

April 1988

\$5.00 £2.00

A LINK HOUSE PUBLICATION

STUDIO SOUND

AND BROADCAST ENGINEERING



ELECTRONIC MUSIC SYNTHESIS

Probably the best recording deal you'll ever sign.



The new Producer Package.

Seven years ago Soundcraft pioneered the original 24 track Producer Package, creating the concept of professional quality personal studios at an affordable price.

Following the success of that system, sold to hundreds of composers and producers around the world, we've now brought the idea right up to date with the New Producer Package.

The Saturn multitrack with Total Remote, and the TS12 in-line recording console with FAME console automation. As a system they're a perfect match. As a recording deal they're unbeatable (take a look at the bottom line).

The Saturn multitrack provides a standard that no other machine can match at the price.

A technical performance to equal the finest analogue

multitracks, plus a host of facilities including remote alignment automation. You can expect nothing short of outstanding results.

To complement it, the TS12 Console has both excellent facilities and transparent audio performance.

Each in-line module includes a 4-band parametric equaliser, six effects sends and 2 programmable mute groups. Up to 44 I/O modules can be accommodated, giving 88 inputs in mixdown.

Our unique Fader and Bounce switches allow 'one touch' track bouncing, audio sub grouping and the facility to use multitrack busses as auxiliary sends.

Not only that, but by splitting the busses all these facilities can be used simultaneously – something you'd never expect on a console in this price range. And there

are six stereo returns with 4-band EQ and full re-routing – as standard.

Finally, with the optional FAME automation system, Faders, Auxiliary sends, Mutes and Equaliser in/out are fully automated. Ten mixes can be stored on a 3½" disk, with mix information displayed on the colour monitor.

A disk-based, SMPTE/MIDI locking system, FAME is the most comprehensive automation available – an astonishing achievement at the price. All in all, an exceptional combination.

The New Producer Package from Soundcraft. A unique deal that's unquestionably the best on record. Call Steve Gunn or Ian Downs for more information.



CONTENTS

- 5 Editorial:** Are synthesisers compromising creative music asks Keith Spencer-Allen
- 14 General news:** Ampex air shipments... Address changes... Forthcoming events... Power Play moves and grows... Successful Midem 88... Literature received... Contracts... People... Machines and music... The Keyboard Club... Digital multitracks at Abbey Road's new Studio Three... Agencies... Berklee Songwriters' recording studio... Sound reinforcement at AES... Studio architects... The Home Service... Fazioli subsidy scheme... Russian CDs produced in Australia... BBC completes RDS network... In brief... AES news
- 30 Product news:** Digidesign Sound Accelerator... Amek/TAC & Steinberg automation... API new products... Soundcraft 6000 console... In brief... NED N software... Mitsubishi Audio Crossbar Switcher... Editall editing blocks
- 34 Music news:** Roland software and keyboards... Ensoniq keyboards... Casio new products. By Mark Jenkins
- 36 Recording for broadcast:** James Betteridge visits the BBC in London where programmes for radio broadcast are recorded
- 40 Studio Marcadet:** Janet Angus visits a studio in the industrial northern outskirts of Paris
- 44 Synthesis:** Recent developments and trends in synthesiser design, by Mark Jenkins
- 50 The 01:** Keith Spencer-Allen takes an initial look at a product that looks set to raise a lot of interest
- 54 Letters:** M&S techniques... Atlantic studio design... Aural Exciter enlightenment
- 56 Perspective:** US correspondent Martin Polon asks are we really improving history by remixing it?
- 62 ESBUS: a practical application:** Dave Foister looks at new bus system and a practical use
- 68 Practical X86:** Patrick Stapley looks at the Mitsubishi X86 2-channel digital recorder
- 72 Business:** Microphones on acoustic instruments... CD Video launch delay... Sports reporting... Soundtrack for Charlie Parker... Amplifying jazz. Report by Barry Fox
- 75 Review:** A user report on the Ensoniq EPS Ensoniq Performance Sampler from James Betteridge
- 78 Review:** James Betteridge looks at Roland's S-550 expander version of S-50 sampling keyboard
- 82 Review:** Chris Jenkins provides a description of the XR300 SMPTE-to-MIDI converter from XRI



... "STYLYX", A Mixer With Style ...

D&R founded in 1973, is a company heavily involved in advanced console design. D&R has expanded their technology to encompass the split format in consoles with the STYLYX series.

The Stylyx is a high quality mixing console with many hidden features. Utilising a 31 mm module width and a selection of different modules, it allows a step by step building up of a comprehensive console customised to your needs.

A TOTALLY MODULAR CONSOLE DESIGN.

Everything is modular, the mic/line module, the stereo line module, subgroup module, (2 subs out & 2 tape/effect returns), master section, meter bridge (led array), rack mount power supply, even the AUTOMATION module can be purchased and installed later, many features yet unknown in compatitive console manufacturing.

DESIGNED COMPACTNESS.

The STYLYX series is extremely compact (31mm module width). While its cosmetics are very appealing and its frame (welded steel) is built like a TANK.

UNIQUE HIGH FREQUENCY COMPENSATION TECHNIQUES.

In our computerized R&D department, our electronic design is pushing the borders of today's technology in analog circuitry. Innovative electronic design such as different levels of grounding and D&R's well known active wide band philosophy sets our products "design years" ahead of the competition.

UNIQUE "SOFT SWITCHING" MUTE AUTOMATION PACKAGE.

The optional available module can manually, sequencer, or via timecode, control your mute settings and store up to 100 different setups internally. Capable of managing MIDI equipment, the Stylyx Automation is an excellent tool for the Midi Studio. Utilizing one of the many SMPTE to Midi conversions available today, this system opens many possibilities for the Post Video Production Studio.

The STYLYX is the next generation in mixer design making the "split" console format even more understandable. Digitally controlled, analogue circuitry in a "user friendly" design.

For more information concerning the STYLYX contact:

HEADOFFICE.

D&R Electronica b.v.
Rijnkade 15B
1382 GS WEESP
THE NETHERLANDS
Phone (-) 31 2940 18014
Tlx 18503 dr nl
Fax (-) 31 2940 16987

U.S.A. OFFICE.

D&R USA
1720 Chip 'N Dale Drive
Arlington, TX 76012
U.S.A.
Phone (817) 548 1677
Fax (817) 277 6066

U.K. OFFICE.

D&R UK
phone (0753) 884319

STYLYX SERIES Beyond Comparison.



AUSTRALIA, AUDIO&RECORDING, 2019 Sydney, 36-38 Daphne St Botany phone: 26669935. AUSTRIA, KUHNLE & WÜRZLER, A 4020 Linz, Waldeggrasse 68, phone: 732668125. BELGIUM, ASE pvba, 2800 Mechelen, Kon. Astridlaan 216, phone: 15 421152. CANADA, J-MAR, M4H 1E9 Ontario, 6 Banigan Drive, Toronto, phone: 4164219080. DENMARK, POWER PLAY MUSIC APS, DK 2200 Copenhagen, Norrebrogade 102A, phone: 1244048. FINLAND, SAHKOLIKKEIDEN OY, 01301 Vantaa 30, P.O. Box 88 Sahkometsa, phone: 908381. FRANCE, METTLER AUDIO, 75009 Paris, 1-3-5 Blvd de Clichy, phone: 148782911. GERMANY, D&R ELECTRONICA B.V. Rijnkade 15B, 1382 GS Weesp, The Netherlands, phone: 0031-2940-18014. HONGKONG, JOLLY SOUND Ltd, Tower B, RM 1214-1215, Hunghom comm, centre 37-39, Ma Tau Wei Rd KLN H.K., phone: 36202025. ICELAND, SAMSTARF, P.O. box 1197, 121 Reykjavik, phone: 354153055. ISLD, CANARIAS, MUSIC ACCORD, S. Cruz de Tenerife Puerta Causeco 35, phone: 22-289506 ITALY, PROFESSIONAL EQUIPMENT SRL, 20142 Milano, Viale Famagosta 37, phone: 02-817839/02-8910241/2/3. NORWAY, VEDUM ELEKTRONIKK, N-1381 Heggedal, Aamotveien 2, phone: 2798990. PORTUGAL, JORSOM AUDIO VISUAL, 1000 Lisboa, Rue Eca de Queiroz 20-3 phone: 19562850. SPAIN, BOSE SA, 28027 Madrid, Aristoteles 3, phone: 4050611. SWEDEN, MONTEZUMA RECORDING, 10265 Stockholm, Kocksgatan 17, phone: 8436291. SWITZERLAND, ISLER AG, 8048 Zurich, Badenerstrasse 808-810, phone: 14321444. VENEZUELA, SOUND AND POWER, 1070 Caracas, P.O. box 76766, phone: 2223201.

STUDIO SOUND

AND BROADCAST ENGINEERING

April, 1988
Volume 30 Number 4
ISSN 0144 5944

EDITORIAL

Editor: Keith Spencer-Allen
Production Editor: Ann Horan
Production Assistant: Carrie Love
US Commentator: Martin Polon
Secretary: Cecilia Farrelly

ADVERTISEMENTS

Sales Manager: Mark Walsh
Display Sales: Andrew Knox
Production Manager: Sarah Howard
Secretary: Joanna Jeleniewicz

USA Advertising/Commercial Manager:

Robert J. Sinnott, 2 Park Avenue,
10th Floor, New York, NY 10016.
Tel: (212) 779-1212

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

Deputy Publisher: Phil Guy
Director: Douglas G Shuard

CIRCULATION

Circulation Manager: Sally White

Editorial and advertising offices: Link House,
Dingwall Avenue, Croydon CR9 2TA, UK
Tel: 01-686 2599
International tel: +44 1 686 2599
Telex: 947709
E-mail: 78:DGS1071
IMC: STUDIOSOUND-UK/US
Fax: 01-760 0973

CIRCULATION ENQUIRIES

Controlled circulation: Controlled Circulation
Dept, Studio Sound, Link House Magazines Ltd,
Central House, 27 Park Street, Croydon CRO
1YD, UK

Paid subscriptions: Subscription Dept, Studio
Sound, Link House Magazines Ltd, 120-126
Lavender Avenue, Mitcham, Surrey CR4 3HP,
UK

2nd class postage paid New York, NY: Postmaster
please send address corrections to Studio Sound
c/o Expeditors of the Printed Word Ltd, 515
Madison Avenue, New York, NY 10022, USA

© Link House Publications plc 1988 all rights
reserved
Printed in England

 A LINK HOUSE
PUBLICATION

Studio Sound and Broadcast Engineering
incorporates Sound International and Beat
Instrumental

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

Annual subscriptions are available for non-
qualifying personnel or where more than two
copies are required in a studio or small
organisation as follows:

UK £24.00. Overseas surface mail: £30.50/\$52.
Overseas airmail: £52.50/\$89.
USA Airspeeded: \$70

 MEMBER OF THE AUDIT
BUREAU OF CIRCULATIONS

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

EDITORIAL

In this issue the cover line is 'Electronic Music Synthesis'. In many ways it is very difficult to look at this subject in isolation from other aspects of modern recording in any field. The days when

electronic music was the province solely of mysterious composers who were adept at extracting sound from a rather primitive collection of electronics, have long since gone. Electronic music making today is a main stream activity and few popular music recordings are made that do not use synthesis or sampling in some capacity. In fact this may well be the last issue in which it is possible to see any dividing line between electronic music and the recording process. MIDI has further blurred the distinction between the two areas, and with increasingly larger items of studio equipment coming under MIDI control, synthesisers could be seen as having a studio control function as well as a sound creating one.

I think that this state of affairs is healthy provided we can keep the electronic and 'traditional' sides of music making in balance. We receive more and more new product releases that assume all music is made by synthesis and I think this is not a healthy sign. It may be more convenient to manipulate a drum machine or synthesiser rather than having to deal with a musician, and you may be able to complete your project more cheaply or quicker or even in such a way that would have been impossible with real musicians (the three-legged, five-armed drummer is a good example of typical drum machine programming). However, just because synthesis may be easier, quicker or cheaper, it does not actually mean that it is better than real musicians. Equally the use of electronics should not be discounted when traditional techniques cannot deliver the sound goods. There have been cases of even classical orchestras turning to synthesisers for certain orchestral effects when the location would not permit the real thing. I can think of many sessions that I have done in years past which would have benefited greatly from creative sounds from synthesis, those occasions when you knew exactly what sounds you wanted but there were no traditional instruments available that would make them. Possibilities of sound colour often were achieved through odd combinations of piano, Hammond C3, harpsichord and guitar normally taking the best part of a day to achieve. Synthesis would have been very welcome here. As would it have been on those occasions when salvaging live recordings—replacing snare drums, etc, with better samples would have saved many discarded tracks.

It may seem that I am taking a rather reactionary line—but I think not. There may be sound commercial reasoning here as well. Most of my children's friends seem to be getting into '60s and '70s music, ie pre synthesis, as they claim it is more interesting than the current produce. I make no comment here but present it as a point of interest. I do know that listening to a Top 40 radio show drives me crazy with the rigid time keeping on records played. There is no lift or variation, of pushing the beat or laying back for artistic effect just that metronomic persistence of tempo that I find profoundly unmoving after 10 minutes of exposure.

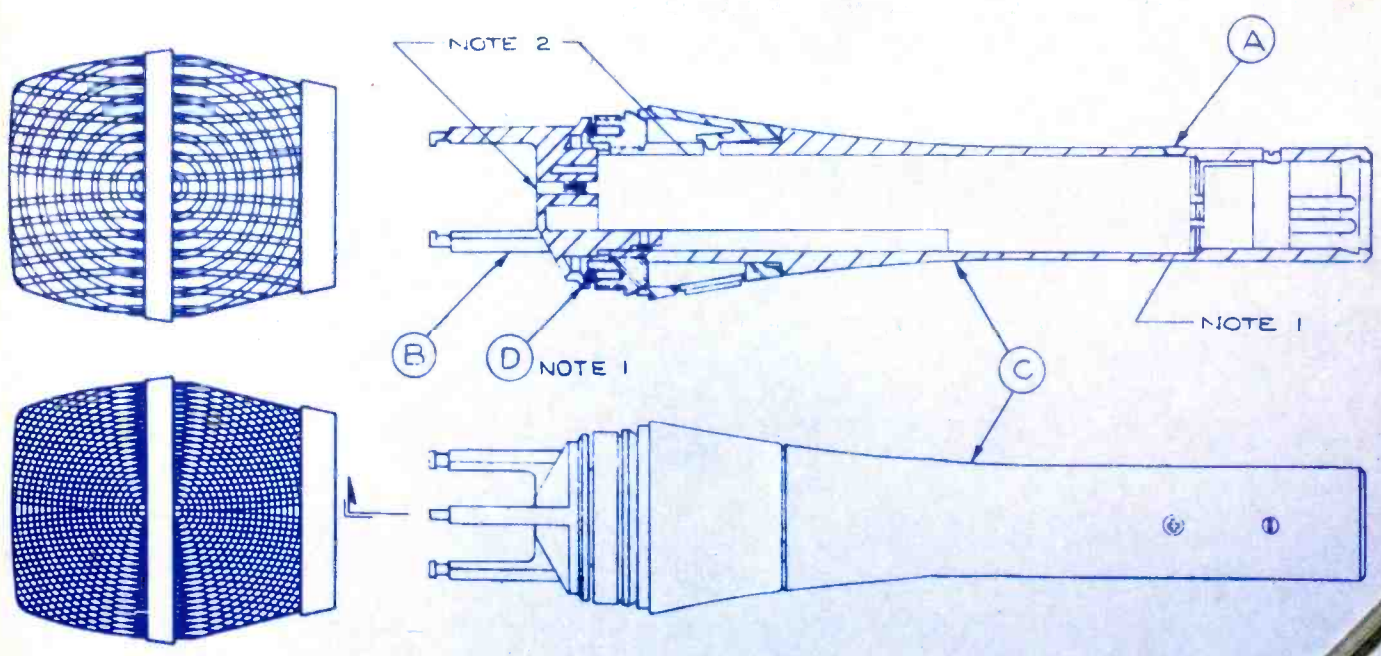
Gripes over—but I would like to leave you with two items—one unattributable but true and the other a quote. Thank you.

Item One: The vast majority of a very popular Japanese synthesiser that are returned for repair have their user programmable memory completely empty showing that the users have not stored any programs of their own and may not even have modified the factory programs—a sign of success for the factory programmer but a possible reason for the lack of sound colour that we hear?

Item Two: "It was fun watching the studio making excuses for charging £1,500 a day and not having the facility to set a drum kit and get an ambient sound. Like you can do anything you want in this studio *except* play live." (Robert Plant from interview in *Sounds* January 16th, 1988, on the recording of his current album.)

Cover: Solid State Logic 01 photographed by Roger Phillips

USE DIMENSIONS SHOWN - DO NOT SCALE DRAWING - THE FOLLOWING APPLIES UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS IN INCHES. TOLERANCES: DECIMAL ± FRACTIONAL ± HOLE SIZES ± ANGLES ± DIMENSIONS SHOWN APPLY BEFORE PLATING.



A little help for those who follow our lead.

At Shure we have always been flattered by the number of copies of the classic SM58 microphone available. However, although a shape can be copied, the unmistakeable sound quality, ruggedness and finish of the SM58 is unique. And professionals are not easily fooled.

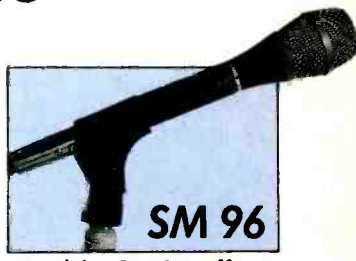
Now, Shure introduce a new range of three condenser mics with a new shape, whose success is bound to encourage a new breed of lookalikes. The SM87 is a studio-quality supercardioid condenser vocal mic with



extremely smooth and accurate response characteristics, and Shure's legendary ruggedness and dependability. It has received enthusiastic acclaim from artists and sound engineers alike. The SM85 is a lightweight, rugged condenser mic designed for hand-held live and TV vocal



applications, capable of withstanding on-the-road punishment yet maintaining the highest quality performance expected of a studio condenser mic. And the SM96 offers superior value in condenser mics, with every parameter fine tuned to give the vocalist professional quality and features at an economical price.



Whichever mic you choose insist on Shure, remember they are sometimes copied in appearance, but they are never duplicated in performance and reliability.

SHURE®

For full details contact: HW International, 3-5 Eden Grove, London N7 8EQ. Tel: 01-607 2717.

TO APPRECIATE THE PC SERIES, TRY HITTING ALL OF THESE MUTES SIMULTANEOUSLY.

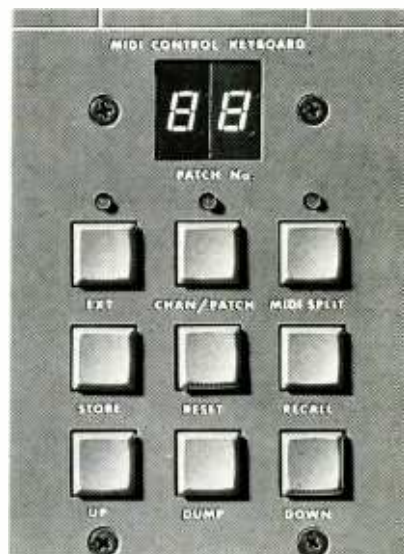
WITH OUR PC SERIES CONSOLE, HITTING MULTIPLE MUTES (FOR GATED EFFECTS OR ACCURATE DROP-INS) BECOMES NO PROBLEM AT ALL.

BECAUSE THE PC PROVIDES MIDI CONTROLLED AUTOMATED MUTING ON ALL INPUTS, MONITORS, AUXILIARY MASTERS AND ON EFFECTS SENDS AND RETURNS.

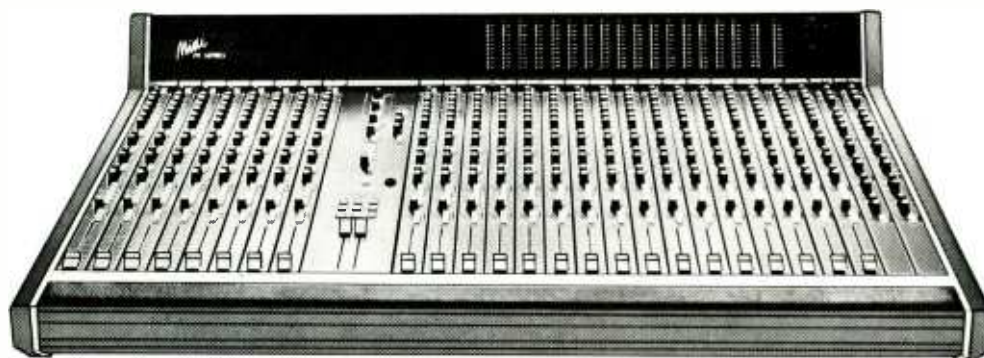
AS WELL AS EASE OF OPERATION, THE 'INLINE' CONCEPT HAS ALLOWED US TO ENDOW THE PC WITH A HOST OF STANDARD FEATURES THAT YOU WON'T FIND ON OTHER CONSOLES. FOR INSTANCE, DUAL LINE INPUTS ON EACH CHANNEL GIVE YOU UP TO 56 INPUTS ON REMIX, 52 OF THESE WITH EQ.

PERHAPS THIS EXPLAINS WHY THIS MIXER IS FAST BECOMING ESSENTIAL FOR KEYBOARD WORKSHOPS, PRE-PRODUCTION AND SIXTEEN TRACK WORK.

BUT THE TRULY REMARKABLE THING ABOUT THE PC IS ITS SPECIFICATION. THIS CONSOLE ACTUALLY MATCHES THE SONIC PURITY OF CONSOLES COSTING MORE THAN TEN TIMES ITS PRICE.



MIDI MUTES CAN BE WRITTEN IN REAL OR STEP TIME, AND RECALLED EITHER INDIVIDUALLY OR AS PATCHES THROUGH THE KEYPAD OR USING A MIDI SEQUENCER



S O U N D T R A C S
PC

SOUNDTRACS PLC 91 EWELL ROAD SURBITON SURREY KT6 6AH ENGLAND TEL: ++(0)1 399 3392 TELEX: 8951073/STRACS/G FAX: ++(0)1 399 6821

UK SALES: STUDIO EQUIPMENT DISTRIBUTION: 0582 452495

PUBLISON *INFERNAL MACHINE 90*



NEW DIGITAL RECORDING WITH INFERNAL MACHINE 90

With the internal hard disk board, you can record up to 14 minutes of digital sound. You can use it in three ways:

- 1—Storage of the sampling memories of the machine, with all their parameters
- 2—Direct recording of stereo audio signals
- 3—Digital editing

NEW DIGITAL TAPE UNIT (CASSETTE)

With the external tape unit, you can store on digital cassettes the contents of the internal hard disk. You can have an unlimited bank of sampled or edited sounds. This unit is connected via the SCSI interface.

