

August 1991

\$5.00 £2.00

STUDIO SOUND

AND BROADCAST ENGINEERING



MONITORING



08 >

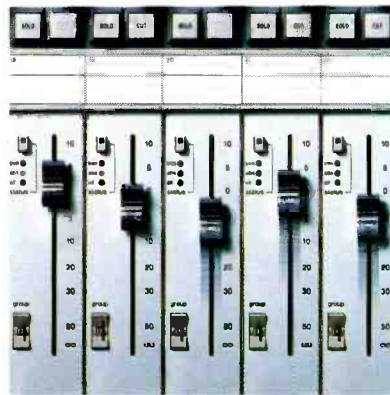
9 770144 594017



Now the world's favourite recording console has added the ultimate moving fader system

THE SUCCESS of Solid State Logic's SL 4000 Series console is legendary.

The system remains successful by growing alongside the creative individuals who use it. An example of this evolution was the introduction of G Series electronics, where new technology allowed subtle improvements to be made to the entire audio path. Now, SSL has changed the face of console automation by devising an automation system which combines the best features of both moving faders and VCAs.



Called ULTIMATION™, this unique dual automation system has been fully integrated with the G Series console. It reads existing G Series mix data, and its commands are immediately

familiar to all SSL users. The system's unique dual signal path circuitry allows the engineer to select operation – either as a full feature moving fader system, or as standard G Series automation. Ultimatum even allows moving faders to perform SSL-style Trim updates without resorting to complex subgrouping software.

Today's G Series consoles, with Ultimatum, take the art of recording one stage further. Together they set new standards, continuing in the innovative tradition of the world's most respected console system.

Solid State Logic

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

Paris (1) 34 60 46 66 · Milan (2) 612 17 20 · Tokyo (3) 54 74 11 44 · New York (212) 315 1111 · Los Angeles (213) 463 4444 · Toronto (416) 363 0101

STUDIO SOUND

AND BROADCAST ENGINEERING

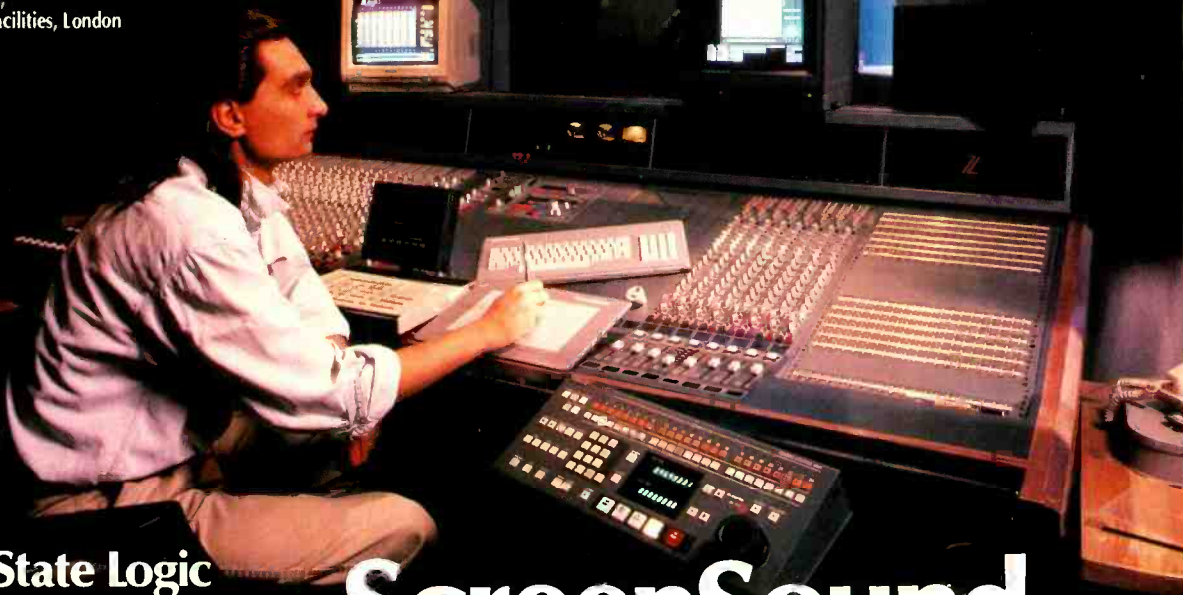


Pet Shop Boys in Brussels

Editorial:	Keith Spencer-Allen comments on the problems of monitoring in the near field	5
News:	Events, news, moves and comment from inside and outside the recording industry	8
Products:	Information on new products, developments, upgrades and software updates	14
Music News:	Products updates and developments from another side of the business. Compiled by Zenon Schoepe	20
Live Sound:	Keeping abreast of live sound news and equipment. News of a MIDI Show Control proposal	22
Pet Shop Boys On Tour:	Mike Lethby witnesses a MIDI manifestation in Brussels with the Pet Shop Boys	25
Logic:	Sue Sillitoe visits a studio in Milan, Italy, with a growing international reputation	31
Monitoring:	We have compiled a selection of products launched over the past year	34
Schoeps Sphere:	Francis Rumsey gives a subjective assessment of this stereo microphone approach	41
Sapphyre:	Soundcraft's latest mixing console is assessed by Patrick Stapley	44
MIDI Timecode:	Vic Lennard explains the necessity for a MIDI timecode	48
Otari DDR-10:	David Miles Huber looks at a 2-channel digital recording/editing hard disk system	53
The Acoustics of Mixing Consoles:	Philip Newell looks at the physical effect of mixing consoles on the monitoring environment	59
Business:	Spreading stereo; eliminating room reflexion; backward message masking. By Barry Fox	64
Perspective:	Bean counting and small fry. Comment from Martin Polon our US columnist	66
User Review:	An operational report from Mike Collins on the Akai S1100 sampler	70

"ScreenSound is fast, flexible and our clients can see exactly what's happening. They get more involved."

Richard Lambert,
co-owner, M2 Facilities, London



Solid State Logic

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

Paris (1) 34 60 46 66 · Milan (2) 612 17 20
Tokyo (3) 54 74 11 44 · New York (212) 315 1111
Los Angeles (213) 463 4444 · Toronto (416) 363 0101

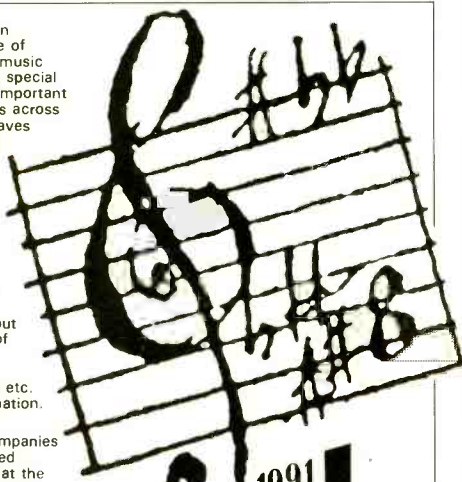
ScreenSound

Digital Audio-for-Video Editor/Mixer

This unique publication has been designed specifically for the use of people involved in professional music recording. It offers a number of special features which allow access to important information on recording studios across Western Europe, and thereby saves both time and money in finding the right studio.

- ★ A comprehensive listing of all 24 track + recording studios in Western Europe in an easy-to-access style detailing all necessary contact details.
- ★ A unique grid system which allows you to access information on studios without needing to know the name of the studio in advance.
- ★ Information on outboard, monitors, recent work, rates etc.
- ★ Multi-lingual guidance information.

Now, after proven success throughout European record companies and producers, we have a limited number of copies left available at the special price of £10 per copy. Either call John on 071-586 6086 or fill in the coupon below.



THE A&R STUDIO handbook

1991

THE COMPREHENSIVE GUIDE TO EUROPEAN RECORDING FACILITIES



Please send copies of the A&R Studio Handbook at the special price of £10 each inc. VAT & P&P. Send your cheque or Postal Order (overseas customers must send international money orders) to:
A&R Studio Handbook
A&R Studio Publications Ltd
PO Box 8, Spotlight Publications Ltd
Ludgate House, 245 Blackfriars Road, London SE1 9UR

HEARD BY MILLIONS BUT SELDOM SEEN



STUDIO QUALITY CONTACT CONDENSER MICROPHONES

- 42Hz to 22KHz Frequency response
- Superb clarity - true acoustic sound
- Complete isolation
- Easy to use
- More than 5000 systems in use world wide
- Abience-Free Stereo



FOR NEAREST
DEALER/DISTRIBUTOR CONTACT:-

UK + EUROPE USA CANADA
A.M.G. C - T AUDIO

Call 0428 658775 Call 1 - 800 C - T Audio West Call 416 360 5940
Fax 0428 658438 Fax 407 738 0319 Fax 416 362 2477
Int + 428 58775 Int + 0101 407 738 0622 East Call 604 222 8190
Fax 604 222 9884

STUDIO SOUND

AND BROADCAST ENGINEERING

August 1991
Volume 33 Number 8
ISSN 0144 5944

EDITORIAL

Editor: Keith Spencer-Allen
Assistant Editor: Julian Mitchell
Co-ordinating Editor: Ann Lowe
Secretary: Elaine Sweeney
Consultant: Sam Wise
Columnists: Barry Fox, Martin Polon (US)
Regular Contributors:

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

ADVERTISEMENTS

Executive Ad Manager: Steve Grice
Deputy Ad Manager: Phil Dearing
Advertisement Production: Mark Trainer
Secretary: Lianne Davey

CIRCULATION

Circulation and Development Manager:
Colin Enderson
Controlled Circulation Manager:
Maria Udy
Enquiries: See classified advertisement

Director: Doug Shuard
Publisher: Steve Haysom

EDITORIAL & ADVERTISING OFFICES

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

NEWSTRADE DISTRIBUTION (UK)

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

AMERICAN OFFICE

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

JAPAN & FAR EAST AGENT

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

© Spotlight Publications Ltd 1991 all rights reserved.

Origination by Project Three Filmsetters Ltd, The Print Centre, 70-72 John Wilson Business Park, Thanet Way, Chestfield, Kent CT5 3QT, UK. Printed in England by Andover Press, St Ives plc, Telford Gate, West Portway Industrial Estate, Andover, Hants SP10 3SF, UK.

Studio Sound and Broadcast Engineering incorporates Sound International and Beat Instrumental.

Studio Sound is published on the third Friday of the month preceding the cover date. The magazine is available on a rigidly controlled requested basis, only to qualified personnel (see classified advertisement for terms)



MEMBER OF THE AUDIT
BUREAU OF CIRCULATIONS

Total average net circulation of 19,166 per issue during 1990.
UK: 6,655. Overseas: 12,511.
(ABC audited)



Speaking on monitors

A couple of weeks ago I had an invitation to listen to a new set of compact monitor speakers in a central London studio. The manufacturer has a high reputation for producing good monitor speakers. In fact the UK distributor and the studio hosting the demonstration also have very good names.

The new monitors were slightly larger than the *NS10s* that sat on the corners of the console meter bridge as well as being quite a bit heavier. They were placed on heavy speaker stands that positioned them just over the meter bridge although for all practical purposes it could be assumed that they were on the meter bridge itself.

I have followed the products of this company in quite some detail often trying to find time to check-out new models in less than perfect hotel rooms posing as convention demo rooms. So I had a degree of familiarity with the sound and design of the manufacturer's products — and a certain amount of expectation.

We were invited to sit centrally behind the console and listen to a selection of CD sources. I was rather disappointed with what I heard.

In this issue we have an article titled 'The Acoustics of Mixing Consoles' and in some ways this might be the most important article on monitoring that we have published for a long time. Author Phil Newell was asked to look at the console and other studio furniture from the point of view of their acoustic effect within the room. The console is arguably the major remaining problem to overcome in control room acoustics and the effect on speaker systems is quite clearly audible — both in the nearfield and farfield. The problem is that we have become used to it.

There is the story of the studio with the very expensive new control room from a top designer, completed several weeks before the console arrived. During this time the studio staff familiarised themselves with the monitoring and were delighted with the sound in the room. The console duly arrived and was installed and the engineers were horrified with the sound they heard through the console. They blamed the console and the designer because he had actually suggested that this console would be their best choice. Following the phone call in the middle of the night the console performance was checked and found to be correct and the designer was able to confirm that what they were hearing was solely the sound of the console in the room. The studio had one of the few chances to listen to a room before and after the installation of the console and didn't like what they heard.

There is little doubt that although we know that the acoustic effect of studio furniture exists it is frequently ignored except where there is the opportunity to hear the room before and after the console. This returns us neatly to where we came in and the monitors in the nearfield demo. When requested, the *NS10s* were removed and the new monitors moved back from the console — not an ideal position but somewhere the reflected sound would not be predominant in the listening position. And they sounded like a different speaker. People wandered back into the room and said that they thought they sounded much better now — and they really did. What had been changed?

It was unfortunate that because of the nearfield-type dimensions of the new monitors they were demonstrated in that position. It really did them no favours and they could have easily been dismissed as not sounding very good. However many are working solely in the nearfield and who knows what the console reflexions are contributing to your ability to monitor accurately. I doubt if it is something that you can fully adjust your ear for. It is, however, something that needs to be considered, particularly if you are working solely in the nearfield.

Keith Spencer-Allen

Cover: Tannoy System 15 DMT. Photography by Nik Milner

Ready to Rack™



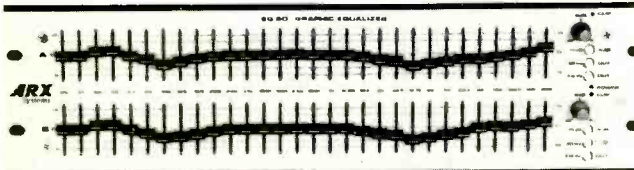
Sixgate™. Six noise gates in a single rack unit package. Ultra low noise and fast. Features include Key Inputs/Sidechain Inserts.



Quadcomp®. Four compressor/limiters in a single rack unit package. Features include balanced Ins and Outs, Sidechain Inserts, multi LED gain reduction metering and stereo linking.



Multi Q™. Six channels of parametric EQ, with exclusive internal patching system to link channels without patch leads. A unique creative tool for any EQ situation, in one rack unit. Balanced Ins and Outs.



EQ 60. Dual channel 'Constant Q' graphic EQ. Balanced Ins and Outs, compact design, and ultra Low Noise circuitry. The EQ that DB magazine called "The most accurate we have ever tested!" Hear it for yourself!

ARX Systems

USA and Canada
ARX Systems USA 714 649 2346
Great Britain
MTR Ltd 0923 34050
Spain
Excel SA 811 2563
Belgium
Eurocase 3 239 6995

Germany
ARX Germany 06 174 23433
Italy
Armonia Nova 39 51 765 068
Austria
MTEC 43 7242 60860
Sweden
Tal & Ton (0) 31 80 3620

Media™

AUDIO SYSTEMS Media Patch Panels for every audio system format

1/4" BPO	✓	4000, 5000, 6000 SERIES
BANTAM	✓	7000 SERIES
NORMALLING	✓	ALL BPO AND
PREWIRING	✓	BANTAM TYPES
DIGITAL	✓	DAP SERIES

Media Products

'a sound choice'

send for our Short Form Catalogue

14 The Markham Centre, Station Road, Theale, Berkshire RG7 4PE, United Kingdom. IDD (+44 734) Telephone: (0734) 303800 Fax: (0734) 323121

NOTE

The work print or copy master is one of the most important links in the Post Production chain. Whether it is Video Off-Lining, Dialogue Replacement or Audio Sweetening the quality of the Work Print brings out the creativity in both Actors and Operators alike.

On further details call GTC or your local dealer.

UK: F.W.O. Bauch LTD
(44)81.953.0091
FRANCE: VIDEODIO
(331)48219129
SWEDEN: MSI Broadcast AB
(46)87680975
SPAIN: FADING S.A.
(34)3772400
TURKEY: UTIN Trade Co.Ltd
1404037-1262919

A new type of

Film to Tape...

TELESCAN



The heart of the TELESCAN is the SCANSCOPE, a newly developed optical system which provides flicker free moving and still pictures. Combining this with an innovative transport and a 3 CCD scanner results in the most cost effective high quality FILM to TAPE transfer system currently available.

- User Friendly, easy operation
- 16/35 mm Formats
- Interlock Capability to LTC, VITC & Pulse
- Evolution Transport
- Anti-Scratch condensor feature
- Continuous Motion
- Vari-Speed
- Careful Film Handling

GTC have, since the late 70's, been leaders in the field of timecode referenced multi-format machine synchronising. Now the 90's see us once again at the forefront of control techniques, bringing fast, accurate, system automation within the reach of all production facilities.

GTC

BROADCAST PROFESSIONALS

g.t.c. Film- und Fernseh- Studioteknik GmbH
Woehrendamm 19, D2070 Grosshansdorf
Phone: (0)4102-62062, Fax: (0)4102-64907

AMEK BCIII

THE IMPORTANCE OF EVOLUTION

Specifications in broadcast audio and video production are continually developing with the emergence of new formats and methods. AMEK's benchmark BCII compact console set a world standard for performance and facilities, but as technical needs evolve so we have evolved a new design generation, BCIII.

Over five hundred BCII installations worldwide have given us the viewpoint of engineers working in all aspects of audio production. We have deep knowledge of what is needed and through an incredibly versatile design with many options from circuit level upwards, we can build from basic components a console to fit your system.

BCIII is designed for AMEK by Rupert Neve brings many of the characteristics of transformers to both Mic and Line inputs without the bulk and cost.

MULTIPLE CONFIGURATIONS

BCIII can be configured for up to 32 inputs or for as few as 6 inputs according to operational requirements. With 6 input module variants including 3 versions of the stereo module, 4 group modules and 5 output stages, BCIII lends itself to a host of applications.

BALANCED INTERCONNECTIONS

Pre- and post-fade inserts and all outputs are balanced, operating at full studio level – allowing seamless, trouble-free interfaces to complex studio environments.

EXPANDABLE MONITORING

With complex multi-feed monitoring for several points including audio and video control rooms and performers' feedback, BCIII's flexible monitoring system allows control in all production environments.

OUTPUT FLEXIBILITY

Outputs can be configured with 4 or 8 mono or stereo groups feeding 1 or 2 separate stereo busses. Multiple clean feeds allow simultaneous handling of outside sources. Four fully-independent Auxiliary sends handle all Effects and Foldback/Cue requirements.



VERSATILE CHASSIS DESIGNS

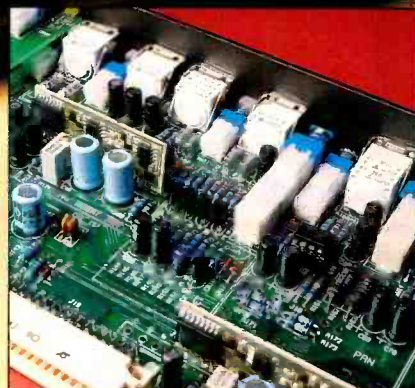
BCIII comes in 3 standard chassis packages including the freestanding SC (studio chassis). The onboard jackfield and extensive 19" rack space (>20U) within the console base allow significant space saving. The meter panel may be supplied with a range of metering options from 200-segment plasma bargraphs to VU meters.

CONTROLS

On both inputs and subgroups, the Image control allows the signal to be changed from stereo through mono to reverse stereo – absolutely essential for stereo television audio.

AUDIO

VCA's may be fitted to faders; the addition of AMEK's ESM/ESR unit allows remote control from Video Editors with a number of manufacturers and protocols being handled. In addition, BCIII is also prepared for DC fader grouping systems.



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

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

AMEK SYSTEMS & CONTROLS LTD. part of AMEK TECHNOLOGY GROUP Plc

Mark IV Audio enters agreement with Intelix

Mark IV recently entered a technology-marketing-product development agreement with Intelix Corp, a Wisconsin-based electronic research and development firm in the USA. The agreement also covers licensing of Intelix products.

Under the agreement, Intelix will aid the development of computer hardware and software designed specifically for Mark IV Audio products. Mark IV Audio will market Intelix hardware and application development software through their US and international distribution channels.

Intelix product for Mark IV Audio will be manufactured at Altec Lansing's Oklahoma City facility, and products made specially for Mark IV Audio will be marketed as

'Intelix, Mark IV Audio Control Technology'.

Also under the agreement, Mark IV Audio have purchased the Intelix *MIND Control* system hardware and application-specific software. The *MIND Control* system is a remote control tool that allows control and status indication of building systems. Specific tasks include adjustment of audio, lighting, HVAC and security systems.

It has been stressed that Intelix is still an independent entity and has not been purchased by Mark IV. Dave Merrey, president of Altec Lansing, a Mark IV owned company, will direct the activities between the two companies.

Intelix will still be distributed in the UK by Shuttlesound.

Mitsubishi announce 64 tracks

After June's APRS show in London, Sonny Kawakami, Mitsubishi Pro Audio's International marketing manager and head of the PD Format Committee issued a statement about the possibility of a 64-track digital audio recorder.

Says Kawakami, "We have recognised the need for a single 64-track digital recorder. The go-ahead has been given on the

development of a 64-track PD machine using 1 inch tape, which will be fully compatible with all existing 32-track PD machines.

"The proposed design, jointly agreed by Mitsubishi and Otari, has already been submitted to the IEC working group in Tokyo. Mitsubishi will also be presenting a full paper on the new format in October at the AES Exhibition in New York."

In brief

● Los Angeles, CA: **The beat goes on at the Record Plant:** The Record Plant in Hollywood, USA, has been bought by Summa Music. Future plans include increasing the

facility from two rooms to a five room complex.

● London, UK: **Practical radio training:** RTC is a new service offering a training and back-up advice service for radio stations and studios in the UK and Europe. The company offers technical operation; production skills; presentation skills; and studio management. RTC, 59 Camelot House, Camden Park Road, London NW1 9AS, UK. Tel: 071-608 0635.

● London, UK: **College equipment stolen:** During the weekend May 25th to 27th, the Electronic Music Studios and adjacent storeroom at the Royal College of Music were broken into and a substantial quantity of equipment stolen. Anyone who can provide any information about this equipment is asked to contact Lawrence Casserley or Matt Saunders on 071-589 3643.

● Manchester, UK: **Amek joint sales venture:** Console manufacturers Amek have announced a joint UK sales venture to market Mitsubishi digital tape machines in a package with the Rupert Neve designed *Mozart-RN* 56-input console. Under the new deal, it will be possible to buy a digital tape machine and a desk in one package.

● English Channel, UK: **PASTY boats:** This year's industry PASTY charity yacht race will be held on the last weekend in September (27th to 29th). For the first time there will be two types of boat, opening the event to potentially more companies.

● Hayes, UK: **New Sunkyong factory:** Sunkyong have announced the formation of a new company, Sunkyong Magnetics Europe Ltd. This is a joint venture between Sunkyong Europe and Sunkyong Magnetics to run a cassette tape slitting factory and sales operation in Hayes, Essex.

Exhibitions and conventions

August 20th to 22nd Audio Engineering Society 3rd Australian Regional Convention, Moonee Valley Convention Centre, Melbourne, Australia.

September 8th to 9th AES 10th International Conference, Kensington Town Hall, London, UK.

September 8th to 11th PLASA Light & Sound Show, Olympia 2, London, UK.

October 4th to 7th 91st AES New York, Hilton Hotel and Sheraton Centre, New York, USA.

October 16th and 17th The Playback Show '91, RDS Industries Hall, Dublin, Eire.

October 17th to 21st Mediatech 91, Milan, Fiera, Lacchiarella, Italy.

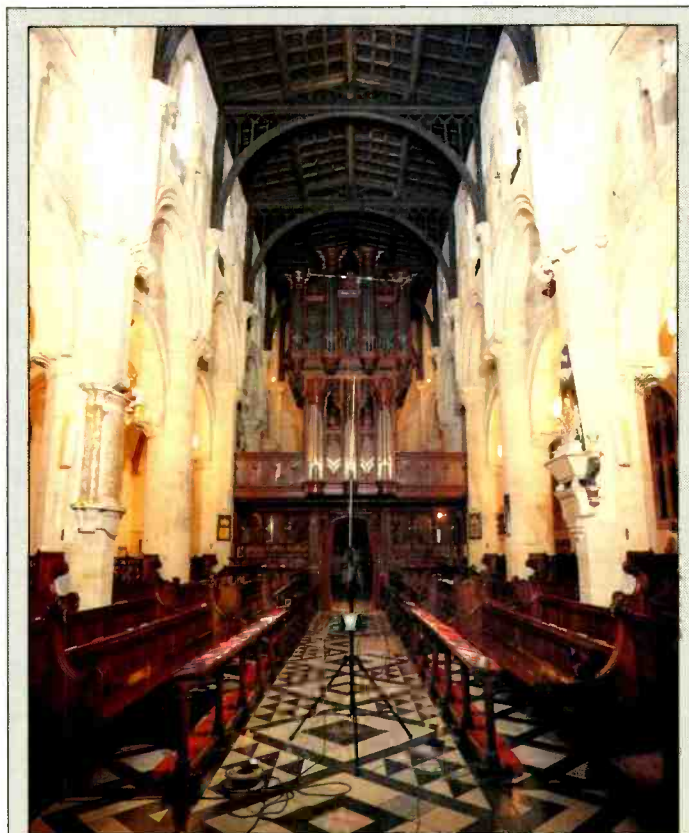
1992

March 24th to 27th AES 92nd Convention, Vienna, Austria.

October 2nd to 5th 93rd AES Convention, San Francisco, CA, USA.

1993

January 18th to 21st Middle East Broadcast 93, Bahrain International



A project to record a selection of the best City and University organs in Oxford, UK, included this Austrian Rieger Orgelbau at Christ Church Cathedral. Music was carefully selected to suit the style and design of each instrument recorded. Full story soon in Studio Sound.



DIGITAL



ISSUE 6
SUMMER 91 ♦ AUDIO TIMES ♦ 081 960 2144

NEW LOOK LISTENING ROOM

A visit to our Scrubs Lane premises is incomplete without experiencing HHB's brand new Listening Room: an acoustically-treated space with a full choice of active monitors by ATC, where customers can critically evaluate the very best products available from a wide range of manufacturers. Popular demonstration subjects include the revolutionary Yamaha DMC-1000 digital mixing console, Eventide's UltraHarmonizer range, valve processors from Summit and the latest generation of Apogee converters.

Call now to make your appointment.

SUMMIT AUDIO

HHB is now the sole UK source for the full range of classic valve signal processors from Californian manufacturer Summit Audio. All Summit products are hand-built from selected components to deliver a uniquely musical sound that remains as popular as ever – especially in the age of 'clinical' digital. Alongside the TLA-100A Tube Levelling Amplifier (shown here) and TPA-200A Dual Tube Preamp are two equalizer designs: the EQF-100 Full Range Eq and the dual-channel EQP-200A. And remember: 'valve' is really pronounced 'toob'. TLA-100A: **£995.**



YAMAHA DMC1000

We're the nation's number one source for Yamaha's stunning new console. A 22-input digital audio mixer with timecode-based moving fader automation, instant recall of all front panel settings and powerful on-board DSP including 4-band parametric digital channel EQ. Yamaha has won the race to produce a full-function all-digital mixer that can interface directly with digital multitracks of all formats, hard disc recording systems, PCM-equipped VTRs, CD, DAT and digital signal processors. Touch-sensitive motorized faders and continuous rotary controls allow mixer moves to be automated against timecode during mixdown and subsequently edited. All parameters can be controlled via either MIDI or RS-422 for compatibility with video edit controllers. Equally at home in music recording or audio-for-video environments, we believe the DMC1000 represents an extraordinary development in digital audio. **From £18,500.**

DIGITAL AUDIO RESEARCH

DASS-100
'DASS' stands for 'Digital Audio Synchronising System', but there's far more to the DASS-100 than the name might suggest. Conceived as a 'problem solver' for the modern studio, the DASS-100 allows digital devices of all formats to be interfaced successfully in the digital domain. The spectrum of possible applications is vast, ranging from CD preparation and mastering to audio transfer between digital multitracks, hard disc recorders, D1, D2 & DX VTRs, CD, DAT, digital consoles and signal processors. Basic features include digital format conversion, sample rate conversion, gain adjustment, mixing, addition or removal of emphasis, DC offset removal, synchronisation to word clock and delay. Quick and easy to use, the DASS-100 is a must in any serious digital facility. **£7,995.**



FOSTEX G24S

24 tracks on 1" tape plus ultra-quiet Dolby S noise reduction, a removable front control panel that doubles as a remote with an in-built 10-point autolocator, MIDI function control and an on-board chase synchroniser option all make the G24S a formidable proposition. Brilliant user ergonomics and impeccable construction help ensure that the G24S is a real contender when it comes to choosing a studio multi-track. **£7,330.**

SOLID STATE AUDIO FOR VIDEO

Klark-Teknik's DN735 can record and play back short passages of stereo audio in perfect sync with other devices (notably VTRs) via externally applied SMPTE timecode. As such, it can augment any VTR with two fresh audio tracks, greatly simplifying stereo edits and crossfades. 20 seconds is standard, up to 175 seconds with additional memory cards. The 1u, 19" rack-mountable DN735 can be controlled manually, remotely, or via serial RS422. A snip to the audio-post specialist at **£3,550.** Plug-in memory cards from **£475.**



APOGEE

Here at last, the new generation of Apogee converters offer startling audio quality. Both stand-alone units can help extract optimum performance from your existing digital hardware without substantial reinvestment. Simply the best converters money can buy. AD500 **£1,195** DA1000 **£1,595.**

SONY STEREO MICS

To partner your DAT portable, HHB offers a choice of stereo condenser microphones from the Sony range. The popular ECM-979 (shown here) and ECM-959 both represent extraordinary value for money, while the ECM-MS5 is built to tackle the most demanding applications. We also stock a wide selection of mics from other manufacturers, including the new VP88 from Shure. Sony ECM-979: **£210.**



MORE NEWS FROM EUROPE'S DAT CENTRE

We're the world's leading supplier of DAT recorders to professional users. And we back all our DAT products with the best advice and service support in the business. Call us first to discuss your precise application requirements.

AIWA HHB1 PRO KIT

HHB's own groundbreaking professional portable with A-Time record capability is partnered with the Sony ECM979 stereo condenser mic to deliver an unbeatable ENG and location recording package. **£1,250.**

SONY DTC1000ES 'PRO'

Another HHB exclusive, the 'PRO' takes all the features of the industry standard, best-selling DTC1000ES, while adding a 44.1kHz digital record modification, balanced analogue XLR connectors and a rackmount kit as standard. **Unbeatable value at £1,195.**

SONY TCD-D3

We now have limited quantities of the world's first DAT Walkman. Buy the TCD-D3 from us and you also tap into Europe's finest service back-up. **Great value at £425.**



SONY DTC-55ES

Thanks to its superb performance and comprehensive function control, the DTC-55ES continues to provide audio professionals with an ideal low-cost alternative to conventional pro units. **Now just £468.**



PANASONIC SV3900/SV3700

The new SV3900 from Panasonic can be controlled by either the SH-MK390 wired remote controller or via the unit's comprehensive serial interface ports. Other features include comprehensive indexing functions, SCMS status indication and error rate display. The SV3700 offers similar performance without wired remote operation. SV3900: **£1,250** SV3700 **£950.**

SONY PCM-7000 SERIES

HHB has the full Sony range of professional 4-head recorders, options and remote controllers on demonstration. Featuring timecode, precision electronic editing and synchronisation, the PCM-7000 Series kicks DAT firmly into the nineties as the Number 1 choice for broadcast audio and post-production applications. **Call now for price details.**

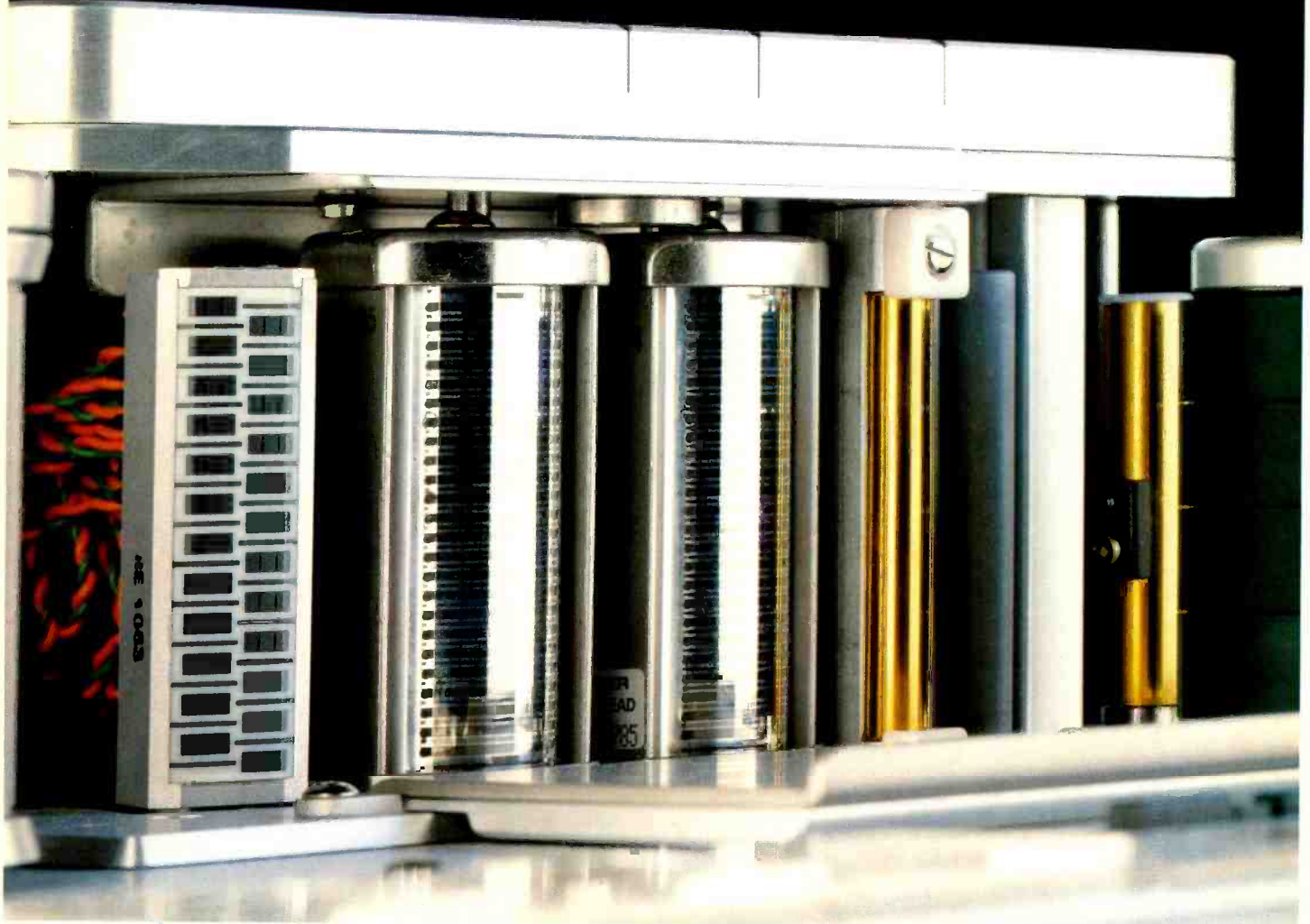
SUMMER SALE BARGAINS

HHB is offering a number of selected new and ex-demo items for sale at greatly reduced prices. Call for further details.

- Akai DR1200** 12-track Digital Recording System **£8,950**
- Akai DD1000** Optical Disc Recorder **£6,295**
- Akai S1000PB** Playback Sampler **£1,195**
- Tascam MSR24 1"** 24-track tape recorder **£5,295**
- Roland S770** Sampler **£2,795**
- Roland SDE-3000A** Delay **£549**
- Yamaha SPX1000** Multi-effects **£750**
- Klark-Teknik DN360** Dual Graphic Equaliser **£995**
- Wellard** Powered Monitors (pair) **£795**
- Sony DXC-M7PK** Camera Kit (with lens) **£6,200**
- Sony PVM-1320** Colour Monitor **£995**
- Aiwa HDS1** DAT Portable **£395**

— All prices exclude VAT.

EXCELLENT. SWISS.



Highly complex electronic circuits and reliable mechanical components are all very well. But of what use are they if the sound is poor? None whatsoever. Only if the electronics are reliable and user-friendly, if the mechanical components are stable and durable, and also if the sound is superb can a product excel. Like our **A827** multichannel tape recorder, its mechanical and electronic components are of top quality and, as most professionals know, the sound is in a class by itself. In the **A827** we have left nothing to chance. Every detail, be it ever so small and insignificant, is fully developed and well engineered. We can only speak of true quality and

real user benefits if each item of a product is first class. That is our philosophy – the standard of excellence for the **A827**.

STUDER

PROFESSIONAL AUDIO EQUIPMENT

Worldwide Distribution: STUDER International, a division of STUDER REVOX AG, Regensdorf-Zurich, Althardstrasse 10, Switzerland, Telephone +411 870 75 11, Telefax +411 840 47 37

New training standards for UK broadcast, film and video industry

A project has recently been initiated to build a new framework of training and development for the broadcast, film and video industry.

The Industry Training Organisation has been set up to provide an industry-wide forum to address training issues. It has been stressed that this is not an initiative imposed on the industry, but one that will be developed by and for

those working in it.

The immediate priority for the ITO is to finish the project of developing common standards and vocational qualifications for the industry within the national qualification structures.

Working groups from the industries involved have been formed and include sound and post-production.

Address changes

● **Arup Acoustics** have opened a new office at St Giles Hall, Pound Hill, Cambridge CB3 0AE, UK. Tel: 0223 355033. Fax: 0223 61258.

● **Amfon** have moved to Box 184, Sonsterudv 2B, 1412 Sofiemyr, Norway. Tel: (472) 800570. Fax: (472) 806140.

People

● Mike Breslin, until recently course director of the ND Music Technology course at City Poly (formerly the London College of Furniture) has joined **Ashdown Environmental Ltd (AEL)** as a senior acoustic consultant.

● John Vitale has been named sales

manager at **Bag End** loudspeakers of Barrington, IL, USA. Vitale joins Bag End after a recent management position with the Sound Post in Evanston, IL.

● **Studer Revox America** have appointed Thomas M Spain to the position of national sales manager, Revox Division. Spain will take charge of US sales activities for all Revox product lines, both professional and consumer.

Agencies

● The **Augan** multitrack optical recorder/editor **408 OMX** will be exclusively distributed in the UK by FWO Bauch Ltd, 49 Theobald Street, Borehamwood, Herts WD6 4RZ. Tel: 081-953 0091. Fax: 081-207 5970.

● **DDA** have strengthened their distribution in two territories since the acquisition of the Klark-Teknik group by Mark IV Audio.

In Japan, Mark IV Audio Japan have taken over distribution of the sound reinforcement range although the recording range stays with Studer Revox Japan.

In Germany Mark IV Audio GmbH has assumed full distribution for the

entire DDA range, setting up a new division to market their product.

Most recently Audium has been appointed as DDA's first distributor in Portugal.

● **Soundtracs** have announced their products are now distributed in Germany through Beyerdynamic GmbH & Co, Heilbronn. Tel: 07131 6170.

● Michael Stevens & Partners have been appointed worldwide distributors for **TotalSystems** products. These comprise a range of analogue and digital audio metering units together with a preamplifier designed for studio use. Michael Stevens & Partners, Invicta Works, Elliott Road, Bromley, Kent BR2 9NT, UK. Tel: 081-460 7299. Fax: 081-460 0499.

News from the AES

Images of Audio is the subject of the 10th AES International Conference, the first to be held in Europe. It will present delegates with four 'images' of the current state-of-the-art in audio technology and techniques. Two sessions are concerned specifically with sound for pictures, while two further sessions cover exciting current developments in digital audio data compression and signal processing.

The main proceedings are preceded by a one-day tutorial on the principles and technology of digital audio, and this may be attended separately or in conjunction with the main proceedings. The digital audio tutorial day has been structured in such a way as to make it an ideal proposition as an isolated event for students and self-funded members, as well as being available as a 'refresher' to those who wish to attend the following two days.

The conference programme is as follows:

September 8th RECORDING & POST PRODUCTION

Chairman: John Ives, Sony Broadcast & Communications

Audio within digital video tape formats

John Watkinson, Watkinson International

Digital audio formats: which format for which application?

David Walstra, Sony Broadcast & Communications

Automation and control of equalisation, gain and pan via segment-based processing DSP systems

Mike Parker, Digital Audio Research

Digital workstation networks for TV post-production: the way forward?

David Collie, Solid State Logic

DIGITAL AUDIO BIT-RATE REDUCTION

Chairman: Neil Gilchrist, BBC Research

Digital audio bit-rate reduction for broadcasting

Francis Rumsey, University of Surrey

The APT-X 100 digital audio data compression system

Charles Day, Audio Processing Technology

The Dolby AC-2 adaptive transform coding system

Louis Fielder & Grant Davidson, Dolby Laboratories

MUSICAM coding

Yves-Francois Deheroy, CCETT

ASPEC coding

Karlheinz Brandenburg, University of Erlangen

Subjective assessments on low bit-rate audio codecs

Christer Grewin & Thomas Ryden, Swedish National Radio

WORKSHOP ON DIGITAL AUDIO BIT-RATE REDUCTION

Chairman: Neil Gilchrist

September 9th DIGITAL AUDIO SIGNAL PROCESSING

Chairman: Francis Rumsey, University of Surrey

So you think performance is cracked using standard floating-point DSP's?

David Spreadbury, Neve Electronics

Application of realtime assignable FIR filtering in audio

James 'Vig' Sherrill, Audio Animation

Noise cancellation for the '90s — adaptive filtering explained

Attila Mathe, Adaptive Digital Systems

Considerations for interfacing digital audio equipment to AES-3, AES-5 and AES-11 standards

Julian Dunn, Prism Sound

AUDIO FOR HIGH DEFINITION TELEVISION

Chairman: Jeff Baker, BBC Television

Sound for high definition television

Graham Carter, Dolby Laboratories

3-1 quadrasonic sound system for HDTV

Katsumi Nakabayashi, NHK

HDTV sound systems: how many channels?

Gunther Theile, Institut fur Rundfunktechnik

High quality sound for high definition television

David Meares, BBC Research

DEMONSTRATIONS OF HDTV SOUND WORKSHOP ON HDTV SOUND

Chairman: Jeff Baker

For further details on any of the above information or 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.

