

October 1990

\$5.00 £2.00

STUDIO SOUND

AND BROADCAST ENGINEERING

AUDIO RECORDING- TAPE/DIGITAL/DISK



↑
SONY

MAGNETO
OPTICAL DISK
EDM-1DA1
CAV
512byte/sector

B



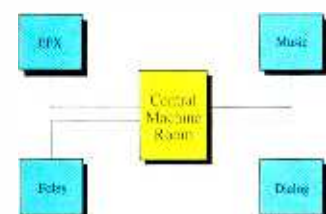
The Future. We've Been There Before.



The DSP Option, a 24-bit digital mixer/digital signal processor.

This is not the first time we've introduced a revolutionary new digital audio product today with the promise of a long and profitable future.

As a matter of fact, as the company that started it all, we've made our share of promises. But a look at our track record (at right) shows we've delivered on those promises — and in the process changed the way the industry works. At the same time, customers who bought systems even way back in 1977 have



With MultiArc,™ multiple users user share processing and storage resources from a central machine room.

been able to upgrade every step of the way.

Take, for example, our latest breakthrough, the

DSP Option. It's a 24-bit, multitasking mixer/digital signal processor that provides 5-band EQ, automated level control, multitrack digital I/O, plus sample rate conversion. And it's compatible with all current Synclavier and PostPro systems.

What's more, the new DSP Option eliminates the Achilles' heel of digital audio: back-up. Loading and saving can occur in the background while you continue working.

Synclavier, Sample-to-Disk, The Tapeless Studio, and the New England Digital logo are registered trademarks of New England Digital. Direct-to-Disk, PostPro, EditView, AudiMation and MultiArc are trademarks of New England Digital. Apple and Macintosh are registered trademarks of Apple Computer, Inc. SoundDroid is a trademark of LucasArts Entertainment.

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1977

We make history with the introduction of the first digital synthesizer/sequencer — the Synclavier.®

1980

A new Synclavier keyboard design accompanies powerful new features like sound layering and real-time digital effects.

1982

New England Digital introduces the first commercially available disk recorder, Sample-to-Disk.®

1985

Presenting the new polyphonic sampling Synclavier and the first multitrack disk recorder/editor, Direct-to-Disk™ — The Tapeless Studio.®

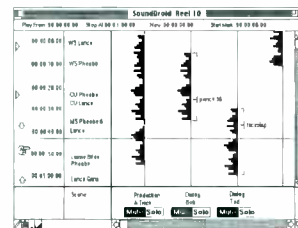
1988

New England Digital goes Macintosh,™ paving the way for new, easy-to-use screens like our own EditView™ and third-party software like SoundDroid.™

1990

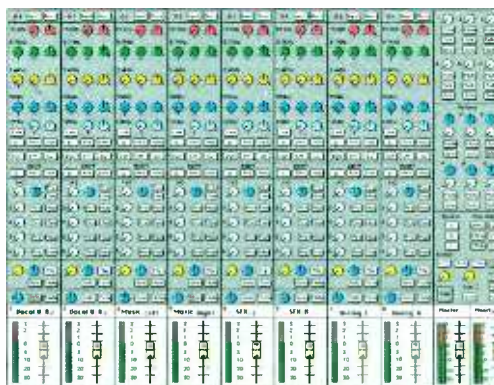
Enhanced with the new DSP Option, today's Synclavier and PostPro™ workstations revolutionize the industry again as multiuser systems.

Our commitment to third-party software development ensures the widest variety of user interfaces. For example, with our EditView window and Lucasfilm's new SoundDroid Audio Editing System, you now have your choice of tape- or film-style editing.



Lucasfilm's SoundDroid is the first in a series of third party user interfaces created for NED.

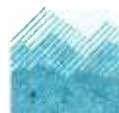
And here's a look at the future: because the DSP Option incorporates our new MultiArc platform, it provides for a true multiuser system tomorrow, where multiple users will share the same disk and processing resources.



Our AudiMation™ virtual mixer gives you fast, intuitive control over EQ, levels, routing, and other system parameters.

By investing today, you can take advantage of such powerful features as 24-bit signal processing and multitasking. What's more, your investment will be rewarded in the future, as true multiuser operation becomes a profitable reality.

To find out more, send for a complete brochure package on the DSP Option and MultiArc.

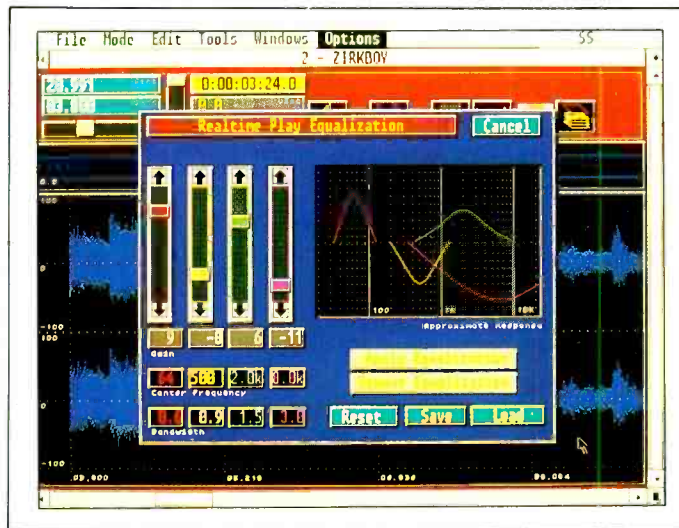


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STUDIO SOUND

AND BROADCAST ENGINEERING



Turtle Beach recording software

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ScreenSound. A fully integrated audio for video editing suite



Post production facilities need to take advantage of the efficiency offered by today's technology. Speed and creative flexibility are essential to commercial success. Digital sound quality is no longer a luxury.

ScreenSound is a fully integrated audio for video editing suite. It combines digital audio storage and editing with machine control of multiple VTRs, Laserdisc or film reproducers. It also interfaces with Quantel's digital video editor, Harry.

Simple to learn and fast to use, a cordless pen, tablet and RGB monitor provide control of all ScreenSound functions.

Multiple sound reels enable music,

dialogue and effects to be laid back to picture and synchronised to the exact video frame.

Edit, review, time offset, track slipping, cross fades and many other production techniques are available at the touch of a pen. Gain and stereo pan controls can be automated to timecode.

AES/EBU interfacing keeps digital audio transfers free of analogue distortions and losses, preserving the highest audio integrity through to the final format.

Above all, ScreenSound is a dedicated system - purpose-built to bring the advantages of hard disk sound manipulation to audio post production.

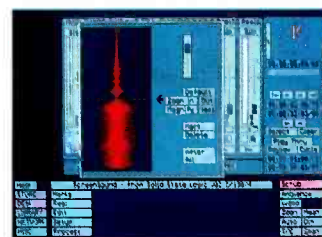
AUDIO STORE

The hard disk store of sound clips gives title and duration, in addition to powerful search and sort routines.



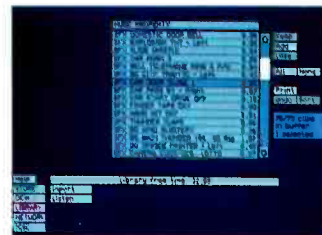
SCRUB EDITOR

Provides accurate edit marking and scrub of audio waveform.



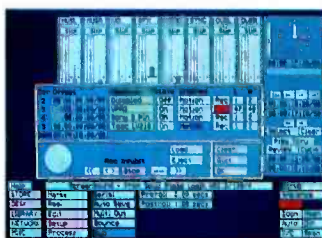
OPTICAL LIBRARY

An off-line library of sound clips and effects can be compiled on a Write Once Read Many (WORM) optical disc.



MACHINE CONTROL

For control of multiple VTRs, laserdisc or film reproducers.



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BUREAU OF CIRCULATIONS

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(ABC audited)



Twinkle, twinkle little standard

I like to think of myself as pretty much the average kind of person in this business. I like the recording industry. I like music of most types; still enjoy working with musicians, engineers and producers; still get a kick out of recorded sound—even more so when it is the result of my own efforts. I also like products that make my life easier without creating further problems. I like pieces of equipment to talk to each other without undue hassle. This, however, needs standards.

Standards always suggest matters of morality, hygiene or academic achievement, and perhaps it is not the most suitable of words for a common agreement about ways to do things. Certainly, if you are an operational engineer standards only matter when their absence makes life difficult. The rest of the time they are exceedingly dull topics.

Standards are also formats. On a recent long train journey, having exhausted my reading matter, I decided to make lists of things to do, things done, memory testing lists and lists of lists. Among these was a list of all the mechanically different tape recording formats there are, ie if a client came in saying 'I have a tape here to work on' how many possible variations of analogue tape width, track layout and recording direction could there possibly be without including cassette formats, tape speed, record equalisation or noise reduction. I made 17 with little trouble. Even in the analogue domain we were a non-standard world but we lived with it because there were formats that were more common and this reduced problems. This meant that it was possible to interchange tapes between machines, between studios and between different parts of the world.

For many people I talk to, the erasable magneto-optical disk (as, or similar to, the one featured on the front cover) presents many opportunities to bring the world of workstations and digital hard disk recording formats back into a more practical working practice. They present a way of removing the need for up- and down-loading time as the disk with the recorded material can be just plugged or unplugged at will. You can change material within seconds rather than hours and minutes—and even take the disk away to another similar machine, just like tape. Except that it isn't.

There are no standards for these Magneto-Optical Disks (MODs) at present. Although many manufacturers are using physically similar products there has been little or no attempt to agree any standards for the interchange of material between machines. I am advised that reading edit instructions and the like is going to be 'almost impossible' and any form of standard for the interchange of data is unlikely ever to be agreed between manufacturers for a million and one different reasons. However, would it not be useful if we could *even just read* the audio data so that at least there would be a way of moving the raw audio between machines without having to upload and download each time? It would make for happy engineers, happy clients and less unusable studio time. We would also come to realise that standards do have a real world and practical application.

Keith Spencer-Allen

Cover: Sony magneto-optical disk. Photography by Tony Petch

AKG buy into EdgeTech

After last year's acquisition of Orban Associates and dbx Professional Products, AKG have continued on the acquisition trail taking a controlling interest in the EdgeTech group of companies—Turbosound, BSS Audio and Precision Devices.

The acquisition is part of AKG's declared strategy to extend their involvement in the live sound, recording and broadcast industries, by substantially broadening their product profile.

Turbosound and BSS Audio are both major companies in the live sound field. Precision Devices exclusively supply drivers for Turbosound systems as well as independently supplying for OEM and small end-users.

Jim Hallington, UK MD of AKG Acoustics, said, "We are delighted to welcome Edge Technology onboard and the acquisition can only be of benefit to both companies. The acquisition is by no means the end of AKG's expansion plans in the professional sound arena. We envisage becoming a key supplier of all the major components of studio and concert systems in the near future."

AKG say Edge Technology will maintain their existing operating structure for the foreseeable future, although there is a question over distribution as AKG already distribute Turbosound in Germany and may want to do the same in other territories.

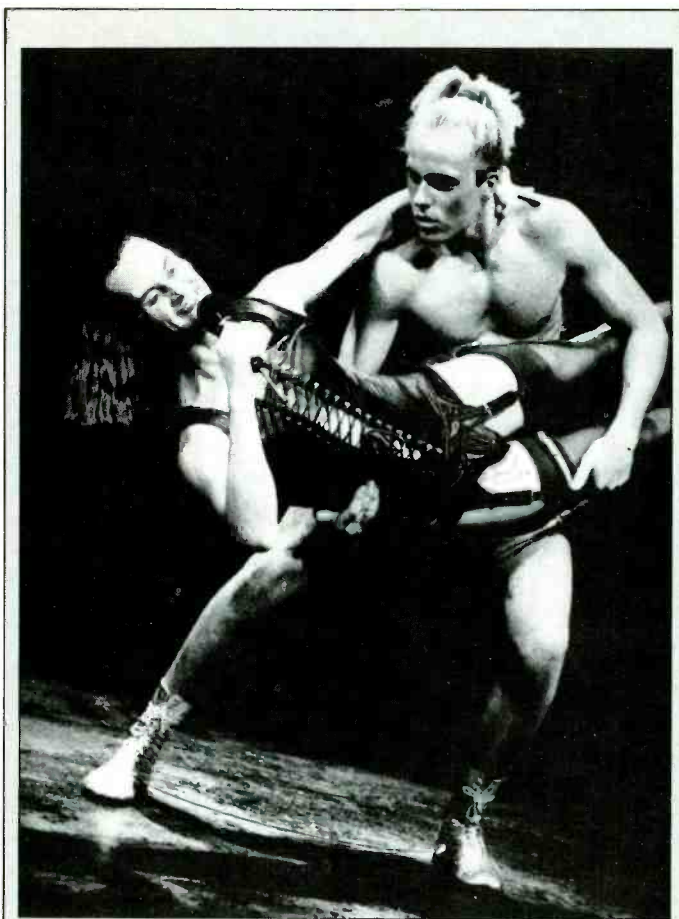
Medium-wave stereo radio

The IBA are testing transmissions for stereo radio on medium wave in the UK and are confident that by the end of the year at least one major ILR station will take up the new technology.

AM stereo is currently available in the US, Australia and Canada, but it wasn't until the recent introduction of split programming on ILR that interest was renewed in the UK.

The IBA have been assessing various ways of achieving AM stereo

EdgeTech chairman Michael O'Flynn commented, "Like AKG, we have maintained a specialist product profile, which is how the pro-audio industry like its major suppliers to operate. But the synergy generated by the two companies, with their considerable R&D activities, are certain to change attitudes."



OK spot the mic transmitter. 'Frank 'n' Furter', alias Tim McInnery getting totally carried away in the new version of the *Rocky Horror Show* at the Piccadilly Theatre, London. All sound design and equipment supplied by Autograph Sound Recording.

but as yet there is no world standard. A system they say would be relatively easy to incorporate, however, is the C-QUAM system developed by Motorola.

Tests with the C-QUAM system at Radio Orwell in Ipswich and more recently Crawley Court, the IBA's own engineering centre, have proved that stereo AM can be transmitted without any interference to the existing mono signal. In practice stereo AM is like the BBC's RDS

Cash boost for Focusrite

Venture capital company Grosvenor Venture Managers have invested more than £½ million in Focusrite Audio Engineering of Buckinghamshire, UK. Effectively this gives Grosvenor a minority stake in the company.

Focusrite's managing director, Phil Dudderidge, had approached

Grosvenor for the investment to continue the development of the company and new product research.

Focusrite was formed in March 1989 by Dudderidge, who was previously co-founder and chairman of Soundcraft Electronics, "The injection of funds by Grosvenor will give Focusrite the working capital to effectively eliminate borrowing and put the company in a much stronger position."

Dudderidge made use of venture capital while at Soundcraft in 1985 2 years later Soundcraft was bought by Harman International.

APRS changes

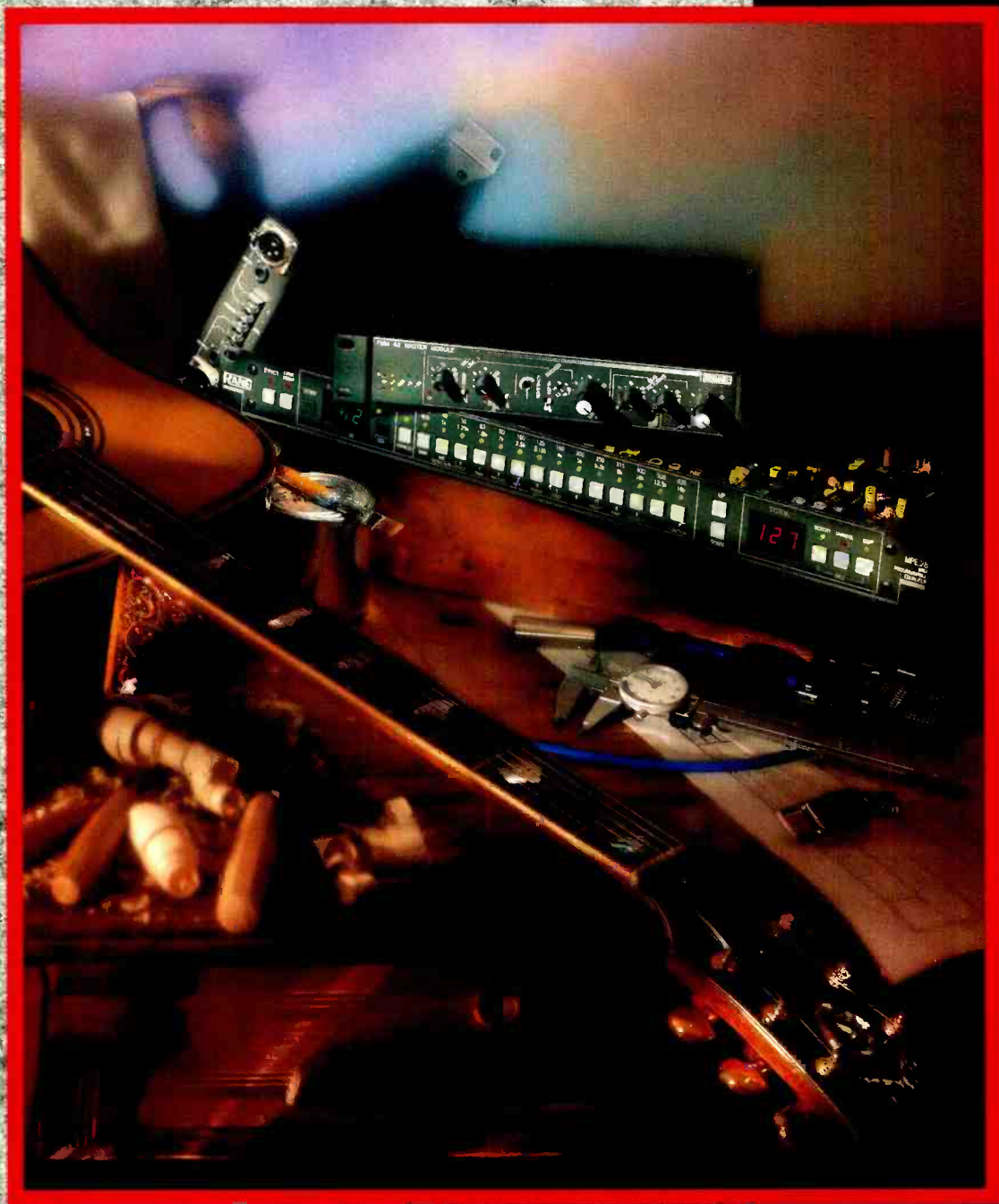
The APRS, formerly the Association of Professional Recording Studios, have changed their name to the Association of Professional Recording Services. The decision was made at the APRS AGM in the light of the changing membership. The new name is felt to reflect the fact that companies supplying equipment and services such as equipment hire, consultancy, cassette and CD duplication now comprise more than half the membership.

The AGM also heard that the APRS are moving and are now contactable at 2 Windsor Square, Silver Street, Reading, Berks RG1 2TH, UK. Tel: 0734 756218. Fax: 0734 756216.

DIE postponed

As a result of International Thomson Publishing pulling out their sponsorship for the Digital Information Exchange, this year's seminar has been postponed. No new dates have been supplied as yet although APRS board member, Sony's Chris Hollebhone, has said that the association are committed to the concept of a high-profile seminar event and they fully expect to announce revised dates soon.

PURITY, BY DESIGN



It takes great skill and experience to create the distinctive flavor and power of a fine musical instrument.

Rane equipment is uniquely engineered with the same meticulous craftsmanship, perfected through continuous technological innovation.

To accurately preserve the full richness of complex acoustic timbre is the most demanding challenge of audio reproduction. That's why discriminating artists and engineers have come to appreciate the audible difference in Rane gear: Purity. By design.



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45 million to watch stereo TV

By the end of the year the IBA hope to have NICAM digital stereo broadcast in 80% of the UK transmitting to a potential 45 million people. NICAM—Near-Instantaneous Companded Audio Multiplex—adds a special digital signal to a standard television transmission to enable reception of stereo sound with quality

similar to CD.

The introduction of NICAM on a national basis is geared to a major IBA project to replace the original ITV transmitters, installed about 20 years ago. The IBA have already converted the programme distribution networks for ITV and Channel 4 to digital stereo operation.

Exhibitions and conventions

November 5th to 8th Audio Video Pro, Paris, France.

November 7th to 9th InterBEE, Nippon Convention Center, Makuhari, near Tokyo, Japan.

1991

February 19th to 22nd AES 90th

Convention, Palais des Congrès, Paris, France.

April 15th to 18th NAB, Las Vegas, USA.

June 13th to 18th International Television Symposium, Centre des Congrès, Montreux, Switzerland.

Contracts

• NED have sold four *PostPro SD* workstations in the USA to Bob Schott Music in conjunction with Editel and Aquarius post-production in New York city; Catspaw and Crawford in Atlanta; Soundwave in Washington, DC; and Beachwood studios in Cleveland.

• FWO Bauch have delivered a *Lexicon Opus/e* digital audio editing system to TSI Video Ltd in London, UK.

• API have announced the installation of their newest series 4848 console into Remote Recording Services' new Silver Studio mobile recording facility in New York, USA.

• House of the Hits, Boston, MA, USA, have purchased a 40-input *Amek Mozart* console. The studio is owned by Maurice Starr, the producer behind bands like New Edition and New Kids on the Block.

• Music production company, Loomis Productions, Texas, USA, have

ordered a 40-input *Amek Mozart* console. Loomis specialise in the development of musical scores for feature films and corporate communications films and videos.

• Elias Associates, one of the largest music production houses in the US have recently bought two 40-input *Amek Mozart* consoles through New York dealer Martin Audio Video.

• Tyneside, UK-based radio station Metro FM, part of the Metro Radio Group, have purchased an *Audio Kinetics ES.Lock* machine control and synchronisation system for a new sound studio. The new studio will offer not only audio facilities but also music-to-picture. The *ES.Lock* system includes three *ES.Lock 1.11* synchronisers and one *ES.Lock Penta* five-machine controller. Machines will be an Otari *MX70* 16-track, a Studer *A807* timecode 2-track and a Sony *BVU800* video recorder.

• *Digitec* of France have won a



The Eventide range is now so good it's moved some to tears.



Whereas many of today's most popular signal processors are of Eastern origin, there's one name that stands out from the crowd. The name is Eventide. American innovation and design flair have been combined to create Eventide's H3000 Ultra-Harmonizer range — an answer to any audio professional's prayer.

First up, there's the H3000SE that gives you pitch shift, reverb, delay and other time-based effects — all with exemplary 16-bit audio quality. Spin the control wheel, choose one of 200 presets, change a few parameters — and

HB COMMUNICATIONS LIMITED, 73-75 SCRUBS LANE, LONDON NW10 6QU



Hill Concept console at John Wood studios.

contract for the design and construction of Radio France Internationale's new continuity room.

- UK-based **Recording Architecture** have completed an acoustic modification project at Ground Control studios in Santa Monica, USA. The modification, Ground Control's SSL studio, consisted of complete reconfiguration of the control room monitor wall and associated acoustic treatments.

- John Wood studios have re-opened their post-production company in the Manchester, UK, suburb Ashton-upon-Mersey. The **Hill Concept** console has been chosen for the new studio.
- **Recording Architecture** have designed and is managing the construction of a new three-studio complex for Magmasters, one of Soho's audio-for-film and video post-production companies. The 3000 ft² development will incorporate two fully equipped audio/video post-production studios.
- Following Thames Television's major refurbishment of their presentation and master control area to incorporate a digital AES-interfaced presentation mixer, **Prism Sound** have provided a batch of custom-designed PCB's to upgrade Thames' AMS Audio/Video Synchronisers to full digital audio spec.

- Entercom, Philadelphia, PA, have recently purchased four **TAC Bullet** compact-format mixing consoles, through Bruce Coffman at LD Systems, Houston, Texas. The consoles will be installed at KITS, San Francisco; KLXX WAYL, Minnesota; KLDE, Houston and EXCR/WYUU, Clearwater, FL.
- ORF, the Austrian broadcasting company, have installed in total 220 units of **Genelec S30** in their small control rooms situated in Vienna, Tyrol and Salzburg and 38 units of **Genelec S30NF** in their local TV studios.
- **IP Kinloch**, designers manufacturers and installers of broadcast systems, have won their largest order to date, a contract from S4C to design, manufacture and install the whole of the technical facilities at the Welsh Fourth channel's new headquarters in Cardiff Business Park.

- The Royal Festival Hall have bought an **Allen & Heath SR16** sound reinforcement console for lunchtime live music performances in their foyer/bar.
- Australia's premier sports channel, Channel 9, has ordered an **AMS 40-channel, 48-fader virtual console** system with full dynamics. The order was handled through Australian distributor Syncrotech Systems.
- A new **JBL** speaker system has been installed in the preview theatre at Shepperton Film Studios. Three **JBL 4675As** were installed behind the screen and six **TLX12s** were supplied for surround sound, using **JBL 5235 2-way** electronic crossovers.
- Thatched Cottage Audio have announced sales of 11 **Allen & Heath Saber** consoles including two installed in a new production suite being built as part of a major expansion by Amazon Studios in Liverpool.

you've got the effect you've been looking for. As soon as you try any Ultra-Harmonizer, you'll notice that it doesn't sound like any other effects processor. The effects are inspiring, different, creative.

Or try the H3000S. The sounds all feature the same sparkling audio quality as the H3000SE. 48 of them are taken up by the remarkable Steve Vai Preset Collection, perhaps the best starting point any musician could imagine.

Many broadcasters choose the H3000B. It provides an impressive palette of ready-to-use treatments and sound effects to dramatically enhance any on-air presentation.

While we're on the subject of broadcast applications, take a look at the BD-980 stereo profanity delay – a unit that takes the stress out of running phone-ins and live radio shows.

HHB can quickly transform your H3000, giving it the features of any other model in the range.

We could go on to talk about the H3000 series' versatile MIDI implementation, the informative LCD display and the ease of programme editing – but that might be rubbing salt into other people's wounds. So call HHB for a demonstration, and you'll understand why there are a few tears being shed in the East.



In an age of disk and digital, why buy analogue?

We know there are some applications where our 32-channel digital machine, the DTR-900, is the only answer. But if your business is such that you can do anything you want to do in the analogue domain, and at the same time do less damage to your budget, then our brand new analogue 24-channel MTR-100A may be the perfect machine for you.

When you consider that the MTR-100A will literally *change forever* the way engineers interface with audio machines, and



The MTR-100's auto-alignment saves you hours of time by eliminating constant tweaking and re-tweaking between sessions.

that this new way will save you hours spent in non-productive time, the analogue choice begins to make even more sense. You see the MTR-100A features full Auto-Alignment that allows total recalibration of the record and reproduce electronics. This means you can compensate for different tapes in a *fraction* of the time that it previously took, and your studio is not bogged down with constant tweaking and re-tweaking between sessions.

And if you think only digital machines feature high performance transports, think again! The MTR-100A's new transport incorporates reel motors that approach one horsepower – you'll get fast wind speeds of up to 474 inches per second! Of course,

the transport is pinchrollerless to give you the legendary tape handling and ballistics of our MTR-90.

What's more, with its optional EC-103 chase synchroniser, the MTR-100A maintains frame-lock in forward and reverse from 0.2X to 2.5X play speed and will typically park with zero frame error.

Then, there's the sound. New cylindrical-contour heads built by Otari especially for the MTR-100A result in remarkably low crosstalk and outstanding low-frequency performance. Pre-amps are located directly beneath the heads to further improve frequency response, and HX-Pro™ is built-in for enhanced high frequency headroom. (An optional internal noise reduction package houses Dolby™ SR/A.) Add all these features to gapless, seamless, punch-in, punch-out, which is also built in,

and your MTR-100A's sonic performance will rival any digital machine in the world.

So there you have it. With these powerful benefits available in analogue, does it make sense to go digital? Certainly, for some applications, a top analogue tape machine like the MTR-100A is the right choice.

And because we can see both sides of the question, ask us. We have the information that can help you make the right decision. Call Otari (U.K.) Limited on Slough (0753) 822381, or Fax us on (0753) 823707 or call U.K. Main Dealers, Stirling Audio Systems on 01-624 6000.



Reel motors that approach one horsepower are driven by pulse width modulation amplifiers to tape speeds up to 474 ips.

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News from the AES

Our next evening meeting will be held on Tuesday October 9th, when the AES has its **Annual Dinner**, which will be held at the Queen Elizabeth II Conference Centre. The guest speaker will be Colin Rugg of Services Sound and Vision Corporation (SSVC).

To help future planning, the dates, speakers and titles of our forthcoming monthly meetings are listed below (more details will be available on each nearer the time).

Oct 9th
AGM & Annual Dinner

Nov 13th
Digital Audio in Professional Video Recorders
John Watkinson

Dec 11th
Room & Loudspeaker Correction using Digital Equalisation
Peter Craven

A number of new books are available that will be of interest to many in the audio business. John Watkinson has followed up his highly acclaimed book **The Art of Digital Audio** with the companion **The Art of Digital Video** (£42.50). He has also written a book entitled

Coding for Digital Recording (£15.95).

John Borwick has complemented his book **Loudspeakers and Headphones** with a publication looking at the other end of the audio chain **Microphone Technology and Techniques** (£25.00).

After his book **Stereo Sound for Television**, Francis Rumsey has now written one on the very topical subject **Tapeless Recording** (£14.95).

The papers are available from the last AES UK Conference, which was on the subject of **Hard Disk Recording**. This brings the number of proceedings from AES UK Conferences to four. These are **Sound with Pictures** (May 1988), **Sound Reinforcement** (May 1989), **AES-EBU Interface** (Sept 1989) and **Hard Disk Recording** (May 1990). They are priced between £10 and £20 and are available from the address below.

For further details on any of the above or information on joining the AES, please contact:

Heather Lane, AES British Section, Lent Rise Road, Burnham, Slough SL1 7NY, UK. Tel: 0628 663725. Fax: 0628 667002.

NED move to Lebanon

New England Digital have moved from their home of the past 13 years in Vermont, USA, to larger premises in Lebanon, New Hampshire. The new centre houses all NED's manufacturing, R&D, product

development, sales, marketing, finance and administration operations under one roof. NED, Rivermill Complex, 85 Mechanic Street, Lebanon, NH 03766, USA. Tel: (603) 448-5870.

Agencies

- **Solid State Logic** have appointed Mediacom as main distributors in Germany. Gunter Zierenberg, Mediacom, Gildnestrasse 60, D-4530 Ibbenburen 1, West Germany. Tel: 0 54 51/50 01 85. Fax: 0 54 51/50 01 40. Audio Sales will represent the company in Austria.
- The recently formed test consultancy NaTCH Engineering has been appointed the UK and Eire distributor for the **Ortofon P400**

transducer test set. NaTCH Engineering, 11 Coxburn Brae, Bridge of Allan, Stirling FK9 4PS, UK. Tel: 0786 833541. Fax: 0786 833358.

- Digitec are now the sole national and international agents for **ABAC Rustin** mixing consoles. Digitec SA, 57 bd de la Republique, 78401 Chatou Cedex, Paris, France. Tel: 33 1 34 80 75 00.

In brief

- Connecticut, USA: **Mitsubishi fit Apogee filters**. Following a new agreement announced recently between Apogee Electronics Corporation and Neve, exclusive North American distributors of Mitsubishi digital pro-audio products, all new Mitsubishi multichannel recorders sold in the US and Canada will be fitted with Apogee filters for digital audio.
- London, UK: **Nimbus acquire Ambisonics rights**. Nimbus Records a leading British recording and CD manufacturing company, has signed an agreement with the British Technology group securing the rights to Ambisonics technology. The new licence granted to Nimbus covers all Ambisonics patents granted or applied for worldwide.
- Los Angeles, CA: **Ed Sullivan releases use NoNoise**. Tee Vee Toons Productions in conjunction with Sullivan Productions have announced that the very best performances from the 1000-hour Ed Sullivan show archives are being released for the first time in a 10-volume set of records. The shows are currently being transferred onto DAT tape via Sonic Solutions' **NoNoise** system to ensure the minimum of generation loss from the original Quad tapes.
- Newbury, Berkshire, UK: **Racom Broadcast to sell DAMS**. Racom have announced that for the foreseeable future they will handle sales of their **DAMS** systems by

dealing direct with its end users. No other company is authorised to sell **DAMS** equipment in the UK. In mainland Europe, a new dealership network is currently being formed by recently appointed European sales manager Catherine Oates.

- Buchanan, MI, USA: **Mark IV announce takeover**. Mark IV Audio has announced the acquisition of Audio Consultants Company, a Hong Kong-based distributor of audio products and professional equipment sound contractor. Bob Pabst president of Mark IV Audio claims that with the additional financial help the takeover will give, ACCL is expected to accelerate its growth, especially in China.

- London, UK: **TV aids Rock Steady**. A Casio pocket TV played a crucial role in the production of Channel Four's recent series of **Rock Steady**. Each programme in the 16 week series was broadcast live and involved switching from the studio to live gigs. It was essential that the handovers from the studio were at the right moment so the solution was for the producer at the gig to carry with him a Casio **TV-3100** mini TV to monitor the on-air activity.

- Milton Keynes, UK: **BSI new publication. BS 5084 Magnetic tape for instrumentation applications. Part 5: 1990 Specification for interchange practices and test methods for unrecorded tape** is now available from BSI Sales, Linford Wood, Milton Keynes MK14 6LE, UK.

People

- tc UK have appointed Richard Peace to head direct sales and specialist demonstration, concentrating on recording studios and professional musicians. Katherine Wilding is now tc's sales and customer liaison person.
- Bob Goleniowski has taken over responsibility at **Harman**, UK, for sales of the JBL range of professional products, following the departure of Guy Hawley, who has left to join JBL International in the States. Richard Moore has joined the JBL sales team as area sales manager. He joins Harman from Toa.
- Sound engineering company RG

Jones of London, UK, have appointed Bob Caple as director and general manager. Caple joined the company in 1978 and became manager of the hire division in 1980.

- Hans Tschernig, president of Dynacord in West Germany, has been appointed to the additional position of vice-president of **Mark IV Audio**. Dynacord was acquired by Mark IV earlier in the year.