NEW EXTENDED MEMORY CAPACITY

On option you can use large memory boards, with 2×83 sec or 1×166 sec of memory capacity (always with 16 bits and 20 kHz frequency response).

UNIVERSAL DIGITAL AUDIO PROCESSOR

- ★ DELAY, ECHO
- ★ PITCH CHANGER EVOLUTIVE VIBRATO, AUTOMATIC ARPEGGIO
- ★ STEREO PARAMETRIC REVERBERATION
- ★ MULTI SAMPLING WITH TIME COMPRESSION-EXPANSION, SOUND REVERSED IN TIME
- ★ MIDI INTERFACE
- ★ MEMORY CAPACITY (16 Bits, 20 kHz Frequency Response)—OPTIONS:
2×5.2 seconds 2×20.9 seconds
NEW 2×83 seconds or 1×166 seconds at 20 kHz
- ★ SMPTE INTERFACE (OPTION) FOR AUTOMATIC SYNCHRONIZATION OF THE MACHINE WITH VIDEO OR AUDIO EQUIPMENT, AND FOR AUTOMATIC PITCH TRACKING ON TWO COMPLETELY SEPARATE CHANNELS.

UPDATES AND AFTER-SALES: CALL TOLL FREE

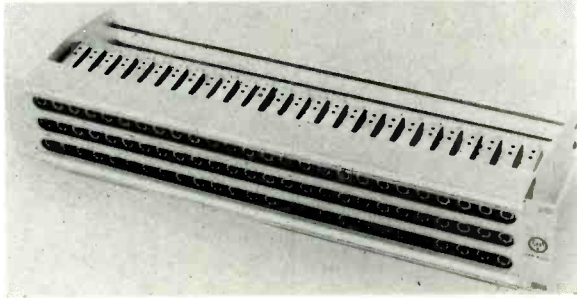
Whatever the age of your **INFERNAL MACHINE 90**, we can easily and quickly update it with the new boards and softwares. You can call us toll free from Europe on: 33 (for France) 1 (for Paris) 43-60-84-64. For England, we now have an English technician who is living in the London area and who is at your disposal for after sales service.

PUBLISON AUDIO PROFESSIONAL

18 Avenue de la République — 93170, Bagnole — France
Tel: 33 (for France) 1 (for Paris) 43-60-84-64 Fax: (1) 43 60-80-31
America: 6464 Sunset Boulevard, Suite 775, Hollywood, CA 900 28.
Tel: (213) 460 63-55. Telex: 3717528 PAI.

Media Products

Our range of BPO audio jackfields are of the highest quality and economically priced, from £155.

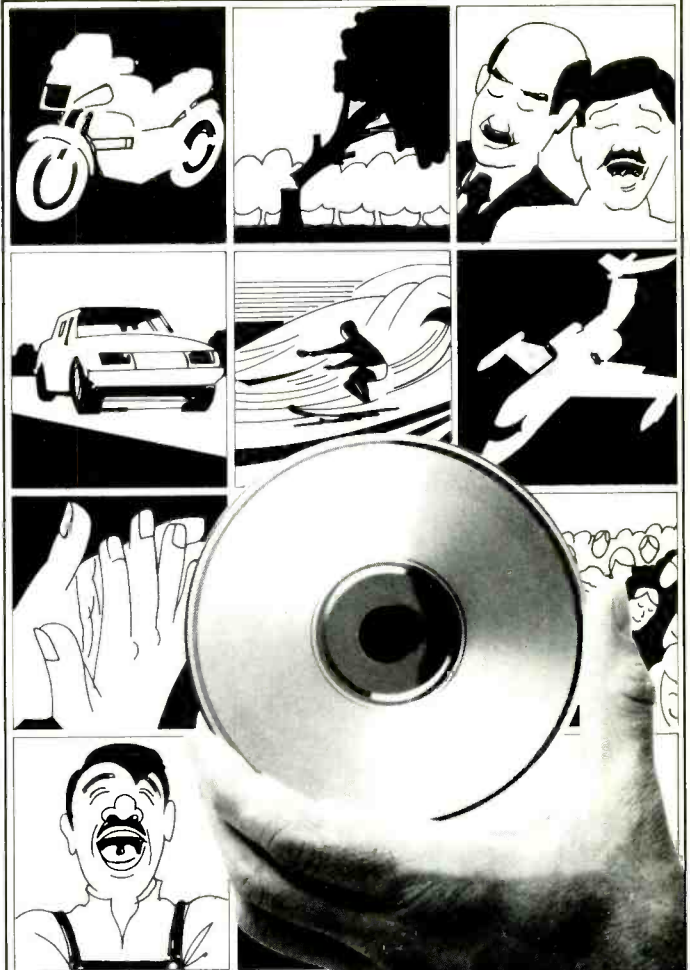


Featuring high quality 5-point palladium contact gauge B jacks, the jackfield occupies just 2U, of rack space. Standard versions are 2 or 3 row in 20, 24 and 26 ways. Please contact us today for information on our range of audio and video systems equipment.

'It's in the name'

Media Products Limited
Unit 4
Chiltern Enterprise Centre
Station Road, Theale
Reading, Berks RG7 4AA
United Kingdom

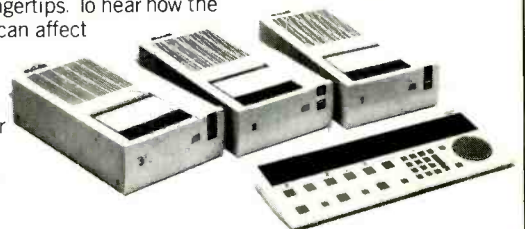
Phone (0734) 303800
Telex 858893 FLETEL G
Fax (0734) 323121 (G2/3)



CD sound affects the effects

Sound effects records and tapes have become a thing of the past! Today's purest sound comes from the compact disc. And now you can experience that CD purity in a superb sound effects library. From Philips, the pioneers of the compact disc system. A library of 28 discs has been specially created for programme makers and presenters. It's a real A to Z of stereo sound effects, with more than 3000 different recordings. Each fully described with track and index numbers, plus playing time.


You'll hear the best of the sound effects library when you use it with the Philips Professional Compact Disc Player System. A modular concept that's not only easy to use, but puts exceptionally fast and accurate programming and cueing facilities right at your fingertips. To hear how the Philips library can affect your effects, contact your nearest Philips organisation, or the address below. Hearing is believing.



PHILIPS

F.W.O. Bauch Limited

49 Theobald Street, Boreham Wood,
Hertfordshire WD6 4RZ Telephone 01-953 0091,
Telex 27502 Fax 01-207 5970



mains distribution panels

VERTICAL — HORIZONTAL
UP TO 20 SOCKETS

**NOW WITH
BRITISH
AMERICAN
FRENCH
GERMAN
AND
6A CEE22/IEC
SOCKETS**

DATA PROTECTOR
Rated at 10A 250V

Attenuation of up to 80dB is provided

for 19" rack mounting

DATA BOXES AND PANELS
PANELS WITH CLEAN EARTH SOCKETS
ELCB PROTECTED SOCKET OUTLETS
110V-240V 10mA-30mA
FOR WALL MOUNTING,
SLOPING TRUNKING
FOR BENCHES

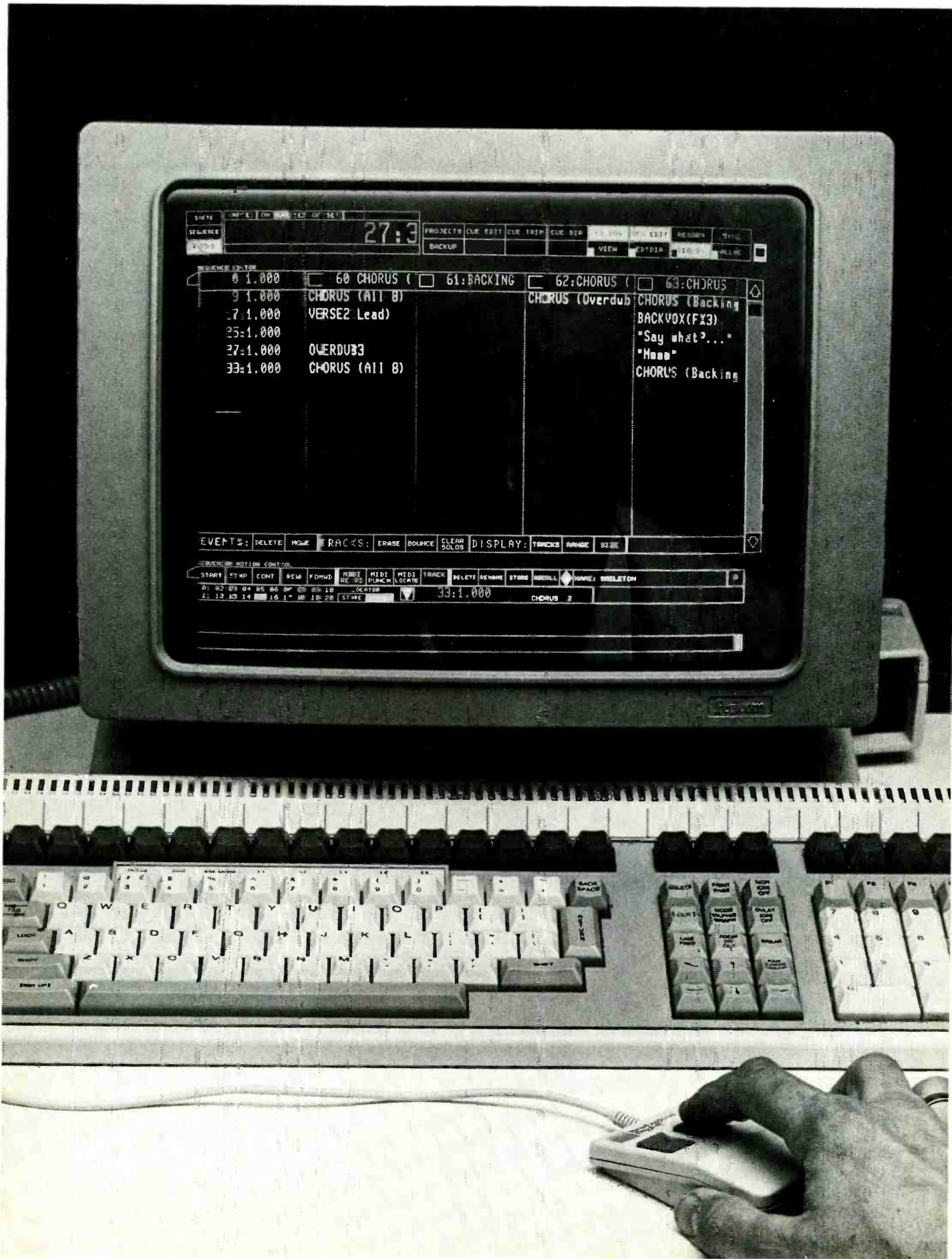
★ SPECIALS
TO ORDER

4FT-6FT LONG 30 Amp INTERNAL WIRING

OVER 300 TYPES FROM STOCK!

OLSON Electronics Ltd
UNIT 3, FOUNTAYNE HOUSE,
FOUNTAYNE ROAD, LONDON N15 4QL
TEL: 01-885-2884 TELEX: 296797

RECORDING IN PROGR



27:3

0:1.000	60: CHORUS (61: BACKING	62: CHORUS (63: CHORUS
9:1.000	CHORUS (All B)		CHORUS (Overdub	CHORUS (Backing
17:1.000	VERSE2 Lead)			BACKVOX(FX3)
25:1.000				"Say what?..."
27:1.000	OVERDU33			"Hooo"
33:1.000	CHORUS (All B)			CHORUS (Backing

EVENTS: DELETE MOVE TRACKS: ERASE BOUNCE CLEAR SOLOS DISPLAY: TRACKS NAME SIZE

START STOP CONT FWD REVERSE MIDI PLANCH MIDI LOCKS TRACK DELETE RENAME STORE METALL NAME SKELETON

P: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

33:1.000 CHORUS 2

ESS. (AND VICE VERSA.)

He could be making an album, mixing a film score, or editing a soundtrack.

He could be in any of the dozens of recording and post-production studios around the world that are equipped with Direct-To-Disk.

What makes it remarkable, is that he's doing the whole job without a spool of tape in sight.

He's getting digital audio with 16-bit, 100kHz fidelity. Which can be re-edited ad infinitum, without ever moving away from first generation quality.

And he's carrying out his work with a speed and flexibility that would have been quite unthinkable before Direct-To-Disk.

With its instant random access facility, you can cue any part of the recording, play back, put things in, take things out and execute the most intricate edits at the speed of thought.

While massive computer power keeps precise control of everything that's going on, and the monitor display keeps you constantly informed.

You're no longer waiting for machines to catch up with you. You don't have to unpick hours of work to make changes.

Instead, you're left free to experiment and to improve.

You want to fly that perfect vocal take in on all your choruses? In the time it's taking you to read this ad, it's been done. And then undone, if you don't like what you hear.

How would that music cue work if it moved forward five frames to picture? Ready when you are, Mr. Director.

The next move

The Direct-To-Disk digital multitrack system is the first system to provide a wholly viable, proven

leap forward from traditional recording technology.

It can now be configured up to 32 tracks, to stand alone or partner the Synclavier.

Hours of continuous recording are available on hard disk.

Software is adaptable for cut-and-splice, rock-and-roll or hit list editing. So while the machines are new, the way they're used will be immediately familiar.

And a 16-track version costs little more than a digital tape recorder with a fraction of the capability.

Doing the system full justice is impossible in print. To appreciate how awesome and how exciting it is, you have to witness it in person.

So we invite you to arrange a demonstration, by calling Vaughan Crampton on 01-202 4366, Harman Deutschland on (071) 813400 or Harman France on (331) 4876 1144.

Or by sending the coupon to: Harman UK, Brent View Road, London NW9 7EL.

The last thing you want is to get left behind. The first thing you should do is see Direct-To-Disk in action.



Direct-To-Disk MULTITRACK RECORDING SYSTEM

Please send me information on the Direct-To-Disk and Synclavier systems Please call me to arrange a demonstration

NAME _____

ADDRESS _____

TELEPHONE _____

COMPANY _____

POSITION _____

NEWS

Ampex air shipments

Ampex are now making regular air shipments to European and Asian distribution centres. Weekly deliveries are now being made to nine points in Europe and to Hong Kong and air shipments to Australia and Japan are being considered for the future. The air distribution programme is controlled and monitored by a new computer and

communications system at the company's Opelika, Alabama, manufacturing centre. With the new system each local market's inventory can be accessed on a day-to-day basis. The North American ground fleet has also been increased to 34 trailers to better serve its 10 American and Canadian distribution centres.

Address changes

● **TotalSystems** (Tendrashaw Ltd) have moved and are now located at 41 Windermere Avenue, Kempshott, Basingstoke, Hants RG22 5JH, UK. Tel: 0256 468555. Telex: 858893 Fletel G. Fax: 0252 620729.

● **D & R Electronica** of The Netherlands now have UK and USA offices. D & R UK Ltd, 5 Fulmer Drive, Gerrards Cross, Bucks SL9 7HH. Tel: 0753 884319. Fax: 0753 889133. D & R USA, 1720 Chip 'N Dale Drive, Arlington, TX 76012. Tel: (817) 548-1677. Fax: (817) 277-6066.

● **Audio Services Corp** and

Professional Sound Corp are now located at 10639 Riverside Drive, North Hollywood, CA 91602, USA.

● **UK loudspeaker manufacturer Fane Acoustics** have opened an office in The Netherlands to handle the local market. Fane Nederland, Julianaparklaan 2, 3534 AN Utrecht, The Netherlands. Tel: 030 421142/421162. Fax: 030 435004.

● **Stage Accompany** of The Netherlands and West Germany have opened a UK office. Stage Accompany (UK) Ltd, 14-16 Deacons Lane, Ely, Cambs CB7 4PS. Tel: 0353 2278. Fax: 0353 67637.

Forthcoming events

March 21st to 24th 7th International Conference on Video, Audio and Data Recording, University of York, UK.

March 22nd to 24th Digital Audio Signal Processing, The Institute of Sound and Vibration Research, Southampton University, UK.

March 22nd to 26th 28th USITT (United State Institute for Theatre Technology) Annual Conference and Stage Expo '88, Disneyland Hotel, Anaheim, California, USA.

April 5th to 8th Acoustics '88, University of Cambridge, UK.

April 8th to 12th NAB, Las Vegas, USA.

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

April 14th to 16th ABTT Trade Show '88, Riverside Studios, London, UK.

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

April 25th to 28th Audio Visual '88, Wembley Exhibition Centre, UK.

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

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

May 18th to 20th ShowTech Berlin '88, Berlin Exhibition Grounds/International Congress Centre, Berlin, West Germany.

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

June 22nd to 24th APRS '88, Olympia 2, London, UK.

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

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

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



Power Play moves and grows

After exhausting all expansion possibilities Power Play studios, New York, moved to larger premises just a block away. Benchmark/Downtown Design were recalled to carry out the architectural and acoustic design.

Phase one of the new construction, now complete, includes a 700 ft² studio, 48-input SSL 4000, two Sony 24-tracks, a Sony digital 2-track, UREI monitors, an assortment of outboard gear and synthesizers, plus reception area, kitchen and offices.

Two additional recording suites and a mastering lab are planned.

Contact between studio and control room is by a large window extending nearly floor to ceiling. RPG diffusers are installed over low frequency traps. Black lacquered RPG diffusers are also used in the studio ceiling. Walls are covered with panels that alternate thick, absorptive material with hard, reflecting surfaces and the room has a generally live ambience.

Successful Midem '88

Midem have reported the most successful exhibition in 22 years reflecting the world music market. Between 1985 and 86 business was reported to be up 13% in the UK, 5% in the USA, 9% in France and 6.8% in Germany.

Compact disc sales rose by 229% (61 million units in '85 to 140 million in '86) and estimated figures for '87 are around 300 million. Broken down, 1986 sales figures are as follows: USA 53 million; Japan 36 million; France 14.5 million; UK 8

million. It is estimated there are around 7000 titles currently available and CD singles should increase the market. There are now 25 pressing plants in Europe, 20 in North America and 12 in Japan.

Midem regards its biggest star to be CD Video. It was felt this would benefit from the success of audio discs and present a new growth area. Its three formats—5 min, 40 min and 2 hr of audio with video—offer potential for promo clips, concerts, operas and compilation videos.

Literature received

● The second edition of *The Exhibitions, Trade Fairs and Conference Centres Data Book* is to be published on March 25th. Around 2,400 exhibitions throughout Europe and the Middle East are listed with details including exhibition title, organisers, sponsors, history, location, space and stand costs, profile and estimated attendance figures, associated conferences, and future dates and sites. A quarterly supplement provides subscribers with updated information. Copies cost £80 and are available from Clare Walter, The Data Book, Reed Information

Services, Windsor Court, East Grinstead House, East Grinstead, West Sussex RH19 1XB, UK. Tel: 0342 26972.

● The *Technical and Craft Books for the Film Video Industry* catalogue no 6 is now available from Alan Gordon Enterprises, Hollywood. The 52-page catalogue lists over 160 titles as well as directories and operation manuals and pre-production computer software.

Free copies are available from Alan Gordon Enterprises Inc, 1430 Cahuenga Boulevard, Hollywood, CA 90078, USA. Tel: (213) 466-3561.



IT DOESN'T MAKE A BAD STUDIO GOOD. IT MAKES A GOOD STUDIO BRILLIANT.

Otari's new DTR 900 digital multitrack recorder isn't the first digital recorder on the market.

But it's undoubtedly one of the most advanced.

For a start, it includes Otari's legendary pinch-rollerless transport.

It combines outstanding sonic performance with utter practicality for the operator.

And best of all, it's ready to work with complete reliability, 365 days a year, from the first day it's installed in your studio.

If that sounds like a machine your studio could use, we'd be delighted to send you a fuller description of it, in our literature. Alternatively, we'll be happy to arrange a complete demonstration.

But first, we'd like to warn you that the DTR 900 sells for a fairly serious sum of money. And no recording machine – even one as advanced as ours – will make an average studio better than it is.

But all we can say is that if your people have the skills, the DTR 900 will make them shine as never before.

THE OTARI DTR 900. DIGITAL FOR PROFESSIONALS.

Otari Electric (UK) Limited
22 Church Street, Slough, SL1 1PI, Berkshire.
Telephone: (0753) 822381. Telefax: (0753) 823707
Telex: 849453 OTARI G

Otari Corporation,
2 Davis Drive,
Belmont, California 94002
Telephone: (415) 592-8311
Telefax: (415) 591-3377
Telex: 910-376-4890 OTARICORP BLMT

Otari Electric Co Ltd,
4-29-18 Minami-Ogikubo,
Suginami-ku
Tokyo 167
Telephone: (03) 333-9631
Telefax: (03) 331-5802
Telex: J26604 OTRDENKI

Otari Singapore Pte Ltd,
625 Aljunied Road,
07-05 Aljunied Ind,
Complex Singapore 1438
Telephone: 743-7711
Telefax: (743) 6430
Telex: RS36935 OTARI

Otari Electric Deutschland GmbH,
Rudolf Diesel Strasse 12,
D-4005 Meerbusch 2
West Germany
Telephone: 010 49/2159/50-861, -862 or -863
Telefax: 010 49 2159 1778
Telex: 8531638 OTEL D

NEWS

Contracts

● **Fidelipac** have completed shipment of 216 *Dynamax CTR10* cart machines to the US Navy Communications Electronics Command for use in the Shipboard Information, Training & Entertainment systems. Other major deliveries include 171 *Dynamaxes* to the Voice of America, cartridges and cart machines for the Canadian Olympics, and 56 *Dynamaxes* for use at the Korean Olympics and subsequent distribution throughout the republic.

● **DDA AMR 24** mixing consoles have recently been supplied to Cyclop Studios, Madrid, and Pacific Studios, UK, through Stirling ITA and Morningstar Studios. Nashville, through Klark-Teknik USA. Abbey Road have purchased a shortened version of the *D* series bringing their total of DDA desks to six. *S* series consoles have been supplied to Wigwam Acoustics, Canadian distributor Gerr Electro Acoustics and Mike Clements.