Contracts

- **Amek Systems and Controls** have supplied The Human League with an *Angela* console working in conjunction with an Otari *MTR-90* tape machine. Their studio is part of the new Audio Visual Enterprise Centre in Sheffield, UK.
- **Bruel & Kjaer 4006** omnidirectional mics have been used by the Music Performance Research Centre (MPRC) to record the CBSO's opening concert at Birmingham's new Symphony Hall, in the UK.
- **FWO Bauch**, Herts, UK, have won a contract to install a drama post-production desk for BBC Radio. The installation is centred on a **Studer 24-channel 962** mixer.
- **TVi**, a London-based leading post-production company, are using the **DAR DASS 100** for their sample rate conversion functions as well as for its ability to generate and synchronise digital audio clock rates to lock to video.
- **TVS Television Centre** in Southampton have their DAR systems in service in their new digital dubbing theatre. With **DASS 100** TVS can stay in the digital domain throughout their dubbing until they re-lay to video, thereby eliminating audio quality loss through multiple conversions.
- **Videomix**, a New York-based, post-production house have invested in an 8-track **Sonic Solutions Sound-for-picture** system as well as the realtime **NoNoise** option for removing hum and broadband background noise.
- **Universal Studios, USA**, have one of the world's largest film libraries and have invested in **Sound-for-picture** and **NoNoise** systems to restore older film soundtracks.
- **db Sound Studios** in New York, USA, have bought an **NED 8-track Post-Pro SD**. Also in New York, **Magno Sound** have invested in a third **NED** system, a **Synclavier 6400** with 32 Mbytes of RAM, and **Sync Sound** have opened a new room based around an 8-track **Post-Pro SD**.
- **Nimbus Records**, Malvern, UK, have installed **Swedoor's** sound reducing doorsets. Design and manufacturing methods have allowed **Swedoor** to remove the heavy lead sheet from their 40 dB sound reducing doorset, which has traditionally been used to supply dead weight for sound reduction.
- **The Ocean Group**, one of Canada's largest audio post-production

companies, have bought their second and third 8-channel **DAR SoundStation II** digital audio production systems for their Vancouver post complex.

- **Xenon**, one of London's top nightclubs, has been equipped with a **JBL SR** system for a new live music promotion held each Tuesday night. The sound system — designed especially for **Voices Inc**, the name of the new promotion — has been installed by **Tarsin Entertainments**, who specialise in leasing and hiring professional sound systems to commercial enterprises.
- **Rolling Stone Ronnie Wood** has confirmed the purchase of an **Otari MTR-90 MkII** for his new home studio in County Kildaire, Eire. The sale was negotiated through **Idea Systems** in Dublin.
- **UK glass manufacturer Pilkington** have turned to sound installation company **Wigwam Acoustics** for the design and installation of a specialised 2-way calling system linking their new £65 million glass production line in St Helen's, Lancashire, UK. **Wigwam** have had to develop a highly intelligible speech reinforcement system, enabling the central operator in the control room to communicate with the line's individual section controllers at all times.
- **Musician/composer Stephane Joly** has ordered a 40-input **Amek Hendrix** console for installation in his private studio in Meudon, near Paris, France. **Commercials production facility, JE Productions**, has ordered a **Hendrix** for the French Caribbean island of Martinique. **Amek's** French distributor, **Cyborg**, will supply both of the consoles.
- **Musitron recording studios, Madrid**, have recently installed a 40-input **Hendrix**; **Vibe Records, Oldham, UK**, have taken delivery of a 40-input **Mozart** console; and a **Mozart** console has been ordered by **Lansdowne Studios, Dublin, Eire**.
- **Award winning film composer Hans Zimmer** has taken delivery of the new **Euphonix CSII** digitally controlled studio system. The **CSII** is an automated recording and mixing system that includes snapshot recall of all console settings within 30 ms, together with full dynamic automation of all console controls and parameters.
- **The UK's Television South West's** extensive equipment investment over recent months includes the purchase of three **Audio Kinetics ES.Lock** systems at the heart of operations, machine synchronisation.

AKG buy into Amek

AKG, through their UK subsidiary, have purchased a 30% stake in **Amek Technology Group**, the holding company for **Amek** and **TAC**. **Amek** chairman, **Nick Franks**, commented, "Careful discussion and

analysis has revealed an outstanding opportunity for co-operation at all levels. In short, the development of a coherent approach to Group activities will make us into a formidable competitor."

Audio Kinetics have also supplied seven **Mastermix II** console automation systems for incorporation in seven identical **Amek Classic** consoles, destined for national broadcaster **Turkish Radio and Television (TRT)**.

- A number of broadcast and recording facilities in the South Korean market have recently moved to **FM Acoustics cabling**, among them **Jeil/EMI Recording**; **Jigu Recording/CBS**; and **Korea Broadcasting System**, all in Seoul.

- **Robert Plant** has taken delivery of a **TAC Scorpion II**, configured 24/16/2. The console is being installed in **Plant's** private 8-track recording studio.

- **Producer/engineers Neil Dorfsman and Steve Lipson** have both recently bought **DynaudioAcoustics M1** nearfield monitors for personal reference use. **Composer/producers Terry Britten and Graham Lyle** have taken a pair of **M2** midfield monitors; and **Fish**, ex-lead singer of **Marillion**, has bought the **M4** system for his new studio in Scotland.

Other recent sales include **M1s** to **Air Studios, London, UK**; **Studio du Palais de Congres, Paris, France**; **Markant Studios, Holland**; and **Sweet Silence Studios, Copenhagen, Denmark**. **Euro Disney** have also confirmed an order for three pairs of monitors, which will be used in the two-studio recording complex currently under construction at the **Euro Disneyland** site near Paris.

- **Pro-Bel, Reading, UK**, have supplied high density video, audio and timecode switching matrices to the recently formed company, **The Machine Room**.

- **BSkyB**, the UK-based satellite broadcasting company, have bought an **Audio Kinetics ES.Lock** system comprising a **Penta** controller and four **ES 1.11** units, plus a system services unit. The system was bought following the conversion of an existing stereo dubbing suite to a multitrack studio.

- **MPL** have just ordered 24 tracks of **Dolby SR** for use at **Paul McCartney's** private studio in **Sussex, UK**.

- **BBC Ealing, UK**, have placed an order with **Audio Developments** for a large number of **AD066-11** stereo microphone amplifiers.

- The biggest console **Raindirk** have ever built is to be installed in what could be the world's largest mobile recording studio. The 96-channel, 192-mic-channel **Symphony** console, measuring 5.4 metres long was selected for the mobile by **Anders Muhr** of **Media Sound**. The **Symphony** will be mounted on a purpose-built moving section of the mobile. This allows the console and one side wall of the trailer to be extended on hydraulic rams to double the area of the control room to 28 m² (300 ft²).

- **Chateau du Pape** has become the first German studio to install a **Neve VR** console. A **VR72** desk fitted with 64 mono and eight stereo channels, dynamic metering, recall, and **Flying Faders** automation has been installed in their new-look **Studio Three**.

- **Austria's** national television and radio broadcasters **ORF** have placed the first order for an **AMS Logic 2** large format digital audio mixing console, through **Siemens** in **Vienna**. The **Logic 2** console will have 32 fader strips, full dynamic automation of every function and multilayering of facilities.

- A 56-input **Amek Mozart** mixing console has been ordered by **Univision**, a leading Spanish-language television network in the US, for the network's operations and broadcast centre in **Miami, Florida**.

- The **Shiki Theatrical Company** of **Tokyo** are to receive the latest version of **Cadac's E-type** console from **UK theatre console manufacturers, Clive Green & Co**.

- **Philip Drake Electronics** have recently won their first order from **Oman's Ministry of Information** to supply their **6000** series talkback system and three customised **PD 600** systems for **Oman TV**.

- **The China Theatre** in **Stockholm, Sweden**, will be the world's first recipients of the new **Europa** console from **Soundcraft**.



• PERFECT SOUND • PURE VISION •

PERFORMANCE
CRAFTSMANSHIP
RELIABILITY

T

he Sennheiser name has been associated with high quality yet affordable audio products for nearly half a century. In order to fully service and support the ever-growing customer base, Sennheiser now announce the opening of their UK offices in High Wycombe.

Staffed by dedicated professionals and demonstrating the company's total commitment to the UK market, Sennheiser UK is the number to call for sales enquiries, product information and technical support.

Details of our complete range of innovative audio equipment including Studio, Vocalist and O.B. microphones, headphones, acoustic systems and the new range of M.K.H. Studio Condenser Microphones featured here, are available from Sennheiser.

For further information call Sennheiser UK on (0628) 850811.

 **SENNHEISER**

Sennheiser UK Ltd. • B2 Knaves Beech Business Centre • Loudwater
High Wycombe • Buckinghamshire HP10 9QY • Tel. 0628 850811
Fax: 0628 850958

Akai DL1000 remote

Akai have introduced the *DL1000* remote control system for the *DD1000* optical disk recorder. This unit provides remote access to all the *DD1000* functions while allowing control of up to seven units under an SCSI ID management system. This will allow features such as simultaneous playback of four tracks per *DD1000* connected. Features include an LCD display and an integral SMPTE generator. With the

optional IB-107 VITC interface it is possible to operate a number of chained *DD1000s* in sync with external video equipment through VITC.

UK: Akai Pro Audio, 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.



Otari MX-5050 improvements

Otari have announced improved versions of the *MX-5050* series of tape machines. The models are now the *MX-5050 B-III* 1/2 inch 2-track, the *BQ-III* 1/4 inch 4-track and the *Mk IV* series available in 2-, 4- and 8-track versions on 1/2 inch tape.

Improvements are: better HF response and S/N ratio, developments in the microprocessor control systems, gapless and seamless drop-

in/out on the *Mk IV-4* and *IV-8*, chase synchroniser compatibility and better remote capability.

UK: Otari UK Ltd, Unit 13, Elder Way, Waterside Drive, Langley, Berks SL3 6EP. Tel: 0753 580777.

USA: Otari Corp, 378 Vintage Park Drive, Foster City, CA 94404. Tel: (415) 341-5900.

D&R Triton and Portamix

D&R Electronica have introduced the *Triton*, a 16-bus recording console featuring a 'floating subgroup' system that enables users to go to track 17 and above without the need for patching. Each channel is equipped with 4-band sweep EQ that is switchable between the channel and monitor, and 10 aux sends.

Also new is a small ENG type mixer known as the *Portamix*. This is a 4-channel stereo mixer with highpass and RF filter on each channel as well as 48 V phantom power, four switched input levels and switched stereo positions. Other

features include vu/ppm meters, output compressor/limiter, oscillator, headphone monitoring and stereo tape returns. Powering is two 9 V batteries and another 9 V battery for phantom powering.

D&R Electronica bv, Rijnkade 15B, 1382 GS Weesp, The Netherlands. Tel: 02940 18014.

UK: D&R UK Ltd, 5 Fulmer Drive, Gerrards Cross, Bucks SL9 7HH. Tel: 0753 884319.

USA: D&R USA, 1720 Chip 'N Dale Drive, Arlington TX 76012. Tel: (817) 548-1677.

Stage Accompany SA 1600/800

These two new power amplifiers, rated at 2x1100 W peak into 2 Ω and 2x550 W peak into 2 Ω respectively, feature Class G operation for increased performance and sonic transparency, small size and weight compared to power output and rugged housings.

Operational features include balanced inputs and loop-through,

bridge mode switch, dynamic damping control circuitry for a virtually infinite damping factor across the speaker terminals, and Neutrik *Speakon* loudspeaker connectors.

Stage Accompany, Anodeweg 4, 1627 LJ Hoorn, The Netherlands. Tel: 2290 12542. Fax: 2290 11192.

In brief

● Akai have added a 16-voice polyphony expansion unit for the *S1100* sampler. The *S1100EX* can either be used to add 16 voices to the 16 of the *S1100* or as a multi-timbral unit increasing the choice available.

● **Fostex** have introduced a Dolby S version of the *G16* 16-track 1/2 inch multitrack. The *G16S* also includes the option of a built-in synchroniser, MTC capability and RS422 port.

● **Publison** have expanded the

Infernal Workstation hard disk system to 12 tracks with the *12000* model. There are now three versions available: *4000*, *8000* and *12000* (4-, 8- and 12-track).

Features of the *12000* include: 12 inputs and outputs, 12 hours basic recording time, independent record/play functions for each channel, 12 pitch shifters, automated mixing plus all the existing features of the *4000/8000* models.

Publison Audio Professional, 10 Avenue de la Republique, 93170 Bagnolet, France. Tel: (1) 43.60.84.64. Fax: (1) 43.60.80.31.



AKG

ACOUSTICS

ULS: THE ULTRA LINEAR SERIES



ADV 355/1/E



Digital recording techniques call for high quality microphones and audio processors.

We supply the microphones.

Get more information from your dealer or directly from

Wersi electronic grand piano

The Wersi Grand Piano is the result of five years extensive research into the characteristics of the grand piano and how to translate them into electronic terms for an electronic version. The main development areas included the sampling of the notes and their individual characteristics and the 'feel' of the keyboard to a player's touch. Similar design attention has been concentrated on the sustain, damping and sostenuto pedals. The 88-note keyboard is fully dynamic.

In order to help overcome the large amounts of data storage required, the Wersi Grand uses a combination of ASIC (Application Specific Integrated Circuit) processors, ROM chips for parameter memories, control processors, DSPs for effects and ambience, and an 18 bit DAC.

For even greater realism, the

piano range is distributed over 15 sections across the stereo field.

The piano features four basic piano sounds, plus a transposer control, master level control (for all signal outputs) and a Program button for special functions such as tuning, programming effects, MIDI, etc. An interface panel provides all necessary connections to external equipment (including an external signal input) and enables the instrument to be used as a MIDI master keyboard.

Three models are available with internal or external amplification, depending on the required application.

**Wersi GmbH & Co,
Industriegebiet, 5401
Halsenbach, Germany. Tel:
67.47.123-0.**



AD Systeme Optiview

Optiview track previewer system provides a 3D graphics display of up to 24 tracks of audio and is designed as a production tool for A/V studios. *Optiview* can also be used as a vu meter during recording or with a sequencer.

Features include: 24-track bargraph, palette of user-selectable colours, I/T/L/R/G/B interface, PSL-NTSC option, selectable display

direction and track choice, and large timecode display of all formats.

A D Systeme, 21 Avenue Jean-Jaurès, 92120 Montrouge, France. Tel: (1) 42.53.31.18. Fax: (1) 42.53.36.77.

Worldwide: The Home Service, Unit 2, 12 William Road, London NW1 3EN. Tel: 071-387 1262. Fax: 071-388 0339.

FULLY LOADED DAT

YAMAHA

DIGITAL SYSTEMS

It's all in there.

Balanced XLRs, 32/44.1/48 kHz sampling frequencies, a rack-mount chassis, hard-wired remote and digital I/Os.

Add to this the stunning sound quality of Yamaha's advanced A/D and D/A convertor technology (including Delta-Sigma and oversampling techniques) and you can see that our new DTR-2 professional DAT recorder is fully loaded in every department.

Except one. Price.

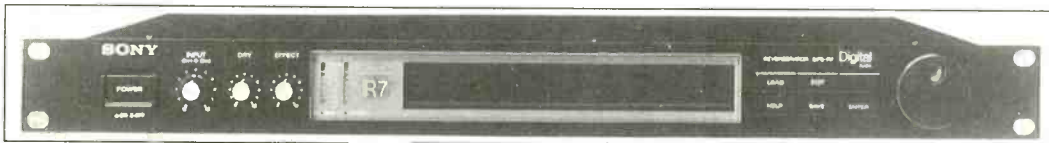
YAMAHA

DIGITAL SYSTEMS

0908 366700

Yamaha-Kemble Music (U.K.) Limited
Professional Music Division





Sony DPS-R7 digital reverb

Sony signal processing

Launched earlier in the year were two new processors for studio and live sound applications. The *DPS-D7* is a stereo digital delay line offering eight basic delay modes. These include stereo delay, feedback delay, double delay, tape delay, panpot tap delay and multiple delay. Maximum delay is 1.3 seconds and the unit also includes a 3-band EQ and post-delay autopan facility.

The second unit is the *DPS-R7* digital reverb, which is described as a more refined successor to the *MU-R201*. Programs include Hall, Room, Plate, Gate, Early Reflection and

Delay modes. These can be expanded with pre- and post-effect sections, each of which can be operated in phase shift, flanger, stereo EQ, exciter/EQ and gate modes. Both units are 1U with analogue inputs (either balanced *XLR* or unbalanced phono), 100 factory presets, 256 user memories and MIDI control. Internal digital specification is 48 kHz sampling with 32 bit linear internal processing.

The established *SDP-1000* 2-channel digital multi-effector has been enhanced with *Version 2* software. This introduces snapshot automation that allows effects

changes against timecode to be written in a cue sheet form. The dynamics section now has an additional dual compressor mode and other facilities including panpot, auto-fader, event rehearsal, defeat, individual parametric EQ on/off and a help window. There is also the addition of a printer interface.

Sony Corp, PO Box 10, Tokyo Airport, Tokyo 149, Japan. Tel: 03 448-2111.

UK: Sony Broadcast & Communications, Jays Close, Viables, Basingstoke, Hants RG22 4SB. Tel: 0256 483506.

USA: Sony Corp of America, Professional Audio Division, Sony Drive, Park Ridge, NJ 07656. Tel: (201) 930-1000.

AGAP SYGAR

The radio broadcasting network automatic management system provides full computer control of either a main broadcast studio controlling a network or a local studio within a network. Functions include automatic sequencing of programmes, ID jingles, commercials, newsbreaks, etc. Other facilities also include automatic test routines, simultaneous programme and digital data transmission — such as files and mail — to different stations together with individual addressing.

The system architecture is of an open multi-cellular structure that allows systems to be configured as required, as well as leaving room for future expansion and development. **AGAP, PO Box 118, 254 Avenue Sainte-Catherine, 84144 Montfavet Cedex, France. Tel: 90.31.10.68. Fax: 90.23.51.26.**

Mitsubishi PDX, from 20 bit to 64-track

Being shown currently at trade shows is the *PDX Eight Eighty Two* 64-track digital recording system from Mitsubishi. The system comprises two 32-track digital recorders; the *Eight Eighty Two* master and slave machines. The master comes complete with a 64-track autolocator which gives full control of both master and slave machines to a lock-up accuracy of $\pm 20\mu$ s. Offsets can be set in increments of a single sample, so that electronic edits can be as accurate as possible.

Mitsubishi also introduced the *PDX*

8620 2-track 20 bit mastering machine. The *PDX* is based on the *X-86* but uses the *PD 5050A A/D* and D/A converter designed and built by Philip Drake.

Mitsubishi Electric Corp, Mitsubishi Denki Bldg, Marunouchi, Tokyo 100, Japan.

UK: Mitsubishi Pro-Audio, Travellers Lane, Hatfield, Herts AL10 8XB. Tel: 0707 276100.

USA: Rupert Neve Inc, Berkshire Industrial Park, Bethel, CT 06801. Tel: (203) 744-6230. Fax: (203) 792-7863.

ASC DART digital cart machine

The *ASC DART* employs *apt X 100* data compression and 3½ inch floppy disks.

Almost identical in appearance and function to standard cartridge recorders and players, the *DART* system consists of the Master Player, the Record Module and Slave Players (which are controlled from the Master Player).

Features include sampling speeds

of 44.1/32/22.05 kHz, 'instant' cue and start, virtually no maintenance and full function parallel, and serial RS-422 remote control.

Audio System Components Ltd, 1 Comet House, Calvea Park, Aldermaston, R67 4QW, UK. Tel: 0734 811000.

USA: Fidelipac Corp, PO Box 808, Moorestown NJ 08057. Tel: (609) 235-3900.

AKG BAP 1000 binaural processor

The *BAP 1000* binaural audio processor has been introduced as an attempt to optimise the quality of a monitoring environment. It uses new psychoacoustic research into binaural hearing and seeks to simulate an ideal listening room. The basic unit contains four pairs of filters, one each for generating the left and right loudspeaker signals and two reflexions. Four presets related to different head shapes are available. The unit can be used with

headphones and loudspeakers and could be used in any monitoring environment, recording studio, OB van, etc.

AKG, A-1150 Vienna, Brunhildengasse 1, Austria. Tel: 0222 95 65 17. Fax: 0222 923458.

UK: AKG Acoustics Ltd, Vienna Court, Lammas Road, Godalming, Surrey GU7 1JG. Tel: 0483 425702.

USA: AKG Acoustics Inc, 1525 Alvarado Street, San Leandro, CA 94577. Tel: (415) 351-3500.

Beyerdynamic 170 radio mics

Beyerdynamic's *170* wireless system range is available for different applications including the *S170* lavalier, which is intended for broadcast, speech and conferencing, the *S170H* handheld for professional vocals and the *S1706* system for electric guitar and bass.

Also from Beyer is the *GST500* heavy duty microphone stand and boom. The stand features folding legs and a maximum height of 1.6 metres. The boom is two-piece and

adjustable to 0.785 metres. Finish is non-reflective black.

Beyerdynamic, Theresienstrasse 8, 7100 Heilbronn, Germany. Tel: 7131 617 0. Fax: 7131 6 04 99.

UK: Beyerdynamic (GB) Ltd, Unit 14, Cliffe Industrial Estate, Lewes, East Sussex BN8 6JL. Tel: 0273 479411/2.

USA: Beyerdynamic Inc, 5-05 Burns Avenue, Hicksville, NY 11801. Tel: (516) 935-8000.

Updates

● **AKG** have announced a timecode chase option for the *DSE 7000* allowing applications in video post-production. The option will be incorporated in all new units or can be retrofitted to existing versions. All video and frame rates are supported and there will be a choice between separate or combined processing of LTC and VITC. There is on screen display of all essential timecode parameters.

● **AMS** have announced that the *AudioFile Plus* is now available with an optional EDL translation capability and so does not require the use of an external PC. The EDL is translated with the cue and edit information being fed directly into the system. Further, AMS have demonstrated multiple machine control via the EBus protocol on both the *AudioFile* and *Logic* series. This allows multiple transports to be run in synchronisation with the *AudioFile*. The EBus interface is provided by Audio Kinetics *ES 1.11* modules.

● **Soundtracs** have launched an improved version of their *Tracmix* fader automation system. *Tracmix II* offers the facilities of the original version but with addition of off-line editing that includes mix merging, mute editing, autofading and master trimming of channels; three mute modes on each channel and improved displays for VCA grouping. *Tracmix II* is able to read all existing *Tracmix* files ensuring compatibility. An upgrade for existing users is available.

● **Klark-Teknik** have introduced new software for the *DN735* solid state audio recorder. *Version 1.6* software enables the unit to support Sony and Ampex *VPR3* protocols via the *RS422* interface as well as operating with most edit controllers. It also has the ability to operate in an 'eavesdrop mode' with the *Abekas A60/64* looking at the *RS422* link between the editor and *Abekas* adding two sync'd audio tracks to the *DVTR* without using an editor point.



Fostex portable DAT

Fostex have launched a professional four head portable timecode DAT recorder. The *PD2* is designed for mobile or location use with off-tape monitoring and the ability to slate to tape via the integral mic. Timecode is represented in both the IEC and Fostex record formats plus A-time with full user bit access. The *PD2* has an internal timecode generator and will jam sync to external timecode and can accept external video and word sync. There are independent 2-channel inputs with mic/line switching, 30 dB pad, phantom powering for 48 V and T12 types, LF cut filters and phase reverse. Powering is via external 12 V power, rechargeable Nicad or 10 HP2-type batteries. Monitoring facilities include line in/out headphones switching, MS/AB

matrix switching, mono/stereo switching, momentary timecode monitoring and an internal speaker. Indexing features include slate tone/mic, automatic take numbering, error indication and search, manual start ID and error mark. To cope with climatic changes automatic temperature sensing head drum heaters are included. The *PD2* is supplied with a waterproof carrying case designed to allow access to all operational areas together with add-on sections to accommodate accessories such as radio mics and mixers, etc.

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 Avenue, Norwalk, CA 90650. Tel: (213) 921-1112.

Digitec Virtuoso console

The Digitec *Virtuoso* digital post-production console is divided into two main sections: the control surface — or desk — with the control modules and the digital audio processing racks. The latter are composed of three types of mainframe: 32-input microphone preamplifier unit; input unit for 32 inputs/outputs (digital or analogue); and processing unit. As many mainframes as required can be used to configure the final console. The desk is configured from two types of module, the channel modules and the assignable command or general function modules.

The channel modules consist of the 8-channel input fader module, each channel featuring a motorised channel fader plus Mute/Solo/PFL buttons and an 8-channel module with programmable controls for different functions, these being a potentiometer with two readouts for

Value and Function, a switch with Function readout and two assign buttons.

The general — or overall command — modules consist of the General Control module, with controls for input/output selection, oscillator, pan, metering, inset, etc; a filter module with sweepable high- and lowpass filters with three slopes, a sweepable notch filter (eg for hum rejection) and 4-band fully parametric equaliser; a routing and a monitoring module with metering; and a Process module.

The console can be configured as required and the set-up stored and recalled (ALL AGAIN) as necessary. Patching is handled by a central digital/analogue matrix, which provides a lot of flexibility. Patch, or insert, points can be programmed in at any point in the signal chain, together with inboard or outboard

ASL ISM intercom system

The ASL *ISM* system offers full 2-way, or duplex, communications and is fully microprocessor-controlled. A wide range of modules is available for master stations, beltpacks, local stations, interfaces, switchboards, etc, which can be fitted together three to a 1U rack chassis. Tabletop versions are also available. The system can also be optionally modified for 4-wire operation (excluding the beltpacks).

Technical features include automatic headset detection, different protection functions, frequency correction, rugged construction and high speech intelligibility.

Operational features include an advanced Call system, Mic Kill, Speaker Kill, adjustable Listen levels, a range of inputs, Solo function and many programmable functions.

Ampeco Sound Lab BV, Zonnebaan 42a, 3606 CC Maarssen (Utrecht), The Netherlands. Tel: 30.433.134. Fax: 30.446.914.

processing.

Signal routing is very flexible and different hierarchies of groups and subgroups can be set up as required.

The console's inboard processing capability includes assignable digital dynamics, delay and reverbation processors and these various functions can be called up to the Process module for programming.

Other features include internal or external sync to CCIR or NTSC video, AES/EBU or TTL clock. Internal transmission is 32 bit with audio processing at 24/48/56 bits. The digital I/Os are AES/EBU 20/24 bit; the A/D-D/A converters being 20 bit.

A useful feature from the mechanical side is that all console modules are a standard size, allowing custom frames for particular needs to be made, rather than using a standard chassis.

Digitec SA, 25 Avenue de l'Europe, 78400 Chatou, France. Tel: 1 34 80 87 00. Fax: 1 34 80 87 79.



Every audio professional knows that the DAT format is ideal for portable recording. But at HHB we believe it need not cost the earth.

That's precisely why we've joined forces with Aiwa to design our own professional DAT portable – the HHB1 Pro.

In spite of its compact dimensions, the rugged HHB1 Pro offers a wealth of features for the professional user. A single

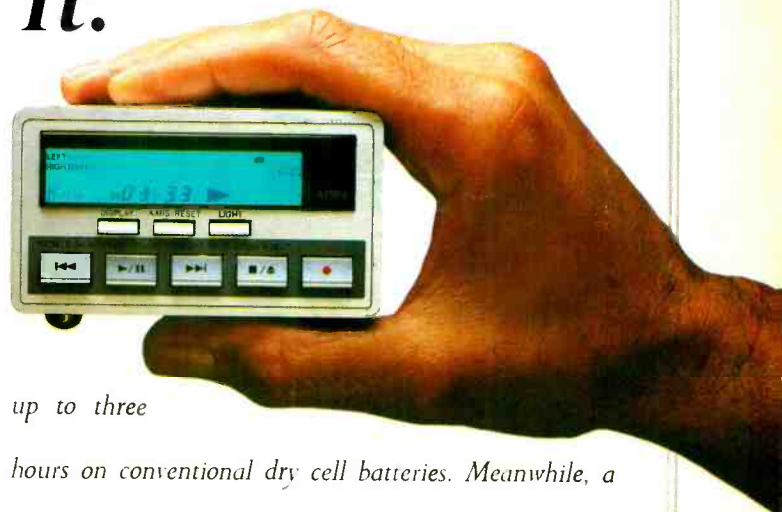
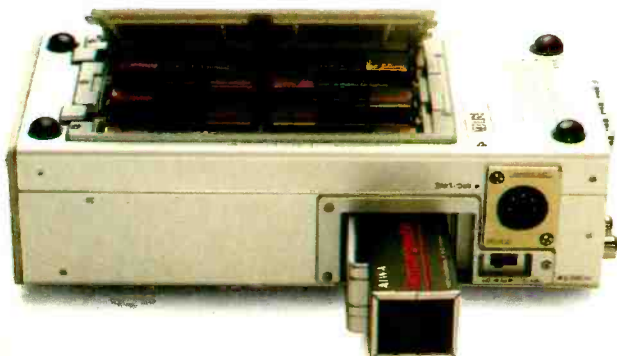


The HHB1 Pro stripes tape with 'absolute time' information as it records. So whenever you insert a recorded cassette, you can see precisely where you are on the tape. With Sony's PCM-7000 range of studio DAT recorders capable of editing to absolute time as well as time-code, you can be confident that your HHB1 Pro will function as their ideal low-cost acquisition partner.

The HHB1 Pro records for

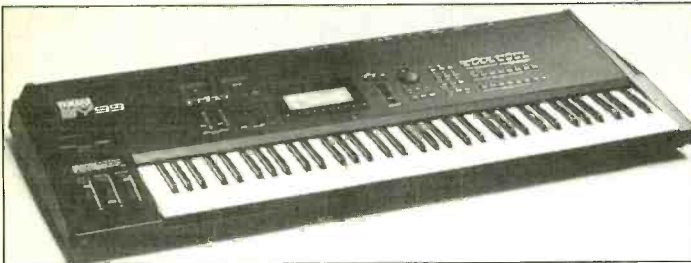
A professional DAT recorder that goes easy on your pocket. And in it.

5-pin XLR switchable mic/line input allows stereo recordings in the field, while audio quality is assured thanks to the latest single-bit oversampling conversion technology. Of course, AES/EBU as well as SPDIF digital interfaces are provided as standard. And because the Pro's informative LCD display can be illuminated, monitoring in low-light conditions could not be more convenient.



up to three hours on conventional dry cell batteries. Meanwhile, a multi-voltage transformer and a NiCad battery pack – together with a selection of useful professional accessories including a wired remote controller – are supplied as standard. Since it weighs in at under £1,000 and less than a kilogram, picking up an HHB1 Pro from the world's number one DAT centre just couldn't be easier.





Edited highlights of Yamaha's SY99 76-note synth previewed at the APRS Exhibition include RCM tone generation, 8 Mbytes of wave ROM, 267 AWM waves, 16-track sequencer with 27,000 notes, 16 simultaneous timbres, four simultaneous effects and 512k of wave RAM expandable to 3 Mbytes.

Drawbar sounds in 1U

The VOCE *DMI64 Mark II* 1U synth module has been causing a considerable stir among keyboard players most notably for its collection of fairly authentic drawbar organ sounds. While it is unlikely to convince the most hardened Hammond tonewheel user, its method of additive synthesis approximates the use of drawbars in the older designs. It also benefits from an extensive MIDI implementation that allows effects such as distortion, vibrato, chorus, key click and rotating speaker simulations to be influenced by MIDI controller information in a unit that is 64-note polyphonic with 99 user presets.

Presets can include splits, pitch and volume offsets, and audio channel assignments with 52 parameters per patch. Front panel controls are sparse: increment/decrement buttons for

presets, and parameter and parameter value increment/decrement buttons working in conjunction with a four-character LED display making editing something more than a little awkward. However, a *Mac* editor is planned, which should help to realise the considerably greater sound generating potential of this device, which, after a brief investigation certainly looked capable of producing far more contemporary noises than the organ sounds it has become somewhat famous for.

The fact that it is also 16-channel multitimbral through the aforementioned polyphony will also be of interest.

VOCE, 11 Tenth Street, Wood-Ridge, NJ 07075, USA. Tel: (201) 939-0052.

UK: MCMXCIX, 9 Hatton Street, London NW8 9PR. Tel: 071-724 4104.

Analogue/digital pre-amp hybrid

Alesis is a little late into the guitar processor fray but as usual have made their entrance with characteristic panache. The *QuadraVerb GT* combines all the spectacular qualities of the *QuadraVerb* multi-effects processor such as multitap delays, reverbs, EQs and modulation effects but with an analogue front end. This preamp section offers compression, distortion, tone-curves, bass boost, a slow attack envelope for volume pedal type effects, a noise gate plus the now expected amplifier/cabinet simulator.

Interestingly seven analogue and five digital effects can be combined in

a preset.

● Alesis has released the rackmount *D4* drum module with the four assignable outputs of the outstanding *SR16* standalone drum machine but with 500 drum samples that include the best of the *HR16*, *HR16B* and the aforementioned *SR16*. Thirty-two drum kits can be assembled with tuning and panning adjustable for each constituent sound.

Alesis, 3630 Holdrege Avenue, Los Angeles, CA 90016, USA. Tel: (213) 467-8000.

UK: Sound Technology plc, Letchworth Point, Letchworth, Herts SG6 1ND.

Classic analogue conversions

Those not already aware of US company Studio Electronics' range of analogue synth conversions should sit up and listen. Offering the sounds of yesteryear without the pain in the rump that integrating the originals into a modern set-up represent, each device is rackmounted and given a MIDI spec that adds considerable value.

The sweetest conversion is undoubtedly the *Prophet V* MIDI rack with the notable MIDI additions of velocity to VCF, VCA and resonance, aftertouch for modulation, VCF frequency, resonance and oscillator plus the recognition of pitch bend, modulation, patch changes, portamento and continuous controller information. Other features include MIDI Thru, overflow and SystEx patch dump.

The *Midimini* is a mini Moog with MIDI in a rack with velocity control of VCF and VCA, mod wheel control of LFO and filter, recognition of aftertouch, pitch bend, glide and Controller 7 plus the ability to hard sync oscillator 2 to 1 and modulate the frequency of 2 with 3.

Many people will prefer the

Obierack though — based on the Oberheim four-voice duophonic synth. It's been enhanced with MIDI velocity to VCA and filter, aftertouch to modulation and filter frequency, plus recognition of pitch bend, Controller 7, portamento and modulation wheel control of LFOs and filter. Studio Electronics also offers a rather nifty conversion of that old dog the Roland *TR808* that just won't lie down and die and this includes all the MIDI spec that the original never had. Available in the UK from MCMXCIX.

● Oberheim have released the *OBM* — the first true analogue synth to hit the streets with real knobs and switches for too many years. With a full blown potential of 12 stereo polyphonic voices in a chunky rackmount more details soon.

Oberheim Electronics Inc, 2015 Davie Avenue, City of Commerce, CA 90040, USA.

Tel: (213) 725-7870.

UK: MCMXCIX, 9 Hatton Street, London NW8 9PR. Tel: 071-724 4104.

Studio Sound's Music News is compiled by Zenon Schoepe

ART takes the tube route

As the art of mic placement goes further and further out of the window, manufacturers are resorting to more and more ingenious methods of simulating the art of mic placement. ART is pushing its way to the forefront of guitar processors with the release of the *SGX2000*, which distinguishes itself by incorporating two tube pre-amp sections in its 3-channel structure.

Channels can be stacked for bank holiday weekend sustain and the programmable unit offers a five-band front-panel equaliser in addition to digital effects that can be combined in any number of ways. Effects available include delays, reverbs, choruses, an exciter, a compressor and would you believe distortion and

overdrive and these can be stored in 200 memories. Control can be administered via the company's *X15 Ultrafoot* pedal board, which allows realtime control of parameters.

ART have also produced a version for bass players in the intriguingly titled *SGX-Nightbass*, which sports similar features to those on the guitar model but with an internal crossover that allows processing of only the high frequency information and thus leaving the lower frequencies unaffected.

ART, 215 Tremont Street, Rochester, NY 14608, USA.

Tel: (716) 436-2720.

UK: Harman UK, Mill Street, Slough, Berks SL2 5DD.

Tel: 0753 76911.



Westlake Audio Is Your Only Choice...



When You Want All These Monitor Choices:

- The Lowest I.M. distortion and best sound imaging in the industry.
- Biwired, mono, bi, tri, quad or pentamplified systems.
- Any one of 15 high resolution reference monitors.
- Black or furniture grade hardwood finishes.
- Horn or soft domes.

from acoustic design
to down beat...

**Westlake
Audio**

Manufacturing Group
2696 Lavery Court, Unit 18
Newbury Park, California 91320
(805) 499-3686 • FAX (805) 498-2571

On tour

● **AudioLease** are looking forward to a very busy month. They've got OMD out with a Meyer system and a Midas XL-3 desk, and Siouxsie & The Banshees' European tour, using the company's new A-2 SR system. The A-2 spends no more than a day in the warehouse before shipping to the States for a major tour with EMF. AudioLease are also doing The Almighty and James Brown's UK shows at Wembley and the NEC.

● **Autograph Sound Recording** had two major live events in July. First was the three-week Montreux Jazz Festival, for which — as in previous years — they supplied Meyer SR including sidefills and monitors to supplement the gear already owned by Montreux Casino. Even more spectacular was Harvey Goldsmith's five-night run of Tosca at Earl's Court, with system design by Terry Saunders and FOH mix by Paul Stanering. They deployed separate orchestral and vocal systems using Meyer MSL-3s, UM-1s and UPM-1s. Autograph's customised Cadac E series boards handled a total of 104 channels: "Planning it all was a bit of a nightmare," says Saunders.

● **Britannia Row** has Whitney Houston (with MSI SR) and Dire Straits' worldwide extravaganza — both starting in late August. The straits are using Turbosound Flashlight SR while Concert Sound are supplying the desks and control gear for the tour. Robert Collins is on FOH mixing duty. BRP's other major August date is with Level 42 at the Crystal Palace Bowl, London.

● **Capital Sound Hire** is on the road with longstanding client Simple Minds and a large Martin F2 system. Three separate F2 systems have been assembled to cater for different types of venue.

● **Encore** have the Rockering Festival (in conjunction with Germany's Showtec) and the annual Tourhout & Werchter 'twin festival' in Belgium, this year headlined by Paul Simon and Sting. An 80 kW Martin F2 rig features there on both dates and Encore's production is in conjunction with EML.

● **SSE** spends August on the AC/DC-headlined Monsters of Rock tour. Using their E-V MT-4 SRS, there are two 66-input TAC SR9000s and two Yamaha PM3000s out front, and three Midas XL-3s and a couple of Ramsa S-840 desks on stage.



One of the biggest concerts ever staged? Vangelis' recent Rotterdam concert in front of 150,000 people, pushed out 500,000 WRMS (700,000 W peak) and used 1 MW of generator power for the sound equipment. The stage featured a full-sized replica of the Parthenon in Athens and Vangelis was playing to an area the size of 30 football pitches. The picture shows one of three pontoons used for the Stage Accompany sound system.

Nexo SR loudspeakers

Nexo have introduced the first of a new line of sound reinforcement loudspeakers. Specifically designed for professional touring, the TS4000 is a 3-way all-horn loaded system and features 3 inch Neodymium HF drivers, a compact design with dimensions optimised for efficient truck packing, Aeroquip tracks for easy flying and aiming, different possibilities for array configurations and the dedicated TD controller for overall system performance and control.

The TS4000 is particularly suited

JBL Accord

JBL have announced their new Accord 212 W wedge monitor. Designed by Richard Clark using JBL's Cabinet Simulation Programme, its size and performance were specified by Marquee Audio. They claim the Accord is the first compact wedge "able to achieve maximum gain before feedback, handle high input levels and maintain full bandwidth intelligibility".

Inside are new JBL VGC 12 inch high power cone drivers, a Neodymium compression driver and integral equalisation. Clark says the two drivers' combined cone area accounts for the 1350 W rating and that the design allows distortion-free extended LF. The finish is in heavy duty grey carpet.

to long throw applications such as arenas and stadia and features include new horn designs and Ferrofluid technology.

Specified frequency response is 40 Hz to 17 kHz ± 3 dB for a dispersion angle of $70^\circ \times 35^\circ$ (h x v).

The LSub range of subwoofers — the LS2000 and LS1500 — is designed to complement Nexo's own and other sound reinforcement systems in the low frequency range down to 28 Hz. These are proprietary-design enclosures combining horn and direct

Altec Lansing new additions

Altec Lansing have issued a new catalogue listing the latest additions to the Altec range. These include a range of three stereo power amplifiers from 150 W/channel into 4 Ω to 600 W/channel into 4 Ω , together with the revised incremental power amplifier range.

The Altec range of horns has been supplemented with the Vari Intense systems, which provide uniform SPL coverage over large seating areas. The VIR horn has a rectangular pattern with variable vertical pattern, and features minimal SPL behind the horn. The VIT horn is suited for fan shaped or corner seating areas and provides a true trapezoidal pattern combined with a variable vertical pattern. The horns are ideally suited to the Altec 299-6A

News round-up

● **TAC** have announced the first sales of their new SR6000 console in two countries — to their Japanese distributor Hibino for their rental stock, and to Canadian distributor SF Marketing for demonstration.

● **Fender** have joined the power amplifier market with the 2450, a stereo amplifier rated at 450 W/channel into 4 Ω or 900 W into 8 Ω in mono bridged mode.

● **Sheffield Events Arena** — part of the World Student Games Project — have awarded their SR contract to Hi Profile Technical Services of Southport, Lancs. Their tender drew on arena calculations by AMS Acoustics and specified Community's latest RS loudspeaker range (53 in all), sourced from The Sound Department, London.

radiator characteristics and employ 18 inch and 15 inch drivers respectively.

The LSub TD controller provides variable delay and phase control, adjustable crossover slopes of 12/24/48 dB/octave and test generator at the crossover frequency for system alignment.

Nexo Distribution, 154 Allee des Erables, ZAC de Paris Nord II, BP 50107, 95950 Roissy, Charles de Gaulle Cedex, France. Tel: (1) 48.63.23.01. Fax: (1) 48.63.24.61.

UK: Wigwam Acoustics Ltd, St Anne's House, Ryecroft Avenue, Heywood, Lancs OL10 1QB. Tel: 0706 624547. Fax: 0706 655655.

driver and may be combined with the 816A/B bass horns for large arrays or the 8256 ported enclosure for 'soft' acoustical environments.

Altec Lansing Corp, PO Box 26105, Oklahoma City, OK 73126-0105, USA.

Tel: (405) 324-5311.

Fax: (405) 324-8981.

UK: Shuttlesound Ltd, 4 The Willows Centre, Willow Lane, Mitcham, Surrey CR4 4NX.

Tel: 081-640 9600.

Fax: 081-640 0106.

Contributors to Studio Sound's Live News are Mike Lethby, Vic Lennard and Terry Nelson

MIDI Show Control for lighting

Although the background to MIDI is very much within synths and music, the MIDI protocol has a sufficiently precise definition to make it usable in other areas. One such application is lighting control and theatre cueing, which share the live performance aspect with synthesisers.

MIDI has been used as a 'language' by some manufacturers for interfacing lighting controllers to their command master device for the last couple of years. The main problem is that there are as many different implementations as there are systems, due to the lack of a lighting standard within the detailed MIDI specification. This has led to lighting designers riding roughshod over the MIDI commands by using them outside the context for which they were intended. For example, there are 128, 7 bit MIDI controllers, of which around 60 are currently defined but their definitions are of little consequence to lighting, which has no need for a MIDI breath controller or sustain pedal. Consequently, many lighting designers feel that the entire MIDI

protocol can be used as they see fit, leading to a total lack of compatibility between the various systems.