- Recent additions at **Apogee Electronics** are Pam Mongeon who is to manage their purchasing department and Rick Porter who has joined their engineering department.

Address changes

- **Audico Chicago Inc** have moved to 7206 W Grand Ave, Elmwood Park, IL 60635, USA. Tel: (708) 456-0003. Fax: (708) 456-0418.

- **APRS**, UK, have moved to 2 Windsor Square, Silver Street, Reading, Berks RG1 2TH. Tel: 0734 756218. Fax: 0734 756216.



AKG V6HP headphone amplifier

AKG Acoustics have introduced a high power headphone amplifier. The V6HP contains two built-in amplifiers with short circuit protection and can be used freestanding or on a mic stand with 3/8 or 1/2 inch thread. Six headphone outputs in three groups of two are provided and the output signals can be routed five ways—left or right

channels to one side or both and a stereo position. The unit weighs 2 lb and can deliver an output voltage of over 20 V into 200 Ω or greater. Highpass filters are included as are clip LEDs set 2 dB below clipping. UK: AKG Acoustics Ltd, Vienna Court, Catteshall Wharf, Catteshall Lane, Godalming, Surrey GU7 1JG. Tel: 04868 25702.

Neutrik A1 test system

The A1 is a new audio test and service system from Neutrik containing a sweepable (internal or externally controlled) audio generator, analyser and digital oscilloscope in a single case. Measurement possibilities include level, noise and crosstalk in absolute and relative terms, frequency, THD+N, wow and flutter, and drift. Measurements are shown on backlit 256×128 dot LCD. Single measurements are shown in numeric form and as bargraph. Sweeps are in graphical form. Screens can be printed out on a standard dot matrix printer. An internal monitor speaker

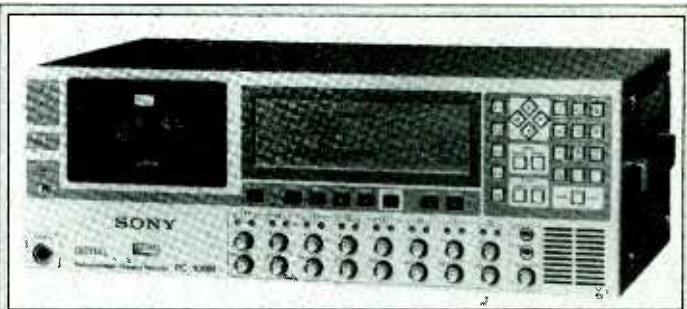
is provided. Future additions include an optional RS 232 interface and a software package to control the A1 with a PC. The unit is auto-ranging, tuning, auto-nulling and scaling. Neutrik, FL-9494 Schaan, Furstentum, Liechtenstein. Tel: 075 29666. UK: Eardley Electronics Ltd, Eardley House, 182-184 Campden Hill Road, London W8 7AS. Tel: 071-221 0606. Fax: 071-727 9556. USA: Neutrik Products, 77 Selleck Street, Stamford Street, Stamford, CT 06902. Tel: (203) 348-2121.



New consoles from DDA

DDA have recently introduced two new consoles. The DMR 12 is also being referred to as the '24-track tapeless console' and uses a multiple input concept. Every module is an input with 4-band EQ, eight auxes and routing to all the multitrack outputs. Twelve modules are dedicated to the group outputs with each of these having routing capability to the second set of 12 outputs. In use all inputs have identical EQ and channel features. The desk is also compact with 56 channels and patchbay in just over 2 metres. Each input has mic input and two line inputs while the output type of module has provision for monitoring and mixing bus or tape signals. There is also an optional MIDI muting package, which adds

nine mute groups, solo-in-place and 128 MIDI patches. The second console is the DCM224V, a variation on the DCM232 designed for post-production. Enhancements include an extended EQ with five bands and two filters on the input module, stereo group modules with mono and stereo matrix systems and a different monitoring system. The desk also uses the same automation facilities as the DCM232 including automated channel function switches, VCA faders and mutes. DDA, Unit 1, Inwood Business Park, Whitton Road, Hounslow, Middx TW3 2EB, UK. Tel: 081-570 7161. USA: Klark-Teknik Electronics Inc, 200 Sea Lane, Farmingdale, NY 11735. Tel: (516) 249-3660.



While having very little directly to do with standard audio applications it is interesting to note new uses being made of established formats by Sony. They have just announced an instrumentation recorder using DAT to record up to eight channels of analogue signal data encoded digitally on a standard DAT cassette. The PC-108M operates eight channels with a bandwidth of 5 kHz and increases to 20 kHz for two channels, there being four selectable levels between these. Also data recording, the DIR-1000 is a high capacity storage recorder based upon the D-1 video format. Data acquisition rates range from 10.7 Mbits to 256 Mbits giving record times of 20 hours to 50 minutes. Interestingly, the data is still compatible regardless of what rate it was recorded at.

Valley powered racks

Valley International have introduced two new powered racks for housing their modular signal processors. The PR-2A accommodates a pair of 800 modules in a 1U rack with Valley listing design features as improved RFI and electromagnetic shielding while the power supply design offers better performance and more headroom. XLR-type connectors are provided on all inputs and outputs. The larger PR-10A contains up to 10 800 modules in 3U rack space with XLR-type connectors on all audio connections. The rack has the same shielding capabilities as the smaller model but the power supply is of a two-section bipolar design with each section supplying five of the modules so half the modules remain powered in the event of a regulator failure. Valley International Inc, 616 Bradley Court, Franklin, TN 37064, USA. Tel: (615) 370-5901. UK: Stirling Audio Systems Ltd, Kimberley Road, London NW6 7SF. Tel: 071-624 6000. Fax: 071-372 6370.

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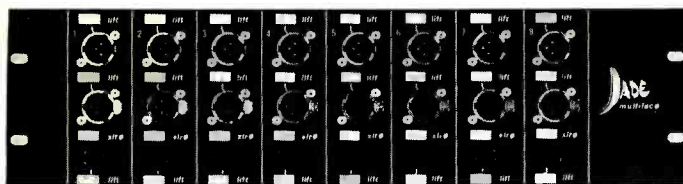
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DIGITAL AUDIO RESEARCH





Jade Multiface

Jade Marketing are a new company that describe themselves as providing simple units that solve everyday control room interface problems. Their first product is *Multiface*, a passive multiple interface panel designed to do away with assorted non-standard cables in the studio. The unit offers eight channels of connector conversion between XLR

male, XLR female, mono and stereo ¼ inch jack. Polarity is switchable between pins 2 and 3 'hot' and with ground-lift for each connector. The unit is available in three different versions: rackmount, flush or surface mount and Jade claim it could save the need for up to 320 specialist cables.

Jade Marketing, Jade House, The Green, Charlbury, Oxford OX7 3QA, UK. Tel: 0608 810069.

DCS D to A converter

Data conversion Systems have introduced the *DCS 950* digital-to-analogue converter to complement the *DCS 900* analogue-to-digital converter. Features of the *DCS 950* include claimed 20 bit resolution, discrete component implementation of bit-stream technology, wide range of inputs including AES/EBU, SDIF-2 and SPDIF, choice of 44.1 or 48 kHz sampling, controllable dither and noise shaping. Outputs are at +24 dBm on XLR-type connectors, +6 dB on phonos, headphones on ¼ inch jack and SPDIF on phono. **Data Conversion Systems Ltd, The**

Jeffreys Building, St Johns Innovation Park, Cowley Road, Cambridge CB4 4WS, UK. Tel: 0223 423299.

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

USA: Audiotechniques, 1600 Broadway, Suite 803, New York, NY 10019. Tel: (212) 586-5989. Fax: (212) 489-4936.

USA: Sonic Image Ltd, 1100 Wheaton Oaks Court, Wheaton, IL 60187-3051. Tel: (708) 653-4544. Fax: (708) 665-4966.

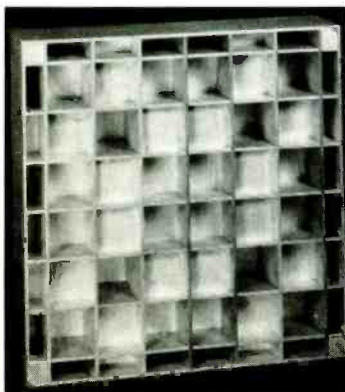
RPG Omnifusor

RPG Diffusor Systems have introduced a two-dimensional QRD sound diffusor called the *Omnifusor*, which scatters incoming sound from any direction uniformly into a hemisphere. Physical construction is as an array of cells with fourfold rotational symmetry, the depth of the wells being based on a two-

dimensional quadratic residue number theory sequence that creates identical diffusion performance in horizontal and vertical planes. The omnidirectional scattering characteristic results in a steady state energy that is half that obtained from a conventional single dimension QRD. This makes the *Omnifusor* suitable for applications where attenuated omnidirectional diffusion is required such as studio ceilings, voice booths, etc.

The *Omnifusor* is available in lightweight 2x2 and 2x4 ft architectural acoustic panels for wall use or standard suspended ceiling grids. Custom sizes and finishes are available with standard options of natural lacquered or painted wood and translucent acrylics.

RPG Diffusor Systems Inc, 12003 Wimbledon Street, Largo, MD 20772, USA. Tel: (301) 249-5647.
UK: RPG Europe, Unit 15, North Field Industrial Estate, Beresford Avenue, Wembley, Middx HA0 1YB. Tel: 081-900 0255. Fax: 081-900 2793.



Fostex have launched the latest model in their series of 16-track ½ inch format multitracks. The *G16* is an upgrade on the *E16* and includes an optional built-in synchroniser and removable front panel that allows full remote of all functions. The synchroniser allows the *G16* to chase external SMPTE as well as read it at high speed. It can also look for and respond to MIDI commands and convert SMPTE timecode on tape to MIDI timecode. The front panel tilts and detaches and includes counter frame rate, head life counter and tape characteristics. The manufacturers also claim improvements in the transport make it quieter and more responsive.



UK: Fostex (UK) Ltd, 1 Jackson Way, Great Western Industrial Park, Southall UB2 4SA. Tel: 081-893 5111.

USA: Fostex Corp of America, 15431 Blackburn Ave, Norwalk, CA 90650. Tel: (213) 921-1112.



Klotz A-DAM interface

Klotz have designed a new digital interface for the Akai A-DAM digital standard as used in the *DR1200* digital multitrack. The Klotz *AFC-1.12* means that A-DAM can be linked to Sony SDIF and Mitsubishi ProDigi formats for recording and playback. The sampling frequency at which the interface operates is determined by the playback machine as long as the recording machine will operate at that frequency. All 12 channels of the A-DAM system have to communicate with the connected machine at any one time. The

interface will also allow communication with the Yamaha *DMP7D* digital mixer (with the IFU 2 interface) for mixdown.

This launch follows the recent release of the Akai *DIF 1200*, which allows 2-channel digital transfer in AES/EBU and SPDIF formats. **UK: Akai Pro-Audio Division, Haslemere Heathrow Estate, Silver Jubilee Way, Parkway, Hounslow, Middx TW4 6NQ. Tel: 081-897 6388.**
USA: Akai Professional Products, PO Box 2344, Fort Worth, TX 76113. Tel: (817) 336-5114.

Turtle Beach editing system

Turtle Beach Systems have announced a low cost digital 2-track editing system based on an IBM AT or 386 compatible computer. Known as the *56K* Digital Recording System it combines modular digital signal processing hardware with a graphic software package. The basis of the system is the *56K-PC* 16 bit card that gives access to the computer's hard disk for recording and playback of audio material using the Motorola *DSP56001* DSP microprocessor.

Connection to external devices is through external units such as the *56K-D* Digital Audio Interface

providing AES/EBU, SPDIF connections as well as SMPTE timecode and MIDI. The *56K-A* is available as an A/D converter.

The software for the system is called *SoundStage* and provides the mouse-driven editing and control capabilities. The *56K* can record mono or stereo audio at sampling rates up to 48 kHz with editing facilities including cut/copy/paste as well as splice smoothing to reduce splice point glitches.

Turtle Beach Systems, PO Box 5074, York, PA 17405, USA. Tel: (717) 843-6916.

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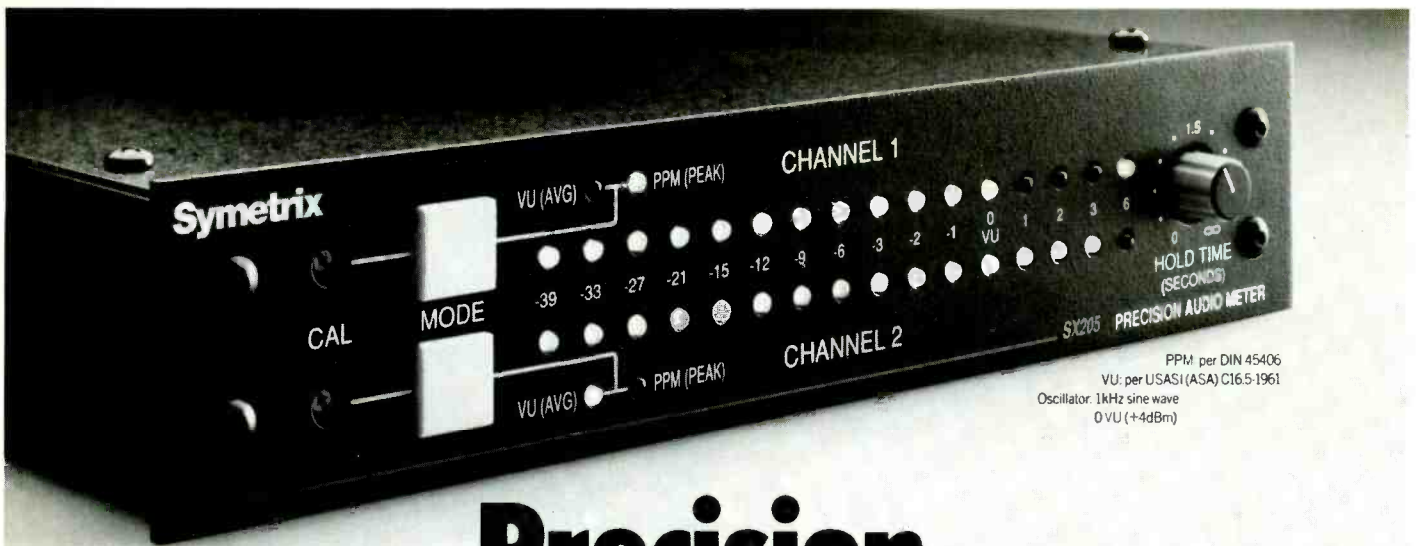
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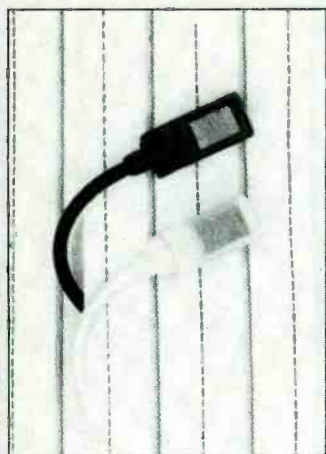
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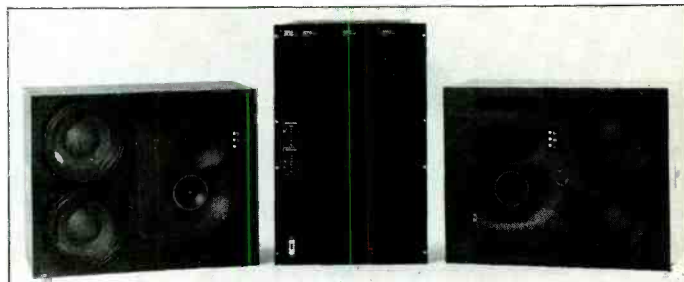


Countryman Associates have introduced a new microphone in

the *Isomax* series. This is a small omnidirectional electret condenser known as the *Isomax EMW*. It is available in a choice of flat, shelved or peaked frequency responses with a wide assortment of clips. The design is described as giving very low 'rubbing noise' and is moisture resistant. Suitable for wired and wireless use, the *EMW* is manufactured in both black and white.

Countryman Associates Inc, 417 Stanford Avenue, Redwood City, CA 94063, USA. Tel: (415) 364-9988.

UK: SSE Marketing, Unit 2, 10 William Road, London NW1 3EN. Tel: 071-387 1262. Fax: 071-388 0339.



Genelec 1033A active monitor

The *1033A* active monitor is a smaller edition of the *1034A*, designed for use in small and medium sized control rooms. Many of the features used in the *1034A* have been employed in this model. The *1033A* uses 2x10 inch long throw woofers, a 120 mm Genelec developed mid-range high sensitivity cone driver and 25 mm metal dome tweeter. The system consists of three

modules, two speaker enclosures and the amplifier unit.

Genelec, Tehtaantie 17, SF-74100 Iisalmi, Finland. Tel: (358) 77 133 11.

UK: SSE Marketing, Unit 2, 10 William Road, London NW1 3EN. Tel: 071-387 1262.

USA: Quest Marketing, PO Box 20, Auburndale, MA 02166. Tel: (617) 964-9466. Fax: (617) 969-7758.

Electro-Voice 7600 amplifier

Electro-Voice have introduced the *7600* stereo power amplifier rated at 400 W/channel at 8 Ω and 600 W/channel at 4 Ω from 20 Hz to 20 kHz. Claimed performance includes a THD rating of less than 0.1% rising to less than 1% at 850 W/channel into 2 Ω . Other features include Neutrix *Speakon* connectors, octal sockets for crossover and EQ modules, and front-mounted controls. The *7600* has a dual speed

fan that EV describe as 'exceptionally quiet running'. Other design aspects include extensive protection circuitry and attention to thermal gradients and heat flow.

Electro-Voice Inc, 600 Cecil Street, Buchanan, MI 49107, USA. Tel: (616) 695-6831.

UK: Shuttlesound Ltd, Unit 15, Osiers Estate, Osiers Road, London SW18 1EJ. Tel: 081-871 0966. Fax: 081-870 9300.

In brief

- **Saki Magnetics** have announced the availability of *0-900* series replacement record and replay heads for the Otari *MTR-90* series 24-track machines. The heads are manufactured from Permalloy and Saki claim they meet or exceed Otari specifications in all essential characteristics. Saki Magnetics Inc, CA, USA. Tel: (818) 880-4054. UK: Tapetek, Laindon, Essex. Tel: 0268 561999.

- **Audio Kinetics** have introduced a serial control option for the *ES.Lock 1.11* synchroniser when used with certain Sony and Panasonic video machines or Studer *A820/A827* multitrack machines.

- **Alpha Audio's DR-2** digital audio hard disk recorder now has discontinuous timecode support and the ability to handle up to 192 ascending timecode discontinuities. The proper address can be located within $\frac{1}{10}$ second and 1 second pause that has no timecode is

tolerated. The *DR-2* can preroll before a code break point allowing a longer preroll than might exist on the field source reel allowing greater time for machines to synchronise. Alpha Audio, VA, USA. Tel: (804) 358-3852. UK: Stirling Audio Systems Ltd.

- **Fostex** have made the software and hardware available to support RS422 in the *D20* DAT machine in the form of the *8310* interface board. This is now available as an option for new machines and as a retrofit on existing units. The *D20* will now be able to connect directly to video edit controllers and transports via the 9-pin RS422 serial port of which Fostex will support a variety of implementations. Transports already supported for direct connection include Sony *BVU-800*, *BVW-75*, *BVH-3100* and *DMR-4000*, and the Panasonic *MII AU650*. Editors supported include Sony *RM450*, Ampex *Ace* and Sony *BVE9000*.

Letter: CEDAR/recordable CDs

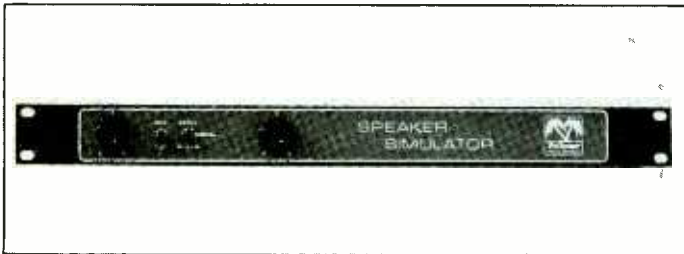
Dear Sir, I enjoyed very much Barry Fox's article about *CEDAR* in a recent issue of *Studio Sound*. About 3 years ago I discovered the system in the back corner at an APRS. I've pursued these people ever since. The system is far superior to others, I feel, I've heard. The article uncovers much about the 'behind the scenes' goings on which I suspected. In the past month, however, things have changed rather dramatically for the better. I believe we will soon reach an agreement to place *CEDAR* systems in several major studios.

Now for a completely different matter: recordable CDs. You make the statement on page 44 "Sonic Solutions' *CD Maker* comes all set to become the standard..." Nothing could be further from the truth! Our *CDR 90* system is already the standard (list of users enclosed). There are two systems conveniently located in London for you to see. Bill Foster's (Tape One) had his for months, I'm sure he'd be happy to show you.

If you take a close look at the *START/Sony* machine you'll see why the market distribution is rather strange. It is a CD-ROM drive with SCSI interface intended for data processing not audio. When available later this year it will probably be sold by Sony's computer division. That's who displayed the prototype at the recent CD-ROM conference in San Francisco. Sonic Solutions produces an audio CD by making a disk to disk transfer via the *Mac II's* SCSI bus. This is really a third generation digital dub and not the same as the reference disc which our *CDR 90* makes directly from the digital master tape.

Our *CDR 90* now uses the Taijō Yuden discs as well as discs manufactured by Fuji. We have both types in stock and are already delivering to our customers in the US and Europe.

Yours faithfully, Russell O Hamm, President, Gotham Audio, 1790 Broadway, New York, NY 10019-1412, USA.



Palmer PDi-03 Speaker Simulator

Already established in many of the most prestigious guitar rigs around, studios are beginning to take note of the opportunities afforded by the Palmer *PDi-03 Speaker Simulator*. A 1U rackmount of passive design, the unit is connected in place of the speaker cab driven from the guitar amp and materialises at the desk via a balanced output.

The meagre front panel controls offer a filter volume control, two switches marked deep/flat and bright/normal/mellow, and a line level control. Judicious use of these controls imparts the character of different speaker configurations as well as imitating, with reasonable authenticity, the peculiarities of particular drivers—anything from the classic British sound to the harder

nosed American variety. Rear panel connectors allow for a speaker 'thru' as well as four line outs for multiple amp configurations and a stereo version is soon to be released catering for the stereo nature of modern effected guitar setups.

Bearing in mind that the contemporary DI'ed guitar sound owes as much in its origins to the ignorance of mic placement technique as it does to the need for isolation, the Palmer speaker simulator offers a wholesome method of re-injecting the real sound of an electric guitar or bass back into the mix without rousing the neighbourhood.

UK and worldwide: Gladden Pro Audio, 29 Morse Lane Industrial Estate, Brightlingsea, Colchester, Essex CO7 0SD. Tel: 0206 303017.

E-mu news

Building on the success of the E-mu *Proteus/1*, the *Proteus/2* has 8 Mbytes of 16 bit orchestral and classical samples taken from the E-mu *III* library, which can be added as a 4 Mbyte expansion bank to the original unit. More than 40 program parameters can be accessed via MIDI controller and 32-voice polyphony is spread across six polyphonic outputs, which can also be configured as three stereo pairs with programmable panning.

E-mu has released 128 new presets for the *Proteus/1 XR* and these are available free of charge to existing owners.

MIDI metronome

MIDI Metro is a 1U digital metronome with a MIDI interface that gives timing information from eight large multicoloured LEDs rather than via an audible click. This reduces the chances of bleedthrough from cans when recording quiet

The *Emax II* 16 bit digital sound system is now available with 2 Mbytes of internal RAM in addition to a 4 Mbyte stereo sampling version. The latest software *Version 2.10* adds compatibility with CD-ROM drives over the unit's SCSI.

The *Proformance/1* and *1+* 16 bit true-stereo sampled piano modules offer 90 dB dynamic range, 16-note polyphony and user assignable splits. Aside from the collection of piano sounds available in the *Proformance/1*, the *1+* also includes electric pianos, organs, vibes and acoustic and electric basses.

acoustic instruments or indeed bleedthrough the drummer's ears when listening at high levels for long periods of time.

Q-Logic, East Haugh, Pitlochry, Perthshire, Scotland PH16 5JS, UK. Tel: 0796 2001.

Software update

• **Macintosh Passport's Pro4** 64-track sequencer offers a graphic song editor, graphic and event list step editing, realtime editing, graphic editing of MIDI controller info, play list, standard MIDI files, global change filter, keyboard control mapper and SMPTE synchronisation. Notation is available by using the system with *Encore*.

Passport has enhanced its sample editing program *Alchemy* to include the *S950*, *Emax II* and Digidesign's *Audio Media DSP* card.

Opcode Systems' *EZ Vision* is a simplified and upgradable version of the company's powerful *Vision* sequencer and is aimed at educational establishments and multimedia presentations. Opcode's

Korg editor/librarian now supports the *M1*, *M1R*, *M1-Ex*, *M1R-Ex*, *M3R*, *T1*, *T2* and *T3*. Of particular note is the program's ability to convert *M1* sounds to *M3R* format.

• **Atari Opcode** have released an editor/librarian for the E-mu *Proteus*. Features includes a preset editor for changing aspects of timbre, master parameter editor, program map editor, tuning editor and storage and organisation for thousands of sounds.

Steinberg *Cubase Version 1.0* is a low cost version of *Cubase* most notably without score printing and editing but with 16x64 tracks, M.ROS, Visual Song Processing, graphic editing, human sync, direct lock and MIDI file compatibility.

Multimedia CD-ROM

Prosonus has announced a series of CD-ROMs containing music and sound effects that can be played at 16 bit CD quality by Digidesign's *SoundTools* and *AudioMedia Mac* digital recording system.

Aimed primarily at providing production sound for *Macintosh* multimedia presentations, each CD-ROM has 35 minutes of stereo music

and 300 Mbytes of ambience including street, industrial and interior sounds, and hundreds of sound effects. The disk is sold on a buy-out basis permitting repeated use of the material without additional charge.

Prosonus, 11126 Weddington Street, North Hollywood, CA 91601, USA. Tel: (213) 463-6191.

DataDisk updated

Existing Alesis *DataDisk* owners will be able to upgrade their units to the new software version at a nominal charge allowing the data filer to record and playback MIDI sequence information in realtime—a must for live work.

Building on the great success of the company's *HR16* series drum

machines, the *SR16* has more than 100 on-board sounds and a total of 200 preset and user patterns. Dynamic Allocation adds realism to fast drum rolls while Dynamic Articulation imitates the way a real drum's timbre alters with playing intensity.

Yamaha TG77 arrives

The Yamaha *TG77* is the expander version of the popular *SY77*. With AWM2 samples, AFM synthesis and realtime interaction of the two, the sum adds up to more than the parts providing a powerful portfolio of building blocks when combined with the new series of waveform and voice cards released by Yamaha. The *S7701*, *S7702* and *S7703* card sets each contain 64 voices in addition to a collection of precision waveform

samples that can be incorporated with user voices for the creation of new sounds. Yamaha now offer a total of 14 voice data cards available for the *SY77/TG77* generation synths along with an assortment of libraries for the similar but simpler and cheaper *SY55*, *TG55* and *SY22*.

Studio Sound's Music News is compiled by Zenon Schoepe

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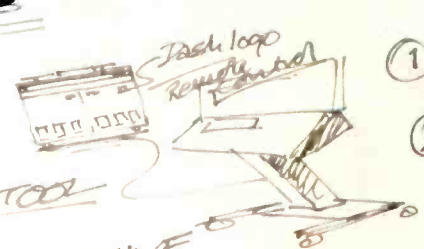


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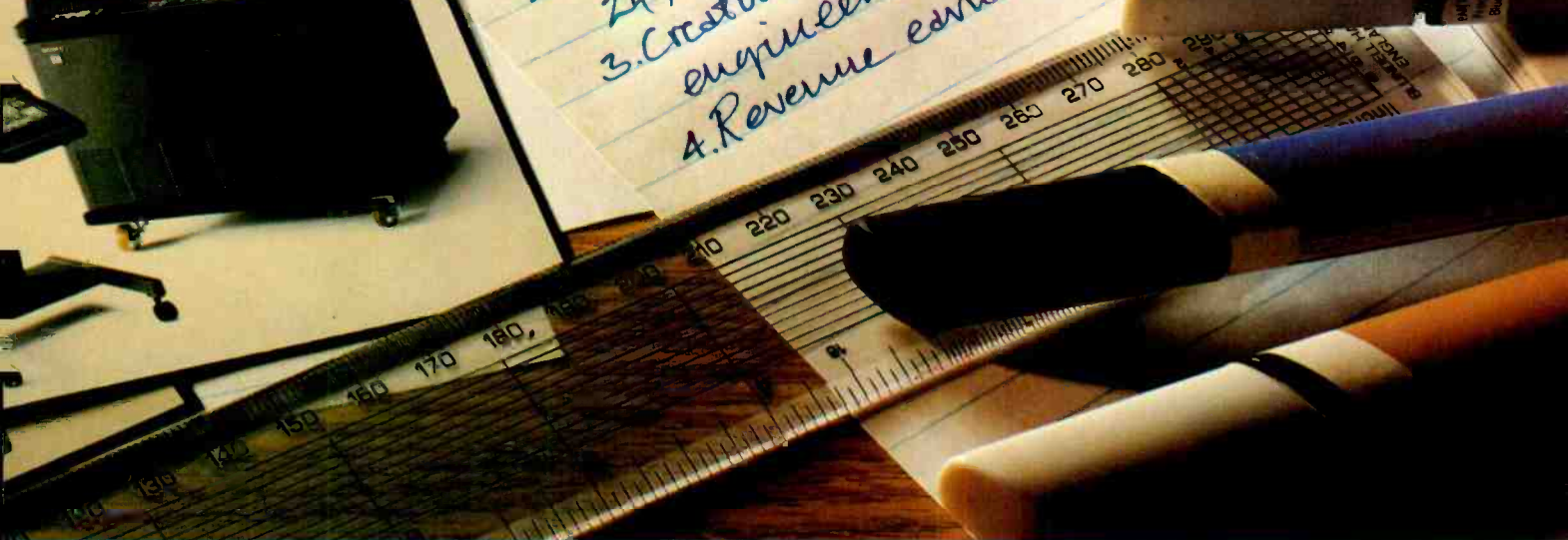
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FLASHLIGHT DEBUT

Mike Lethby looks at Turbosound's new UHQ speaker system on its first outing—the Glastonbury Festival

But the lessons learned from its development—and in particular the 10 inch midrange loaded using the then-revolutionary Turbo device technology—spawned the hugely successful *TMS-3* full-range medium throw enclosure and a host of derivatives.

Andrews comments: "It was a bit of a climbdown from our original idea—but it was Alan Wick's (chairman of Turbosound) major contribution, because he convinced me to put that technology into one box. We were into a sectorially additive approach to coupling back then, and that concept continues now. Most importantly, creating the *TMS-3* gave us the understanding to refine every component of the box and the drivers."

The *TMS* series' commercial success provided the *UHQ* project's funding. It also gave Andrews and design partner John Newsham free rein to return to their original high-Q concept, armed with the fruits of 8 years research, in an effort to create a state-of-the-art arena PA system.

UHQ system

In a highly competitive marketplace, Turbosound are careful to emphasise where the new system will fit in. *UHQ* is not intended as a direct replacement for the *TMS-3*; nor, with a subtly distinct sonic character and different crossover points, will it sit readily alongside its predecessor in an SR stack. Instead, Turbosound aims it at a higher niche where its directivity and projection suit it to large applications.

In fact, a long-throw version of the *TMS-3* is planned, sharing the existing model's crossover

The UK's 1990 Glastonbury Festival provided the first major public airing of Turbosound's latest PA system concept, the *UHQ* system.

The *UHQ* stands for Ultra High Q. It's also known as the 'Flashlight', a tag that neatly sums up its highly directional long throw design.

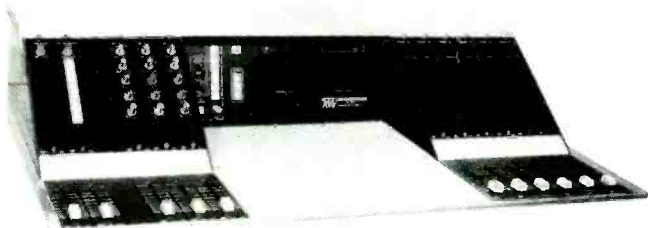
It was an appropriate debut: Turbosound have been associated with what is now one of the UK's few major annual festivals since the mid '70s. Many of their most influential designs—from the original modular Festival system to the now-ubiquitous *TMS-3* full range enclosure—owe much to technical director Tony Andrews' experience of fine-tuning his evolving ideas in farmer and festival promoter Michael Eavis's picturesque Somerset valley.

The latest *UHQ* concept has its roots in the Festival system. It was a high Q modular PA designed for large shows, which ultimately proved too physically inefficient and directionally uncompromising to gain widespread acceptance.



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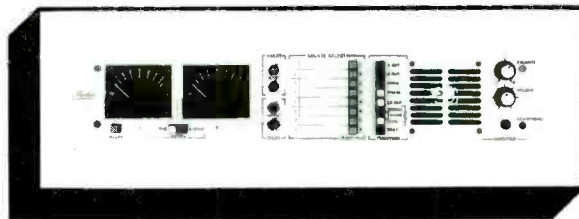
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and acoustic character in order to complement rental users' existing stocks.

Originally scheduled for release last year, *UHQ* has gone through numerous refinements prior to this summer's launch, which sees a 4-way system embracing many of the *TMS-3* principles but with a radical move into new demarcation lines with two drivers extending the range of the Turbo-loaded mid band.

It's a two-box, 4-way design. One box contains a TurboBass-loaded 21 inch LF driver with a hefty 6 inch voice coil, which runs up to 150 Hz. The other contains two more Turbo-loaded devices: a 12 inch low mid, crossing over at 1.6 kHz to a 6½ inch high mid, which extends to 8 kHz, and finally a 2 inch HF unit on a specially-designed flare.