● Recent contracts for **Audio Kinetics** include two *Q.Locks* to TRT in Turkey, bringing their total to nine, supplied in conjunction with Sony Broadcast; 32-channel automation-ready *MasterMix* to the Australian Film and TV School to be fitted to an Amek *Angela*; 32-channel full retrofit *MasterMix* on a Neve *V* series delivered to Pearl Sound, Canton, Ohio; 64-channel automation ready *MasterMix* being installed by Studer in a 900 series console to be delivered to Hong Kong; and two *Pacer* synchronisers with remote control option to BBC London.

● **Trident Audio Developments** have installed the first fully operational *Di-An* digitally-controlled assignable mixing console at George Tobin's studios, Los Angeles. The console is a 40/32 configuration with 72 moving faders. A second console with the same configuration is also been delivered to Goodnight LA Studios. Other orders have been received from the UK and Europe.

● **Flyte Tyme** of Minneapolis have ordered a **Harrison Series Ten** and a second *MR-4* as a result of their expansion. The 80-input *Series Ten* is totally automated; the *MR-4* has 48 inputs.

● Stirling ITA have supplied the

BBC with their first **TimeLine Lynx** synchronisers and the **Valley International DSP415** de-esser. Two *Lynxes* are in use at the Film Dubbing Dept. Wood Lane and the *DSP415* will be used by the Transcription and Recording Unit to eliminate sibilance from their recordings of BBC programme material.

● **ATC SM100A** loudspeakers are to be supplied to UK CD manufacturers Nimbus, and Crescent Studios have taken delivery of a pair of *SCM200s*.

● One of **Soundtracs'** first *Eric* consoles has been sold to Pete Townshend for his Eel Pie Studio in West London. The console will be installed in Control Room One and an additional *CP6800* will be placed in the *Synclavier* programming suite. Supply of the consoles was arranged through Don Larking Audio Sales.

● **A Solid Stage Logic SL 6000 E** with 56 inputs and *Total Recall* has been installed at Encore Studios, Burbank, California. Encore have modified and enlarged their control room under the direction of Vincent Van Haaff of Waterland Associates to allow for multiple synthesiser setups. Nicholas Spigel and Bill Ravencraft of Specialised Sound were responsible for wiring pre-assembly and electronic installation and Bennett Construction handled renovation, construction, finish carpentry and interior design.

● **Soundcraft** have supplied the in-house mixing facilities in London's recently revamped Astoria Theatre.

Eastern Audio have installed series 8000 for front-of-house and 500 series monitor consoles.

● **Solid State Logic** have announced the following orders: *SL 4000 G* series consoles at A&M, Summa Music Group and Soundcastle Studios in Los Angeles; a 40-input *SL 4000* with *G* series EQ and mic preamps at Whitney Houston's new personal studio in New Jersey; and a 32/32 *SL 4000 E* in a 40-channel frame at Sound Chamber Recorders, Pasadena, California.

● Pink Floyd have purchased a further 24 channels of **BSS MSR 604** for their fully-active stage box system, making 96 channels in all. They have also invested in five *DPR-502* MIDI noise gates.

News from the AES

Many of you will have visited the AES Conventions but in addition, local sections around the world organise regular meetings and technical visits to places of interest. Here are a couple of forthcoming British events to make a note of.

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

The first session, *Studio Practice* takes a look at the practical aspects of acquiring the sound signal and the operations in post-production, while *Storage and Transmission* focuses attention on various storage media in current use. In the evening there will be a buffet reception followed by what promises to be a fascinating presentation by Dick Mills on the work of the **BBC Radiophonic Workshop**. On the second day *The*

Home Front, the Receiver and the Listener looks at the future from the consumer's point of view and also looks back to some of the early work which was carried out by Blumlein.

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

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

● Before that on April 12th we have one of our regular monthly meetings when Dr Sowter of Sowter Transformers will unravel some of the mysteries of **Audio Transformers** from the beginning to the present day. Meetings start at 7.00pm (coffee at 6.30).

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

People

● **Harrison Information Technology** have announced the appointment of David Kempson as technical director responsible for the development of future products. He was previously with Neve where he was part of the R&D team for the *DSP* console projects.

● **Michael Stevens & Partners, UK**, have appointed David Cottam as a sales representative. Cottam is in addition to the sales team and his appointment is a result of the company's expansion.

● Philip M Ritti has been appointed general manager, audio and video tape, at **Ampex Corp** in California. Ritti was previously director of marketing and retains directorial responsibility for that aspect.

Greg Emery takes up the new position of product marketing manager and will assist Ritti in the co-ordination of marketing programmes.

● Boaz Eli Eli has joined **The TGI Group** (Tannoy, Goodmans and Mordaunt-Short) to strengthen their research and development resources. Boaz is a graduate in acoustical engineering and has been a research fellow at the Institute of Sound and Vibration Research. He has worked

with Celestion and as an independent acoustic consultant.

● **Mitsubishi Pro Audio Group** in the US have announced three new appointments. S Miyata becomes president succeeding Tore Nordahl who is now director of new business development. Both men have been with Mitsubishi for several years.

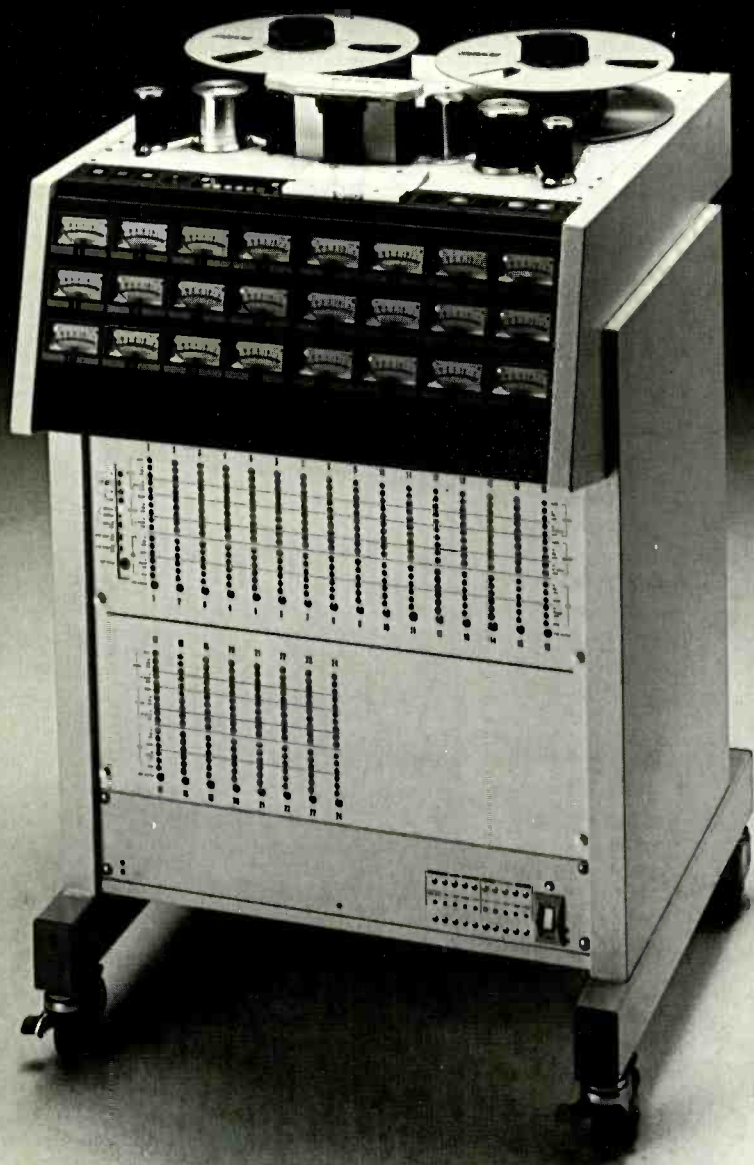
● Graham Carter has joined UK company **Audio Kinetics** as technical sales engineer. Carter comes from Dolby Laboratories where he was primarily involved with the broadcast and video markets.

● Paul Westbrook has become **D & R Electronica's** national sales director in the USA.

● British export marketing services company **Expotus Ltd** have made two appointments. Tim Chapman joins as marketing director; and sound engineer Andrew White becomes technical sales manager.

● London studio **Music Works** have appointed a new studio manager, Pat Tate, who has worked with Pink Floyd, Audio Rents, The Roundhouse and WEA.

● To manager their new German office, **E-mu Systems** of the USA have appointed Harry Diewald. During his 10 years in the music industry Diewald has worked with Sequential Circuits and Moog.



▲ MX-80

▼ MTR-20



▼ MTR-90



THE LANGUAGE OF OTARI SPOKEN AS ONLY WE KNOW HOW

When we talk Otari, we're talking about one of the best all-round multitrack propositions in the business.

It includes the expertise of the UK's foremost Otari specialists.

And the back-up of Service Director Rod Thear and his team, with over 15 years' Otari experience between them.

The MX-80 is the multitrack that puts Otari quality within reach.

Its precision, reliability and high sonic performance (which you can enhance still further with a Dolby rack) are typically outstanding.

The MTR-90's performance with tape is legendary and with our custom Dolby SR* overbridge, its status as the most successful multitrack is assured.

And for mastering, the new MTR-20 sets audio and engineering standards other analogue recorders still aspire to.

With all three you'll find our back-up service as critical - and reliable - as the machines themselves.

To speak Otari simply call Garry Robson or Mick Boggis, for further details.

OTARI[®]

AT

Stirling ITA

1 Canfield Place, Swiss Cottage, London NW6 3BT.
Tel: 94012986 STIR G. Fax: 01-372 6370. Tel: 01-625 4515.

*Dolby SR and HX Pro are trademarks of Dolby Laboratories Ltd.

NEWS

Machines and music

The great thing about compact disc is that it is now possible to listen to interesting old recordings without the accompaniment of the noise and distortion produced by vintage vinyl. I might go so far as to say that the current awareness of '50s music and its promotion in TV advertising is largely due to its availability in a listenable form. Perhaps this is mere coincidence but the fact is that I can sit in the comfort of my luxury studio apartment(?) and listen to Buddy Holly recordings made between 1956 and 1960 and hear almost what Holly and his producers heard on the day of the session.

But how do they sound? Well, actually they sound very good, so good that I'm inclined to wonder just how the audio industry has progressed in the last 30 years. The CD I am referring to, by the way, is *Buddy Holly*—an original title—on MCA Records that claims to be transferred from the original master tapes. With or without EQ is open to speculation.

The question I have to ask is whether Holly would sound any better if he could be timewarped into a top class 1987 studio with SSL and digital and whatever else is considered to be necessary to record music these days? I think not. It seems to me that the music is so suited to '50s recording qualities and techniques that it would be difficult even to match what was achieved then.

Instrumentation is basic. *Not Fade Away*, for example, has vocal, harmony vocals, guitar, bass, hi-hat and what sounds like a sofa being hit with a drumstick (no sarcasm intended). That's all. Other tracks are slightly more complex but not by much. For all the apparent simplicity, the sound from the speakers is clear, full and for the most part well balanced. Pretty much what we need 48 tracks

and automated mixdown to manage today. Mind you, think of all the advantages we have these days—versatile equalisation, noise gates, noise reduction, sampled percussion. Perhaps that's the difference. Everything we do in the aim of progress seems to be towards fidelity and clarity—then we have to use effects to mess things up again.

Those '50s engineers didn't have such problems. Their microphones had the 'dirt' of an exciter built in. That's the only way the manufacturers knew how to make them. The puny amplifiers used by the guitarists distorted at anything over 20 watts or so. Not only that but those valve tape recorders... and tape that saturated when you looked harshly at it.

I could say much the same things about other '50s and early '60s

recordings, such as Joe Meek's *Telstar* for instance or Booker T and the MGs' *Green Onions*, where the sound of the recording is so suited to the music and the arrangement. The point is, how did this synergy come about? Did the manufacturers specifically make equipment to complement contemporary musical styles? Of course not, the style evolved to fit the equipment: simple equipment; simple music; simple.

Going further back in time to the '40s, there was a trend for 'big voice' recordings such as those made by Bing and Frank, where the vocal is louder than the 30-piece orchestra that accompanies it. It had to be that way, you just couldn't scrape out any degree of complexity from a rough slab of shellac with a blunt sewing needle. This style was popular well into the '60s, even though recording techniques had advanced beyond it.

There is a progression in musical styles which follows advances made by the equipment manufacturers. To be fair, musical developments occur of their own accord. Most people would cite *Sergeant Pepper* as a landmark of sorts but to me it sounds a bit like a collection of nice demos.

The next major equipment-led musical change was brought about by multitrack recording. When someone writes the definitive history of the recording industry I hope they will have space to answer a question that is usually left unasked: why did it take so long, once 4-track working had come about, to multiply the tracks up to 16 and 24? Surely the advantages should have been so obvious that it would have happened

in six months. (*Unfortunately the technology did not develop fast enough.* Ed)

This was not so because there was a change in recording techniques involved. Four-track made life easier because you could lay a tune down, then add a little gloss to it, 8-track was the same but more so. The concept of multitrack as we have it today did not come about until it was realised that it might be desirable to have each instrument on a separate track. People hadn't been longing for this facility all through the '50s and early '60s. It had not been thought of but once it had...wow, you can take as long as you like to get it right! Even the tiniest fluff in the bass line could be put right, without involving other instruments. So obvious now.

This is a big step. This is why modern recorded music comes so close to technical perfection performance-wise. It's possible, so it has to be done. Never mind if a little bit of inspiration goes out the window as long as every note is spot on. Of course, it may take a little longer to record an album.

My story is almost up to date. I could bring in Mr Linn at this point but I'll jump a bit further forward to Mr MIDI. I remember buying my DX7 in '84 and wondering what use that little DIN socket on the back was going to be. I could link up to my mate's Roland of course and have the two going at once but I could do that anyway on multitrack. For the purposes of this article I'll call myself a musician and say that just four years ago, we musicians couldn't figure out the point of it. After all, why not just play the instruments?

We musicians couldn't see the point but other people who didn't assume such airs and graces could. They could buy a MIDI sequencer and have it play all their MIDI instruments for them. No longer do you have to have a metric tonne of instrumental ability to make music—all you need is ideas. The manufacturers have done it again. They have put a product on the market and turned the musical world upon its head. Nobody (apart from a few boffins) asked for it but once it was there, big things started happening and suddenly the excitement was back in music.

So here we are, up to date, what's next? I can't hear musicians clamouring for anything in particular. We'll have to wait until the manufacturers suddenly discover that they can make something new that no-one has any application for yet, then someone somewhere will use it to make a noise, which will come to be called—music.

David Mellor



THE LADY

Alison Moyet, whose unique voice and musical approach have established her as a recording and concert artist of International stature.

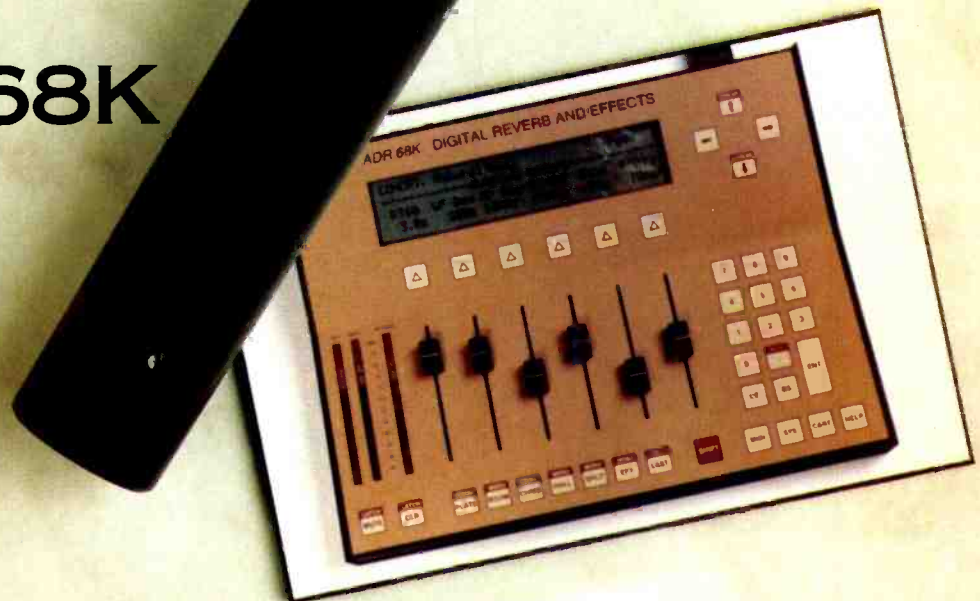


THE MICROPHONE

The C535EB, chosen by Alison and her engineer for its combination of absolute clarity and sound transparency, its tough construction and its complete rejection of handling and ambient noise.

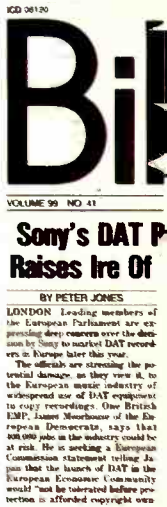
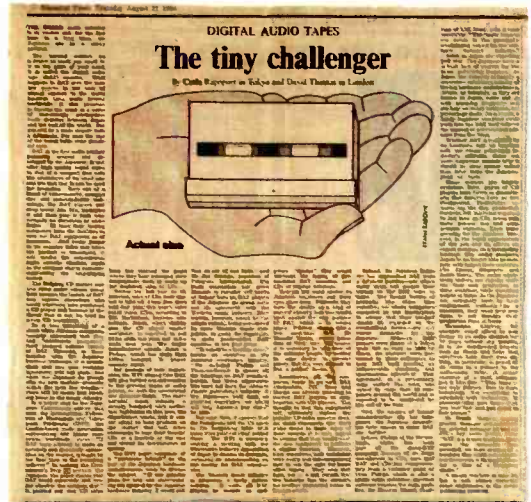
THE ADR 68K

A state of the art, 16 bit computer controlled multi-tasking sound processor, versatile, user friendly and capable of opening many new creative horizons, being used for Alison's current concert commitments.



AKG ACOUSTICS LTD., Vienna Court, Lammas Road, Godalming, Surrey GU7 1JG. Tel: (04868) 25702. Tx: 859013 akgmic g. Fax: (04868) 28967.
AKG AKUSTISCHE U. KINO-GERÄTE GESELLSCHAFT M.B.H. Brunhildengasse 1, A-1150 Vienna/AUSTRIA. Tel: (222) 95 65 17-0. Tx: 131839 akgac a. Fax: (222) 92 34 58.

F i c t



F a



From its very conception, Digital Audio Tape has been the subject of hype and controversy. Much of the hysteria has stemmed from the use in which some consumers may choose to put DAT equipment.

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



It is quality that will guarantee a successful future of the music business as well as the studio industry.

Forget the hype. Ignore the controversy. DAT is highly convenient and it works. And it can provide professionals everywhere with the extra quality they seek.

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

Hopes rise of accord on digital audio tape

By David Thomas

HOPE has sprung in Europe and the US about the chance of a satisfactory agreement with the Japanese. An industry industry is expected to be developed by the Japanese which would cover the music industry.

The Western music industry believes that as early as next year, digital audio tape could be used to replace the compact disc, and increase the revenue of high quality personal music.

Japanese likely to launch digital tape despite outcry

By Carla Rapoport in Tokyo and David Thomas in London

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

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

TECHNOLOGY

Michael Cross

Don't panic over DAT

THE second Japanese negotiator agrees digital audio tape (DAT) is being proposed to record a 100-fold increase in the number of tracks. The format is based on the digital audio tape (DAT) which is the most common format for the music industry.

Japanese companies ready to sell digital audio tape systems

By Carla Rapoport in Tokyo

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

DAT, which will both record and play back music with almost perfect quality, has been selected by five international music industry. It claims that this technology would undermine the industry by allowing music pirates to record copyrighted material such as compact discs, without penalty.

er Intro can MPs

Port's Gips de Vries, to EEC Commissioner, says that the launch of a wider aspect of the consumer electronics market for the Commission to be discussed on page 100.

C t



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

The DTC 1000ES is designed primarily as a domestic device at a domestic price, but we see it as an every-day tool in any professional recording environment.

HHB should know. The company created a massive pro-audio role for the EIAJ digital format.



Of course, both machines are well supported by HHB's legendary expertise and back-up service. That's the special reward for those that choose Europe's leading pro-audio centre for their digital technology.

You've read the fiction and you've got the facts. Now buy the product. There's no turning back.

SONY/HHB

WHAT TO LOOK FOR WHEN YOU LISTEN TO A POWER AMPLIFIER.

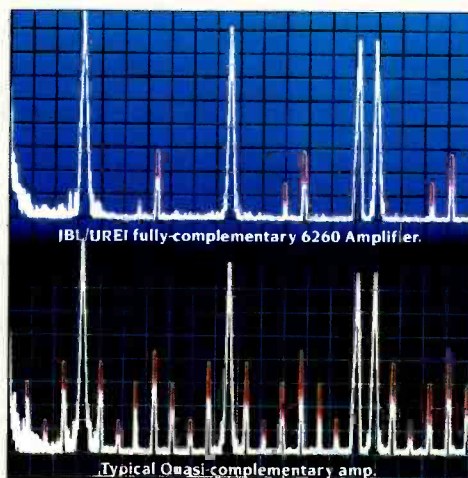
When it comes to evaluating amplified sound, seeing is believing.

In fact, when engineers judge the sound quality of an amplifier, they often rely on *two* precision instruments: the human ear, and the industry-standard Transient Intermodulation Distortion Test, because when measuring sound with T.I.M. what you see is what you get.

And what you see can be eye-opening. Amplifiers that seem to square off evenly spec. for spec., often perform very differently under the scrutiny of T.I.M. Pushed to their limits, many produce brittle, edgy or distorted sound especially during high frequency passages and sharp transients.

Many manufacturers deal with distortion by using massive amounts of feedback through a single overall feedback loop, placing greater demands on the amplifier and producing an inferior sound.

When we built our new JBL/UREI Amplifiers, we committed ourselves to designing the industry's purest-



Red spikes in the TIM Spectrum reveal the dramatic differences in distortion output.

sounding amps that would not only score highest marks on the T.I.M. Test, but deliver the truest amplified sound ever heard.

Instead of sloppily force-feeding massive amounts of

output signal back into input stages, and congesting it all into one circuit loop, we've established operating points at *each* gain stage. This allows signal purity to be maintained along the entire circuit. And permits optimized use of the type and amount of feedback for each individual gain stage.

In a simple analogy, the new JBL/UREI Amplifiers do each signal track right the first time, so that you don't have to fix it in the mix. The result is sound far cleaner than typical quasi-complementary and fully-complementary output stages only. And far more pleasing to the ear.