The MIDI Manufacturers Association (MMA) in the USA, along with their Japanese counterpart, the JMSC, are the bodies who instigate changes within the MIDI specification and have recently agreed on a proposal called MIDI Show Control. This is a series of system exclusive realtime commands intended to allow for high-level control of lighting systems. Lighting devices are connected open loop with the master allowing for the system to continue should one unit break down. Individual units generally have a cue list built-in, which is then synchronised to the master by MIDI time code. Commands concerning the

cue lists can then be sent to individual devices. These commands include go, stop and resume as well as the ability to add or delete events in the current cue list.

It is true to say that MIDI is generally of a low resolution when compared with some other computer protocols, especially when taking its serial nature into account. Using the velocity of a MIDI note-on, or a standard MIDI continuous controller to control, for instance, the intensity of a filament, leads to a less than adequate degree of smoothness in a fade-up due to the 7 bit nature (ie 128 positions) of MIDI data bytes. Admittedly, there is an option for handling a number of 14 bit controllers but that hardly solves the problem. MIDI Show Control leaves the actual lighting management to

each individual device while allowing for overall control by the master.

Regarding the speed of MIDI, basic MIDI Show Control messages will take less than 3 ms to transmit, while even the most complex should take no longer than 10 ms. The other fault often thrown at MIDI is its inability to transmit over long distances, due to the current loop nature of the interface and the capacitance of MIDI leads. However, line drivers can be used to extend this distance beyond 250 metres.

There is little doubt that MIDI Show Control is a necessary extension to the MIDI protocol if lighting devices are ever to achieve the degree of compatibility that currently exists among musical instruments.

Vic Lennard

Contracts

● DDA have delivered 15 consoles to the International Convention Centre, Birmingham, UK, home of the Birmingham Symphony Orchestra.

Seven of these are *D* series for house and monitor use.

● TAC have supplied their first *SR6000* console into Japan to the Hibino Corporation for their SR rental stock.

ONLY BLACK & WHITE CAN DO JUSTICE TO A COLOURLESS MONITOR...

We could have shown you the MONITOR ONE REFERENCE in glorious colour. We could have written reams about the fact that many consider it to be the most accurate and impressive mid/near-field monitor speaker they have heard. Instead, we decided you'd probably prefer to judge them for yourself, so call your local distributor to arrange an audition and hear the truth in black & white.



MONITOR TECHNOLOGY

P.O. Box 1102, Nedergade 35 C
DK-5100 Odense C, Denmark
Phone: +45 6613 9981 / +45 6614 5958
Fax: +45 6614 9181

DISTRIBUTION: Denmark/Norway/Sweden: Monitor Technology, +45 6613 9981/+45 6614 5958 France: Coach Audio Sales, +33 8777 0000 England: Raper & Wayman Ltd., +44 81 800 8288 Germany: Coach Audio Sales, +49 6894 47174727 Holland/Belgium: Ampco Audio Products B.V., +31 30 433 134 Rep. of Ireland: Control Techniques Ireland Ltd., +353 1966 866 Switzerland: Gotham AG., +41 1840 0144 Italy: Professional Equipment SRL., +39 2891 0241 Japan: Heavy Moon Inc., +81 33 797 6765 Singapore/Malaysia: Swee Lee Company, +65 336 2307/+65 336 0752.

DACS MODULAR MONITOR SYSTEMS

The simple and effective choice for monitoring



Monitor Mix 1 — 8 into 1 audio (line or unbalanced mic)
 Monitor Mix 2 — 4 into 2 (pan and vol per channel)
 Headphone amplifier — Stereo or 2 into 1 mixing. Clean power to 2 pairs of stereo headphones

Panel size — 5.2" x 1U high

These modules are extremely high quality.

Using them, complex and effective monitoring systems can be assembled easily. Call us and speak to Douglas Doherty to discuss your monitoring requirements.

Audio Interface Accessories

Line Boost — 8 inputs at -10dBV, 8 outputs at +4dBm, balanced outputs available as purchase option or retrofit.
 (Distortion at Max Output < 0.11%, S/N into 600R > 96dB, Crosstalk > 93dB)

Passive Level Match Board — 8 inputs at +4dBm, 8 outputs at -10dBV, balanced input version available.

Unbalanced Distribution Amplifier — configurable as 1, 2, 4 or 8 in to 8 out with adjustable gain.

Modular Balanced Distribution Amplifier — 1 in — up to 8 out housed to user specification

Balanced Input and Output Boards — Unity gain transformer action electronic balancing boards.
 (Output Boards 1 1/2" by 1 3/4", Input Board 1" by 1 3/4")

Stereo Pro Interface Board — Line level balanced inputs and outputs to unbalanced outputs and inputs respectively. These boards are factory set to operate for nominal balanced in and out at +4dBm, unbalanced side at -10dBV, but gain settings can be adjusted to user specification (3 1/2" by 2 1/4")

48 Volt Power supply board — Regulation circa .003%, .5A output

For Retail outlets, UK & foreign trade enquiries and further information

DACS Ltd, Stonehills Complex, Shields Road
 Pelaw, Tyne & Wear NE10 0HW

Tel: 091-438 5585 ★ Fax: 091-438 6967



SEEPORT THE PORTABLE AUDIO MIXER

- 8 input channels, mono or stereo
- 4 auxiliaries, with returns
- 2 band equalizer in each channel
- Pre fader listening and channel on switches
- M/S switch in each channel
- Penny & Giles long scale faders
- 2 stereo instruments
- DC or AC powered
- Weight 9.8 kg
- Fits in a 19" rack

SEEM AUDIO A/S Broadcast Telecommunication Audio/Video

P.O. Box 115 - N-1380 Heggedal - Norway
 Tel. +47 2 79 77 30 - Fax +47 2 79 61 54 - Telex 79207 SA N

RECITAL STUDIO AUTOMATION

RECITAL MIDI FADER AUTOMATION

RECITAL gives you the opportunity to automate your audio system, sixteen audio channels in this slim 1U rack mounting unit. To achieve full automation of your audio levels you simply connect your audio outputs, to RECITAL's audio input i.e. mixer send, keyboards, drums etc then, connect the output back into your mixing desk (mixer return input) or amp, 16trk, etc. Insert your MIDI signal, to MIDI IN socket and you are ready to have full control over your mix. Now simply send a MIDI controller to RECITAL by means of a sequencer, sequencing software package or R-TECHNOLOGY's fader page, to change the level of the audio channel. Recital powers up at unity(0dB), by sending MIDI control change 16,1,112, (MIDI channel, audio channel, audio level) the audio channel 1 will drop in level by -5db. There are 127 control changes, which enables you to have fine control over audio levels.

There's more, not only does RECITAL give you 16 audio channels, but there is a mix bus in/out. Eight audio channels are connected to the left bus output, the other eight are connected to the right. This feature allows you to mix your sixteen audio levels onto a stereo mix, also it is possible to have MIDI control over the level of the stereo mix bus this turns RECITAL into a stand alone line level mixer..... There are ten fader configurations, each are selectable by one MIDI controller, for example, you can MUTE all audio channels, INVERT faders, REDUCE all levels, by sending the appropriate MIDI controller at the right time in your mix. This can be achieved by setting your levels on a sequencer or our MIDI WORKSTATION and transmitting them to RECITAL at a preset MIDI clock, SMPTE timecode, or event controller. All modes of operation are in real time and at a truly affordable price....



- dbx 2150A VCA's
- Assignable stereo mix bus
- Operates under MIDI control change
- Based on modular card system ● NE5532 Op-amps
- Enables up to 112 audio channels on one MIDI channel
- Maximum attenuation -110dB ● THD .004% DIN
- Cross talk (vca card's) -100dB ● MIDI channel select switch ● MIDI thru connector
- MIDI online led ● Earth lift switch ● Voltage select switch ●
- RECITAL I Phono unbalanced inputs/outputs ,1U Rack mounting unit
- RECITAL II XLR Electronically balanced inputs/outputs ,2U Rack mounting unit

R-TECHNOLOGY

Wynn House,
 20 Church street,
 Tankerton,
 Kent CT15 1PH,
 Tel: 0227 264862
 Fax: 0227 771600

MIDI WORKSTATION 700

The workstation has been designed to let you have full control over your audio via MIDI by moving the faders to control audio levels, pushing a button to mute a channel It will give the mouse a rest !
 16 faders + master fader ,16 channel mutes, dump switch, MIDI out



Any band — however successful its studio output — that dares to tread the boards with a show that's less than conventionally 'live' can expect to meet scepticism from self-appointed arbiters of whatever it is that constitutes 'live music'. At least the Pet Shop Boys are honest about it. While their latest tour was a masquerade in theatrical terms, it certainly wasn't any kind of a sham.

When Pink Floyd performed *The Wall* from behind a symbolic plastic wall at Earl's Court in 1979, reviewers caustically suggested a tape recording might have been equally useful — and cheaper. Jean-Michel Jarre's outdoor shows make heavy use of multitracked material, and it's common practice to 'spin in' difficult vocal passages and orchestral parts with a backing tape synced to timecode.

It's the stars who pretend to play or sing when they're not, either on stage or record, who provide cannon-fodder for the media. From The Monkees (who got away with it through sheer charm) to Milli Vanilli (who didn't), the press has had plenty of shock 'exposés' that must sometimes bewilder musicians.

In the era of sampling and sequencer-built songs, why should anyone balk at a band using pre-recorded material in its set? The Musician's Union will point — with some justification — to a long-term shrinkage in work for 'real musicians'. Yet many current hit acts would find live shows either physically impossible or hugely expensive if they were forced to replicate their studio technology with live musicians.

For example, indie chart-toppers EMF, playing to sell-out crowds this summer in Europe, proved that audiences are happy to hear them at their best — however that's achieved, even with off-stage sequencers, samplers and effects.

So when an act like the Pet Shop Boys opt to take their latest album and an impressive back catalogue of hits (all lovingly crafted in the studio with the best MIDI technology money can buy) out on the road, you can be sure they are unlikely to miss a trick.

The stage was cleared for an elaborate masquerade involving 30 dancers, with main men Neil Tenant and Chris Lowe taking star roles and, respectively, vocal and live keyboard duties. Stage right were the guitarist and the percussionist accompanied by a bank of MIDI-controlled sequencers, samplers, sound modules and mixers, which provided the backbone of the shows.

The 1991 spring tour played indoor arenas, starting in Canada and the US before moving to Europe and England. With sound by Britannia Row under tour manager Ivan Kushlik and production manager Roger Williams (now amicably divorced from Britannia Row Productions) it featured Turbosound's *Flashlight* sound reinforcement system, the Radio Station in-ear monitor system and the aforementioned MIDI Mountain.

The show

Brussels for the Pet Shop boys meant the Forêt National, an unlovely concrete blockhouse surrounded by the gloomy remnants of the forest that someone felled to make way for dismal suburbia. It has circular amphitheatre-style seating sloping down to a central flat standing area, at the rear of which sat the FOH mixer and lighting desks. The venue's chief acoustic problem is a bare concrete rear wall which curves around behind the seats providing plentiful reflexions. Opinions on its merits differ: Ampco boss Eric de



Engineer Nick Bruce-Smith at the monitor desk



MIDI racks situated side of stage

PET SHOP BOYS ON TOUR

Mike Lethby caught up with the band in Brussels on the second date of the European leg of their tour

Bruyn says he considers it comparatively easy to play, while BRP's people feel the acoustics are well down in the league of European arenas. Both de Bruyn and the show's local promoter — Herman Scheuremans, owner of Belgium's largest SR firm EML, were there to judge for themselves.

The Pet Shop Boy's show is bizarrely entertaining. Without a band to occupy the senses there's a non-stop theatre of the absurd in which 30 dancers and our heroes play out a sometimes nightmarish, sometimes hilarious, masquerade of sin, sexual perversion and barbed jibes at English middle-class attitudes and paranoias. All these allusions and illusions are accompanied by split second costume changes and dramatic use of minimalist props and theatrical lighting — courtesy of a leading New York theatre designer.

For *Suburbia*, Tenant appears dressed as a mental patient on an iron bed while attendant 'nurses' supply flagellation. In the middle of a slow love song — with the audience holding up flickering lighters — someone will drag on an electric chair or simulate a sex act. It's that kind of

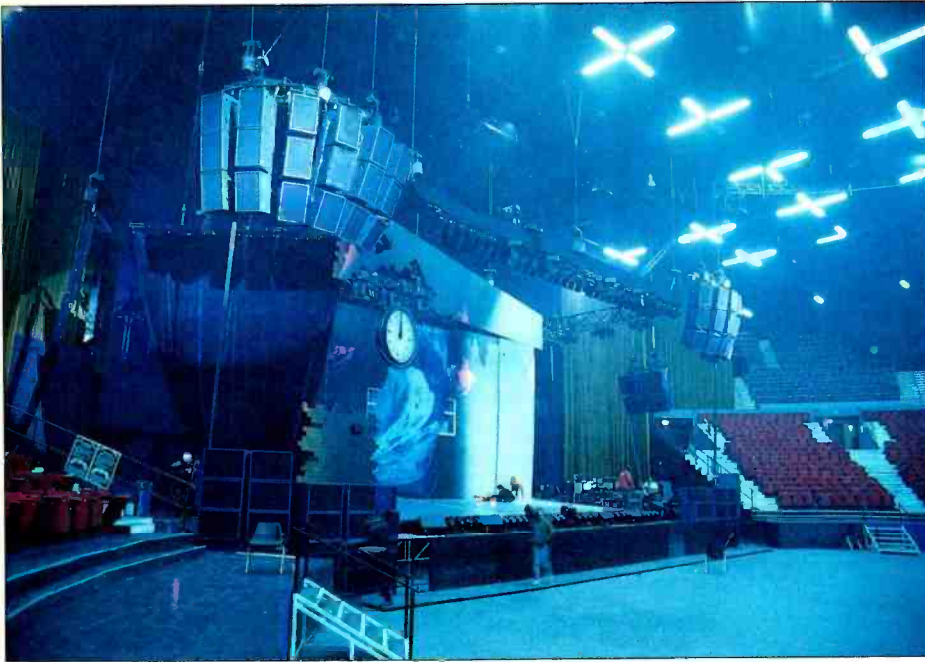
show. Somewhere between a Prince tour with goulish humour and an animated Magritte painting, if that makes any sense.

MIDI studio on tour

There was no pretence about the nature of this tour. The Pet Shop Boys — habitual studio recluses — first toured 'live' just three years ago. But if an attempt at rock 'n' roll theatre appeared a little contrived, this production was far more balanced (though equally eccentric) and proved that important lessons had been learned.

Far from using sequencers *et al* to cover up inadequate musicianship, Lowe and Tenant have exploited MIDI technology to the max. But how does this translate to a live show? Is it simply a case of taking their studio hardware and MIDI on the road — or is there more to be done?

Derek Simpson, keyboard technician and programmer to the band, considers the question: "It's created specifically for the road. In the studio,



Main SR stacks

the Pet Shop Boys are famous for using samplers, sequencers — creating electronic music. To go on the road they've picked the best possible machines to recreate those sounds. They're not hiding behind the stage with a DAT machine; they're known for electronic music and here it is at the side of the stage.

"They want it to be as live as possible, and this is as live as they can get it. Any time they want, they can change the music, change the way it's ordered or add another song — as they're doing today. They'll load it up into the sequencer in the sound check and then rehearse it — which you can't do with DAT machines!"

The show also features two real, live musicians. "Scott Davidson is on keyboards; he looks after the whole thing, presses 'start' on the sequencers, makes sure it's all running and plays his own parts. J J Bell is on guitar and he's one of the best. He's also playing percussion from an *Octapad*, which is featured heavily on four different numbers."

The MIDI set-up is elaborate and relies on tried and trusted technology. A crucial factor is Lowe's and Tenant's experience of what works in the studio.

"They're very technically *au fait*. They employ people like me to set up the gear and look after it, and Pete and Dominic Clark to program it, but the guys know what they're talking about, they'll say 'this is what I want, can you do it for me?' They're on the ball."

Simpson, who worked with the band on their last tour but not in the studio, had quite a lot to get his head round at the start of this tour.

"I come in and look at what they're using and try to make it roadworthy: have it wired so that if a problem should arise, I can go to a cable and repatch without having to think about it. I put these racks together myself. But unlike a lot of people I'm not afraid of MIDI — its simply a tool to be used."

Many of the show's samples and sequences are taken directly from studio material, including the last album's sessions (co-produced by the band and Harold Faltermeyer), transferred via DAT and re-sequenced in pre-tour production sessions. Samples were copied into either Akai *S1000s* or the *DD1000*.

The racks of MIDI modules and Yamaha *DMP7*

mixers are controlled by a brace of Roland *MC500* sequencers.

Simpson: "The set is divided into two parts; the first half is on two *MC500s* and they're reloaded for the second half of the set. The other two are spares. I did the last tour as well, with a similar set-up of sequencers, and we never used the spares."

"They always use *MC500* MkIIs, they're the most reliable, and for editing they're fast. Each drum sound has its own master module; while the bass sounds come off a Roland *S770*. Chris reckons they have a better bass response; he prefers their sound."

Notator sequencer software was used on the road for last-minute song changes, the results then being dumped into the *MC500s*. Along the way, Derek says, the process has to compensate for subtle timing differences that show MIDI is not quite the universal standard it's supposed to be.

Both keyboard players played their patches from Roland *A50* mother keyboards. Simpson adds: "Most musicians take a keyboard or a unit and only use 25% of it and then move on to something else when they're fed up with it. But the Pet Shop Boys use everything to the maximum; the samplers all have 40 Mbyte drives and most of them have 32 Mbytes of RAM as well."

"The modules include some Korg *M1s*, a few *MKS-50s*, an *MKS-80*, a *Proteus*, a couple of *TG33s*; Chris and Scott have their own keyboard set-ups, each using a Korg *M1* and an *S1000*. All the other units are purely played by the sequencers. There's also a Link *1000* portable keyboard, which Chris plays on stage; that's going through a Samson radio system into a Midiman MIDI converter. That's just for sound effects on stage from the *S1000s*; he can play piano, explosions, vocals 'oohs' and 'aahs', orchestral stabs, lots of space-age noises and bass samples."

"Another key sound source is an Akai *DD1000* optical disk recorder. That's featured quite heavily for orchestral parts, string section and background vocal effects — it sounds very clean and it's easy to use but it doesn't seem to like vibrations. On a gig where the stage is a bit unstable and the sub-bass units or the dancers are moving things around it might miss a sample. Most people use it for small samples but the Pet Shop Boys use it for longer samples, so if it misses you really notice it."

But then they made it for studio use; I don't think they intended it for the road. But it's well looked after. If we know the stage is a bit creaky we'll take it out of the rack, sit it on lots of foam and babysit it."

The only nod to analogue synthesis I could see in the racks was a *Super Jupiter* module, which is down to Lowe: he apparently loves raw sounds and "the low end you can get from a *Super Jupiter* is amazing — through a big PA system it sounds... mighty! He loves it".

What does a man so adept at programming machines via incremental buttons think of Roland's recent introduction of an upmarket synth bristling with real knobs and buttons?

Simpson: "Absolutely great — it's about time. Look at the *S770* sampler, it's a great machine but if you don't have a monitor and mouse it's a nightmare to edit. Once the whole set's loaded in there, fine, but if you have to edit something in a hurry, scrolling through all the pages and working out where you are under dim lighting — well, forget it. I'd love to see more knobs and buttons. Keyboards like that are easier to use and they also look better. It's good to see musicians using three or four synths on stage instead of one master keyboard with everything else in a rack, and never varying their set patches — so many shows have exactly the same keyboard sounds."

The outputs of all the sound modules were routed through Yamaha *DMP7* mixers; providing stereo-pair submixes to simplify the house and monitor engineers' tasks.

"We've got five *DMP7s*; we're using four live with one spare that we can patch into at any time. The *MC500s* change the *DMP7s*' patches at the beginning of each song to the right configuration for the sound engineer."

"The *DMP7s* have their own EQ settings programmed in so the guy out front knows exactly what he's going to get every night. If something changes, a fader can be pushed up on a *DMP7*, press 'Store' and it's there — it's instant. But so far it's stayed the same every night."

"The last tour was basically this set-up, minus the *DMP7s*: the house sound engineer had a couple of Midas boards strapped together and with the band there were 80 channels out front. Whereas now it's all mixed down to about 20 channels of keyboards, a couple of guitar channels and vocals. So he's got one desk out front and less to worry about; he can concentrate on getting the sound right, without the headache, if someone on stage doesn't turn up a volume knob, of finding out which keyboard part has changed out of all those channels. It's all done for him, unless we want something changed, nothing changes."

Do they use a MIDI patchbay?

Simpson: "We use Yamaha *MJC-8s*. Patch 1 is for the first half of the set; Patch 2 is for the second half. Scott uses a Digital Music *MX-8*; that's just for him so he can flick through his *S1000* and *M1* and pick his sounds out."

At the back of the racks, there's yet more MIDI hardware hidden away.

We have the *Super Jupiter* programmer just in case it's needed, and there's no room for it round the front. There are some Roland *A110* MIDI Thru boxes — the keyboard-style display shows any note or chord that's being played and MIDI channels, so if something's not playing I can see instantly where the problem is.

"Our *DMP7* outputs are going through BSS DI boxes — they're clean and easy to use. The power source is regulated by a Galatrek UPS system, so if a spike comes in, in a millisecond it'll jump to battery without missing any sequencer missing a



SOME ACHIEVE GREATNESS

With the Megas Studio console we've achieved what others merely aspire to; exceptional audio quality and an unparalleled range of facilities at a cost that even the not so well-heeled can afford.

The Studio is a 'split' console that can be specified in either 16 or 24 group buss formats. Four different frame sizes can

accommodate a combination of mono or stereo input modules plus up to twelve dual group modules, a comprehensive master module and an optional patchbay.

Standard features include MIDI controlled muting which can be interfaced with a sequencer to provide automated mutes, full metering which is housed within an integral

meterbridge, and a remarkable new switching type power supply that operates at low temperatures for higher efficiency and greater reliability.

The name Megas literally means 'great'. And greatness is precisely the result that the Megas Studio is intended to achieve.

MEGAS
STUDIO

SOUNDTRACS_{INC}

91 EWELL ROAD, SURBITON, SURREY KT6 6AH, ENGLAND. TELEPHONE: +44 (0)81 399 3392 FAX: +44 (0)81 399 6821

TOMORROW'S VINTAGE MIC TODAY'S REVOLUTION



INTRODUCING

EQUITEK II

Multipattern Side Address
Condenser Microphone

A dual capsule condenser microphone featuring a frequency response of 10-18,000Hz, cardioid, Figure 8 and omnidirectional patterns, and exclusive I.N.R.[™] (Impact Noise Rejection) internal shock mount system.

From Conneaut Audio Devices, a revolution in performance at an absolutely incomparable price.

1-800-762-9266



Conneaut Audio Devices

CTI Audio P.O. Box 120 Harbor & Jackson Streets Conneaut, Ohio 44030-0120



beat; it analyses the power and when the spike's gone it'll revert to mains. If the power fails totally it'll go on for half an hour. We could either carry on or have time to turn everything off before the hard disks crashed. A lot of damage could be done to the hard disks — and it takes about 15 minutes to power everything up and reload it all. It's an essential piece of equipment. A lot of managements balk at hiring things like this but if your power fails it pays for itself in a millisecond.

Does Simpson think the concept of 'live MIDI' automation could go further?

"Technologically, that's probably the way to go, but I like the human feel and you get to the point where it's sterile. You could have no sound or lighting people out front, just a person at the side of the stage to press 'go' on a sequencer and then retire to the crew bus."

But isn't that essentially what he's got here — apart from the dancers and the lights?

"You could say that...how do I get out of that one? But look, they're showing that what they can do in the studio, they can do on the stage here; they can re-arrange the songs, ad-lib if they want at any time. They can speed songs up, change parts and change samples — it's as live as they can get it. There are bands out at the moment who have a tape machine at the side of the stage but the Pet Shop Boys have this — and it *can* go wrong at any time!"

There must be inherent limitations in MIDI with live work and Simpson finds there are times when he wishes he had more than 16 channels to work with. But there are ways around that.

Simpson: "I give each module or sampler its own dedicated MIDI channel, and each sound or sample has its own note base on that channel. So you'll never get a note that should be playing the bass drum playing a violin. No matter what program changes come in, once the *S1000* changes to a new drum set the right notes trigger the right sounds. If someone gave us more MIDI channels I'm sure this set-up would grow even further. Even with the amount of memory we've got on RAM and hard disks and optical disks, there's never going to be enough."

What about data integrity. Has he had any problems with disks becoming corrupted?

"During the shows, no; but in setting up we've had the occasional bit of data going down on floppy disk. As far as hard disks go, we've had some corrupted data on one *S1000* hard disk and we just reloaded it. You expect that with hard disks, no matter how careful you are with them."

Monitors

The show's unusual design and theatrical content dictated an equally unconventional monitor system. On stage, it had to serve four vocalists (Tenant on lead and three backing vocals), Lowe on roving keyboards and the dancers; plus the two off stage musicians. But with so many people cavorting around the stage, creating an effective monitor mix on wedges alone seemed virtually impossible. Another complication was the designers' insistence on keeping the stage clear of rock 'n' roll paraphernalia.

Monitor engineer Nick Bruce-Smith's solution to all this was a hybrid of old and new technologies. Basically, conventional *MS1* wedge monitors served the off-stage duo while four flown Turbosound *TMS-3s* provided sidefills for the dancers. But for the vocalists, Nick chose the new *Radio Station* in-ear monitoring system.

Mixing from a Ramsa 40/18 monitor console, he explains: "The keyboard player has a stereo mix in

2x15 wedges and the guitarist has a stereo mix in 2x12 wedges — all *MS1* units, powered from two *MS1* switcher racks. The *TMS-3s* are flown to cover the dancers."

Radio Station

The *Radio Station* in-ear monitors had already been seen on numerous tours (in pre-production form and using VHF frequencies) since last autumn. A UHF-spec final version is due to be launched this summer.

Martin Noar of Hardware House (Sound) subsidiary The Stage Radio Company, the *Radio Station's* manufacturers, developed the system. Canegreen's Yan Stile and his partner Chris Lindup also contributed their ideas to the project. Personal Radio Systems (UK) Ltd helped finance and market the finished product. At the end of this chain are LMC — the UK distributors.

Bruce Smith: "In rehearsals we tried all kinds of conventional monitors but when we saw how much movement there was on stage and how much people hated seeing monitors we knew it had to be different. Also, Neil has a very 'low input' voice. I figured that with speakers in the ears we'd have no problems with levels; and because the ear moulds [the *Radio Station* comes with earpieces individually moulded to the artist's ears] block off a lot of the external sound, it's ideal for pitching.

But what were his initial feelings about the ability of an in-ear monitor system to perform in practice?

"Ever since it was first mentioned I'd been rather sceptical — like many other people — and I'd heard widely differing reports about it. But as a concept I think it's brilliant — I think it still needs more research but with certain provisos it's working very well for us."

Most of Nick's 'provisos' centred on the VHF spec, which he hoped the UHF version would largely eliminate. But the shortage of legal frequencies and power restrictions continue to make it difficult for any manufacturer to build an ideal product and do it legally. The *Radio Station*, however, is fully legal.

"There is already too much on the three legal VHF bands as it is. Your power output is limited, which restricts your distance and you always have to be in line-of-sight, which is very difficult. The lower you drop the power the more drop-outs you'll get. And I'm running seven handheld mics — all in a similar range; that means there's a lot of cross-bleeding...!"

While anticipating greater things from the UHF version, what is the reproduction like in the VHF-based earpieces?

"It depends on how much local RF interference is causing distortion, ie when it's not getting a clear signal. That's the biggest problem.

"Plus you can get it too loud and not realise it — so limit the desk outputs before the transmitters to stop distortion. Obviously you can distort the headphones quite easily."

Presumably you wouldn't use them for Iron Maiden.

"I was asked to use them on Depeche Mode but I just couldn't see them working for them: they like to feel so much of the music. But you always supplement them with something else anyway, to supply more depth to kick drums or bass."

As regards processing there are: "gates across the *DMP7s*, for that usual Yamaha sizzle in quiet moments, K-T graphics on the outputs and lots of compressors. When all three of them are singing in unison they can get a lot of gain together on the

same monitor mix...they'd end up with bits of headphone speakers inside their eardrums."

The SRS

The final component of the tour as far as sound goes was the Turbosound *Flashlight*. It had been unavailable for the US/Canada leg, where a *TMS-3* system had been used instead. It would be fair to say the *Flashlight* arrival had been greeted with relief on the crew bus.

Flashlight was originally devised as an advanced stadium system rather than a general purpose *TMS-3* replacement, and this was its first large indoor arena tour. To find out whether such high-Q cabinets can evenly cover a tight space we turn to Jon Lemon, FOH engineer in recent years to Sinead O'Connor, Level 42, The The, Spandau Ballet — and Pet Shop Boys. His comments are interesting because, unusually for a FOH engineer, he's worked with many of the major touring SR systems.

"In the last 18 months to two years I was the first person apart from Simple Minds' engineers to take out the *F2*, with Spandau Ballet. That sounded pretty good, though a bit tough to fly. I used to run a 20-cabinet Clair Brothers *S4* system in Australia but I've never really rated the *S4*. The *E-V MT-4* is very powerful but you can get throat distortion on the manifolds. Having said that, it sounded great with Prince.

"After the *F2* I shifted over to *Prism* with Sinead and Level 42, and I've got to say that for me it's a great sounding system. But I've also heard it sound...not so good, shall we say.

"But during the summer season last year I did some festivals with Sinead using *Flashlight*. Nothing else flies as well or is as flexible. Last night [in Paris] we measured the power it was drawing — 28 amps a side, which is remarkable. And it works in any area — you can contour it to the way you want it to be.

Will *Flashlight*, with two standard boxes, be able to work in as wide a variety of venues as *Prism* in all its variations?

"I can't be too categorical — I haven't tried smaller systems in theatres. But I heard Cliff Richard's Gospel Tour was a success with six pairs a side."

How is the show to mix?

"It's partially pre-mixed in the studio, driving *DMP7s* here. So I can concentrate on getting a good sound. So it's a weird one — it's like having musicians without the attitude bit — consistent every night!"

Britannia Row's Bryan Grant explained the presence of a pair of Midas *PRO-40s* on FOH duty: "They were due to be sold off but people kept requesting them because they love the EQ; so we had them completely refurbished," he grins.

Finale

It's difficult to know what to say about a show like this. It certainly was 'live', at least as far as the audience were concerned — they danced from start to finish.

The *Flashlight's* clarity seemed well suited to the hi-tech music and Jon Lemon was clearly having a lot of fun playing with the system and trying out its possibilities. As for the band, despite the wealth of hits under their carefully-marketed belts, they're implausibly fresh and wide-eyed about the joys of touring. No jaded 'thirtysomethings' here — just a whole lotta MIDI and a whole lotta energy. Yes...I confess to secretly enjoying it. □

Express Yourself

Aphex Expressor™ Compressor/Limiter

The "sound" you were looking for, but could not find! "Punch, slap, fat, pump, or squeeze" ... now you can get it *fast* ... get it *clean* ... and get it at *low cost* with the Aphex Expressor. It gives you greater flexibility to express yourself without the sonic degradation associated with other compressor/limiters.

The exclusive High Frequency Expander* allows higher ratios without the "dullness" of other wideband devices. Spectral Phase Refractor™ restores bass clarity and punch without any increase in amplitude.

*Patent Pending

© 1990 Aphex Systems

The Expressor works with any system, balanced or unbalanced because of its servo-balanced input and output. It's loaded with other features including adjustable input, threshold, attack, release, output and ratio, plus link, slave and hard or soft knee compression. And, like all Aphex products, the Expressor features the highest quality signal path.

Express yourself! Audition the Aphex Expressor at your authorized Aphex dealer today.

APHEX SYSTEMS

11068 Randall Street • Sun Valley, CA 91352 • (818) 767-2929

Exclusive UK Distributor

Sound Technology • Letchworth Point • Letchworth
Herts SG6 1ND • England • (0462) 483000



All Aphex products are designed and manufactured in the U.S.A.



LOGIC

Sue Sillitoe
visits Milan

Logic Recording Studios is located on the outskirts of Milan. It is to this 48-track digital facility, owned by brothers Michelangelo and Carmelo La Bionda, that people like Beautiful South, Depeche Mode and Robert Palmer have been flocking, despite the fact that there are plenty of similar studios much closer to home. Some may argue that UK-based bands would be better off using UK-based studios, if only to avoid language barriers but Logic has a strong multilingual policy in force — everyone who works there speaks English and some of the staff speak German, French and Spanish as well. However, this still doesn't explain why Logic has been attracting so much business from the UK, nor why it is perceived as a success when many other studios are finding times very tough indeed.

In Logic's case the answer is obvious: they succeed because they have the right attitude. They manage to combine an efficient and businesslike manner with style, friendliness and a sense of humour — how could they fail?

I was shown around the facility by the funniest pair of engineers I've ever met — Pino Pischetola and Antonio Baglio. They were like a comedy double act, interrupting each other in their excitement to point out every little thing about the studio and finishing each other's sentences when their English — which was pretty good as far as I could tell — ran out on them.

The recording studio, which is housed on the first floor of a large modern building, was initially built by Italian record company CDG back in the early '70s. CDG constructed the studio separately inside the main building so that although it has no natural daylight, it does have total isolation.

When the record company got into financial trouble it sold the studio to the La Bionda brothers — former Italian pop stars who had moved into music production, publishing and running their own record label. The brothers have been running the studio as a commercial facility for about five years. Michelangelo is the business brain behind the operation while Carmelo provides the artistic content, composing music for advertising and developing Logic's audio-for-video post-production skills. Over the last five years they have totally revamped the studio and ancillary services and have built up its reputation as a major



Studio A

international recording facility.

Soon after they took over, Michelangelo and Carmelo called in studio designer Andy Munro to redesign the control room and check out the acoustics in the recording area. A lot of work had to be done in the control room to bring it up to scratch including the installation of a 56-channel SSL *SL 4056* console, new Quested monitors and new tape machines.

But Munro's advice regarding the studio area was to leave it alone — it sounded fine and therefore why change it?

The studio area is rather unusual. Firstly, it is huge — easily big enough for full orchestral scores which do occasionally form part of its workload. And, secondly, there's the acoustic



Post-production suite

treatment, which really is unusual. It consists of a system of large cylinders covering every wall, which revolve at the touch of a button to give a live or dead atmosphere depending on what the client needs. Also very interesting are the light fittings, which hang like the underbelly of the *Starship Enterprise* from the ridiculously high ceiling. As part of the redesign Michelangelo talked about ripping the lights out. But he was persuaded to leave them in because they are so unusual.

The engineers say: "We find bands really like this studio because they can set up all their gear and still have room to move around. Often they use one half of it as a recreation area — they hang around in there rather than in the control room because there is so much space.

"It is a shame that there is no natural light but because of its size it doesn't feel claustrophobic. Its very rock and roll — the finishes are not fine wood and delicate things, so a bit of mess is OK. We have installed tie lines everywhere and we have also got an extra wide lift so bringing machines up from the ground floor is not a problem."

One reason for Logic's international success is Michelangelo and Carmelo's attitude towards equipment. They happily admit that they like to stay one step ahead of the competition, which is why they were the first studio in Italy to install an SSL desk, the first to upgrade it with a G series computer and the first to go 48-track digital.

The studio is equipped with a Sony PCM-3348 digital tape

machine and also has two Studer A800 mkIII 24-tracks with full Dolby SR. If clients prefer to use Mitsubishi digital machines Logic rents them in — usually from Hilton Sound in London.

Pischetola and Baglio say: "Logic chose Sony rather than Mitsubishi because it felt it was a better machine and would eventually be the format most people would want to use.

"Michelangelo likes to be the first to do things and he is prepared to take risks with new machines — the Sony was a risk because a lot of Italian studios have been getting Mitsubishi machines. But we think it's great. Not long after we got it two Japanese engineers turned up from Sony and changed over the heads because someone had reported a fault — we hadn't even realised there was a problem but they changed them anyway."

Apart from the Quested main monitors, Logic has Yamaha NS10s for nearfield. Pischetola/Baglio add: "We also have a pair of Alphi speakers which cost £7 and have to be the worst speakers in the world. We play everything we do through them, working on the basis that if it sounds OK through them then it's going to sound OK anywhere!"

Logic's equipment is certainly very up-to-date but that alone isn't enough to stay ahead in this business so why are so many big name bands choosing to record here? Surely it's not just the lure of Milan?

The engineering duo put it down to efficiency on an international scale. They said: "In Italy there are a lot of studios that are frankly awful. They have cheap desks, dreadful wiring and no proper acoustic treatment. They don't have proper maintenance either, whereas we have 24 hour maintenance because in order to run an efficient international studio you have to have your equipment 100% right.

"Also our policy is to invest in new equipment. We have the usual range of outboard gear and we check with clients in advance to make sure we have everything they need. If we have not got something we will either buy or hire it. For example, when Robert Palmer was here for the first time he asked for a Lexicon 480, which we didn't have. Michelangelo said: 'Why mess around hiring — let's just buy it.' The same thing happened this year when Palmer wanted a Focusrite rack — we simply bought it. We want to show that we care. If we have to hire it's no problem. There are no hire companies in Italy so we have to bring equipment in from the UK but we have done this so often now that we have found a way through the customs red tape.

"Another reason we do well with international artists is because we can help out with finances. If a band comes here and wants to use backing singers or specialist musicians they may



Studio B



Pre-mastering room

have trouble financing payments. Because we have the back-up of a record label and a publishing company we can arrange temporary finance while money transfers are being sorted out. This is a vital point and comes with experience. You have to work with international bands over a long period of time to fully understand the problems they have when they are abroad and find ways you can help make the process as smooth as possible."

These comments were reinforced by Michelangelo La Bionda: "One of our main selling points is the staff. We have 18 excellent people working here who all speak English. Also the studio is of a very high standard — we like to get new things in fast."

"We are attracting a lot of international business because Milan is a great city. It's the centre of the fashion industry and the costs of recording here are comparable with recording in the UK. I think the main reason we get a lot of international work is historical. Carmelo and I started out in the music business over 20 years ago as artists and producers so we have built up a lot of contracts. Work comes here by word of mouth and once that happens the whole thing spreads."

"I have always believed in being international — both as an artist and as a studio owner. I see myself as an internationalist, I'm married to a Swedish woman, I have lived and worked in London, in Munich and the US so I have gained a lot of experience. We try to make sure the studio has the right kind of ambience and we are constantly picking up new ideas, which we put into practice in the studio. It seems to be paying off."

He adds that diversification and success go hand-in-hand at Logic. Apart from the recording studio, Logic also houses a copying room for cassette and DAT; tape storage areas — they store all CBS Italy's masters; a Sony 1630 editing room, which has recently been redesigned to make it more comfortable; a cutting room; a relaxation area for bands; administrative offices and a digital audio/video post-production suite equipped with an AMS AudioFile.

Logic are now moving more and more into post-production as a result of a joint venture it has recently undertaken with film company Zeus. The two companies have set up a new post-production facility in the centre of Milan, which is known as

Logic West. Most of Logic's television and advertising agency work is being moved across to Logic West, leaving the existing *AudioFile* suite free for CD pre-mastering.

La Bionda says: "The aim is to have everything we need in-house so that we can do all our own work here and also take in work from other companies. My investment in the studio must be aimed at getting top quality results. When we started we had very little — just one studio. But now we have opened out the business to cover lots of different areas so that if one side is down, due to usual market fluctuations, we are making a living with one of our other activities. Having a diverse client base is vital to our success."

Apart from the existing facilities, the La Bionda brothers are in the process of building a second studio on the fifth floor of the complex. Once again they have called in Andy Munro to design the room, which will be equipped with a 36-channel Amek *Angela*, a Studer *A800* and Dolby *SR*. Primarily this studio will be used by them for their own work, which involves a lot of composing for advertising. They had been finding it difficult to get into the main studio because it was so much in demand by clients.

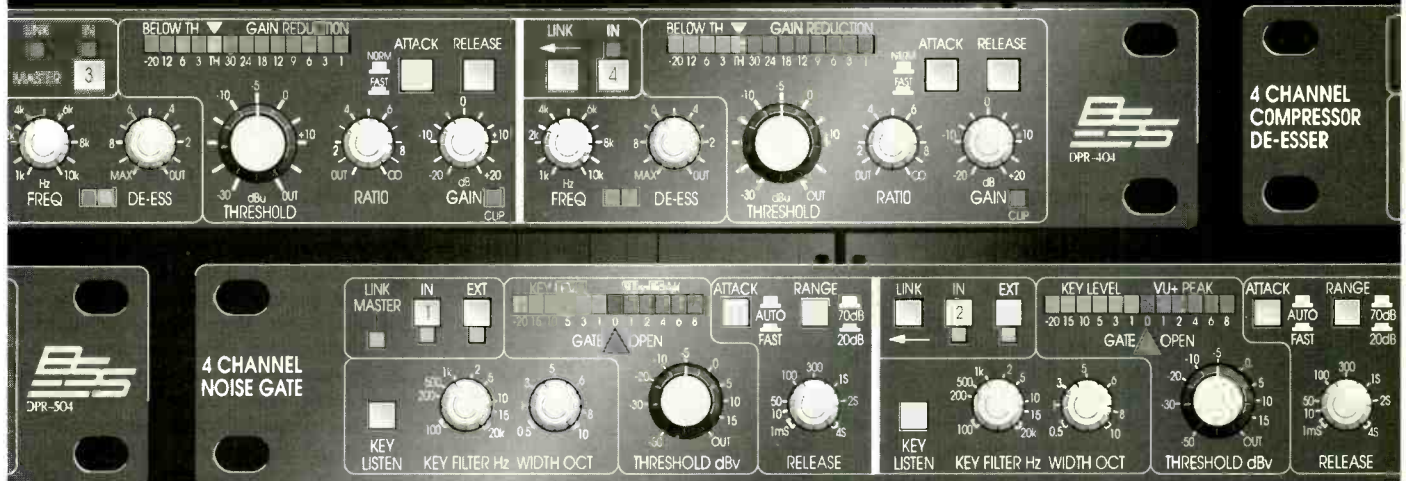
"The new studio upstairs will be geared towards the sort of work Carmelo and I do. It will have lots of keyboards and a *Synclavier*, which we are installing in the spring."

There is so much to say about Logic Studios that one wonders where to start. But the overriding impression you get from visiting this facility is that it's the people that make the place so interesting.

But why have they never put together a brochure or gone in for heavy advertising campaigns? La Bionda's answer was simple and yet typical of Logic's attitude: "We have never bothered with a brochure because I think the best way to sell Logic is to get people over here to see it. If someone shows an interest in using the studio I will fly them out to visit us at my expense. That is usually all we need to do because the studio sells itself." □

**Logic Studios, Via Quintiliano 40, I-20138 Milan, Italy.
Tel: 258 01.11.60.**

The multiple choice....



....advanced in design, simple and effective in use....