Andrews comments: "We considered other shapes, including trapezoidal designs. Our conclusion was that they would lock us into awkward array angles; a trapezoidal box is fine in one row but you get unnatural angles between

multiple rows. And of course in physical terms it's more awkward to deal with when you're packing a truck."

The *UHQ*'s drivers are produced by Precision Devices, the sister company set up to give Turbosound control over the design of its drivers. The research Andrews and Newsham undertook in developing new drivers for every Turbosound enclosure paved the way for the radical designs that were needed to make *UHQ* a reality.

Thus, says Andrews, "We learned how to optimise each driver in its particular frequency band and the ideal way to load it. It's a strange irony—even though the *UHQ* has less than half the *TMS-3*'s dispersion we need far fewer boxes to get total coverage because it doesn't rely on coupling at all. And every sonic characteristic is a step up."

As well as being highly directional—with a dispersion angle of around 25°—in the Turbosound tradition efficiency is also extremely high and Andrews notes that its maximum SPL

borders on the dangerous: "It's easy to take it past a sensible limit because it's incredibly clean and the transients stay intact at very high levels. But if engineers use their heads there's a tremendous amount of new information in the upper mid range which has never had the chance to come through before."

In action

The result of all this, as unveiled at Glastonbury, was a startlingly small SR system. Just 18 pairs of *UHQ* cabinets a side, the core of the system,

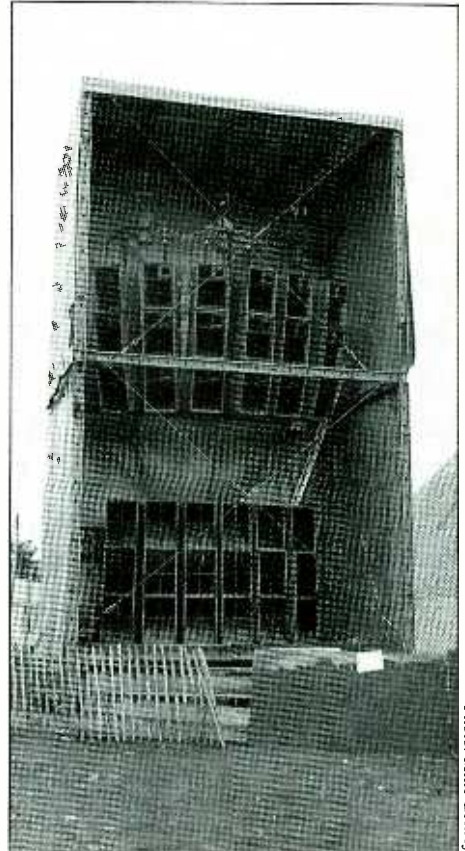


Photo: Mike Lethby

served where 36 *TMS-3*s has been used before. Each wing was flown using a newly-developed flying system from a steel framed tower specially built by Upfront.

To meet exceptionally stringent Environmental Health demands (which stipulated an almost ludicrous 93 dB_{Leq} at the desk) the arrays were angled hard down into the audience; likewise, no delay system was allowed. Yet although the FOH engineers, aided by John Newsham, used the *UHQ*'s transient capabilities to hit 106 dB peaks without busting that tough average allowance, it's a fact that the restrictions curtailed festival-goers' enjoyment of the music they came (and paid £38) to hear. At Denmark's Roskilde Festival a week later, a limit of 110 dB at the desk allowed far better exploitation of the system's dynamics.

Flashlight has yet to move into full production. The Glastonbury system—virtually a pre-production item, hand built at Turbosound's R&D unit—was swiftly moved on by production company Britannia Row to the Roskilde Festival, stadium shows in Milan and Roger Waters' *The Wall* extravaganza in Berlin.

But *UHQ* is without doubt a radical and single-minded development in PA design. Its potential impact on the sound reinforcement industry is indefinable: an intriguing question to which more widespread exposure in the coming months should provide an answer. □

Do You Know these terms?

Monitor — a reference loudspeaker system for the mixing and mastering of recorded music.

Standard — a reference from which qualitative judgements can be made.

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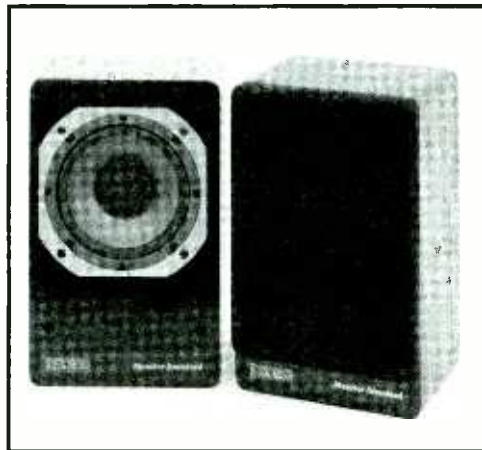
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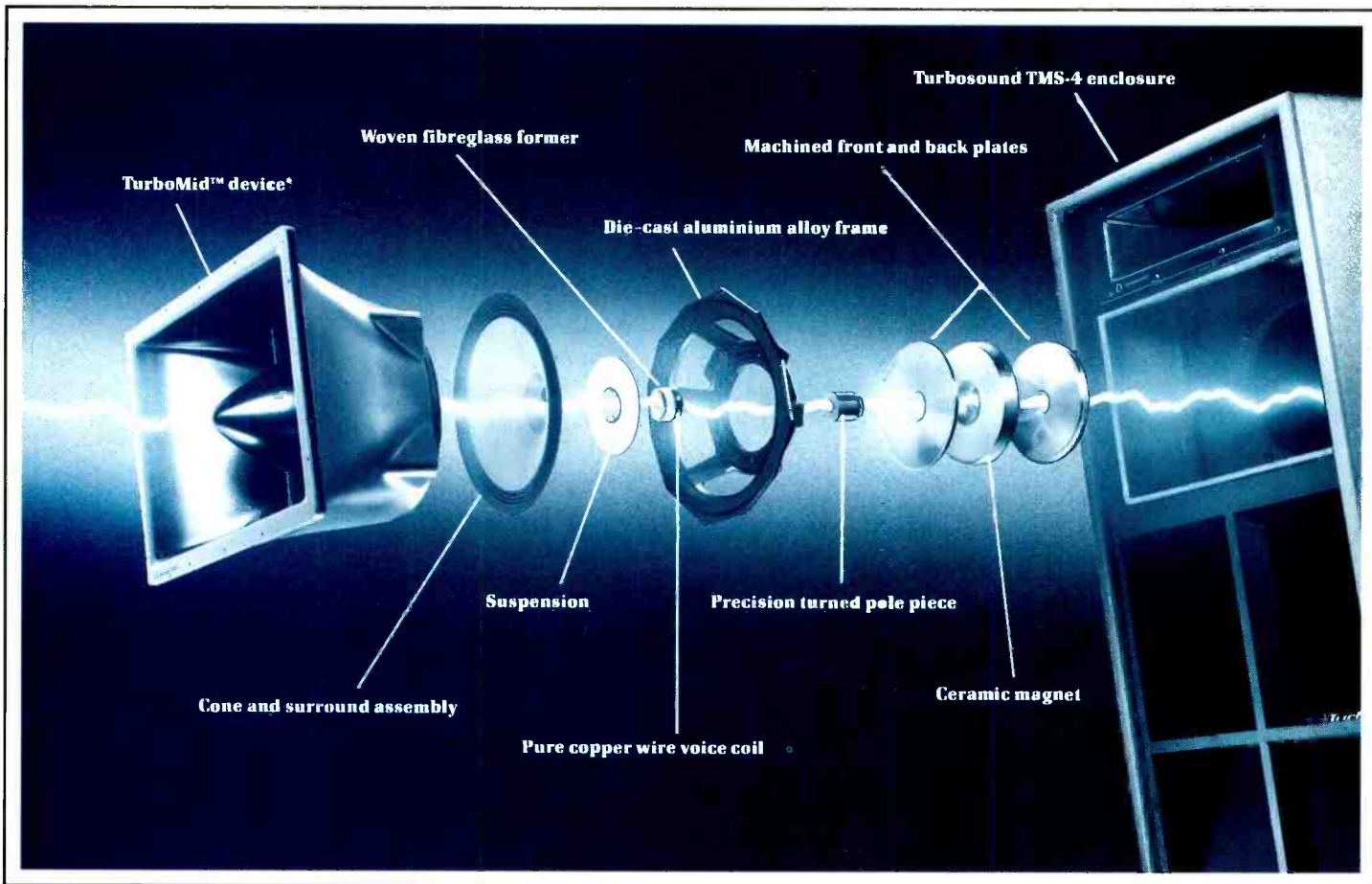
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*Turbosound Patent Information: Australia: 515, 535 Canada: 1,076,033 Japan: N1C3424/77 UK: 1,592,246 & 1,598,310 U.S.: 4,215,761 & RE 32,183 West Germany: P2742600/2 Other patents pending.

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STUDER A80 MkII N/B, auto/remote.	£12,750.00
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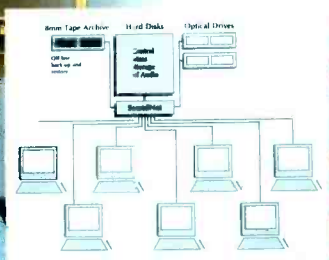
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Right Track Installs NYC's Largest Music Console

New York's Right Track Recording has installed the city's largest music mixing console - a 'winged' 80 channel SL 4000 G Series.

The desk was specified by leading producer Frank Filipetti and Chief Technical Engineer Robin Thomas for Right Track owner Simon Andrews. It includes several customised features, such as the 45 degree angled wings, designed to bring all channel modules and ancillary equipment within easy reach of the console operator. Right Track's console has 48 channels in the mainframe, with a further 16 modules in each wing.

Another feature of Right Track's console is the inclusion of both G Series EQ and the earlier Bell EQ. Both benefit from improved G Series electronics and sonic performance.

"SSL works extremely closely with its customers to fit the console configuration to their specific needs," says Filipetti. "It simply gives Right Track more flexibility to serve its different clients." The console also features the original SSL Raven Sparkle colour scheme.

Since the installation, Frank Filipetti has used the SL 4000 to record and mix a Carly Simon score for the Mike Nichols film *Postcards From The Edge*. It was also used by Filipetti to record and mix Carly Simon's forthcoming album *Happy Birthday*.



Hugh Padgham Welcomes G Series Options

▶ Hugh Padgham (left) and Sting pictured during recording of the new album at Studio Guillaume Tell, Paris



Producer Hugh Padgham has been working on a new Sting album over recent months. Much of the recording has taken place at Studio Guillaume Tell in Paris using their 56 channel SL 4000 console.

Once tracking is complete, the project will move to The Townhouse Studios in London for mixing. The Townhouse is equipped with three SSL consoles.

Hugh has long been an SSL fan. "I am very happy to hear that SSL can now provide G Series consoles with a choice of either their classic Bell EQ or G Series EQ - or even a mixture of both," he comments. "Particularly as both systems benefit from improved G Series electronics and G Series computer system."

Hugh has also used the Logic FX G384 Stereo Compressor on the Sting album. The Stereo Compressor uses the same circuitry as the G Series console Quad Compressor. "The compressor sounds great, particularly on drums," said Hugh.

Leading New York Studios Install G Series

Two of New York's most historic music recording centres - Electric Lady Studios and BMG Recording Studios - have recently installed SL 4000 G Series consoles.

Electric Lady, which was founded by Jimi Hendrix as his home recording base in 1969, has installed a 64 channel SL 4000 G Series console in its recently renovated Studio C. The console joins Studio B's SL 4056 E Series upgraded with G Series Studio Computer and Total Recall™.

Chief Engineer Dennis Alichwer is impressed by the new desk's performance: "Solid State Logic has console design and manufacturing down to a fine art, with advanced G Series technology and improved sound quality."

BMG Recording Studios - located on the site of the famous RCA Recording Studios - has installed a 56 channel SL 4000 G Series console, fitted with SSL G Series Studio Computer. "Many of our clients have shown a preference for SSL consoles, especially for mixing," explains Studio Manager, Hank Meyer.



▲ SL 4000 G Series console in the newly renovated Studio C, Electric Lady Studios, New York

Larrabee Sound Upgrades Oasis With G Series

Larrabee Sound is redesigning Oasis Studios in a \$2.5 million upgrade which includes the installation of two of the largest SL 4000 G Series consoles in North America.

Los Angeles-based Larrabee purchased Oasis recently from producer/composer Giorgio Moroder. The upgraded studio, which will be known as Larrabee North, is scheduled to open in early November.

The G Series desks were chosen as the focal point for the studio's two mixing rooms. Both feature the Real World Automated Send Matrix which provides four additional automated sends per channel.

The consoles - one with 80 channels and one with 72 channels - are also equipped with both G Series and the optional Bell EQ. This reflects a growing trend to choose the flexibility of both styles of SSL sound treatment.

Studio Owner Kevin Mills wants to ensure that the studio provides a complete recording and mixing environment. "We want to give it a modern, clean, sunny feel," says Mills.

According to Mills, the studio is also aimed at the post-production market, with resources and equipment chosen with a view to mixing to video and film.

▼ Producer Taavi Mote at one of Larrabee's SL 4000 G Series consoles



Sounds Interchange Expands With G Series



▲ (left to right) Gerry Eschweiler, SSL Canada, Les Bateman and Peter Mann

Toronto's largest full-service audio and video production and post-production facility is constructing an extension which is to feature a number of new SSL G Series consoles, plus a ScreenSound system.

The new Sounds Interchange building includes a four-studio facility. Sounds Interchange has decided to combine the most technologically advanced acoustic design with state-of-the-art audio and video equipment.

The SSL consoles - two 56 channel SL 4000s, a 64 channel SL 4000, and a 40 channel SL 4000 - all feature G Series EQ. A ScreenSound system was also chosen for use in the Foley/ADR room, because of its simplicity of operation.

Les Bateman, Director of Engineering at Sounds Interchange, comments, "We're planning on using ScreenSound in the Foley room with a G Series console. With ScreenSound's eight tracks, you can have eight different takes in line and in sync at once, and you can see what cuts aren't going to work before you even put them down."

According to Les Bateman and the facility's Acting Director Peter Mann, Sounds Interchange selected ScreenSound after a thorough investigation of competitive products. ScreenSound was found to be the easiest to operate and best laid out machine to meet their needs.

CBS Choose SL 6000 to Post 'Wheel of Fortune'

American television network CBS is installing two new SL 6000 G Series consoles for mixing work on popular US television dramas and quiz shows.

A 56 channel desk will be based in Studio 41 at CBS's television facility in Hollywood. Studio 41 is used for post-production of daytime dramas like *The Young and the Restless*.

The other console - a 56 channel SL 6000 G - will operate from

Studio 33, where game shows such as *Wheel of Fortune* and *Family Feud* are mixed.

"CBS is in the process of upgrading Studio 41," says Director of Audio/Video Engineering, Alan Hodgson. "Our investment in these SSL consoles reflects the seriousness of our commitment at CBS to high quality audio broadcasting."

SoundNet - World's First Digital Audio Network

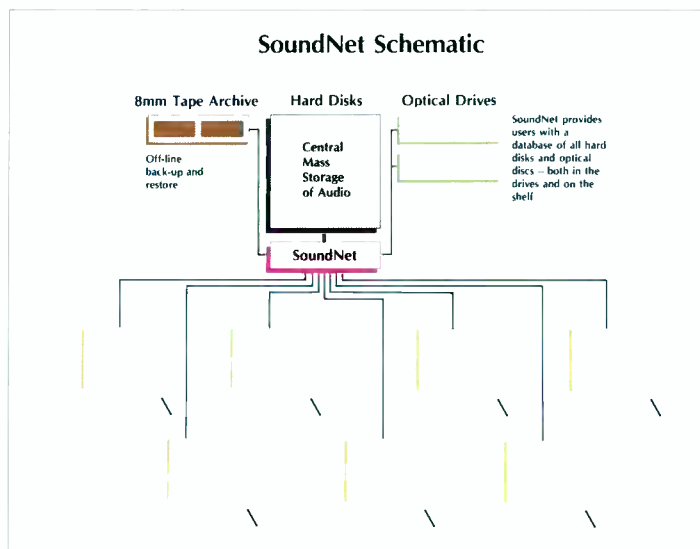
The world's first Digital Audio Network system, SoundNet, was unveiled at September's AES and IBC conventions. Designed to work in conjunction with ScreenSound, SoundNet allows up to seven operators to share and copy work without compromising system power and performance. SoundNet also provides central mass storage of audio and a database of all sound clips.

The announcement came only nine months after ScreenSound became commercially available, indicating the importance SSL is giving to the system's development.

"A commercial facility is wasting time and money every time it has to back up its work, with more wastage for the lengthy restore process later," says Chris Jenkins, SSL's Product Director. "It also loses the flexibility to reschedule work quickly. That means there has always been a trade-off between the efficiency of random access editing, and the downtime needed to archive projects."

SoundNet also adds several features that are entirely unique to the ScreenSound system. These include:

- **Distributed Projects** - The SoundNet Digital Audio Network allows up to seven ScreenSounds to share and copy work, without the need to download and upload projects
- **Central Mass Storage** - SoundNet provides central mass storage of audio and a database of all sound clips, including those on optical discs not currently in the drives. This means that dialogue, effects and music can be laid-up separately, but with each operator's contribution being transferable around the network. All users can also access audio from the central store and optical drives which they can then incorporate into their own part of the project.
- **System-Wide Audio Database** - All operators have immediate access to the same, central database of clips, avoiding the need for duplicated sound libraries. This database is system-wide, and audio can be located by keyword and combined keyword searches.



- **48 Hours of Hard Disk Storage** - SoundNet allows up to 16 SCSI devices to be resident on the system. System owners can select the devices most appropriate to their current activities. For example, one user might use only hard disk storage, allowing 48 hours of audio to be held for instant access and manipulation. Alternatively, there could be a combination of hard disk storage and optical drives.
- **Off-Line Back-Up and Restore** - All back-up and restoration of projects is performed as an off-line function, saving hours of machine and operator time.
- **56 Channel Playback** - A further function of SoundNet allows multiple ScreenSounds to slave to one master, providing an unprecedented 56 channels of either digital or analogue audio playback, enough for a feature film-size project.

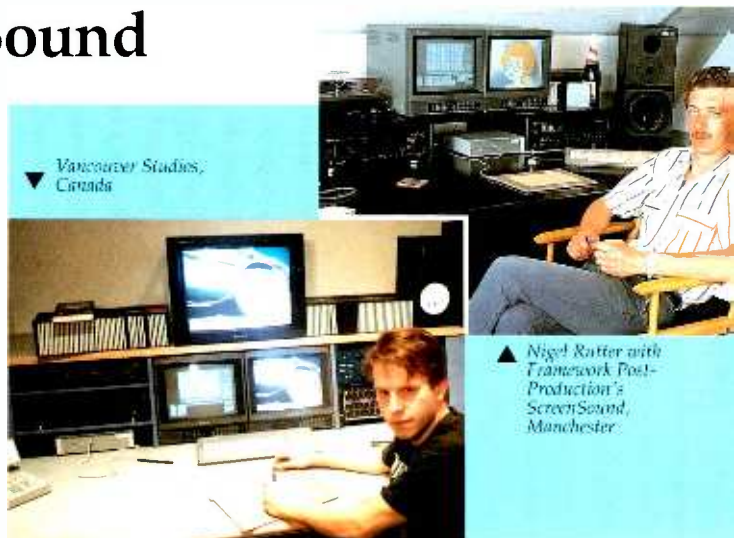
Rapid Growth For ScreenSound

Recent ScreenSound installations in Europe include Manchester-based Framework Post-Production and Fahrenheit 601 in Paris.

Framework was established by experienced film editor Nigel Rutter and provides a comprehensive off-line editing service, combining quality with cost-effectiveness and speed. As Rutter explains, ScreenSound was the ideal answer to his requirements. "I chose ScreenSound because I could understand it immediately. There is no fiddling around with timecode numbers - you just select a function and it is put into effect instantly. This is a valuable advantage from a client-relation point of view. If a client comes in to see work in progress, he can watch the results of edits as they happen."

Paris audio/video facility Fahrenheit 601 has also installed a ScreenSound system. Claude Pierre, Technical Manager, sees the purchase as a natural expansion of the facility's editing and post-production capabilities: "ScreenSound appealed to us because its digital processing and pen and tablet control surface fitted in with our video editing techniques. It is also extremely fast to learn and easy to use.

"I have been impressed by the colour graphics and clear screen displays, providing on-screen versions of familiar controls such as faders. I like the multitrack aspect of the system, and the ease with which fine adjustments can be made when mixing."



In North America, new ScreenSound facilities include Canada's Vancouver Studios. The studio is diversifying into post-production with the installation of two ScreenSound systems. Vancouver Studios has already won a contract for post-production work on a major television series, and ScreenSound will also be handling audio projects for the company's in-house production unit, West Coast Post.

ScreenSound Used For Wide Range of Audio Projects

ScreenSound's increasing popularity is reflected in the wide range of broadcast and post-production projects for which it is being used.

▼ ScreenSound at Producer's Color Service, Detroit



Advertisement Production

At Image Express and Producer's Color Service, the two Detroit facilities to boast ScreenSound systems, agency producer Craig MacGowen was able to assemble the soundtrack for Chevrolet's S-10 Blazer campaign. MacGowen works for the US advertising agency Lintas: Campbell-Ewald, and was responsible for Chevy's earlier award-winning *Heartbeat of America* campaign. For busy producers like MacGowen, ScreenSound's ease of use and convenience is a major advantage. "ScreenSound is the easiest to use - well thought out and laid out," he explains. "If you are dealing with advanced editors who are heavily into the electronic editing system, ScreenSound will become their right hand."

Other advertising projects to feature ScreenSound's recording, mixing and editing capabilities include short commercials for America's Great Western Bank and the California Lottery. Both are the work of new ScreenSound installation, Miller/Wishengrad of Hollywood. Miller/Wishengrad's ScreenSound has also been used for work on ads for Del Taco, DisneyLand and Shell Oil. It has even produced a radio ad for LA Gear.

Television Programme Production

The second series of David Lynch's popular US drama series *Twin Peaks* is going into production this autumn. To meet an extremely tight production schedule for the 13 episodes, music editor Lori L. Eschler is using ScreenSound for all the programme's music edits. The music is scored in New York and the tapes sent to Todd AO/Glen Glenn containing 'wild cues'. This leaves Lynch and Eschler tremendous room to experiment and work the music in with the picture.

"I liked the versatility of ScreenSound," says Eschler, whose previous experience includes work on the U2 film *Rattle and Hum*. Eschler has also used ScreenSound on the pilot *Class of Beverly Hills*. "If I want to repeat or create a loop it happens in seconds. I am also able to cut more versions."

Eschler has wired ScreenSound to operate from a pen and tablet situated on the dubbing stage to accommodate last minute changes. It is interfaced with a Sony nine-pin 3/4 inch video deck and a 1/4 inch Dolby-encoded two track audio recorder. "The combination has replaced a roomful of mags which was very

expensive and kind of a pain," says Eschler. "If I needed more of something, I had to go through the transfer process once again. Sometimes it took a couple of days. ScreenSound simply gives me and my director a lot more choices and at a much faster speed."

Television Music Editing

Perhaps the most ambitious music recording and post-production project for which ScreenSound has been used to date was the broadcast transmission of Liszt's *Hexameron*. This masterpiece, which features a 90-piece symphony orchestra and six dueling concert pianos, has only been performed four times in America and had not previously been recorded. However, this year the Houston Symphony Orchestra performed the piece in honour of conductor Christoph Eschenbach's 50th Birthday.

Houston digital recording specialists Digital Services were assigned the task of recording and post-producing this important concert. John McClure, the programme's audio producer, recorded the audio to Sony PCM 3324 digital multitrack and mixed it on Digital Services' SL 6000 E Series console, fitted with Total Recall™. The mixes were then recorded onto ScreenSound for editing, assembly and synchronisation to the edited video.

Digital Album Assembly

New York's Soundtrack Recording Studios - who recently purchased their second ScreenSound system - has used ScreenSound on projects ranging from albums to ads. Chief Engineer Bob Giammarco recently completed the 12" single from Jermaine Jackson's *Two Ships* album using the system. ScreenSound was brought in for vocal sampling, lining up percussion on different tracks and other editing functions.

UK Film Consoles Dub Major Film Projects

Goldcrest Facilities are installing 48 channel and 64 channel SL 5000 M Series consoles as part of the company's extensive studio modernisation at the historic Elstree Studio complex and Roger Cherrill's.

Elstree were able to specify their new console to include options which exactly answer the studios' requirements. Bill Rowe, Director of Post-Production at the facility, explains the importance of SSL's high level of user-specification in the selection of the SL 5000 M Series console: "For years we have been saying 'if only'. Now we can fulfil our ultimate requirements, knowing that the console has been designed and manufactured with our particular film dubbing needs and particular way of working in mind."

Barry Chatterington, Managing Director of Goldcrest Facilities, is also impressed by SSL's engineering excellence. "We were impressed by SSL's dexterity of design and their speed of operation," he says.

The console is configured to accommodate three operators, and features SSL G Series automation, joystick film panning and Moving Faders. It is also fitted with Instant Reset™.

Elstree's SL 5000 M Series is being used for dubbing on features such as the animated *Rock-a-Doodle* made by Sullivan Bluth whose last feature, *An American Tail*, received widespread acclaim. Other projects scheduled for work on the new console include Bernardo Bertolucci's latest film *The Sheltering Sky*. Bertolucci's last project *The Last Emperor* was also dubbed at Elstree and won an Oscar for Best Sound.



▲ SL 5000 M Series console will be used at Elstree Studios for dubbing Bernardo Bertolucci's latest film 'The Sheltering Sky'

Roger Cherrill's SL 5000 M Series film console has 48 channels and is a two-operator configuration. It will also be used for feature-length projects once it is operational. Recent projects undertaken at the facility include Michael Winner's new film *Bullseye*. *The Fool*, a film by Christine Edvard of *Little Dorrit* fame, will also be post-produced at Roger Cherrill's.

Swiss TV Choose Trio of SL 5000s

The Zürich headquarters of SRG (Swiss Television) currently operates a trio of SL 5000 M Series broadcast consoles to cover production and post-production work on a wide variety of programmes.

The largest of the consoles, a 56 channel SL 5000, is fitted with both Total Recall™ and Instant Reset™ computer systems. It is based in the facility's Studio 1, which handles major light entertainment productions. Studio 2 is equipped with a 40 channel SL 5000, also featuring Total Recall™ and Instant Reset™. The console is in use for work on weekly quiz shows and children's programmes, and is the most recently installed of the three desks. The smallest SL 5000 has 34 channels and again features Total Recall™ and Instant Reset™.

The studio in which it is based produces short programmes, often with a political or news emphasis.

Mike Broom, Head of Sound at SRG Zürich, comments on the installation of these three, highly specialised audio production systems: "When we started talking about the type of console we wanted, the most important requirement was for a Recall system. We also discussed the need for an assignable console. At the same time, we wanted to create a family of consoles that shared certain features, despite being used in different studios for different types of programming. With SSL, we were able to combine these elements, and SSL were the only manufacturer producing really good consoles with Recall. All three SL 5000 desks are now well established, and everybody is very happy with their operation."



▲ 56 channel SL 5000 M Series in Studio 1, SRG, Zürich



▲ 34 channel SL 5000 M Series in Studio 3



▲ 40 channel SL 5000 M Series in Studio 2

SL 5000s Fulfil Radio 2 Transmission Needs

BBC Radio 2 is installing three SL 5000 M Series consoles in a major modernisation of its Transmission Suites.

The consoles each have 28 channels and are fitted with SSL's proprietary Instant Reset™ computer system, enabling all switch settings on the cassettes to be stored and reset.

SSL was able to meet the BBC's highly specialised requirements for a Transmission Suite, where control is shared between a presenter and the technical operator. A unique Control Assignment system, using largely standard SL 5000 M Series components, has made this possible.

John Tidy, Project Leader of BBC Radio 2 Transmission Suites Scheme, says, "The modernisation of the Transmission Suites,

and the installation of the three SL 5000 M Series consoles will allow the Radio 2 Network to accommodate a wide range of radio presenters and broadcasters within one facility. We see this project as equipping us to handle all elements of the network's output well into the next decade."

Phil Hughes, Senior Producer with Radio 2 adds, "the key element in our choice of consoles was flexibility. We needed a user-friendly desk that was easy to get to grips with. Some of our presenters drive their own records, have guests on the show and operate the console themselves. Others have the support of a studio manager. We needed these desks to be able to cope with both types of programming."

BBC Launches New Radio Network



▲ 40 channel SL 5000 M Series console at BBC Radio 5 used for outside broadcasts, with (inset) the smaller 22 channel SL 5000 M Series

With the launch of the BBC's new radio network - Radio 5 - on August 27, two new SL 5000 M Series broadcast consoles were called upon to prove their operational ability.

The consoles had been transmitting programmes under internal, closed circuit conditions for several weeks. In addition, Radio 2's popular Saturday programme *Sport on 2* had also been broadcast from the purpose-built Radio 5 suite by the SSL consoles since August 11. *Sport on 2* (now *Sport on 5*) has been incorporated into the new network's schedule, which is focused around sport and education. The network's subject matter necessitates a large number of outside broadcasts and the transmission of live, 'one-off' events. The larger of the two desks, which has 40 channels, was specified to handle such complex outside broadcasts. The smaller console, fitted with 22 channels, has a more general-purpose role.

Simon Shute, General Manager Operations and Engineering, BBC Network Radio, is very satisfied with the installation and operation of the consoles: "Radio 5 found themselves with a very short lead-time up to the launch. It was therefore a great help to have properly installed and working consoles which gave us some breathing space and enabled us to ensure that everything would run smoothly on the day."

NRK Favours SL 5000 For Radio Drama Broadcasts

A year after installing its first SL 5000 M Series broadcast console, Norwegian Broadcasting Corporation NRK has placed an order for a 32 channel SL 5000.

NRK has over 50 years experience in the production of radio drama theatre. The new console will join the existing SL 5000 in the Oslo facility. It will be used for live stereo radio drama.

Sture Backe, Technical Leader of NRK's Radio Drama Group, is impressed with the SL 5000's performance, "The console is very easy to operate, and is therefore fast in fulfilling the operators' requirements. The fitting of SSL's Instant Reset™ computer system also contributes to the desk's speed. We are more than satisfied with the sound quality, including good filters and EQ, and Compressor/Limiter performance.

"Our new console will be based in the K24 drama control room in Oslo. It will be used for multitrack music recording and mixing as well as drama production."



▲ 32 channel SL 5000 M Series console at NRK (Norwegian Broadcasting Corporation), Oslo

APT Is Finalist In Prince of Wales Award

Audio Processing Technology (APT) has been selected as a finalist in this year's Prince of Wales Award for Innovation and Production.

The company was one of seven chosen from over 500 initial applicants for the award. All seven finalists for the award have appeared on a special BBC TV *Tomorrow's World* programme, featuring HRH The Prince of Wales in conversation with entrants.

The apt-X™ 100 system is a customised integrated circuit which can be incorporated into products such as turnkey satellite terminals and provides real-time compression and retrieval of audio data. apt-X™ 100 technology is currently integrated with equipment made by manufacturers including Long Island-based LNR and San Diego's ComStream Corporation. Sales of the apt-X™ 100 system have also been made in the UK, Japan, Australia and the Middle East.

Charlie Day, Operations Director of APT, is pleased with the

company's success in the award scheme so far, and is looking forward to the next stage of the selection process.

"Over the next two years, APT's commercial progress will be monitored. In that time we expect to launch products for cable and microwave links, and CD and solid state storage, in addition to the hardware currently being used for applications like satellite transmissions."



▲ Stephen Smyth, Technical Director APT (left) and Charlie Day, Operations Director APT, receiving the Finalist Certificate from HRH The Prince of Wales

SSL Milan Sees Steady Growth in Sales

Since establishing a sales and service office in Italy two years ago, SSL has seen a steady growth in SL 4000 Series users throughout the country.



▲ SL 4000 G Series console in Excalibur Studios, Milan

Nine SSL-equipped facilities based in Milan, Rome, Naples, Rimini and Bologna attract a wide variety of artists from Italy and Europe.

Excalibur Studios in Milan was the first Italian installation to introduce a G Series console, and played an important part in consolidating the success of G Series in the country.

Franco Santamaria, Manager and Co-owner of Excalibur, explains his reasons for choosing the 48 channel SL 4000 G Series desk: "When I started looking for a console for the studio, I realised that by installing G Series, I was getting the quality that has made SSL the world standard."

"Before I bought the SSL, freelance engineers coming into Excalibur would have to give up precious studio time to learn how to work the console and this did not help the smooth development of whatever project they were working on. Once the SL 4000 G was installed, they were able to get straight down to work."

"The console's computer system co-ordinates all the control room operations. If you want good EQ, there is good EQ right there on the desk, and there is no need for outboard noisegates, compressors or transport control."

SSL Japan Console Sales

SSL Japan continues to enjoy a high level of console orders from recording studios, OB mobiles and post-production facilities throughout the country. There are now over 140 SSL consoles installed in Japan.

Recent installations include 48 channel and 32 channel SL 4000 G Series consoles for Japanese broadcasting organisations NHK and TBS (Tokyo Broadcast Systems). Both consoles are to go into mobile units.

Eight recording studios have also purchased consoles. These include JVC Aoyama's eleventh SSL, Tokyo-based Sound Alive's second SSL, and Korean Seoul Recording's third SSL console. New clients include Mixers' Lab and Apollon, which is installing an SL 4072 G. Residential studio DJ Socks has purchased a 64 channel SL 4000 G. Other forthcoming installations are at M-bar Studio in Osaka and Yea Song in Seoul.

Imagica, Japan's largest film and video processing facility, and Media Town have both ordered SL 4000s.

SSL Japan's Summer Users' Meeting, held at Sound Inn Studios, reflected the success of recent console sales there. American producer Frank Filipetti was the guest engineer, demonstrating recording and mixing techniques using the studio's two SSL consoles. 40 SSL users attended this year's meeting, which was held over five days in July.