Put JBL/UREI's remarkable new Amplifiers to the test at your local JBL/UREI dealer today. We're confident you'll think it's the finest amplified sound you've ever heard. Or seen.

For an informative Technical Paper on the unique design philosophy behind the new JBL/UREI Amplifiers, please write to:



JBL Professional
8500 Balboa Boulevard
Northridge, CA 91329



UREI
ELECTRONIC
PRODUCTS

Available in Canada through Gould Marketing

NEWS

The Keyboard Club

Two years ago The Wool Hall studio in the UK's West Country set up an in-house programming and pre-production room. As a result of its popularity The Keyboard Club has been moved to its own building adjacent to the main studio. The facility is connected to the main

studio by video and audio tie-lines but it can also be used separately.

Wool Hall is housed within a group of old stone buildings which have their origins in the 11th century and include an Elizabethan farmhouse, stables, etc. and the Wool Hall so-named as it was once a wool market.

Digital multitracks at Abbey Road's new Studio Three

Abbey Road studios have now taken delivery of the first of two Mitsubishi X-850 32-track digital recorders. The second machine will arrive during April and it is planned that the two will be made available to offer a 64-track recording facility.

The new machine will be put to work immediately on the film

soundtrack of *Willow* and will then take up permanent residence in Studio Three, which is being redesigned and refitted.

The new studio, designed by Sam Toyoshima and John Flynn, will include a spacious control room, programming suite and a self-contained lounge and balcony area.

Agencies

● **E-mu Systems** of California have formed a sales office in Germany to serve dealers in Germany, Austria and Switzerland. E-mu Systems Deutschland, Franz Pueller Strasse 150000, Munich 80, West Germany. Tel: 089 4480544.

● **Harrison Systems Inc** have appointed exclusive agents in Italy and Spain. Audio International SRL, 20090 S Maurizio Al Lambro (M1), Via S Maria 100, Milan, Italy. Tel: 02 253 90121. Fax: 02 253 91008. Singleton Productions, Via Augusta, 59 Desp 804, 08006 Barcelona, Spain. Tel: 34 3 237 7060. Fax: 34 3 237 3163.

● **Dearden Davies Associates, UK**, have appointed Audio Sales to handle distribution of their consoles in Austria. Audio Sales Neusiedlerstrasse 19, A-2340 Moedling, Austria. Tel: 022 36 26123. Fax: 022 36 83223.

● **Sound Com Distribution** are introducing to the UK a new range of sound reinforcement equipment from **Good Will Instrument Co Ltd** of Taiwan. The **GW** range includes microphones and accessories, mixer preamplifiers, mixer amplifiers,

cabinet and horn speakers.

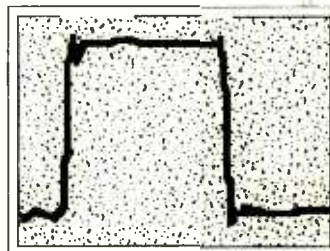
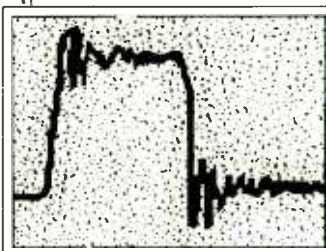
● **AKG Acoustics** have been appointed sole UK distributor of **Fidelipac's** *Dynamax* cartridge machines.

● **Court Acoustics Sales** have appointed the following new distributors for their range of equalisers: Matsuda Trading Co Ltd, Tokyo, Japan, tel 03-295-4731; Audio International SRL, Milan, Italy, tel 2-25-390121; Solan Ltd, Bnei-Brak, Israel, tel 03-702207; Manta Electronics Group, Ontario, Canada, tel (416) 868-0513.

● **Audio Intervisual Design** have been named USA national distributor for **Sanken** products. They are located at 1032 North Sycamore, Los Angeles, CA 90038, USA. Tel: (213) 469-4773.

● **The Muart 4** MIDI control system and optional Spirit sequencer software manufactured in the USA by **Mellotron Digital Corp**, is now available from **Synchrotech Sales** who are now exclusive distributors. **Synchrotech Sales Ltd**, 66 Rochester Place, London NW1 9JX. Tel: 01-267 4202.

If you think they look the same, you need your ears tested.



It's a frustrating fact of life. When we sit down and listen critically, a domestic compact disc player frequently sounds better than even the best professional digital recording hardware. Until now, that is.

The waveform on the left reveals how a popular professional digital system handles a 1 kHz square wave. On the right the same waveform through an Apogee filter. The difference sounds as remarkable as it looks. It also confirms the suspicion that the people who buy compact discs might just be able to hear it too.

Unless your digital system includes Apogee anti-aliasing filters. Our low dispersion, linear phase filters simply smooth away that unwanted 'edge' from professional digital recordings. Apogee filters can be retrofitted to CD Mastering systems or to any digital multi-track recorder. They even breathe new soul into the good old F1.

You invested in digital because you care about quality and you strive for excellence. Now you can fully realise the digital promise — without compromise. Apogee Filters. Your investment deserves them as much as your listeners.

Apogee FROM **HHB**
HHB HIRE & SALES, 73-75 SCRUBS LANE, LONDON NW10 6QU,
TELEPHONE 01-960 2144 TELEFAX 923393 FAX 01-960 1160.

APOGEE ELECTRONICS CORPORATION, 1517 2012 STREET, SANTA MONICA,
CALIFORNIA 90404, USA TELEPHONE (213) 828 1930



NEWS

Berklee Songwriters' recording studio

Berklee College of Music in Boston, MA, USA, has been busy updating its music technology facilities. The college is just a stone's throw from many other cultural institutions: Symphony Hall is just down the street, as are the Christian Science Mother Church, Horticultural Hall and the New England Conservatory, to mention a few.

Berklee is one of the few four-year colleges offering comprehensive training to rock, jazz and pop musicians and songwriters—and budding sound engineers. The school keeps an eye on the increasing use of technology in music-making and updates its facilities accordingly. In the past year, the music synthesis department's teaching labs have been reconfigured and expanded to include analogue, digital and systems labs, the last of which offers nearly every type of technology available. In all three labs, each station is equipped with a *Macintosh* computer linked to a central network and file server. In the music production and engineering department, new digital editing facilities are now available in the 6-studio recording complex. And to prepare songwriting students/composers for the hi-tech world of composers' studios, Berklee has built a 'home recording studio'.

The Home Recording Lab opened last September and features 10 workstations plus a teacher's station. Each station is equipped with an Ensoniq *ESQ1* digital wave synthesiser, a Yamaha *RX17* digital rhythm programmer, an Akai *MG614* 6-channel mixer/4-track recorder, plus Beyer Dynamic *DT100* headphones. At each student's feet is a flight case containing an Alesis *Microverb*, a Yamaha *SPX90II*, a Nakamichi *MR-2* 2-head professional cassette deck and a patchbay. Two *Mirage* rackmountable units are available. At one end of the room, three closets of about 6x4 ft serve as iso booths, each equipped with an Akai mixer, Alesis *Microverb*, a Yamaha *SPX90II*, Yamaha graphic EQ and a dbx 166 plus patchbay, headphones and mic stands.

The lab was two years in the making. In the summer of 1985,

David Van Slyke, an assistant professor in the music production and songwriting department, and members of the songwriters department discussed the technical needs of songwriters. A curriculum was drawn up and the equipment obtained—about \$70,000 worth. By this time, Jack Perricone had joined the faculty as chairman of the songwriting department and worked with David to get the room built.

"We picked the equipment in here because we wanted to give students, at the very least, a working

knowledge of basic recording, programming and synthesis techniques. Students should be able to create very good demos on what's available," states Jack. "They have a choice—they can pay a studio or, for the same amount of money, equip themselves."

As for the layout, he comments: "We had to get the most into the least space. The equipment is not difficult to learn to use, so students can feel creative and not lose track of their ideas. Many bands hash out ideas on tour and in rehearsal, and then put it all down on a 4-track before going into a studio, and this course provides some valuable hands-on experience for our students."

The students, all third-year songwriting majors, are taking it well: "It is overwhelming for them at first and we approach it systematically," says David, who designed the course. "Students are tested before taking the course, so for the ones who end up here, it's all very new. Most of them just want to write songs, really, but they are very enthusiastic. At first, I thought I would run out of things to teach but that hasn't been the case—many have not been exposed at all to this technology and have only worked with their instruments."

Certain rules and regulations have been set up: no food, no smoking (anything), no coke! Nothing gets unplugged, it's all done through the patchbay, and playing while the teacher is talking is not helpful. Outside of class, students have six hours of lab time available a week. Their first project involves

recording a song using one instrument per track: from there students move on to the joys of drum programming and mixing six tracks down to four. By midterm, students have created a demo using stereo drums, stereo keyboards and background vocals. For their final exam, students are working with six to eight sequencer tracks, two vocal tracks, and stereo drums—if they sync drums and synths and get three tracks of vocals, they get extra credit.

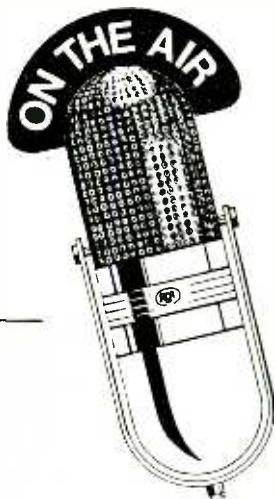
"All very practical," comments Jack. But then, Berklee's songwriting department has long understood the practicality of teaching students how to get on in the business of writing music. The course schedule includes musical surveys, a course on John Lennon's music, lyric writing, songwriting, as well as a business course. The latter teaches budding songwriters about copyright law, publishing contracts, sources of royalty income, performance societies and collection agencies, and how to market a demo.

And Berklee itself has been practical in accomplishing all this. Although the school is on a very good financial footing, this sort of technology is expensive. Berklee has been quick to approach manufacturers and other industry professionals for help—and in turn the industry has responded. Yamaha, Kurzweil, Sony, Alpha Audio, Lexicon, Opcode Systems, Perfect Fretworks and local music shops, even, are among those who have provided or donated equipment, services and advice.

Kathleen White



Students hard at work in Berklee's home recording lab



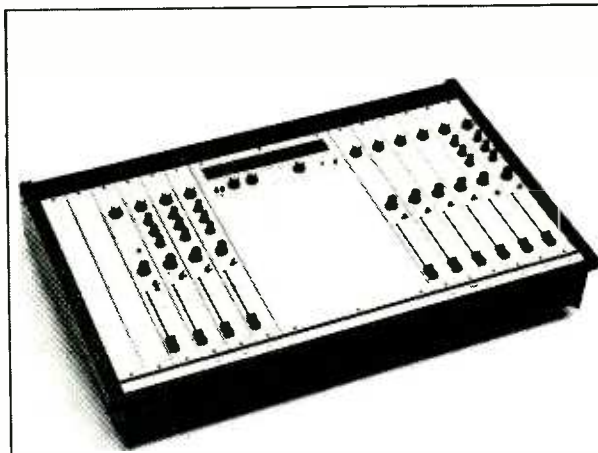
ON AIR WITH eela audio

EELA AUDIO BROADCAST MIXERS SPECIALLY DESIGNED TO SATISFY THE REQUIREMENTS OF "DJ-SELF-OP" BROADCASTING. ALL THE MIXERS ILLUSTRATED USE THE LATEST TECHNOLOGY ie VCA LEVEL CONTROL, VOLTAGE SENSING FOR MUTES, START, PFL, COUCH, OVERALL LIMITING etc, MODULAR CONSTRUCTION, ALLOWS THE USER TO POSITION MODULES TO SUIT HIS PREFERRED MODE OF OPERATION.

PROFESSIONAL BROADCAST EQUIPMENT

SRM

HAS BEEN DESIGNED FOR THE SMALLER COMMUNITY OR STATIONS EQUIPPED WITH ALL THE NECESSARY FUNCTIONS, TO ENABLE THE STATION TO GO ON AIR, WITH THE MINIMUM COST, AND TIME. AND WITHOUT THE DRAWBACKS OF GENERAL PURPOSE MIXERS. IT COMES AS A STANDARD MIXER WITH THE OPTION OF TWO SPARE MODULES OF YOUR CHOICE.



SBM

TWO FRAMES ARE AVAILABLE FOR THIS MIXER, ONE TO ACCEPT A MAXIMUM OF 12 INPUTS, AND THE OTHER 16. AS IS COMMON WITH THE OTHER MIXERS, THE TELEPHONE CHANNELS COME EQUIPPED WITH BUILT IN TELEPHONE HYBRIDS.

S90

A FURTHER DEVELOPMENT OF THE SBM. THIS MIXER HAS MANY OF THE SRM OPTIONS AS STANDARD FUNCTIONS, IN ADDITION THE STEREO CHANNELS ARE EACH EQUIPPED WITH A "D" CONNECTOR, WHICH IS WIRED WITH ALL THE FUNCTIONS TO INTERFACE WITH THE SOURCE ie START, INPUTS AND OUTPUTS, MUTES, +/- 18 VOLTS TO POWER PRE-AMPS etc. SPACE IS PROVIDED ABOVE THE METER BRIDGE TO HOUSE CLOCKS, TIMERS, AND ANY OF THE NEW EELA 800 SERIES MODULES.



EELA AUDIO
Hondsruglaan 83a
5628 DB Eindhoven

Tel. 040-424455
Telex: 59281 bolle nl.
Fax: 40-428925

Dealer: UNITED KINGDOM
0992-468674

NEWS

Sound reinforcement at NY AES

Following on from last month, further sound reinforcement equipment shown at the New York AES.

Ramsa, the pro-audio division of Panasonic, made an impressive entry into the sound reinforcement field with the *WR-S840* mixing console, in both house and monitor versions. The *WR-S840* has been designed to meet very high 'on the job' performance specifications.

Areas where special attention has been applied to the console design include crosstalk and here Ramsa use a bus structure where a ground conductor is paired with each signal conductor for proper ground isolation between adjacent channels together with a chrome-plated solid copper ground bus running the length of the console that ties all the modules' audio commons together.

The console is composed of seven different types of module including an input module featuring routing switches to the eight buses, 4-band sweep EQ with peaking mid bands, sweep highpass filter control, insert return in/out, eight auxiliary send pots with pre/post and on/off switches, channel-on switch with LED, overload LED, PFL switch with LED and channel fader. The input module also features a separate direct output and this can be internally configured to be post fader, pre-fader, pre-EQ, etc, as required.

The monitor version input module is virtually identical to the standard input module with the exception of the routing switches and pan facilities.

A useful option for the *WR-S840* is the sub input module. This is a double width module with the left side taken up with eight microphone preamplifiers with gain control and phase, 48 V. PFL and direct out switches, together with eight on/off switches in the channel fader space.

The console is normally equipped with two effects return modules, each module containing two return circuits. Each return features routing switches and pan, 2-band EQ, level pot, on and PFL switching with LED indicators.

The monitor module has been configured so that the console can easily be used in live sound and studio situations.

The Digitech *DSP-128* offers 128 MIDI-controllable pre-programmed effects in a 1U rack package. The unit offers electronically balanced stereo inputs and outputs together with loophrough outputs for daisy chaining with other effects processors. The *DSP-128* comes pre-programmed with 128 effects drawn from 32 basic algorithms and these can be user-modified and put into memory or down-loaded into external storage. A master reset function restores all factory presets should they be required and memory settings are backed up by battery. The processing is divided into six reverberation types—large room, medium room, small room, gated, reverse, damping, six types of effects—delay, multi-tap delay, chorus, flange, special effects, equalisation. Up to three different programs can be layered together for complex processing and an LED display indicates the program in operation or displays the parameters. A handy package where a library of effects is required with rapid access.

Audio Logic introduced the *SC31* and *SC215* graphic equalisers, the *SC31* being mono 31-band and the *SC215* dual-channel 15-band. Both equalisers are 2U and feature balanced inputs/outputs with *XLR*, stereo jack and barrier strip connectors, variable high and lowpass filters, 6-LED level indicator and low noise high-slew operation.

AKG Acoustics presented the *DSP 10* processor for use with the *Delta* stereophony system developed for theatre use by the German Radio & Television research centre (RFZ). The *DSP 10* is essentially a computer-controlled (IBM AT or compatible) multichannel digital delay processor with six input channels being routed to an output matrix of 10 channels. The video monitor displays all input and output levels, delay times and also the stage area, enabling the movements of performers/sound sources to be followed with a mouse. At present AKG are the sole licencees to manufacture a control system for *Delta* stereophony and purchase of a *DSP-10* includes an

operating licence.

The CADD *DL-1* crossover may be configured for stereo 2-/3-way operation and features a digital compressor/limiter and delay line for each band, providing both driver protection and alignment. The compressor threshold can be programmed from -10 dB to +10 dB in 1 dB steps and the ratio from 1:1, 2:1, 4:1, 8:1 and 16:1. Good transient response is ensured through a 'Safe Operating Area' type of algorithm. The delay lines can be programmed from 0 to 5 ms in 20 μ s steps.

The Carver *PMX* 24 dB/octave electronic crossover is intended for use with Carver *PM-175* and *350* amplifiers and can easily be installed in the field. Two- to 5-way systems can be configured and one system will drive all power amplifiers in an installation. The *PMX* features fourth order Linkwitz-Riley alignment, plug-in crossover frequency selection, subsonic highpass filter, high frequency limiter and auxiliary balanced outputs for driving external amplifiers.

The TDM Design *CX* series can be used as 2- or 3-way crossovers, the *24CX-2* comprising two filter sets and the *24CX-4* four sets. The modular concept allows a variety of configurations. The filters use 24 dB/octave fourth order Linkwitz-Riley circuitry. The high range outputs feature switchable CD horn equalisation circuits and optional limiters are available for all outputs.

The BGW *GTA* is rated at 900 W continuous power per channel into 2 Ω or 1800 W into 4 Ω in mono with a 'dynamic power output' of 4 kW. The amplifier is built as a dual mono unit with heavy-duty mains transformers for each channel and features modular construction allowing rapid substitution of cards in the field.

The casualty rate of amplifiers on the 'diesel and dust' touring circuit in Australia decided Australian Monitor (built by Graftons) to make their own amplifier that would combine ruggedness with audio quality and this has resulted in the *AM 1600* and *AM 900* MOSFET power amplifiers. Both models are rated at 0.015% THD (maximum) at full power with the *AM 1600* delivering up to 1100 W RMS/channel into 2 Ω and the *AM 900* 700 W RMS/channel into 2 Ω . The amplifiers feature massive protection circuitry (short circuit, DC, thermal and slow startup) and front-to-back cooling fans for each channel.

Design Direct Sound manufacture a whole range of horns made from biaxial stitched glassfibre and balsa wood laminations, thus eliminating many of the problems associated with ringing and hangover. DDS also use a special spinning technique to mount the throat adaptors that provides both increased strength and absence of vibration. Latest additions

are a line of 40°, 60° and 90° horns developed in collaboration with Gauss for the contractor market. Also new is the *CFD 1-90* 'Continuous Frequency Distribution' 90° horn (1 in throat) for use in small to medium house systems and large stage monitor systems.

JBL introduced several new compression drivers. The *2450* is a 2 in driver combining neodymium rare-earth magnets and new phase plug technology for improved clarity and smooth response. Other advantages include smaller physical dimensions and weight, allowing tighter spacing in arced arrays and less loading weight. The *2427* 1 in drivers use a single piece bottom-plate/pole piece/phase plug with integral 2 in throat exit, allowing them to be mounted directly on *JBL 2380* horns. The *2426* utilises the same manufacturing techniques as the *2427* and also features a removable front snout, which enables the driver to be mounted directly to horns with a 1% in throat and screw thread.

Apogee Sound Inc manufacture a range of 2-way loudspeaker systems together with their own dedicated processors providing crossovers, time domain alignment, fixed corrective equalisation points and the PAF (Positive Amplifier Feedback) driver protection limiting system. Two versions of each processor are available, one for permanent installation and one for road use, and these differ in the arrangement of the input and output connectors.

The largest Apogee speaker system is the *3X3* which features two 15 in (38 cm) speakers coupled to separate horns, a 60x40 compression driver horn with 2 in driver and an array of four 1 in compression driver horn assemblies for the high frequencies. Continuous power handling is 1 kW RMS and 4 kW peak. The frequency range is 53 Hz to 19 kHz and the enclosures are made to form arrays with what Apogee call 'Bi-Planar Arrayability' (acoustic arrays in both the vertical and horizontal planes).

For situations demanding subwoofers Apogee offer two systems, the *AE-10* dual 15 in enclosure with the *A-10* processor and the *AE-12* dual 18 in enclosure with the *A-12* processor. Both enclosures are of the vented type with the low end frequency response being 38 Hz and 35 Hz respectively.

Wireworks have introduced the Prism multicable component system. This consists of stageboxes/rackmount units for 3, 6, 9, 27 and 36 channels with modular sub-assemblies enabling the wiring system to be configured as required, ie male or female connections for the main and sub-systems. Also from Wireworks is the *CR1207* cable reel, featuring sturdy steel construction, large holding capacity and a 3-position braking mechanism. Terry Nelson

A Good Reason To Call RTS When You're In The Business Of Recording On Tape.



Our Model 927 Programmable Reference Tone Generator adds a new dimension to tape recording quality assurance.

Operating in a *stereo* mode, it is user programmable with discrete tones, pink noise, noise reduction tones, phase check, stereo I.D. and more.

We think the 927 can improve your audio business. Please call or write for descriptive literature.