The **DPR-404** 4 Channel Compressor De-Esser
The **DPR-504** 4 Channel Noise Gate



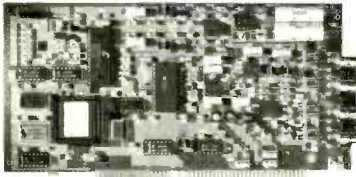
BSS Audio Ltd., Unit 5, Merlin Centre, Acrewood Way, St Albans, Herts AL4 0JY England
Phone: (0727) 45242 Fax: (0727) 45277 Telex: 265612 BSS G

an **EdgeTech** company
a member of the AKG Group

Introducing

The CardD System™

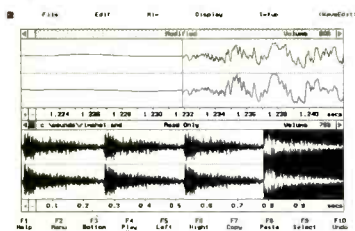
Hard Disk Recording
and Editing on your
AT-compatible!



The CardD

The CardD is an AT-compatible bus board that gives you:

- Real time direct to disk stereo recording and playback
- True professional-quality 16-bit audio
- Stereo analog inputs and outputs
- 32kHz, 44.1kHz, and 48kHz sampling rates



The EdDitor

The EdDitor is an interactive stereo waveform editing program that features:

- Non-destructive editing
- Cut, copy & paste
- Full zoom-in and zoom-out
- Mixing
- Catalog feature for fast access of sounds
- On-line help

The CardD

Add The I/O CardD to give you the S/PDIF & IEC digital interface, allowing direct digital transfer to and from your DAT machine.

Digital AUDIO



SSE Marketing

Unit 2, 10 William Road
London NW1 3EN
Tel 071-387 1262

France - Audio Delta (33) 1-45-260-292
Spain - Hypertech (93) 4-309-790
Sweden - Tal & Ton (46) 31-803-620

MONITORING

A list of recently introduced products compiled from information available to us at the time of writing

Audix: The US Audix company have launched a 2-way nearfield monitor known as the *HRM-1*. The LF driver is a 6½ inch polypropylene unit while the HF is handled by a polyamid dome tweeter. The crossover is at 3 kHz with 24 dB/octave filter slopes. Audix claim that the use of a 1½ inch voice coil on the LF unit together with the vented cabinet design gives a power handling of 150 W and a -3 dB response of 48 kHz in a cabinet of 16x10x7¼ inches. Audix have used a *Neoprene* faceplate to cover the front cabinet surface and reduce cabinet diffraction problems and the speaker pairs are component matched and supplied as symmetrical sets. The *HRM-1* is available in natural oak or black oak finishes.

Audix, 5653 Stoneridge, Pleasanton, CA 94566, USA. Tel: (415) 463-1112.

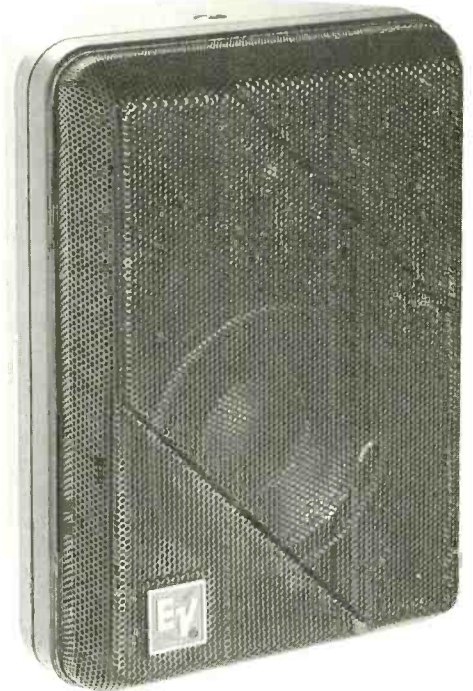
UK: Rose Morris Co Ltd, 8/9 The Crystal Centre, Elm Grove Road, Harrow HA1 2YR. Tel: 081-427 5377. Fax: 081-861 3595.

BNS: The BNS professional *A-4* compact monitor is a small 2-way monitor designed for small rooms and close monitoring. It uses a 140 mm bass driver with a cone made of woven glassfibre. The driver is placed in a vented cabinet, which is tuned at 65 Hz. The tweeter is a 25 mm dome with high damping losses.

The *A-3* is a 2-way design that includes an active crossover, input amplifier and two power amplifiers. It's intended for small to medium sized control rooms.

The *Sub-A* is a woofer system to supplement the

A-3 and the *A-4* on the lowest notes in the spectrum. The *Sub-A* contains its own crossover and power amplifier, and can be used as a centre



Electro-Voice S-40 compact monitor



Genelec 1031A compact active studio monitor

woofer or in a stereo configuration.

BNS Professional, AX Loop op Zand, The Netherlands. Tel: 041 662434.

UK: Dyer Audio Systems, 13 Molesworth, Hoddesdon, Herts EN11 9PT. Tel: 0992 468674. Fax: 0992 467581.

B&W: British speaker manufacturer B&W launched a new nearfield monitor that was originally developed for Abbey Road Studios, London. The *Matrix 805* has a 6.5 inch mid/bass driver featuring a *Kevlar* cone with a 30 mm high temperature voicecoil wound on a *Kapton* former; the tweeter is a modified version of that used in the *801*, having a 1 inch metal dome design with ferrofluid control and a high temperature voicecoil. A sixth order Butterworth bass filter crossover delivers a bass extension down to 35 Hz, and the physical placement of the drivers aids the crossover in producing time alignment. Gold plated terminals are fitted allowing bi-wiring or bi-amplification. The *Matrix* cabinets come in two formats, vertically standing (*805V*) or horizontally standing (*805H*); a number of finishes are available.

B&W Loudspeakers Ltd, Marlborough Road, Lancing, West Sussex BN15 8TR, UK. Tel: 0903 750750. Fax: 0903 750694.

Cabasse: The *Oberon* is a 3-way system equipped with four drivers. The system is particularly designed for theatre use where very high sound levels are needed without distortion. In some cases the *Oberon* can be backed up by the *Saturne* subwoofer. *Saturne* can also be combined with two satellite systems: *Janus*, an efficient 2-way system speaker, and *Phobos*, a multi-amplified 3-way speaker.

Cabasse Paris, 22 bd Louis Michel, F-92230, Gennevilliers, France. Tel: (1) 47 90 55 78. Fax: (1) 47 90 65 35.

DynaudioAcoustics: DynaudioAcoustics represents a collaboration between studio monitor

designer Andy Munro of Munro Acoustics and Danish driver manufacturer Dynaudio A/S. Dynaudio have developed new ranges of professional monitoring systems, the *M* and *C* series.

The *M* series consists of the *PPM1*, 2-way passive design for nearfield application; the *M1* 2-way passive nearfield; the *M1-SW* 2-way passive with active subwoofer, the *M2* 3-way passive; the *M2-SW* 3-way passive midfield system with active subwoofer; the *M3*, a 3-way active midfield system; and the top of the range *M4* 4-way active system.

The *C2* was developed as a high quality compact reference monitor for applications in small broadcast studios and in classical music monitoring.

DynaudioAcoustics A/S, Sverigesvej 15, DK-8660 Skanderborg, Denmark.

Tel: 45 86 52 34 11. Fax: 45 86 52 31 16.

UK: DynaudioAcoustics, The Studio, 13-16 Embankment Gardens, London SW3 4LW. Tel: 071-352 8100. Fax: 071-351 0396.

Electro-Voice: E-V have introduced the *S-40*, a 2-way 'personal' sized monitor to accommodate a variety of monitoring and playback applications. The *S-40* features a 5/4 inch direct-radiating polypropylene woofer, coupled with a 1 inch ferro-cooled soft-dome tweeter. It's long term power handling is rated at 160 W.

Electro-Voice, 600 Cecil Street, Buchanan, MI 49107, USA.

Tel: (616) 695-1304.

UK: Shuttlesound Ltd, 4 The Willows Centre, Willow Lane, Mitcham, Surrey CR4 4NX. Tel: 081-646 7114. Fax: 081-640 0106.

Feltway: Feltway is a new Swiss company designing and manufacturing active monitors. Currently there are three models in the range all with a similar design — all are 3-way active systems.

The electronics for each monitor are contained in a box mounted on the rear which can be removed

from the unit for service or maintenance. The smallest in the range, the *83*, has an 8 inch LF unit and a 52 Hz lower limit; the *103* has a 10 inch LF unit and a lower limit of 39 Hz; and the *103E* is a variant on the *103* with a front mounted port that extends the LF response to 31 Hz.

Cabinets are built from a honeycomb material that's derived from aircraft construction and is very light and rigid. All the models are available with Gel Coat (a clear finish over the honeycomb structure) or Carbone (black piano lacquer).

Feltway claim specifications of 107 dB SPL at 1 metre and crossover frequencies of 350 Hz and 2.7 kHz on all models. A range of accessories are under development for different mounting requirements and fixings.

Feltway SA, Ch du Stand 18, 1026 Echandens, Switzerland. Tel: 21 702 42 94.

Fax: 21 702 42 94.

Genelec: 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.

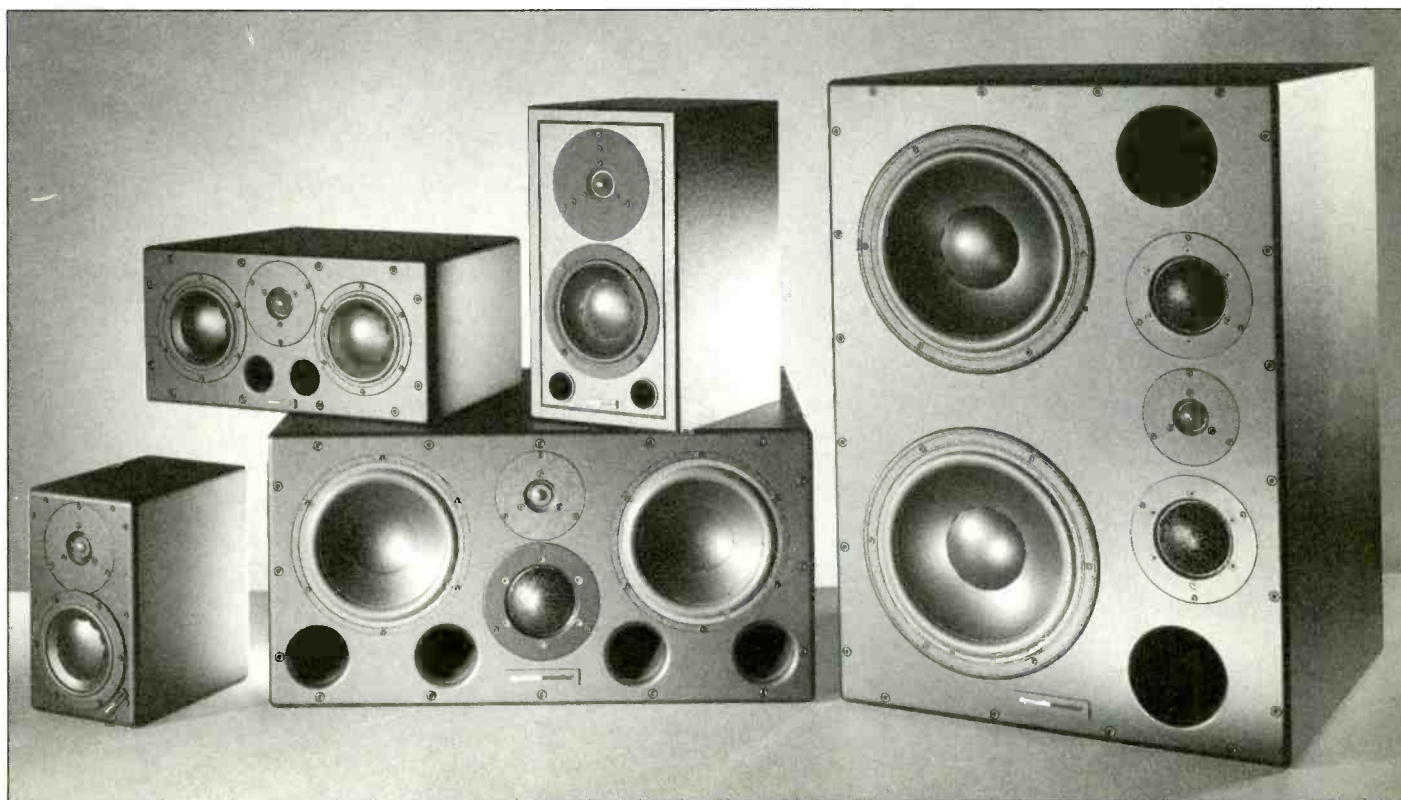
The *1031A* studio monitor is an active 2-way DCW (Directivity Control Waveguide) design for broadband high output applications. The *1031A* uses an 8 inch polymer composite cone woofer and a 1 inch aluminium dome tweeter. The tweeter is mounted in a DCW to minimise diffraction, and controls the system's overall directivity.

Genelec, Tehtaantie 17, SF-74100 Iisalmi, Finland. Tel: 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.



The DynaudioAcoustics range of monitors



Sonosax JM3-A

Monitor Technology: Monitor Technology have announced their second product — the *Monitor One Reference Limited Edition* nearfield monitor, a 2-way, bass reflex unit with passive crossovers. Although the crossover frequency is at 2.5 kHz, the angling of the front of the speaker cabinet boosts the response of the tweeter at frequencies down to 1.7 kHz to give a flatter response. The cabinets have been designed to give the minimum of reflexions while ensuring good off-axis response.

Monitor Technology, Nedergade 35 C, DK-5100 Odense C, Denmark.

Tel: (66) 13 99 81. Fax: (66) 14 91 81.

UK: Raper & Wayman Ltd, Crusader Industrial Estate, Unit 3, 167 Hermitage Road, Haringey, London N4 1LZ. Tel: 081-800 8288. Fax: 081-809 1515.

The Professional Monitor Company: Shown for the first time at this year's APRS are the company's two ranges. The *LB1* is a 2-way compact studio monitor, with a frequency response of 35 Hz to 30 kHz and power handling of 300 W. The *BB5* series active studio monitors come in two configurations, both 3-way systems. The *BB5/2* includes two *BB5* cabinets, three *PM1200* amplifiers, one *PS 2500* PSU and electronic crossover; the *BB5/4* features four *BB5* cabinets

(two main, two slaves), four *PM 1200* amplifiers, two *PS 2500* PSU and electronic crossover.

The Professional Monitor Company, 27 The Avenue, Highams Park, London E4 9LB, UK. Tel: 081-531 5308. Fax: 0582 579278.

Quested Monitoring Systems: Quested have launched two new studio monitoring systems, the *HQ410* — the first large fully passive system from Quested, and the *H208*, a passive monitor designed for use in broadcast pre-and post-production.

Quested, AKG Acoustics Ltd, Vienna Court, Lammas Road, Godalming, Surrey GU7 1JG, UK. Tel: 0483 425702. Fax: 0483 428967.

USA: AKG Acoustics Inc, 1525 Alvarado Street, San Leandro, CA 94577. Tel: (415) 351-3500.

Sonosax: Sonosax have introduced the *JM-3A* compact 3-way active monitor, which is equipped with the same technology as the new *FD-A100* power amplifier. The active crossover uses slopes up to 54 dB/octave and each way has its own limiter to ensure reliability.

The *JM-3P* is the passive version of the *JM-3A* and contains high efficiency LC filters.

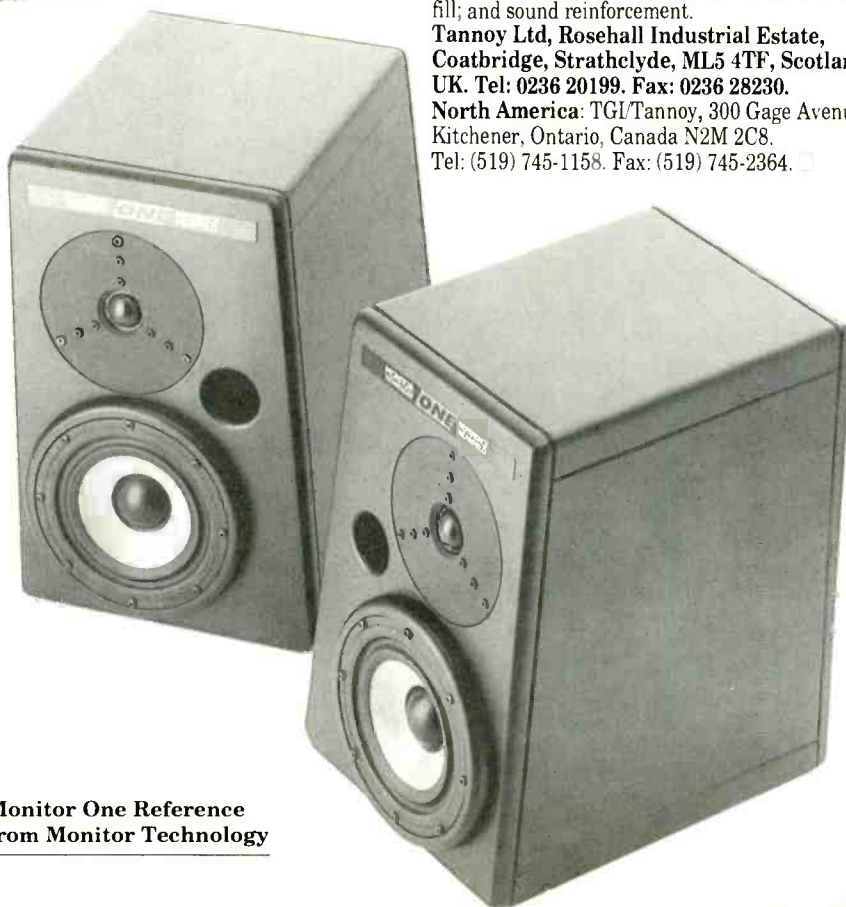
Sonosax SA, 1162 St-Prex, Switzerland. Tel: (021) 806 02 02. Fax: (021) 806 02 99.

Tannoy: The *CPA 15.2* is a rugged compact reflex sub-bass system using two 15 inch long throw transducers operating down to 26 Hz. The *CPA 15.2* has been designed to operate with an active crossover and has a recommended crossover point of 125 Hz to 300 Hz. The *15.2* uses DMT construction for the enclosure. The main application is as sub-bass for the *CPA 12* and *15*, as well as other systems benefiting from LF reinforcement.

The *CPA 5* uses a 5 inch inductively coupled transducer with a frequency response of 80 Hz to 22 kHz and yet uses no tweeter voicecoil eliminating the need for a crossover. Applications include restaurants; AV presentations; theatre in-fill; and sound reinforcement.

Tannoy Ltd, Rosehall Industrial Estate, Coatbridge, Strathclyde, ML5 4TF, Scotland, UK. Tel: 0236 20199. Fax: 0236 28230.

North America: TGI/Tannoy, 300 Gage Avenue, Kitchener, Ontario, Canada N2M 2C8. Tel: (519) 745-1158. Fax: (519) 745-2364.



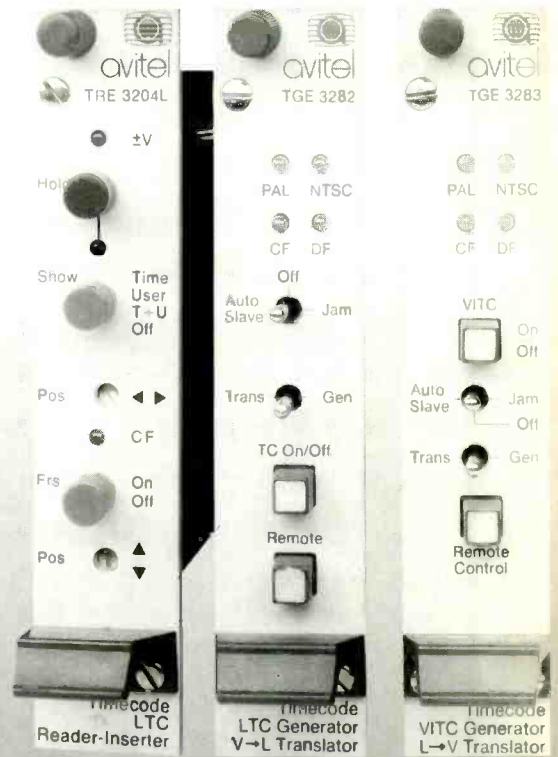
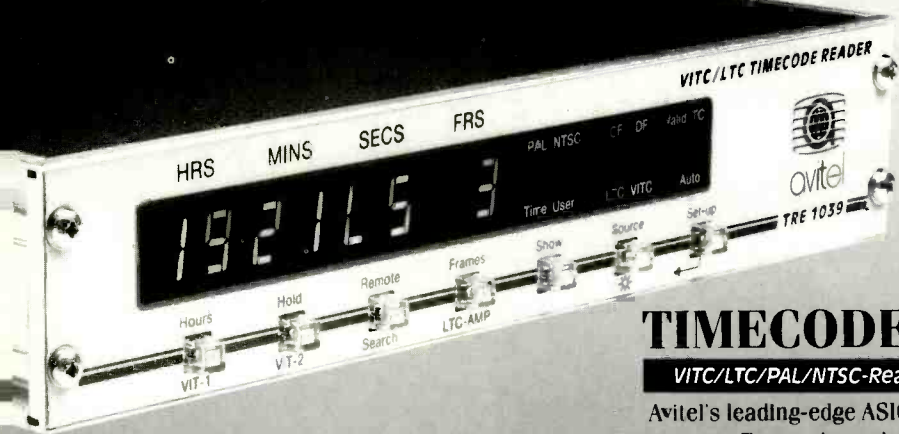
Monitor One Reference from Monitor Technology

All the best!

The 3200 Series - Distribution - Switching - Timecode

Avitel's continuing development into Timecode and Video Switching equipment has produced systems which can supply the best of all worlds for the user. They are more compact, more efficient, more cost effective and have more facilities than any other similar products today.

The ongoing cycle of research and development in our modular system continues to keep Avitel the leaders in the field, supplying all the best to the world's broadcasters.



TIMECODE

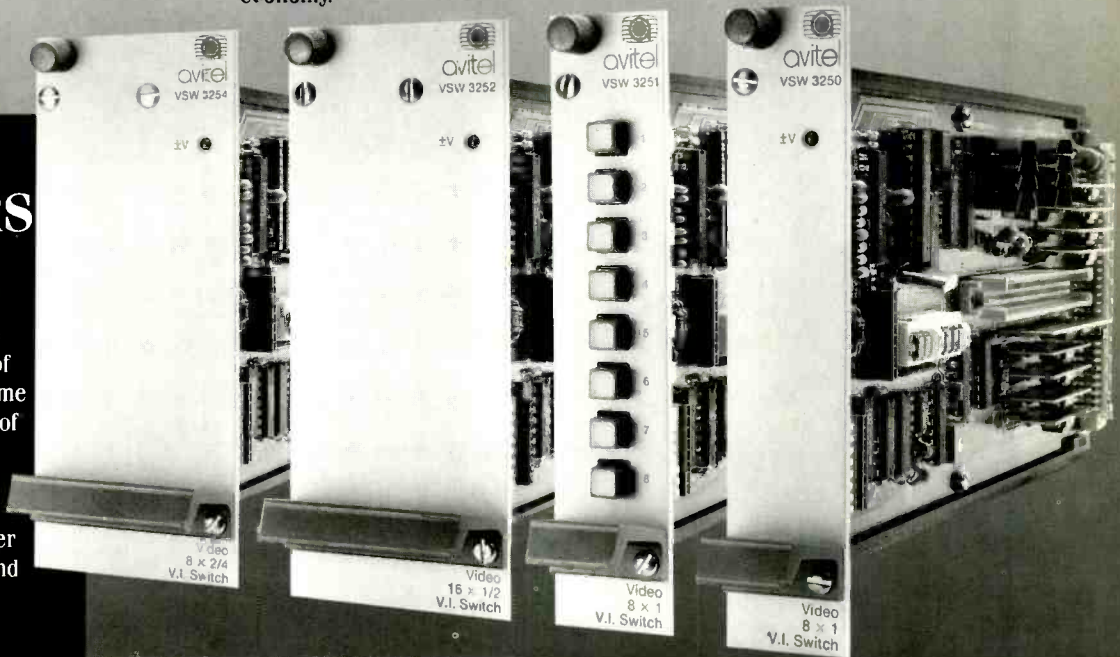
VITC/LTC/PAL/NTSC-Readers-Generators-Translators-Inserters-VITC Source Idents

Avitel's leading-edge ASIC Timecode technology now offers a new range of extremely compact Timecode modules with an unrivalled combination of facilities, space and economy.

VIDEO SWITCHERS

8x1, 8x2, 8x4, 8x8,
16x1, 16x2, 16x4,
Component, A-F-V...

A completely new series of Switchers, but with the same outstanding combination of facilities, space and economy. V.I. switching, 'joystick' override, DC restoration, multi-switcher slaving for components and A-F-V, are all built-in as standard.



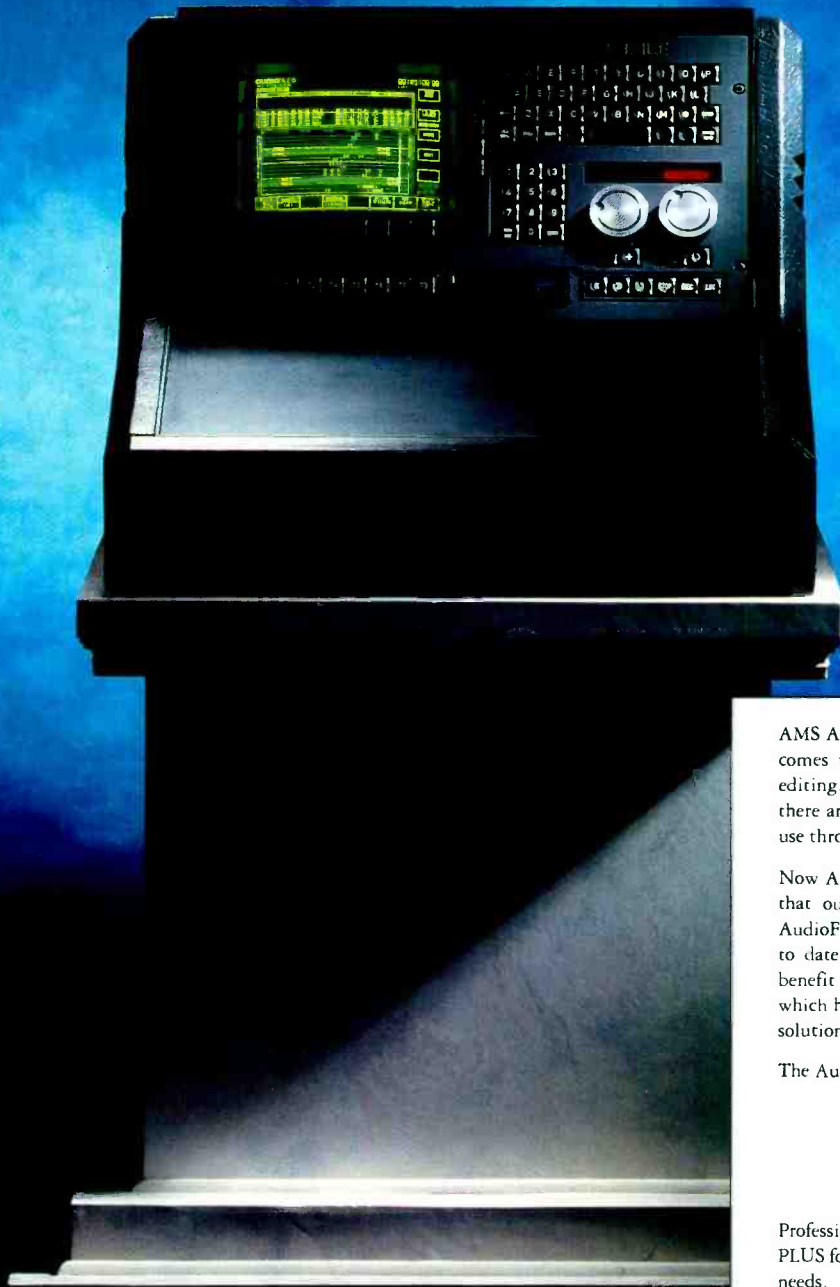
SERIES AVITEL
FOR EXCELLENCE IN VIDEO & AUDIO



THE COVER VERSIONS



THE ORIGINAL



AMS AudioFile PLUS is the all time number one when it comes to hard disc based, digital audio recording and editing. Naturally there have been cover versions but there are still many more AudioFile units in commercial use throughout the World than any other.

Now AudioFile PLUS gives users an expanded capability that our imitators will find hard to match. Existing AudioFile users already know that AMS keeps them up to date with advancing technology. All our customers benefit from our "user feedback development policy" which has ensured that AudioFile remains a cost effective solution to audio production problems.

The AudioFile PLUS 16 now includes these new features.

- 16 Outputs
- New 16 track Event List, large display
- 8 or 16 track Cut and Splice display with simultaneous Events List

Professionals Worldwide continue to choose the AudioFile PLUS for its proven ability to meet their audio production needs.

The AMS AudioFile PLUS - Has the Competition Covered.

For more details on The Original complete the coupon below and we'll send you further information.



AMS Industries plc, Billington Rd, Burnley, Lancs BB11 5ES, UK.
Tel Int. +44 282 57011. Fax Int. +44 282 39542.

AMS Industries Inc., 7 Parklawn Drive, Bethel, CT 06801, USA.
Tel Int. +1 203 792 4997. Fax Int. +1 203 730 8549.

Name _____
Position _____
Company _____
Address _____
Tel: _____

SS8/91

BROADCAST FOR NOW AND THE FUTURE



The EELA AUDIO S 240 is a versatile broadcast mixer, designed in collaboration with broadcast engineers. Therefore it is equipped with many facilities required by broadcasters in the nineties. It is appreciated by producers and operators for its ergonomics and simplicity in operation.

- Full range external fader control
- ON/OFF logic
- Cough mute on microphone channels
- Fader inhibit
- Channel inhibit
- Ducking
- Overall limiting
- Selective limiting/compression
- Multiple Clean Feed

eela audio

Parmentierweg 3, 5657 EH Eindhoven Airport, Phone: 040-510484, Fax: 040-570482



To order your copy of the music industry's favourite desk accessory please complete the coupon opposite and return to:

**Music Week Directory 91, CPL,
120-126 Lavender Avenue, Mitcham,
Surrey CR4 3HP. Telephone: 081 640 8142
Fax: 081 648 4873**

JUST PUBLISHED!

The most comprehensive up to date guide to who's who in the UK music industry. More than 350 pages and 8,000 entries covering record companies, music publishers, distribution, media, pressing, recording studios, promoters, venues, lawyers, merchandisers, booking agents ... in fact everyone in the business of music.

This essential reference book includes names, addresses, phone and fax numbers and key personnel conveniently organised for ease of use.

At only £25 + £2 for postage and packaging the Music Week Directory is worth its weight in gold discs to anyone who needs to know who's who in the UK music business.

Name _____

Address _____

I enclose a cheque for £ _____ for _____ copy(ies) made payable to Music Week

To pay by credit card enter details below

My card number is _____

Access (Mastercard) Visa American Express Diners Club

Date card expires _____

Signature _____

SCHOEPS SPHERE

Francis Rumsey gives a subjective assessment of the Schoeps 'sphere' microphone system

Schoeps have developed a stereo microphone based largely on Gunther Theile's innovative stereo pickup and listening model^{1,2}. It is currently being made available in prototype form for assessment, and the following is a report on subjective listening tests performed at the University of Surrey in March. The production version does not differ substantially from the prototype we assessed, the differences being only cosmetic. These results are based on a one-day test made when the microphone became available at short notice, and are the combined subjective impressions of the author plus two experienced listeners. No attempt was made at double-blind conditions, since we were not trying to arrive at any sort of 'order of preference'.

We compared the Schoeps 'sphere' with a number of other stereo microphone techniques on a number of sources in different positions in the studio (250 m², RT 1.5 to 2 secs, NR 15), although time did not permit as many tests or comparisons as we would have liked. It was suggested by UK distributor SSE Marketing, that the success of the mic would depend considerably on the acoustics of the building concerned and, particularly, the mic's siting. To verify this it would be necessary to try it in more locations than was possible in the time. Nonetheless some interesting points arose which are worthy of discussion.

The microphone

The *KFM 6U* is essentially two pressure-operated mics mounted flush with the surface of a sphere, diametrically opposite each other, roughly in the positions of ears on a human head. The sphere has a diameter of 200 mm (again roughly head-sized) and is covered with a matt grey material and filled with damping. It is heavy compared with most other stereo mics, at 1.5 kg. The preamp housing protrudes from the base, and a five-pin *XLR* connector carries the output, which is not passed through any kind of control box or

power supply. In the production model the preamp housing is expected to protrude less than on the prototype and the 'seam' joining the two halves of the prototype sphere will disappear.

Principles

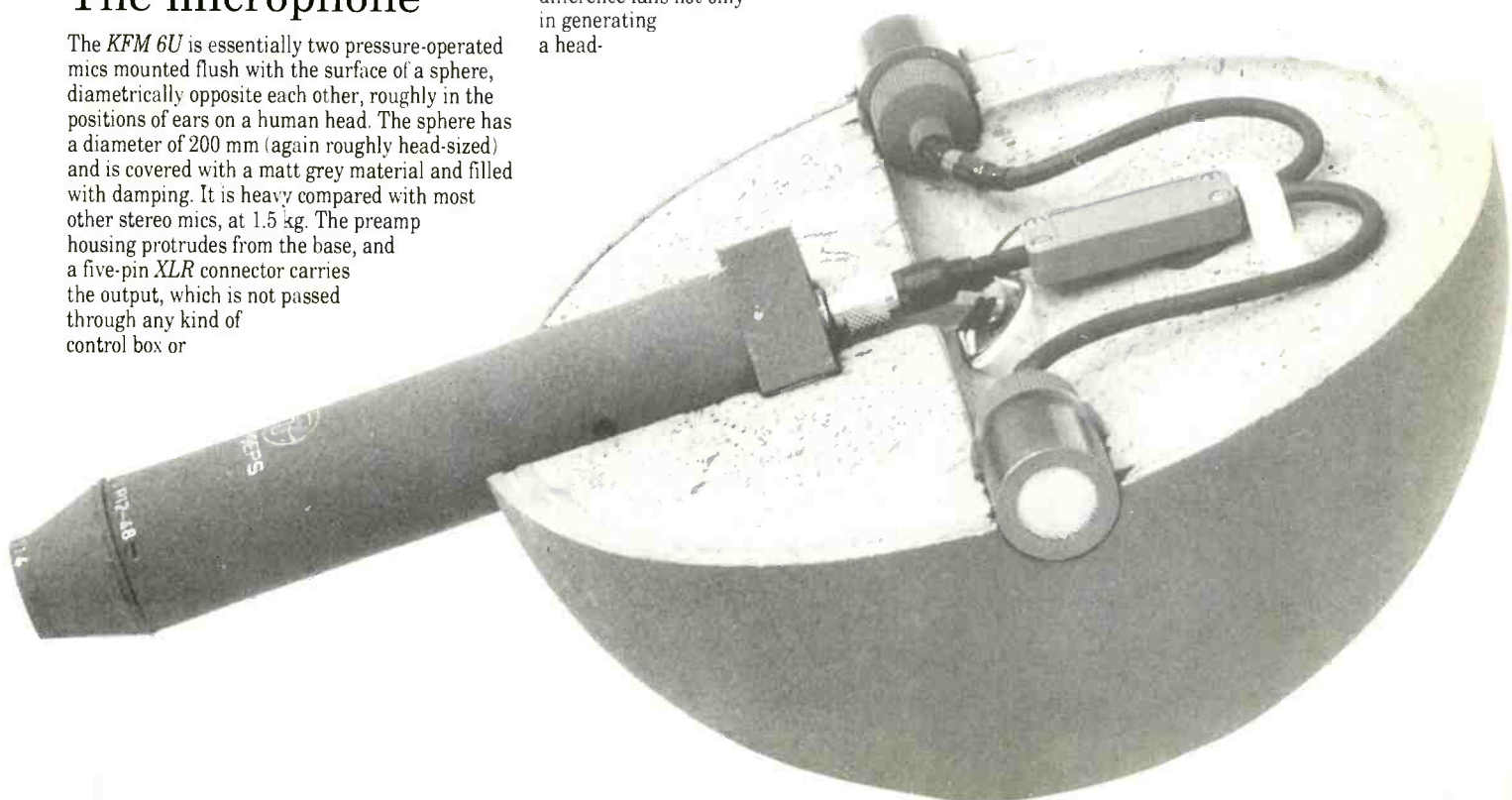
The reproduction of binaural signals on loudspeakers may be improved by equalising them to remove the colouration of the frequency response, which normally results from dummy-head sources³. This amounts to equalising the signal to make the 0° incidence freefield response flat, as well as making the sum of left and right channels frequency-independent for any angle of incidence. The integrated diffuse-field response is also almost flat.

The sphere microphone does not have the pinnae often simulated on dummy heads (that is the visible skin and bone structure of the outer ear), and thus is not provided with the spectral-modification cues which aid front-back perception. When the result is replayed on loudspeakers, it is claimed that the effects are a greater sense of 'spatial integrity', a stereo image of outstanding naturalness, as well as excellent sound-colour neutrality and LF response comparing dummy-head signals with conventional coincident-pair techniques. Theile² claims, "The coincidence microphone signal which does not provide any head-specific inter-aural signal difference fails not only in generating a head-

referred presentation of the authentic impression and depth, but also in generating loudspeaker-referred simulation of the impression and depth."

What is suggested is that we should not be concerned with how the signals from the two loudspeakers sum at the ears to produce phantom images, but with the image in the so-called 'simulation plane' between the speakers. This is clearly just one way of approaching the stereo reproduction conundrum but one which is getting a lot of exposure at the moment. The real situation, of course, is nothing like as black and white as implied, since it is not true that coincident-pair recordings always lack depth and spatial integrity. The real problem is that in any two-speaker stereo set-up one is attempting to project a full three-dimensional sound field onto a 60° two-dimensional angle, and thus 'reality', 'naturalness' and 'spatial integrity' become very much a matter for subjective interpretation. Typically stereo microphone techniques have always been a compromise between a feeling of 'space' (or 'phasey stereo' as someone recently dubbed it!) and imaging accuracy. This is one principal reason why near-coincident pairs often score very highly in subjective comparisons (as indeed was again proven in a recent large scale test carried out in Germany, including the sphere discussed here) since they combine many of the imaging advantages of a truly coincident pair with some of the 'spaciousness' which results from spaced mics. (The sphere also scored highly in the aforementioned test.)

We must ask ourselves if this sphere is really that different from a near-coincident pair? Roughly the same timing differences exist between the capsules as between the mics of an ORTF arrangement, although the level differences only become significant at middle-to-high frequencies. The mics in the sphere are pressure-operated (basically omni if not mounted in the sphere), whereas the typical ORTF arrangement uses cardioids. Cardioids, though, become more omnidirectional at LF and more directional at HF.



Clearly the two configurations are not the same but have striking similarities.

Subjective assessment

We compared the sphere with a coincident pair of AKG C414-ULS set to fig-of-eight, a spaced pair of B&K 4003 omnis (first spaced at 4 ft, then at 6 ft), an AKG C24 stereo microphone set to fig-of-eight, and a Calrec Soundfield microphone. A suspected fault with our Soundfield mic led us to reject the comparison with this. Monitoring was via B&W 801s. Headphones were also tried when listening to the recordings of the comparison.

We tried a number of mic positions, first locating them all together (as close as possible without occluding the 'ears' of the sphere), then moving the sphere closer to the source and then further away. We listened to a small string ensemble playing sustained classical music, a solo grand piano, a mixed ensemble of strings, wind and piano playing transient-dominated 20th century music (Webern) and a spoken voice walking around the mics. We also tried mixing the sphere with other mics to see whether or not it added useful 'space' as an ambience microphone.

The sphere is certainly a mic that one has to learn to listen to. Our general impression was that we perhaps grew to like it more as we listened more, since it requires that one rather suspends conventional expectations and accepts the 'picture' of the source and the room that it often presents. Some specific points emerged though, these being based principally on an attempt to use this mic as a 'main pair', positioning it so as to give a reasonably broad image with sources appearing to be spread evenly across the sound stage.

Positioning

It became clear that it was necessary to place the sphere considerably closer to the ensemble than any of the other mics, in order to get a similar separation between the channels when compared with other mics, and to get a more 'conventional' image. When the sphere was placed some 2 to 3 ft behind the conductor's head it was subjectively vastly improved over the first position (that was with the other mics, approx 6 to 8 ft behind the conductor).

At further distances from the source the sphere's output became quite monophonic, with the players largely confined to the centre half of the image. Interestingly, though, transients and high-energy HF signals appeared to be pulled towards the edges of the image, while continuous sounds appeared to be closer in. There was some evidence of low frequency image-wandering on continuous sounds as the frequency changed.

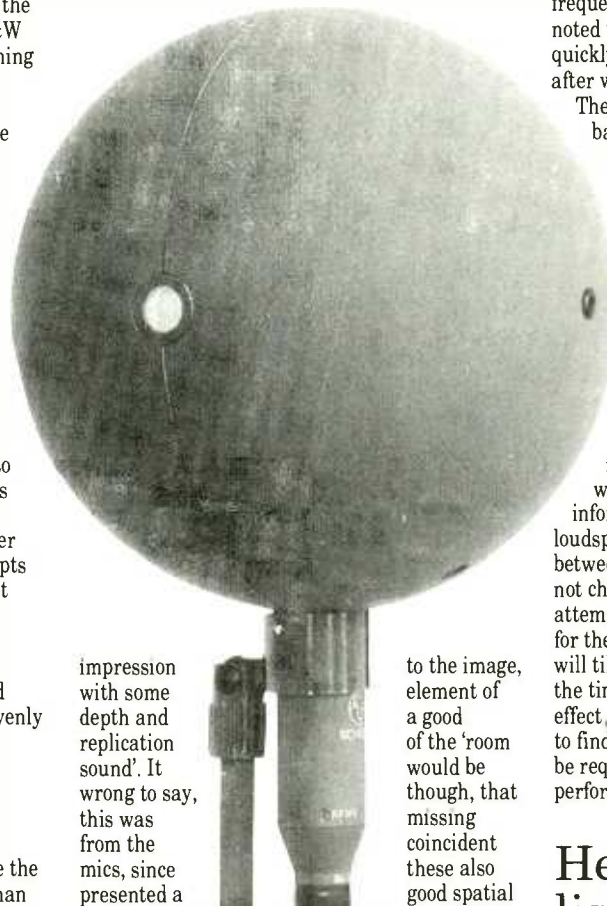
Localisation

The coincident pairs gave, in general, better point-source localisation, but these images were quite 'forward' and 'immediate' compared with the sphere, which gave more of a 'perspective picture' of the event. That is not to say that the sphere did not localise point sources but that they were not as crisp and stable with the sphere as with coincident mics. Point sources were much easier to localise

with the sphere when the music contained a lot of transient and HF energy, such as in the Webern ensemble. The image from the coincident pairs was considerably more 'left-right' than that from the sphere. The spaced omnis gave a less precise image than any of the others, but a pleasing sound.