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A few years ago there were general worries being expressed over the number of, and variations on, audio recording formats being proposed and introduced. Despite our concerns many of these are now realities and the almost universal compatibility of audio tape formats has long gone. No longer does the uniqueness of a tape format seem any form of barrier to its introduction—the positive side of this being that some really useful products are now available for ‘niche’ areas. As long as the transport is itself transportable or, in the case of digital formats, there are also suitable interfaces available it is possible to use almost any recording format that suits us. With these technical provisos it would seem, at least for the present, that our swapping of compatibility for suitability is not so much of a hardship as we thought.

Analogue tape

Analogue tape shows no sign at all of falling out of use. On the multitrack front we have seen many recent installations of ‘cost effective’ machines such as the Studer A827 and the Otari MX series. It would seem that either for financial reasons or technical needs, there is an increasing demand for the more basic multitrack that may then be teamed with Dolby SR according to requirements. Against this trend it is worth noting the considerable number of 24-track machines that Saturn Electronics have sold in the UK and Europe. The 824 has memories for presets allowing storage of four different tape setups with differing tape speeds and EQ. There is also an optional auto-alignment facility.

Low cost multitracks new this year include the Tascam MSR-24 24-track on 1 inch (based around the transport used for the MSR-16 and including built-in dbx 1 noise reduction) and the Fostex G16 16-track on ½ inch machine that has an internal synchroniser allowing it to chase SMPTE from an external machine.

A quite different machine has been shown in prototype form by UK company Thompson Audio Developments in the form of the T24. This is a 2 inch 24-track using a transport without capstan or pinchroller. All control for the machine is via trackerball, keypad, function and transport keys. The metering is on a colour monitor together with all data displays. Information from the session can be stored to disk or printed while the full operation is under updatable software control. This is quite a radical departure from established design and we watch its development and quoted price of under £13,000 in the UK with interest.

Two new 2-tracks are worth mentioning—the Teac BR-20 and the Otari MTR-15. The BR-20 is a compact three-speed machine available in NAB, DIN and centre-track timecode versions. The Otari MTR-15 is available in both ¼ and ½ inch versions with a wide range of track variations including centre-track timecode. It also has the same auto-alignment system as the MTR-100A.

One last analogue point—32-track analogue is still bubbling under. Otari have a machine in the MX range and Tascam were showing a model in the ATR range at the NAB Convention in April of this year but nothing else has really been heard.

Digital formats

The fierce format battles that raged a few years ago have now calmed and it appears that the *status quo* is now divided between those who want



Tascam MSR-24

AUDIO RECORDING SYSTEMS

A round up of equipment and facilities that have been introduced over the last year



Nagra D

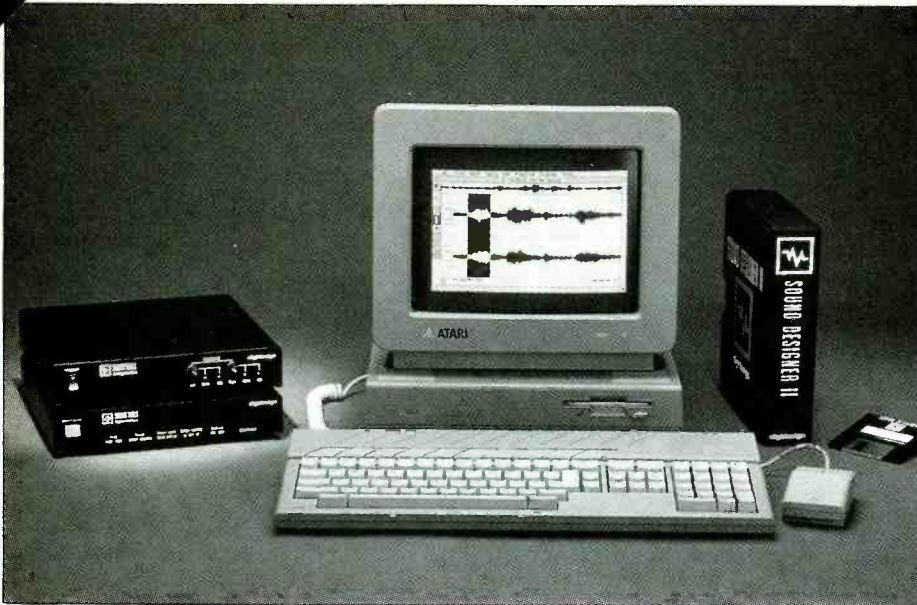
to work 32-track and those that prefer 24-track (or their multiples). On the DASH side, the Sony PCM3348 48-track is now an established option although the cost currently appears to be deterring a number of possible studios. Sony have also been joined in the multitrack market by the long awaited Studer D820-48 48-track that differs in certain features from the Sony but remains fully compatible otherwise. There have always been a large number of European studios that said they would refrain from investing in digital multitracks until they could see what Studer would offer. It will now be worth watching to see if there's a sudden rise in 48-track usage as a result. A third DASH format signatory, Tascam, launched its 24-track machine, the DA-800. This is a slightly more basic machine than the 3324 and this difference is reflected in the price. Mitsubishi have announced that all their digital machines are now shipped with Apogee filters

installed, which is a worthwhile move. Further, all their X-86 2-track machines are now fitted with digital interface (DIF-2) cards as standard allowing the bypassing of the internal A/D and D/A converters and the use of external units with greater numbers of bits. The X-86 can record and replay up to 20 bit recordings with the suitable converters. Mitsubishi's ProDigi partners Otari, have updated their digital 32-track now known as the DTR-900B. Improvements have been made in hardware and software and in particular the use of VSLI technology to reduce power consumption and improve reliability.

Two new formats have appeared this year as well. There had been much speculation about how Nagra would respond to digital audio and what would appear in response to portable DAT. The result is the Nagra D, a ¼ inch reel-to-reel format but with rotating heads in a case about the size of a Nagra IV. Four digital tracks are available plus one analogue and timecode. Word length is 20 bit with 4 bits of aux data and sampling at 48 kHz. One clear advantage is the ability to record 3 hours of 2-track on a 5 inch reel.

The other new format has come from Yamaha. Using a non-standard audio cassette that looks similar to DAT but is larger, they have developed an 8-track stationary head digital format that is part of the DMR8X combined mixer/recording system or as a rackmount standalone recorder in the form of the DRU8X. Playing time is 20 minutes at 48 kHz.

DAT has perhaps been the most active area of digital audio this year. Despite the fact that a standard for DAT timecode recording in the DAT subcode had yet to appear, considerable number of Fostex D20 timecode-capable machines find applications particularly in broadcast and post.



Digidesign's SoundTools for Atari



Panasonic SV-3700

Fostex say they will provide updates to allow all sold *D20* machines to meet the agreed timecode standard. In the meantime they have added a new remote controller and shown edit control software, *DES*, allowing basic editing functions on DAT.

The NAB saw the first showing of professional timecode-capable DAT from Sony, Panasonic and JVC. These were set up to be as close to the proposed IEC format as possible at that time although were not to be launched until the standard is fully implemented. The Sony machines are a range of three recorders, an edit controller and two remote command units. The *PCM-7010* is a broadcast-type machine with fader start, instant start and auto stop facilities with an optional timecode module. The *PCM-7030* is video orientated with facilities to support 9-pin serial control and chase-lock synchronisation. The top of the range is the *PCM-7050*, which can be under the control of the edit controller *RM-D7300*. There are also plans to launch an interface to allow the machines to be used as a source for editing on the *DAE-3000* digital editor but not capable of recording from it. The Panasonic machines are the *SV-3700* and the *SV-3900*. The *SV-3700* features a front panel shuttlewheel with 0.5 to 15x speed control, 44.1/48 kHz sampling selection, autofade in and out functions, and infra red remote control. The *SV-3900* is similar to the *3700* but has a full serial control interface allowing full remote control of transport and programming modes. The *SH-MK360* remote controller can control up to 32 similar machines on a control network.

Other DAT launches include machines from Stellavox, Teac and Aiwa. The *StellaDat* from Stellavox is a professional portable machine with particular emphasis on rugged construction and climatic resistance. It has mic mixing facilities, timecode capability, a wide range of digital interfaces, a software controlled interface for editing and is about the same size as Stellavox analogue portables. The Teac *DA-30* is the opposite type of machine being a rackmount studio-type and replacement for the *DA-50*. It includes an AES/EBU interface and co-axial digital I/O, 32/44.1/48 kHz sampling rates and a fully wired remote. The Aiwa *HDX1* is really a consumer machine but its attraction is its small size and a still quite acceptable level of performance for many applications. For professional use, however, it does have limitations in the version currently being marketed as they are equipped with SCMS copy prevention chips. This means that it will not be possible to make a digital copy of a recording made on this machine as the copy prevention system will flag up. All domestic machines will eventually carry this device and therefore restrict their suitability for pro-applications.

Disk-based systems

Although hard disk-based recording systems were initially seen as just that—recording systems—many current systems are placing more emphasis on signal processing and manipulation rather

than recording capability. Systems have also appeared in a wider range of prices and with dedicated applications areas. At the low cost end of the market there are systems such as Digidesign's *SoundTools* that has developed considerably over the last year. It has now been made available for the Atari *ST* series, which is a cheaper computer than the Apple *Mac* the *SoundTools* was originally designed for, so the overall cost has reduced. Another approach is the *Desktop Recording Board* from Digital Audio Labs, which is a basic 2-channel system with sampling rates of 32/44.1/48 kHz. The board requires an IBM *AT* or compatible computer and is just about the cheapest way into the whole business, although a good knowledge of software is probably needed.

Ease of use is another approach to system design and Alpha Audio stated that their *DR-2* 'was no more difficult to use than an analogue 2-track'. The *DR-2* can record up to 60 mins of 16 bit stereo audio at 44.1 or 48 kHz and uses 'tape recorder controls'—no computer interface. The unit is a 3U 19 inch rack unit and when placed under RS422 control emulates a Sony *BVU-800*. Another interesting interface is the *SSL ScreenSound* designed principally for working to picture. Originally shown as *HarrySound* in conjunction with Quantel, the system is now totally *SSL* using a screen, graphics tablet and cordless pen.

The system has developed considerably over the last year and *SSL* are about to add a networking system that will further add to its capability. The Digital Audio Research *SoundStation II* has also evolved considerably, adding 16-track ability as well as *WordFit* ADR and other facilities. *SoundStation* also has erasable magneto-optical disk back-up as an option and this will be seen increasingly on other machines.

WaveFrame now have recording capability in the *AudioFrame* system. This had been present previously but only for internal use, ie samples, etc. The *DRM* disk recording modules can be added in blocks of four channels and are capable of running at 24 bit feeding of the 24 bit bus system. WaveFrame also launched the *CyberFrame*, which is a record and manipulation system designed just for film post applications. The system emulates the traditional way of working in film post but allows far greater flexibility particularly in the area of looping.

Lexicon have introduced a variant on the *Opus* system in the form of the *Opus/e*, which has all the editing and recording capabilities of the full *Opus* but without the mixing and signal processing capabilities. Physically it is much smaller and can operate as an independent system or in conjunction with a full *Opus*. It is also possible to upgrade to a full *Opus*. The *Opus* itself has also had new software added and included are changes to the recorder interface to allow manual record in/out as well as auto record against timecode.

A totally new system was introduced by Digital Dynamics—a system variable in size from 4 to 64-track. Control is through an Apple *Mac* with the screen displaying transport, level and editing information.

The Steinberg *Topaz* hard disk system is now becoming available but in an interesting move during the APRS exhibition, Mitsubishi announced that it would be distributing it as the *Diamond* workstation in the UK and Ireland. They also intimated further developments that would allow closer working with their digital tape machines.

Following the acquisition of *IMS* by Studer and

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Fougerolle's Melody hard disk system

the formation of Studer Editech, several new products have been added to the *Dyaxis*. The *Dyaxis 2+2* is a 2-channel record/4-channel playback system radio, music and post applications. The *Dyaxis* now has a system synchroniser to sync against a wide variety of external sources, DAT back-up systems, a Time Scaling option allowing alterations in programme length and additions in the optional storage capacity available.

Hybrid Arts have released new software and hardware for the *ADAP II* hard disk recording system including a low cost digital interface, an erasable optical disk option and enhanced editing software.

A number of developments have come from European manufacturers. Publison have a 4-track hard disk recorder known as the *Infernal Workstation 4000*. The design is for separate ins/outs and separate tracks as a tape machine. Hard disk options allow for storage of up to 20 hours in 2, 3 or 4 hour sections with back-up on Video 8 cassette or erasable optical disk. Fougerolle have a new system by the name of *Melody*, a hard disk system with particular emphasis on broadcast and post applications. Controls are set out as traditional tape transports. In the broadcast mode the system can act as four separate cart machines while in post use it locks to external reference. Coach Audio Sales have a rather different system in the form of the *DI.REC.T 32* modular hard disk system. It uses 8-track disk modules with 12.5 min recording time per track allowing up to 32-track use. It can also function in a smaller track arrangement with greater recording time. It has full digital interfaces for most formats and features a compact controller with a track ball and dedicated

transport buttons.

Another new name to hard disk recording is US company Turtle Beach with their low cost 2-track system, the 56K Digital Recording System, which uses an IBM AT or 386 compatible computer. The user can buy the interface boxes and component parts of the system to meet his needs while the system can operate mono or stereo at sampling rates of up to 48 kHz.

Audio Design's *SoundMaestro* hard disk/editing system has continued development. Of particular interest is the stereo programme editor with graphic waveform display and realtime EQ, compression and reverb. It has a full range of digital interfaces with DAT back-up.

Last, but not least, come two of the larger names in this market

area, AMS and NED. AMS have now gone into production with the *Logic 1* digital console, which functions with the *AudioFile* and offers a 'logical' way of processing audio on a more traditional looking mixer rather than within the *AudioFile* control surface itself. *AudioFile* is now upgraded to *AudioFile Plus* with the introduction of transputer technology. This means that the system is now faster with eight simultaneous inputs and 16 outputs. Optical drives are also being integrated within the system.

NED have added many new products this year but the principal addition is the *PostPro SD* workstation. This is a 24-track hard disk recorder with a *Synclavier* Sound Design module integrated within the system. This allows signal manipulation and processing on a musically creative scale as well as the standard *PostPro* features. NED are also about to start the launch of third party software—software for their products developed by external developers, the first of which will be the *Sound Droid* software package from LucasFilm. This will be followed by *DSP* systems that will continue to integrate the production process within the system.

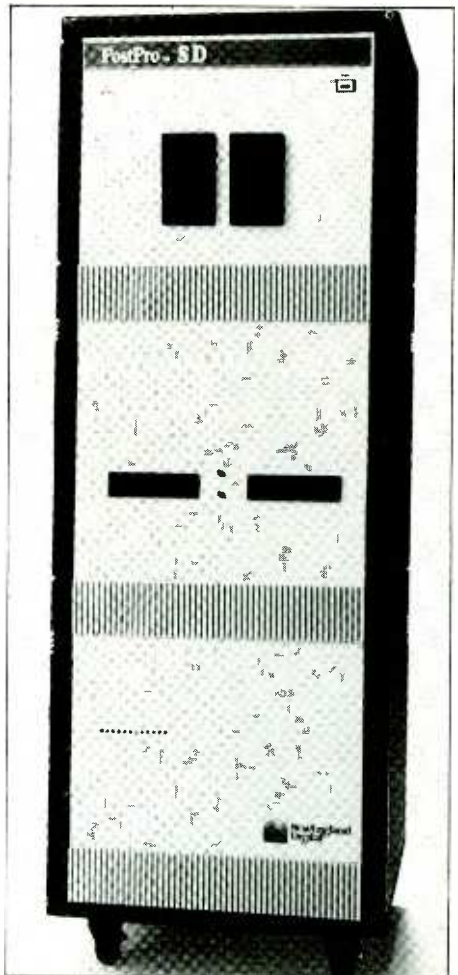
Other systems

The AKG *DSE 7000* RAM workstation is now in production and, for those working on short pieces of audio, is fast and easy to use. The complete system now includes a non-interruptable power supply and a hard disk option for loading to and from.

One of the most talked about new products of the year must be the Akai *DD1000*. This is a compact recording/editing machine that uses

magneto-optical erasable disks. Recording time is about 30 min per side parallel and series disk operation is possible to expand tracks and recording time. The system will record two tracks at a time and can replay four tracks. The interest is in the ability to remove the recording media and hence the lack of up and down load time. The machine has different operating modes dependent on the type of work—mastering, post or composition—and is about to become available at a quite attractive price.

Finally, in the area of audio recording, we must mention two solid state recorders that have become available. These are marketed as 'layoff recorders' to meet the need to layoff audio from a VTR when editing the picture so it is possible to make a crossfade at the picture edit point. The Bel *BDE-6000* is a 1U rackmount unit with expandable memory. The other machine is the



PostPro SD workstation processor from NED

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Klark-Teknik *DN735* that, with additional memory, can offer up to 175 sec of stereo audio. Both units read timecode and lock to external reference. Whether these two units are just a useful fix-it for a specialised application or are the start of a solid state recording movement is open for discussion. They are not really samplers but recorders and my guess is that they may find further useful application working in collaboration with digital multitracks offering some of the facilities that are present in disk-based systems creating a hybrid mixed-medium system that allows track time-slipping and spinning-in from solid state memory. The prospect of such possibilities when further linked with a hard disk editing system and DSP signal processing suggests a very exciting future. □

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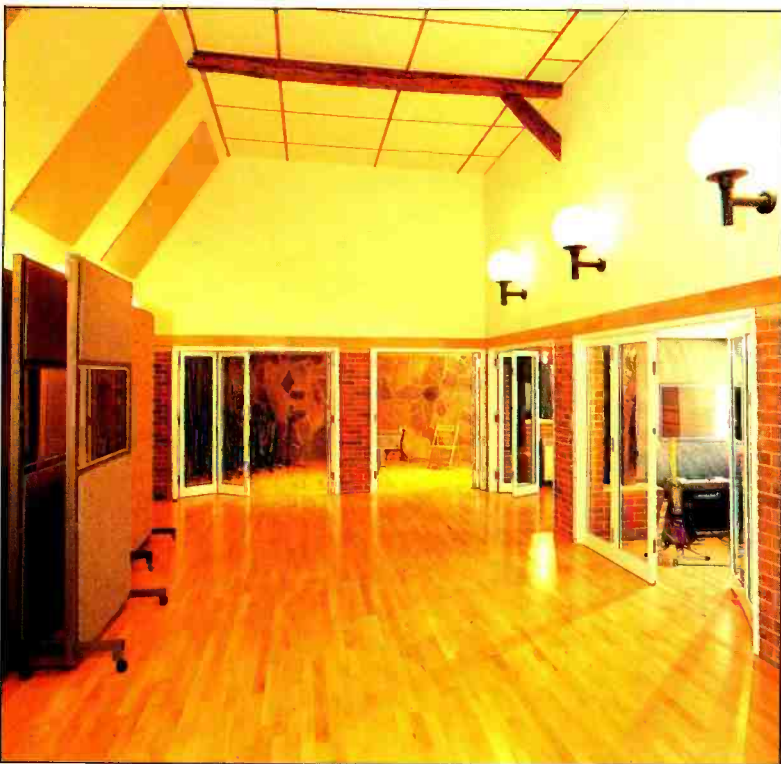
The C426B Comb. represents the next logical step in the development of a legend amongst professional microphones, the C422, which itself is derived from an earlier microphone that set new recording standards, the C24.

The operating principles of the C426B remain the same - two twin diaphragm condenser capsules which rotate for MS and XY stereo recording, each with individually selectable polar patterns from a remote control unit. But as engineering standards have developed, so has every aspect of the C426B design, which now offers ultra low self noise operation, in-built electronics for the digital age, and a host of physical operating features which make it ideal for busy recording studios.

You might think it presumptuous for us to predict a future legend, but with the success of its forerunners, the C426B exemplifies the best.



AKG Acoustics Ltd., Vienna Court, Lammas Road,
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Facsimile: (048 68) 28967.
Telex: 859013 AKGMIC G.



PARKGATES

Bob Stokoe visits a newly refurbished and reopened UK studio

Catsfield may be another small village you find sitting in open countryside 12 miles or so from the English coast where day trippers stop and look at country life on their way from London but what better setting than this for a recording studio.

Dan Priest moved on, along with partner Eric Hine from Magritte Studio in West London. Magritte was quite simply the ground floor of Priest's Victorian home on the outer perimeters of Heathrow airport. Magritte, who had their own production company and worked with major recording companies, grew and being 48-track, brought in clients such as Gary Moore and Nik Kershaw. But with the amount of studios to be found in and around the London area, Priest decided it was the perfect time for a move as studios like Magritte couldn't continue to attract top clients.

At this time Parkgates was on the market and at first glance appeared to be the perfect situation for what Priest had in mind but an imperfect history could have given anyone doubts. At better times in its history, Parkgates clients included the likes of Def Leppard, Cheap Trick, Roger Daltrey, Level 42 and Paul McCartney but in the latter part of the '80s financial problems became too much and the studio was forced to close. In order to clear outstanding debts after only 9 years of operation the place was completely cannibalised. Everything was sold; every piece of equipment (naturally), the acoustic cladding was taken from

the walls, acoustic flooring was ripped up, the double glazing was removed, air conditioning taken out, even the wiring went. Everything.

Before Priest could start work on the studio he had two problems to solve: The Parish Council and the Department of the Environment. For the last 9 years Parkgates had been operating as a commercial residential recording studio without permission but after months of giving assurances to both parties, full commercial planning permission was granted in September 1989.

With Parkgates being an old Sussex farm, extensive work had to be carried out to the acoustics. The present control room is an adjoining barn, which has one straight wall facing an angled wall, so another brick room has been constructed inside the original shell which is totally isolated from the existing building. Inside that is another 'inner shell' this one manufactured of wood, the room being a wooden box completely floating on rubber mountings. Tests have proved it virtually impossible to detect any noise or vibration from the outside.

The stone live room was originally designed for the previous owner by Sam Toyoshima, though after some thought it was decided to carry out some modifications. Terry Ottley and Steve Quinn, who work mainly for Eastlake, worked independently for Priest. Being specialist builders they have worked on many Toyoshima studios in the past. Newly restored beams support the blue slate clad roof, which soars some 25 ft above the 1200 ft² floor space, the ceiling has been raised by 15 ft and treated acoustically in much the same way as the control room. A glass-fronted booth stretches the full width of the studio and is spacious enough for any size kit or the studio's Bechstein grand piano, two further glass-fronted booths run the full length of the studio and are lit naturally by daylight.

As Priest puts it, "Having that much height gives you all the ambience of the acoustic instrument, like drums. Drums sound automatically great in a big room; drummers love playing in a room like that with the sound of their drums coming back to them. It's preferable to being in a booth although we have the facility to booth the room six different ways."

That gives you the option of having six or eight people playing in the same room at the same time with virtually complete separation. All the options are there, the best being to capture the 'live' atmosphere in a studio, with all the musicians being able to work in the room at the same time.

Priest: "We would like to point the studio in a direction where performance can count for something, particularly as we have so much space. We have a recording environment where performance can be that magic ingredient, the feel that adds to a group's identity."

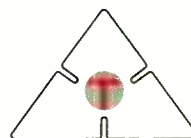
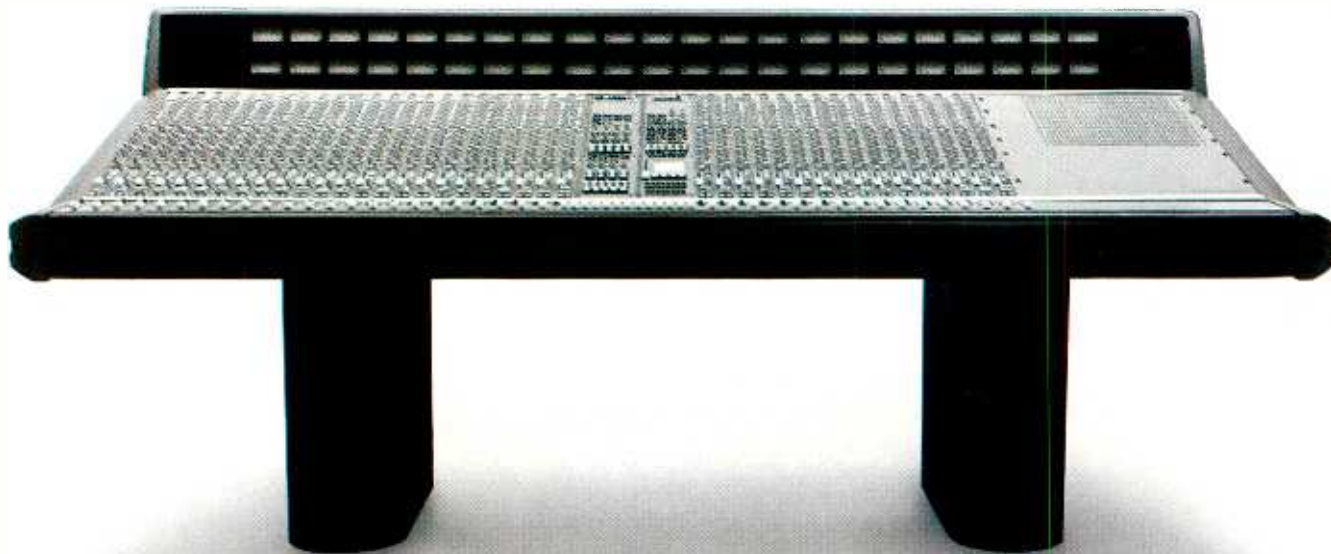


Technology Embraces Art.

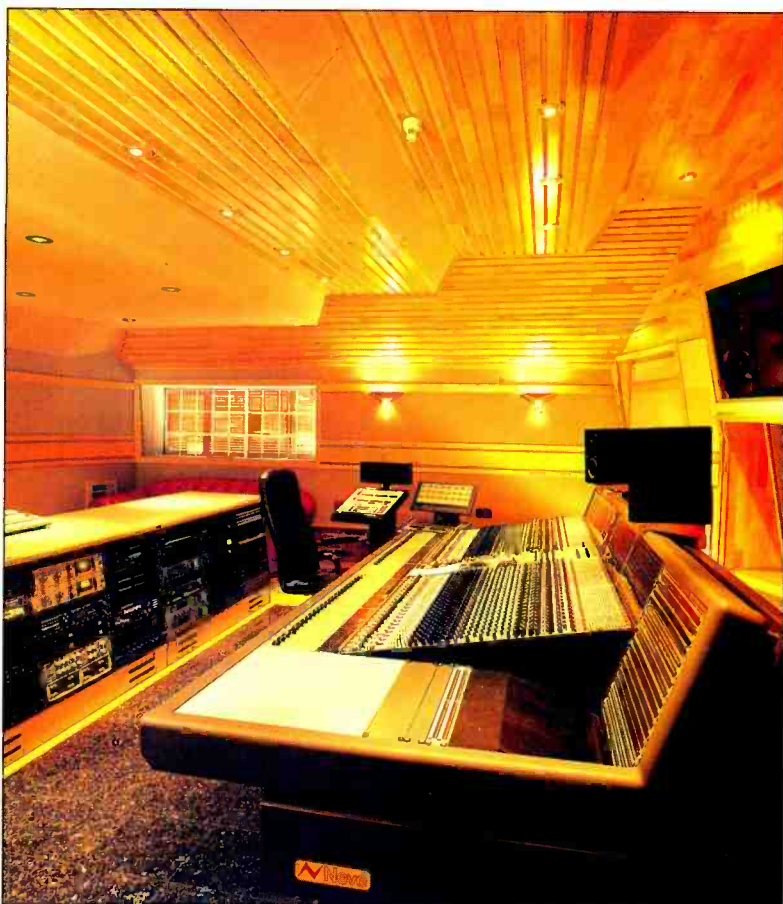
There was a time when these words were seldom used together. The disciplines necessary to produce *art* had little patience for technology. *Today* the union is prerequisite. With this fusion in mind, Trident engineers set out to combine vintage sonics with adaptable studio integration and control.

The Vector 432 in-line console. Featuring balanced bussing, 32 groups, 4 stereo mix busses, 4 band equalizer splittable between channel and monitor and 8 auxiliary send busses. The 16 mute groups, fader automation, and multiple machine control are all accessible from our Central Command Panel.

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TRIDENT



Otley and Quinn have also remodelled the 600 ft² control room, the angular, stepped roof with panelled beech fascia is bright and spacious and aesthetically appealing. As in the playing area low voltage halogen lighting illuminates the control room wall.

A Neve V3 48-channel console sits at the front of the control room. Priest's choice of the Neve was not too difficult. He has gone on record as stating he was quite tempted to use the Trident *Dr-An* though: "At the moment it is hard to find a better board than the Neve." The only thing missing from the board is the recall facility but at the price difference between the V and the VR series, Priest believes the desk Parkgates have purchased is more than sufficient."

Choosing the Genelec 1035A monitors on the other hand, was not an easy decision to make. Priest had heard them a few times in a London studio but he was to take some convincing, especially as he was used to working with a horn loaded system. The Genelecs are of a soft dome design.

He took the Finnish manufacturers up on a one month in-situ trial and was overwhelmed by the monitors at the end of the first week. Priest is sure they will stay here as long as he does.

The installation of the Genelecs is no straightforward task, the fact that they have a sophisticated computer controlled system prompted Priest to contact Genelec to ask them to come across and set them up. The positioning of the monitors was not made any easier by the fact that each monitor weighs over 310 kg. The final proof was Priest's own ear, as he puts it: "Musicians like to hear on monitors what they actually sound like. In some studios you can stand in one place and hear a sound, you move

across the room and hear a different sound. Not here, we believe with the Genelecs wherever you stand the sound is fairly consistent."

Priest's first thought was of going 48-track but instead went for a Mitsubishi X850 32-track digital, which he feels is fairly appropriate to the recording climate in the UK at the present time. Alongside this he has gone for a Saturn 824 24-track analogue recorder. At first all concerned at Parkgates held some reservations. Priest himself had been happy with a 24-track Soundcraft until then but Saturn supplied the machine and everyone in the studio has been delighted, although, Priest states, "If a customer wants something different we will, of course, hire in whatever machine they want but I have worked with almost every machine there is and I think the Saturn 824, with the combination of the new auto-alignment software, head design and circuitry, make it a very formidable analogue recorder."

Every piece of rack equipment is MIDI compatible and Parkgates are one of the few studios with a MIDI patchbay, so if you need to control any of the rack equipment—reverb, DDLs, anything that is MIDI assignable—you do it all on the keyboard although it is not for the fainthearted to start controlling reverb settings from a keyboard, especially in a situation such as this when you have 10 reverbs in total.

Priest has been contemplating the addition of a MIDI programming suite although no one has asked for one yet. The majority of bands, however, have already done any programming they require before they go into the studio and as Parkgates have the facility to convert SMPTE to MIDI, studio time can be used in other ways.

In the days before Priest came to Parkgates accommodation was minimal compared with the newly extended facilities now completed. To one side there are 10 en-suite bedrooms, a large barn-style double garage has been converted into four more en-suite rooms with a covered verandah which travels its full length and two separate cottages stand apart from the main building each with their own entrance.

The 'producer's cottage' has two larger sized bedrooms and a bathroom. At one time this cottage was joined to the main building but during the recent renovations it has been blocked off giving this part of the complex more privacy.

The main cottage, which is in the same block as the studio is a self-contained two-bedroomed unit. Behind the control room is a large band room, which houses TVs, pool table and lounging chairs, all adding to the feeling of spaciousness. All the units have retained the character of the old farmhouse which Parkgates was until mid-1970. The food, served in the large barn-roofed dining room is prepared by the studio chef Mark who spent quite a while preparing dishes in some of the UK's better hotels, a separate side kitchen enables anyone to 'help themselves'.

All this has been put together since September 1989. Work on the control room started in November and was completed by Christmas (8 weeks). Rebuild, installation of equipment and all rewiring.

Everything has happened very quickly and bands have been making enquiries since the studio re-opened. At first Danny Thompson from Island was in to do a couple of jazz albums. He was followed almost immediately by The Fields of Nephilim who were recording and mixing down. At the time of writing Phil Brown is doing the engineering but no decision has been made on whether to employ a resident engineer.

Over the last 10 months no one has been more busy than Pippa Keates-Williams, the studio manager, who has had to oversee the delivery of everything from handbasins to acoustic panelling, making sure that everyone is OK, and working closely with Priest towards the opening time. But Pippa assures me it is a nice return as she was studio manager here before its closure. The added bonus for Pippa is working with her husband, chef Mark.

At the present there is still a queue of bands making enquiries at Parkgates, with 1990 being fully booked and much of next year being on hold it is promising to say the least, especially in a climate where London-based studios are having to reduce their rates by anything up to 40% just to get the bands in.

Parkgates Studio, Catsfield, Battle, East Sussex TN33 9DT, UK. Tel: 04246 4088/4810. Fax: 04246 4088.