PROFESSIONAL INTERCOMMUNICATIONS • PROFESSIONAL AUDIO PRODUCTS

RTS SYSTEMS

INCORPORATED

1100 West Chestnut Street • Burbank, California 91506 • Telephone 818 840 7119 • Telex 194855 • Telefax 818 842 4921

INTERNATIONAL DISTRIBUTION

AUSTRALIA
PACIFIC COMMUNICATIONS
Rydalemere
Phone: 638-6400

CANADA
APPLIED ELECTRONICS
Toronto
Phone: 416-252-3761
GERR ELECTRO ACOUSTICS, LTD
Toronto
Phone: 416-868-0528

COLUMBIA
ELECTRONICA DE LA SABANA
Bogota
Phone: 257-24-04

DENMARK
INFORMATIONSTEKNIK A/S
Kobenhavn
Phone: 011-45-1

FRANCE
SCV AUDIO
Paris
Phone: 48 63 22 11

GREAT BRITAIN
FUTURE FILM DEVELOPMENTS
London
Phone: 434-3344 / 437-1892

HONG KONG
ACE INTERNATIONAL CO.
Hong Kong
Phone: 74522343

ITALY
AUDIO INTERNATIONAL
Milano
Phone: 25390121

JAPAN
OTARITEC CORPORATION
Toyko
Phone: 333-3891

KOREA
SAMA TRADING CORP
Seoul
Phone: (02) 733-9336

MEXICO
VARI SA
Mexico City
Phone: 525-250-7394

NEW ZEALAND
GENERAL COMMUNICATIONS LTD.
Wellington
Phone: 881-169

PERU
CARSA PROFESIONAL
Lima
Phone: 321510

SOUTH AFRICA
PRO SOUND
Johannesburg
Phone: 337-6556-9

SWEDEN
INTERSONICSYSTEM AB
Stockholm
Phone: 744-58-50

SWITZERLAND
GOTHAM AG
Regensdorf
Phone: 840-01-44

RTS SYSTEMS

NEWS

Studio architects

A team of UK architects specialising in recording studio projects have come to our notice. Rogers & Webb are currently undertaking work for Dave Gilmour of Pink Floyd and Guerilla Studios. Completed projects include Angel Sound, Animal House, Lillie Yard, Mingles, Riverside Recording Studios and Black Wing.

Through an associate company, a complete turnkey package can also be arranged from help in finding premises to designing the studio and overseeing the entire building operation.

Rogers & Webb, 66 Hampton Road, Twickenham, Middlesex TW2 5QB, UK. Tel: 01-755 0991.

The Home Service

The Home Service has been set up to offer a personal service in the UK to home and commercial studios.

Demonstrations can be given in the home or studio, trade-in deals can be arranged, general advice is offered and for those starting, upgrading or refitting their studio a personal

studio design plan can be supplied.

The Home Service is run by Louis Austin and based at the premises of equipment distributor Scenic Sounds Equipment.

The Home Service at SSE, 12 William Road, London NW1 3EN. Tel: 01-387 1262.

Fazioli subsidy scheme

Fazioli have recently announced a subsidy scheme for the professional purchase of their grand pianos.

The new scheme falls into two parts. Where the piano is to be used in education, performance or recording, a rebate against the first

five years' guarantee is available. On the professional side, where the piano is recommended by an adviser some form of commission may be payable in the form of remuneration, a credit to works or instrument sponsorship.

Russian CDs produced in Australia

A trading agreement was formalised in early December between the Russian state-owned Melodiya music company and Australian company Melodiya (Aust) Pty Ltd. Melbourne CD manufacturer Disctronics are producing the entire catalogue of 20 initial classical releases being distributed throughout the Pacific

rim area.

Melodiya Australia was formed last year to exclusively produce and distribute the Russian label's releases throughout Australia, New Zealand and other Pacific countries and already the first production run has sold out. A further 40 titles are to be released also produced by Disctronics.

BBC completes RDS network

Installation of Radio Data System equipment at all the BBC's network and local radio VHF-FM transmitters serving England was recently completed. RDS signals will allow the 'intelligent' receiver to automatically

tune to the best signal, give a visual indication of the station name and display the current time and date. Extension of the same service to Scotland, Wales and Northern Ireland will begin this year.

In brief

- The *ESH10* splice find/erase NAB cart machine from Fidelipac's *Dynamax* range is now being distributed in the UK by AKG Acoustics.

- UK studio Terminal 24 have upgraded their mastering facilities. Otari *MTR12* ¼ and ½ inch machines have joined the existing *MTR90* to make the facility entirely Otari. Monitoring has also been overhauled by Sandy Brown Associates.

- **Cheshire Communications** are now installing BES hemispherically radiating ceiling loudspeakers in churches and other highly reverberant areas. The system can be installed as ceiling tiles or adapted for suspension over a seating area and eliminates the need for loudspeaker boxes, which can detract from the aesthetics of the building. It is claimed that fewer speakers are necessary and the sound is more evenly dispersed.

- **Robert Berke Sound** of San Francisco, CA, have renovated Control Room A. Enhanced acoustics were designed by Randy Sparks of RLS Acoustics and new equipment includes Sound Workshop *34C* mixing console with disk-based automation, Kelly Quan disk-based audio for video editing system and Dolby *SR* noise reduction. Another audio sweetening room featuring layover/layback to 1 inch video and extensive library of sound effects and music selections has also been added.

- **Rhino Distribution UK** are offering discounts on Whirlwind and Switchcraft ranges of connectors and adaptors. The Whirlwind range includes in-line *XLR*, chassis *XLR* and ¼ inch jacks, and Switchcraft products include in-line *XLRs*, in-line plugs and jacks and RCA phono jacks.

- **Celestion International** of Ipswich, UK, are to sponsor the Suffolk County Council Rock and Pop Band Competition for a second year. Celestion are keen to support their local community and the event also gives them a chance to demonstrate their compact, high-powered *SR* loudspeaker system launched last year.

- Bruce Springsteen's *Tunnel of Love* album has been recorded and mastered on Sony *3324* and *1630* equipped with **Apogee** filters. Apogee believe this is the first 'all Apogee' project where the recording, mixing and mastering chain employed their lowpass filters in place of standard industry filters.

- **The Music Station** in London have upgraded their multitrack to a Studer *A820* and their monitors to Quested *212s*. A moving fader automation system is planned.

- For his *Something Special* album, country & western artist George

Strait has received an **Ampex Golden Reel Award**. Plaques were also presented to co-producer Jimmy Bowen and engineers Bob Bullock, Ron Treat and Chuck Ainlay in a ceremony at Sound Stage Recording Studio in Nashville. The \$1,000 charity donation that accompanies the award is to be given to the Jennifer Strait Memorial Foundation.

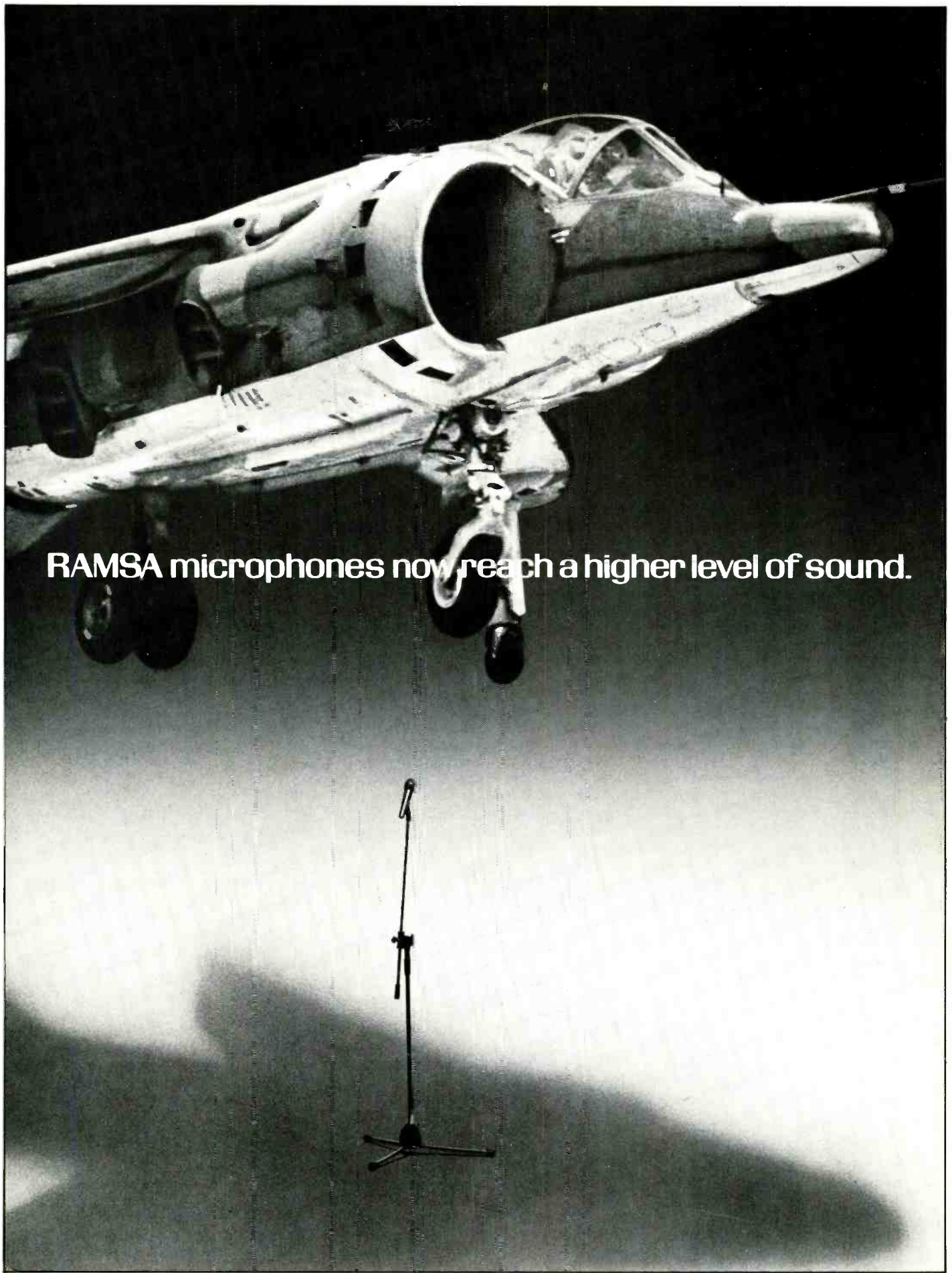
- **Sheffield Audio-Video Productions'** remote truck recently recorded *A Tribute to Harry Chapin* in New York's Carnegie Hall. The purpose of the event was to honour Harry Chapin for his work to end hunger in America. Performers included Paul Simon, Graham Nash, the Smothers Brothers, Pat Benetar and Bruce Springsteen. Bob Lifton engineered the audio portion of the show, Maryland Sound provided in-house PA system with Al Tucker mixing, and video production was handled by Richard Kilberg.

- **Hip Pocket Recording Studios** opened on January 1st in the Manhattan area of New York. Formerly Blank Tapes Inc, the studios were recently purchased by a syndicate headed by Bob Merrill. Extensive upgrades have been announced to the existing three studios and a fourth room will be opened this spring.

- The **AES** has announced the opening of its 1988 educational grant programme for university studies with emphasis on audio topics. Awards, for graduate students only, are made annually and successful applicants may request a one-time renewal of their grants. Information and application forms are available from AES Educational Foundation, 60 East 42nd Street, New York, NY 10165, USA. Completed applications must be received by June 1st to be considered for the 1988-89 academic year.

- **Midifur** is the latest recording service offered by **Different Fur Recording** in San Francisco, California. Equipment in the computer and MIDI production room includes E-mu *Emulator III* and *Emax*, Roland *D-50* and percussion such as Roland *PD-31* multi-trigger drum pads and Roland *PM-16* pad to MIDI interface. There is also an Apple *Macintosh* with *Digidesign Sound Design* and *Performer 2.2* MIDI Sequencer and a library of custom samples.

- **Yamaha** have donated some of their latest musical equipment to the Physics Dept of University College, Cardiff. Following contact at last summer's International Computer Music Conference, Yamaha and the Electronic and Computer Music Systems Research Group at the University have collaborated on research and development of digital synthesisers and the £6,500-worth of equipment given will provide a boost to the course's research in the field of FM-synthesis and other projects.



RAMSA microphones now reach a higher level of sound.

RAMSA
PRO-SOUND

300-318 Bath Road, Slough, Bucks SL1 6JB. Tel: 0753 34522.

See the full range of amps, microphones and speakers at your specialist dealers.

NEWS

In Brief

● **Otis Communications** have launched a compact power amplifier known as the *Power Station*, which is described as an affordable low-cost single-channel design rated at 100 WRMS into 4 Ω. The unit may be used free-standing or rackmounted in a cradle or right-angled brackets for wall or under speaker use. Output terminals are two 4 mm sockets or 2-pole standard jack. There are three input sensitivities and signal is on a jack. There is provision for a low level balanced *XLR*-type output and the front panel has LED indication of signal present, soft clip, thermal protection and DC status. Frequency response is quoted as 15 Hz to 20 kHz +0, -0.5 dB at rated power with THD of less than 0.06% into 4 Ω at 1 kHz. Hum and noise is -87 dB with 0 dB input sensitivity selected and a slew rate of 30 V/μs. Otis Communications Ltd, Thriplow House, Thriplow, Cambridgeshire, UK. International: Emberman Ltd, The Innovation Centre, Cambridge Science Park, Cambridge, UK. tel: 076 382 465.

● **Solid State Micro Technology for Music (SSMT)** have introduced the *SSM 2016* differential audio preamplifier, an IC designed for high quality applications such as high

gain mic preamplifiers, signal summing, differential line receivers and low gain balanced input stages. The 16-pin device can be operated off split supplies from 9 V up to 36 V for improved headroom. Solid State Micro Technology for Music Inc, 2076B Walsh Avenue, Santa Clara, CA 95050, USA. tel: (408) 727-0917. UK: Hartech Ltd, 7 West Pallant, Chichester, West Sussex PO19 1TD, tel: 0243 773511, fax: 0243 779196.

● **AKG** have announced optional software for the *ADR 68K* digital processor. *Release V4.00* contains additional reverb programs in the form of Hall/Hall Split, Plate/Plate Split, Hall/Chorus Split; additional effects program (8 s tape loop program); additional sampling—32 s mono and 16 s stereo both with pitch shifting, 32 s mono multisampler with 12 voices and 16 s stereo multisampler with six simultaneous voices, 24 s mono sampling or 24 s sampling while using any reverb or effects program; additional MIDI features—Auto-Midi parameter control of any 10 program parameters. Auto-Midi total system automation and sample storage via MIDI sample dump standard. More than 150 presets will be stored in EPROM.



Soundcraft 6000 console

Soundcraft have recently launched the series *6000* console, which is designed as a high performance multitrack console. Soundcraft describe the console as having signal handling without compromise and as having a specification designed to exceed the performance of digital equipment.

The console is of fully modular construction built into a rigid extruded aluminium frame. 16- and 24-bus versions encompass frame sizes from 16 to 40 inputs with optional spare slots for effects returns. There is provision for an optional patchbay.

Facilities include 4-band sweep EQ, six independent aux sends, programmable muting and solo-in-

place. Output modules incorporate EQ and two aux sends on the monitor section with all group outputs and tape returns switchable to -10 or +4 levels.

The mic amp is of an electronically balanced design that accepts signals from -2 to -70 dBu without a switchable pad. The *6000* uses an active panpot design that it is claimed to improve typical L/R isolation by 25 dB and provides a near-perfect sine/cosine panning characteristic.

Soundcraft Electronics Ltd, Borehamwood, Herts, UK, tel: 01-207 5050.

USA: JBL Professional, Northridge, CA, tel: (818) 893-4351.



Amek/TAC & Steinberg automation

Amek/TAC and Steinberg have collaborated in the development of a new console fader, mute and switch automation system. The R&D team at Amek have designed the necessary hardware and the automation interface, and have advised Steinberg on aspects of automation techniques. Steinberg have developed software for the system to run.

The automation will run on an Atari *ST* computer and will also be configured for the Apple *Macintosh*. It will be able to handle up to 128 faders and 15 switches per channel with synchronisation via SMPTE code. As with other software packages from Steinberg, comprehensive screen graphics will be used to display the automation process.

The system will be available for

Amek/TAC ranges of consoles and as a retrofit to consoles made by other manufacturers using standard Amek interface and VCA hardware. Pricing for the system is described as 'highly competitive'. Amek have stressed this development will not alter their policy of offering choices of automation. They are OEM licensees for GML systems, and have supplied large quantities of Audio Kinetics *MasterMix* systems. They have recently entered into negotiations with Digital Creations Corp to offer the *Disk Mix* system. TAC have demonstrated a universal interface with the Jellinghaus *C-Mix* and JL Cooper systems.

Amek Systems & Controls Ltd, Salford, UK, tel: 061-834 6747.

USA: Amek Consoles Inc, North Hollywood, CA, tel: (818) 508-9788.

Confused about DAT?

SONY

Sony will point you in the right direction.

Beware! The digital maze offers many enticing routes.

If you need to record at 44.1 kHz, copy digitally to and from other formats, and take advantage of sub code editing and switchable emphasis, there is only one way to go: the Sony PCM-2500.

Tread carefully. Consumer DAT machines will lure

you down the garden path. Only PCM-2500 leads you clear of the confusion.

For your plan of the maze (and the way out of it) fill in the coupon below, or contact your nearest Sony dealer.

HHB Hire & Sales
73/75 Scrubs Lane
London, NW10 6QU
Tel: 01 960 2144
Tlx: 923393

Future Film Developments
114 Wardour Street
London, W1A 3DG
Tel: 01 437 1892
Tlx: 21624 Alofid G.

ASC
4A King Street
Mortimer
Reading, RG7 3RS
Tel: 0734 333100



The Sony PCM-2500

Return to: Marketing Services Department, Sony Broadcast Ltd.
Belgrave House, Basing View, Basingstoke, Hampshire RG21 2LA.

Name _____

Position _____

Company _____

Address _____

Tel No: _____

S/S/4/88

SONY
THE LEADER IN DIGITAL AUDIO.

NEWS



API new products

API Audio Products have announced a 2-channel, 19 inch rackmount equaliser, the *API 5502*. This is a fully discrete unit that uses the same circuit design as the original *API 550A* modular equaliser. In addition to the *550A* features, the *5502* has four frequency bands and 14 new frequency points including 20 Hz and 20 kHz. Many functions are selectable with special jumper plugs including the polarity of the in/out jacks, the overall gain of the EQ in 3 dB steps and a high/low band pass filter section that can be bypassed completely.

The front panel has the same look as the *550A* with silent in/out and hard wired bypass switches. There is also a version dedicated for disc mastering with 1 dB steps and 0.1 dB accuracy and known as the *5502D*. API are also looking at the possibility of fitting the 4-band *5502* in the same packaging as the *550A* for retrofitting into existing slots, and a special modular *5502* that will

fit into the Sony line of consoles.

API have also announced that they have successfully converted the well known *2520* discrete op-amp to an automated assembly procedure and have switched to surface mount discrete components. Apparently one of the difficulties was ensuring that all of the components were the exact original part numbers only in a surface mount package. They were able to retain 100% of the original part number on every component, and after bench and listening tests it has been pronounced 'to sound just like the original'. This process cuts costs dramatically and yields greater consistency between amps. A 24 V version of the *2520* will also be introduced for circuits that require more headroom. This will be available for the same price.

API Audio Products Inc,
Springfield, VA, USA, tel: (703) 455-8188.

UK: Syco Systems Ltd, London, tel: 01-724 2451.

Editall editing blocks

Editall have introduced the *EC* series of editing blocks. These feature a new edge clamping design for accurate holding and cutting of very thin tapes, such as those used for digital and video recording. The edge clamps hold the tape on the 'guard bands' of the lower and upper edges and are activated by a slide lever. The system is claimed to give virtually unhindered access to the tape for cutting and though primarily

intended for digital editing, the blocks may also be used with other tape formats for 'delicate editing'.

Blocks available are the *EC-D5/EC-D1* for ½ inch and 1 inch digital tape and the *EC-A1/EC-A2* for 1 inch and 2 inch analogue tape.

Xedit Corporation, Mount Vernon,
NY, USA, tel: (914) 668-0388.

UK: Scenic Sounds Equipment Ltd,
London, tel: 01-387 1262.

NED N software

The latest release of software from New England Digital introduces two main developments and a number of enhancements to existing displays on the *Synclavier Digital Audio* system and a series of features on the *Direct-to-Disk* system.

The recent addition of the Optical Disk (WORM) storage system to the *Synclavier* is the first of these developments. The Optical Disk System increases its on-line storage capabilities by 2 Gbytes. In practical terms this means immediate access to 20,000 s of sound data. Sounds can be transferred from any storage device on the *Synclavier* to the Optical, and organised into multiple categories; a sample of a car horn, for instance, may be categorised under a 'transport' catalogue and a 'car' catalogue.

The new Sequence Editor Display is the second development. Apart from duplicating many of the sequencer functions normally accessed by buttons on the *Synclavier*, the Sequence Editor also provides immediate access to any of the 200 polyphonic sequence tracks and introduces a variety of simple-to-operate, mouse-controlled features for sequence manipulation. These include cutting, moving, copying, pasting, merging and filling. Sections of tracks may now be transposed and times may be displayed in seconds, minutes, beats, measures and beats, timecode and even feet and frames.

An improvement to the Sound File Directory now allows the user to search for and sort sound files from any storage device in the system including the Optical Disk, then list them by name, description or length and audition them while they are being loaded.

The Audio Events Editor is the most significant software upgrade and is available for both the slave and standalone *Direct-To-Disk* systems. Designed for music and post-production applications, the AEE display is a series of panels that can be called up simultaneously and in any combination on to the screen. Totally mouse-driven, these display panels offer the facility to create cues from any combination of tracks on the *Direct-To-Disk* multitrack, store these into a cue directory and sequence the cues using the 200-track sequencer.

The random access capabilities of the *Direct-To-Disk* are such that elements of a track, no matter how far apart on the disk, may be cued and re-cued instantaneously due to the large buffers allocated to each track. More sophisticated cues may then be created which in themselves may contain multiple edits and even blank 'leader'. Each track is totally independent thus allowing a cue on, say, tracks 7 and 8, 4 min into a project, to be played with a cue from tracks 1, 2 and 5 only 3 s into the project. A special feature on the Record panel allows multiple takes using the same start time. Each take is stored and numbered automatically into the cue directory—ideal for voiceover techniques.

Time values on both the Audio Events Editor panels and on the Sequence Editor displays may be 'dragged' and incremented using the mouse.

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

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

Digidesign Sound Accelerator

Digidesign have announced the development of *The Sound Accelerator*, a high speed digital signal processing card for the Apple *Macintosh II* and *SE*. The release of this product coincides with updates to the company's *Sound Designer* and *Softsynth* software releases. When working with *Sound Designer*, samples that have been digitally loaded into the *Macintosh* can be played directly from the computer with 16-bit performance. Digital EQ, mixing and merging of sounds can be adjusted while the sound is playing, allowing the user to hear each adjustment as it is being made. 'Three-dimensional' FFT frequency analyses can be made to appear instantly on the *Macintosh* screen.

When used in conjunction with *Softsynth*, all synthesis functions are processed in realtime. This means that the user can adjust parameters of a sound while listening to the corresponding changes in timbre. Digidesign say that this makes the program more effective and quicker to use.

Digidesign have decided to make the specifications for *The Sound Accelerator* available to other software developers with the intention that it will become the basis for future programs from Digidesign and other developers. *The Sound Accelerator* card will be available worldwide by June.