Spaciousness

Concerning the elusive quantity of spaciousness, it is true that the sphere gave a very 'open'



impression with some depth and replication sound'. It wrong to say, this was from the mics, since presented a impression with some front-back discrimination. In comparison, the spaced omnis gave a typically imprecise but pleasing image, with excellent LF response and again a 'spacious effect', although sources were difficult to locate at times, especially at LF. In order to achieve a similar direct-to-reverberant balance with the sphere as with the other mics, it was necessary to move closer to the source.

to the image, element of a good of the 'room would be though, that missing coincident these also good spatial

eight and hypercardioid pairs. Any reverberation and reflexions picked up in these regions, therefore, would be cancelled somewhat less in mono than with the crossed pairs, although of course there is the fixed spacing between the mics to consider with the sphere, which results in a variable phase difference between the channels, dependent on frequency. (It is claimed that the HF level difference between the channels of the sphere minimises the losses due to cancellation when the two channels are summed to mono, and that at LF the phase difference is small, although this would not entirely account for the problematic middle frequencies.) Also during the walk-around it was noted that the sphere image tended to jump quite quickly from the centre to half-left or half-right, after which it simply became more left or right.

There was no left-right reversal around the back of the sphere as there was with the crossed pairs.

We attempted to assess whether or not any height information could be derived from the sphere, although it was hard to see how this could be achieved, since the sphere is symmetrical in all planes (apart from the projecting amplifier housing) and doesn't have pinnae or a torso to give the necessary reflexions, and the mics are mounted symmetrically in it at exactly opposite sides of the diameter. Over an angle of approximately $\pm 45^\circ$ up and down at 0° frontal incidence we would detect no reproduced height information when monitoring a speech signal on loudspeakers. The image remained firmly fixed between the speakers at a constant height and did not change markedly in timbre. The reason we attempted this was because the initial information for the microphone suggests that tilting the sphere will tilt the sound field correspondingly. Unless the tiny hole in the front of the sphere has any effect, which was not indicated, then it is difficult to find a reason for this claim. Further tests would be required to be certain about this aspect of its performance.

Headphone listening

Some sections of the recording from these comparison sessions were subsequently monitored on headphones and the sphere showed a marked improvement over the other mics in giving an out-of-the-head spacious image, whereas the images from the crossed pairs were very much 'inside the head'. In this respect the sphere's image was more loudspeaker-headphone compatible than that of the other mics, although the headphone stereo was not as good as that obtained from true dummy heads. The headphone image from the sphere was all in the rear hemisphere (as I have noticed in all but the best dummy-head recordings) but this was to be expected considering the lack of pinnae and other head/torso characteristics, as well as the equalisation for a flat frontal response. The walk-around was impressive from the sphere, although frontal hemisphere positions were transposed to the rear hemisphere. It was better in almost all respects than the other microphones when monitored on headphones. □

References

- 1 Rumsey, F 'Creating a new image', *Studio Sound*, June, 1991
- 2 Theile, G *On the naturalness of two-channel stereo sound*. Presented at 9th AES International Conference, Detroit, Feb 7th to 9th, 1991, Audio Engineering Society)



**The prototype of our
M1 nearfield monitor
produced a number 1
album**

"Choke" by the Beautiful South,
recorded and mixed exclusively on
Mike Hedges' DynaudioAcoustics M1s



**The prototype of our
M2 midfield monitor
produced a
number 1 album**

"Listen Without Prejudice" by George Michael,
recorded and mixed almost exclusively on
Chris Porter's DynaudioAcoustics M2/SubWoofer system

But we're still working on it!



**The new M3.3
Main Monitor**



**The new PPM1
"Personal
Professional
Monitor"**

dynaudio **acoustics**®

The Studio, 13-16 Embankment Gardens,
London SW3 4LW, England
Telephone (+44) 71-352-8100
Telefax (+44) 71-351-0396

Denmark: New Music Tel. (86) 19 08 99 Fax (86) 19 31 99 **France:** Hilton Sound SARL Tel. (01) 46670210 Fax (01) 4789 81 71
Germany: MEGA Audio GmbH Tel. (06721) 2636 Fax (06721) 13537 **Ireland:** Ideal Systems Ltd Tel. (01)177 4663 Fax (01) 774 675
Japan: General Traders Ltd Tel. (03) 3293 2274 Fax (03) 3293 5391 **Norway:** Lydconsult (TECH. DIV) Tel. (09) 190381 Fax (09) 191334
Sweden: Tonkraft Import AB Tel. (031) 13 49 50 Fax (031) 11 34 72 **USA:** 21st Century Ltd Tel. (213) 463 4718 Fax (213) 463 1209
UK: Stirling Audio Tel. (071) 624 6000 Fax (071) 372 6370, Systems Workshop Tel. (0691) 655019 Fax (0691) 658549

The original philosophy behind *Sapphire* was to build an affordable, compact console featuring facilities and spec more usually associated with top level studio desks — a scaled down SSL or Neve V for the home studio, if you like. An in-line design was chosen and attention paid to the styling from an aesthetic and an ergonomic point of view. Peter Philips of Landmark Products Design, who has been responsible for styling previous Soundcraft consoles, including the award winning *Delta*, was commissioned. First impressions are always important and this console has an attractive and professional look about it.

Sapphire comes in five frame sizes (20, 28, 36, 44 and 52 inputs) and should appeal to both domestic and professional markets — in fact one potential client was so impressed with the console, the signal path in particular, that he's considering 'side car-ing' it to his existing SSL. The spec is impressive and the console is quiet, with group and mix output noise figures quoted as -88.5 dB (24 channels routed).

I/O module

For what's on offer, the console is extraordinarily compact — 765 mm from the moulded front buffer to the base of the meter bridge; a 28 I/O frame measures a little over 1,000 mm. Although space is at a premium, the controls are not over miniaturised or cramped and, apart from one of the buttons on the noise gate, visibility is generally good. New look pots, incorporating a broad plastic collar over the lock nut, not only improve the appearance of the controls but also guard against dust. Pots throughout the console, such as EQ gain, have been detented.

At the top of the I/O module is a dual-concentric level control — the upper controlling the switchable mic/line input to the channel path and the lower trimming the tape return level to the

monitor path by ± 10 dB. The channel path includes phase-reversal, HPF (100 Hz second order), and phantom powering; a SUB button routes the associated group bus (ie I/O Chan 10 inputs Group Bus 2) to the channel path to provide audio subgrouping.

Like Soundcraft's *3200*, *Sapphire* includes a noise gate on every I/O channel. Although the gate is derived from the *3200*, feature for feature it actually offers more facilities albeit without the same degree of flexibility; the fixed attack (100 us) gate offers the usual IN/OUT, CHAN/MON, THRESHOLD (-40 to $+10$ dB), RANGE (-15 or -60 dB) and RELEASE (0.1 to 4 seconds), but in addition there is a sidechain bandpass filter (70 Hz to 4 kHz) to allow frequency conscious gating, a sidechain FLIP switch for external keying from whichever path is not selected by the CHAN/MON switch, and a HOLD function, which allows up to 2 seconds of hold to be set from the double function RELEASE control. With HOLD active the RELEASE time is fixed at its fastest speed of 100 ms. A single red LED lights when the gate is shut.

The EQ and gate have been designed by freelance engineering consultant Trevor Stride who is well known for his work with SSL and Focusrite. In fact, the console is really Stride's baby, as he originally approached Soundcraft with the concept, which he had been considering for some years. A great deal of importance was attached to the EQ and Stride took a 'black box' to various producers and engineers to get direct feedback on his designs. The end result is a 4-band, splittable equaliser comprising HF (± 15 dB at 12 kHz) and LF (± 15 dB at 60 Hz) second order shelves in one section, and an HMF (600 Hz to 12 kHz) and LMF (100 Hz to 2 kHz) with ± 15 dB peak boost/notch cut in the other. The asymmetrical design of the mid frequency section came about by Stride's observation that engineers generally tended to boost using a broad Q and cut with a much tighter more specific Q; as no room was available to include variable Qs, this arrangement was adopted. The LF shelf is also asymmetrical with a shelving curve for the cut,

but a bell curve for the boost. The thinking behind this is that a shelf would over-accentuate the very low frequency content of the sound, causing general muddiness and confusion to the bass end. The bell shape produces a much cleaner, tighter response, and considering the console is only $\frac{1}{2}$ dB down at 10 Hz and the increasing ability of equipment to reproduce VLF these days, it makes sound sense. Each of the two EQ sections has a MON button allowing it to be positioned in either signal path — an overriding IN/OUT button affects both. The time spent on the EQ has paid off and it produces a pleasing, natural sound without adding coarseness or the harsh electronic quality sometimes found on cheaper consoles. It has the advantage of being uncomplicated and the less experienced user should find it easy to get along with without destroying the sound on the way. I think the quality on offer here may surprise a lot of people.

Six aux sends are arranged in two sections; Aux 1 and 2 are primarily intended for foldback and share CHAN/MON and PRE/POST switching. Aux 1 is a stereo send that follows either the channel or monitor panpot irrespective of prefade selection. The remaining four auxes are permanently positioned in the monitor path, post fade. There is no ON/OFF switching included for the aux sends.

Below the auxiliaries is the small channel fader (60 mm) with its cut, PFL/AFL and pan. Like previous Soundcraft designs the channel fader is given secondary status to the monitor fader (100 mm). The routing buttons to the eight groups and mix bus are arranged in pairs (five buttons) and follow channel pan. Also included are FADER REVERSE (only reverses faders leaving cuts, solos, pans, etc, in their original position), BOUNCE (monitor path accesses routing buttons) and XFX (channel fader is sourced from post monitor to allow additional sends during mixdown).

The routing system has been designed to allow any track on the multitrack to be accessed from the eight groups, without track duplication, ie although Group 1 feeds Tracks 1, 9, 17, etc, it can be routed to just one or a combination of these

SAPPHYRE



Patrick Stapley reviews a new console design approach from Soundcraft

multiples of eight. This is achieved by adding a BUS button to each module — if the button on Channel 9 but not on Channels 1 and 17 is selected, the output of Group 1 will go only to Track 9. This rather clever idea combined with the fact that channels feed direct if no group selections have been made, should mean that with careful planning the minimum of patching will be required. It also means that the routing capability of the console is determined by the number of modules, 24 inputs will have 24 BUS buttons, 32 inputs 32 buses, and so on. To help work out which of the eight groups feeds which track, the individual BUS buttons are numbered (ie Chan 17 to Bus 1), additionally an ID/scribble strip has been fitted above the modules marking channels and their corresponding group numbers. A scribble strip is also fitted below the modules.

As mentioned the monitor fader takes precedence at the bottom of the module with a more prominent pan control than the channel and a more elaborate solo system. A SEND button positioned directly below the BUS button provides group/tape sourcing for the monitor. Apart from its dedicated CUT button, each monitor section also includes four MASTER MUTES which are controlled from the Master module.

The only buttons on the module to include light indicators are the SOLO and CUTS in both sections. Two LEDs have been built into the bottom section of the module, one indicates Peak (6 dB from clipping), measured independently at the input pre-amp, and the two EQ sections; the other, Channel Active, lights when the output of the input pre-amp exceeds -20 dBu.

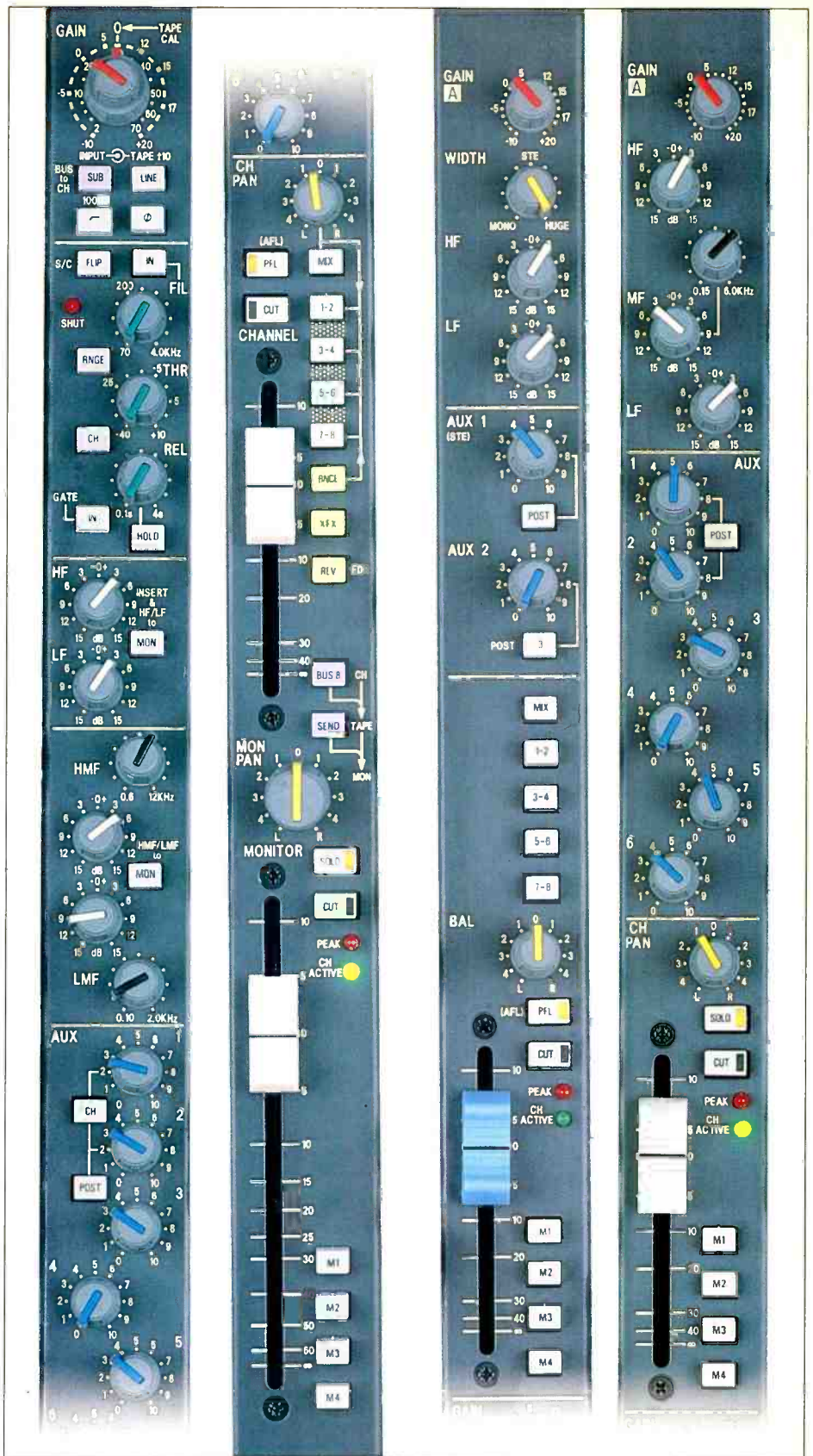
Each I/O module has a 20-segment LED meter above it in the meter bridge sourced from the monitor path and following tape/group switching. The meters are normally set to peak but can be internally set to read AVERAGE.

Dual stereo input module

The DSI module can be used as an effects return or as a general purpose stereo return for synths, CDs, etc — three modules are fitted as standard. As its name suggests the module is divided into two identical stereo sections, which provide sends to the group and mix buses. Each contains a 60 mm stereo fader, balance control, cut, four master mutes, PFL/AFL, basic 2-band EQ (± 15 dB at 60 Hz and 8 kHz shelf), input gain, and a width control that varies the input from mono through to stereo through to huge. 'Huge' produces a phasey, out-of-the-speakers effect, causing a degree of bass cancellation, and can be useful for creating ethereal or spacey effects; 'width' first appeared on the *Venue* console. The module also has a limited auxiliary capability, feeding a stereo pre/post signal to Aux 1, and a mono sum either to Aux 2 prefade or to Aux 3 post.

Dual line input

This module is an option that replaces I/O modules in groups of four. Like the DSI module, it is made up of two identical sections housing a 60 mm fader, pan, cut, master mutes, solo, full auxiliary capability, 3-band EQ (same shelf EQ as DSI module with additional peak 150 Hz to 4.5 kHz with fixed symmetrical Q) and input gain. The output of the module routes directly into the mix path, making it particularly suitable for economically returning MIDI sequenced



I/O, dual stereo input and dual line input modules

instruments running live within a mix. Each module has two 8-segment bargraph meters placed one above the other in the meter bridge.

Master module

The Master module is a double width module positioned below the main, mechanical vu meters. In addition, it incorporates a pair of peak,

20-segment bargraphs, built into the top right hand side, that follow monitor selection and are reminiscent of those used on the *Delta* console. The vu's will also follow source switching unless overridden by the VU SELECT button, which puts them permanently in the mix output path. The Aux Masters are arranged in a column, and each has an AFL button; Aux 1 includes a MONO switch. Foldback can either be sent directly from the auxiliaries or sourced from a foldback mixer,

which submixes Aux 1, Aux 2 and the monitor source to supply a stereo foldback output. There are three intercanceling monitor source buttons — Mix, 2-track A (+4 dBu) and 2-track B (-10 dBV) — which feed the control room monitor, the foldback mixer and a phones circuit. The control room signal can be monoed and dimmed, and an ALT LS button is provided. Talkback is from a built-in microphone, which will route via a gain control and four momentary buttons to MIX, GROUPS, AUX 1 and 2, or FOLDBACK. When Talkback is operative the monitors will either dim or cut (depending on an internal link) lighting an LED.

There are three modes of solo distributed throughout the console: SIP (Solo In Place), AFL and PFL. The Master module contains a PFL/AFL button with a level control, and a SIP DEFEAT button — depending on the location of the solo within the console, it will function differently (see Table 1). The I/O module's monitor path and the DLI module are the only areas to feature SIP; this destructive mode can be overridden and replaced with AFL or PFL through master selection. Stereo signals are summed to mono by AFL and PFL. SIP will normally leave the DSI inputs unmuted, to allow effects to be monitored along with the soloed channel cut this can be disabled from internal links. AFL/PFL and SIP alert LEDs are included.

The module also incorporates a six-frequency test oscillator sending to Mix or Groups with Auto Monitor Dim. At the bottom next to the 100 mm stereo fader, are the four MUTE MASTER buttons and the phones level control, which supplies a socket under the armrest. LED integrated buttons have been generously used and PSU voltage indicators are installed at the top of the module.

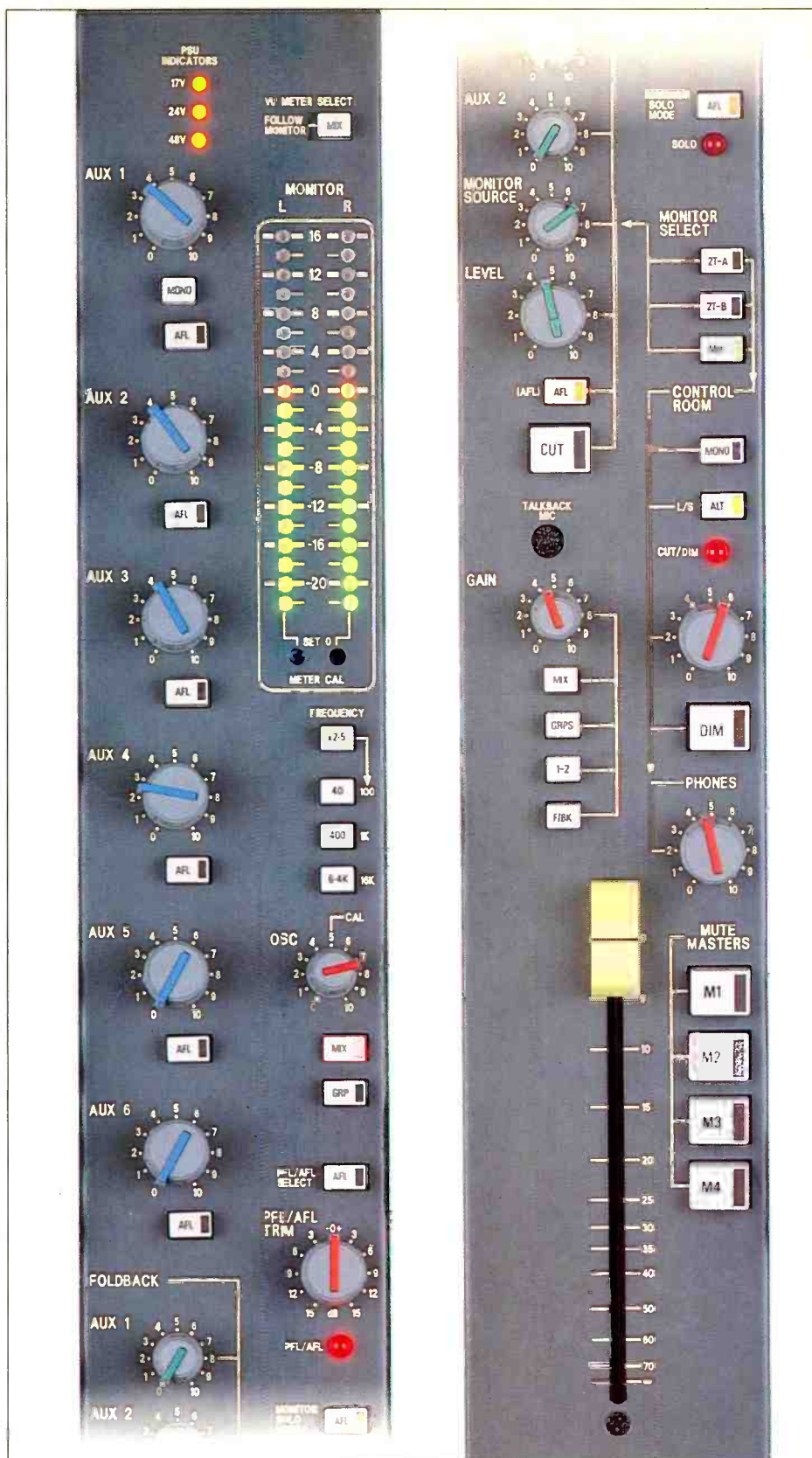
Connections and patching

The console was originally conceived without a patchbay but, at the time of writing, integrated (eight-module width) and remote bays are being planned as options. Inserts have been provided on the I/O module (following the LF/HF section CHAN/MON EQ button), the DLI module and the Master module; all are pre-fade and pre-EQ in the case of the input modules. Multitrack tape sends/returns are individually switchable at the back of the console between +4 dBu and -10 dBV; likewise, two track sends/returns cater for both levels — 2TA is +4 dBu on XLRs, and 2TB is -10 dBV on jacks.

Conclusion

Size, facilities, price and sound all combine to make this console a potential winner. It puts a new level of professionalism within reach of the home studio, and will appeal to the user already familiar with large studio consoles who is looking for greater flexibility at home and so indirectly it may be responsible for more empty pages in studio diaries. However, the console is not restricted to the small non-commercial studio, it is eminently suitable for programming rooms, additional small studios and even mobiles. With the gap narrowing between the capabilities of low and high end equipment, it will be interesting to see exactly where *Sapphire* finds its level.

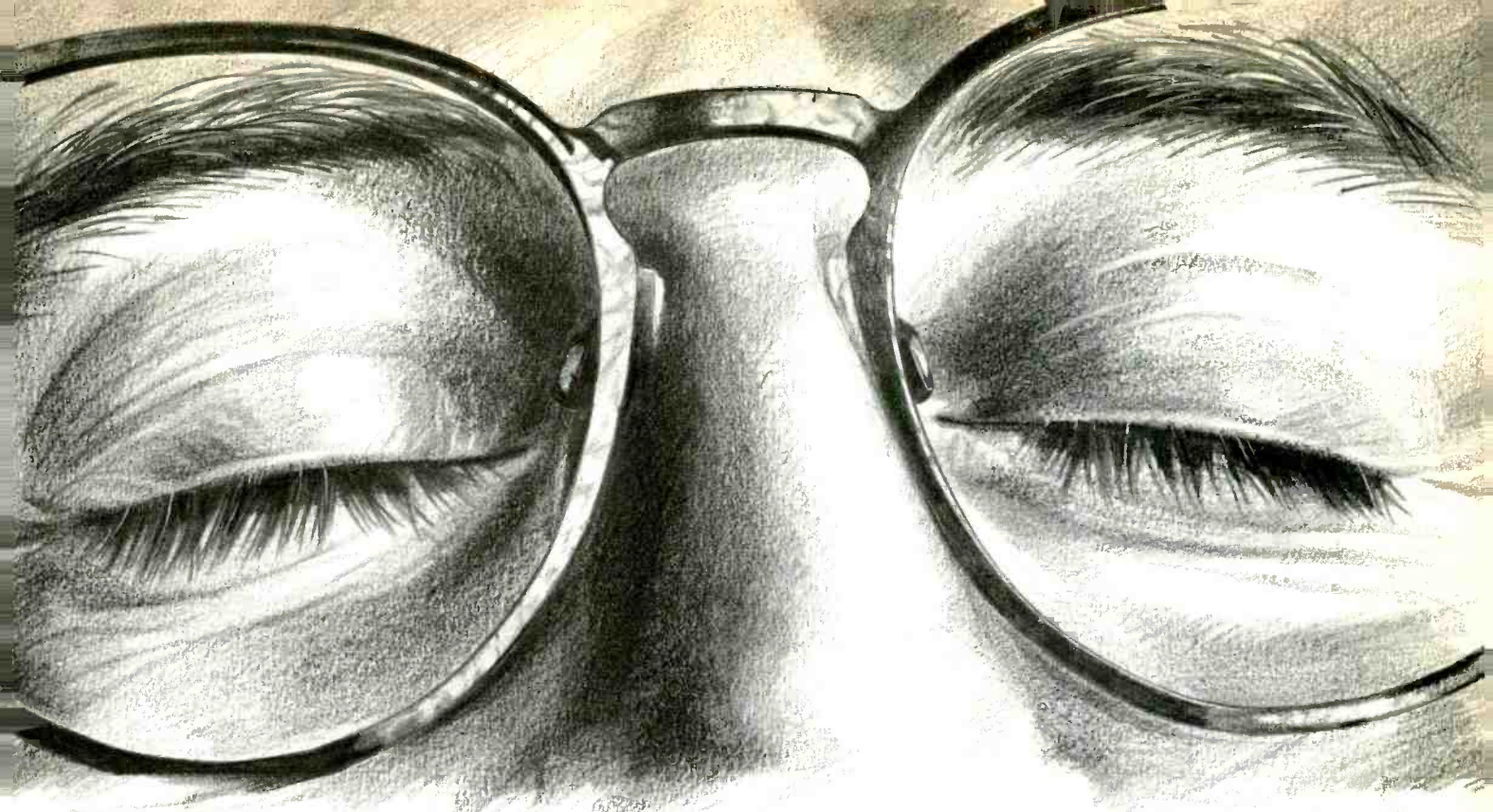
● Many thanks to AMP Sound, St Albans, for the access to their *Sapphire*.



Master module

Master module switches	I/O mon path	I/O chan path	Dual line input	Dual stereo input	Aux master	Foldback master
PFL+SIP	SIP	PFL	SIP	PFL	AFL	PFL
PFL	PFL	PFL	PFL	PFL	AFL	PFL
AFL+SIP	SIP	AFL	SIP	AFL	AFL	AFL
AFL	AFL	AFL	AFL	AFL	AFL	AFL

TABLE 1: Solo Master switching chart



FOCUS ON GENELEC

*THE DISCERNING PROFESSIONALS CHOICE
THROUGHOUT THE WORLD!*

GENELEC 1031A

TV SOUND MONITORING
NEARFIELD MONITORING
BROADCAST REFERENCE

Constant directivity from the DCW pioneers.
Sonically consistent with the Genelec Control
Room Monitors.

GENELEC®



Tentaantie 17, SF-74100 Iisalmi, Finland - Tel. Int +358 77 13311 - Telefax Int +358 77 12267

AUSTRIA: Audiosales tel. 02236-26123, BELGIUM: Hes Electronics tel. 02-4662917, CANADA: Solotech Inc. tel. 514-5267721, DENMARK: DA Distribution Aps tel. 31610755, FRANCE: SCV Audio tel. 01-48632211, GERMANY: Audio Export Georg Neumann & Co. GmbH tel. 07131-62470, GREECE: Kem Electronics tel. 01-6478514, HONG-KONG: Power Source Development tel. 4240387, ITALY: Audio Equipment S.R.L. tel. 039-2000312, JAPAN: Otari-tec Corporation tel. 03-33323211, KOREA: Seoul Sound Technology tel. 02-5844313, THE NETHERLANDS: Audioscript B.V. tel. 02155-20400, NORWAY: Siv. Ing. Benum A/S tel. 02-145460, PORTUGAL: Amperel Electronica Industrial LDA tel. 01-532227, SPAIN: Promovisa tel. 01-5352017, SWEDEN: Intersonic AB tel. 08-7445850, SWITZERLAND: RTG Akustik AG tel. 061-2721912, TAIWAN: Acesonic International Co Ltd tel. 2 7168896, TURKEY: Omer Trade & Representation tel. 04-1380296, UK: SSE Marketing tel. 071-3871262, USA: QMI tel. 508-6509444.

MIDI TIMECODE

Vic Lennard explains the operational virtues of MIDI timecode

Prior to MIDI, synchronisation between a tape recorder and sequencer was achieved by using an audio click measured in Pulses Per Quarter Note (ppqn). This allowed for a master device to keep multiple slaves in sync but the advent of MIDI precluded the use of a slow speed pulse and so the idea of MIDI Clock was born, a 1 byte message (F8H) received by a slave at 24 ppqn. Due to the 31.25 kHz bandwidth of MIDI signal, such data cannot be recorded directly onto tape and has to be encoded usually via the Frequency Shift Keying (FSK) technique. Other related MIDI commands include Start (FAH), Stop (FCH) and Continue (FBH) along with MIDI song position pointers allowing for synchronisation from a point other than the beginning.

The principal failure of FSK is that the precise code is proprietary per manufacturer leading to a lack of standard. As clock interpolation is required within the programming of a sequencer to keep the internal resolution. MIDI Clock leads to inaccuracy when carrying out tempo changes as the point of reception of the next clock is unknown. Also, conversion between bars/beats and actual time is generally awkward to calculate and almost impossible within tempo changes.

The SMPTE (or LTC to be precise) standards already existed and it became obvious to various people within MIDI that attention would have to be paid to this standard. Some software manufacturers already had specific pieces of hardware to inject SMPTE directly into their

programming but this pinned a user down to one manufacturer's software. The whole basis of MIDI is compatibility — the ability to use mixed manufacturer products.

Trying to cram SMPTE down the MIDI line presented problems. Although SMPTE is slower than MIDI, it is too fast to send each bit down the stream as a MIDI byte. There then has to be a trade-off between the MIDI bandwidth taken up and the time between each update. Consequently, Chris Meyer, who was principal in developing the standard, decided that four times per frame would be acceptable; 25-frame code gives an update every 10 ms but only takes up 6.4% of the available MIDI bandwidth. Gerry Lester of Adams-Smith encodes the actual messages, which are based on the way time is broken down into digits within the SMPTE word itself.

An MTC (MIDI Time Code) generator will read and write SMPTE to tape and create the necessary MIDI messages to synchronise any slave that will recognise MTC. As SMPTE is effectively being translated into MIDI, any tempo changes will be programmed within the slave.

Quarter frame messages

These are analogous to MIDI Clock in that they provide the basic timing pulses for the system, however, they also have four data bits in the form

of nibbles giving a value for the hour, minute, second or frame of the current SMPTE time. This time is encoded into eight MIDI messages of 2 bytes each so the SMPTE time is updated every two frames. Allowing for clock interpolation, the accuracy of this method should not be an issue.

Table 1 shows the message format. Taking an example of encoding, the time 10:32:53:18 at 25 frames/s would give:

F1 02, F1 11: 12 Hex = 18 decimal/ no of frames
 F1 25, F1 33: 35 Hex = 53 decimal; no of seconds
 F1 40, F1 52: 20 Hex = 32 decimal; no of minutes
 F1 6A, F1 72: 2A Hex = 42 decimal; no of hours/frame rate

Breaking down the last number into binary gives:

0 01 01010; an hours count of 10 and a frame rate of 25

These messages can be sent in either order depending on the direction in which the tape is running. Either way round, the boundary of a frame will always fall on the F1 0X or F1 4X message. This means that correctly establishing a SMPTE time will require a full sequence of eight messages to be read, which will take between two and four frames depending on where the first message to appear is in sequence. The problem occurring at initial start up is dealt with by a Full Message.

In keeping with SMPTE, the first Quarter Frame message must be sent on a frame edge, and the frame number given in the Frame Count will be for the ensuing frame. The slave has to keep an internal offset of two frames to allow for the fact that once SMPTE time has been decoded it will be two frames out of date.

Full message

When the tape initially starts, the MTC unit needs to be able to send the entire SMPTE time quicker than can be achieved by the use of Quarter Frame messages. This is dealt with by a Full Message whose format appears in Table 2. This message will take just over 3 ms to send and time will be considered to be running once the

F1 <message>

F1 = System Common status byte
 <message> = 0nnn dddd
 dddd = 4 bits of binary data for the message type
 nnn = Message type:
 0/1 = frame count LS/MS nibble
 2/3 = seconds count LS/MS nibble
 4/5 = minutes count LS/MS nibble
 6/7 = hours count LS/MS nibble and SMPTE type

Constituent parts are put together as follows:

Frame Count: xxx yyyyy
 xxx: currently undefined
 yyyyy: frame number (0-29)

Seconds Count: xx yyyyyy
 xx: currently undefined
 yyyyyy: seconds count (0-59)

Minutes Count: xx yyyyyy
 xx: currently undefined
 yyyyyy: minutes count (0-59)

Hours Count: x yy zzzzz
 x: currently undefined
 yy: timecode type:
 0 = 24 frames/second
 1 = 25 frames/second
 2 = 29.97 frames/second (30 drop-frame)
 3 = 30 frames/second
 zzzzz: hours count (0-23)

F0 7F <channel> <sub-ID 1> <sub-ID 2> hr mn sc fr F7

F0 7F = realtime universal system exclusive header
 <channel> = 7F—message intended for entire system
 <sub-ID 1> = 01—MIDI timecode
 <sub-ID 2> = 01—full timecode message
 hr = hours and type: 0yy zzzzz
 yy = type
 00 = 24 frames/second
 01 = 25 frames/second
 10 = 29.97 frames/second (30 drop-frame)
 11 = 30 frames/second
 zzzzz = hours count (0-23)
 mn = minutes (0-59)
 sc = seconds (0-59)
 fr = frames (0-29)
 F7 = end of system exclusive

TABLE 1 Quarter frame message

TABLE 2 Full Message

Examine your Options

The complexity of today's studio environment demands an operational flexibility not available in a single console, until now! The VECTOR 432 from Trident.

Equally comfortable in Music or Post Production and built to Broadcast standards, the VECTOR is truly the console of choice. All this and Trident sonics at an affordable price.

Examine our competition and then investigate the VECTOR. We are sure you will find your options are few.



TRIDENT VECTOR AT SOUNDSHOP STUDIOS, NASHVILLE

- ▲ 32 balanced multitrack routing buses.
- ▲ A/B/C/D balanced stereo buses with mix matrix and Main Output Bus compressor.
- ▲ Grouping and automation of 12 switches per module via SMPTE or MIDI.
- ▲ P & G faders. Sealed conductive plastic pots throughout.
- ▲ Four band Parametric equaliser splittable between both Channel and Monitor with individual bypass switches.

The VECTOR 432 is available with a wide range of options including:-

- ▲ LCRS Film, Stereo Input, Effects return & 4 way Dynamics modules. VCA grouping, VU or bargraph meters.
- ▲ Single VCA (channel), Dual VCA (channel & monitor), or Moving fader automation systems, any of which may be integrated with the Trident Machine Control, enabling sophisticated cue list management, cycles and 'drop in' of master, slave and MIDI (virtual) transports.



In France, a mixer you've never heard of outsells the ones you have.

Why?

Standard features of the dazzling



include :

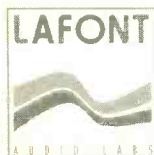
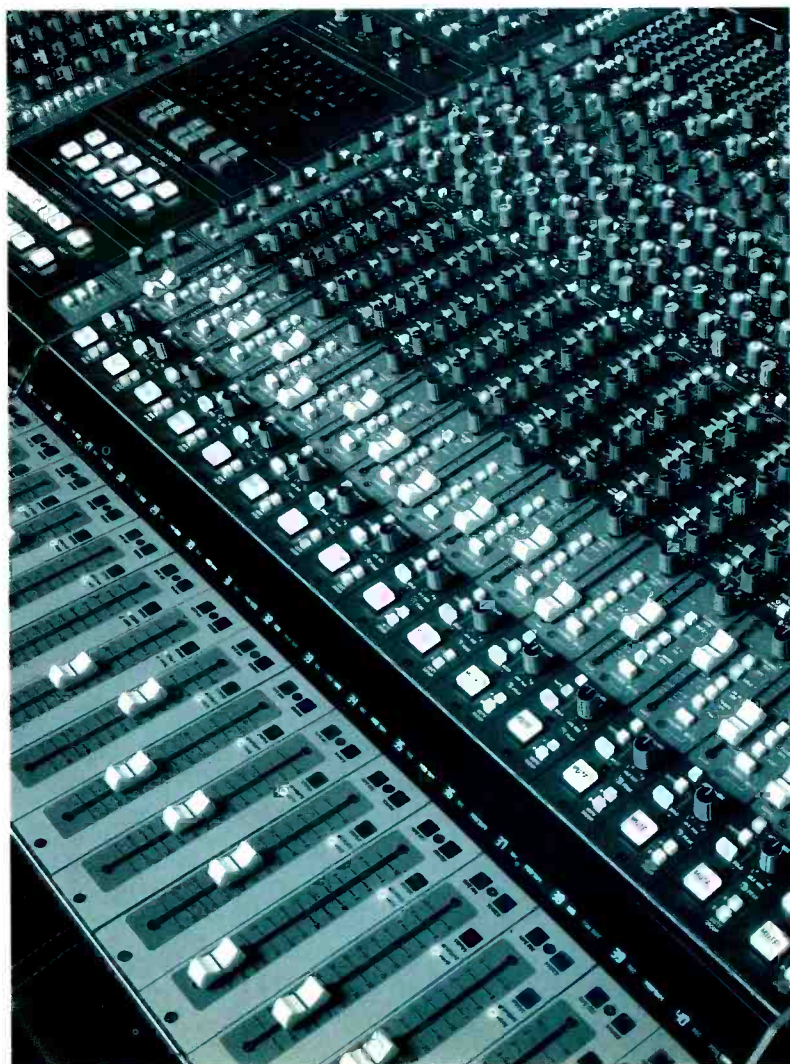
- Integral console/tape machine automation
- Multi-function dynamics on every channel
- Powerful parametric equalisation
- Twin mix concept, 2 line inputs
- 2 stereo busses
- 14 automated sub groups
- Individual status control
- Reverse talkback
- 2 stereo fold backs
- 5 stereo echo returns
- Bargraph option
- Lo noise and hi dynamic range
- Sophisticated soloing system
- 32 track routing
- Stereo output compressor

When Jean-Pierre Lafont began designing mixers in 1973, he started building a strong reputation. Within a few years of launch, his Producer consoles had become the most successful of their price range in the country.

Thankfully, **Lafont Audio Labs** consoles are no longer France's best kept secret. The innovative **Twin Mix 800** makes its début to the rest of the world through the Home Service.

The mixer comes with an integral computer system for tape and console automation.

Sound it out for yourself and we are convinced you'll agree Jean-Pierre makes consoles par excellence.



MANUFACTURED BY
LAFONT AUDIO LABS

INTERNATIONAL REPRESENTATION :
THE HOME SERVICE
UNIT 2, 10 WILLIAM ROAD, LONDON
NW1 3EN
TEL : 071 388 1820, FAX : 071 388 0339

DIGITAL AUDIO RESEARCH



Introduces

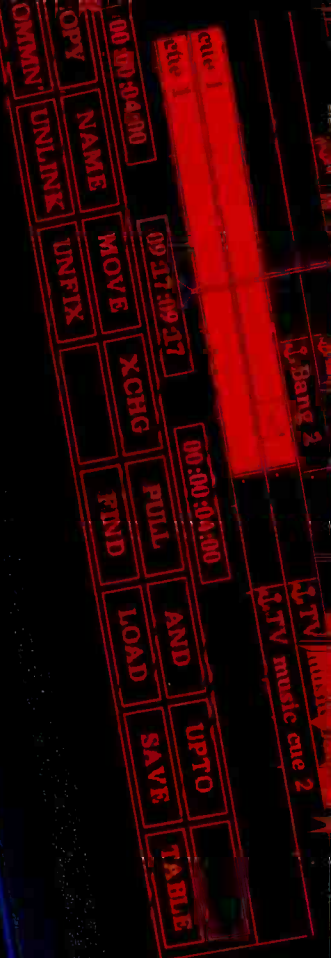
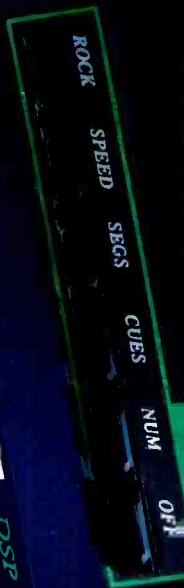
SOUNDSTATION *SIGMA*

A Fully Integrated

Digital Audio

Production

Environment



Turn to a better way of working..

SOUNDSTATION SIGMA revolutionises production

NEVER BEFORE . . .

. . . have audio professionals been offered such a powerful set of recording, editing and production tools. We started with the uniquely intuitive SOUNDSTATION interface which dispenses with the typical computer keyboard and mouse in favour of an instant response touchscreen, dedicated keys and a tape-like shuttle wheel. Now, with SOUNDSTATION SIGMA, DAR has gone much further to bring you a truly better way of working. Our widely acclaimed user interface has now been seamlessly integrated with new electronics offering extraordinary power and a host of innovative functions, to deliver speed, cost-effectiveness and creative power that are truly remarkable at the price.

WHAT MAKES SIGMA BETTER?

Σ-SIGMA, the sum. A most appropriate name for our unique, fully integrated, production centre which combines - for the first time - all of these productivity-boosting features in a single affordable package:

- ▶ Revolutionary DSP capabilities, including *Segment-Based EQ*, gain and pan settings along with multichannel varispeed.
- ▶ 8 channels of simultaneous recording and/or playback with superb audio quality. In addition, 8 channels of intelligent AES/FBU digital I/O, 4 analogue inputs and 8 analogue outputs with 18-bit converters are provided. A 16 channel version is also available.
- ▶ A 650 Mbyte rewritable optical disk subsystem that accelerates work flow with "background mode" backup and rapid archiving/retrieval.