Equipment list

Console: Neve V3 48-channel

Tape machines: Mitsubishi X850 digital 32-channel; Saturn 824 24-track analogue; 2 Sony DAT; TimeLine Lynx SMPTE sync

Monitoring: Genelec 1035A main studio monitors; Acoustic Energy AE1 and Yamaha NS10 nearfield monitors

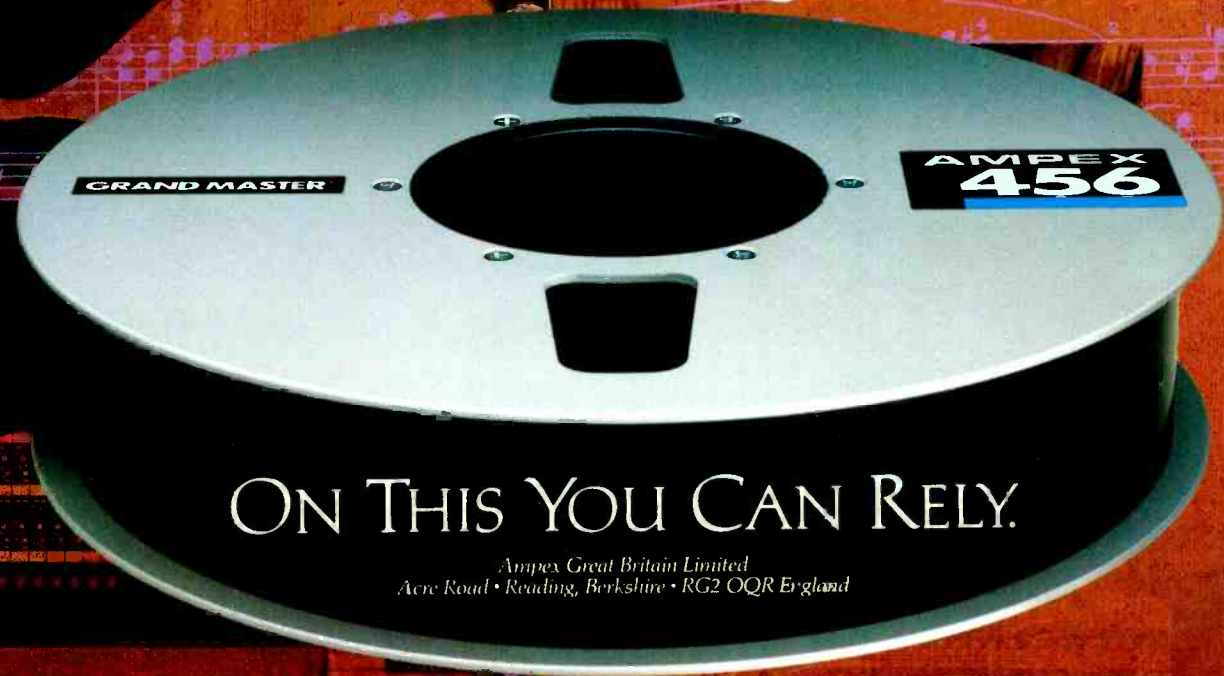
Outboard: EMT, Lexicon, Yamaha reverb; UREI, Drawmer, Trident, Orban comp/limiters; AMS, Bel, Eventide DDLs; graphic and valve (tube) equalisation

Microphones: Neumann (inc valve), Sennheiser, AKG, Electro-Voice, Schoeps, Shure

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WURLITZER RISING TO THE OCCASION

When Wurlitzer organ fan Roy Richards had problems making his own Wurlitzer heard, the choice was an expensive room extension or an effective sound reinforcement system. Mike Lethby reports

The Wurlitzer organ is no ordinary instrument. And Roy Richards' National Motorcycle Museum complex in Birmingham—where an historic Wurlitzer has lovingly been brought back to life—is certainly no ordinary venue.

For Richards is a self-made millionaire with a dream. The fruits of his successful plant hire business created the Motorcycle Museum, purpose-

built to house a wonderful and internationally unique collection of classic bikes. This altruistic venture is financially supported by an adjacent complex of function rooms—their commercial future assured by a well-chosen location next to the fast expanding National Exhibition Centre.

The centrepiece of the largest room, a luxuriously appointed conference and banqueting suite capable of seating 1,500 people, is a

magnificently restored Wurlitzer organ, originally built for a Los Angeles movie theatre. But matching the vintage organ's sound to this thoroughly modern room swiftly turned out to be a daunting task.

In 1988, Britannia Row Productions in London became the third sound company to take up the challenge. The subsequent story, as outlined by Steve Spencer—their man in charge of the project—makes unusual and interesting reading.

A venue and its problems

The multi-function suite, built one floor below ground level, measures roughly 160 ft long and 60 ft wide but just 16 ft high from monogrammed carpet to pale cream ceiling.

Richards, a long-time Wurlitzer fan, seized the opportunity to install a prime specimen in the suite on learning of its existence in a Los Angeles storeroom. Alas, says Spencer, this happy acquisition led to the discovery that the room “wasn't acoustically very clever for a Wurlitzer”, even though its design had been altered to provide a large backstage area for the organ.

Spencer: “The room is used for anything from dinner/dances to concerts and conferences. When we arrived, they already had extensive lighting and facilities for video and film; and they'd gone through two sound systems that hadn't worked out.”

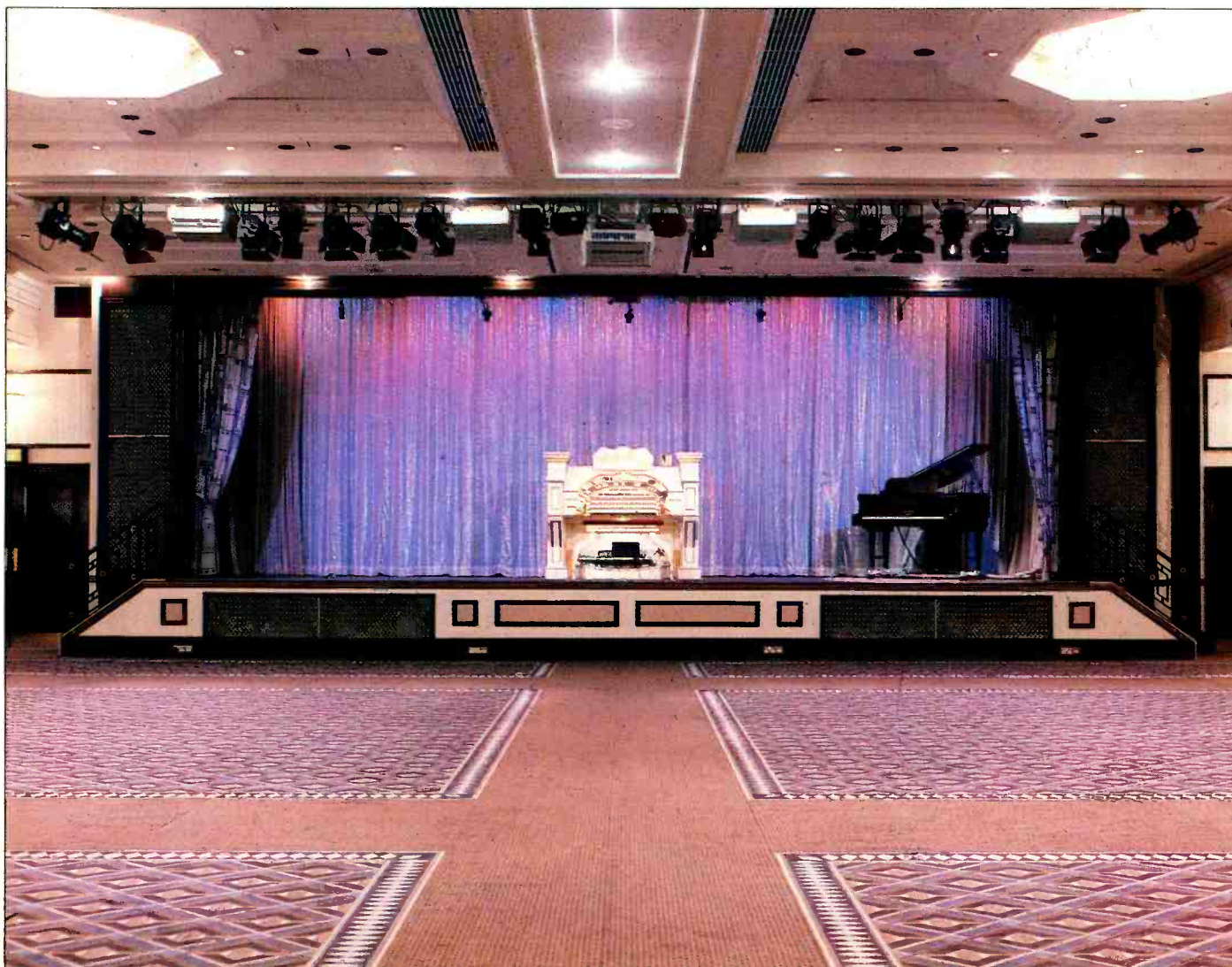


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The root of the problem lay in the nature of the Wurlitzer. The sound from its compressor-driven pipes, enclosed in a chamber, exits through an array of pneumatically-controlled vertical slats behind the stage.

In the original movie houses these slats were usually high up, allowing the sound to roll under the roof creating a mellow, reverberant sound and designed to exploit the resonant acoustics of huge silent movie theatres and ballrooms. For example, the other famous UK Wurlitzer installation (at the Blackpool Tower) enjoys a high ceiling and polished floor, which provide plenty of natural reinforcement.

Spencer: "There's very little resonance in the room structure; it's very solid and well damped. So the sound from the audience's point of view is extremely dry—great for conferences because the vocal articulation is very good. But on stage there's quite a long delay slapback from the rear wall.

"The crucial thing to appreciate about these organs is they were designed to work with no obstructions to the room they're in. But here there was a deep proscenium arch, which immediately restricted the organ's natural sound. The net effect of this together with the room acoustics was that the sound simply didn't project far enough.

"Altering the room itself would have been pretty difficult. At one stage Roy was prepared to raise the ceiling, which would have been enormously expensive—there are other rooms above it—though it shows how dedicated he is. A lot of money had been spent on fittings and decoration, so we felt that to start again was out of the question.

"I knew we could deal with it, because that's exactly what we have to do when we're working live—so we promised to make it work with technology rather than wholesale rebuilding. And that's what we did."

Besides Richards, the other people most closely concerned in the installation's progress are Keith Tomlin, resident organist and 'custodian', Wirral-based organ builders Keith Ledson who tune and maintain it, and Tim Martin head of sound at the complex.

Out of the silent age

The mighty Wurlitzer makes an impressive sight. The console, a '20s fantasy in cream and gold surmounted by a huge, carved gilded logo, sports two vast banks of voice tabs and stops that curve gracefully around three keyboard tiers.

Keith Tomlin, recalls its origins:

"The Wurlitzer came about when theatre owners decided they couldn't or wouldn't pay for a full orchestra or dance band but they didn't just want someone playing a piano. It was called the 'Unit Orchestra' and it was designed to maintain rhythm and tempo, hence the snappy reed sounds and percussion.

"Although every organ was tailor-made, Wurlitzer always followed a standard layout. When they were running in the '20s and '30s, they carried out the installations themselves, with each part numbered to make it simple to assemble on site, and specified the chamber designs to the theatres."

At your disposal are three manuals, each controlling its own array of voices, and an octave of bass footpedals. Flicking through the large and elegant cream tab switches invokes an array of

servo-mechanically triggered acoustic instruments and sound effects, originally designed to add spice to silent movies—a sort of wind-driven MIDI master keyboard, just 50 years before its time.

These control a specially-adapted Cramer Grand 'player piano' and backstage tonal percussion instruments including glockenspiel, xylophone, marimba and tubular bells. There's also a drum kit and percussion set comprising bass, snare, cymbals, triangles and castanets; plus a range of effects from chimes and sleigh bells to a train hooter and ship's siren—all cued from the console.

Well travelled

Richards' pride and joy is a classic, the biggest example in Europe and according to Tomlin has the UK Amateur Organ Society's members clamouring for a go on its gleaming ivories.

Tomlin: "It has a colourful history. It was made for the United Artists Theater in LA, down the



Huge LF pipes towering to the ceiling on the 'Bass' side

road from Hollywood, so it was a flagship for Wurlitzer. In the 1950s Buddy Cole, Bing Crosby's musical director, a real organ enthusiast, installed it at his home and experimented to create what he called his ideal organ. When he died, his widow sold it to a pizza parlour; they went bust and it was put into storage.

"When Roy Richards first planned the suite he didn't have the organ in mind. So in 1985, once he and the museum's trustees had decided to buy a Wurlitzer, they modified the room and stage plans.

"We supervised the packing ourselves and shipping went smoothly from Portland, Oregon, via the Gulf of Mexico and across the Atlantic to Folkestone, only to find that when it got to the container base in Birmingham, customs insisted on checking every single part for drugs. There's thousands of parts—it took forever!

"But it was all installed according to plan; we laid it out in the organ builders' factory then erected it on site. And it was first played in November 1988."

As to its value, Tomlin explained that a price of £1,500 to £2,000 per rank is common. This one has 27 ranks, plus the console and some £15,000 worth of relays and it's currently insured for

£¼ million—though no amount of insurance could ever procure a genuine replacement in the event of disaster.

Tomlin: "It's like steam railways versus electric; if you're into it, that's it. You enjoy it because of what it is. You couldn't possibly sample it and capture all its resonance, the clatters and bangs of vents, the wind noise in the background; they're an intrinsic part of what a Wurlitzer is. The only modern concession is the use of electronic rather than pneumatically-controlled relays.

"People criticise what they see as a lack of musicianship in this type of entertainment and the Music Hall image but I love the fact that it's hugely popular with people who fondly remember that era."

Inside the beast

Directly behind the gleaming console, beyond the rear stage wall and its shimmering curtain, lies a labyrinth of interconnecting chambers. Here is the pulsating heart of the machine in all its glory: a huge room filled with rows of soaring pipes and telephone exchange-style racks of relays controlling the pipe valves.

On this floor are the loud 'Solo' side—shorter pipes dealing with mid and high frequencies, the tiniest of which provide little but upper harmonics—and the 'Bass' side, with huge LF pipes towering to the ceiling.

Just above your head there's a suspended mezzanine floor carrying the drum kit, tonal percussion section and sound effects, all of which are operated by a combination of relays and air pressure, played from the keyboard.

Temperature and humidity back here are carefully controlled: the accuracy and consistency of the organ's tuning depends absolutely on the stability of these sensitive, biodegradable components.

A floor below lurks a further, deeper series of chambers. Like some ship's engine room, they house the 'lungs' of the organ—its compressor and a bank of giant pressure regulator boxes. They also incorporate Britannia Row's new soundproofing measures, designed to reduce microphone spillage (as far as possible) from this array of extremely noisy machinery.

The pipe chamber's acoustic output to the room is controlled by 4 ft high vertically-mounted hinged wooden vents in the rear stage wall. This array is divided into five sections—one per console section—each providing eight volume levels from the console's swell pedals.

Picking up the pieces

Two earlier attempts by previous sound contractors to extend the organ's 'throw' using sound reinforcement were markedly unsuccessful. Spencer: "Roy put a lot of effort into trying to get the sound right. It was difficult because he couldn't articulate what he wanted in technical terms, yet he knew what was right or wrong as soon as he heard it.

"The first system consisted of two recessed speaker columns, either side of the dance floor, which was pretty disconcerting for anyone sitting near a speaker and looking at this supposedly acoustic instrument.

"The second system, with small speakers distributed around the place, didn't work out any

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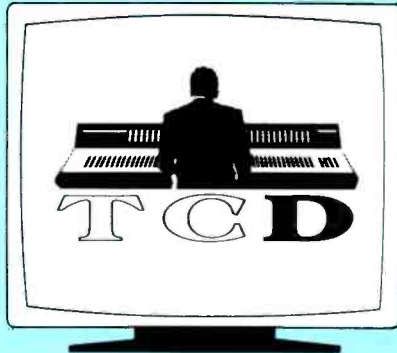
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IN BRIEF

Recent agencies include **TAC** (look at the magnum console), **Amek, Neve, Tannoy** professional, **Focusrite** and **AMS**. We are still waiting for the **Yamaha Digital Workstation**, but the **Akai Adam12** track is selling well (we have deals on fully loaded S1000 + disk drives as well). We can package the Tascam MSR24 1" 24 track with most desks. Computerwise, **C-Lab** and **Cubase** are still most popular and the **Proteus II** full orchestra module is simply stunning.

Recent visitors to our 24 track studios include Ches Hawkes and Nik Kershaw working on a soundtrack for a new film with Roger Daltrey, and several new MIDI courses have been added to the school prospectus. Finally, last month's complete studio installations included Nenah Cherry, David Sylvian, Barry Upton (Brotherhood of Man), LA Mix and Amazon.

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Photo: Nik Milner

The drum kit is miked with two Beyer M160s

better. At one point they tried slinging long-throw LF units from the suspended ceiling, which had all the metalwork rattling in unison!

"It's an acoustic instrument and initially that's what I thought we should try to reproduce but in fact wasn't what Roy wanted at all.

"What he really wanted was a system that would make this organ sound the equal of anything in the world and project it right to the back of the room. Essentially, he wanted to transform his room into a perfect environment for the organ."

With a frequency range from around 15 Hz to 20 kHz and a wide spread of internal and external sound sources, optimising microphone placement around the instrument was the hardest part. The stage right side houses low bass and accompaniments, while behind stage left are the solo pipes and percussion; but since they're all in one chamber there's considerable spillage between sections.

Spencer: "Mike Lowe (of Britannia Row) and I took in two sound systems and a trunk full of microphones.

"That was the beauty of having the resources of a large production rentals side to call on—we were able to try all kinds of mics: PZMs, omnis, fig-of-8s, cardioids and shotguns, to find the best possible solution."

During this process, Britannia Row held a series of mutual progress meetings with the organ builders to ensure that every detail was covered.

Spencer: "We decided we couldn't simply mic it from out front; it was impossible to capture the true chamber resonance that way because of major low frequency feedback.

"We looked at close miking in the pipe chamber but that sounded too clinical. Working with mics in the pipe chamber took a long time because we couldn't stay in there to adjust the mics while the organ was playing—it was incredibly loud!

"The solution we ended up with had most of the sound coming from five AKG 414s—one in front of each set of vents out front. They are suspended on shock mounts to damp low frequency rumble from the compressor—even though it's shock mounted you can always sense it; it's moving a lot of air.

"But those are augmented by three boundary mics, attached to the chamber walls specifically to

reproduce the very low frequencies, which are EQ'ed with all the mid and high frequencies rolled off. We also laid two more boundaries on the upper floor for the percussion."

The drum kit, meanwhile, is miked with two Beyer M160s, one for the crash and ride cymbals and another for the snare and bass drum.

Spencer: "I didn't expect the boundaries to work so well but they're very effective indeed: they really helped to capture that huge sound. The result is we achieved pretty good mic separation even though most of the sound sources are all in one room.

"Mind you, that operation was the horror of Wurlitzer experts all over the UK; they hated the idea of microphones inside the chamber. But when I explained to the organ builders why we were doing it, they agreed the concept was sound. And in fact, mics have quite often been used inside Wurlitzer chambers for the percussion."

Spencer's only regret about the final microphone line-up concerns the Cramer player-piano: "I'd love to get my hands on a Helpinstill piano pickup to replace the microphone; they're wonderful. I know people who have them but no-one wants to sell them!"

SR system

Britannia Row's solution to the suite's acoustic problems was a sound reinforcement system designed to project a direct sound down the length of the room. The major work involved replacing the internal walls of the proscenium arch with tall columns of speakers.

The MSI system comprises four MS-12s and two MS-12Bs a side with four MS-218 sub-bass cabinets below stage, all mounted on brick pillars to decouple them from the stage.

The drivers are progressively attenuated downwards, with only the topmost mids and horn loaded HF units driven at full power. The horns' 40° vertical dispersion ensures that on moving further away from the stage, there is a smooth transition between the sound of the closer, low power components to the upper full power units.

The PA is mixed in a 60:40 ratio 'mirror image' of the organ's sound, ensuring that revellers near

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the front don't simply hear one side of the instrument—with the added benefit of distancing speakers from their source mics to help the feedback threshold.

Amplifiers are Crest 8001s on sub-bass and low mids, Crest 7001s for the mid range and Ramsa amplifiers driving the horns.

In control

The main house control room resides on a raised mezzanine floor at the back of the room, with a brand new 24-channel Soundcraft 200 Delta console at its heart in place of the former Hill MultiMix.

In the backstage control room, Britannia Row's control racks stand amid video, film and A/V equipment and the original HH V150-L and VX-900 SR amps—all remnants of earlier installations. Those amps sit cheek-by-jowl with racks of lighting dimmers. Comments Spencer, "They were grounded together and they hummed like mad."

The new racks house minimal (but essential) digital reverb, microphone mixers, preset graphic equalisers and system crossovers.

All the microphones are sub-mixed on two Sonosax rackmounted mixers and routed through four BSS MSR-604 active mic splitters—used purely as line drivers—via star-core cable to reduce field effect noise induction.

Spencer: "The Sonosaxes have incredibly high specifications, and they're virtually bomb-proof and maintenance-free. We chose them because we felt that every single part of the system should be able to last as long as the instrument. The only modification was that instead of using their

standard basic EQ, we opted for an Amek 4-band fully-parametric EQ on each input.

"Because we put in a much bigger sound system than you'd normally use there's always going to be a small problem with feedback, so we've been careful to ensure the basic settings on the rack can't be changed.

"There's a Lexicon PCM-70 on 'Large Ballroom' setting, as it's a pretty dead room—and Lexicon do that very well. We've used two tc 1128 programmable EQs on the system, and two more for the organ outputs. They were set up to Mr Richards' preference by taking the rack down to the dance floor—a long process, so having presets was a godsend! And the BSS crossovers have their time/phase alignment and EQ curves preset for the MSI system."

There is similar attention to detail in the power supply arrangements. A sequential switching system powers up the control equipment first, followed by the amps and finally the BSS crossovers (the sequence is reversed on shutdown). Each stage is duly protected, while for convenience, master power switches are triplicated backstage and in both control rooms. In the event of total mains failure, the whole system switches to back-up generators.

£½ m and 2 years later

The organ's installation was followed by a lengthy period of 'settling-in', including 6 months spent regulating every pipe individually to suit the room acoustics. The further process of fine-tuning the pipes' balance for each stop could be likened

to mixing down a multitrack tape—with the rider that most stops have 61 pipes (one for each note), while some also have 4 ft and 2 ft extensions for good measure.

And, like owning a vintage car, loving maintenance is essential. Tomlin: "Keeping it in tune is like painting the Forth Bridge. It's sensitive to temperature changes; it can be in tune one day and 3 days later half a dozen voices are out."

As for the results, comparing the unaided organ with the reinforced sound confirms the new system's projection capabilities. As intended, the sound is strongest on the dance floor, gracefully diminishing across the dinner tables behind. Clarity at the back is further enhanced by reflexions from the polished dance floor with its 'conference mode' carpet lifted.

Roy Richards is in no doubt as to whether the project was worth all the effort and expense: "My whole aim was to create something that was totally different for that lovely room and we've ended up with a fabulous installation. Besides the conference and banquet bookings Saturday party nights are taking off like a rocket. The Wurlitzer is an incredible attraction; people are coming long distances to enjoy it.

"It was never a purely commercial exercise; with the costs of shipping, restoration, installation and so on I didn't expect much change out of £½ million. And being such a huge instrument, 63 years old, it would have been a miracle if everything had gone perfectly."

So would he do it again, given the chance? Richards: "Yes, though this is the first time I've admitted it. We do intend to expand; and I hope to install another Wurlitzer in an even bigger room... if we can find one!" □



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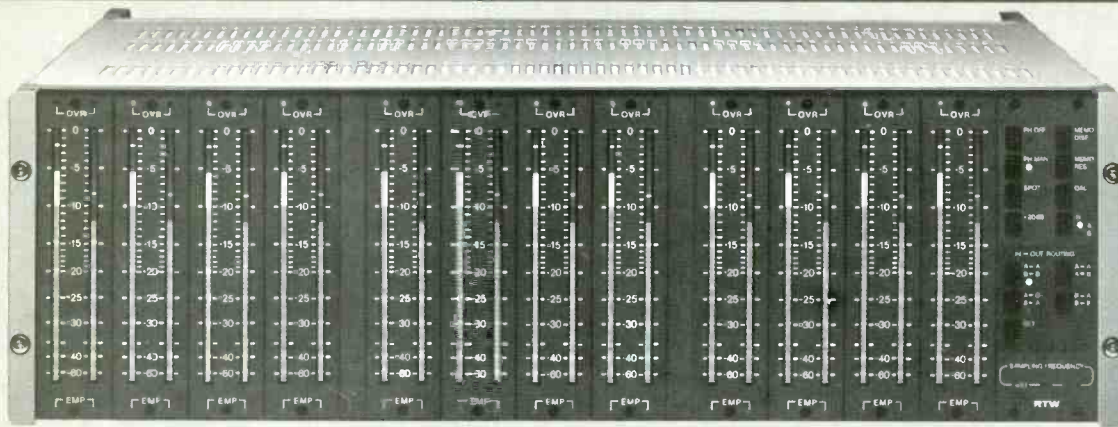
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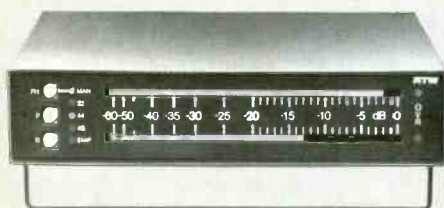
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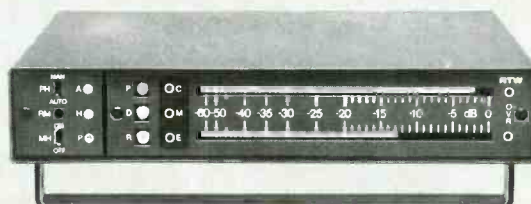
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The biter was well and truly bit at a radio industry conference when an ex-IFPI lawyer rose up from the audience and savaged me over some non-too-flattering remarks I had made about Nesuhi Ertegun, who as president of the IFPI had spearheaded the campaign against domestic DAT.

The lawyer's line was that we are quite wrong to think there was a *quid pro quo* deal between the electronics industry and record industry along the lines of: 'You let us sell DAT with digital dubbing and we won't launch recordable CD.'

The idea of acknowledging such a deal horrifies lawyers, because it adds up to a violation of the Draconian anti-trust laws in the USA. Although the origins are long forgotten, the Sherman Anti-trust Act was passed to curb monopoly interests in the US motion picture industry. Between 1908 and 1912 the Motion Picture Patents Company, a cartel of Thomas Edison, Eastman Kodak and other manufacturers of movie equipment, which called itself The Trust, used monopoly patents to carve up the market for film stock and hardware. To this day, anti-trust offenders are at risk of jail. Which is why so many lawyers were present at the roundtable meetings on DAT and will sit in on the new round of meetings on recordable CD.

No-one would dare even to hint at a *quid pro quo* deal. But sometimes the spaces between words speak volumes.

To avoid further misunderstanding, I suggest that the IFPI organise a factual briefing at which those present at the roundtable meetings give a first-hand explanation of what was said and done, and what is being said and done at the new round of meetings on CD-R, analogue copy prevention technology and smartcard debit systems that keep tab of home copying.

Don't be fooled into thinking it is only the Japanese who have been developing recordable CD systems. Recently I chanced on a patent application filed by Philips in the Netherlands, which claims refinements to a home recordable CD system. The recorder uses the Q subcode and table of contents to let the home user build up a preferred running order of tracks recorded at different times, and thus at widely different places on the disc blank. In other words, if tracks 1, 2 and 3 on the disc were recorded months apart (eg dubs of favourite music tracks from published CDs) the Q code can be used to make the disc play with the tracks in 3, 2, 1 order.

Meanwhile the first signs of tabbing technology are already there to be seen. The new Philips CD 840 Bitstream CD player has a fascinating feature buried deep in the instruction manual. The player can memorise the number of times any disc that has been logged for favourite track selection is played. Just press the FTS INFO keys and the 840 tells you how many times you have played each of your favourite discs.

It is not a long way from there to having a DAT deck or CD recorder that logs recordings made and dumps the info onto a smartcard for royalty payments—which is just what the record industry wants for the future.

Finally, apologies to those whose sensibilities are offended by my less than reverent attitude to the late Nesuhi Ertegun. Just because someone is

Barry Fox

CD-R copy prevention; domestic DAT; jazz festival sound; only a hobby

dead, it doesn't make them a better person. Try reading Mel Torme's autobiography, *It Wasn't All Velvet*. Torme tells how he was signed to the Atlantic record label by Ertegun, and found himself lumbered by him with "three chord obscenities passing for songs". Concluding the story, Torme says, "It saddens me to say that some of the vilest people I have ever met are those who run and control the record industry—they hold the original patents on 'creative bookkeeping'... some day you are going to see many people in the music industry exposed and convicted and, believe me, it will be a scandal of the proportion of Watergate."

In late July Aiwa, Sony's subsidiary, announced they would start selling a domestic DAT recorder in the UK in October. It is a portable unit, with add-on A/D converter, that can be used in the home, car or on the move. At £600 all-in, it sounds like a great bargain for professionals, especially broadcasters.

But don't rush and buy without thinking. There is a snag. And it applies to the new breed of domestic DAT machines that honour the Athens agreement and incorporate SCMS digital copy restriction circuitry. (Incidentally, Aiwa refers to this as SCMS/Solocopy, accurately acknowledging that SCMS is the same as the Philips Solocopy system the record companies had previously rejected out of hand.)

The guts of the matter is that all SCMS/Solocopy machines will hinder editing of original recordings, making domestic machines useless for professionals and semi-pros.

The SCMS circuitry is in the digital circuitry in the main body of the recorder (not the add-on A/D converter in the case of the Aiwa machine). This is logical when you bear in mind that SCMS works in the digital domain to limit digital copying.

The SCMS circuitry works in the same way as all digital sampling frequencies, 48 kHz, 44.1 kHz and 32 kHz, preventing any digital dub from being digitally copied.

When an analogue recording is made (whether from a microphone or hi-fi system line output) the A/D converter automatically puts out a 48 kHz digital signal, which is recorded onto tape.

When a digital copy of this tape is made, the SCMS circuitry allows that one copy to be made but puts an SCMS flag on the copy tape.

On first evidence there seems to be no way of using the new breed of domestic DAT decks for

creative editing, or distribution, of live recordings. This will create a divisive split between the amateur and professional markets, which in reality means giving professional outlets the chance to hike and hold high prices.

Small rebellion in the ranks. More than a few people inside JVC are unhappy that their bosses in Japan have signed for another 3 years of joint sponsorship with Capital Radio for the annual jazz festival at the Royal Festival Hall. The rebels inside JVC wanted a deal with new station Jazz FM, and an end to the trend towards ever louder and more distorted live sound. They know it does nothing for JVC's image as a purveyor of hi-fi.

The first night of this year's festival, at which the 3 year deal was announced, confirmed all their worst fears. A jazz-rock quartet featuring US pianist Herbie Hancock, with guitarist Pat Metheny and drummer Jack DeJohnette (he pronounces it 'Dee Johnette', by the way) used surprisingly crude sampling and massacred the sound of the RFH's lovely grand piano. Sound levels were so high that many of the guests invited by sponsor company JVC (and many JVC people, too, for that matter) left after a few tunes and sought refuge in the bar.

Later I found that Hancock's group had brought their own sound engineers and the Brits employed to stage the show could only stand back and wince at the sheer volume of sound and maelstrom of distortion. The next night they were given a free hand with B B King and produced some welcome light and shade.

The most telling discovery was that Hancock's bass player, expatriate Brit Dave Holland, had been spotted pushing wads of cotton wool into his ears just before he went on stage.

Once in a while, someone, somewhere, comes up with a new word or phrase that neatly says it all: upfront, uptight, getting your act together, taking care of business, bottom line, nitty gritty, far out, by and large, out to lunch, and lunchy. Soon it becomes a cliché which journalists and broadcasters have to struggle to avoid using.

There's a new one for the US that is a gem for summing up any situation where someone who should know better, whether engineer, manufacturer, studio or radio station, gets something badly wrong.

First you have to hear the joke behind the punchline.

An office worker in Manhattan says he has a new hobby. It is keeping bees.

'Where on earth do you keep bees in Manhattan?' asks a friend.

'I keep them in my desk drawer,' says the office worker.

'You're crazy,' the friend says. 'Bees need light and air and plants and open spaces to swarm. They will all die in a couple of days.'

'Who cares,' says the beekeeper, 'it's only a hobby.'

So next time you hear a rotten recording, messy mix or unreliable piece of kit described as 'only a hobby', you will know what they mean. □

Commander Tralagh found it all vaguely depressing—the huge tape recorders, the behemoth recording consoles, the racks of electronics all sitting dusty and abandoned in the vast desolate spaces of the obsolete acoustic recording studio. The plywood nailed and bolted over opening doors and windows was somewhat the worse for wear but it had clearly survived numerous assaults from breakers, squatters and other urban campers. He could feel the ghosts of music past swirling about him. Midnight sessions, shared coffee breaks, hit records—all good feelings now past phantoms of better times in the recording studio business. This wasn't his choice after all, looking at yet another dead recording studio. This was his vacation, for God's sake. He was supposed to be at his hobby—painting adverts onto billboards. The local CID man had nailed him for help, when he was supposed to be adding the Sistine Chapel to a plea for British 'New Peas'.

After all, he was supposed to be high atop a billboard overlooking the estuary of the River Snix and the M3393, midway between Little Cobble on Snix and Big Cobble. Painting billboards was a way to show them he was more than just a policeman. A skilled detective, yes, but with the soul of an artiste. He thought back to the first dead studio he had investigated. It was in central London. They had started to disappear in the early-to-mid '90s. The original owners, of course, had bailed out early in the last decade of the century via sale, foreclosure, bankruptcy or mechanic's lien. One or two had been the victim of eminent domain with government agencies using their power of condemnation only to run out of money for the project originally intended for the space—leaving only a sad eyesore—a dry hole. His first experience was with the then new Poll Tax. He shuddered involuntarily at the thought of that. He had seen it all: axe murders, drownings in beer vats, bodies pulled apart by dogs, etc, but nothing, and he really meant nothing, had shaken his belief in the system quite so much as the Poll Tax. Anyway, he pondered, that studio had seen its owner just get up one morning after receiving a tax bill and walk away. That had been the first. But it was not the last. As he had climbed the ladder of success at 'The Yard' it seemed that he was the man most often assigned to these things.

He had met the Arragh Valley CID at the local pub, the 'Flagon and the Codpiece'. The local man had remained aloof to Tralagh on his earlier courtesy call before taking up residence for his holiday in one of the valley's abandoned coal mines. Tralagh always felt comfortable in the mines—cool and dark, with the space he needed to paint the highway billboards he now so favoured. He had written off the younger man's standoffish behaviour to the natural resentment so often found in country police to a so-called Metropolitan police super performer. But in fact, there was more going on here. For some bizarre reason, Tralagh sensed that the younger officer considered Tralagh a possible suspect in this case, the loss of all activity at 'The Creamery'. Nothing had been said directly but something was in the

Martin Polon

Our US columnist ponders the disappearing studios trick

air. The studio, lodged in an old milk factory, had been favoured by top London pop groups who used to venture the long drive from the capital city. The place's calling card had been the live echo chamber using the giant milk bottle that the previous owners had placed on the roof of their plant.