Digidesign Inc, Menlo Park, CA, USA, tel: (415) 327-8811.

Mitsubishi Audio Crossbar Switcher

The ACS Audio Crossbar Switcher finds applications in music recording, film sound and broadcasting for general audio routing, central mixing and routing for broadcast stations, mix-minus plus clean-feed, audio-follow-video switching, audio console input premixing and routing, audio console output bus assign expansion, electronic patchbay, central audio distribution switcher and tape-to-tape transfer mixing and routing.

The system can be configured as standard to 96 inputs and 64 outputs (mono or stereo), with larger systems available by special order. The inputs and outputs use high-performance dual differential balanced circuitry with transformers being optional. Switching is accomplished with low resistance FET crosspoint circuitry for minimal noise and distortion.

The ACS uses a standard PC-XT-compatible computer though AT-compatible computers may also be

used. The software includes a powerful self-test and fault-finding program and failures are indicated down the relevant board and IC.

An extensive number of configurations can be stored to disk with 11 switching assignment presets ready and waiting in memory. Set-up is via the computer keyboard or an optional touch-sensitive plasma display panel. A further option is up to 32 remote control stations that can be daisy chained via a shielded ribbon cable bus to a maximum distance of 1,000 ft (300 m) from the system computer.

The ACS is also fitted with RS-232C/RS-422 communications ports for integration with external systems.

UK: Mitsubishi Pro-Audio Group, St Albans, Herts, tel: 0727 40584.

USA: Mitsubishi Pro-Audio Group, San Fernando, CA, tel: (818) 898-2341.

Brainstorm TB-4 Communicator

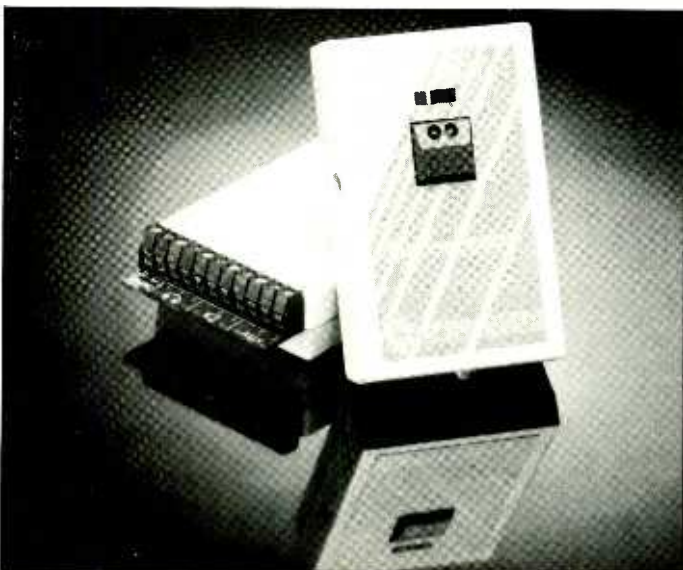
Introduced at the New York AES, the *Communicator* is an infra-red remote control system designed to interface with the talkback system of a mixing console. The bidirectional transmitter activates the console's talkback switches from anywhere in the control room even without direct line of sight with the receiver, which can sit on the console. The *Communicator* uses a PCM-encoded infra-red signal to eliminate interference from outside sources.

The transmitter features four switchable functions whose precise operation depend on how the receiver is wired into the console but

Brainstorm suggest: 1=talk to headphones; 2=talk to headphones and speaker; 3=talk to speaker; 4=talk to aux. The talkback switch on the transmitter is momentary. Claimed system response time is 85 ms as typical.

The system includes a rechargeable transmitter with charger and a receiver with power supply. The transmitter and receiver each measure 3¾x2¾ inches and additional transmitters are available separately.

Brainstorm Electronics Inc, Los Angeles, CA, USA, tel: (213) 475-7570.



For many years ATC have been regarded as one of the world's leading designers of loudspeaker components. Their soft-dome drive units and electronic crossovers have been used by some of the UK's leading studio monitor designers including Neil Grant, Andy Munro and Roger Quedsted. ATC now manufacture their own active and passive studio monitors.

ATC's two new models, the SCM-50A and SCM-100A are both active three way systems: the "50" houses a 9" bass driver in a 50 litre enclosure, the "100" houses a 12" bass driver in a 100 litre enclosure. Both combine high sound quality and high sound pressure levels with reliability.



SCM-50A £2600 per pair
SCM-100A (not shown) £2950 per pair

The facts:

- The SCM-100A's can produce 115 dB s.p.l. at one metre per speaker (118 dB per pair) and still have a further 12 dB of headroom.
- The SCM's drive units have unrivalled dispersion characteristics which provide wide and precise stereo imaging.
- The SCM's uses of a short coil in a long magnetic gap results in one of the lowest distortion figures of any studio monitor and also reduces "listener fatigue".
- The ear has its most sensitive between 350 Hz and 3500 Hz. The SCM's have no crossover points in this range.
- Each SCM is "tri-amped" (350W) producing very low intermodulation distortion. ATC's famous electronic crossover is second order filtered with phase correction (time alignment) and momentary gain reduction.

Suited to all sizes of control room, private recording facilities and broadcast environments, ATC's Studio Control Monitors are a reference tool which provide an uncoloured and true sound, ensuring that what you hear is what's being recorded or broadcasted.
 All prices exclude VAT.



Syco: Conduit Pl. London W11 Tel: 01 724 2451 Fax: 01 262 6081

MUSIC NEWS



Ensoniq keyboards

The SQ-80 is a development from Ensoniq's successful ESQ-1 multitimbral synthesiser. It features 75 multisampled digital waveforms used to create complex synth sounds; each of its eight voices has three oscillators and new additions include a built-in disk drive, waveforms for five complete multisampled drum kits, and 20,000 note capacity for the on-board 8-track sequencer.

As on the ESQ-1, the SQ-80's sequencer has internal voices allocated to it in a dynamic ('voice-stealing') fashion for maximum flexibility but can also control external polyphonic synthesisers. Advantages of using the SQ-80 as a mother keyboard also include its provision of individual key aftertouch; as a result, the keyboard has an unusual feel but this is acceptable considering the enormous

power and low cost of the machine.

The EPS is Ensoniq's Performance Sampler, compatible with existing Mirage disks but better suited to stage use. It's a 16-bit sampler with 2 Mbyte memory, 20-note polyphony (12-note if higher bandwidth is required) and an 80,000-note sequencer.

Expert systems make sampling and looping extremely easy and the same individually pressure sensitive keyboard as on the SQ-80 is supplied. As for other 16-bit samplers, a full disk takes around 40 s to load but this fact is offset by the unique ability to load new sounds while the SQ-80 is still playing.

UK: Ensoniq UK, PO Box 806, London NW3 1HL. Tel: 01-439 8985.
USA: Ensoniq Corp, 155 Great Valley Parkway, Malvern, PA 19355. Tel: (215) 647-3930.

Casio new products

For launch at the Frankfurt Music Fair, Casio have announced the VZ-1 synthesiser, with 16-bit sound based on a new voice generation system. It's an 8-operator design with 64 presets and RAM card facilities, and the rackmounted VZ-10M version will be launched simultaneously.

The FZ-10M, the rackmounted version of the FZ-1 16-bit sampler, is also for launch at Frankfurt and standard 2 Mbyte memory and XLR outputs have been added to this

design.

PG-380 is a new MIDI digital guitar compatible with the VZ-1 synth; 64 preset sounds on-board can be added to by RAM cards programmed on the VZ-1 and inserted into the back of the guitar.
UK: Casio Electronics, Unit 6, 1000 North Circular Road, Staples Corner, London NW2 7JD. Tel: 01-450 9131.
USA: Casio Inc, 15 Gardener Road, Fairfield, NJ 07006. Tel: (201) 575-7400.

Roland software

Roland has introduced new software for its MC500 MIDI sequencer and S50 digital sampler.

There are three new packages for the MC500. The MRB-500 Bulk Librarian disk stores patches, patterns and sequences from most MIDI instruments on to MC500 disks. One-way or handshake MIDI operation is possible and files saved can be named with any combination of letters and numbers.

The number of files on a disk and memory remaining is shown, and it's possible to type in a Memo concerning the contents of the disk. Roland claim compatibility with all their current alpha Juno and MKS synths, most drum machines, Yamaha DX/TX/QX/RX units and the DMP-7 mixer, Casio CZ synths, Korg synths, Ensoniq ESQ-1, Kawai K5 and many others—the extensive handbook details how to handle these and other instruments. MC500 owners will find this an economical and efficient way of saving data and avoiding expenditure on several different types of RAM cards, cartridges and tape backup systems.

The Rhythm Bank software comprises some 800 rhythm patterns set up for the TR-707, CR-1000, MKS-7, TR-505 and TR-727 drum machines. They have also been found

to be compatible with other machines such as the Sequential Drumtraks.

Data is dumped to the Rhythm Track of the MC-500, leaving the four sequence tracks blank. Rhythm tracks loaded can be disassembled into their component patterns to create new songs, which can be renamed as desired. Notes are included on how to use samplers and synthesisers rather than drum machines as the sound source.

The pre-programmed patterns are largely very imaginative and the software quite powerful. But it's not possible to load a pattern directly under an existing sequence since the Rhythm Bank software and normal composition software can't be run simultaneously.

The MRP-500 Performance Package disk is intended largely for stage applications. It allows the MC-500 user to type in a list of songs on disk in order of performance; define pauses between them; rename them and play them once or repeatedly.

The original MC-500 software was not very well designed for stage performance; songs held in memory could only be replaced by switching the machine off and on again. The new software makes the MC-500 a very powerful proposition for stage purposes.



Roland keyboards

Launched at the Frankfurt Music Fair, Roland's D-10 is a multitimbral LA synthesis keyboard with velocity sensitivity and built-in rhythm composer using sampled sounds. The D-20 version also features a multitrack 16,000-note sequencer. The PG-10 is an optional programmer for these two, and for the D-110, a 1U rackmount version of the D-10.

The S-330 is a new 1U rackmount sampler based on the S-50. It has 16 voices, 750k memory, eight outputs, Time Variant Filters, and connections for a mouse controller and for a monitor screen for sample editing. The existing S-550 sampler now has an optional Hard Disk (HD-5) and multichannel sequencer software (SYS-553).

P-330 is a new 1U rackmount

digital piano module using SA synthesis; three piano sounds, harpsichord, clavi, vibes and two electric piano sounds are available with 16-voice polyphony.

C-20 and C50 are digital harpsichords in a wood finish. Various harpsichord and lute tones are available as well as organ and string sounds; MIDI, variable dynamics, room and hall reverb and dual or multitimbral modes are also available. Selectable Equal, Just, Mean Tone, Werckmeister and Kirnberger tunings are included. UK: Roland UK, 983 Great West Road, Brentford, Middx TW8 9DN. Tel: 01-568 4578.

USA: Roland Corp US, 7200 Downsview Court, Los Angeles, CA 90040-3647. Tel: (213) 685-5141.



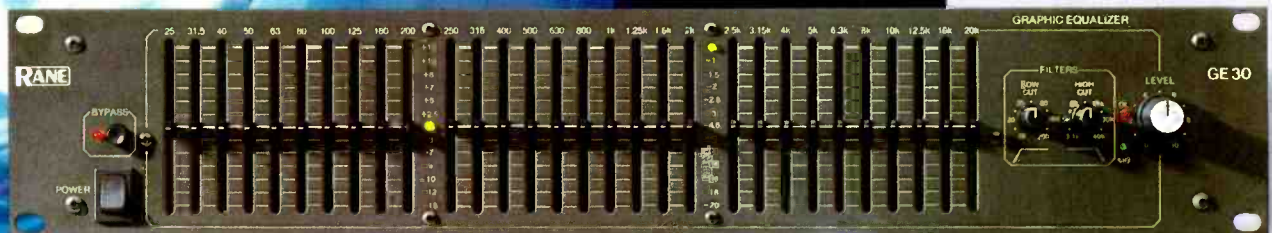
SUPERNATURAL CONTROL



ature doesn't recognize the ISO centers on graphic equalizers. But with the GE 30 Interpolating Constant-Q Equalizer you maintain proven constant-Q filter performance between ISO centers when two sliders are activated simultaneously. Interaction and unwanted side-effects are minimized.

You'll never have to bother making decisions about boost/cut or cut-only, direct or transformer coupled outputs, terminal strips or three-pin connectors. The GE 30 gives you all these options with the push of a button. Even a steel security cover is standard.

The power of two conventional equalizers in one. Meet your acoustical challenges with the super-natural control of the Rane GE 30.



RANE

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

RECORDING FOR BROADCAST

There are many fundamental differences between radio in the US and Europe: factors such as the sheer number of stations in the US; the way that much European broadcasting is in the hands of state funding—directly or indirectly; the comparatively small number of commercial stations in Europe and the small number of non-commercial stations in the US. From our area of interest there is a further aspect—most of the large European broadcasting corporations record large amounts of their own music for broadcast. Many also maintain their own orchestras and almost all have quite extensive recording facilities. This article by James Betteridge looks at some of the London-based studios recording material for Radios 1, 2, 3 and 4, the four national networks of the BBC

The large, white, flat-roofed building at the north end of Delaware Road, Maida Vale, London, is home for the BBC's Music Recording Section of Programme Operations. It is here that virtually all the music recording for BBC radio takes place. The operation is divided into two groups: Group 3—serious classical; Group 2—all music for Radio 1 and Radio 2, plus various extras including jingle packages for local radio, work for BBC Records, BBC Television and outside broadcasts.

In all there are six music studios at Maida Vale and, with the exception of Studio Six, they are currently all fitted with 40-channel SSL 4000E

mixing consoles. Studio One is the home of the BBC Symphony Orchestra, one of three London-based BBC house orchestras, and it is dedicated to the recording of serious classical music for Radio 3. It is a very large, live studio ideal for classical orchestral recordings and is currently equipped with Studer A800 24-track. Studio Two, though somewhat smaller than Studio One, is a large, live room generally used for chamber orchestra, but currently has no multitrack facilities. Studio Three is the home of the BBC Radio Orchestra, which broadcasts exclusively on Radio 2. It is identical to Studio Two, but with a less live acoustic, and its 40-channel SSL 4000E console has been augmented by a further 26 channels of SSL 5000E series built into the existing frame.

Studios Four and Five are two fairly large and structurally identical rock pop studios, though the former has a Tom Hidley acoustic treatment whilst the latter has been treated by the BBC's own technical department. Both are equipped with Studer A800 24-track machines. Studio Six is not specifically for rock or classical but in capacity falls somewhere between the two and is well-suited to string orchestras. Unlike the others, it is equipped with a relatively old Neve console.

Bob Conduct, assistant manager operations for Group 2, emphasises the high intensity of work they handle at Maida Vale: "The BBC records orchestras at a phenomenal rate. We often make an album in about three hours, and we like to think it doesn't show. In a standard 3½ hour music recording session, which includes a statutory 20 minute break, we would frequently expect around 30 minutes of fully mixed, broadcastable air time to emerge. Orchestral sessions we record straight to stereo with a multitrack as a back-up, so that if there are any problems they can be patched up in the break; it's really as tight as that. We also have a very rapid turnover of pop and rock work for Radio 1.

Studios Four and Five are in use from noon until the early hours of the morning for that purpose, virtually seven days a week, recording various sessions for the shows of John Peel, Janis Long, Andy Kershaw, Nicky Campbell, and *The Friday Rock Show*. We try to get about four numbers recorded and mixed—about 20 minutes of material, within that 13 to 14 hour period. About 85% of the time we manage that, the other 15% will require more time for mixing."

This is notably faster than most commercial rock/pop projects, where several days might be spent arriving at an acceptable drum sound and many months can be taken to produce a completed album. I asked Studio Manager, Mike Shilling, how the BBC product compared to that of the commercial studios.

Mike Shilling: "We certainly do work at a far faster rate than the commercial studios, and most commercial engineers would be pushed to work within these time restraints. Most of our recordings will be listened to only once or twice on the radio, and so they don't come under the same critical analysis. In terms of production we're not looking to use a band to make a record, as is often the case commercially; instead we're looking to record the band, their material and their production ideas more or less as they are. It's a very different approach. Knowing that we have limited time there's no question of taking days over a drum sound, we can't get around separation problems by doing cymbal overdubs or replacing parts of the kit with triggered samples, etc, so we go for more of a live, spontaneous feel. I think that, while our final product may not be as technically polished as something that's taken weeks or months, we do maintain high standards, and what we produce captures more the sense of a performance, which is something that many artists and record companies appreciate. We have a wide range of bands coming through; some will have major record deals and perhaps a single in the charts, while others may not have a contract at all and might have been accepted purely on the strength of a rough cassette they sent in. Gone are the days when we used to spend hours simply trying to duplicate a successful single for broadcast. It is quite common for record companies or bands to buy recordings made here and release them as commercial singles. Or sometimes we might re-record an album track that a band have already spent weeks recording elsewhere, and they prefer our result and include

it on the album or release it as a 12 inch."

This sounds like a bout of 'Beeb' propaganda but apparently it's all true.

Bob Conduct: "No, it really happens quite a lot. People don't recognise the artistic value of spontaneity, and of course we have the advantage of starting where the original producer left off. If a band have fairly recently spent weeks going over and over a song, they'll know it very well but have had a sufficient break from it to allow the spontaneity. So, in a way we have the best of both worlds. There have been a number of chart successes recorded here—Bauhaus's *Ziggy Stardust*, for example, and Elton John and Rod Stewart have both released BBC recordings of live performances on B sides of singles."

Another important part of the BBC's orchestral recording facilities is to be found in a converted Edwardian theatre in Golders Green called The Hippodrome. The auditorium has recently been levelled off to create a capacious, live recording environment clad mostly in maple wood, ideal for recording large orchestral combinations. The control room is equipped with a 56-channel, L-shaped SSL 4000E, with an extra 56 mic amps fitted allowing up to 112 mic level sources to be mixed. This makes it suitable for live broadcast of large orchestras, a use it is put to on average two or three times a week. The Hippodrome is the home of the BBC Concert Orchestra which broadcasts more or less equally on Radio 2 and Radio 3, and gives many public performances around the country.

Conduct: "Our engineers frequently work with radio OBs. Their vehicles include the well known DCV mobile in London, with the Neve digital console. There are also rigid mobiles with 40-channel SSLs in Bristol, Glasgow and London, and articulated SSL mobiles in Birmingham and Manchester. They're all multitrack capable and are generally equipped with Studer A800 or Otari MTR90 24-tracks. If we need more than 24 tracks, or require two multitracks in order to do gapless changeovers—usually on rock concerts—we have the MRV (Mobile Recording Vehicle), which is a separate, smaller truck containing two Studer A800 24-tracks with synchronisation capabilities."

The rapid turnover of sessions at Maida Vale puts the equipment under unusually high pressure.

Conduct: "Many of the sessions coming into a commercial studio will run for several days, weeks or months, and once the desk is set up, the majority of the controls will be left static. In our studios, on the other hand, virtually all the console controls on every desk are twiddled and reset to zero at least twice, often three times, a day, which puts a very much greater strain on them. SSL themselves consider that we work their consoles about three times as hard as any commercial studio. We have completely worn this desk out (Studio Four) in four years. It was new in 1981, we have since had it completely mechanically rebuilt by SSL, all the pots have been replaced, and now it is virtually worn out again, although it will have to last a little longer yet because we can't at present afford a new one. This is in no way a criticism of SSL, it's just that we really do thrash the thing. Because of the large number of engineers using the facilities we need to maintain maximum flexibility and so there is no normalling on the patchbay. If you want to bring a mic up you have to patch it, and that also puts a great strain on the patchbay itself."

How useful is the *Total Recall* with such a rapid turnover?

Shilling: "Not all the desks have *Total Recall*,



Studio One



Studio Two



Studio Three's control room

RECORDING FOR BROADCAST



Studio Three



Studio Four's control room with engineering staff

and in fact because we start and finish most of our sessions in one sitting, it's not in constant use. Also, the idea of being able to take your disk into any other SSL studio and recreate the original sound and balance doesn't work because no two desks are alike; the pot laws are different with different models, and you have to reset all the outboard gear anyway. So unless you can at least guarantee returning to the same studio, it's easier to start again. It can be useful to take a snapshot of the monitor mix of a particular track whilst recording it so that when you come to mix it later in the session, you can return to approximately the right balance, bearing in mind that the auxiliary equipment will probably be more or less static. In a live situation, when recording a concert in a mobile where there may be a number of bands performing, the snapshot facility is very useful. It means that you can return quickly to the balance you achieved during the soundcheck—if you've managed to get one!"

There are a number of modifications that the BBC specified for their original SSL consoles.

Shilling: "There are certain master control switches on the SSLs which, in their standard form leave the desk very vulnerable to disastrous operator error, especially if you're mixing live or broadcasting directly from the studio, which all our studios are equipped to do: the PFL is totally destructive, going into replay mode will instantly lose all your mic inputs, the fader reverse switch will drastically alter your mix with just one inadvertent nudge, and so on; thus, we have had fitted what we call a 'status lock' button, which effectively locks the status of these master controls, and precludes any of these things happening. With that button in you can't do any of the things I mentioned, or send tones or talkback to the outputs, or anything else too disastrous. These things we specified when we got our first SSLs, and they've proved so useful even to commercial studios that I think they are now more or less standard."

Rupert Brun, maintenance supervisor: "One mod we still make that I don't think anyone else does, is to remove the left back and right back outputs from the stereo and mono outputs. In the majority of cases, the way the desk is configured, you can have programme on these buses and not see it on the stereo metering or hear it over the monitors but it will still go down the line to the transmitter, which can be very embarrassing. We then have to alter the combining amps to maintain the correct gain structure. We also change certain components—uprate resistors or fit larger heatsinks to improve reliability. The original bargraphs are no longer available, and we now manufacture our own PCBs so we can keep them working."