09:12:16.13 RTC

- ▶ Four track-hours of digital audio storage on Winchester hard disks.
- ▶ Full timecode chase and machine control.
- ▶ Stereo TimeWarp™ time compression and expansion.
- ▶ Advanced high-speed CPU for incredibly fast touchscreen response, parameter changes and edit execution.



SIGMA DSP: Power made simple

CREATIVE REVOLUTION

SOUNDSTATION SIGMA's sheer power is unprecedented in the domain of digital audio production. Even more phenomenal from such a multi-faceted system is what it does *not* do - get in your way. This is a direct result of DAR's unique approach to digital audio, which recognises operator skills as an essential part of the process. SIGMA will help you accomplish ordinary tasks in less time than you think possible. Equally important, it gives you the creative freedom to produce extraordinary results.



Dedicated function keys combine with SIGMA's touch screen to speed learning and operation of the system.



SIGMA's interchangeable read/write optical disk provides rapid access to an entire library of sound effects, programme segments or your last several sessions.



SOUNDSTATION operations are carried out in an intuitive manner - for instance, audio segments are selected for editing or signal processing simply by touching them on the screen.

What can you expect from SIGMA?

Here's what experienced SOUNDSTATION users say...

ON PRODUCTIVITY AND QUALITY

"We've had up to 50% savings in post production time and we're doing better work."
Alberto Villa, Mac Master, Madrid.

"The DAR System lets us work intuitively. Sessions that took 8 hours we can now do in only 4. We're finally able to do fine tuning and adjustment that was rushed before. As a result we make an all-over improvement in quality."
Adrian Sear, Soundtracks, London.

ON EASE OF LEARNING

"It's very easy to understand, even when you've been working in the old-fashioned way."
Jarle Felin, Norsk Film Studio, Oslo.

ON SATISFACTION

"Our experience has convinced us that we made the right choice from the very start."
Ken Morrison, Ocean Group, Vancouver.

"SOUNDSTATION offers incredible flexibility and it's very easy to use."
Mich Raboy, Superdupe, New York.

DIGITAL AUDIO RESEARCH Ltd.

2 Silverglade Business Park,

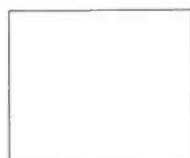
Leatherhead Road,

Cheshington,

Surrey

KT9 2QL,

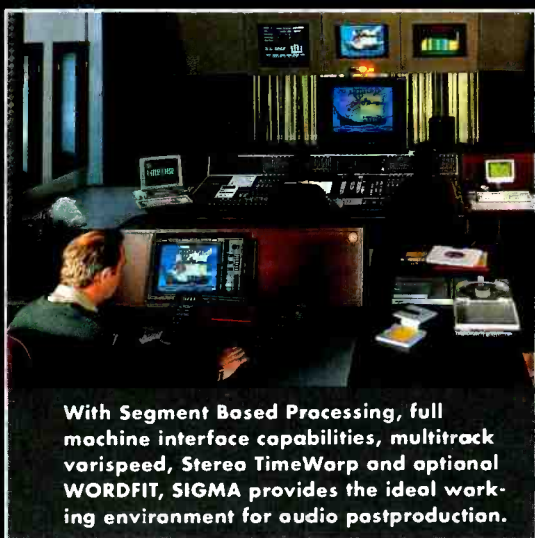
England.



D.A.R. - World leaders in integrated audio production

A TURN FOR THE BETTER

Every workday, hundreds of creative engineers and editors turn to their SOUNDSTATIONS at video and film postproduction houses, broadcasting and recording studios worldwide. Owners have found that SOUNDSTATION integrates smoothly into their facilities and delivers a rapid return on their investments, thanks to its unprecedented combination of digital audio production power, superior user interface, comprehensive audio and timecode interface capabilities, and surprisingly short learning curve. With its advanced, high-speed CPU, massive storage, highly efficient backup and archiving, plus advanced functions such as Segment Based Processing, TimeWarp and exclusive options including WORDFIT®, SOUNDSTATION SIGMA truly provides a "better way of working", that can help make your facility more creative, more productive and more competitive.



With Segment Based Processing, full machine interface capabilities, multitrack varispeed, Stereo TimeWarp and optional WORDFIT, SIGMA provides the ideal working environment for audio postproduction.

YLE FINLAND



DAR's DASS 100 multifunction digital audio interface and sampling frequency converter solves the main problems of connecting digital audio equipment together and keeps signals digital.

OPTION: WORDFIT

Automatic Dialogue Synchronisation.

Unique to SOUNDSTATION, WORDFIT *automatically* edits replacement dialogue to align with the timing of audio modulations on the original guide track. Processing is carried out "offline" and produces a finished, ready-to-use segment. WORDFIT is an invaluable tool for:

- ▶ Off-line dialogue replacement
- ▶ Foreign language dubbing
- ▶ Overdubbing vocals
- ▶ Aligning transfers to "dailies."

Digital Audio Research: Committed to Innovation, Reliability and Customer Support

The original SOUNDSTATION, introduced in late 1987, established DAR as a leading force in digital audio engineering. Since that time, DAR engineers have continued to revolutionise the audio editing suite with unique and innovative developments such as WORDFIT, advanced DSP and the DASS 100 multifunction digital audio interface. With well over 100 SOUNDSTATION systems installed around the world in less than two years, DAR's reputation for imaginative engineering, quality manufacturing and professional customer support, both factory-direct and through a carefully chosen global distributor network, continues to grow.



DIGITAL AUDIO RESEARCH



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

F0 7E <chan> <sub-ID 1> <sub-ID 2> hr mn sc fr ff sl sm <add> F7

F0 7E = non-realtime universal system exclusive header
 <chan> = channel number—different for each device
 <sub-ID 1> = MIDI timecode
 <sub-ID 2> = set-up message type
 hr, mn, sc, fr = as for full message
 ff = fractional frames (0-99)
 sl, sm = event number—LSB first
 <add> = additional info for any point
 F7 = end of system exclusive

TABLE 3 Set-up Message

F0 7F <chan> <sub-ID 1> <sub-ID 2> u1 u2 u3 u4 u5 u6 u7 u8 u9 F7

F0 7F = realtime universal system exclusive header
 <chan> = 7F—message intended for entire system
 <sub-ID 1> = 01—MIDI timecode
 <sub-ID 2> = 02—user bits message
 u1 = 0000aaaa
 u2 = 0000bbbb
 u3 = 0000cccc
 u4 = 0000dddd
 u5 = 0000eeee
 u6 = 0000ffff
 u7 = 0000gggg
 u8 = 0000hhhh
 u9 = 000000ii
 F7 = end of system exclusive

TABLE 4 User Bits

next Quarter Frame message has been received. Apart from being used initially, a Full Message can also be used when the tape is against the head and operating at other than normal speed, like cueing. Continually sending Quarter Frame messages in these situations could lead to the clogging up of the MIDI stream.

Set-up messages

So far, MTC data has concerned itself with providing timing information, however, this is only half the story. If one considers the situations that occur within sound effects, edit decision lists and mix automation, it is clear that cue lists are required. These are likely to exist within each slave device, which will best know how to manage that list but the ability to edit the list from the master device would be useful.

This particular area of MTC is dealt with by a Set-up message, the basic format of which is given in Table 3 — note that 16 devices per MIDI Out can be independently addressed. There are various formats for sub-ID 2:

SPECIAL (00) is for the global set-up of information within a unit including timecode offset, enable/disable event list and event list request. The type number is sent in place of event number;

PUNCH IN/OUT (01/02) will enable or disable record mode on a device with multiple points being sent by multiple messages. This can be deleted by using DELETE PUNCH IN/OUT (03/04);

EVENT START/STOP (05/06) is for single events such as slider movements or a sequence of events;

EVENT START/STOP WITH ADDITIONAL INFORMATION (07/08) can incorporate additional parameter values such as the volume level of an effect. Either of the EVENT commands can be deleted by using DELETE EVENT START/STOP (09/0A);

CUE POINT (0B) is used to remotely program individual events that can also be removed by DELETE CUE POINT (0C).

Finally, an EVENT NAME can be programmed in Additional Information format. This is sent in the form of two nibbles per byte with the least significant byte first as usual. For instance, a MIDI Note On message of 93 3C 40 would be sent as 03 09 0C 03 00 04. This allows for any type of MIDI data to be transferred including ASCII and SystEx.

There is a space for various additions to the

specification as only 15 sub-ID 2 type messages have so far been used.

User bits

Certain information needs to be sent once per session or reel of tape. This may be the date or reel number. User bits are 32 bits provided for within SMPTE for this purpose. The MTC format is given in Table 4.

The fields from u1 to u9 will be decoded into an 8 bit format:

aaaabbbb ccccdddd eeeeffff gggghhhh ii

Four, 8 bit characters are formed along with a 2 bit code. u1 to u8 coincide with the SMPTE groups 1 to 8 while u9 is the two Binary Group Flag Bits as defined within SMPTE. This message can be sent at any time but will usually not change through the normal running of the Timecode.

MTC current situation

As a timing standard, MTC is taken as a *de facto* standard in America, being found in software by manufacturers such as Mark of the Unicorn, Passport and Opcode, however, there are a few, if any, devices that attempt to make use of MTC to its fullest. Part of the reason for this may be because MIDI SystEx messages cannot be interspersed with MTC messages due to presence of a data byte with the system common status byte. Such system exclusive messages are used by

some manufacturers to send background information of an update nature.

The situation in Europe is far worse. With the exception of Steinberg (*Cubase* and *Cubead*), no other software manufacturer has been involved with MTC. Some have publicly stated that MTC is too inaccurate but have been unprepared to substantiate their claims. The commercial fact that the existence of MTC would put paid to the need for proprietary SMPTE interfaces may have something to do with their reticence.

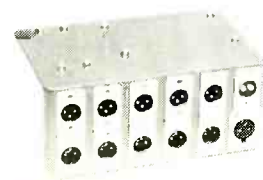
The original idea behind MTC was to allow for any device to be automated cheaply with the requirement of a single timing device for any software or hardware within a studio. Fostex have gone some way towards this end by designing the *MTC-1* to go with their *R-8* tape machine. This not only reads/writes SMPTE and generates MTC, it also controls the transport of the tape recorder via a serial port. Control is achieved by one of two methods, namely MIDI Note On/Off messages or Fostex SystEx messages. Their *G-16* and *G-24S* machines have a similar facility courtesy of the optional 8330 synchroniser card. Steinberg have worked in conjunction with Fostex to provide the necessary link-up to control the tape machine transport via the on-screen transport icons. While this data is sent by SystEx, the timing data, which is then sent back from the tape machine, is MTC and is locked to the SMPTE stripe on tape.

Perhaps this gives a guide to the direction for the future, where transport and cue list control for multiple devices can be centralised in one, relatively inexpensive, unit. □

Author's note: Thanks to Chris Meyer for information provided

Vic Lennard is director of the UK MIDI Association

10 OUTLET DISTRIBUTION AMPLIFIER 4



A compact mains-powered unit with one balanced input and ten AC and DC isolated floating line outputs. Further noise level reductions.

- Exemplary R.F. breakthrough specifications giving trouble-free operation in close proximity to radio telephones and links.
- Excellent figures for noise, THD, static and dynamic IMD.
- Any desired number of outlets may be provided at microphone level to suit certain video and audio recorders used at press conferences.
- Meets IEC65-2, BS415 safety and I.B.A. signal path requirements.

Also available as a kit of parts less the case and all XLR connectors for one or ten outlets.

Broadcast Monitor Receiver 150 kHz-30 MHz * Stereo Disc Amplifier 3 and 5 * Stabilizer * Fixed Shift Circuit Boards * Illuminated PPM boxes and TWIN TWIN Rack * PPM7, 8 and Digital Stereo PPM9 * PPM5 20 pin DIL Hybrid and Movements * Advanced Active Aerial 4 kHz-40 MHz * Stereo Coders * Variable Emphasis Limiter 3 * PPM10 In-Vision TWIN TWIN PPM and Charts.

SURREY ELECTRONICS LTD., The Forge, Lucks Green, Cranleigh, Surrey GU6 7BG Tel: 0483 275997 * Fax: 276477

A black and white studio mixer is positioned on a rocky ledge, overlooking the vast, layered landscape of the Grand Canyon. The sky is a deep blue with scattered white clouds. The mixer is the central focus, with its numerous knobs and sliders clearly visible. The canyon's rugged terrain and deep valleys stretch out into the distance, creating a sense of scale and grandeur.

The Avalon Studiosystem.
Some things are just beyond compare.

D&R. Every sound under control.

The logo for D&R, consisting of the letters 'D' and 'R' in a stylized, bold font, with an ampersand between them. The letters are white with a black outline, set against a dark background.

D&R: Headoffice, D&R Electronica b.v., Rijnkade 15b, 1382 GS Weesp, The Netherlands, Phone (..) 31 2940 18014, Fax (..) 31 2940 16987.
U.S.A. Office, D&R USA, Rt. 3 Box 184-A, Montgomery TX 77356, USA, Phone (409) 588 - 3411, Fax (409) 588 - 3299

www.americanradiohistory.com

OTARI DDR-10

The trend towards integration of hardware and software from different manufacturers continues. David Miles Huber assesses this hard disk system

An occurrence of particular interest at the dawning of the digital '90s, is the increasing number of third party development systems sprouting up throughout the industry. This is the practice of integrating existing digital audio software or hardware systems into another company's product, to create a new or more flexible product. This is a popular route in the case of digital audio software that has been developed for use on popular brands of personal computer. Such integrated systems are the result of major company collaborations and represent a trend that may allow the particular strengths of upstart or specialist companies to be integrated into, or based firmly on established computer-based digital audio systems.

A classic example of such a third-party system is the recently-released Otari *DDR-10* 2-channel digital audio recorder/editor. This represents a co-operative effort between Otari, Digidesign and J L Cooper, and is targeted towards film/video post houses, recording studios and broadcast stations.

In short, this system is a custom-modified, turnkey digital audio workstation based on the popular *SoundTools* hardware and *Sound Designer II* software system from Digidesign. It has been created expressly for those who do not wish to integrate a modular digital audio system into their existing computer (as is often the case in most MIDI production studios) but instead would simply like to roll the system in as a standalone editing/mastering system, turn it on and go.

The *DDR-10* includes a custom-designed Otari console and cabinet with such computer hardware periphery as an Apple *Macintosh IIfx* with a single 1.4 Mbyte floppy drive, 5 Mbyte RAM, a 19 inch (482 mm) monochrome monitor with video card and a retractable, under-the-panel QWERTY keyboard.

Other components include a proprietary hardware control panel, Digidesign's *Sound Designer II* software, high performance AD/DA digital conversion module (Pro I/O), Digidesign *NuBus* digital signal processing card, digital audio I/O interface (AES/EBU and SPDIF) and a meter/monitor bridge. The *DDR-10* is capable of generating and reading film and all SMPTE/EBU frame rates. Incoming synchronisation is converted MTC (MIDI timecode), so it may be directly read by the computer and

associated software.

The basic system is shipped with a single internally-mounted 345 Mbyte hard drive (30 minutes). However, the custom cabinet includes space for three additional expansion drives and power supplies. In this way, the system can easily be expanded in 30 minute increments, offering a total storage capacity of 2 hours. Additional memory options include a MOD (Magneto-Optical Disk), R-DAT soundfile archival/mastering and 36 Gbyte (60 hour!) storage systems.

Hardware control panel

The heart of Otari's contribution is the Hardware Control Panel. Its basic purpose is to provide the

user with dedicated hardware control over many of *Sound Designer II*'s software functions (Digidesign's waveform editing program).

The following is a brief description of the sections which make up the control panel.

- **Cursor control finger pad:** In place of the standard *Mac* mouse or rollerball, Otari has opted to make use of a rectangular 'finger pad' controller. This rather novel X-Y grid lets your finger directly control cursor movements across the screen.

- **Mode selection buttons:** As with *Sound Designer II*, the *DDR-10* is designed to operate in one of three basic operating modes: Tape Deck, Waveform Edit and Playlist. Each of these modes can be directly accessed from the control panel by way of three dedicated icon buttons.

The Tape Deck button opens the on-screen Tape Deck window and prepares the unit for recording a soundfile direct to hard disk. Once the soundfile has been recorded, the WAVEFORM icon button can be pressed and the process of editing the file can begin by defining regions or performing other DSP functions. Defined regions can then be placed into a sequential playlist by pressing the PLAYLIST button, thereby beginning the process of assembling a final edited program.

- **Data wheel section:** The data wheel section, which was developed in collaboration with J L Cooper Electronics, is probably the control panel's most important and interactive section. It comprises a weighted flywheel that provides direct control over the cursor bar's position and movement within a soundfile. A number of associated buttons provide control over cursor function and soundfile region selection.

The data wheel can control cursor movement using a number of selectable modes:

- **Scroll/scrub button** The Scroll mode allows the cursor to be fast-wound to any position within the overall recorded soundfile. At the desired point, any play or scrub option can then be invoked for finer cursor positioning. Upon selecting the Scrub option, the soundfile can be auditioned as the play pointer moves over the soundfile. This operation can be

performed in the Jog or the Shuttle mode, and is often used for defining the In and Out boundaries of a sound region.

- **Jog/shuttle button** Digidesign's most recent software update has added the capability of 'jogging' the cursor over a soundfile. In the case of the *DDR-10*, this means that the play pointer (and thus the auditioned sound) will directly follow the rotational movements of the data wheel. This mode is used in defining the In and Out boundaries of a sound region. In fact, in order to define a region, the user must enter Scrub mode and move the cursor over a range of samples. This rather redundant feature seems to inform the computer where it is, so it can mark the beginning or end of a region.

The Shuttle mode is used to scrub over a soundfile as a function of the initial speed and direction of the data wheel's rotation. For example, by turning the data wheel slowly to the left,



the play pointer would slowly continue shuttling in the reverse direction (even if you were to take your hand off the wheel). Turning the wheel quickly in the right direction would send the pointer scrubbing in a fast forward direction, until the wheel was rotated in the opposite direction, thus stopping or slowing the scrub.

In button This button is used to mark a region's beginning point, while in the Waveform Edit mode. The In point of a selected region (or one from the Cue register memory) can be located by pressing Recall, In and Search, in that order.

Out Button The Out button's function is identical to the In button, but is used to mark or locate a region's ending boundary.

Add button Once the In and Out boundaries of a region have been selected, the pressing of the Add button will enter the newly-defined region into *Sound Designer's* playlist. When in the Playlist mode, pressing this button will insert the currently highlighted region at the bottom of a playlist.

- **Numeric/cue location display:** Current Time, Event Time and Cue Number Displays — these numeric displays offer direct readout of time related data as it relates to SMPTE time or address locations. The Current Time display indicates the timecode location of the play pointer in the file. When recording, this display will either indicate an internally-generated SMPTE/EBU address or incoming timecode, depending on whether internal code is selected as a source.

The Event Time display is used to show the time address of such events as Cue Memories, Cue Search, Timecode Start and Timecode Stop. The Cue Number display indicates which of the possible 100 event memory registers — which can be active within a soundfile — has been selected.

The cue location section comprises four buttons: Store, Recall, Search and Top-of-File. These allow for the management, storage and access to the system's 100 cue location points. These cue points can be placed into memory when the system is in record or play modes, or may be used to recall the In or Out points of a sound region when in the Waveform Edit mode.

- **Special function keys:** 15 user-definable soft keys are used in conjunction with a supplied macro program to quickly perform common software functions. The *DDR-10* comes equipped with a set of 15 often-used macro key functions.

- **Status selection keys:** In addition to software-

related buttons, a number of additional status keys are supplied, providing control over such standard transport functions as Ready/Safe and Input/Repro. A number of timecode-related status buttons are also supplied, offering control over frame rate and timecode management.

Personal comments

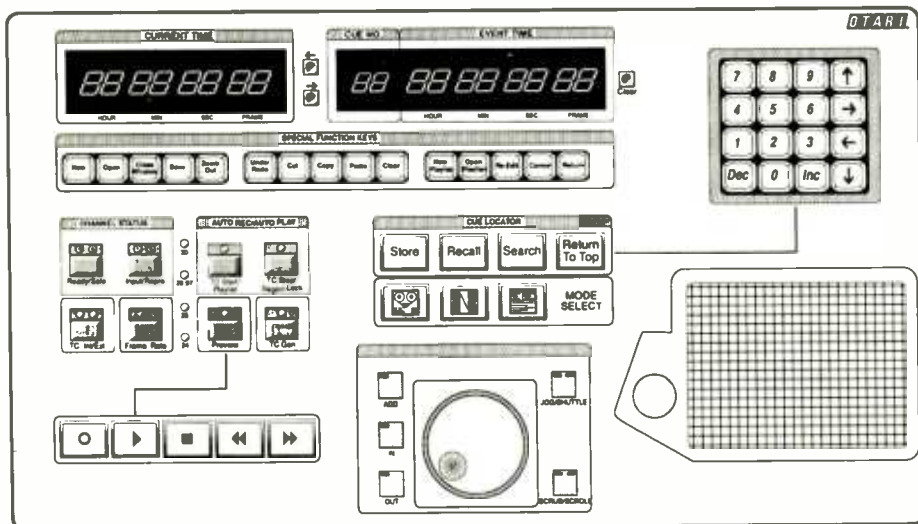
After having used the *DDR-10* for the completion of a recent production, I found its use to be rather straightforward once I became familiar with the control panel and certain system-specific ground rules were established.

The weighted data wheel made for quick and easy movement within the soundfile although it must be remembered that in order to select a region's In and Out marker points, the Scrub mode must be invoked and the play pointer moved over the soundfile to the proper edit point. When attempts are made to mark a file without scrubbing, the edit marks will simply not take and attempts to define a region will cancel out the region definition process. In all fairness, though, the scrub mode would almost certainly be used when fine tuning the In and Out edit points of most critical edits.

In principle, the *DDR-10's* control panel has been designed to provide a virtual, hardware access to many of *SoundTools'* functions. This seems to have reduced the need for accessing the *Mac's* slide-out keyboard to the alphanumeric naming of files, markers, etc. Those who are used to dealing with many of *SoundTools'* keyboard keystroke functions will have to restrain from using them and deal directly with the control panel. This is due to the fact that when both the control panel and standard operating keyboard functions are used, the computer doesn't quite know whose commands to respond to and runs the risk of locking up.

The finger pad is a novel alternative to the more familiar mouse or rollerball. It provides a good cursor movement interface, however, I'd like to see the ratio of cursor-to-finger movement be expanded, as I often ran out of pad surface when making long reaches for a pull-down menu or when placing a region into a long playlist.

In conclusion, it's clear that this system isn't for everyone. However, the *SoundTools*-based Otari *DDR-10* lives up to its initial conception of being designed for those who want a turnkey digital audio workstation that can be rolled in and powered-up as a standalone digital editing system. □



DDR-10 hardware control panel

TASCAM European Distributors

Hi-Fi Stereo Center Kain
Muenchner Bundesstrasse 42,
5013 Salzburg,
AUSTRIA.
Tel: (0662) 37701

Teac Belgium NV/SA,
Woluvelaau 14 3C,
1831 Diegem,
BELGIUM.
Tel: +32 27256555

So and Hoyem A/S,
Bulowsgarden,
Bulowsvej 3,
1870 Frederiksberg C,
DENMARK.
Tel: (031) 22 44 34

Studiovox Oy,
Hoylaamotie 8,
SF-00381 Helsinki,
FINLAND.
Tel: 0506 1311

Teac France Sa,
17 Rue Alexis de Torqueville,
92182 Antony,
FRANCE.
Tel: (01) 4237 0102

Teac Deutschland GmbH
Bahnstrasse 12,
6200 Wiesbaden-Erbenheim,
GERMANY.
Tel: (06121) 71580

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

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

GBC Italiana spa,
Viale Matteotti, 66,
Cinisello Balsamo, Milan,
ITALY.
Tel: (02) 618 1801

Hjodriti — Hot Ice,
PO Box 138,
Hafnarfirdi,
ICELAND.
Tel: (01) 53776

AEG Nederland NV,
Aletta Jacobslaan 7,
1066 BP Amsterdam,
NETHERLANDS.
Tel: (020) 5105 473

Audiotron A/S,
Seiduksgt. 25,
PO Box 2068 Grunerlokka,
0505 Oslo 6,
NORWAY.
Tel: (02) 352 096

Goncalves,
Avenida 5 de Outubro, 53, 1,
Lisboa 1,
PORTUGAL.
Tel: (01) 544029

Audio Professional SA,
Francisco Tarrega, 11,
08027 Barcelona,
SPAIN.
Tel: (93) 340 2504

Erato Audio Video AB,
Asogatan 115,
116 24 Stockholm,
SWEDEN.
Tel: (08) 743 0750

Telion AG,
Rutistrasse 26,
CH. 8010 Zurich,
SWITZERLAND.
Tel: (01) 732 1511

TASCAM



LEARN SOMETHING TO YOUR ADVANTAGE

TASCAM innovations have changed forever the face of music recording and with the release of the dbx-equipped MSR-24 the power and flexibility of 24 track recording became available to musicians and engineers at a previously unheard of price.

Now that DOLBY S-type noise reduction is available on the MSR-24S a further level of choice has been opened up to the recording engineer.

The increasing sophistication and performance of our recorders has placed heavy demands on mixing console

technology and at TASCAM our expertise has allowed us to design and build consoles which perfectly partner our multi-track recorders. A long line of consoles renowned for their sonic quality has now been joined by the M3500 Series.

Designed from the ground up to partner our MSR Series tape recorders

TASCAM
the right track

using distributed in-line monitoring (effectively doubling input capacity during mixdown) and a design philosophy in tune with today's production requirements we believe the M3500 simply surpasses all competition in its class.

The cost of financing traditional mixing consoles and multi-track recorders has proved to be the death of many studios both large and small... The competitive edge which TASCAM equipment gives you has never been more valuable than today.

Contact your TASCAM dealer today to learn something to your advantage.

Teac UK Ltd, 5 Marlin House, The Croxley Centre, Watford, Herts. WD1 5YA. Tel: 0923 225235. Fax: 0923 36290

THE POSSIBILITIES

The Flex System from Rane: A Powerful New Approach to Modular Signal Processing



F

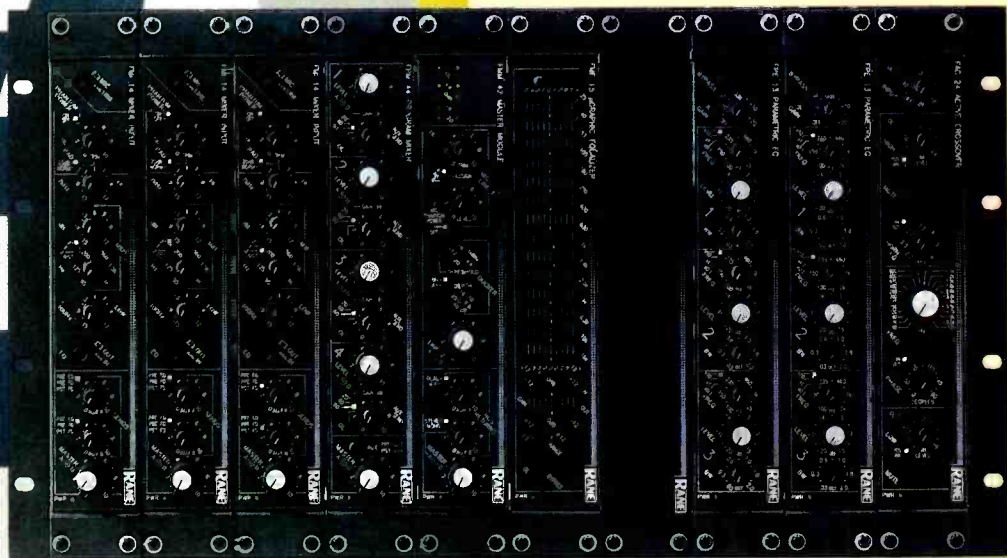
Flexibility, no matter how you spell it, means power. It's the power to meet varied needs. To meet budgets with optimum performance. To efficiently accommodate system growth. Long into the future.

Flexibility is the essence of Rane's new FLEX System. The first universally compatible, cost effective, modular approach to signal processing and routing. With no special requirements. And no dead ends.

Each Flex module is an HR (Half Rack) compatible, UL/CSA/VDE approved, self-contained processing unit. Each capable of being EIA rack-mounted either horizontally or vertically, with inexpensive, readily available hardware. Or simply set on a shelf, stand-alone fashion.

HIGH-POWERED COMPATIBILITY. Using standard 3-pin, 1/4" or barrier strip connectors, FLEX modules are directly compatible with professional audio gear. And since they are remote powered—via Rane's proposed power supply standard—troublesome ground loops, hum and agency approval problems are solved up front by design.

ENDLESS POSSIBLE COMBINATIONS FOR CUSTOM DESIGNS. The FLEX non-exclusive modular concept makes it inherently expandable



ARE STAGGERING!

and upgradeable. It boasts a large and growing number of functions and components to choose from. Mixers. Preamps. Splitters. Crossovers. Dynamic controllers. Equalizers. Amplifiers. Line drivers. And much more under development.

And thanks to Rane's efficient bus design, system wiring is greatly simplified in even complex mixing and splitting layouts.

COST EFFECTIVE CAPABILITIES. Modular flexibility. Uncompromising performance. All without a premium price. That's the FLEX System manifesto. There is no expensive main-frame to buy; you only pay for the functions you want, when you want them.

Say, for example, you only need a 3 channel mixer with one channel of crossover. The FLEX System delivers. And when your needs expand, just add more modules. No need to obsolete old equipment for a loss.

Whether you use two modules or twenty modules, the FLEX System remains cost effective. And supremely flexible. Year after year.

SUPERLATIVE PERFORMANCE, RANE RELIABILITY. The design and performance of each and every Flex module is, in a word, superlative. Every model carries top-grade studio specifications, utilizing the best components available. The result is unsurpassed performance and reliability.

Our HR compatible modules may be compact, but they're stuffed with more top-notch features than you would have thought possible. For example, the **FMI 14 Mixer Input module** measures only 1.75" x 10.5", yet it boasts a -128dB EIN mic stage, switchable phantom power, true 20dB pad, powerful 3-way EQ section, insert loop, two source-selectable Aux sends and balanced master channel outputs. A single DIN cable, supplied with each module, routes the Master and Aux buses from unit to unit for quick and clean hook-up.

+15/-20dB boost/cut, 2-octave down to 1/30th-octave bandwidth range for notch capability, and a full 10Hz-20kHz frequency sweep range for unprecedented flexibility.

The **FME 15 MicroGraphic Equalizer** brings Interpolating Constant-Q filter performance to the Flex line, pioneered by our full-sized GE 30

current balanced outputs, and you've got a powerful, flexible new crossover standard.

This is but a sampling of the innovative Flex Modules to be released this year. We encourage you to obtain separate, detailed data sheets on the many FLEX System modules. Then compare these with the best standard equipment available. You'll discover that FLEX offers the best of all worlds: compact, cost effective, flexible, uncompromising performance.



The **FMM 42 Master Module** not only provides Aux returns and mixing, but features extra mic and stereo line inputs with ducking capability for paging and other applications.

For even more mixing flexibility, the **FPM 44 Program Mixer** allows 4 separate mic or line inputs to be mixed to 4 output programs, with pre or post fade switch selection for the Aux sends. Both the direct balanced/unbalanced terminal strip and the DIN Flex bus inputs and outputs can be used simultaneously for easy expansion and integration into larger systems.

Carrying on a fine tradition of innovative equalizer technology, Rane sets yet more new standards with the Flex Series. The **FPE 13 Parametric Equalizer** provides 3 separate bands, each capable of

model which has set new industry standards. Minimized filter interaction, smooth combined response and fully balanced three-pin and terminal strip input/output are but a few of the features. Both the FME 15 and the FPE 13 also provide an exclusive Patch I/O jack which allows direct connection to an insert loop jack with a single 1/4" TRS patch cable.

The **FAC 24 Active Crossover** is the next generation to follow in the respected footsteps of our AC 22 and AC 23 designs. In addition to the proven 24dB/octave Linkwitz-Riley performance, the FAC 24 features a true 24-position frequency selector switch to provide plug-in card accuracy and repeatability with the convenience of a knob. Add to this a built-in CD Horn EQ section, electronic phase alignment, summing LF input and three-pin high-

FLEX MODULAR SIGNAL PROCESSORS SERIES

RANE

10802-47th Ave. W.
Everett, WA 98204
(206) 355-6000

The AES 91st Convention

AUDIO FACT AND FANTASY • RECKONING WITH THE REALITIES

DATES: 1991 Oct. 4 through Oct. 8 • LOCATION: New York Hilton, N.Y.C.



PHOTO: N. Y. CONVENTION AND VISITORS BUREAU

**Plan to attend the most productive
Professional Audio Event of 1991 ...
the 91st AES Convention in New York**

Audio Engineering Society, Inc.

60 E. 42nd Street, New York, NY 10165 USA

(212) 661-8528 OR (800) 541-7299 ...except N.Y.

Telex: 62098UW Fax: (212) 682 0477

THE ACOUSTICS OF MIXING CONSOLES

Philip Newell looks at the acoustic effect of placing mixing consoles and studio furniture in control rooms

Many studio designers have long complained that console manufacturers seem to show little inclination towards addressing the problems of the acoustic effects of mixing consoles in the control room. Probably the most obvious problem is the physical shape of the mixing console and its effect on reflexions, and hence the imaging and definition of the monitor system and room. The second problem is the quite alarming degree to which panels can resonate sympathetically with the music, adding

undesirable coloration to the sound.

While manufacturers cannot be expected to tailor the shape and size of consoles to each and every room, there are certain fundamentals which it would seem reasonable to address more thoroughly.

The most significant of all physical problems exists where a large console has a deep, flat, vertical, resonant back. In many instances, the rear of the console receives virtually a full wavefront from the monitors. Almost invariably,

the rear of the consoles is hard, and thus highly acoustically reflective. Sounds impinging upon this surface will reflect back towards the front wall, which is also frequently hard and reflective.

Indeed, this wall often contains a window or door. The sound will then either return to the mixing console rear or pass into the room. Chattering can begin between these two hard surfaces, energising resonant modes that will colour the sound in the frequency domain, where phase and amplitude will be disturbed, and in the time domain. With sound travelling at around 1,000 ft/s, every foot the reflected waves must travel before reaching the ear will cause that sound to be delayed by around 1 ms. Therefore, if the console were 6 ft from the front wall, a sound reflecting from the console rear bouncing back to the front wall then returning to the ear, will arrive at the engineer's ears around 12 ms after the arrival of the initial sound. The result of this is time smearing, in addition to the coloration produced by the modal chattering and resonant panel coloration.

What is more, the panel resonances will usually arrive at the ear via a non-direct path, reflecting off another surface. They will thus be perceived as delayed resonances. Delayed resonances are even less desirable than non-delayed resonances as the temporal separation increases the ear's ability to detect them. And it does not stop there. The fact that these resonant reflexions will bounce off a surface that is not co-located with the source of the drive signal, means that they are also spatially, as well as temporally separated.

It is difficult, even in good control rooms, to support stable, clear, stereo images. Compounding this with delayed, spatially separated, frequency dependent amplitude and phase modified spurious sounds increases the potential for spoiling the clarity of the monitoring. And this is what happens when the console manufacturer designs a product to look pretty on an exhibition stand rather than considering its operation in a real life control room. Most acoustics will benefit considerably from the damping of the rear console panels with an automotive type of damping material, together with a screen of Sonex or similar type foam wedges, preferably at least 6 inches thick, shielding the console from the direct impact of the wavefront leaving the monitors. Depending upon whether the console rear needs

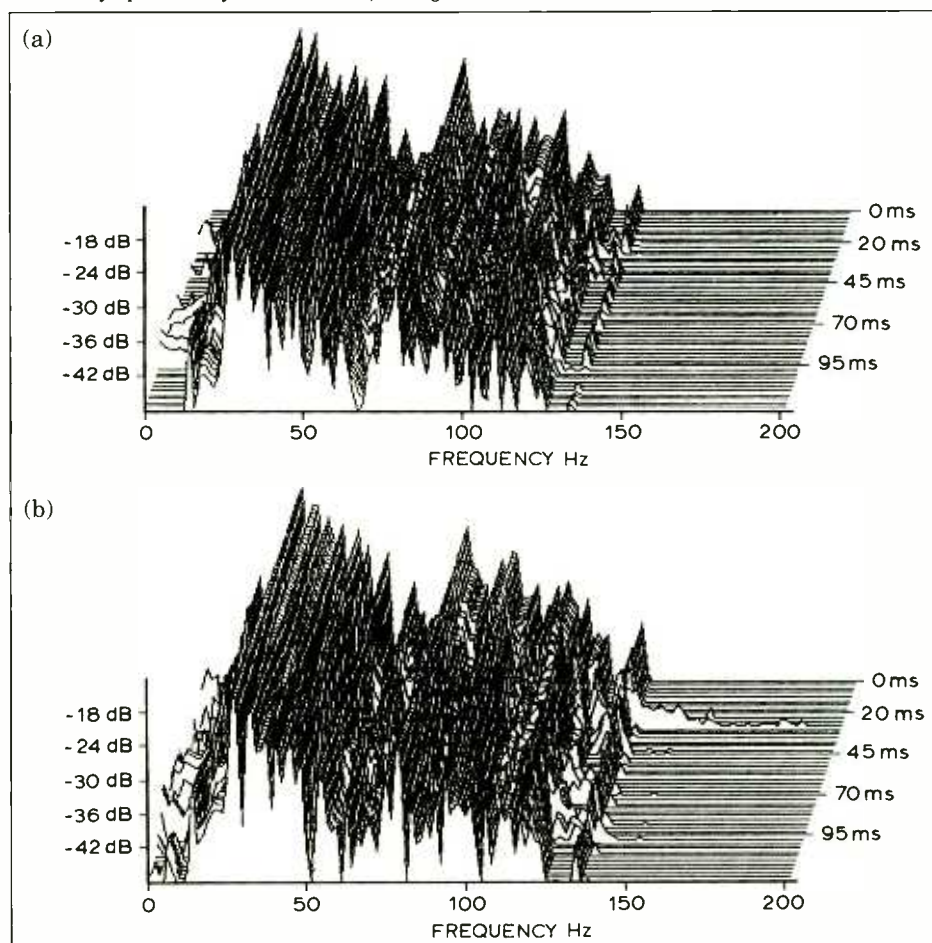


FIG 1: Room response (a) before and (b) after the installation of a mixing console

ventilation, the absorber panel could either be attached directly to the console, or spaced off a few inches as a free-standing unit.

Consoles with very high backs, especially those which go all the way down to the floor, are acoustic disaster areas. Some manufacturers should be ashamed of their lack of awareness of consoles' true circumstances of application. Full height console rear ends can form resonant cavities between the floor and the front wall of a room. They also block the path of low frequency waves, which should be allowed to pass freely under the console. When monitors are mounted high up on the front wall of a studio, pointing down at a steep angle, there is potential for the floor to reflect a wave back upwards onto the underside of a mixing console, and possibly back down to the floor before finally coming up once again towards the engineer's ears. Given this pathway, a considerable delay will be present between the direct and reflected waves. Poor mixing console design is not necessarily the cause of this problem but it is, nonetheless, a possible consequence of placing a mixing console in a room. One acoustic designer quite routinely places absorbent material below the mixing console in order to ease this problem.

Many consoles have built-in, or built-on, 'wings' for the mounting of effects. Again, these wings are frequently fitted as a mechanical or electronic engineering exercise rather than an acoustic one. Care should be taken to ensure that the wings are sited so that resonant modes could not be established between adjacent wings or a wing and a wall, nor could sound impinging upon the wings from the monitor system be reflected into the critical listening area. Wings should be angled so any reflected sound from the monitor system will pass away from the central listening area and, if possible, into an absorbent area of the room where it subsequently will be lost. Furthermore, the top and bottom panels on the effects units should be checked for sympathetic vibration when certain musical notes are present.

Wings can be acoustically problematical but with care, can be rendered all but neutral in their acoustic disturbance of the room. Mounting the effects in a long, angled rack, immediately behind the engineer's position places an almost perfect, large acoustical mirror behind the listening position, and if one strikes a line from the main monitors to the face of the effects, the reflected ray would come right back up to the engineer's ear with a delay of around 8 to 12 ms. In many such rooms, a lack of distinction from the main monitors is easily detected, so people choose to rely more on nearfield devices. While the effects must be housed somewhere convenient, if they are placed in such a way behind the console, it must be accepted that they have been sited with an emphasis on the ergonomic operation of the electronics and that this will significantly degrade the acoustics. If this choice is made, neutral monitoring cannot be expected nor can there be any pretence that 'accurate' monitoring could exist in such rooms.

Fig 1 shows the response of a room before and after a mixing console was installed. The effect is clearly visible on the plot and in too many cases, is clearly audible as well. Despite the fact that nearfield monitoring can be less prone to some of the effects described above, the console design can still exert an influence over their response. One obvious problem would be resonating or rattling top panels on the console; particularly lightweight blanks where the console awaits the future fitment of further modules.

Fig 2 shows the response from a small

loudspeaker placed on the meter bridge of a console with a large, shallow angle top surface area, plus plenty of space round the knobs and a significant number of blank panels. An almost perfect reflexion, delayed by around 1 ms can be seen quite clearly in the response plot. Fortunately, the ear is far less susceptible to confusion by vertical reflexions than by horizontal ones, but nonetheless, any such reflexions can only

be detrimental to the monitoring quality so should be avoided where possible. The console in Fig 2 is generally well liked for its clean sounding electronics path, yet little attention seems to have been paid to its acoustic properties as in addition, until treated, a 2 kHz ring was clearly audible from its panels upon excitation by a snare drum or similar transient signal, either directly or via the monitors.