The local CID man confronted Tralagh. Hadn't he been 'knocked off his horse' when his wife had run off to America with their only child? Not again, thought Tralagh, please not again. Yes, I miss my wife and child more than anyone... more than this thick and clotted local bumpkin could ever imagine. But please, he thought, let me not hear yet again about the Elvis Impersonator she ran off with.

Assistant Chief Inspector Markson interrupted his reverie: "Tralagh, it's just that you have discovered so many of these dead studios."

With significant apologies to P D James and her Commander Dalgliesh, the little excerpt above could be a precursor of truths yet to come or merely a simple entertainment. Which shall it be? I don't know and I suspect many major studio owners don't either. What is clear at this time is that the major recording studios in the western world are under a level of assault not seen before and capable of seriously unsettling the balance of the studio recording business. The following factors are clearly part and parcel of these difficulties.

Credit crunch: The problem of the worldwide credit crunch drying up viable credit sources for the professional studio as well as for the rest of the high technology world. The most obvious symptom of this disorder is the inability to acquire top grade new recording hardware to differentiate the pro studio from its project and home counterparts. Obviously, the ability to provide the very latest and most elaborate equipment is more important to the professional studio than ever before due to the impact of home and project studio competition. That, unfortunately, does not swing much weight with loan officers at big banks. Nor with small ones in this 'tight money' market. The problem itself is cyclical and reflects the outcome of a decade of worldwide extravagance in real estate development and equally outrageous lending policy in the banking community. As many of the bad real estate loans have come home to roost, so have the banking regulators. The net result is a virtual fear of the loan making process by the banks themselves.

This is especially true of high technology projects in general and recording studios in particular. Even though high technology companies have been paying their bills on time and gentrifying run down facilities and neighbourhoods, the banks choose to award loans to a more 'stable' clientele and to be hell on wheels for less-desirable loan categories such as professional studio recording. Major purchases for studio recording have always been vexing to the banking community. The normal amortisation periods of 7 to 10 years for large capital items like consoles and digital multitrack recorders never worked due to the possible rapid replacement of a product—upstaged virtually overnight. Add to this bubbling financial stew some uncertainty over standards and you have loan officers taking risks. In this current climate, with regulators faulting small loans to children who bring in their full piggybanks, the competition-ridden professional recording studio does not feel like the direct pathway to the 'Bankers, Hall of Fame'.

The decline and fall of the demo business:

This is one of the purest examples of the competition posed by the project and home studio. If the Japanese captured one category of studio 'ops' directly, with their assault on studio recording equipment, that would be the demo. The ability to install high quality mass-produced recording consoles and tape recorders in a basement, an attic or a garage and at affordable prices has made the demo process one of installation and use rather than the old pattern of 3 days in a professional studio. Groups today use their demo budget to 'build their own' or worst case to pay for studio time in somebody else's home or project studio.

The bottom line seems to be avoidance of the professional studio with its professional charges. Never mind that it is both unethical and probably illegal for home and project work to be solicited by those in home and project studios. Many of these installations use the break given by the tax laws to these 'home office' applications. As soon as they begin to bring in extra income, the entire basis of the deduction for the home studio could be in jeopardy. Zoning considerations are another problem. But, ultimately none of this really helps the pro studio. The damage has been done and one of the greatest areas of slippage in billed recording time over the last 10 years has been the demo.

Record company catalogue revival: Just as it plays—the process of the record companies building up an extensive CD catalogue from the library of LP vinyl titles. All this, of course, is at the expense of recording activities involved with new album production at the pro studio. The current push to move the majority of vinyl titles to CD, has produced literally thousands of old 'new' titles at the expense of much new recording activity. Of course, mastering houses have been happily occupied with the boom in re-releases but these represent just a small fraction of those working during the 'good old days' of new release production. In a nutshell, many analysts accept as accurate the figure of 80% for that percentage of

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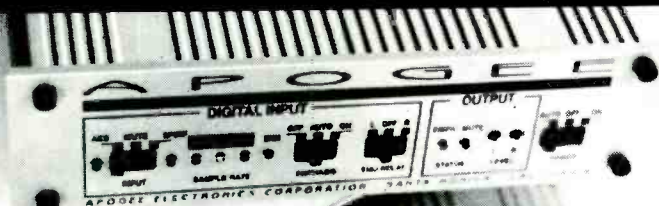


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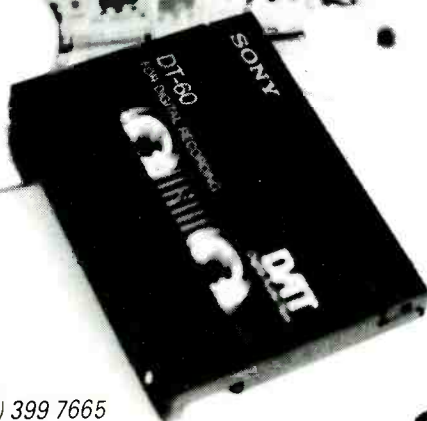
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time, in the past, that the professional studio business was involved with producing new releases. Today, a figure of 20% of studio time dedicated to new release recording is used but many fear that even this will have to be revised downwards as too general and, of course, too large. The issue many pro studio owners emphasise is that at some point in time, this process will shift back to more traditional patterns as a renewed commitment to new releases is made by the major record labels. One can only hope so.

Too many pro studios dividing the recording pie: Rate competition among regular studios, home studios, project studios, 'glasnost studios', 'vanity studios' and 'school studios' has left very little room for profitability at any level. The perception that the recording marketplace is vast and deeply populated with affluent clients has driven many individuals who are looking for second careers into recording. As one pro studio owner puts it, "After all, there can be only so many bed and breakfast cottages with 'quilted kitty' door stops and serving banana ginger muffins with kiwi marmalade. Those dear souls who cannot make it in the B and B marketplace obviously go into recording." Yet there is more to it than that.

There is the allure of 'star' contact that in all seriousness drives many of the newer entrants into recording. In some cases, wealthy scions of monied families have decided to build first class studio facilities with every new piece of equipment available—damn the cost. Or else 'daddy' builds it for them. These 'vanity' operations charge under the going rate of the latest gear—obviously frustrating the rest of the professional studio world. Needless to say, home and project facilities charge in the range of half the prevailing rates for what is in some cases reasonably decent quarters. The result of all of this is that unrealistic charge levels in terms of profitability exist at all levels of recording activity.

Costly downtown pro studio premises: For some studios this is the only problem that comes with a built-in silver lining and a plentiful one at that. The recording studio was part of that wonderful mix of new and used book stores, cafes that served meat loaf and beans on toast, 'old lady' tea shops, shoe repair establishments, that used to define 'downtown' urban centres as places where people were welcome. Today's centre core is modelled on a different scale. New buildings have replaced the old: ground floor retail is as likely to be uptrend seal fur-lined rubber undershorts for the Eskimo S&M enthusiast (*you may fill in this subtitle yourself—Ed*), as well as blue corn pancakes covered with duck chilli in a raspberry coulis. People without mid-five-digit income need not apply. So as our downtowns are turned into block after block of yuppiterias (*you figure this out too—Ed*) by architects frightened before puberty by Lego sets, developers are paying better than top dollar for spaces formerly dedicated to recording facilities. If the space held by a downtown studio is owned by that studio, well... happy days are here again. If not, well... then another studio bites the dust.

Insurance costs and shrinkage have moved off-the-charts: The cost of insuring multiple millions of studio hardware as well as the facility itself have become prohibitive. First, a studio 10 years ago had half as much invested as today. Second, the urban location was a lot safer. Third, the city fire and police response times and underwriters' ratings were a lot better in the 'good old days', etc. The land and building were valued at a lot less. As far as insurance is concerned, the 'good old days' were just that. And the problems with shrinkage have become horrendous. Whether caused by careless staff or customers, dishonest staff or customers, or just plain breaking and entering, the disappearance of studio equipment has become a major problem. Even with the insurance premiums reaching into the thousand dollar multiples, the deductible for shrinkage in studio policies is frequently at the thousand dollar level or higher.

Too many pro studios have tried to make up for lost music business with post-production, video, advertising, etc

The current recessive economy: Depending on where one is located, the effect of these 'spot' business slumps is felt throughout regional economies and throughout certain segments of the world. Ad production has been most influenced as mergers, junk bond takeovers and slumps have cut away at the cash available for advertising. Although it is not clear that record sales are down at the consumer level due to higher per unit prices, the sales of consumer audio hardware are down and the demand for CD players remains soft. As one retailer opted, "People on unemployment don't buy CD players. If they already have LP records and a turntable, you can bet your last dollar, and they have bet theirs, that there is no need for CDs and CD players."

'Dry pan' business ventures: Too many pro studios have tried to make up for lost music recording business with post-production, video, advertising, mastering, etc. The market will only support so much activity in these areas. The clients for such work, such as the movie and television studios, the ad agencies, etc, have taken much of their work in-house by building or modernising their own facilities. The same kind of problems have occurred for many with expansion into equipment rentals and sound reinforcement. So the investment to expand in scope as well as in size has not paid off for many studios.

Unpaid bills: Clients not paying their invoices has become yet another problem for the besieged mainstream studio to deal with. Record companies

have become especially vexing—sitting on large bills for months at a time. Studio owners have little or no option for collection because if they scream too loudly or use aggressive outside collection help, they might antagonise record company brass. At least, that is the perception expressed by numerous studio owners. Other studio clients are caught in an inexorable vice of tight credit and cash flow problems and they too have begun to 'age' invoices far too long. Most if not all these outstanding accounts will be settled, eventually. The clients are basically honest. Not so scrupulous are many music industry hangers-on who are assembling projects and then renege on bills owed to recording studios. Some of these 'project lizards' have become so adept at using incorporation and seguing from one business name to the next, that collection is virtually impossible.

Now, as we go on into the '90s, it is clear that some mainstream professional recording studios will prosper and some will fall by the wayside. That that is inevitable, is the result of there being too many studios at all levels. Some kind of a shakeout is the result, however, there will continue to be several rôles played by the professional studios that are closed to all but the big league facilities. It is up to studio management to emphasise the following areas of supremacy that the professional studio dominates.

- Sell staff, staff experience and staff skills. That coupled with the state-of-the-art equipment that the professional studio stands for is exactly the stock-in-trade that the other smaller studios do not have
- Sell acoustics. The professional facility has a room or several rooms that can be used to record vocals, acoustical instruments, groupings, bands, etc. There is hardly a home or project studio that can compare or compete with treated facilities
- Sell not hardware but, rather, hardware flexibility. Always be in a position to give the client whatever the client wants. The superb and well designed studio consoles and digital tape recorders can be used to accomplish whatever is necessary for a record. One should never hear the excuse, "we can't do that here"

- If you cannot 'beat them', then consider 'joining them'. Build and maintain a number of project studios to supplement your larger suites. You have no idea how many of your clients will clamor to have 'home studio' flexibility and rates within the comfort and safety of your maintenance and operations umbrella

- Above all sell the competence in all areas that marks your professional establishment. Aside from the presence of too many studios at all levels, there is a place for each kind of facility in the tiers or hierarchy of recording activity we now have in the '90s. The professional studio is the place where acoustic tracks can be laid down, where imperfect MIDI tracks from a home studio can be re-recorded, where a master mix can take place, where mastering-ready tapes can be prepared and stored, where a remix can take place, etc. As a rather beloved old chestnut of a song put it: "accentuate the positive—de-accentuate the negative..." □

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Photo: Terry Nelson



SOVIET SOUNDINGS

In conversation with Terry Nelson, audio engineer Vladimir Vinogradov talks about the Soviet recording scene, his career within it and thoughts for the future

A major figure in the Moscow recording scene is Vladimir Vinogradov and a recent conversation with him revealed a lot about recording in Russia and the career route into the business.

"Basically, you have to be a musician first. The system here is very ordered and not nearly so loose as in Western countries, where you haunt the local studio or get a foot in the door through the friend-of-a-friend.

"You could say that my beginnings were as a cellist in music school, where I was able to attain the first level of performance (there are three levels in the USSR). This allowed me to go to the Mid Music School in Moscow where I took a Choir Master course for 3 years.

"Military service being obligatory in the Soviet Union, my studies were interrupted in order for me 'to do my bit' and I was posted to the RDA (East Germany). Fortunately, I was able to keep up with things by being a choir master for the military and by playing string bass in bands.

"After military service I finished my studies and I would like to give credit to the help given to me by professors of Gnesin's Music Mid School. I finally graduated as a choir master and soon after saw an advertisement that Soviet television was looking for music graduates to be trained as recording engineers.

"As well as being interesting, this was also a good job to have and I was lucky enough to pass the acceptance test. This meant that you had to know how to read a score, have a knowledge of the acoustics of instruments, etc, and basically

know about music!

"Anyway, May 1966 saw me finally entering the industry and I have been in it ever since."

So how does one become an engineer and what are the opportunities?

"Future sound engineers are chosen mainly from graduating musicians," says Vinogradov. If you want a career as a musician—classical or rock—you must be qualified, ie have a musical education. The situation is changing now with 'unofficial' musicians, especially in the field of rock, but it still remains very difficult if you are not qualified. In other words, you have to be a musician first and then become an engineer.

"One of the problems I had when I was starting out was the lack of any serious documentation in Russian for audio equipment. What there was available was usually in English so this was the spur for me to learn that language and be able to read English and American publications."

The educational process, it seems, has always been problematic: "Who teaches who? Generally speaking, the older engineers pass on what they know to the younger generation but only in dribs and drabs. They are always afraid that if they give too many 'secrets' away the new engineers will supplant them (though the Soviet system cannot really be compared to the Western system where results often count more than seniority).

"I also tried to listen to as many British and American records as possible to see if I could work out what they were doing—what techniques they were using. I must admit that this made me a fan of many engineers and producers.

"Looking to today, I really look forward to special courses for sound engineers being offered (such as Tonmeister programmes). However, this still seems to be difficult to realise.

"I remember that back in 1979, there was a meeting between the radio, television, Melodiya (the state record company), etc, in order to establish a college course for sound engineering. The idea was fine, there was just one problem—no studio facilities that the students could use meant that idea went by the wayside.

"In the USSR everything is very compartmented and this also applies to sound engineering. For example, for radio and television you have sound directors (and these are usually from what we call the High Level School) and for film, there are sound operators.

"This means that unless you are very energetic, it is difficult to cross over from one activity to another, which tends to be stifling in the long run and bring about a narrow outlook on how best to do things.

"The actual jobs are dependent on the positions available so if you want to be an engineer, you can't necessarily pick and choose, you take what is going as openings are relatively scarce.

"Candidates are selected by interview and talent, musical knowledge and a hearing test all form part of this. If you are accepted this is followed by a 6 month probation period to see whether you have an aptitude for the job. Once this is passed successfully, you are then an 'official sound engineer' (starting out on the lowest, or Fourth Level)."

Though the system is different from the West—with the exception of official institutions such as broadcast companies—it would appear that it is just as difficult to get into audio in the Soviet Union as it is elsewhere.

Each field of audio keeps very much to itself and moving from one to another is often very difficult and usually requires a certain amount of 'personal intervention'. The areas open to engineering candidates are television, radio, film, music recording for records (Melodiya) and sound reinforcement, the latter principally concerning the theatre.

But returning to Vinogradov's career.

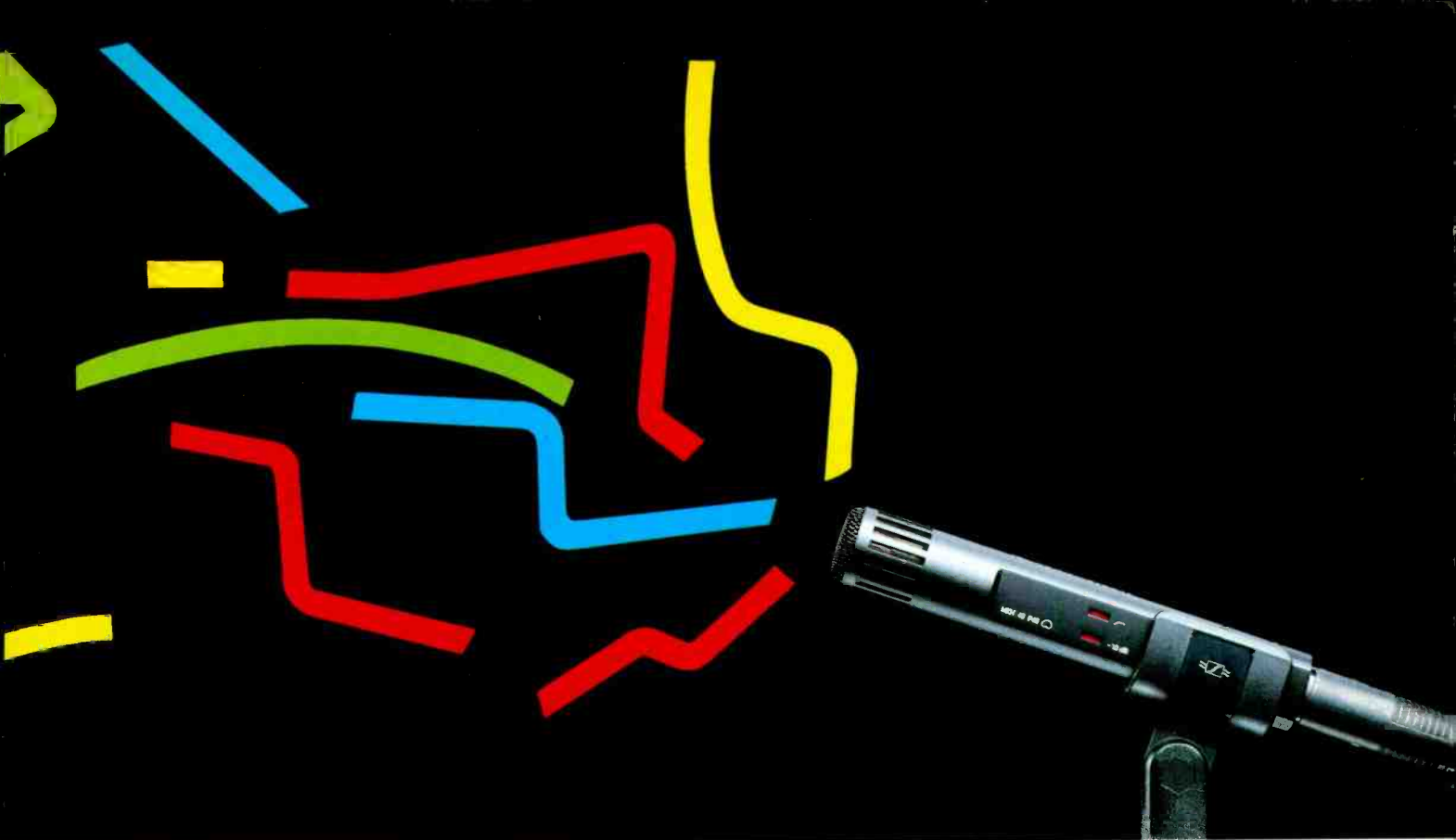
"I started off by doing the sound for television productions but was soon able to move over towards music recording, which I found more of a challenge and what I wanted to do. At this time, I was using Soviet-made equipment and, of course, everything was in mono.

"The year 1967 marked the 50th anniversary of the Revolution and one of the ways in which this was celebrated was by building a new Television Centre. This was equipped with modern black and white TV cameras and new Russian mono audio consoles.

"The consoles were the expression of a 'new philosophy' and featured input channels/groups/masters together with 3-band EQ. It may sound very unexciting now but back then it was almost a revolutionary step and it meant a lot of hard work to get familiar with the equipment in order to produce proper results.

"The programme people must have liked some of what I was doing as I was made responsible for the sound for my own TV show in 1969 and this was very well received. It was also around this time that I first heard stereo and I must confess that I did not like it at all! My ears were so used to listening in mono that stereo sounded really strange."

By the time the '70s arrived, Western techniques and technology were starting to filter through to the Soviet Union.



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"A very important event for me was the recording of Ray Conniff's album *Fairy Tale*, in Moscow (1974) made by Victor Baboushkin and Ray Conniff, as it gave me first-hand experience of how Western sound engineers and musicians worked and I was able to learn a lot from the sessions. I also think that they were interested to see how we worked!"

The following year, 1975, saw the installation of the first 8-track in Russian TV (Studer A80/8). This was followed by Ampex MM1000 16-track machines, which were first installed at Melodiya and then in the music studio of Mosfilm.

Stereo finally arrived in a big way in 1979 when Vinogradov was involved in the purchase of MCI 500 series consoles for the television and Mosfilm sound studios.

"It was during this period that I met Siggy Jackson (then of MCI UK). I was on his stand at an exhibition in Moscow and wanted details on the consoles. The translator was very beautiful but, unfortunately, she was not very technical and I mentioned this to Siggy.

"That became the signal for him to take over the conversation and to ask me outright whether I wanted to buy the console! I was able to help in the discussions with the various heads of department in order to conclude the contracts. I was also able to help Siggy sell the MCI mobile into Russia (it is presently outside the Melodiya studios in Moscow as a backup control room).

"For me, getting the MCI consoles into the Soviet Union was a great advance and I would like to thank Siggy through these pages."

By this time, Vladimir Vinogradov was getting to be a very well-known personality in the Soviet audio engineering world and he describes the period 1979 to 1982 as his: "beautiful years in television. We did many what were called Magic Lantern projects and I am very proud to say that some of these programmes won the Silver Rose award several times at the television festival in Montreux, Switzerland (Golden Rose Festival)."

In the audio world, however, things rarely stand still and in 1982, Victor Baboushkin (a respected and influential figure in the Soviet audio engineering community, who was also largely responsible for the installation of the first MM1000s at Melodiya) suggested to Vinogradov that he move to the sound department of Mosfilm.

"When someone like Baboushkin 'suggests' that you do something, it is always a good idea to take the advice as it means that he has the interests of your career at heart."

As it turned out, this was the case as in 1983 Vinogradov was confronted with the new studio project for Mosfilm for the first time and he has been involved in this ever since. The 'Mosfilm, Project' consists of two new music recording studios and two dubbing stages, which are scheduled to be on line in early 1991.

Vladimir Vinogradov is also probably one of the first—if not the first—Russian independent engineer and divides his time between Mosfilm, Novosti (APN—the Soviet press agency) and individual projects for Soviet television.

"You could say that I am officially employed but in reality, I am independent."

Were the changes in the political situation having an effect on the audio industry and where were things heading?

"I would say that the main single development over the last 2 years or so is the emergence of private studios. These are usually equipped with 16- and 8-track machines from Tascam and Fostex and, in general, can be described as composer

studios. I also think that the standard of production is very poor and though the owners may think of themselves as engineers, the recordings are really only demos.

"The independent studios are very much at the mercy of an improved economy and the development of private enterprise. This basically means that they will have a market to sell into and an income that will allow them to invest in suitable equipment.

"How long this will take is difficult to estimate—perhaps 3 to 5 years?"

Though *Studio Sound* is hardly a political magazine, when talking about the Soviet Union one is obliged to tread in this area as politics are still the central pivot of life there.

One of the major problems (as most people are probably aware) facing would-be independent Soviet studios is the lack of a solid economy and the necessity to have hard currency in order to purchase Western or Far Eastern equipment. This is very much a chicken-and-egg situation where you cannot have one without the other and it's impossible to say which one was first.

One possible solution for the immediate future will be joint ventures where an outside concern puts up the money to finance a studio in order to be able to sell Soviet recordings worldwide. Melodiya are already feeling the pinch from this.

Because of the lack of copyright protection in the past in the USSR (this is now finally under discussion), records were either official Melodiya and Comecon recordings or 'pirate' records, which were often taken from foreign recordings and distributed in the USSR. These were generally of poor quality. There are 'licensed' versions but these are more the exception than the rule.

The sting in the tail of this situation has been that cassette duplication by the general public has caught on in a big way—after all, there is no real copyright law—and this has brought about a fall in sales of Melodiya records.

Vinogradov gives his point of view: "Russians have a lot of artistic talent so why shouldn't they join in with the world at large? I really feel that creative interchange is the way towards peace between nations and should be encouraged. This is the reason that I am always keen to be involved in studio projects with official backing and to do my best in securing the necessary funds from the government departments.

"The problem with organisations such as Melodiya is that they are victims of their own system. For instance, in economic terms, they know that they must do something about their situation but are powerless to get things moving. They are also known as very bad payers: artists get a low recording fee and that is that. No copyright means no royalties. There is also the Artistic Committee, which essentially decides what is to be recorded and musicians find this very stifling.

"Decisions to purchase new equipment are also very long and drawn out, which means that updates are slow and not timely.

"The increase in joint ventures is also another threat, especially with people such as Mobile Fidelity Sound Labs with Arts & Electronics. Many USSR artists are recording with this label now because they get both a decent recording fee and royalties—not to mention a far wider distribution."

The long term future of recording in the Soviet Union could be seen as encouraging, however, it will be very much dependent on the overall living conditions and a real development of the economy and for that, only time will tell. □

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design SoundTools

Mike Collins describes the operation of the SoundTools digital recording, editing and processing system

Hard disk recording has been around for some time now. The technology offers fast random access to stored data and the convenience of the digital format for copying and manipulating data. It allows extremely rapid editing of audio without the need to wait for tape recorders to rewind and sections of recordings can be replayed via software control in edited versions while retaining the original data unaltered. As a result, there is no need to fear mistakes and, because of the random access, edits may be performed in perhaps a quarter of the time of tape-based systems. The computer industry has spent years perfecting the technology, with the resultant cost reductions, and the audio industry is now in a position to reap the benefits.

One of the major factors here is the easy access from personal computers via SCSI (Small Computer Systems Interface)—a computer industry standard that allows connection of up to eight SCSI-equipped devices via an SCSI bus. SCSI interfaces are now available for most personal computers and the various hard disk systems, as well as for the optical WORM and read/write disk systems and CD-ROM drives also available as storage media.

Digidesign has been supplying a range of software for the *Macintosh* for several years, including *Sound Designer* waveform editing software for a broad range of digital samplers, *Q-Sheet* MIDI/SMPTE automation software and *Turbosynth* synthesis and signal processing software. Now they have developed the *SoundTools* digital recording and editing system for the *Macintosh* that provides many of the features of the high-end hard disk systems at a relatively affordable price.

SoundTools has also recently become available for the Atari *Mega 2/Mega 4* computers. An Atari-based system would cost about one third less than a *Mac*-based system, and offers a more cost-effective solution if you only want to use the computer to run *SoundTools*, however, the user interface on the Atari is not quite as slick and the Atari is built as a games machine. As a result, the Atari does not support the industry-standard business and graphics software available on the *Mac*: packages like Microsoft Word, or Hypercard, or MacroMind Director for animation. It is easy to run several of these concurrently on the *Mac*, which may be more useful professionally.

There are three basic components in the system. The AD IN stereo ADC is contained in a standalone box, about the size of one of the popular hard disk drives for the *Macintosh*, and finished in a 'platinum' colour to blend with the *Mac* system. The Sound Accelerator card fits into the computer and contains a stereo DAC and a Motorola 56001 DSP chip. The *Sound Designer II* software controls recording, editing and playback while continuing to provide waveform editing

from most popular digital samplers.

Beyond the basic system there are various other options. First there is the DAT I/O unit, which provides various digital input and output formats for digital editing of DAT tapes. If you are working to picture, *Q-Sheet* software provides a more sophisticated SMPTE cue list and allows you to trigger *SoundTools* hard disk recordings, replay sequencer MIDI files control automated MIDI mixers (such as the Yamaha *DMP7*), and synchronise to VITC if required. For more sophisticated signal processing and sound synthesis features, *Turbosynth* software provides a comprehensive range of functions that may be easily integrated with the *SoundTools* system.

A standard *Mac SE* model can be used but this will only allow a 32 kHz sampling rate for stereo recordings. A card is available for the *Mac SE30* that provides full 44.1 kHz stereo recording and all *Mac II* models are ideal for use with the system. The cards for the *Mac II*, *SE30* and standard *SE* are not interchangeable, however, so this must be borne in mind. Two Mbytes of RAM is considered the practical minimum on the *Macintosh* at the moment, however, between 4 (on the *SE*) and 8 Mbytes (on the *Mac IIs*) are really highly recommended in order to make full use of MultiFinder, HyperCard, various utilities, desk accessories, and so forth. As most *Macintosh* programs are loaded into memory in segments, which are swapped in and out of memory as this runs short, extra memory will also make any program run more speedily and efficiently. So plan on having at least 4 Mbytes of memory for best results. Prices for *Macs* range from about £2,000 for an *SE* to about £6,000 for a *Mac IIfx*—the top of the range model. Extra memory can now be bought for well under £100 per Mbyte, so add about £150 to these prices for your extra 2 Mbytes. A standard *Macintosh II* will provide adequate processing power for the present system but the 68030-based computers, such as the *SE30*, *IIfx*, *IIfx*, *IIfx* and *IIfx* models will allow you to take advantage of the full range of features in the new *Version 7.0 Macintosh* Operating System, which should be available later this year. Upgrade kits are available for all models of *Macintosh*, however, so you could buy an *SE* or a *Mac II* and upgrade later in the year.

A large-screen monitor will require a *Mac II*-based system, because the *SE* only has one card-slot, which you will use for the *Sound Accelerator* card, and you will need another slot for the video card to drive the large monitor. Prices range from around £1,000* up to about £6,000*, depending on features such as size and whether they allow colour or not.

Hard disk storage

About 10 Mbytes of disk storage is needed for each minute of 44.1 kHz stereo recorded sound, so

large hard disks are required for any serious work. Most *Macs* now come with an internal hard disk and sizes go up to about 160 Mbyte for these, although they are typically either 20, 40 or 80 Mbytes in size. Standalone units are readily available to provide up to 700 or so Mbytes of space and there are several popular 45 meg removable hard disk systems available for about £1,000*, which would allow you to put a typical 4 minute pop-song on one disk and edit it. There are several 650 Mbyte fixed units costing between £2,500* and £4,000* and providing about an hour's recording time. The new Hitachi 720 Mbyte drives, priced at £3,990* have 19 ms access time and are 19 inch rackmounted with fan-cooling and space for a second unit. A 1 Gbyte DAT tape backup unit is available at £3,250* which would fit in the same 19 inch rack, and this unit allows complete backup of all *Mac* files including *SoundTools* audio, playlist, EQs, and so forth. A new Hitachi 1.2 Gbyte unit with a built-in DAT backup is also available, and this will provide around 2 hours recording time. Hitachi also supply a 256 Mbyte 3.5 inch internal unit for the *Mac* priced at £1,950* giving about 25 minutes recording time. The access time of the hard disk system is important, because the *SoundTools* recording system requires an SCSI hard disk with 28 ms access time or better. This means that most of the read/write optical disk formats currently available cannot be used for recording with *SoundTools* because their access times are not fast enough (although they could conceivably be used for backup purposes). Optical drives would not provide such a cost effective solution as DAT backup systems, of course, because of the cost of the optical disks compared with the price of DAT cassettes, however, DAC can now supply a 1 Gbyte *Maxstor* optical drive that will allow recording with the help of a *Mac*.

Samplers and MIDI

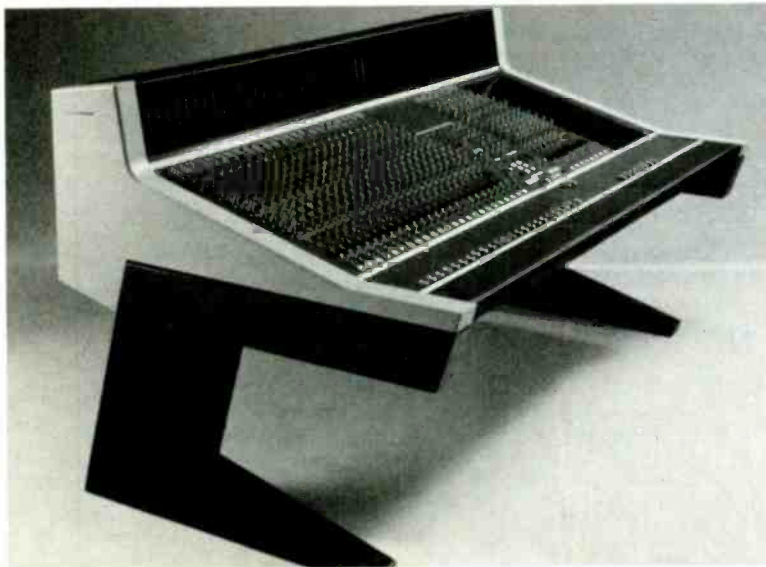
You may want a digital sampler hooked up to your system. The *Sound Designer* software is ideal for editing Akai *S1000* samples and the SCSI disk storage can be used to store them in *Sound Designer* or other formats. Most popular samplers can be used and they are very useful to play effects back at different pitches triggered via a MIDI keyboard, and then subsequently via a MIDI sequencer.

A MIDI sequencing and synthesis setup would work well with *SoundTools*, especially when putting music to picture. The MIDI sequences can easily be synchronised with the audio playback, especially if you use *Q-Sheet* to replay sequences as MIDI files. If you are dumping MIDI sample sounds to your sampler you will need a suitable interface, although some samplers use RS422 or SCSI. To synchronise to SMPTE you need a SMPTE to MTC converter, as the *Sound Designer* software only reads MTC.

Elaborate sound effects could be created using a combination of synthesisers, samplers, *SoundTools* DSP processing and *Turbosynth*, all controlled and edited centrally from the *Macintosh*. *System 7.0* should provide a much higher degree of multitasking on the *Macintosh*, and using the new *Midi Manager* software from Apple it will probably be feasible to run a MIDI sequencer and *SoundTools* at the same time on one *Macintosh*. Alternatively, you could use a *Mac II* for *SoundTools* and an *SE* (or any other MIDI sequencer) for your sequencing. Opcode have a new software package called *StudioVision*, which



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their popular *Vision* MIDI sequencer and *SoundTools* editing to provide an integrated sequencing/hard disk audio editing system. C-Lab are also reported to be developing a similar system on the Atari for use with their *Notator* sequencer and *SoundTools*. Also, Steinberg's *Cubase* sequencer for the *Mac* can be run concurrently with their *Topaz* hard disk system.