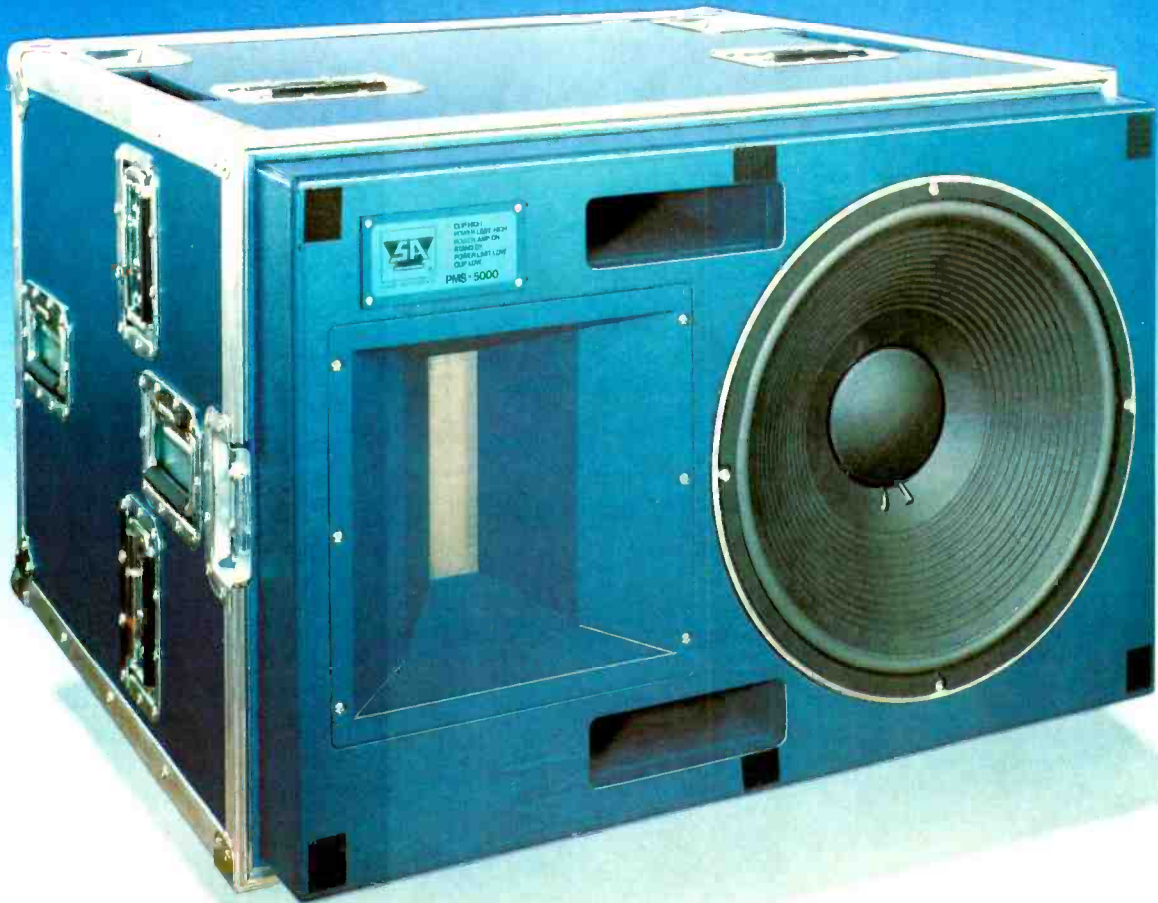
"We have three technical engineers on duty here 12 hours a day, and they have to cope with the maintenance of all the studios plus any minor modification work and the setting up of complex sessions that needs to be done. They tend to be kept very busy."

Colley: "Our maintenance team are absolutely invaluable. Whereas with a late session in a commercial studio you might have to phone up someone on the other side of town who will then take an hour or two to get over and then possibly not have the knowledge or equipment to fix the fault, here we have three excellent engineers on hand who are keen and know exactly what they're doing."

"That's vital," says Mike Shilling, "because here two or three hours is often 25% of the session!" □

SA 4525 BLUE BOX[©]

“The spectacular new concept for PA systems”



- **Super HiFi quality**
Unmatched clarity & reproduction of dynamics
- **Unequaled transient response**
Amazingly short attack and decay time
- **Superb frequency response**
Flat from 30 Hz - 32 kHz
- **High acoustic output**
120 dB continuous, 130 dB peak, (SPL, 1m)
- **High-tech electronics**
Built-in active 2-way system
- **Microprocessor control & protection**
Dedicated software controls all functions
- **Full remote control**
Through high-speed SA-net and PC
- **Extremely low distortion**
THD & IM less than 0.01 % at all levels

For more information please fill in coupon and send it to:

Stage Accompany, Anodeweg 4, 1627 LJ Hoorn, The Netherlands, Tel: 02290 - 12542, Tlx: 37989 Stage nl, Fax: 02290 - 11192
Stage Accompany UK, 14 - 16 Deacons Lane, Ely, Cambridgeshire CB7 4PS, Tel: 0353 - 2278, Tlx: 81625, Fax: 0353 - 67637



stage accompany

I would like to have more info on the Blue Box.

- I am: PA sound engineer
 theatre sound engineer
 studio engineer
 musician
 discotheque owner

Other:

Name:

Address:

Zipcode: City:

Country: ss



STUDIO MARCADET

Janet Angus visits Studio Marcadet in the heart of the industrial northern outskirts of Paris

Although Marcadet continually pulls in name clients—both producers and musicians—no one was more mystified than owner Georges Blumenfeld when the studio topped a *Music Week* studio poll in 1986. They tend to exist in their own little world without taking much notice of what other studios are up to.

The Parisian recording studio business seems to be experiencing the growth and price cutting problems seen earlier in the UK but Marcadet remains aloof.

"More and more studios are opening and I don't know where the money is coming from," says Blumenfeld. "When they open they drop the price and they don't know what they are doing. They can't even pay the rent and they will have to close down. 1988 will see five more SSL rooms opening. How will they pay?"

Blumenfeld has been working as a recording engineer in Paris since 1968. His entrepreneurial eye fell on Apex products at an AES convention, whereupon he proceeded to represent them in France. In 1982 proceeds from this arrangement enabled him to accept the opportunity to buy Studio Marcadet, then situated in the heart of the city. High rents and Paris' notorious traffic problems prompted the move to Plaine St Denis, which, apart from anything else is easily accessed from D'Orly and Charles de Gaulle airports.

The association with Apex also led to contacts with Lakeside Associates in the States who were to design the new facility. Studio A comprises a large recording room (approx 100 m²) with marble floor, and wood and blue fabric wall finishes typical of the time. A drum area now houses the Yamaha grand piano; contemporary drummers prefer to record in the middle of the room, making use of the acoustics provided by the marble floor.

The control room is again a sizeable area (approx 50 m²)—large by comparison with others of the time but allowing the addition of the DI techniques increasingly popular today, without major reworking of the rooms.

An abundance of wood makes the room bright to work in. This

was the first room in France to use TAD drivers in its monitoring system, as recommended by Lakeside. Blumenfeld also lays claim to many more 'firsts', ie the Marcadet he purchased was based around an API mixing console and in 1985 it became one of the first to install SSL 4000 E (there are now around 25).

When SSL launched the G series he was again one of the first in the queue.

"Since the beginning I have told SSL I didn't like the EQ. So now they have changed the EQ and we have bought the new desk. There is no market pressure here to purchase SSL consoles. I chose it because as an engineer I find the console very easy to understand. It is designed by an engineer for an engineer I think."

The G series was installed at the beginning of November last year with new EQ, preamp and when it is in production the G series computer will be added.

Digital multitrack is very much the order of the day in Paris with Mitsubishi and Sony as well as 3M formats all being in demand. Blumenfeld bought his first two 3M DMS 32-tracks in 1983 and 84—again one of the first to do so. 1987 saw the arrival of Sony 3324 24-track and Mitsubishi X86 2-track; 1988 will complete the set with Mitsubishi 32-track. Surely a huge investment for a single studio? Blumenfeld merely shrugs it off.

"We have to have all formats because everybody wants something different. We got the Mitsubishi because Bryan Ferry and Sade requested it. We couldn't afford to hire the machines in; it puts too much extra on the client's bill.

"Everything is digital in France. The CD market took off very fast and has doubled every year. So there is much demand for the digital multitrack machines."

The 3M format, although the first available digital multitrack technology, is still popular in France.

"All the problem was in the tape transport; if you take care of it it is a good machine. There are five or six other 3M studios in Paris. It has a very good sound. It is difficult to maintain but that is OK."

Analogue tape recorders are by Otari (MTR90 II 24-track, MTR12 ½ inch, MTR20 and MTR12 ¼ inch). The machines are all recessed around the control room leaving the room itself free for keyboard setups. Outboard effects racks are similarly recessed, containing an extensive stock of equipment. Hire is not a realistic proposition in this area either. "We sometimes hire equipment to other studios and I suppose there are some hire facilities in France but there are really not many things available. British and American artists know precisely what they want and send specific instructions. Others you could give 10 different choices and they probably wouldn't know what to choose. For example US and UK artists like very much the Pultec EQ—others don't care. But I have the real thing (ie

Focusrite: *ff*irst and *ff*oremost

ISA

First came the 110 –

(Already a classic, building on a legend that started 25 years ago – a wide band, distortion-free, musical sound acclaimed by top people around the world.)



Then the 115 HD –

(A more compact dual version providing two identical equalizers in a 1U 19" rack mounting.)



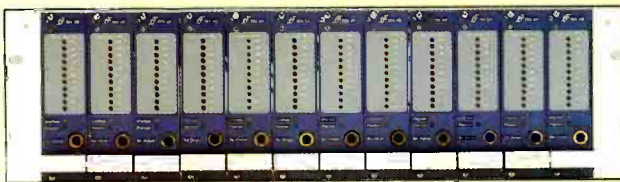
Next the Sidecar –

(A miniature console package including microphone and line inputs, mixing and outputs using ISA technology throughout. Used as a stand-alone for remotes or alongside a larger console – "The best of both worlds.")



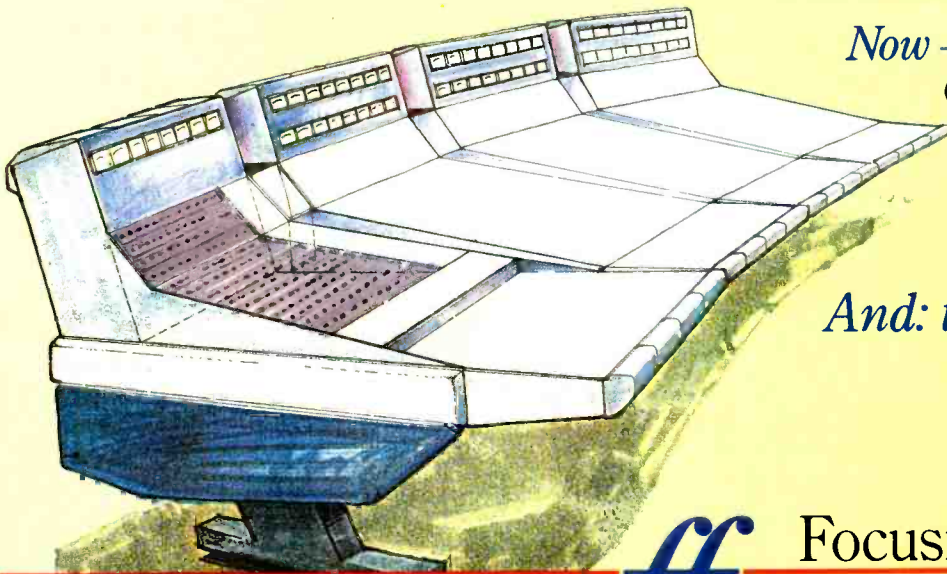
– and the 116

(A unique remote gain control microphone amplifier capable of feeding long lines. It transforms microphone performance even on shorter runs. 12 to a rack-mounting frame.)



Now –

(A new Dynamics unit combining the best of the traditional values with a performance for the '90s.)



And: the new Console!

Focusrite Ltd,
P.O. Box 38,
Newmarket,
Suffolk CB8 7EG
Tel: (0638) 730696
Fax No: (0638) 730537
Telex No: 265871 (MONREF G)
E-Mail No. DG:S2379

Focusrite (U.S.) Ltd,
1100 Wheaton Oaks Court,
Wheaton,
Illinois, 60187
U.S.A.
Tel: 312 653 4544
Fax: 312 665 4966



Focusrite
a sound philosophy

send me full details
and make contact

Name _____

Co. _____

Address _____

Tel: _____



STUDIO MARCADET

original Pultec equalisers), always."

The outboard list comprises: AMS *DMX15-80S* DDLs and *RMX16* reverb; Eventide *H949*, *H910*, *SP2016* and *Instant Phaser*; Alesis *XTs*; Quantec *Room Simulator*; Ibanez *SDR1000*; Lexicon *Prime Time* and *Super Prime Time*, *PCM60*, *PCM70*, *224*, *224XL* and *480L*; UREI *1176* limiter; DeltaLab *DL2*; Orban *526* de-esser, *622* equalisers; AMS *DM2-20* phaser; Aphex *Aural Exciter II*, *Compellor* and *Dominator*; dbx *900* series rack and *160As*; Drawmer noise gates; Marshall *Time Modulator*; Scamp autopanner and *ADT S24*; Pultec equalisers; Dynafex; Yamaha *REV7s*, *SPX90*, *EMT 245* and *140S*; MXR *01* reverb; and tc electronic delay line.

Other facilities include two Sony *PCM701/5850* U-matics; Onkyo and Tascam cassette machines; Yamaha *NS10M* and Electro-Voice *Sentry 100A* nearfield monitors; and Adams-Smith synchronisation.

The biggest headache with a well-stocked studio is maintenance.

"Here it is very difficult—the French mentality. The back up service is very bad in France. If you are working for a company you should know everything about your products and how they work and how you should do your job. They don't do that here in France. It is a big problem. We are lucky because we have an English guy, Paul Jarvis, who looks after our maintenance. He is great; he knows where to find the root of a problem and he is good in anything—machine, desk, quite a lot of things."

When the shops at the front of his premises went up for sale, Blumenfeld's wheeling and dealing in property enabled the purchase of the shops that now function as Studio B and a coffee shop. Studio B therefore faces on to the street—strangely out of place in the midst of Parisian industry, but nobody seems to take much notice.

Studio B is a much smaller facility in every way. There is just about enough room to swing a cat in the control room, which is complemented with an adjoining overdub booth. Blumenfeld is quite clear about the fact that this is aimed at a totally different and less affluent market.

"We opened Studio B at the end of 1984. We were doing too many overdubs in the big studio and were working 24 hours a day. There was no way to make it work 25. Many clients also wanted a cheaper room in which to record overdubs."

The rooms were designed by Blumenfeld himself. "They seem to work; I've no idea why," he laughs, not mentioning his university studies in acoustics. The overdub booth walls and ceiling are finished in cork and carpet, while the floor is marble. "It makes a good sound for vocals."

The control room has a wooden floor. The original Marcadet API console lives in here, retrofitted in 1981/2 with Aphex EQ, gates and compressors.

"We have modified all the chain: everything was new. We took out all the transformers and it is really a good desk." TAD monitors are mounted above a 3M *DMS* 32-track digital recorder and Otari *MTR10* 2-track ¼ inch analogue machines. A Revox *A77* and Onkyo cassette player complete the recorder complement. Outboard equipment is reduced in number although still comprehensive including AMS *RMX16*, Eventide *SP2016* and *H969*; Yamaha *REV7*; Lexicon *PCM60* and *PCM70*; UREI *1176* limiter and *527* graphic equaliser; Orban *622*; dbx *160* limiters; DeltaLab *DL 4*. Small monitors provided are Yamaha *NS10M* and Auratones.

Studio Marcadet is planning Studio C for 1988. It is to be a mirror image of the large Studio A with brighter acoustics, offering alternative sounds to the more traditional Studio A. The control room will also feature a separate machine room and will house the original SSL *4000E* usurped in Studio A by the *G* series.

Competition doesn't appear to be a word Blumenfeld understands, although his English is otherwise pretty impressive.

"For me there are around five other studios in Paris and the rest... well they call themselves studios. I know that sounds terrible but it is true.

"No I don't seek business in the record companies like some studios do, going round to see people all the time; I really don't do that."

Even if he doesn't take himself seriously, he might at least take the studio seriously: "Why do I need to worry? My studio works. It's true."

Marcadet staff is headed up by Blumenfeld himself assisted by secretary Frederique Amory. There are three full time assistant engineers: Jean-Christophe Vareille, Alain Lubrano and Diane Kone. Freelance engineers attached to the studio are Gabriel Nahas and Jean-Philippe Bonichon.

Extras (referred to in the studio info as miscellaneous accommodations) include satellite television, kitchen facilities, free parking and tennis at the adjacent tennis and sports club where you can also get food and drink. The area offers many restaurants and take aways and accommodation can be arranged.

Some 40% of business comes from abroad and the bulk of that from the UK.

"Why do the English like coming here? I suppose primarily for tax reasons. I don't know, maybe they like France—croissants, the coffee, the wine? How should I know?" □

Studio Marcadet, 52 Av du Président Wilson, 93210 Plaine St Denis, Paris, France. Tel: (1) 48.09.18.66.

★ NEW ★
GRAPHIC PRINTOUT!

THE NEW ★ TOP GUN ★ IN AUDIO TESTING!

THE ST3100A PROGRAMMABLE AUDIO GENERATOR
AND THE ST3200B AUDIO ANALYZER



THE NEW 3000 SERIES AUDIO TEST SYSTEMS FROM SOUND TECHNOLOGY



There's a new TOP GUN in audio testing... the Sound Technology 3000 series. The 3000 series is singularly THE most flexible audio test system available. And, with its exclusive on-board FSK automation, the 3000 series becomes THE most practical audio test system to automate! Here are a few of the features:

ULTIMATE FLEXIBILITY

- The 3000 series can be configured as a separate oscillator and analyzer for remote work OR in one main-frame as an audio test system.
- The 3000 series is portable. Use the 3000A manually for troubleshooting OR use the built-in automation for quick and comprehensive checkouts.
- Obtain tabular or graphic hardcopy directly from the Analyzer to a standard dot matrix printer!

PRACTICAL AUTOMATION

- Automate benchtop testing using the 3000's built-in automation OR use ST's IBM®/compatible bundled software with the 3000's industry standard GPIB and RS-232 interfaces!
- Automate remote tests using built-in FSK automation: no need for modems, computers or phone lines!
- Simple automated playback testing: record FSK automation on audio tracks of ATR's and VTR's. Analyzer then automatically tracks overall playback performance. Excellent for testing multiple playback-only machines!

With the ST3000 series you have ultimate flexibility with no compromises. For instance, true-floating transformerless balanced outputs allow for the world's finest squarewave output. And no one offers a greater selection of waveforms. Finally, our specifications are the finest one can encounter.

Contact us now for full technical and applications information. Learn firsthand why the ST3000 series is the TOP GUN IN AUDIO TESTING!

SOUND TECHNOLOGY

PRECO LTD
21 Summerstown, London SW17 0BQ
01-946 8774



Put The Best
To Test!

In Canada, contact the Pringle Division
at (416) 222-2447

In the December issue we reviewed Roland's *D50* keyboard synthesiser ('LA synthesis—a new form of sound creation'), one of the most successful releases of 1987. The *D50* uses a new form of sound creation called LA (Linear Arithmetic) synthesis, and this system is now the basis for several other models including the *MT-32*, *D-550*, *D-110*, *D-10* and *D-20*.

LA synthesis is only one of many forms of sound creation announced to the music business recently. On a commercially viable scale, Yamaha's groundbreaking FM synthesis system is less than 10 years old, yet now it has competition in the form of LA, additive or the older analogue synthesis. Cross Wave synthesis, Wave Table synthesis, Digital Waveform Generation, digital sampling, PCM sampling, re-synthesis of various kinds, Vector synthesis, and even more exotic hybrids.

The fact of the matter is that a new professional instrument launched with a well-established system of sound creation has very little chance of success. The constant demand from the industry is for completely new sounds, new possibilities and new techniques—not just old ones wrapped up in cheaper or sleeker packages.

Below, we have reviewed the major forms of sound synthesis in use today, giving examples of how they have been applied on various instruments, and attempting to put into words the sounds they typically create. Towards the end of the piece there are a few speculations on possible

trends and developments in sound synthesis over the next few years.

Analogue synthesis

Analogue synthesisers have changed relatively little since the introduction of Robert Moog's *MiniMoog* keyboard. The signal path remains more or less the same—one or more oscillators with variable waveforms, feeding into variable-state filter and amplifiers, each controlled by envelope generators.

On Moog's early modular systems, this signal path was by no means fixed; yet on later instruments, right up to Roland's *Super Jupiter* module, it has become disappointingly inflexible. The introduction of polyphony and digital control of tuning and patches was traded for the flexibility of early modular analogue synths, to such an extent that many modern synths are capable of creating little beyond basic organ, string and piano-like sounds.

Modular analogue synthesisers from Moog, Roland and Oberheim are now in great demand among those who have the time to battle with their unstable tuning and lack of memory facilities. For those who do not, the greatest expression of the modular concept among digitally-controlled analogue synthesisers has probably been seen in the design of the Oberheim *Xpander*, *Matrix 12* and *Matrix 66R*, which have programmable modulation routing capabilities so great as to rival a totally patchable system.

As most of us will know, the warmth of the early Oberheim and Prophet synths (and, for that matter, the *MiniMoog*) derived largely from distortion and drift in the oscillators, and most musicians were happy to accept a little time spent auto-tuning in return for this rich sound. But increased use of multitrack techniques and MIDI layering of synths made rich sounds difficult to handle, and so the thinner, more precise sounds of the Roland synths and Yamaha FM synths became more useful.

FM synthesis

An early decision in the creation of the *DX7* was to avoid the inclusion of analogue chorus or any other device, which would obscure the clarity of the basic FM design. However, in creating the second generation of FM synthesisers, Yamaha (as well as Korg, Elka and others who had licensed FM technology) felt obliged to add something to the basic sound creation method, and each company came up with a different solution.