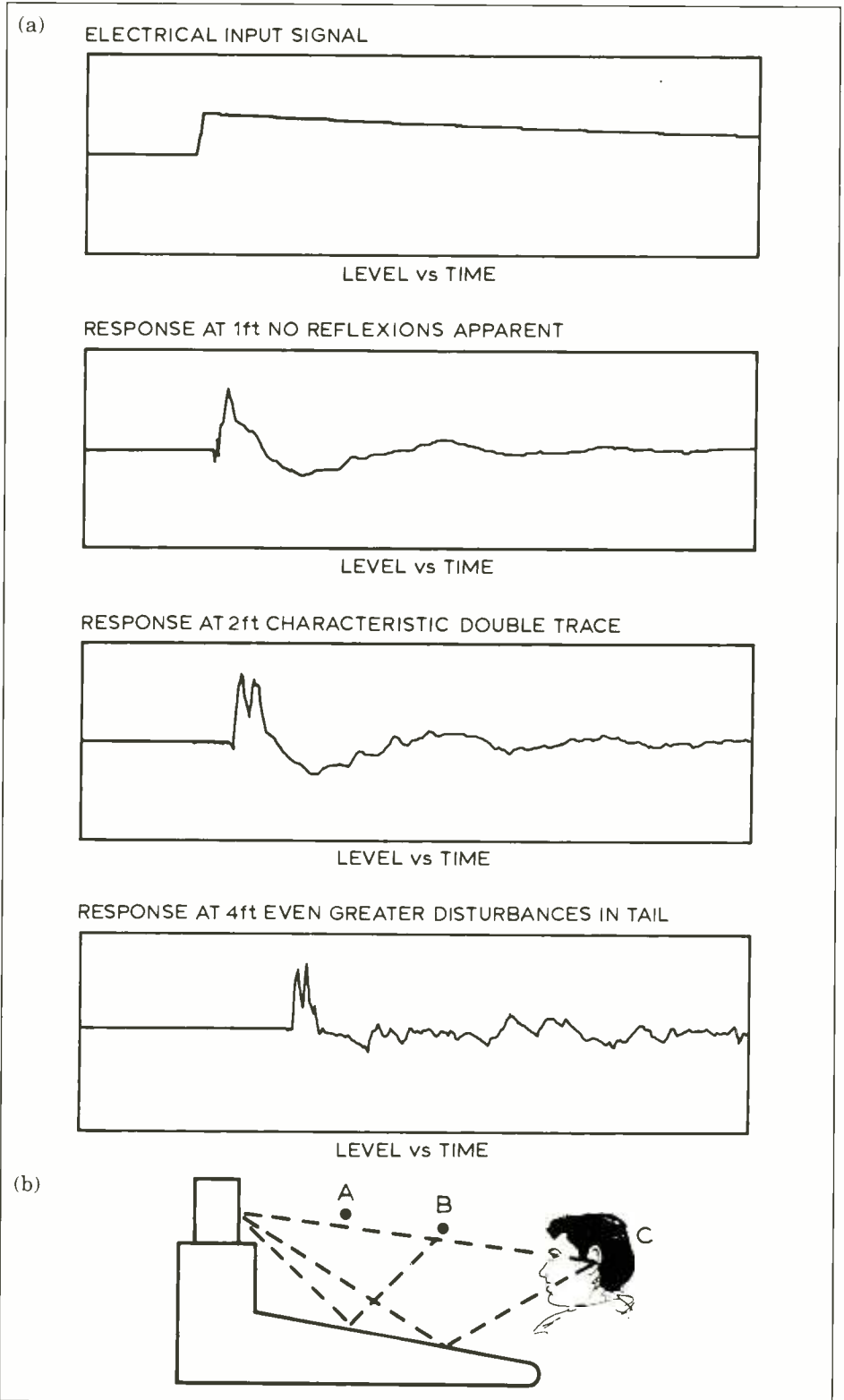
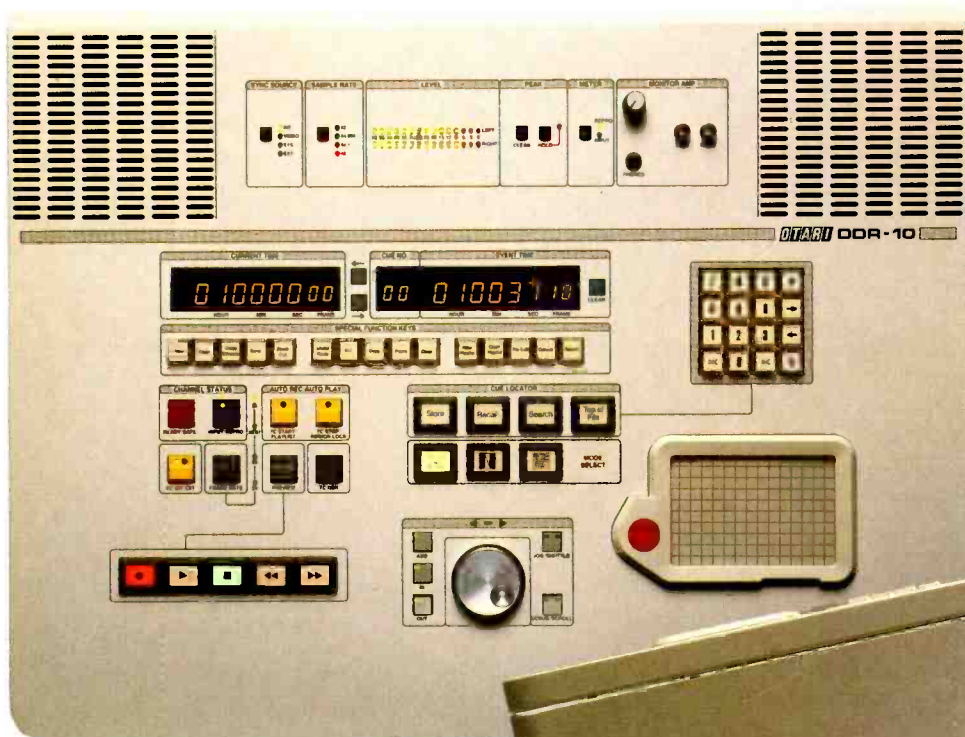


FIG 2: Nearfield monitor response

(a) Effect of the reflexions from the top surface of a mixing console on the transient response of a small loudspeaker placed on the meter bridge

(b) Loudspeaker directivity is too narrow to produce reflexions at position A. Reflexions are apparent at positions B and C with differing ratios of direct to reflected path lengths, hence they produce different composite transient waveforms as in (a). Positions A, B and C relate to the 1 ft, 2 ft and 4 ft plots above

COMING FACE TO FACE WITH THE FUTURE
IS A LOT MORE FAMILIAR THAN YOU MIGHT THINK!



We don't ship tape recorders to you in pieces; you won't get our new disk recorders that way either.

Our new DDR-10 digital disk recorder is a fully integrated system that comes ready to roll in and turn on. There's no assembly, no cabling, nothing more to buy. *And because it looks great, clients simply love it!*

If you know tape recorders, you're ready to go the minute you sit down at the DDR-10's control panel. The buttons and knobs are familiar, and they do what you expect. It's the only audio disk recorder in the world designed in this way – designed for the professional.

With up to 60 hours of the highest quality, full-bandwidth digital audio, *and* extensive editing capabilities, the DDR-10 delivers the best "power-to-price" ratio you can buy. And its standard Macintosh® SCSI

buss (rather than a proprietary design), means you're free to take advantage of future advances in the computer industry. This way, you're not locked-in to a system which seemed "special" at first, but quickly became *ancient*.

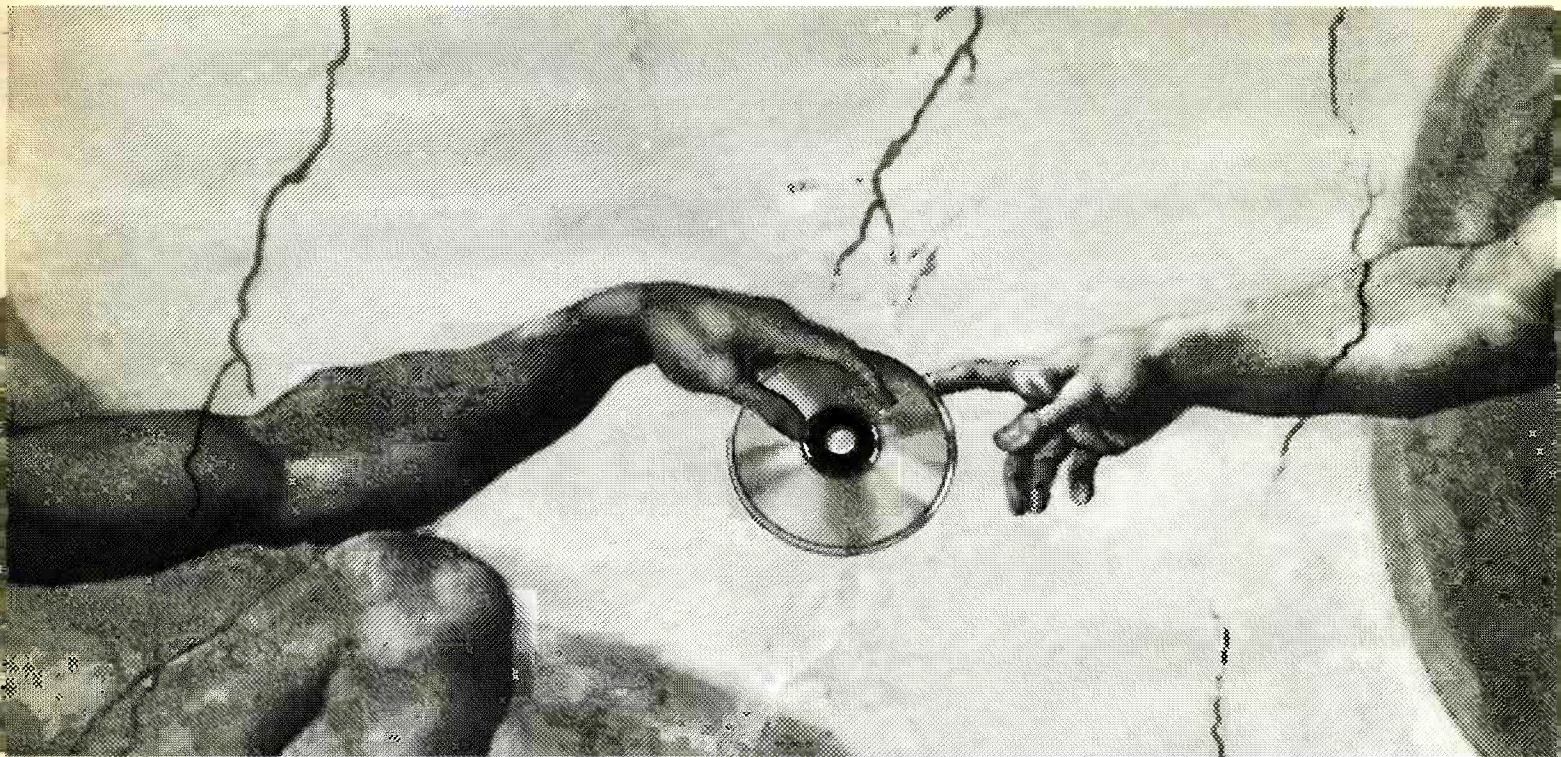
For your convenience, CD replication directly from your DDR-10 soundfile is now available. For more information about this service, and the DDR-10, call your nearest regional office below for information from Otari; a company famous for technical support and customer service, worldwide.

OTARI

Otari, Inc., Tokyo (0424) 81-8626
Otari Corp., California (415) 341-5900
Otari (UK) Ltd., United Kingdom (0753) 580777
Otari Singapore Pte., Ltd. (65) 743-7711
Otari Deutschland GmbH, West Germany 02159/50861-3

© Otari, 1991
Macintosh is a registered trademark of Apple Computer, Inc.

Keep in Touch !



Top music industry professionals the world over - the people at the cutting edge of market developments, new technologies, and artistic trends - have for the past 26 years been using Midem as their indispensable business platform.

Whatever your role - equipment manufacturer, studio, producer or broadcaster -, Midem is definitely for you.

Book your stand at Midem and heighten your profile, exhibit your products and sell them. Negotiate new deals and sign new contracts with partners from all five continents. Promote yourself in the Midem Guide, Pre-news and Midem Dailies.

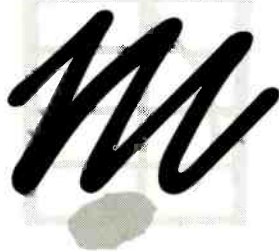
Moreover as a British company exhibiting at Midem, you should qualify for a DTI subsidy,

providing your stand is booked by September 30 th.

At Midem you can explore the future of the music business in the company of the cream of the world's specialists. And with lavish quantities of showcases and concerts, there's no place like Midem to discover the trends and talents of tomorrow.

Year on year, the growth in the numbers of attendees proves Midem's undeniable success and bottom-line usefulness. The figures speak for themselves : 400 exhibitors, 8,000 participants, 1,200 companies representing 54 countries.

It stands to reason. If the music industry needs you, you need Midem. Call Peter Rhodes now on 071-528 0086 or send in the coupon.



MIDEM

The World's Music Market
Palais des Festivals, Cannes, France
January 19-23, 1992

I would like to receive further information on MIDEM 92

Name _____ Company _____ Tel _____
Address _____

CONTACT UK : PETER RHODES, TEL 071-528 0086 • FAX 071-895 0949
I.E.O. METROPOLIS HOUSE, 22 PERCY STREET, LONDON W1P 9FF

As a general rule, predictability of final overall response is made easier when the disk is small compared to the size of the room. Where the desk occupies a considerable percentage of the room's volume, one is no longer really dealing with the room itself as an acoustical space. This is not to say that a large console in a small room cannot sound acceptable but in general the effect of a console is largely a function of the percentage of the space of the room it occupies if predictability of response is to be maintained. From an acoustical viewpoint, the best console is no console.

Of course, manufacturers exist in a highly competitive and cost-conscious world but the console is only part of a system and not the epicentre around which the rest of the studio must revolve. It would take only a little forethought and consultation to produce an ergonomically viable, acoustically streamlined console, which would cost little more to achieve yet could well boost sales. A console that does the least damage to a room's acoustics will no doubt be considered sonically superior to one of similar electronic clarity.

When a well-designed control room is first completed and nothing installed but the monitor system, its sonic characteristics will almost always be heard at their best. As equipment is brought into the room, its acoustic neutrality will generally degrade. If sufficient ill-conceived and ill-sited equipment is installed in that room, then the room as used will probably bear no acoustic

resemblance to the room as designed and constructed. Indeed, many well-designed rooms are acoustically ruined by the careless installation of too much reflective and resonant equipment. More care in the design and placement of such equipment will lead to better overall acoustic performance.

Once a studio is up and running, personnel frequently seem to forget all the careful considerations about the initial attention to system detail. Equipment is moved around without thought, and blank panels screwed into holes, which were to have housed equipment that was never purchased. Movement is a problem where overall symmetry is lost, creating different reflexion patterns on the left and right hand sides of the engineers. Blank panels, especially the larger ones, can ring to produce unnatural coloration unless suitably damped. Where such panels are either in the mainframe of the console or in the effects wings, they can be damped with automotive panel damping material, which is available from most of the larger car accessories shops. Another alternative is *Revac* or similar deadsheet, glued to the inside of the panel.

As with the ringing console panels, such an application of damping material can noticeably improve the imaging and overall perceived neutrality of the monitoring. Unfortunately, such resonances are not always very obvious. They insidiously add their own character to the monitor output, usually blurring the temporal and spatial response of the system, rather than adding any noticeable lumps to the perceived frequency response of that system. It is often only when their unwanted contributions are removed that their significance can be noticed by their absence.

Most studio personnel would be quite alarmed to

realise the degree of acoustical degradation that usually takes place on installing studio equipment in a new room. In each and every studio, somebody should take responsibility for ensuring that any equipment installed in that studio was in itself acoustically neutral and that its siting was consistent with good acoustical practices. The acoustic interactions in a working studio are far too complex for any electronic fix: there must be acoustical solutions to acoustical problems.

Every so often, ships enter dry dock for the barnacles to be scraped from their hulls. Just as those barnacle build-ups reduce a ship's efficiency and performance so the build-up of odds and ends in and around the mixing console can severely degrade the performance of a control room. A regular 'scraping of the barnacles' can work wonders for control room performance just as much as for ships.

When consoles are designed with large, flat top surfaces for their meter bridges, they also seem to be a potential hazard to neutrality. Not only do they reflect glancing soundwaves towards the ears, but they also become home to anything and everything that has nowhere else to go. Electric flowers which dance to the music, cups, beer cans, extra pieces of hired-in, flight cased effects and an

entire array of different nearfield monitor systems that all help to distort the acoustics. Often the proliferations of small loudspeaker systems are down to the fact that various clients can't get on with

the main monitors. I've known situations where they can't even see them. I remember visiting one very well known studio in London where four of the five drive units in each cabinet of a monitor system were invisible from the engineer's position. They were obscured by the loudspeakers and other add-ons to the meter bridge.

Many people like flat top bridges for their convenience but is it the responsibility of the console manufacturers to save the studio personnel from themselves? An angled surface is in itself more desirable on acoustical grounds, but more importantly it will discourage a cluttered bridge. The resulting greater neutrality in the monitoring environment will probably be put down to an improved sonic performance and better reputation for the console itself.

It is surely, therefore, in console manufacturers' interests to reconsider the acoustic effects of the presence of their consoles in control rooms. If the acoustic considerations are addressed at the outset of design, the cost implications are not great. It is largely a matter of the choice of geometry and attention to panel location and damping. Unfortunately, not all control rooms exhibit sufficient neutrality and imaging to render some of the more subtle aspects noticeable. In those environments which do offer such neutrality, it is all too frequently the mixing console that limits the realisation of the full sonic performance of a total control room system. At the other end of the scale, however, panel resonances have produced clearly audible degradation of monitoring performance, even in some of the most rudimentary control rooms.

The problem of the acoustic design of consoles warrants considerably more attention than it has customarily been given. □

A console that does the least damage to a room's acoustics will no doubt be considered sonically superior to one of similar electronic clarity

QUALITY USED EQUIPMENT

from Tony Larking

SUMMER BARGAINS

MULTITRACK

AKAI ADAM 24 track system	£13,995
MCI JH110B $\frac{1}{2}$ & $\frac{1}{4}$ h/blocks	£1,995
OTARI MX80 24 track	£11,500
OTARI MX5050 MK3 8 track	£1,995
OTARI MX5050 4 track	£750
REVOX PR99	£550
REVOX B77 15ips	POA
SONY MCI 2 track $\frac{1}{4}$ "	£1,500
STUDER A820 24 track, rem/auto	£19,995
STUDER A820 2 track	£2,500
STUDER A800 24 track	£8,500
STUDER B67 2 track	£995
SOUNDCRAFT MK3 24 track	£4,995
SOUNDCRAFT MK2 24 track	£2,995
SOUNDCRAFT SATURN 24 track (ex demo)	£12,500
TASCAM MSR 24S NEW	£5,995
TASCAM MSR 24DBX NEW	£4,500
TASCAM MS16 rem, auto & DBX	£4,500
3M M79 24 track VGC	£4,995

CONSOLES

DDA AMR24 36 channels (new)	£28,995
SOUNDRACS IL4832 with AUTOMATION	£24,000
SOUNDCRAFT 6000 36/24/24 p/bay	£8,750
SOUNDCRAFT 6000 44/24/24 p/bay	£9,950
SOUNDCRAFT 1600 16/8/16	£1,995
SOUNDRACS CP6800 40/24 p/bay	£12,500
SOUNDRACS CP6800 32/24 p/bay	£9,995
SOUNDRACS PC MIDI 24	£3,500
SOUNDRACS CM4400 32/24	£3,995
SSL 4000 G-SERIES COMP	POA
TRIDENT TSM 32/24 p/bay	£5,995

MONITORS

ATC SCM100 powered monitors	pair £2,750
COURT MONITORS	£500
EASTMILL T-SERIES	£500
GENELEC TRIAMP 530	£POA
LOCKWOODS/15" TANNOYS	£350
TANNOY 15" x 2 Lockwood style	£395
UREI 809 (ex demo)	£995

VARIOUS

AKG D224E (3 available)	£55 ea
AKG D12	£55
AKG 451 (2 available)	£55ea
AK Q-lock	£500
BEL BF20 stereo flanger	£250
BOSKE US8	£75
BOSKE SM9	£75
DOLBY-A XP24 24 channel N-R	£1,995
DOLBY-A 361 PAIR	£400
DOLBY-A 360 PAIR (4 AVAILABLE)	£300
EVENTIDE H910 harmoniser	£400
GBS x 2	£55 ea
ITC triple stack cart with record module	POA
ITC single cart with record module x 3	POA
KLARK TECHNIK DN22 graphic eq.	£250
LEXICON PRIME TIME	£300
MARSHALL 5002 time modulator	£100
NEUMANN U47 fet	£500
NEUMANN KM861	£350
NEUMANN U47 valve mic	£1,600
NEUMANN U49 valve mic	£1,995
ORBAN 516EC 3 channel de-esser	£400
SME 3009 S2 arm (new)	POA
SONY PCM F1 portable system	£350
QUAD pre-amp	£75
SCAMP RACKS loads of modules	POA
SURVIVAL PROJECTS stereo panner	POA
TELEFUNKEN V76 valve mic pre-amp	POA
TURNER A 500 stereo power amps	£250

Tony Larking Professional Sales Ltd.

PHONE FOR COMPLETE USED LIST

EXPORT ENQUIRIES WELCOME

TEL: 0462 490125

FAX: 0462 490126

All prices are exclusive of VAT

You have to hand it to George Thorn of Roland UK for braving the lions, demonstrating the *Sound Space (RSS)* synthesiser to the Audio Engineering Society in London, and taking questions. It makes a welcome contrast to the way Archer Communications tried to launch Q-Sound, with one-way transmission of hype. But whether Thorn's pragmatic approach to *RSS* succeeds in making the system more than a gimmick flash-in-the-pan, remains to be seen.

Groups of four or five heard *RSS* demonstrated in a separate room. To listen they had to stand in a queue in front of the loudspeakers. There is no doubt that *RSS* does spread sound well outside the speaker stage, like binaural headphone listening, and like JVC's Biphonics two-speaker system of a decade or more ago. But, as with Biphonics, any head movement left or right destroys the spatial effect, and changes the tonality of the sound. I was fifth in the line of listeners and heard very little effect. Demonstrations to a larger audience suffered the same problem. And it all sounded very phasy to me.

Few families form a straight line queue in their living-room to listen to records. Thorn admits *RSS* is a "solo listening experience" but believes that the listening public will "sit in the middle of loudspeakers if told to do so". With commendable

Barry Fox

Spreading stereo; eliminating room reflexion; backward message masking

frankness he acknowledges that *RSS* processing "changes the tonality of sound anyway" and the effects "work best on moving sound".

RSS was the result of seven years of research by Roland's R&D department in Japan, which has 300 engineers on the payroll. New, unspecified developments are promised. It is unlikely that they will solve the basic problem of requiring the listener to sit in a central position and refrain from head movements.

Roland have tried *RSS* on 1,000 different people, and discovered that women hear the effect more than men and that right and left handed people hear left and right handed image shifts.

Professional engineers hear the effect less well. "It is best for the casual listener. But take heart. You

can learn," Thorn reassured the AES audience.

Most hopeful, Roland is advising engineers to use *RSS* with subtlety and avoid overkill. On the Rolling Stones' *Flashpoint* album, *RSS* was used on eight tracks to spread the ambience. On track four, *Miss You*, Jagger's scream is *RSS*-processed. Thorn describes it as "token over-use".

Abbey Road is apparently planning to try *RSS* on an opera recording and Jean Michel Jarre has bought a system. So we can perhaps expect a Docklands extravaganza with sound spread wide across London. You can be sure that having bought a system Jarre will use it.

"There is an education process for us all to go through. Beginners, we call them *RSS* virgins, need to sit smack in the middle," says Thorn replying to criticism of phasiness. "Engineers are brought up to worry about phase. The public doesn't know what phase is, and it doesn't offend them either. Initially I had a feeling of discomfort, but it's worn off. It very rarely disturbs me now."

I have to say I find it hard to swallow Roland's philosophy that people must learn to appreciate *RSS*, first sitting in a tightly defined place and then, when they know what effect to expect, moving out of the hot seat. The general public does not behave like that.

But if used once in a while on a recording, *RSS* becomes just what Thorn says it is, another special

STUDIO
REFURBISHMENTS

Time for a
Change?

BUT NO TIME TO SPARE!



WITHOUT DISRUPTION
GIVE YOUR EDIT SUITE
CONTROL ROOM OR STUDIO
A NEW IMAGE!

TYPICAL COSTS

20' x 20' £ 5,000 25' x 50' £ 15,000
including labour & materials.

Wide experience in the Design and Construction of studios allows us to transform your premises (fabric walls, clean carpets, ceilings, new hardwood surrounds etc) through the night if necessary, leaving you, 2 days later, with a **PRISTINE NEW STUDIO**

Call us TODAY For Further Details



MOUNTBATTEN HOUSE
Fairacres, Windsor, Berkshire. SL4 4LE
Tel: (0753) 841800 Fax: (0753) 840859
DISCOUNTS ON MULTIPLE ROOMS

effect in the audio armoury.

"We do not claim total mono compatibility," adds Thorn, "but it is possible to mix for a good stereo effect and not suffer to any significant degree in mono. The signals are never completely out of phase."

In line with the pragmatic approach of regarding RSS as just another effect, Roland asks for no royalty on use of the system. And they only ask (rather than demand) a sleeve note credit of the Roland logo. "But we put a pretty hefty price-tag on the hardware," says Thorn.

This is probably a very wise policy. News now comes, from the US, that Hugo Zuccarelli is suing Michael Jackson for using Holophonics on the album *Bad* and single *I Just Can't Stop Loving You* without paying for the privilege. It seems that when asked for money Michael Jackson simply took Holophonics out of the mix but left the system credited on the sleeve note, making people think that Holophonics did nothing to the sound.

Having been at the receiving end of Zuccarelli's hype when he first wove the mystery of Holophonics, I have to say that I think he and Jackson may well deserve each other and that RSS is a far better bet for any producer who wants to throw some surprises into the mix.

Nearly 10 years ago I visited Acoustic Research in the US and heard the company's prototype digital signal processing system. This used digital filters to subtract acoustic anomalies from a room. The results were encouraging but the system was not good enough to sell.

Soon after, in 1984 (just as AR's patent on the technology came through) AR's parent company Teledyne (who own 130 companies in the defence and aerospace industry and never seemed too interested in the subtleties of audio) disbanded AR's research and development team.

The Japanese went off at a tangent, with their own DSP systems. These doctor the sound of a domestic hi-fi to add a chosen acoustic, for instance to make a string quartet recorded in a dry studio sound as if it were playing in a cathedral. At the same time the Japanese have put manual equalisers on everything, from hi-fi amplifiers to waterproof *Walkmen*.

In 1989 Teledyne sold AR to Jensen and the next year Cambridge Signal Technologies, or SigTech, of Cambridge, MA, USA, bought the signal processing technology. Ron Genreux, one of the original research team at AR, joined SigTech, and brought the idea up to date. The system, called Acoustic Environment Correction, is now ready for production and sale.

It is worth recalling the first principles of why loudspeakers sound different in different rooms. Sound reflects from the walls, ceiling, floor and furniture so that the listener hears a mix of direct and indirect, and thus delayed, sound. When the different soundwaves are in phase, they reinforce. When they are out of phase, they cancel out. Phasing depends on the frequency of the sound, length of reflexion path and time of arrival.

The ideal fix is architectural. The current second best fix is to analyse the spectrum of the sound at the listening position and manually adjust a

graphic equaliser. But the equaliser bands are too broad for accurate correction.

AR's aim in the early '80s was to automate, using computer control of the digital filters. At the time the only chips available were microprocessors with an operating speed of 10 μ s per calculation. This limited the frequency of the signals doctored in realtime to below 1 kHz.

In 1990 SigTech bought the patented technology and subsequently its designer Ron Genreux has developed and built a new system, using Motorola digital signal processors, which work at 75 ns. This is fast enough to process all audible frequencies in realtime.

SigTech's AEC gangs 24 DSPs in parallel to create 2640 separate filters, each with a resolution of 13 Hz. The filters are set up by a PC. With the filters disconnected, the PC generates a random noise signal, which is fed through the loudspeakers into the room. A microphone, placed where the listener will sit, analyses the pattern of direct and reflected sound. From this the PC builds a set of instructions, which adjust the digital filters so that they doctor sound in exactly the opposite way to the room. From then on, all sound signals are fed through the filters before the loudspeakers reproduce them.

"The Japanese overlay their effect on top of the room," says Ron Genreux. "We are taking the room out of the equation."

"There is general scepticism in the recording industry," he admits. "Everyone wants to try it for themselves." SigTech has tested the system at 15 sites in North America, including the studios owned by Sony/CBS in New York and the Canadian Broadcasting Corporation in Toronto. The effects are most noticeable in poor acoustics, the kind you find in the vestry of a church used for location recording.

In London recently for the APRS, SigTech bravely demonstrated AEC at Abbey Road. Afterwards EMI's engineers felt the system added clarity to the music reproduction. Their reservation was that the effect is most pronounced when engineers sit exactly where the microphone was positioned for set-up. In practice this is not a serious disadvantage because engineers routinely sit in a tightly defined position when recording.

The AEC box will cost around £5,700, the set-up software and hardware for a PC costing another £1,700. Because only one set-up per room is needed, SigTech will appoint agents to set up systems on a service basis. In the long term SigTech plans a domestic model. The price of DSPs is falling all the time. Currently they cost around \$15 (£7.50) each.

Early in January satellite news service CNN ran an item on backward masking: the trick of putting a message on a recording that only makes sense when played backwards. The idea behind backward masking is to disseminate subliminal messages.

Remember the run-out groove on the Beatles' *Sergeant Pepper* album? A lot of people wrecked their gramophone needles by playing this backwards by hand. They were all sure they could hear a message. But everyone interpreted what they heard differently.

The CNN news item featured a recording engineer (from Florida, I believe) telling how he had played all Madonna's recordings backwards and heard masked Satanic messages in several tracks. CNN reproduced the effect, apparently with one of the old Teac 4-track $\frac{1}{4}$ inch open reel machines. These were originally designed for reproducing quadrasonic tapes and then used for 4-track home recording. When a $\frac{1}{4}$ -track stereo recording is played, switching to the wrong head pair plays one stereo pair backwards.

CNN reckoned they heard messages too, and played the backwards tapes with the masked lyrics displayed on screen like a bouncing ball singalong. I only caught the item briefly (around January 10th/11th) while in a Las Vegas hotel. But one of the tracks played was *Rescue Me*, with the word 'Satan' easy to recognise when highlighted with the bouncing ball.

Later I phoned and faxed CNN many times, both the station's HQ in Atlanta and the bureau in London. I asked each time for the name and contact number of the engineer who had unmasked the messages. Despite many promises from CNN, and numerous reminders from me, CNN never came back to me.

Then UK Channel 4's youth entertainment programme, *The Word*, ran a short item. *The Word's* producer, was more helpful than CNN. He had got the material for the story from a US TV station (CNN perhaps?) and demonstrated how two Madonna tracks, *Like A Prayer* and *Justify My Love*, contain the phrases 'Save us Satan' and 'Hear us Satan' when played backwards.

Soon after, Joan Rivers cropped up on the satellite channel Lifestyle, interviewing Rob Holford of Judas Priest, and Gail Edwin of CBS Records. The gist of a rather muddled conversation was that you could hear the words 'do it' when some heavy metal recordings are played backwards. The Rivers interview had been prompted by the \$9 million law suit brought in 1988 against CBS Records by the parents of Michael Waller. In 1986 Waller, then 16, had shot himself. His parents believed that he had been encouraged by subliminal messages buried in Ozzy Osbourne's song *Suicide Solution*.

A similar law suit had previously been brought against Judas Priest, whose album *Stained Glass* was claimed to have caused another suicide.

Both cases have now been thrown out of court. But under the US legal system there always seems to be opportunity for another appeal so I hesitate to say both issues are now settled.

There is no doubt that everyone is sincere in the conviction that they can hear a backward masked or subliminal message, especially when told what to listen to with lyrics displayed on screen. And that's the rub.

Forensic experts know only too well that if you give two people the same poor quality recording, for instance a bugged conversation or telephone tap, they will each hear completely different words and meanings. And once you tell someone what to hear, they will hear it, and swear on oath to hearing it.

Has anyone out there at the sharp end any hard evidence of artists putting masked messages into their recordings? _

Andrew Allen had worked very hard to take his modest inheritance and build it into a fairly successful audio contracting and sales firm in his region of the United States. He had created a successful niche for himself by providing services involving high quality intercommunications and monitoring systems. He also specialised in simultaneous translations systems. His clients included the world of television and motion picture production, theatrical settings, auditoria and stadia, sports arenas, international organisations and the like. He had learned through the years to use certain products of proven reliability to provide carefully defined functions and had thrived from his expertise.

One day his carefully defined world began to fall apart. He had asked his assistant to place an order for 20 of the small 40 W monaural amplifiers that he liked to use in translation systems. He was shocked to be told that his order had not been accepted. He was no longer eligible for the extension of credit, his assistant said. They would be able to pay cash at the full list price, freight-on-board the factory. The company would supply only a 100 W stereo amplifier that could be switched to provide a single output but without a high voltage transformer feed. Without the 70 V line function, his standard for speaker level distribution of signal, there could be no installation. He decided to call the vice-president in charge of sales at the company in question. The conversation at Andrew's end was limited to the stunned utterance of grunts and the occasional sucking of air, as he was told that his company was no longer carried on the approved distributor list and that it really didn't matter anyway since the products in question had been discontinued. After he had hung up the telephone, Andy sat and pondered the implications of his conversation.

The vice-president had explained that the Fiscal Review Operations Group of the company had recommended the discontinuance of all distributor and credit relationships of less than \$500,000 in annual invoicing. The committee had also indicated the need to drop from the product line all models that did not account for at least 2% of the gross sales figures. Andy had asked if it mattered that the products in question and the distributorships in question were profitable to the company? He had been told, "No! Absolutely NO!!!" The only issue that mattered was that such small portions of the total operation still required the same complex management services support as far more profitable areas such as the dog food operations and the brassière manufacturing subsidiary. In fact, he had been told that top management considered much of the electronics operation to be "rather archaic and untidy" in providing what the customer wanted, rather than making the customer want what the company provided.

Andy also jogged his memory with the thought of profitability from push-up bras and fido treats. The sound products company he had been associated with for so long, had been purchased last year by a large conglomerate. The well respected founder had entered his 70th year with some real concerns for the impact of estate taxes

Martin Polon

Bean counting and small fry. Comment from our US columnist

on his heirs and assigns. The lawyers had recommended selling the company. The result was a sale joining amplifiers to women's underpinnings and recycled horseflesh, and not coincidentally bringing the audio concern within the grasp of the industrial octopus's bean counters. Andy was most revolted by the telephonic recantation of an erstwhile slogan that had been temporarily favoured by the new executives: "We feed the beasts, uplift the lives of the ladies and bring music to the ears of mankind."

The above tale is, as usual, a hypothetical amalgamation of various forces at work in our audio industry today. But this piece of fiction is closer to reality than not. The unfortunate consequences of today's business climate in general is to move the audio industry in specific, into a business environment, which is more or less toxic to the traditions and mores of past audio business practices.

Now, no one can question the demise of the one-man-band school of management in many different segments of the audio industry. The 'noble' founder, who loved his customers and dealers nearly as much as he loved his products and innovations as well as audio technology — is today as much an extinct specie as the Dodo bird. Edwin Land, father of the Polaroid camera, among scores of other important inventions, was once described as loving 'technology more than money'. That description could be used for many pioneer manufacturers, studio owners, audio innovators, etc. Our industry is much the loser for the demise of that good specie. No one can deny that prudent management is necessary for any

Maintaining a full line of what is needed as opposed to what is exceedingly profitable is probably the major stumbling block for the so-called modern managers who would remake the audio industry

business venture to survive. But the macro-economic model of a small industry with many inter-related 'Mom and Pop' businesses worked very well for a very long time. Many in the audio industry still do not understand why dramatic change has been necessary.

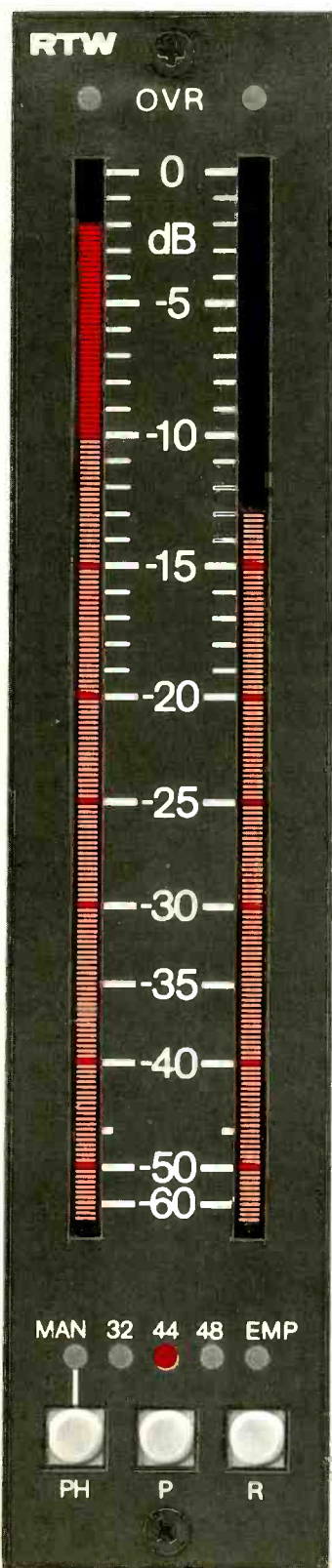
Change in the business structure of the audio industry has occurred primarily because of three factors. One is the 'greying' or death of the 'beloved founder' and his close associates. These people as a group mostly came under the influence of the electronics explosion of the 1950s and '60s. Now, the founding fathers of our audio industries and others newer and less grey but still of the pioneering spirit are ready to 'cash in their cards'. On both sides of the Atlantic, the 'Grim Reaper' or fear of the Reaper's right hand assistants — the Inland Revenue and/or Internal Revenue Service — is prompting a speedy exit from the companies built so laboriously in the past. Death duties or estate taxes have pushed many companies into the open marketplace for purchase.

The second element forcing a change in ownership is the onerous financial demands of research and development. The business of audio has entered the domain of computers and computer chips and digitisation. No one can compete in the development of new products who cannot afford to create their own proprietary chips and that, among a lot of other things R&D-wise, costs money. The last is the incorrect assumption that the audio industry has become 'Sexy'. In this case, 'Sex' is defined as being a very exciting marketplace what with the supposed intimate contact with the record business, motion pictures, and television — plus the perception that because of that contact the audio business is unusually successful. Even if companies do not change hands, the ascension of new management from within the founding family or without, often brings someone to the fore with the same unrealistic expectations of profitability.

Other forces are 'at play' in today's business world that often cause profitable and well-run companies to make a 180° shift in product line policies and dealer/customer relationships. The number one modifier of a company's business practices is the arrival on the premises of a 'management consulting team' from one of the several international firms of management consultants. Described by one audio executive who survived a recent 'putsch' by one of the management consultancies, as: "the real dregs of the Earth. Troll through Sadaam Hussein's middle manager corps for those who championed the concept of combining hospitals with command centres . . . add those formerly at the Internal Revenue Service terminated for 'exceeding the standards of authority', and top off the collection with those in the various state governments who prefer to lop funds off budgets for winter shelters since it is cheaper to remove and bury someone frozen to death than it is to house and feed them when alive."

Now this judgement may be somewhat biased against management consultants but the general

Peak Perfection



The AES/EBM digital format is now well on the way to becoming the established standard in the broadcast and professional studio domain, however metering on most current digital audio products is vague and provides little useful information.

RTW PPM 1152 EBU

The new RTW 1152 EBU Peakmeter is a vital instrument needed for level metering in the digital domain. It displays every single data word, making it possible to exploit the dynamic range of your digital system to the full, and to avoid overloads.

Information on the complete range of RTW Peak Programme and Phase Correlation Meters is available, on request, from Audio Design, Tel: (0734) 844545

Specify the RTW PPM 1152 EBU for peak perfection!

AUDIO DESIGN

Unit 3, Horseshoe Park,
Pangbourne RG8 7JW, U.K.
Tel: (0734) 844545
Fax: (0734) 842604



Coach Audio Sales

GÜNTHER KUTSCH AND STEFAN MEYER, GBR
SCHÜREN 12, D-6670 ST INGBERT, GERMANY
TELEPHONE (06894) 4717 AND 4727
FAX (06894) 383379

USED EQUIPMENT SALE 1991

SOUNDCRAFT TS 24, 56 frame, 56 channels, LED, 2½ years old
ADT-SMT, 48 frame, 24 channels + computer
AMEK 3500, 56 frame, 52 channels
AMER ANGELA, 56 frame, 52 channels, Mastermix, 48 tracks routing
MCI 500, 56 channels, bargraphs, patchbay
SSI 4048 E, 48 channels, patchbay, producer desk, bargraph, 8 years old
SSL 4040 E, 40 frame, 32 channels, Automation
SSL 4064 G, 56 channels, total recall, bargraphs
WESTEC 3020, 56 frame, 48 channels, Automation
TRIDENT 80b, 40 in/24 out, patchbay, best condition
Various SSL-parts: channels, total recall, computers, etc.
Harddisk 380 Mebabyte
Optical Disk

OTHERS

AUDIOFRAME WAVEFRAME + direct-to-disk
FOSTEX G 16
AKAI-ADAM 12 track digital
AKAI DD 1000 Optical Recorder
CALREC SOUNDFIELD Microphone
EVENTIDE H 3000 SE Harmonizer
SONY 3348 + locator/remote 48-track digital, 1 year
SONY 3324 A, 24-track digital + locator/remote
LYREC TR 532 + locator/remote
MAC 2 incl. Keyboard, trackball + monitor 18"
MITSUBISHI X-850 32-track + locator/remote + meterbridge
MITSUBISHI MX-80 2-track digital
MONITOR TECHNOLOGIES Nearfield Monitors, new
OTARI MTR-90 MK II + locator/remote, 4 years old
OTARI MX-80 + remote, 3 months old
OTARI MTR-100 A + remote, low hours, 1 year
OTARI MTR-12 2-track
OTARI DTR-900 32 track digital, 2½ years
QMS 215 speaker + amplifier, complete system
QMS 405 speaker
SYNCLAVIER + 8 direct-to-disk
BAR — digital workstation 4 channels
LEXICON 480 + LARC
TASCAM ATR-80 24-track + locator/remote
AKAI S1100 Sampler
YAMAHA NS 40 M
SYNCLAVIER 9600 in flightcase
SUMMIT AUDIO equalizer TPA-200
SUMMIT AUDIO compressor TLA-100
STUDER TLS 400 Synchronizer
STUDER A-820 2-track master, in console
SONY DAE 3000 PCM 1630 editing system
TUBTECH ME1A Valve Equalizer
TUBTECH CL1A Valve Compressor

Plus: Complete studio 24-track/master/console (GBP 25,000.00)

All offered items are subject to prior sale!

For further information and prices contact:

Mr Günther Kutsch
phone no. 06894-4717!

feeling of most individuals who experience the gentle graces of such 'deep probers' have not been any more positive. The consulting firms are usually brought into a company by the top leadership, fearful of a loss of income, status or market-position or all of the above. The usual result of such a management study is to reduce staff, distributors, products and services. Most often, the focus is on increasing profitability while decreasing the outlay for expenses from less profitable areas.

The potential sale of a company can also upset the various relationship and product 'appreciations'. Brokers brought in to aid the sale of a company frequently suggest a trimming of the workforce and cessation of activities that are considered 'less profitable'. Worse still, a company may experience a takeover where large term debt is used by the acquiring parties to pay for the transaction. To cover the service on that debt, major changes are made with a subsequent downgrading of products and services. This is all considered to be to the good and is frequently described as being 'lean and mean'.