A final addition to your system might be a new CD-ROM drive unit (these also use the SCSI bus). Optical Media International and others can supply CD-ROM disks containing libraries of sound effects and musical instrument samples in *Sound Designer* format or formatted for popular samplers such as the *SI1000*. These drive units can also replay standard CD-Audio discs, for additional sources of audio. Prices range from around £1,000* for the Apple model to as little as £500* for the Sony *CDU 6111* model.

System cost

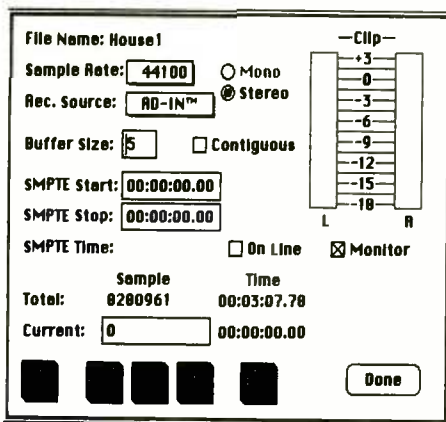
So, a basic system using a *Mac SE30* with an external removable 45 Mbyte hard disk would cost around £6,500+VAT*. A high-end system using a *Mac IICI* and large screen, with a DAT I/O, 720 Mbyte hard disk and DAT cassette backup, *Q-Sheet* and *Turbosynth* software, and a CD-ROM drive, would come to about £16,500+VAT*. These prices are much less than for any other similar system currently available and bring hard disk-based recording and editing well within the reach of any commercial recording studio.

Features

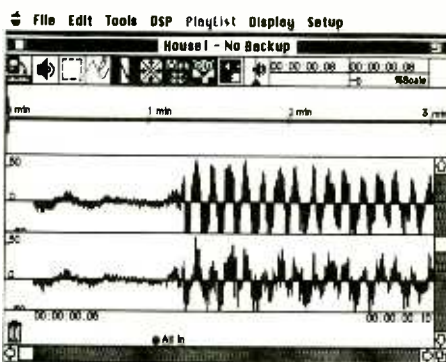
The AD IN has two ¼ inch jack inputs on the back, with two rotary input level controls on the front panel, with associated green (-20 dB) and red clip LED indicators. The conversion is 16 bit and a frequency response of 20 Hz to 20 kHz (+0.05 dB, -10 dB) with a S/N better than 90 dB quoted. Input levels from -10 dBm to +4 dBm are possible, so it seems unfortunate that no XLR connections are provided.

Record dialogue: To record, you boot up the *Sound Designer* software and open up the tape recorder window. Options include routing the input signals from the AD IN to the Sound Accelerator card outputs for monitoring, synchronising to external SMPTE, or mono or stereo recording and you can select the sampling rate to be anywhere from 8 kHz to 48 kHz with 44.1 kHz as default. All the familiar controls are available but to stop recording you click a second time on the record button. This seems a little odd, as Digidesign have gone to the trouble of providing all the other usual controls. Still, it works once you are used to it. SMPTE synchronisation is very easy to set up in this record window and you can choose start and stop times for recording to external code.

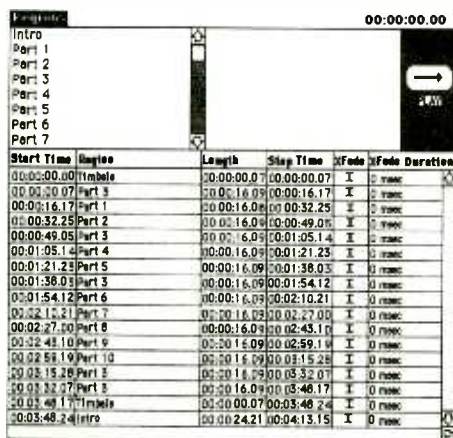
Apart from recording complete pieces of music, you could just take single notes or sound effects lasting maybe only milliseconds, which could be transferred to a digital sampler for playback. As *SoundTools* supports many different sampling rates, you could prepare samples for most popular samplers in *Sound Designer* format on the *Mac*, and store them for use with your sampler. It is even possible to connect a MIDI keyboard to the *Mac* and play samples over a range of keys via the Sound Accelerator card so you can hear how the sample will sound when you eventually assign it to a group of keys. This facility is only very rudimentary, however, and you really need a



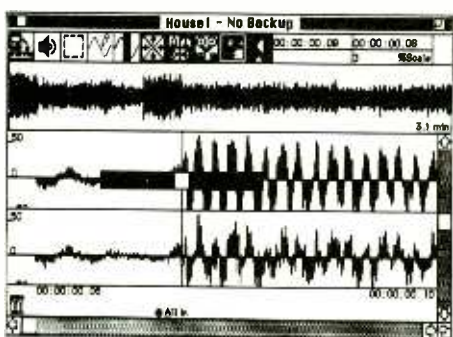
Record Dialog Box



Waveform Editing Display



Playlist Window



Scrub Tool

separate sampler to allow proper assignment and layering of sounds onto a MIDI keyboard. **Editing:** Once the tape recorder window is closed the soundfile editing window follows. This graphic window can be opened up to fill any size of screen and this is where you may appreciate a large screen. There are two main sections in the editing

window. Overview may be switched to show a line representing the length of the recording or the waveform in mono or a composite stereo. This allows you to see the complete recording at all times, and a cursor can show you where you are at any point. The second section is the waveform editing display for stereo recordings. This may be zoomed in or out to show the area you wish to edit and won't always show the whole recording within the window—hence the need for the overview display.

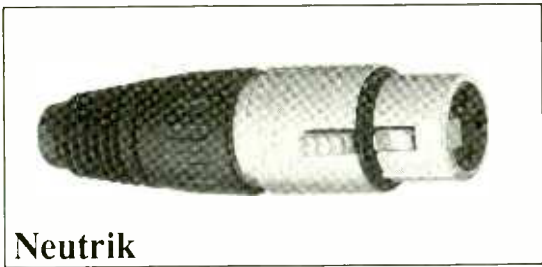
Editing is easy with this display. You just highlight a section of the waveform using the mouse and then use a menu or equivalent keyboard command to cut, copy or paste a section. This is destructive editing unless working on a backup copy and some of the operations can take an appreciable amount of time to complete. If you are preparing samples, however, you are probably working with very short recordings, so this is not such a problem and if you are editing a complete song to create a 12 inch mix for instance, you will probably use the Playlist feature for non-destructive editing. In this case, you select regions as before but capture them using the menu command. This defines the region for use in the Playlist and as these are merely playback markers you can define overlapping regions if you wish.

To open the Playlist you click on the appropriate icon near the top of the window and this opens a dialogue window divided into various sections. Any regions you have captured are listed in the top left hand section. You simply drag any of these to the bottom half of this window and arrange them in a list for playback. You can use any section any number of times.

The SMPTE times are listed to show start and stop time, length of each section and you can set crossfades between regions if necessary. Four types of crossfade are provided and you can set the time for the crossfade, which should cater for most types of edit. If you change the order of any sections, or add new ones the timings all adjust automatically to reflect the changes. You can even edit a region from within the Playlist window by double-clicking on the region's name to bring up the waveform for re-editing. This has to be one of the most intuitive and well-designed user-interfaces available for this type of editing.

'Rock and roll' editing would traditionally be done with reel-to-reel tape recorders. It would be quite easy to identify the first beat in the first bar of the chorus section of a song by finding the bass drum that comes on the downbeat. First you would play the tape to find the spot approximately, then you would stop the tape motors and spin the tape by hand backwards and forwards to locate the sound of the bass drum, making ever smaller movements until you come to rest immediately before the sound on the tape. Then you mark it, find the next edit point at the end of the chorus, then cut it at these points. *Sound Designer* provides something called the Scrub Tool, which attempts to emulate this process, presumably to allow people to use a familiar technique. You click on the Scrub Wheel icon and a marker appears on the waveform display at a point you have selected, say just before the edit point you have found approximately by playing the recording. You then move the mouse in the direction of, say, the start of the chorus and playback begins. If you pass the edit point you can reverse the direction of the mouse and the recording will play backwards. The idea being to 'rock n'roll' until you identify the exact edit point, as you would with a tape recorder.

Unfortunately, this system does not provide



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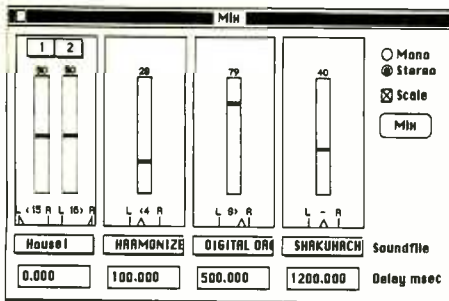
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Mix Window

sufficient control to be as accurate as a tape recorder rocked manually. I found it almost impossible to stop the playback exactly on a bass drum using this method. Digidesign have recently improved this function so it doesn't overshoot quite as much but it still doesn't work properly. Possibly the mouse, or even a trackball, is not the right controller for this type of function. In practice, however, visual inspection of the waveform display makes it clear where the edit points should come in most cases and it is so easy to select and deselect these points and then play your selection that there is no real need to use the Scrub Wheel at all.

You can insert four different types of markers into the waveform display: numbers or text, loop start or end. It is very easy to set up loops using the Loop Window feature accessed from the Tools menu. This allows you to fine tune loops previously defined with the loop start and end icons in the waveform display. Various types of loop may easily be created including 'linear' or 'equal power' crossfades and forwards or backwards loops. Looping is probably most useful when editing short samples for replay by external samplers, because the Playlist is probably better for full recordings.

There is a comprehensive selection of editing features available in the Edit Menu. The standard *Macintosh* Undo, Cut, Copy, Paste and Clear commands work on selected data just as they do on selected text in a wordprocessor application. In addition there is a Replace command, which replaces the selection with whatever is in the clipboard.

The other features include Reverse, which makes the selection play backwards; Silence, which sets the selection to zero while maintaining the duration (unlike Cut or Clear which remove the selected duration); Trim, which 'tops and tails' the recording by removing everything before and after the selection; Invert, which inverts the waveform and the manual says may be useful when looping or mixing; Fade In and Fade Out, which do what they say; Normalise, which scales all the values up so that peaks are at the maximum allowed—to help you achieve the best dynamic range in case you recorded at too low a level; Change Gain, which, again, does what it says; and Smoothing, which can be used to alleviate click and pop problems.

Tools menu: The MIDI Preview command brings up a dialogue window containing a picture of a keyboard, with 'radio' buttons to allow you to select 2-, 4-, 6- or 8-note polyphony. You can play any soundfile from a MIDI keyboard while this dialogue window is open and the range of keys you can play according to the selected polyphony, and the original sample pitch, are highlighted on the picture of the keyboard. This is a nice feature to use if you are preparing samples but you don't want to transfer them until you have them nearer to the finished version although you need to check how a sample will sound when played over a

range of pitches.

The MIDI Keyboard command is almost the opposite of this. It is used with an external sampler to send MIDI Note On and Off messages to test the sampler directly from the *Macintosh*. You can set a sequence or pattern of notes to play automatically. You would typically use this feature with a rackmounted sampler that has no keyboard of its own.

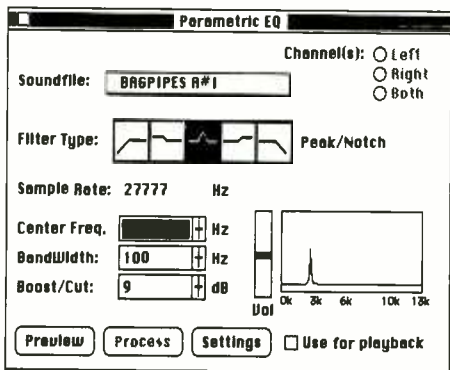
DSP menu: This contains a comprehensive range of digital signal processing tools including mixing, merging, sample rate conversion, parametric EQ, graphic EQ, time compression/expansion and frequency analysis.

With the digital mixing function up to four mono or stereo soundfiles can be mixed with full level pan and delay control to create a new mono or stereo soundfile. You first open up four of your soundfiles then when you select MIX, a window comes up with four sets of faders, mono or stereo, with pop-up menus under each that allow you to choose a different file from the opened windows. Another four boxes allow you to set a delay time in milliseconds before each file starts to play. You can choose whether the resulting soundfile will be stereo or mono; if stereo, pan markers appear below each fader. When you click on the mix button, a new soundfile is created from the MIX you have set up. This is excellent for helping you create interesting sound effects. It could be improved by allowing you to audition the mix before creating the new soundfile.

Merging allows you to take any two mono or stereo soundfiles and create a new soundfile that crossfades from one of the original files to the other. You can set a time for the crossfade, and use a linear or an equal power fade. Unfortunately, this feature did not seem to be working correctly when I tried using the *Version 1.2* software as gaps of silence occurred at two points in the resultant soundfile, no matter what settings I tried. The waveforms looked OK but included gaps when played back. I am sure this is just an unfortunate bug that can be fixed. Again, this function could be improved by allowing you to audition the merged file before creating the new soundfile.

Sound Designer's digital EQs can work either destructively, or non-destructively, in other words, to be effective on playback only. Typically you would use the permanent EQ changes on sounds you are preparing for samplers and use non-permanent EQ on soundfiles containing full-blown recordings you are replaying from your hard disk.

The parametric EQ provides highpass, low shelf, peak notch, high shelf and lowpass filtering. You can use a PREVIEW button to have the section of soundfile in memory play back repeatedly while you adjust the EQ, and a filter response window shows a realtime FFT analysis indicating the performance of your filter.

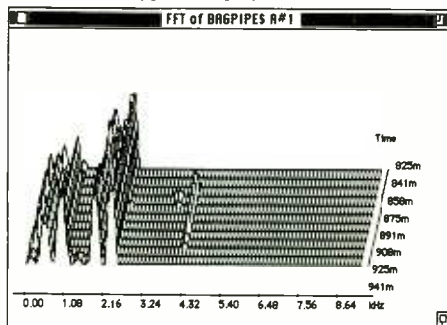


Parametric EQ Window

The graphic EQ provides 14 bands of EQ for mono soundfiles and seven bands per channel for stereo soundfiles. You can adjust the frequency and bandwidth of each filter easily so, in effect, you have multiband parametric EQ here. Again there is a preview facility but, unfortunately, no realtime FFT analysis tool and only the gain can be adjusted during realtime previewing.

Either type of EQ can be applied permanently to a soundfile, alternatively the EQ settings can be saved with the *Sound Designer II* application or individual soundfiles, and applied on playback.

The frequency spectrum of a soundfile may be analysed using the Fast Fourier Transform. The results are displayed on a 3-D graph with frequency, amplitude and time along the three axes. This facility is to allow insight into the EQ settings you may wish to apply to a soundfile. You can vary the number of frequency bands you will generate, and choose linear or logarithmic amplitude values. You can also choose to display the frequency/time slices front-to-back or back-to-front. Various other settings may provide the most suitable type of display.



FFT Window

The time compression and expansion tools allow you to adjust the duration of any samples without changing its pitch. This is particularly useful when working on sound-to-picture for synchronisation purposes. You can enter a new length in seconds, or as a ratio between the current length and the desired new length. According to the manual, the time compression/expansion algorithm used works best with speech or other narrow-band material such as solo instruments, and with ratios between 0.5 and 2.0. In practice, it does seem to work quite well with some types of broad-band music and is certainly an extremely useful feature. Presumably Digidesign will develop improved algorithms to use with broad-band music in future software revisions.

Sample rate conversion is provided and is very simple to use: you select SR Convert from the menu and enter either the new sample rate, or a ratio between the new and the original sample rate. When you click on the button marked Convert, a dialogue box appears that allows you to save the new soundfile in whatever format you choose. The main reason this is available is so you can maintain a central library of sampled sounds, which can be sent to virtually any MIDI sampling device after conversion to the appropriate sampling rate.

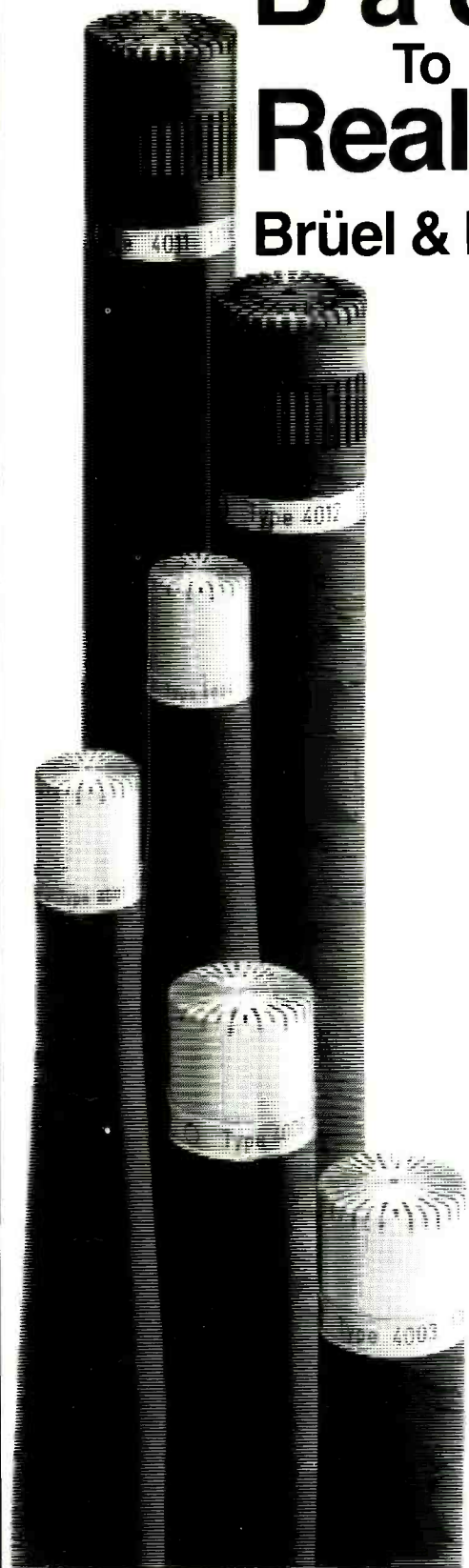
DAT I/O

This unit handles digital input and output via the AES/EBU interface or via the Sony/Philips Digital Interface Format. The S/PDIF connections are made using phono jacks and the AES/EBU connections are via balanced XLR jacks.

The back panel has a D-connector to connect an

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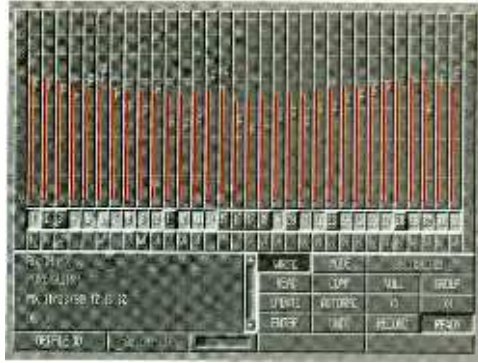
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Further information

System components

Hardware—AD IN ADC, Sound Accelerator digital signal processing card

Software—*Sound Designer II* audio editing software

Free software

Softsynth, Sound Installer, Sound Access, HyperCard

Additional software

Q-Sheet A/V, Turbosynth, StudioVision

DATa 1.1, Live List 1.1, Master List 1.1

Hardware requirements

Requires a *Mac II, IIx, IIcx, IIfx* or *IIfx* running system 6.02 or higher (for up to 44.1/48 kHz sampling rates) or a *Mac SE* (limited to 32 kHz max sampling rate for stereo recordings). Soon a card will be available for the *Mac SE30*, which will provide 44.1/48 kHz sampling rates for stereo recordings. The program will run with 1 Mbyte of RAM but more than 2 Mbytes will be required if you wish to use MultiFinder and various inits

Additional hardware

Optional Digidesign DAT I/O digital in/out unit

A suitable amount of hard disk space (with access time equal to or better than 28 ms) and a suitable back up system

A suitable MIDI interface and SMPTE/MTC converter
Any of a wide range of 'samplers', such as the Akai or Emulator ranges

Features

Direct to hard disk recording/playback with 16 bit linear resolution
Waveform editing and digital signal processing
The copy protection on previous versions has now been removed from the *Version 1.2 Sound Designer* program

Suggested retail prices (UK)

Macversion

The *SoundTools* system costs £3,140 for the three components. These are available separately for the *Mac*: The *Sound Designer* software is £899, the Accelerator card is £1,242, the AD IN is £999 and it costs £999 for the DAT I/O. Q-Sheet A/V costs £799 and *Turbosynth* costs £279. Live List, Master List and DATa are supplied on disk for £89 (All these prices include VAT)

Atari version

£1,995 (inc VAT) for the Sound Accelerator Card, *Sound Designer* software and the AD IN

Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025, USA.

UK: Sound Technology plc, Unit 6, Letchworth Business Centre, Avenue One, Letchworth, Herts SG6 2HR. Tel: 0462 480000.

AD IN unit for analogue input, as well as the two sets of digital outputs, power socket and D-connector to link to the Sound Accelerator card. The front panel features a mode switch to determine whether the unit is transmitting or receiving digital audio data, a format switch to select the digital interface, a record source switch, to route the output of an AD IN unit to the Sound Accelerator instead of the digital input, and a sample rate switch, to set the output sample rate to match one of three rates (32, 44.1, 48 kHz) the soundfile you are playing may be using. There is also an Emphasis switch, which sets a flag in the output data stream to indicate if the data is emphasised or not, and an LED, which lights if the copy prohibit bit is on in the incoming digital audio stream.

This unit provides a cost effective solution when editing DAT tapes or other digital recordings, and this should appeal to those mastering on DAT.

Digidesign can supply a special utility program called 'DATa' for back up not only of audio data but also your edits. This is a realtime process so you may choose to back up to an optical drive, if time is important. The trade-off is in the cost.

Manual

Even though the software is extremely intuitive to use, you will need to refer to the manual from

time to time. It is extremely clear and well written and covers all the operations adequately, although I would like to have seen more notes about practical applications, including detail of how to use the *Macintosh* sound formats with other software on the *Mac*. Digidesign can provide extra software for installation of sounds into programs such as Hypercard to add professional-quality dialogue, sound effects and music to a 'multimedia' presentation, and Apple are currently making plenty of noise about this.

Conclusion

If you have a DAT machine, or a sampler such as the Akai *S1000*, *SoundTools* is the perfect complement providing a comprehensive range of editing functions not found on these units. If you are working to picture, *SoundTools* is an excellent system to use for recording sound and/or handling sound effects, although film people would really require a 3- or 4-track system for compatibility with established working practices. If Digidesign can come up with a multitrack system they will obviously open up many more markets for their product.

The whole system is extremely well-designed and relatively affordable and many studios will find *SoundTools* useful. One of the main advantages is its ease-of-learning and subsequent

ease-of-use, especially compared with some of the other systems on the market.

Version 2.0 software is expected to have been released by the end of the year and this includes additional signal processing features such as compression, expansion, noise gate and pitch shift. There will also be enhanced SMPTE capabilities, plus the ability to insert markers on the fly. Further 'down the line', perhaps by the end of this year or early next year, Digidesign hope to be able to offer a true multichannel system for the *Macintosh*.

The sound quality of most digital hard disk recording systems is more than adequate for most purposes and there is very little to distinguish one system from another in terms of technical specifications. So the different systems will have to compete on other grounds such as how good their 'user-interface' is, as well as on the obvious issue of pricing. In both these respects *SoundTools* emerges as a winner.

Otari have recently formed links with Digidesign in the wake of Studer buying the rival *Dyaxis* system, and Mitsubishi have teamed up with Steinberg to develop the *Topaz* system for use in conjunction with their digital multitracks. All three of these companies are obviously taking these *Mac*-based systems very seriously—so should you! □

* All prices quoted are based on UK recommended retail prices.

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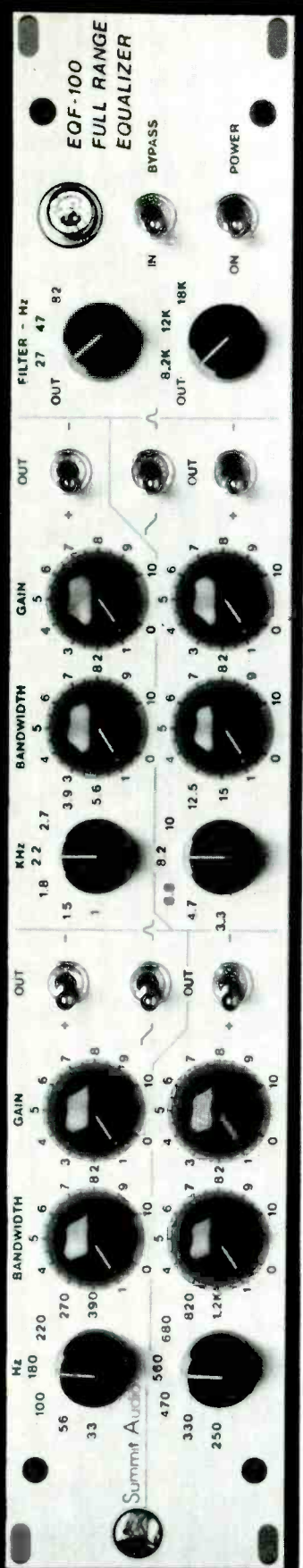
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Trax studio manager

Dave Foister reviews a studio management software package

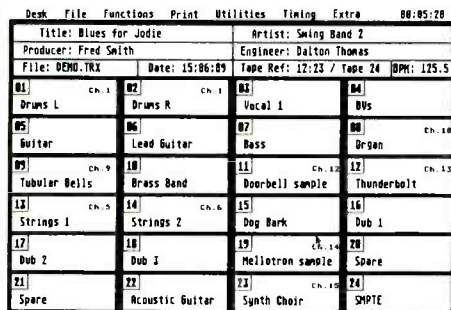
Trax Recording Studio Manager from Quinsoft is a software package for the Atari ST designed to cope with many of the routine administrative and record-keeping tasks in the studio. It consists of four main programs offering full integration where relevant, together with a desk accessory, which can be used from within other applications such as sequencers. Operation makes full use of mouse and windows and it runs in colour or monochrome.

The package comprises the *Tracksheet* program for handling session track splits and other information, a comprehensive set of Address utilities, an accounting program for small businesses and a disk indexing system, together with the *Tracksheet* accessory.

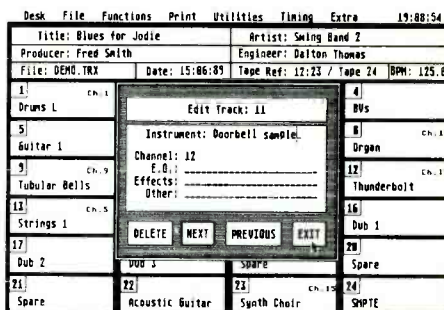
The main *Tracksheet* program displays a set of 24 numbered boxes allowing a conventional tape track split to be built up on screen, saved to disk and printed out. As well as the track contents, the box can display the relevant MIDI channel and a click on any box opens up a larger box with space for notes about EQ, effects and so on. All this is constantly available for editing. In

addition, a click on the screen header opens up a further page with space for all the information about the client, the project, the tape and any necessary floppy disks for loading synths, sequencers and so on.

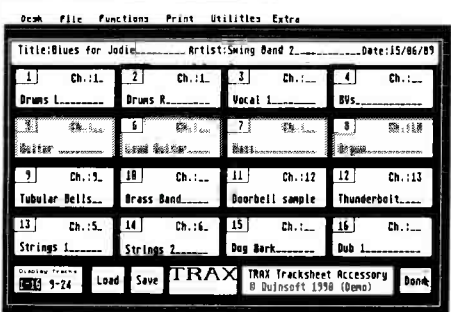
From the *Tracksheet*, access is provided to the Active Cue Sheet, a simple cue list with space to assign frame-accurate timings to each cue. This is linked to a stopwatch that will run through the cues as programmed but since this cannot be sync'd to tape it is presumably intended simply as a guide. Also available is a Mixdown table, which can import data from the *Tracksheet* and store additional information about the sources. A number of utilities are provided, such as DDL/BPM calculator, a cassette label printer, a time/bars/tempo calculator, comprehensive printout facilities and access to the *Address Book* files. An expenses sheet for noting down extra reels of tape, extra time and so on used during the session is always available from the main screen; this information can then be imported into the accounting program for invoice preparation. A nice touch is a countdown screen, showing a conventional video countdown clock, which goes to



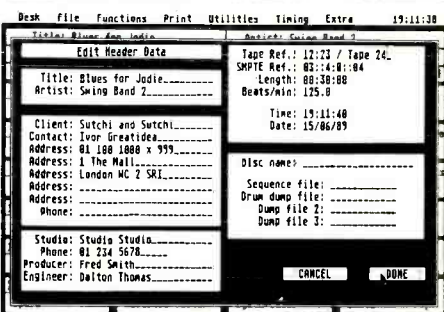
Tracksheet main page



Tracksheet main screen with track 11 in box



Tracksheet accessory screen



Tracksheet header information page

black when it reaches zero.

The accounting program is called *Invox*, and besides invoices it will handle orders, receipts and the general incomings and outgoings of the business, all neatly integrated and providing running balances, calculations for those saddled with VAT or similar taxes and extensive sorting and search facilities. This is again integrated with the address list so that, for instance, client information can be read directly into an invoice form.

The main *Address* program is a reasonably sophisticated database offering searches and

Due Time	Event	Due Time	Event
0:00:00:01	Opening Sequence	13:00:26:02	Fishing stream
0:00:01:14	Door opens	14:00:26:20	Restaurant
0:00:04:09	Pan to car	15:00:27:10	Titles
0:00:06:10	Driving on motorway	16:00:28:10	Car's logo
0:00:09:11	Turns off	17:00:29:21	And fade
0:00:12:23	Landscape	18:00:00:00	
0:00:15:11	Hotel entry	19:00:00:00	
0:00:18:07	Lobby service	20:00:00:00	
0:00:19:00	Porter takes bags	21:00:00:00	
0:00:20:20	View of room	22:00:00:00	
0:00:22:07	View from window	23:00:00:00	
0:00:24:00	Golf course /talkover	24:00:00:00	

Timer: 0:00:00:00 Next Cue: 0:00:00:01 Status: Ready

Cues A Cues B Learn Start Stop Reset Preset

Cuesheet screen

Source	Source	Source
1 Drums L	17 Dub 2	33
2 Drums R	18 Dub 3	34
3 Vocal 1	19 Spare	35
4 Mvs	20 Spare	36
5 Guitar 1	21 Spare	37
6 Lead Guitar	22 Acoustic Guitar	38
7 Bass	23 Synth Chair	39
8 Organ	24 SMPTE	40
9 Tubular Bells	25 Additional toms	41
10 Brass Band	26 Sampled car	42
11 Doorbell sample	27	43
12 Thunderbolt	28	44
13 Strings 1	29	45
14 Strings 2	30	46
15 Dog Bark	31	47
16 Dub 1	32	48

Mixdown screen

Item	Qty	Cost/Unit
1] Tapes	10.	2.50
2] Lunches	5.	6.50
3] Studio time 25:02:50	10.	15.00
4] Studio time 20:02:50	12.	15.00

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Expenses notes

sorting on any field, various printing options, and manual or automatic flagging of records. This allows searches to be made and the results flagged for printing or transfer to a second address book.

The *Disk Index Archiver* is a useful way of keeping track of the contents of all the disks a computer owner inevitably ends up with. It will read in the contents of any *ST* disk according to a set of definable masks so that, for instance, all the .PRG program files could be listed but not the .RSC resource files that go with them. The list itself may be searched so that a known file can be

tracked down to its disk, and comments may be added to each entry.

Finally, the *Tracksheet Accessory* is a simplified version of *Tracksheet*, which can be used apart from the main package. It reads data from *Tracksheet* files and allows it to be displayed, edited and saved.

Use of the various components of the *Trax* package, including the various procedures for transferring data between functions, is virtually instinctive to anyone conversant with the Atari

ST. Its screens are almost completely self-explanatory, the integration between programs is simply implemented and printouts are flexible and impressive. Some or all of its facilities are certain to find a use in any studio that already owns a suitable computer—of which there are more than a few—particularly at the price. □

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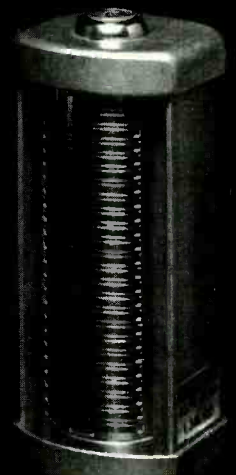
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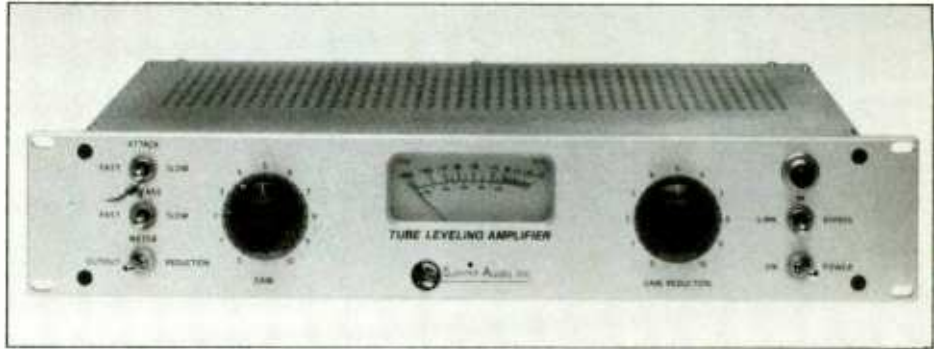
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On arrival, the Summit tube levelling amplifier brought floods of nostalgia, memories of recording sessions completed in a few hours using a 4- or 8-track machine and of such warm and trusty tools as the AKG C28 valve (tube) operated condenser mic. In the effects rack there would sit a Fairchild compressor, a clapped-out recorder used for tape delay and flanging, a couple of passive inductor/capacitor type graphic equalisers and little else. The Summit TLA-100A is designed to elicit just those feelings, since it is styled very like the old Fairchild, with simple, chunky control knobs and full sized toggle switches. And the sound? Well, let's say that it definitely has a sound of its own—it is an effects device as much as a dynamics controller.

