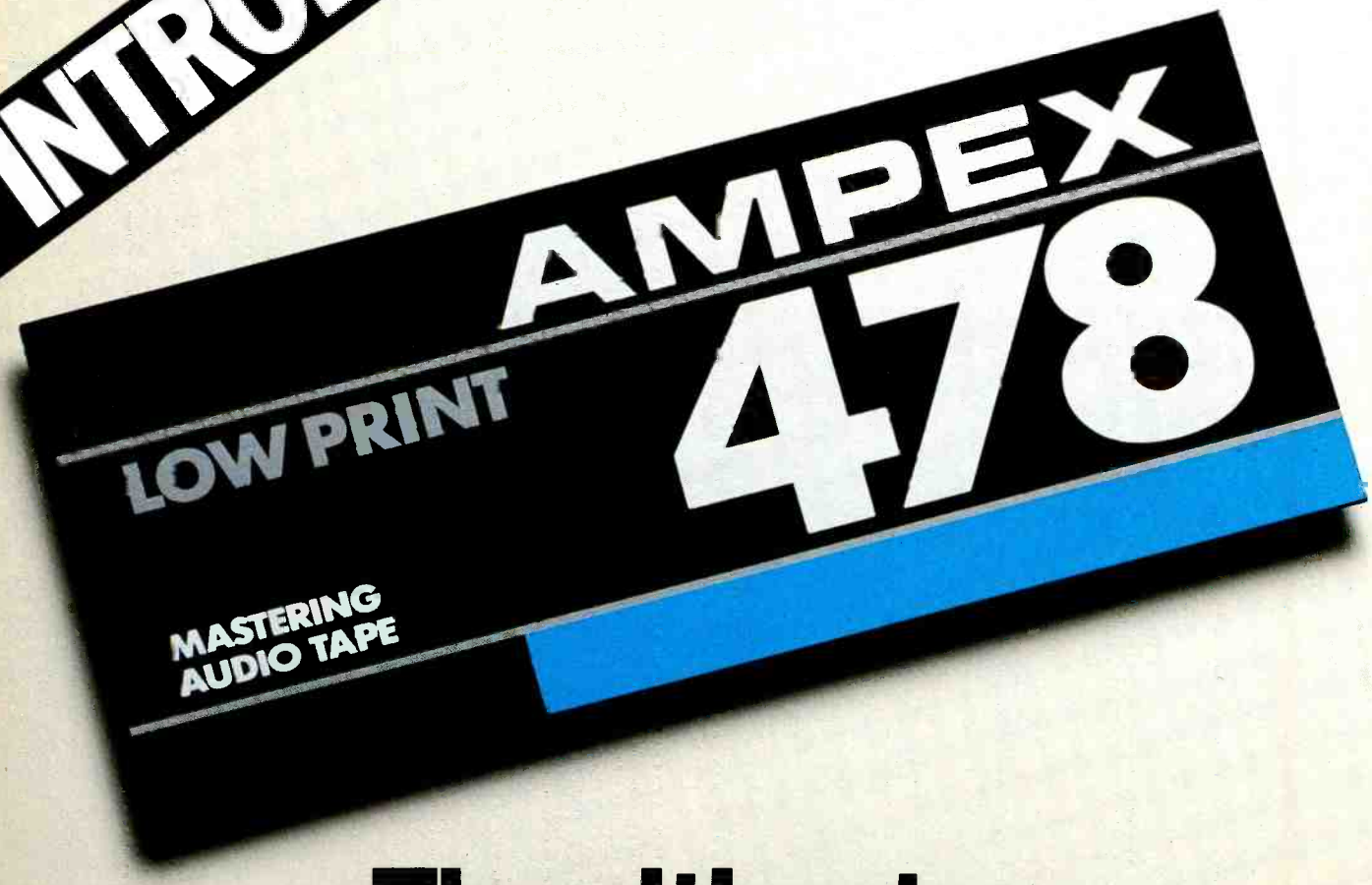

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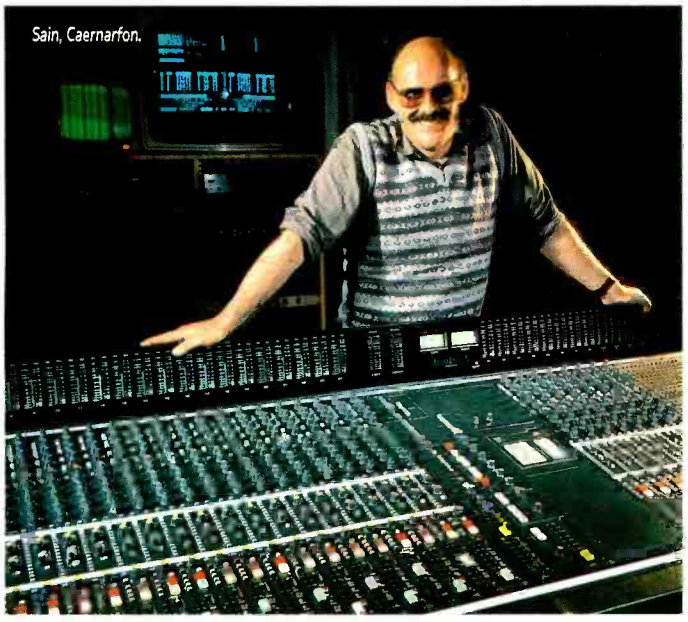

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As you can see, they speak for themselves.

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Soundcraft
TS24

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