At any rate, the end result has been the acquisition of many companies and/or a changing of the guard significantly modifying what was

familiar to audio professionals. Frequently, the new managements at these companies have a general motivation to achieve high profitability in a short term environment. To misquote an old baseball phrase, "That ain't audio!" The problem in many cases is an unwillingness to provide the support so necessary to the function of the audio community. That support can conflict with corporate goals in a number of ways.

Maintaining a full line of what is needed as opposed to what is exceedingly profitable is probably the major stumbling block for the so-called modern managers who would remake the audio industry. A \$400 (£200) mixer-amplifier does need microphone input transformers and speaker line output transformers. These accessories are often the sort of less expensive items that cost cutters want to eliminate at audio equipment makers. The rationale is that the overhead of the company for administration, data processing, information systems, warehousing, etc. is constant no matter what the item. Eliminating the low cost items or similar high cost items (replacing 40 W amplifiers with 100 W units) increases efficiency. But it does not serve the needs of the audio community in terms of providing a full line of accessories for major products sold. If one intends to service the recording services area or sound reinforcement

or the broadcaster or film-maker, the products needed to do the job must be available. One reinforcement contractor noted, "It's just like going to the supermarket. You shop where you can get all of the things you need. If a market stops carrying milk because it isn't very profitable, you will be unlikely to shop there even if the market has everything else you want to buy."

Manufacturers should maintain a broad range of distributorships based on profit rather than on meeting a minimum commitment. Of late, audio equipment manufacturers in several of the English-speaking countries as well as elsewhere, have begun to pare down their distributor or dealer relationships. The goals of such efforts, is to reduce the overhead of servicing the third party sales network. Yet such efforts frequently work against the best dealer or distributor in an area. For most audio equipment sold at any level — consumer, semiprofessional, professional — frequently the most successful sales organisations are the ones that heavily discount and offer distant delivery by mail, or parcel, or express service. That is all well and good for a substantial segment of the equipment-consuming population. But the nature of today's



i

The Next Best Thing To An SSL...

LOGICFX from Solid State Logic

complicated equipment requires considerable support after sales in terms of training in equipment operations and in warranty/repairs. The full service dealer will frequently do less business in total than his discount/mail order brethren. But it is the full service dealer who usually services the items sold mail order. There is no easy formula to determine how many dealers or distributors a company should have from each category. But it is clear that most large established customers, such as broadcasters and recording studios, shop where they get the most service.

Manufacturers should maintain distributors in less profitable geographical and demographic locations. The practice of culling sales points has also worked in some cases to eliminate certain geographical locations. If an equipment maker wants all dealers to sell a minimum amount of equipment each year, there will be many places where that minimum is virtually impossible to reach. For example, there is no way that a dealer in Nashville, TN, can compete with a dealer in Los Angeles, CA. Figures from the US Department of Commerce, Bureau of the Census show the comparison for the category of 'Amusement and Recreation Services', considered by many to be the most important indicator related to the overall consumption of audio products and services. Los

Angeles generates gross economic service figures of over \$8 billion per year in this category while Nashville can only pump about \$1/4 billion per year. Yet the 'right' dealer in Nashville can 'place' product in all the important studios in 'Music City' and those sales can influence other sales all over the south-eastern United States. Dropping such a dealer because of a minimum is business suicide.

Manufacturers should maintain business relationships with customers and distributors in good times and in bad! The current economic slowdown has prompted some audio makers to put strict limits on credit and payment terms for their dealers and large customers who sometimes buy direct. Of course, no one can extend credit indefinitely to a struggling distributor. But most often, the dealers need help 'bridging' the time period from the point where they receive an especially large order to the time that they are paid by the customer and can in turn pay the manufacturer. One would think it would be helpful to support the dealer, who is after all selling a substantial amount of product. But, as one dealer makes perfectly clear, "The yuppies in the credit department have replaced people we did business with for 20 years. They don't know us... they have never been here... they don't know our customers. A large Japanese company has been

after us for three years to give them a try. They have been down here... met our customers... talked to our bankers... gone out on jobs with our people. You figure out what will happen!"

Now the bottom line here is that change is the only factor that is a true constant. And change is continuing to upset the established audio 'applecart'. It is beginning to appear that the audio marketplace has not been kind to those interested only in the 'quick bottom line'. Several audio companies owned by those who had short term goals have been placed back on the block after only a few years of control. Several other companies offered for sale have not found a buyer from the 'quick turnaround' community. Perhaps it is encouraging to note that audio, like most other technology businesses, will flourish when the customer base receives the service that only a dedicated management can and will provide over the long term. The 1990s promises to be an unusually competitive time for doing business. The expectation among most analysts is that service to and for the customer will return to the top of the list of management prerogatives as it becomes the number one competitive tool in the marketplace. □



Now you can have G Series quality wherever you work -- with the new LOGIC FX modules from SSL. LOGIC FX provide the advantages of SSL's world famous G Series Stereo Compressor and Dual Mic Amp/Equaliser in separate rackmount units. They bring SSL's superior engineering and sonic excellence into your studio.

- ▶ Recording engineers/mixers make LOGIC FX standard gear in their racks.
- ▶ SSL studios use them to extend their E or G Series console capabilities.
- ▶ Studios simulate the legendary SSL sound with LOGIC FX on other consoles.
- ▶ Live sound mixers add SSL studio quality to concert performances.

For more information contact:

Solid State Logic

International Headquarters: Begbroke, Oxford, England OX5 1RU · Tel: (0865) 842300
 Paris (1) 34 60 46 66 · Milan (2) 612 17 20 · Tokyo (3) 54 74 11 44
 New York (212) 315 1111 · Los Angeles (213) 463 4444 · Toronto (416) 363 0101

Akai S1100

An operational report by Mike Collins on Akai's latest sampler



Most recording engineers will be familiar with the Akai *S1000* sampler, which has become an 'industry standard' in the UK. Built on the success of its forerunners, the *S900* and *S950* by adding stereo capabilities and 16 bit/44.1 kHz specifications, is considered by many to be the best in its price bracket for overall performance and reasonable ease-of-use.

Studios appreciate longevity in equipment, especially if the specifications can be upgraded to keep up with the latest developments in technology. If the operational aspects of a piece of fairly complex equipment such as this remain essentially the same, engineers who have found the time to familiarise themselves with the original model can continue to work with new models which retain a familiar user-interface.

In keeping with this aim, Akai have recently made available the *S1100* sampler, which has better general specifications and several new or improved features compared with the *S1000*. Yet the basic operation of the two models remains the same.

First impressions

The *S1100* comes supplied with four 3.5 inch floppy disks containing factory samples: Grand Piano #2 holds a very useful program of piano samples that have been very professionally trimmed and looped. Orchestral #1 has a selection of strings, orchestral brass, oboe and flute. The strings are excellent but I have heard better brass, oboe and flute. Workstation #5 has a selection of instruments suitable for a modern dance track, including piano, guitar, clarinet, bass and drum sounds. Sample Wave Mixing #8 contains a very good selection of pads, lead sounds, Xylophone and Marimba and synthesiser sounds, which could be very useful for film scores.

After checking out the factory disks, I tried out some *S900*, *S950* and *S1000* disks. All the disks and the programs loaded perfectly, this latter feature saving the need to recreate your keygroup mappings when transferring sounds from older libraries. The *S1100* effects will obviously not be allocated when you load other formats, however, it is quite easy to set suitable effects up yourself, once the programs are loaded

Multi-effects

The *S1100* is the first sampler to feature internal multi-effects, as the manual proudly announces, and there are 50 preset effects to choose from. These include several types of Reverb, including various halls, rooms and plate reverb simulations. The next category is Chorus/Flange, which uses a complex algorithm with four delay lines modulated by a low frequency oscillator to produce rich, swirling stereo effects. A separate delay lets you add echo effects to these. A stereo Pitch Shifter lets you transpose sounds up or down by as little as 0.01 of a semitone for subtle detune effects, and up to 50 semitones for a more 'outrageous' result. The last category is Echo and a three-tap delay line is used here, with feedback and pan independently adjustable for each delay line. Using this, you can set up effects similar to those of the old Roland *Space-Echo* and similar tape-delay units with multiple heads. In all, there are 20 preset reverbs, 10 chorus/flange/delay FX and 10 multitap delays — all editable.

Each effect has its own level, EQ, Pan and width controls, and every program can have its own unique effects. This is in contrast to some synthesiser units with built-in effects, where these effects are linked to particular sound programs and it can be difficult to re-program these for use with other programs. The Effects file contains 50 effects that can be freely assigned to any program

number. If there is a reverb you like on one disk, you can easily select this for use with any other program. You can even apply the same effect to several programs if you want to, with different amounts of effect applied to each of these using the effects send in the Mix page of the Select Program mode. And the 'icing on the cake' is that you can use the *S1100* effects as a standalone unit, where you route, say, a *Prophet 5* synth into the *S1100* and out to your mixer after adding effects. This feature can even be used in combination with the internal sounds — so you could play the *S1100*'s sounds and route an external synth through the *S1100*'s effects. This is a pretty flexible scheme and the *S1100* definitely scores a few extra points for this feature.

Main features

The review model had software *Version 1.0* operating system in ROM, and the manual stated that there was provision for future upgrades to be loaded from disk into RAM. The excellent manual was written by Steve Howell — a freelance MIDI specialist working for Akai (Japan) here in the UK.

Howell explained: "The *S1100* has 16 bit quantisation, with oversampling on input — the same as the *S1000*, however, it has a 20 bit DAC with 64x oversampling on output as opposed to a 16 bit DAC with no oversampling on the *S1000*. This means less noise and greater dynamic range from the *S1100*. The 20 bit DACs allow you to boost the levels of individual outputs in Edit Program mode by up to 12 dB, and you can boost the main stereo level by up to 6 dB."

This last feature is Akai's response to feedback from users about the *S1000* — which shows that they do listen.

When asked about using computer-based editors for the *S1100* control functions Howell stated that many of these functions will be accessible via SystEx in a future upgrade. This will enable editor software to be written for the *S1100* on personal computers sometime next year — maybe. Perhaps Akai should put a higher priority on this, as many people like to control their MIDI gear from one central location via computer.

One of the best features is Time-Stretch. This lets you lengthen or shorten a sample from 25% of its original length to 2000% (20x) its length. Here you can alter the length of a drum rhythm sample to fit in with the rest of the track without altering the pitch, or fit sound effects or vocal phrases to video soundtracks to get the timing exactly right. I tried this on a four-bar drum rhythm sample and it took 7 minutes to create a sample stretched to twice the length. This worked perfectly — the tempo dropped to half the original but the pitches of the drum sounds stayed the same. There are two 'modes' of operation available: Intel, which is for speech and music (which I used on the drum rhythm sample); and 'Cyclic', which is suitable for individual instrument samples. I tried Cyclic on some voice samples and can report that this also worked well in practice: I sampled an 'Ah' voice sound, and wanted to create a C major triad chord (C3, E3 and G3) from the original C3 sample. I

used Time-Stretch to create new samples at E3 and G3, and then played and held the chord on my MIDI keyboard. When the samples reached the end of their length, they all finished at the same instant — in contrast to what normally would have happened if I had just mapped the original C3 sample to play on the E3 and G3 keys, where the highest note would have finished first, followed by the middle, then the lowest note.

Another major new feature is the Q-Play mode, where you can create, edit and play cue lists. This is aimed at audio/visual post-production suites that do not use MIDI equipment (are there still such places in existence?). The idea here is that you enter a MIDI note to trigger a specific sound effect at a specific SMPTE location, and build a 'cue list' of these, which will play back at specific frame locations on your video. You can even create your cue lists on-the-fly while the video is playing. The *S1100* now has its own built-in SMPTE code reader/generator to facilitate this and the beauty of this system is that you don't need a MIDI keyboard to trigger your samples to SMPTE any more. It is a shame that the code reader won't handle MIDI timecode (MTC) though, because quite a number of A/V studios have MIDI equipment and MTC would be the ideal code to integrate the *S1100* into a MIDI set-up.

The *S1100* also has a built-in 'virtual' mixer with FX sends, pans and level controls for the individual and stereo outputs. Talking about stereo outputs, there is an extra pair of these, via *XLRs*, which provide 'realtime' digital output in AES/EBU and SPDIF formats. Using these, you can output audio to most professional digital tape recorders or DAT machines.

Backup and sound libraries

You can still use the optional IB 04 AES/EBU digital interface board (as with the *S1000*), which lets you sample in from DAT or CD digitally, and transfer data out to DAT. Using this you can back-up the memory, or a hard disk, onto DAT, including all your samples, program information, looping information, and so on. So this is a worthy addition to the system, even though there are direct digital outputs built-in — because these don't allow program data back-up.

There is also a built-in SCSI (Small Computer Systems Interface), which lets you connect any Apple *Macintosh*-compatible hard disk drive to the *S1100* to hold your sound libraries. Various third-party manufacturers can supply rackmounted CD-ROM drives, 45 Mbyte removable hard disk drives, and up to 1.2 Gbyte hard disk storage devices, which use SCSI. A popular combination is a CD-ROM drive and a 45 Mbyte removable drive in one convenient 19 inch rack.

There are no specific sound libraries available for the *S1100* yet, apart from the four 3.5 inch floppy disks that come with the machine, however, you can buy at least half a dozen CD-ROM disks containing different *S1000* or *S900* formatted samples. Also, many dealers have large libraries of samples for the *S1000/S900*, which

they will let you copy onto 45 Mbyte removable drives for a nominal fee.

RAM

The standard *S1100* has 2 Mbytes of RAM and this is expandable to 8 Mbytes using 2 Mbyte units, or to 32 Mbytes using 8 Mbyte units (as is the *S1000*). This gives you from 11.88 seconds for a stereo 44.1 kHz sample using 2 Mbytes, up to about 3 minutes and 10 seconds in 32 Mbytes — just about the length of an average-length 7 inch single, for instance. On a warning note, Akai say that third party memory boards are not recommended, as they have found certain manufactured units may not work properly.

Version 2.0

Akai have already announced that *Version 2.0* software will allow direct-to-disk recording with basic editing facilities. For instance, you will be able to have sequenced sounds playing from RAM in the *S1100* and, say, a sax solo playing back from a hard disk. This will make the *S1100* very much an 'all-round' recording tool — for studio use particularly. For instance, if you use the *S1100* to record material for your master in the studio, you could then take this to a *SoundTools*-equipped editing suite and make careful edits to your vocal tracks, or whatever, with no loss of quality, and only paying for the editing equipment, rather than for a full-blown recording studio. You could then transfer the edited sounds back to the *S1100* and use them on your final mix.

Use with SoundTools

You can transfer *S1100* samples to and from *SoundTools' Sound Designer II (SDII)* sample editing and hard disk recording software on the *Macintosh* via SCSI — using the *S1000* sampler setting in *SDII*. I found that I was able to improve some of the loops using *SDII's* superior facilities. Then I sampled a Wurliitzer electric piano into

SoundTools, trimmed and looped the samples and then transferred these into the *S1100*. Here I found that trimming and looping were much easier to carry out using the *SDII* software.

Unfortunately, I discovered that you cannot play the *S1100* via MIDI while it is connected to the *Mac* via SCSI — and if you turn the SCSI off without quitting *Sound Designer* first, the *Mac* crashes. Once set up properly, the transfer of short individual samples is very quick, however.

Unfortunately, there is no way to ask the *S1100* to send all its samples, one after another. You have to select them in turn and then transfer them individually. The selection is done via a scrolling numerical field in a dialogue box on the *Mac*, and if you want to select the 20th or 30th sample, for instance, this can be a tedious process. Also, I encountered several mysterious *Macintosh* 'crashes' while transferring sounds via SCSI. The 'watch' cursor would appear on screen and refuse to go away until I turned the *Mac* off. Another mysterious problem that occurred was while the SCSI cable was connected to the *S1100*, unpleasant noises found their way into my monitor amplifier every time any of the disk drives on the *Mac* were active, or the *S1100* SCSI transfers were taking place. I disconnected the mixing desk from the monitor amplifier and it still happened — but only with the *S1100* SCSI linked to the *Mac*.

Despite these problems, I recommend *Sound Designer* (or *Alchemy* software) to professional users — as the on-screen editing and looping features are far superior. Using sample editing programs such as these will save you precious studio time and allow for much more accurate work.

Summary

The previous top-of-the-range samplers from Akai, the *S900*, *S950* and *S1000* all became 'industry standard' models in the UK. Akai have worked hard to provide useful new features for the *S1100* to help it to maintain this position.

There is still room for improvements to the design — for example, setting loop startpoints can be difficult, especially as the waveform is not displayed sufficiently well for you to see its envelope properly. It can also be awkward to move between some of the parameters you need to edit on different 'pages'. I believe that front panel editing software for personal computers (as well as the existing sample editing software) would be very advantageous for studio use.

It is good to see the continuity of the *S1000* instrument 'family' in the market of hi-tech MIDI equipment, where each year brings many new models, often with radically different user-interfaces, that the poor musician or engineer has to struggle to learn 'on the job' at his next gig or session.

I wish Akai every success with this revamped *S1000*, and it is a welcome addition to their range of professional samplers. The *S1000* model is still available, as are the playback only and keyboard versions, but studio users may well opt for this higher-spec *S1100* rackmount unit. □

Specification

16-note polyphonic, rackmounted, stereo digital sampler
 44.1 kHz, 22.05 kHz sampling rates, 16 bit resolution
 20 Hz to 20 kHz, 20 Hz to 10 kHz bandwidths
 2 Mbytes of memory as standard, expandable to 32 Mbytes
 Sampling time (2 Mbyte RAM): 23.76 s, mono @ 44.1 kHz; 11.88 s, stereo @ 44.1 kHz; 47.52 s, mono @ 22.05 kHz; 23.76 s, stereo @ 22.05 kHz
 Features time-stretch, SMPTE read/write and cue lists for A/V work. Has eight individual and stereo analogue jack outputs, plus *XLr* AES/EBU digital outputs
 Optional IB-04 digital interface board provides digital in/out and DAT backup
 Will read *S900*, *S950* and *S1000* disks

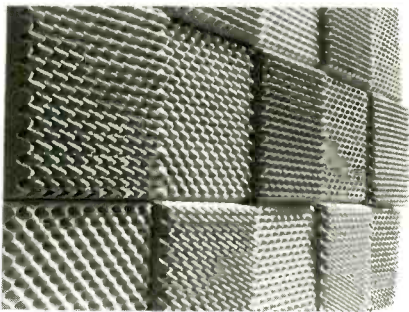
PRODUCT PROFILE

PRODUCT PROFILE

treatment	ROCKFLEX RYCOTE SENNHEISER SHAPE	Leads LED Bargraph Mains Cable	Acoustic Treatment Acoustitle Aerosols AGFA AKG ALESIS AMPEX Audio Oscillators Bantam Plugs BASF BEYER Blanking Panels Boom Arms BRADY BSS Bulk Erasers Cables Cable Drums Cable Markers Cable Ties Cage Nuts CALREC Cassettes Cassette Deck Cassette Label C.D. Players Chinographs Compressors CONNECTR DAT DBX De-gausser DENON D.I.Boxes DRAWMEF EDAC EDITALL Effects Un Editing B ELECTRO Empty S Fishpole F.M.Tun FOSTER Gaffer Tape Goosenecks G.W.INSTRUMENTS Headphones Headphone Amp Headphone Splitter Headsets	ROCKFLEX RYCOTE SENNHEISER SHAPE	Leads LED Bargraph Mains Cable
-----------	---	--------------------------------------	--	---	--------------------------------------



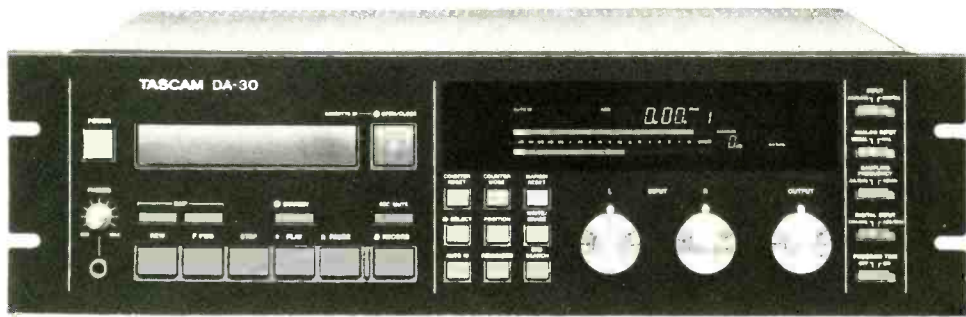
Chrome & Ferric Mastering Cassettes
 BASF tape in Swiss ICM bodies.
 C5-C90.5 We supply over 250,000 a
 year at easily the UK's lowest prices
 Library case included.



Acoustitle
 The UK's most popular acoustic tile.

NEWS UPDATE
60,000 customers
can't be wrong.
 Our 60,000th customer was
 The Eurythmics who ordered
 Switchcraft XLRs for same
 day delivery. A magnum of
 celebration champagne
 accompanied the order.
The 1991 reference
catalogue out now.
 It includes, over 60 types of
 studio cables, 100 different
 plugs/sockets and adaptors,
 chrome cassettes from 40p.
 New products from Sony,
 Drawmer, Alesis, ART,
 Tascam, Denon, EMO etc.
Make sure YOU are on the
mailing list.

One Amp	Boom Arms	Splice Tape
One Splitter	BRADY BSS	Stage Boxes STARQUAD



Tascam DA30 DAT Recorder. Designed specifically for the studio at under £1200.



WE DIDN'T REACH NO.1
BY BEING OUT OF STOCK
OR EXPENSIVE

Save time-phone

Studiospares

61/63 Rochester Place, London NW1 9JU
 tel 071-482 1692 FAX 071-485 4168

first

Please send free 68 page catalogue

Please send account application form

NAME

ADDRESS

.....

.....

CLASSIFIEDS

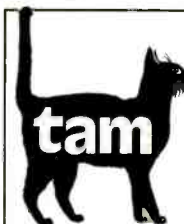
Advertisements for this section must be pre-paid. The rate is £1 + VAT per word, minimum £20.00 + VAT. Box Nos. £10.00 + VAT. VAT (UK only) \$ rate \$2.00 per word, minimum \$40.00, Box No. \$20.00 extra. Semi-display rates on application. Copy and remittance for advertisements in Oct. '91 issue must reach these offices by 16th August addressed to: The Advertisement Manager, Studio Sound, Spotlight Publications Limited, 8th Floor, Ludgate House, 245 Blackfriars Road, London SE1 9UR. Cheques made payable to Studio Sound. **Note:** Advertisement copy must be clearly printed in block capitals or typewritten.

Replies to Box Nos. should be addressed to the Advertisement Manager, Studio Sound, Spotlight Publications Limited, 8th Floor, Ludgate House, Blackfriars Road, London SE1 9UR, 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 of (2) it is in a business employing less than six persons of (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.

The attention of advertisers is drawn to "The Business Advertisements (Disclosure) Order 1977", which requires that, from 1st January 1978, all advertisements by persons who seek to sell goods in the course of business must make that fact clear. From the above date consumers therefore should know whether an advertisement relates to a sale by the trader or a private seller.

SERVICES

CASSETTE DUPLICATING:
GAUSS Loop-Bin / TELEX In-Cassette
High Quality Blanks / Label Printing
OPEN REEL DUPLICATING
 (ANY SPEED - ALSO TO BROADCAST SPEC.)
SPEECH RECORDING
 (VOICE-OVERS; LANGUAGES; AUDIO-VISUALS)
SPEECH-PLUS RECORDINGS LTD.
 UNIT 32, NO. 19, PAGES WALK, LONDON SE1 4SB. TEL: 071-231 0961



Digital and analogue editing, mastering. Duplicating of any format including One-off CDs from £45 Also CD testing, custom wound blanks and voice-over recording.

Ref SS591, 13a Hamilton Way London N3 1AN Tel: 081-346 0033 Fax: 081-346 0530

EAST MIDLANDS AUDIO
STUDER-REVOX
NEW AND USED SALES
SERVICE — SPARES
APPROVED CONVERSIONS
STUDER A62 B62 SPARES

STUDER A62 STEREO 7 1/2 15 IPS	£600.00
STUDER B62 STEREO 7 1/2 15 IPS	£1,000.00
STUDER C37 STEREO VALVE	£850.00
STUDER A80 VU MR ONE 7 1/2 15 IPS	£3,000.00
STUDER A80 EIGHT TRACK	£3,800.00
STUDER A80 16 TRACK	£5,800.00
STUDER B67 MK ONE BROADCAST	£1,800.00
STUDER B67 MK ONE PORTABLE	£1,850.00
REVOX PM99 MK ONE TROLLEY	£1,400.00
REVOX B77 MK TWO HS 1RC	£800.00
REVOX A700 STEREO 3 SPEED	£800.00
REVOX C221 PRO CD PLAYER	£900.00
REVOX C115 PRO CASSETTE DECK	£750.00
REVOX B77 MK TWO HS IEC	£1,200.00
REVOX PR99 MK THREE IEC	£2,000.00
REVOX C270 STEREO US	£2,700.00

ALL PRICES PLUS VAT

TEL 0246 275479
FAX 0246 550421

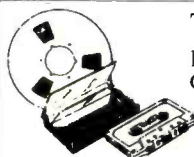
RECORDING TAPE ONCE USED/NO EDITS.
 AGFA 468 2" X 10 1/2" £30.00; 2" X 14" £60.00;
 AMPEX 456 2" X 10 1/2" £40.00. Contact David (0705) 251328.

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.

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



THE CASSETTE DUPLICATING SPECIALISTS
 Real time & high speed loop bin duplication, printing & packaging. Blanks wound to length
TEL: 061-973 1884



TAPELINE
 Blank & Duplicated Cassettes

New Tapematic Loop Bin Duplication & Loading High Spec Professional Bin Mastering

- * 120x Real Time Duplication
- * Ferric & Chrome Cassette supplies
- * Printing & Packaging, cases & accessories.

FOR HIGH PERFORMANCE CASSETTES

CALL 061-344 5438

Tapeline, Unit 2, York Works, York Street Audenshaw, Manchester M34 5HD

jbs records

MUSIC-SPEECH-DATA

REAL-TIME/HIGHER-SPEED Quality Cassette
 Duplication and Blanks from 1-1000. Computer printed Labels. Solo, 1/4" reel, Sony Betamax or R-DAT recording. Fast Security Delivery service:

FILTERBOND LTD, jbs records div, FREEPOST 19 SADLERS WAY, HERTFORD, SG14 2BR 0992-500101

EQUIPMENT FOR SALE

24 track studio for sale, comprising:
 Studer A80 MkII, MkIII mods, Auto locater. Excellent condition.
 Allen + Heath 28/16/24 Sabre Desk. 1 year old MIDI muting patchbay & stand.
 Akai S1000, 2meg upgrade + Library
 Sony DTC 1000ES Pro-DAT machine
 Tascam 32/2 1/2" recorder
 Plust Beyer MC740. Other mics, stands outboard, etc, etc.

Phone Brian 0304-367042

THE COMPLETE SERVICE.....

·D·I·R·E·C·T·

- Record Pressings
- Cassette Duplication
- Compact Discs
- Post Mastering
- P.Q. Encoding
- Print & Reprographics
- Video Duplication
- Competitive Prices
- Free Quotations

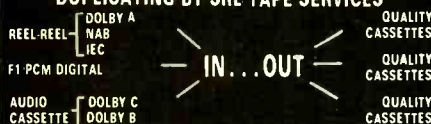
*Make it with us
 We make the hits*

SRT

MARKET LEADERS

☎ 081-446 3218 LONDON
 ☎ 0480 61880 CAMBRIDGE

HIGH SPEED HIGH QUALITY LOOP-BIN DUPLICATING BY SRL TAPE SERVICES



THE BETTER THE MASTER, THE BETTER THE COPY!

HOW MANY WOULD YOU LIKE? 100-5000

081-888 5555 081-866 5555 PHONE FOR PRICE CHECK

FOR SALE

SET IN A FINE GEORGIAN HOUSE WITH PANORAMIC VIEWS OVER WOODLANDS AND ROLLING COUNTRYSIDE WE OFFER A FULLY PROFESSIONAL PRIVATE RESIDENTIAL

STUDIO

Over the last two years this large Georgian house has undergone a fully comprehensive and sympathetic refurbishment with the inclusion of new fully double glazed windows, full central heating, complete plumb and re-wire and finished to a high degree of specification and decoration.

The living accommodation comprises large reception room/sitting room, craftsman installed fully fitted kitchen/dining. Ground floor woshroom/wc. The first floor has central bathroom with five double bedrooms, the master one having ensuite bath-room.

The Studio comprises spacious 480 sq ft acoustically designed control room housing NEOTEK ELITE 48 channel desk with midi-mutes and MTR 90 Mk II multi-track. Architect designed wrap-around rack and programming area benefitting from lots of natural light with private views over gardens and countryside. The recording room is over 200 sq ft with onitque pine parquet flooring. Plate room and tape storage and further outboard available.

FREEHOLD for early sale £325,000

For further details on this unique property Telephone 0507 480761 or 0522 540005



The Old Barn
Barden Road, Speldhurst
Kent TN3 0LH



tel: 0892 1099

fax: 0892 863485

MCI 636 with 30 chs & JH500auto, good cond, compact size £9,500
Cadac 48 channels inc auto £29,500
Soundtracs CM4400, 32/24/12 new P&G faders fitted £7,150
Neve 8038, 40/8/24, rem patch, 60 inputs in mix, very good cond £29,445
SSL4048E with G comp & TR POA
AMS Audiophile version 6.2 with 1 hour storage POA
Neumann U87 £595
Neumann SM2 stereo valve mic, complete & very good cond POA
Neumann KM56 valve mic £475
Neumann U47 valve mic POA
AKG C451E with CK1 + pad 155
Electrovoice RE20 295

Otari MTR90 with rem & auto, well maintained £12,775
Studer A80 Mk1, 24 track with rem & auto £10,950
Studer A80 Mk1, 16 track £3,750
Studer A810, 2 track £1,195
Studer B67 in console £1,450
Studer B67 chassis £995
Sony DTC1000ES DAT £725
Denon DR-M44HX cassette £415
EMT 140 stereo plate & rem £595
Yamaha REV5, nearly new £545
Lexicon 200, very good cond £995
Atari 1040ST + SM125 monitor, + Steinberg PRO24 v3 & Procreator £495
Yamaha C7 studio grand piano £10,250
Yamaha DX7 £375

Call me for the latest list. There are many more items available and the stock is constantly changing. We also have a large selection of useful bits and pieces at clearance prices. Call us now.

DIGITAL SIGNAL PROCESSING . . . REMOVE THE CONFUSION
For a comprehensive, professional DSP consultancy service including noise and crosstalk, removal by adaptive digital filtering, DSP hardware and software design, digital filtering and all other DSP related work, contact
DIGITAL REAL TIME SYSTEMS LTD
Epsilon House, Chilworth Research Centre
Southampton, Hants. SO1 7NS. Tel: 0703 769741

MEET YOUR NEED
FOR 5", 7" and 10 1/2" white tape boxes; 5" and 7" tape spools
Leader and splicing tape; Ampex mastering tape (all lengths and sizes)
Phone us on **0372 460135** for full details and prices
MEDIA TAPE LIMITED
PO Box 120C, Esher, Surrey KT10 9JS

SITUATIONS VACANT



PRO AUDIO SALESPERSON REQUIRED

Due to expansion of our product range, HMB Communications require a Pro Audio Salesperson to join our hard working sales team. You need to have good technical knowledge, fine tuned communications skills, and a passion for audio, especially digital audio. You will also need a full, clean driving licence. The package will be commensurate with experience and expertise. *Please send a single A4 sheet explaining why we should consider you for this position complete with your C.V. to:*

Richard Kershaw, HMB Communications Ltd,
73-75 Scrubs Lane, London NW10 6QU.
Tel: 081-960 2144. Fax: 081-960 1160

BROADCAST PROFESSIONALS

SALES OPPORTUNITY c£25K + COMMISSION
UK and International Sales. Proven track record in sales is required and knowledge of DAT or mixing consoles is particularly relevant.

MAINTENANCE ENGINEER £11 - 18K
One vacancy in a studio the other with a hire company. Experience working on multi-track tape machines required.

Please contact Mike Jones on (0256) 470704, Broadcast & Communications Professionals, Unit 9b, Intec 2, Wade Road, Basingstoke, Hants. RG24 ONE

'BULLETIN BOARD'

1 x Sony 3348 Digital Multitrack, low hours, superb condition EPOA
1 x Studer A80 SR cards, very very low hours, immaculate £14,500
1 x Otari MTR 90 MkII, 1,500 hours, remote in excellent condition £14,500
1 x Otari MTR 12 1/2" 2 track tape machine, immaculate £3,995
1 x Mitsubishi X880 32-track digital, new A/Loc inc, bargraphs EPOA
1 x SSL 4056E, 36 fitted with E/Computer & Total Recall EPOA
1 x pair Genelec 1034A, unused, as new, perfect in every way! £14,500
1 x Lexicon PCM60 £575
1 x Lexicon PCM70 £975
2 x Marshall Time Modulators both in need of repair each £150
1 x Roland SDE 3000 £495
2 x TC 2240 Mic Amp/Parametric Equalisers each £295
1 x pair Westlake BBSM 6's £895
1 x pair Genelec S30 active monitors in Flight Cases, superb £2,000
1 x Yamaha SPX 90 £250
5 x Neumann U87 mics inc suspension mounts, totally immaculate, each £645

CLEARANCE ITEMS INCLUDE:

Neumann U89 £425; Sennheiser 421 £110, AKG D12/D22 £95, AKG 451 & CK1 cap £125, SONY Protec TV's £285, 19" equipment racks various prices, Mic wall boxes £5.00 each, 19" rack £35.00, XLR plugs £1.00 each, Barco 26" TV monitor £250, Linn MkII drum machine £275, Casio CZ1000 £225, Cheetah master keyboard £225, Pukka guitar amp £50.00

The above is just a TINY example of the massive amount of equipment we have for sale at prices intended to guarantee a very quick sale! Including outboard and microphones.

Telephone: 081-994 4433 or Fax: 081-994 9321 or Mobile: 0831 319111
Studio Timeline, Lamb House, Church Street, Chiswick, London W4 2PD

M & B RADIO (LEEDS)

Dealers in surplus electronic equipment, test equipment, amateur radio

86 Bishopsgate Street, Leeds LS1 4BB
Tel: (0532) 435649 Fax: (0532) 426881
Mobile: (0636) 288580

SPECIAL OFFERS ON USED TAPE MACHINES

Revox A77 Stereo	£350
Studer A62 Mono	£250
Studer A62 Stereo	£400
Studer B62 Stereo	£600
Studer B67 Mono	£650
Studer B67 Stereo in console	£850
Studer H67 Stereo portable.....	£1000
Studer A80 Stereo	£1250
Studer A80 8 Track	£1400
Uher 4000IC Report	£145
Nagra 3 Mono portable.....	£295
Nagra 4L Pilot	£1000
Nagra 4S Stereo Pilot.....	£2500
Nagra SN Miniture.....	£750

All machines in good clean condition and in full working order

All prices subject to V.A.T.



AND BROADCAST ENGINEERING

CIRCULATION DETAILS

STUDIO SOUND is available without charge to key personnel actively engaged in sound recording in any part of the world. Copies must be individually requested. Non-qualifying readers will be notified in writing and invited to take out a subscription (see below for details)

SUBSCRIPTION ENQUIRIES:
Subscription Dept, Studio Sound, Spotlight Publications Ltd., 8th Floor, Ludgate House, 245 Blackfriars Road, London SE1 9UR.

The cost of an annual subscription to Studio Sound is:
UK £24.00
Overseas surface mail: £30.50/US\$52
Overseas air mail: £52.50/US\$89
USA airspeeded delivery \$70

The publishers reserve the right to refuse applications considered inappropriate and restrict the number of free copies sent to any one company or organisation

ADVERTISER'S INDEX

A & R Handbook	4	Larking Professional Services	63
AKG	15	Media	6
Allangrove	64	Midem	62
Amec Tac	7	Monitor Technology	23
AMS	38, 39	Music Week	40
Aphex	30	Ohari	61
Audio Engineering Society	58	Rane	56, 57
Audio Marketing Group	4	R Technology	24
Audio Research & Technology	6	RTW	67
Avitel	37	Seem	24
BSS	33	Sennheiser	13
Coach Audio	67	Solid State Logic.FFC. 4, 68 69	
CTI	28	Sondercraft	0BC
D&R Electronics	52	Soundtracs	27
DACS	24	SSE Marketing	34
Dynaudio Acoustics	43	Studer	10
EELA	40	Studio Spares	72
Genelec	47	Surrey Electronics	51
GTC	6	TEAC UK	54, 55
HHB	9, 19	Westlake Audio	21
Lafont	50	Yamaha	IBC, 16

RATE CARD-FRIENDLY DIGITAL MULTITRACK

YAMAHA DIGITAL SYSTEMS

In a recent Producers Guild survey, members were asked the question: "Given no limitation on budget, would you prefer to record digitally?"

Perhaps not surprisingly, 95% replied that they would definitely use digital recording.

Budget limitations, however, are something that most audio production facilities know all about, with rate card wars making it seemingly impossible to invest in the technology that clients are increasingly demanding.

Enter Yamaha to break this vicious circle with a choice of digital multitrack systems which not only make "going digital" financially feasible but, with 20 bit performance, also surpass the audio quality of any other recorder on the market.

As an integrated system with automated mixing, signal processing and multitrack recording, the DRU8 is already making money for scores of users around the world.

And with extensive synchronising facilities and a built-in monitor mixer, the DRU8 makes it easy for a studio to add a rackmount "block" of digital tracks and gain a vital commercial edge.

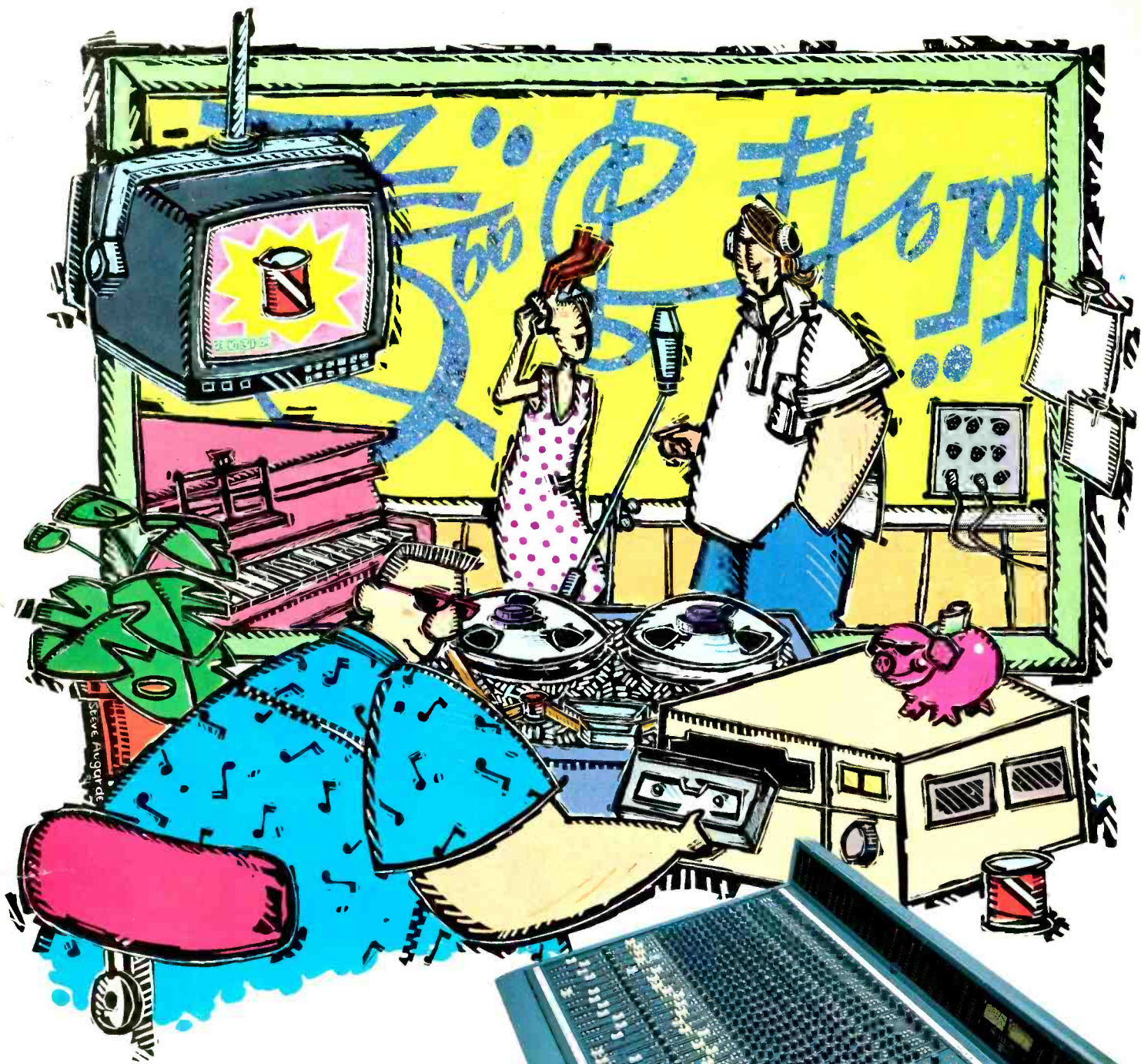
Call Yamaha today and find out how you can invest in digital multitrack – and keep your rate card friendly.

YAMAHA DIGITAL SYSTEMS

0908 366700

Yamaha-Kemble Music (U.K.) Limited
Professional Music Division





IT'S A BRILLIANT WAY TO WORK

If you've ever tried putting together a studio, you know the big problem: the console. What you want is too big—for your room and for the bank. The console you can afford lacks the important facilities you need. Too few inputs. Not enough outputs. And audio quality that just isn't up to your standards.

Soundcraft's SAPPHYRE gives you 32-track performance worth many times the price—better than a digital system. A noise gate on every channel. Great-sounding 4-band EQ. A variety of modules to suit the way you record. And five frame sizes.

SAPPHYRE. Its unique, flexible, ingenious approach to routing and design offers the things you need and throws away the rest. Eight buses you can use for anything you like—direct tape feeds for everything else. An in-line design that takes up less space and is even easier to use than many split-group consoles. It couldn't be simpler. And everything's under your fingertips.

SAPPHYRE. It's a brilliant way to work. Whether you're building a home studio, adding a video post suite or designing Studio Two. A console that brings out the artist in you.

Now you can afford the best. Hear SAPPHYRE today—at your authorised Soundcraft dealer.

Sapphyre

Soundcraft

SOUNDCRAFT ELECTRONICS LTD., UNIT 2, BOREHAMWOOD INDUSTRIAL PARK,
ROWLEY LANE, BOREHAMWOOD, HERTS, WD6 5PZ, ENGLAND. TEL: (+44) 81 207 5050
FAX: (+44) 81 207 0194 TLX: 21198 SCRAFT G ■ A Harman International Company