Construction

Ruggedly built, the Summit has a 5 mm thick satin anodised aluminium front panel and an all-steel chassis. The panel legend is of black anodising with blue highlights, so should be quite durable. There are lots of ventilation holes to let out the heat, so if you buy one, leave space above and below it. Visually, it is more homely than



Summit Audio TLA-100A

Sam Wise gives a technical report on this Tube Levelling Amplifier

Manufacturer's specification

Output: +4 dBm corresponds to 0 vu balanced or unbalanced, transformer balancing optional
Output impedance: 75 Ω
Recommended load: > 600 Ω
Maximum output: +25 dBm
Input: Electronically balanced or unbalanced
Impedance: 20 kΩ
Maximum input level: +26 dBm
Dimensions: 19×3¼×10¼ in (whd)
Power: 35 W, 155-230 V, 50 or 60 Hz
Shipping weight: 16 lb
Summit Audio Inc, PO Box 1678, Los Gatos, CA 95031, USA.
UK: Music Lab Sales; 72-76 Eversholt Street, London NW1 1BY.

beautiful. Front panel controls are simple. On the left are three large toggle switches. From top to bottom they are ATTACK—fast, medium and slow; RELEASE—fast, medium and slow; and METER—output or reduction. To the right is the GAIN control scaled 0 to 10. This operates post-compressor to restore the gain. Next is the vu meter, showing output level or gain reduction, then the GAIN REDUCTION rotary control again scaled 0 to 10. Finally at the right end of the panel there is a large red POWER ON indicator (relampable from outside), with LINK IN BYPASS beneath, and lastly a POWER ON-OFF switch.

The rear panel has a screen printed legend. At the left is a 115/230 V line voltage selector with adjacent ¼ inch mains fuse and IEC mains connector. No fuse rating is printed on the panel. To the right of this is an output BALUNBAL switch, XLR-3 male output connector, 2-pole 6.3 mm jack STEREO LINK and SIDE CHAIN ACCESS connectors, and lastly a differential balanced XLR-3 female input connector. The XLRs are wired pin 3 hot, which is not now standard. Internally, all the electronics are mounted on a single glassfibre PCB complete with component legend. There are three custom-built encapsulated units on the PCB, one labelled VCA, the other two labelled OP1 and OP2. Front panel controls and rear panel connections are hand-wired to the PCB in an orderly manner. The 'tube' is retained by a spring loaded cover and is easy to replace. The lamps for the vu meter are push-fit into a PCB mounting socket for ease of maintenance but could be prone to falling out due to shock or vibration. There are also two internally mounted fuses in addition to that on the rear panel. Internal safety is good, with insulation protecting

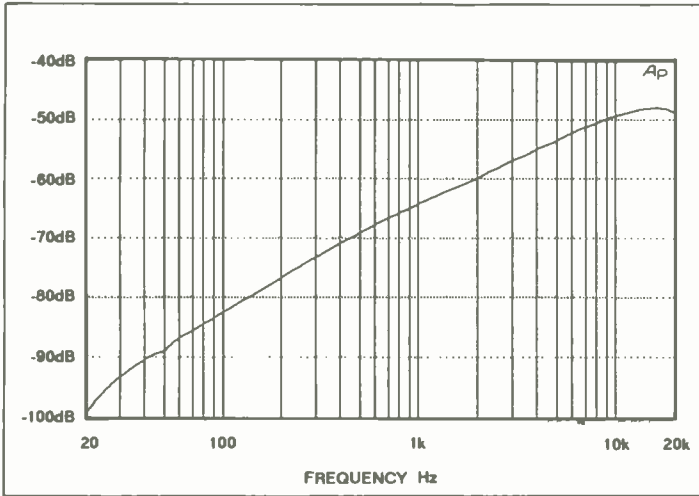


Fig 1: Input CMRR
Input level +18 dBu

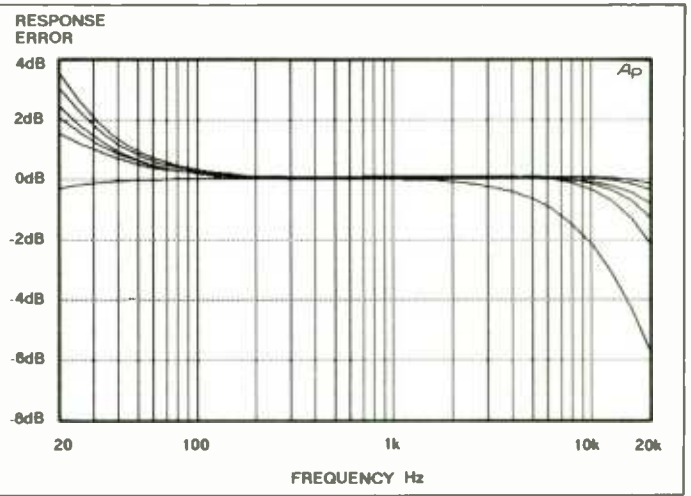


Fig 2: Frequency response with varying levels of gain reduction
 Frequency response (dBr ref 1 kHz)
 Gain reduction set at even integral values 0 to 10 with lower curve at 20 kHz being 0 GR

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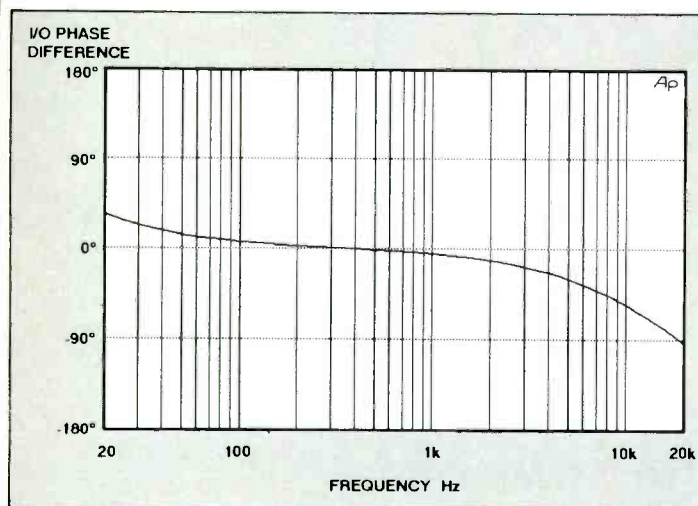


Fig 3: Phase response

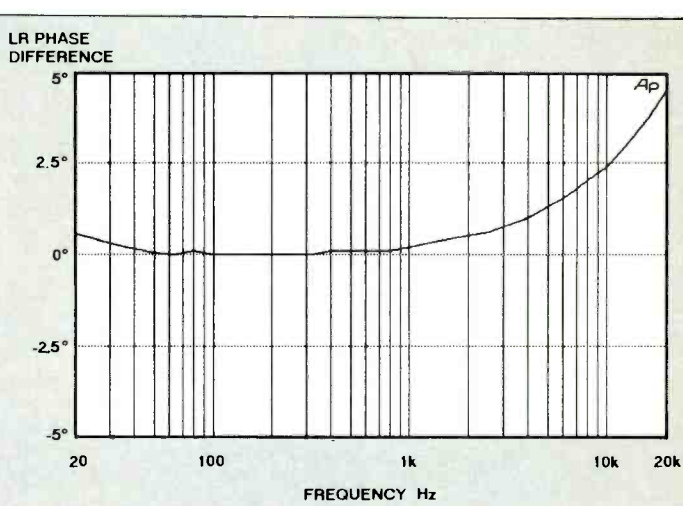


Fig 4: Phase error between two TLA-100A units in linked mode

all components carrying mains power. The mains cable is removable, connecting via a standard IEC socket. All in all, the unit should travel well if one is willing to forego vu illumination or solder the lamps in.

much is defined—you are meant to judge this unit by its sound. To quantify the performance, the normal series of measurements were performed.

voltage of +26 dBu being reduced to the specified +25 dBu when a 600 Ω load is connected. Still, the output level and impedances should not cause a problem.

The vu meter is specified to have a calibration of 0 vu = +4 dBu. This measures +3.98 dBu, which is within our measurement tolerance of specification. Meter accuracy is also excellent and the ballistics match vu specifications.

Circuitry

The Summit tube levelling amplifier combines largely solid-state circuitry with an electronic valve (tube) acting as an internal voltage amplifier. Thus it adds 'valve sound' to its 'soft-knee' compression characteristic, giving a particular type of compression effect. Design differences among compressors and limiters lead to preferences among users as to which unit they will use to produce a particular sound for certain types of source material. In the TLA-100A the difference—a valve sound—is a feature rather than a design by-product.

The compression circuitry is probably solid-state, being hidden within an encapsulated unit. As is clear from the manufacturer's specification, not

Inputs and outputs

A differential input is provided, with an input impedance of 40 kΩ balanced, or 20 kΩ unbalanced, confirming and clarifying the specification. This is adequately high. Fig 1 shows the common mode rejection ratio, which is excellent at low frequencies, decreasing at 20 dB/decade in common with similar circuits.

Input overload occurred at +26 dBu, which is certainly high enough and as specified.

The output amplifier is constructed from two cascaded 990 encapsulated op-amplifiers configured in inverting mode. A rear panel BAL/UNBAL switch bypasses the second inverting stage, connecting the return pin to earth. Output impedance measures 75 Ω/leg, or 150 Ω for a balanced output. This is a little higher than normal and results in the open circuit output

Frequency, phase and gain

With gain reduction set to 0 and gain set to unity, the frequency response falls off at high frequencies, being 6 dB down at 20 kHz. Investigation shows that as gain reduction is turned up, the high frequency response flattens but a bass boost is introduced. This reaches a maximum of +3.7 dB at 20 Hz at maximum gain reduction. This is shown in Fig 2.

Fig 3 shows the phase response with gain

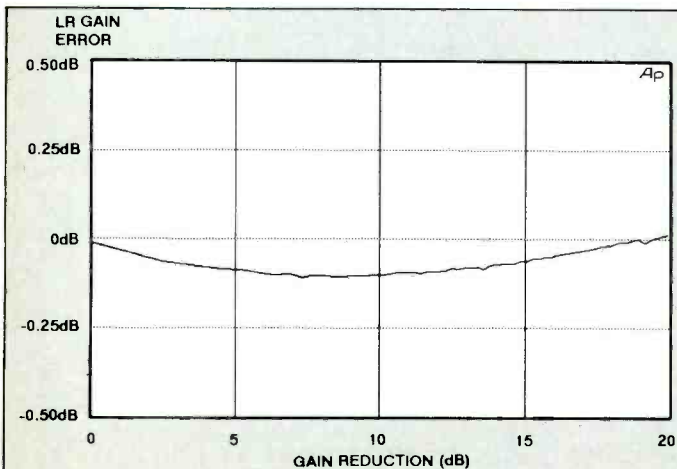


Fig 5: Stereo tracking error +18 dBu input, frequency 1 kHz

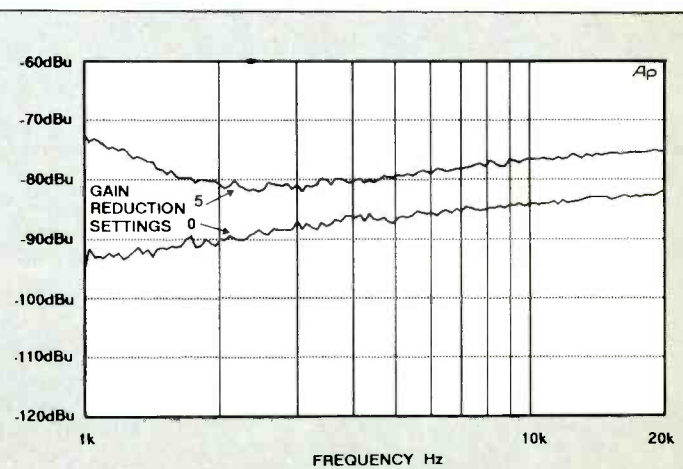


Fig 6: 1/3-octave noise spectrum Gain unity, 60 Hz, 0 dBu tone Rise at low end due to high level of 8th harmonic (480 Hz)

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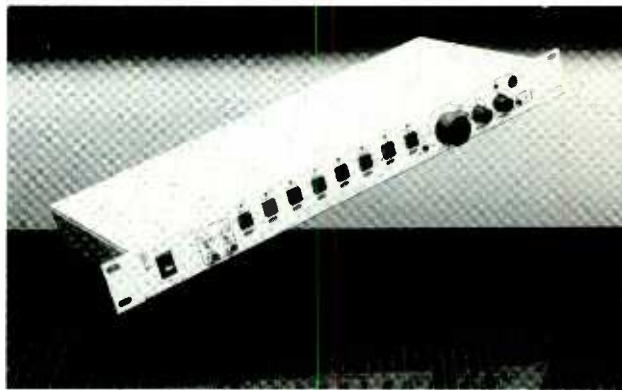
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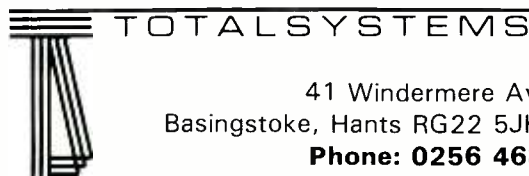
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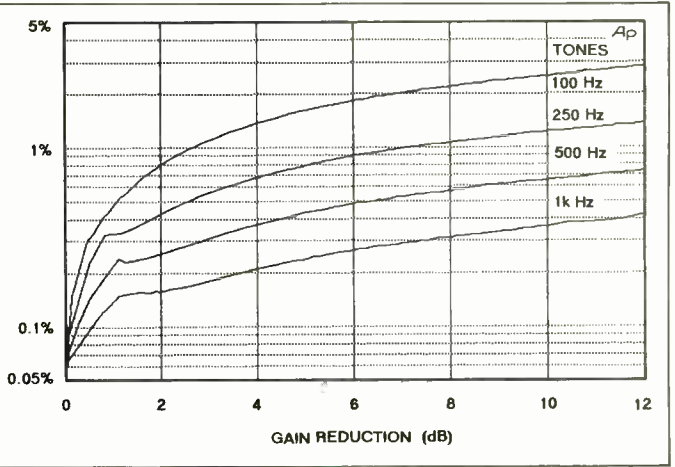
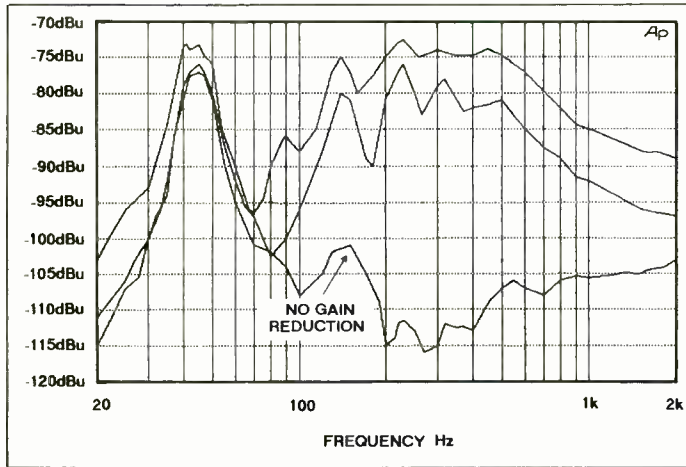


Fig 7: 1/3-octave noise+distortion Harmonic products of an LF tone 400 Hz, 18 dB/octave filter in circuit

Fig 8: THD+N vs gain reduction at various frequencies Measurements are not noise limited in any way

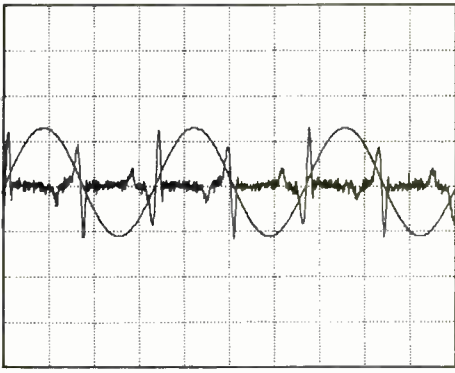
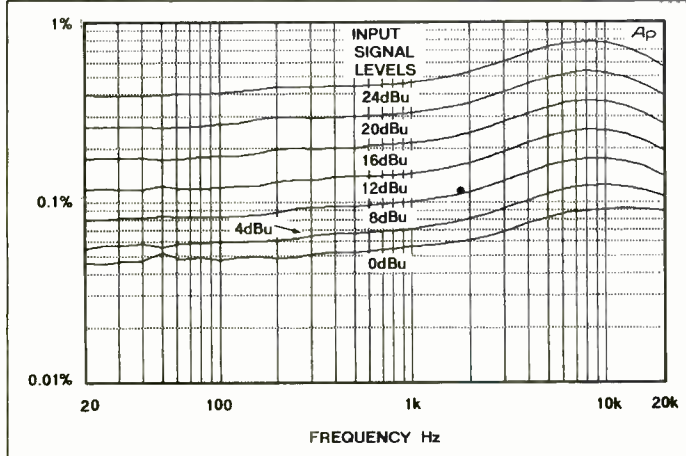


Fig 9: THD+N for various input levels Unity gain, no gain reduction Input levels mainly second harmonic

Fig 10: Scope traces of crossover distortion

reduction set to 0. As expected, the phase tracks the frequency variation. To check stereo tracking, two Summit units were patched together using the rear panel stereo link connectors. Fig 4 shows the phase difference between two units versus frequency, while Fig 5 shows the gain error as a function of gain reduction. Both results are excellent. There is no reservation in recommending these units for stereo applications.

Noise and distortion

As might be expected, noise and distortion are a function of both signal level and control settings. At unity gain and with no gain reduction, the broadband noise is as shown in Table 1. A 1/3-octave sweep of this noise reveals that it is essentially white in character, with a small 60 Hz component at -90 dBu.

To investigate the effect of the dynamic control systems on noise, a low frequency 'probe' tone of 60 Hz is used to set the gain reduction. The 60 Hz tone is removed using the THD+N notch filter,

allowing investigation of changes of THD+N with gain reduction and signal level.

Fig 6 shows two curves. The lower one is without any gain reduction. In the upper curve, the gain reduction control is set to position 5. The input signal level is 0 dBu and the actual gain reduction about 7 dB. This loss is made up by adjustment of the gain control. As is apparent, the broadband noise has increased by 7 dB, indicating that most of the noise is generated in the input and compression cell stages and is not really affected by the amount of gain reduction. The rise in the LF end is actually caused by the 7th and 8th harmonic distortion products of the 60 Hz probe tone.

Fig 7 shows the detail of the lower frequency effects. Note that generally, odd order harmonics

are produced. These low frequency distortion products have nothing to do with the quality of the Summit unit but result from the effect of the compressor attack and release time constants on a low frequency tone and will be common to any compressor with similar settings. Neither is the effect of the valve (tube) shown in any of these measurements, since it follows the gain control, it is operating at a constant level.

Fig 8 shows that as frequency rises, there is a reduction in the distortion caused by the compression process itself. At higher frequencies the result appears to be almost entirely noise.

In Fig 9, a swept sine wave signal is used, with the gain control adjusted for unity gain at 1 kHz. The input signal level is from 0 dBu to +24 dBu in 4 dB increments. There is no gain reduction. This shows the effect of the valve (tube), which is generating mostly second harmonic distortion. This increases almost in step with the signal level.

Lastly, Fig 10 reveals that the residual distortion without gain reduction is largely due to crossover error in one of the internal amplifier stages. This is most certainly not a result of using a valve (tube).

TABLE 1 Broadband noise performance	
Unity gain, no gain reduction	
Source resistance 50 Ω	
22 Hz to 22 kHz BW, RMS	-74.8 dBu
400 Hz to 22 kHz BW, RMS	-74.9 dBu
CCIR 468-3, Q-peak	-63.5 dBu

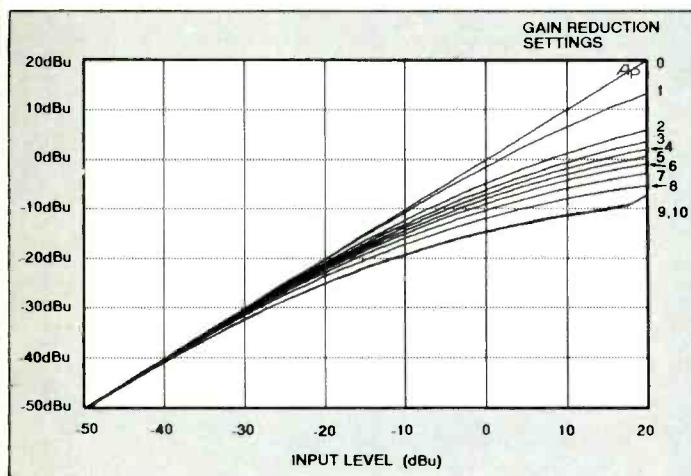


Fig 11: Compression curves
Unit gain set to 0
Note 9 and 10 are identical

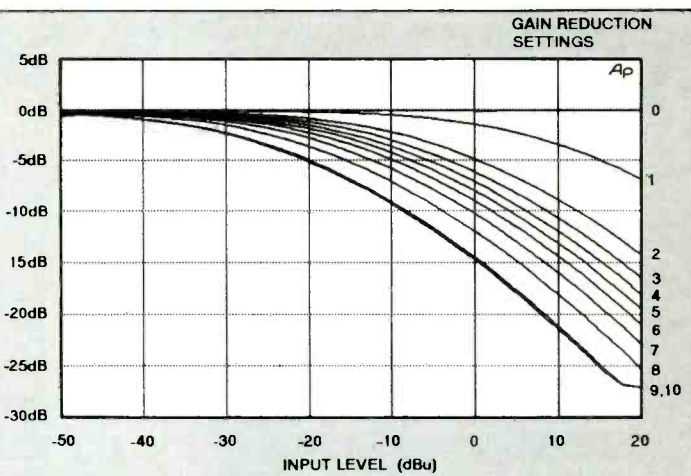


Fig 12: Gain reduction
Unit gain set to 0
Note 9 and 10 are identical

Controls and dynamics

In Fig 11, the compression curves of the TLA-100A are shown. The top curve is with gain reduction set to 0. As gain reduction is increased, the output level drops are expected. There is more effect over the first two calibrated positions but in general the control law is acceptable. Fig 12 shows the same data but this time shows gain reduction itself as a function of signal level and gain reduction control settings.

The gain control provides a gain range from about +37 dB, down to -65 dB. This is adequate to make up for the maximum gain reduction of 27 dB and leaves a further 10 dB of gain in hand. The law is shown in Fig 13, and is quite reasonable over the top three-quarters of rotation.

Attack and release times are dependent on the programme itself and on the settings of the attack and release toggle switches. An example of attack characteristics are shown in Fig 14. In Fig 14a there is no gain reduction and the output signal is unaltered. In Fig 14b, the setting of gain reduction is maximum, and attack is slow. As can be seen, the signal level slowly declines, never reaching its fully reduced value. Fig 14c changes attack to medium and the signal now reduces to its minimum value during the first five cycles. When attack is switched to fast, the signal is almost immediately attenuated as shown in Fig 14d. The effect of various release times is similar.

The sound of Summit

Listening tests were performed using voice, acoustic guitar and a full range trad jazz recording. Unfortunately, flute or a similar pure tone type of source was not attainable in the time available. The TLA-100A gave a gentle warmth to the sound while controlling the level but presented no obvious sense of unpleasant distortion. There was a feeling of increased

fullness, which was probably produced by the combined effect of decreased dynamic range and the second harmonic distortion introduced by the valve (tube). In general the sound was pleasant and noise not too obvious. If large gain reductions were used along with full level restoration, then the noise of the compressor began to be intrusive.

Final comment

The Summit TLA-100A tube levelling amplifier is a well engineered and well made effects unit, which will be the device of choice for certain applications. It will not replace the other level control devices in the studio, rather it will supplement them. There is little in engineering detail of this unit that can be criticised. If something will benefit from improvement, it will be the noise performance but even this really only gets obvious when large gain reductions are in use along with a large amount of make-up gain and that usually implies high level masking signals. □

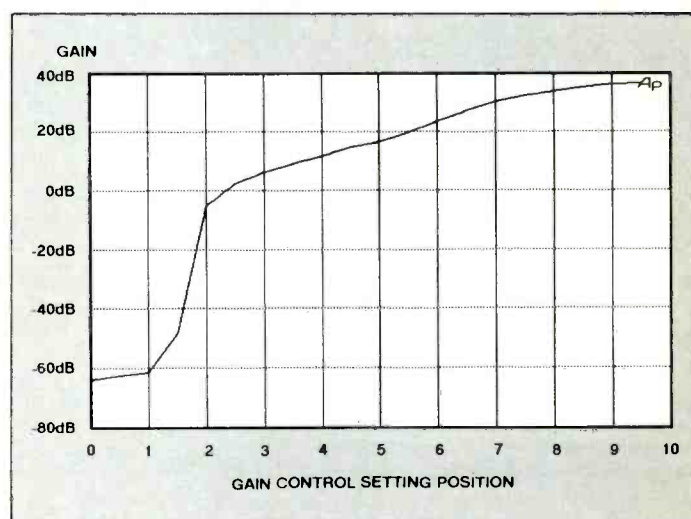


Fig 13: Gain control law

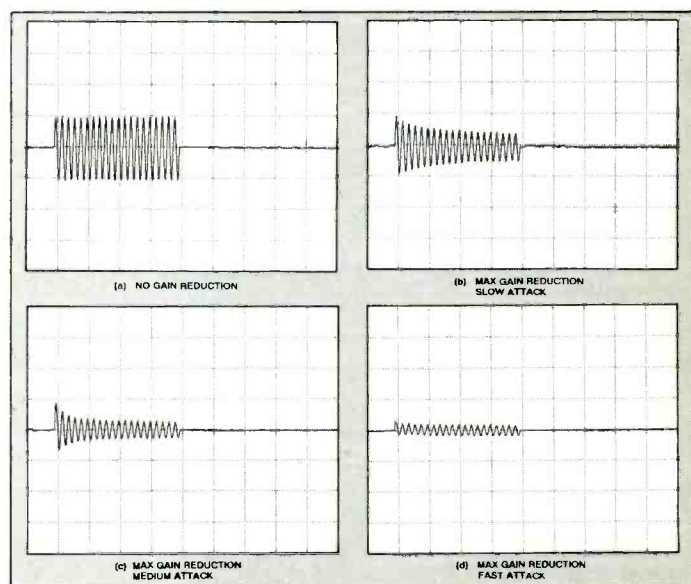


Fig 14: Attack characteristics
1 kHz sine burst: 20 cycles on, 1,000 cycles off



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B.G.C. COMMUNICATION

CLASSIFIEDS

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Replies to Box Nos. should be addressed to the Advertisement Manager, Studio Sound, Link House, Dingwall Avenue, Croydon CR9 2TA, and the Box No. quoted on the outside of the envelope. The district after Box No. indicates its locality. **SEX DISCRIMINATION ACT 1975:** No job advertisement which indicates or can reasonably be understood as indicating an intention to discriminate on grounds of sex (e.g. by inviting applications only from males or only from females) may be accepted, unless (1) the job is for the purpose of a private householder or (2) it is in a business employing less than six persons or (3) it is otherwise excepted from the requirements of the Sex Discrimination Act. A statement must be made at the time the advertisement is placed saying which of the exceptions in the Act is considered to apply.

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The Sound Department is one of nine at Beaconsfield; the others are Animation, Art Direction, Camera, Direction, Documentary, Editing, Film Music Composition and Producing. A shorter course (12-15 months) for Writers is also available.

The School operates an Equal Opportunities policy and there are no special educational qualifications or age limits. However, candidates must be able to provide evidence of their potential.

Brochure and Forms can be obtained from:

The National Film & Television School, Dept. StSo, Station Road, Beaconsfield Bucks HP9 1LG. ★ Tel: Beaconsfield (0494) 678623.

Application Deadline 15th January, 1991.

The School is financed jointly by Government and Industry and is fully recognised by the ACTT.

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QUALITY CASSETTE MASTERING AND COPYING, any quantity, Video duplication PAL/NTSC/SECAM transfers, 24 hour, seven days a week service. G.W.B.B. Audiovision, 42 Lancaster Gate, London W2 2NA. Tel: 071-723 5190.

THE COMPLETE SERVICE. Disc cutting, pressings, duplicated cassettes and blanks. Bin Masters. Location Recording. Free Brochure. Tam Studio, 13a Hamilton Way, London N3 1AN. Tel: 081-346 0033. (X)

LOCKWOOD, TANNON, etc. New and used equipment bought, sold, serviced. Authorised Tannoy specialist. Lockwood Audio, Tel: 0923 210254 Fax: 0923 240558.

DISC CUTTING EQUIPMENT and systems bought, sold, installed and manufactured by TAM/ENGLAND, 13a Hamilton Way, London N3 1AN. Telephone: 081-346 0033.

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RECORDING STUDIO SELLING IN GOOD CONDITION: Sound Console Neve 5315-12; Westrex RAE1231 series E900 16mm optical sound recorder; Magnatech 16mm 3-track recorder and 3-track dubber. Alamo—R. Fidalga, 568—S. Paulo, Brazil CEP 05432. Fax: (0055 11) 8140345. Tel: (0055 11) 8139033.

RECORDING STUDIO FOR SALE: In popular area of Battersea—fully fitted production studio, ready to use. Leasehold, full air-conditioning, 840 sq. ft. Price negotiable and to include fixtures and fittings. Tel: 030 785 378/380 to arrange appointment to view.

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FOR SALE: Otari MTR 90 MkII good condition £15,500. ATC 100's self-powered studio monitors £1,500. Amek/TAC Scorpion 28/16/24 mixing console with patchbay £6,500. Phone: 071-729 6165.

STUDER A80, and Otari MTR 12 half inch 2-track machines. Contact: Paul Cartledge, Joe and Co (Music) Ltd. Tel: 071-439 1272.

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HHB Autumn Sale 1990

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Sony GC9E Video Walkman 4".....		£499.00
Sony LCSGVB Soft Case for GVC9E.....		£39.00
Sony CCDP335 Video 8 Camcorder.....	D	£599.00
Sony CDP790 Compact Disc Player.....		£155.00
Sony CDP470 Compact Disc Player.....		£119.00
Sony D800K Portable Compact Disc Player.....		£155.00
Sony CPA2 CD Car Adaptor.....		£15.00
Sony SSA 701 Stereo Speaker System.....		£55.00
Sony Ex-Demo SLC9UB Betamax Video.....	D	£395.00
Sony EVS800 Video 8 Recorder.....		£650.00
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Sony KVM3412 34" Colour Stereo TV.....	D	£1,600.00
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Sony TAN5E5 Stereo Amplifier.....		£275.00
Sony WMD6 Professional Walkman.....		£195.00

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Sony SU224 Remote Stand for above.....	D	£250.00
Sony PCM2500 Professional DAT Recorder.....	D	£1,750.00
Sony MUR201 Digital Reverb.....		£699.00
Sony PCM701ES & RTW Digital Interface.....	H	£1,250.00
Sony/Audio Design PCM701 Stage 1/2/3.....	H	£999.00
Sony VO 5630DA Digital U-Matic Recorder.....	H	£975.00

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BSS DPR502 Stereo Noise Gate.....	D	£499.00
BSS DPR504 Quad Noise Gate.....	D	£499.00
Drawmer DS201 Stereo Noise Gate.....	D	£250.00
Drawmer LX20 Expander Compressor.....	D	£195.00
Eventide B9980 Profanity Delay.....	D	£3,999.00
Lexicon LXP-1 Digital Reverb.....		£375.00
Focusrite ISA115HD Stereo Equaliser.....	D	£2,595.00
Focusrite ISA131 Dynamics Processor.....	D	£1,545.00
Klark-Teknik DN360 Stereo Equaliser.....	D	£950.00
Klark-Teknik DN410 Parametric Equaliser.....	D	£725.00
Klark-Teknik DN504 Quad Compressor.....	D	£595.00
Klark-Teknik DN514 Quad Gate.....	D	£499.00
Roland E660 Digital Equaliser.....		£750.00
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Sony VO9850P U-Matic Recorder.....		£4,750.00
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Sony PVM2730 27" Grade A Monitor.....	D	£875.00
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Sony TTF1 Timer/Tuner.....	H	£99.00
Sony Ex-Demo SLC9UB Betamax Video.....	D	£395.00

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dbx166 Compressor Limiter.....		£449.00
Aphex Compellor Signal Processor.....		£749.00
Rane HC6 Stereo Headphone Amp.....		£299.00
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BSS DPR402 Compressor Limiter.....	D	£575.00
BSS DPR502 Stereo Noise Gate.....	D	£499.00
BSS DPR504 Quad Noise Gate.....	D	£499.00
Drawmer DS201 Stereo Noise Gate.....	D	£250.00
Drawmer LX20 Expander Compressor.....	D	£195.00
Eventide B9980 Profanity Delay.....	D	£3,999.00
Lexicon LXP-1 Digital Reverb.....		£375.00
Focusrite ISA115HD Stereo Equaliser.....	D	£2,595.00
Focusrite ISA131 Dynamics Processor.....	D	£1,545.00
Klark-Teknik DN360 Stereo Equaliser.....	D	£950.00
Klark-Teknik DN410 Parametric Equaliser.....	D	£725.00
Klark-Teknik DN504 Quad Compressor.....	D	£595.00
Klark-Teknik DN514 Quad Gate.....	D	£499.00
Roland E660 Digital Equaliser.....		£750.00
Roland SDE3000A Digital Delay Line.....		£595.00
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Audio Design PROBOX1.....		£299.00
Audio Design PROPAK1 c/w PCM701ES.....	H	£199.00
Audio Design Stage 1/2/3 c/w PCM701ES.....	H	£999.00
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“I didn’t decide to buy the Soundcraft 3200. My clients did.”

Robin Black, Black Barn Studio.



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“As soon as we saw the 3200 we knew we wanted one.” This was the reaction of Robin Black and his team at Black Barn Studio when the decision was made to up-grade their equipment.

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Robin adds “buying the 3200 was the best business decision I ever made.”

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