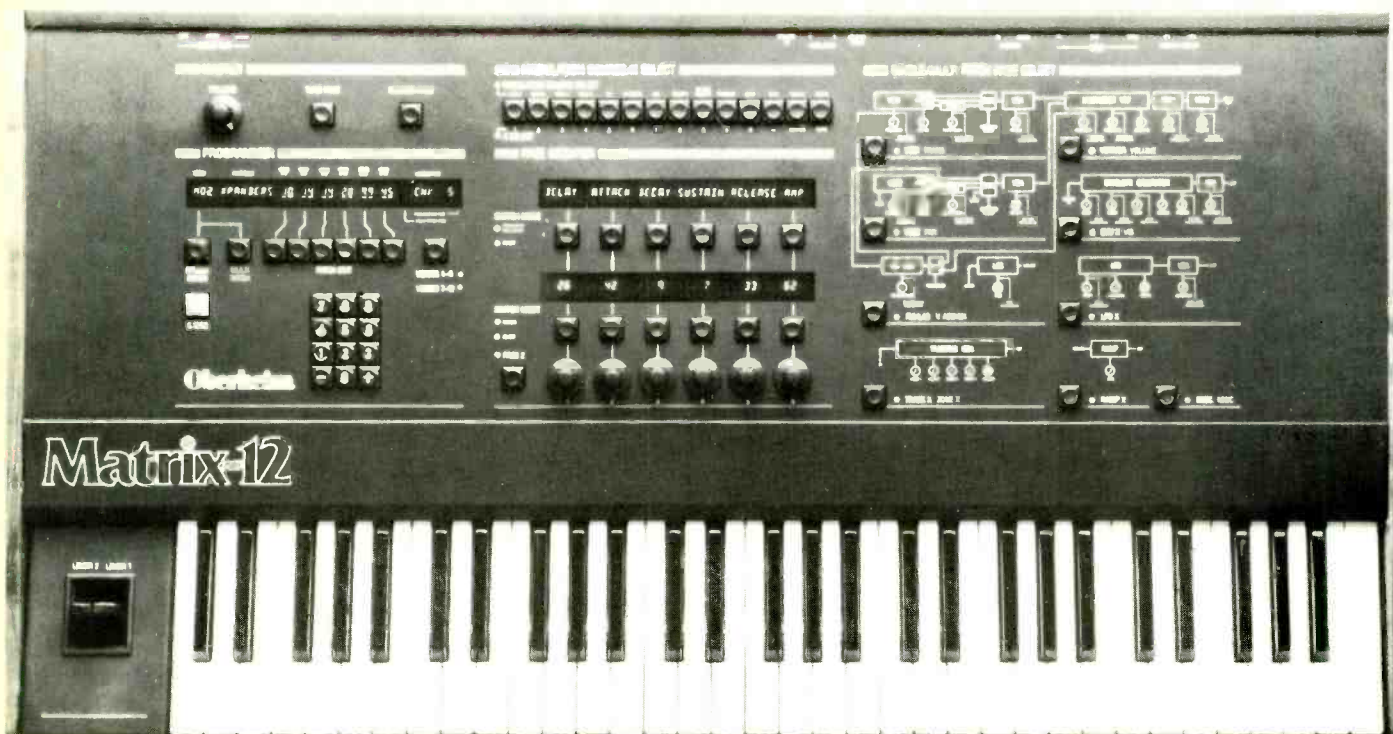
Yamaha's idea was to base FM synthesis on non-sinewave oscillators. On the *TX81Z* module this adds a lot of variation and depth to the sounds but the idea hasn't yet been applied to the *TX802* and other professional models, which are seen as being powerful enough with six sinewave oscillators. Apparently there are no plans to manufacture a model with more than six operators (although the *TX816* rack can be regarded as a 16-voice 48-operator synth at a pinch) and third party companies working on DX-based FM re-synthesis seem to be having mixed success.

Korg's contribution to the development of FM was to add a chorus (on the *DS8*—an easy way out) and to make the overall harmonic balance variable to simulate a filter. Yamaha added this latter idea to the *DX7 MkII* as well, making quick edits and new performing techniques easily available.

Elka's basic idea was to go for large numbers of voices and multitimbrality—their *EK* series of modules offer anything up to 22-voice multitimbral playing.

SYNTHESIS

Mark Jenkins discusses recent developments and trends in synthesiser design



But it's clear that FM synthesis has, to some extent, ground to a halt. Yamaha claim that modern processors aren't fast enough to greatly modify the FM system at a reasonable cost, and other FM users are largely following in the footsteps of Yamaha.

The exception to this generalisation is NED, whose FM-based *Synclavier* system continues to develop apace. But since the very early days of its development, when the Fairlight *CMI* sampler was first perceived as a direct rival, much more work has been done on the *Synclavier's* sampling capabilities than on the FM synthesis techniques that originally gave it birth. Stereo polyphonic long-term sampling to hard disk is now available but the *Synclavier's* FM sounds remain more or less as they have been for some years.

Roland synthesis

Roland are unusual in that they back more than one system of sound synthesis. While still marketing digitally-controlled analogue modules, they have created LA synthesis for their latest synthesisers but also use digital. PCM (Pulse Code Modulation) and SA sampling.

LA synthesis combines a short PCM-sampled attack portion of an acoustic sound with a synthesised sustain/decay portion using simple oscillators. Only square and sawtooth waveforms are available from the oscillators but digital ring modulation, chorus, reverb and delay can be added on-board to create very full sounds.

Some of Roland's LA products also have banks of PCM-sampled drum sounds on board. Roland's drum machines use PCM but this system isn't suitable for longer sounds and their sampling instruments (*S-10*, *S-50*, *S-550*, and so on) use more conventional digital sampling techniques

combined with dynamic digital filtering.

Sounds for their piano range are created using another system, Structured Adaptive Synthesis, which consists of computer-interpolated recreations of long multisamples. Electronic pianos such as the *RD-1000* have used this system to great effect. A new range of digital harpsichords uses what's claimed to be yet another distinct system—DI Digital synthesis.

For Roland, the future seems to be based on multiple solutions to a variety of problems. They are not politically tied to one form of sound synthesis as Yamaha seem to be—witness Yamaha's apparent reluctance to enter the world of digital sampling until very recently.

Additive synthesis

Kawai's *K5/K5M* is the latest commercial synthesiser to feature additive synthesis, and features a range of 128 programmable harmonics plus multitimbral playback and separate audio outputs.

The Kawai has been well received and is capable of a wide variety of sounds, from *DX*-like digital effects to warm, smooth, analogue-like sounds. But the additive synthesis process is slow, boring and non-intuitive, and the factory sounds are generally poor. Additive synthesis seems unlikely to catch on in a big way.

Others

Many other forms of synthesis have lived and (in some cases) died over the last 10 years or so. PPG's innovative method of wave-table synthesis (digital storage of waveforms or samples in a table that can be scanned during the course of a

note, combined with analogue filters and amplifiers) is the saddest loss, although many of its effects can now be reproduced on cheaper instruments such as the *Prophet 2000* sampler and Ensoniq *ESQ-1* synthesiser.

Sequential's Vector Synthesis resembled Wavetable synthesis in that it altered the balance between a mix of four oscillators with different waveshapes during the course of a note. Again, analogue filters were also provided.

Korg's Digital Waveform Generation System also stored waveforms digitally (usually about a dozen, chosen to resemble piano, string and other sounds) and again passed them through an analogue filter and amplifier plus a digital delay for chorus or repeat effects. Their *DW8000/EX8000* was innovative in using a built-in digital delay, an idea Roland took up on the *D50*. Such techniques can add a lot to basically very simple oscillator sounds but it's important for engineers and others to know how to remove such effects should they be undesirable in the context of a complete mix.

Ensoniq's Cross Wave Synthesis technique resembles the Roland LA system and in fact predates it. On Ensoniq's *SQ-80* synth, the attack waveforms are longer than on Roland's *D50*, they are multisampled across the keyboard, the synthesiser facilities are more powerful and the instrument is multitimbral. Only the *SQ-80's* lack of onboard digital sound processing would seem to keep the *D50* in competition, although it has sold very well in competition with the *SQ-80's* predecessor, the *ESQ-1*.

Casio's FM-like PD (Phase Distortion) synthesis system always sounded a little thin, although appearing as it did on great value-for-money instruments such as the *CZ-101* it was welcomed worldwide. Nowadays Casio are into 16-bit sampling (on the *FZ-1*) and a new system of



synthesis (on the *VZ-1*). It remains to be seen whether this will be a great improvement over PD.

Sampling

There is nothing more boring than a sampler that can only play back samples exactly as they were taken. The *Emulator I* almost fell into this category, as did the Akai *S900* and Roland *S50* on their first release. New software for the latter pair allowed much greater flexibility in terms of processing via filters and amplifiers, while the E-Mu solution was to provide greater processing power, multitimbrality, sampling quality and so on with the *Emulator II* and *Emulator III* models.

But even with filters and de-tuning at full blast on the Ensoniq *EPS*, Prophet *3000*, Yamaha *TX16W* and other recent models, many people see sampling as a dead end as compared to 'genuine' sound synthesis.

Although computer-assisted sample editing packages are proliferating, there have been few real innovations in terms of sound creation in the latest batch of samplers, although rumour has it that Akai may well have some up their sleeves. So let's pass on rather quickly to re-synthesis.

Re-synthesis

Early attempts on the *Synclavier* to develop a re-synthesis system have led to great excitement. The intention is to create a sound that has all the

realism of a sample, yet all the 'editability' of a synthesised sound. Powerful processing techniques have to be used to analyse an incoming sound and align an instrument's sound generators to re-create or re-synthesise it as closely as possible; after this stage, every parameter of the sound becomes available for editing.

The *Synclavier* re-synthesis techniques are slow and, of course, the system itself is very expensive. More excitingly, the German software company C-Lab have been developing an Atari *ST*-based re-synthesis package for the Yamaha *DX7*. Called *X-lyser*, it is intended to analyse sample dumps from the *Prophet 2000* and other samplers, and re-create them using the *DX7*'s FM synthesis system.

At the time of writing, *X-lyser* is somewhat behind schedule but it could be a powerful proposition when complete. Certainly no conventional sampler is currently making available anything like the *DX7*'s 147 fully variable parameters.

Re-synthesis seems to be the coming thing. The *Axcel* from Technos (previously known as the *16 Pi*) is described by the company as "the world's first re-synthesiser" and "the world's first intelligent synthesiser". It comprises two main units, the *Axceliser* (which analyses sounds and reproduces them using "intelligent synthesis cells") and the *Grapher* (a new type of touch-responsive display terminal).

The *Axcel* does have some recognisable control functions such as oscillators, filters and LFOs but is capable of time compression and expansion.

polyphonic transpose, voice processing, simulated phasing, timbre interpolation, harmonising, attack exacerbation, FM, double LFO modulation, simulated multimode filtering, detunable additive synthesis, echo, speech synthesis, noise simulation and many other effects unavailable on conventional samplers. Some of these effects would have been available on the PPG *Realizer* but this system has not as yet gone into production.

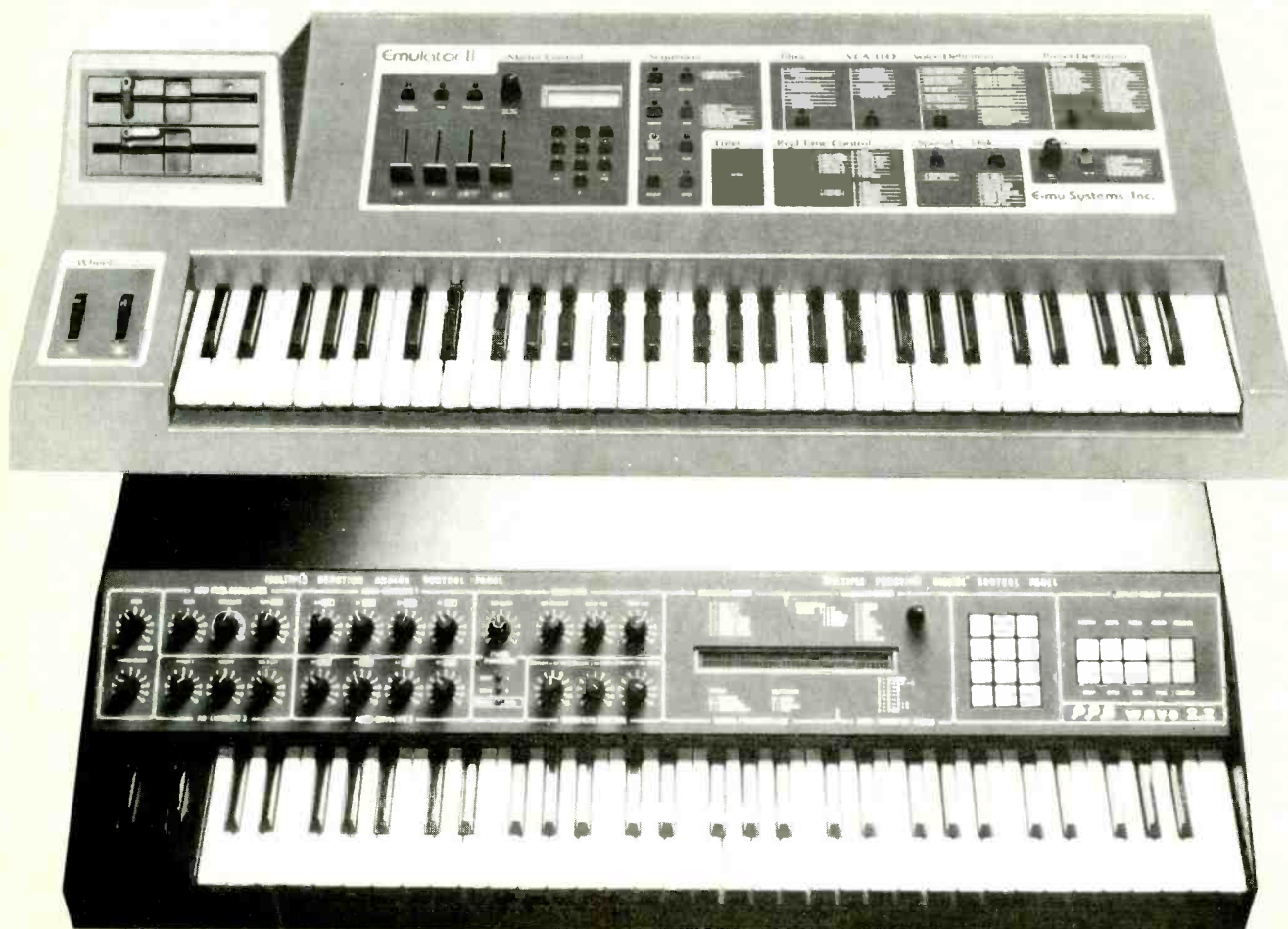
Conclusions

Since multitimbral synthesisers used to recreate entire musical pieces are becoming more common, it is more important than ever that they should be capable of producing a very wide range of different types of sound. FM synthesisers have in the past been denied the warmth of analogue, while analogue synthesisers have lacked the clarity and clinical edge of FM.

The best systems to date have been the hybrids—PPG's *Wavetable* synthesis, Korg's *DWGS*, Ensoniq's *CrossWave* synthesis, Roland's *LA* synthesis. Samplers with extensive sound synthesis features have been popular but sampling as we know it may ultimately be a dead end.

The future of sound synthesis may well lie in cheaper developments of the *Axcel* and similar systems, which blur the distinctions between sampling and synthesis, analogue and digital, FM and LA. In five years we can look forward to seeing sub-£2,000 (\$3,500) re-synthesis keyboards equipped with small touch-responsive programming surfaces rather than acres of knobs or a single data entry slider, and with built-in hard disk units for storing the massive amounts of data needed to define a whole new generation of complex, powerful sounds. □

SYNTHESIS



Simple Intelligence



Let's assume that results are what's important, not which tools you use.

Audio production is at least as much art as science; there will always be those who ascribe a magical aura to certain pieces of equipment. But if your client list is built on quality and consistency rather than techno-oodoo, the DCM 232 in-line console with CAT automation can give you more of both.

You need more console, not more headaches.

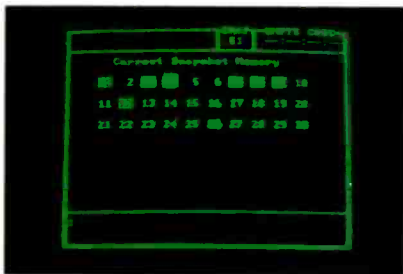
You're working for more demanding clients, on bigger projects, with tighter deadlines. You need greater flexibility, expanded features, enhanced performance. What you don't need is a "mega-star" console—or the jumbo mortgage that goes along with it.

DDA's AMR 24 has already set new standards of audio performance and versatility in the "classic" split configuration. Now the in-line DCM 232 combines the accuracy of digital-quality audio, the flexibility of digital control and the capacity to handle a pair of synchronized digital 32 tracks.

CAT Central Automation

Terminal: engineered to speed your work flow.

The DCM 232's Central Automation Terminal controls one of the most ingenious automation systems ever to shorten a mixing session. Along with the precise fader and muting control you'd expect, the CAT system includes advanced functions like *Channel Copy* that lets you duplicate a channel's signal flow as many times as you need to. The computer will recall a "snapshot" of most console switch settings manually or via SMPTE code.



With all of its convenience functions, this CAT won't leave footprints all over your tracks. The DCM 232 maintains an overall dynamic range of 100 dB with at least 22 dB headroom at each stage, thanks to exacting calculation of every circuit component.

A console investment that instantly doubles your returns.

Each of the DCM 232's channels, including the four band EQ section, can be split during mix-down. So a 56 channel frame can handle as many as 112 inputs from samplers, synths and digital storage media. You'll probably run out of control room space before the DCM 232 runs out of inputs.

The advantages of the DCM 232 in-line console with CAT automation are explained more fully in our brochure. To get a copy, write on your letterhead to the appropriate address below.



DDA

DCM 232

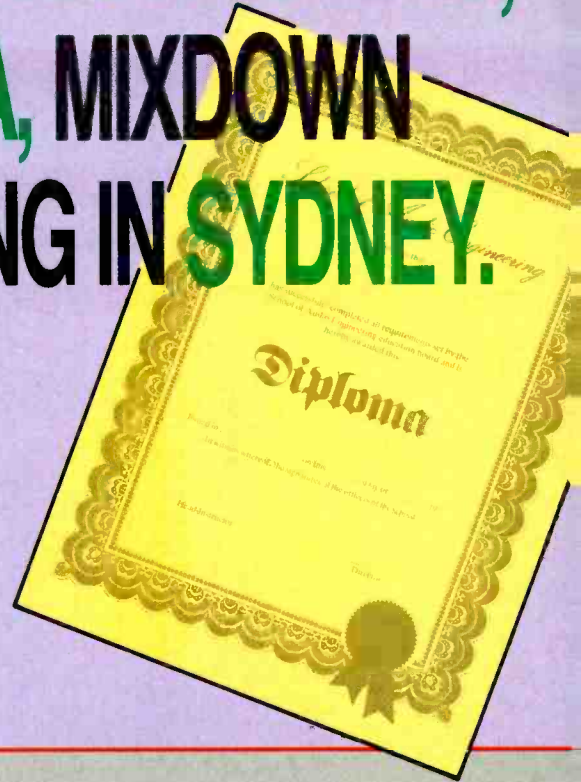


Unit #1, Inwood Business Pk., Whitton Rd.
Hounslow, Middlesex, UK TW3 2EB
01 570 7161

Klark-Teknik Electronics Inc., 30B Banfi Plaza North
Farmingdale, NY 11735 (516) 249-3660

IMAGINE RECORDING IN **LOS ANGELES**, OVERDUBS IN **VIENNA**, MIXDOWN IN **LONDON** & MASTERING IN **SYDNEY**.

with the School of Audio Engineering



- "TONMEISTER" Diplom course (with limited job guarantee*)
- Course duration, 6, 15, 24 months (Studio Broadcast Assistant, Audio Engineer, Tonmeister)
- All inclusive program (electronic, music, digital, practical, etc)
- 3 fully equipped multitrack studios, latest technology, including digital (used only for teaching purposes)
- Editing & MiDi suites
- Study in Europe, Australia and U.S.A. possible (you could study classical recording techniques in Vienna)
- International job placement scheme
- Individual practical studio time to record your own music
- A recognised qualification



***Ring for free brochure or come in and inspect our studios.**

professional audio education

15 SCHOOLS WORLDWIDE. MAJOR SCHOOLS IN:

SYDNEY
68-72 Wentworth Ave, Surry Hills
2010 Sydney, (02) 211-3711

LONDON
St Marks House, 2nd Floor
16 Chillingworth Rd. London N7 8QJ
(01) 609 2653

MUNICH
Weissenburger Str. 19
8000 Munich 80, West Germany
(089) 487 145

LOS ANGELES
3000 South Robertson
Los Angeles 90034
213 559 0973

also in Melbourne, Brisbane, Adelaide & Perth (major schools only)

WE ARE RATHER GOOD AT ASSEMBLING PACKAGES



We think the Soundtracs CM4400 with the CMS2 SMPTE Automation and Soundcraft SCM762 24 track machine represents unbeatable value.

The Soundtracs CM4400 with CMS2 gives you automated routing, channel and group muting, pre-programming of effects, sends and returns, programmable record drop in via events recorder, control of eight external devices and 30 different mixing combinations all under SMPTE timecode control.

The Soundcraft SCM762 Mk III recorder comes complete with remote control, varispeed, zero locate

and cycle functions. It will run at 15 or 30 ips and is widely used by many professionals in master recording and video post-production work.

Package consists of:

Soundtracs CM4400 – 32 input mixing console.

Soundtracs CMS2 – automation system.

Soundcraft SCM762 Mk III 24 track recorder.

Commodore PC and disk drive.

Video monitor.

Set of interconnecting cables.

Please ring for a full demonstration.

Don Larking
audio sales

THE 01

*In this article,
Keith Spencer-Allen
takes an early look
at the SSL 01
Digital Production
Centre—the first
digital audio
product from SSL*

Solid State Logic have made a tremendous impact on mixing console design, marketing and use over the last eight years. There are engineers who have grown up using virtually nothing else and complete engineering styles have developed around the 4000 and 6000 series consoles. The 5000 series is finding applications in broadcast facilities and introduced a higher level of digital control into the console design than was present in the other series. The appearance of the G series computer showed that there was further development within the existing analogue product line as did the refinement of the analogue signal path with the G equaliser and other G series modifications.

As digital audio becomes more fully integrated into the recording and outboard processing aspects of the studio, eyes have been turning to the mixing console as the next major area of digital development. Neve are the only manufacturer so far to have delivered multitrack digital consoles and with the DTC have become the closest thing so far to a 'large volume' digital console manufacturer.

Because of their position in the analogue console market, there has been considerable interest in what their digital plans are and when they might announce them. The first public discussion of this took place in New York in 1985 at the October AES Convention when they released a booklet that was written to promote discussion of concepts surrounding console design. This was followed with several AES papers and presentations at the Digital Information Exchange in London that quite clearly laid out their activities. Two facts were stated quite early on—firstly they were not

happy with the speed and power of digital processing and they realised there was much development work to be done; and secondly they saw the way forward as being recording systems, ie systems that incorporated both storage and processing. In October 1987 they revealed that their next major announcement would be concerning digital product and at the Paris AES, the 01 was launched.

The 01 is the first in a range of products that will be coming from SSL. The digital development programme was designed to originate building blocks that could be assembled into products as the demand and market developed and also to design a software structure that increased operating speed and allowed a considerably different approach to the control functions. The 01 incorporates many aspects of what has been developed.

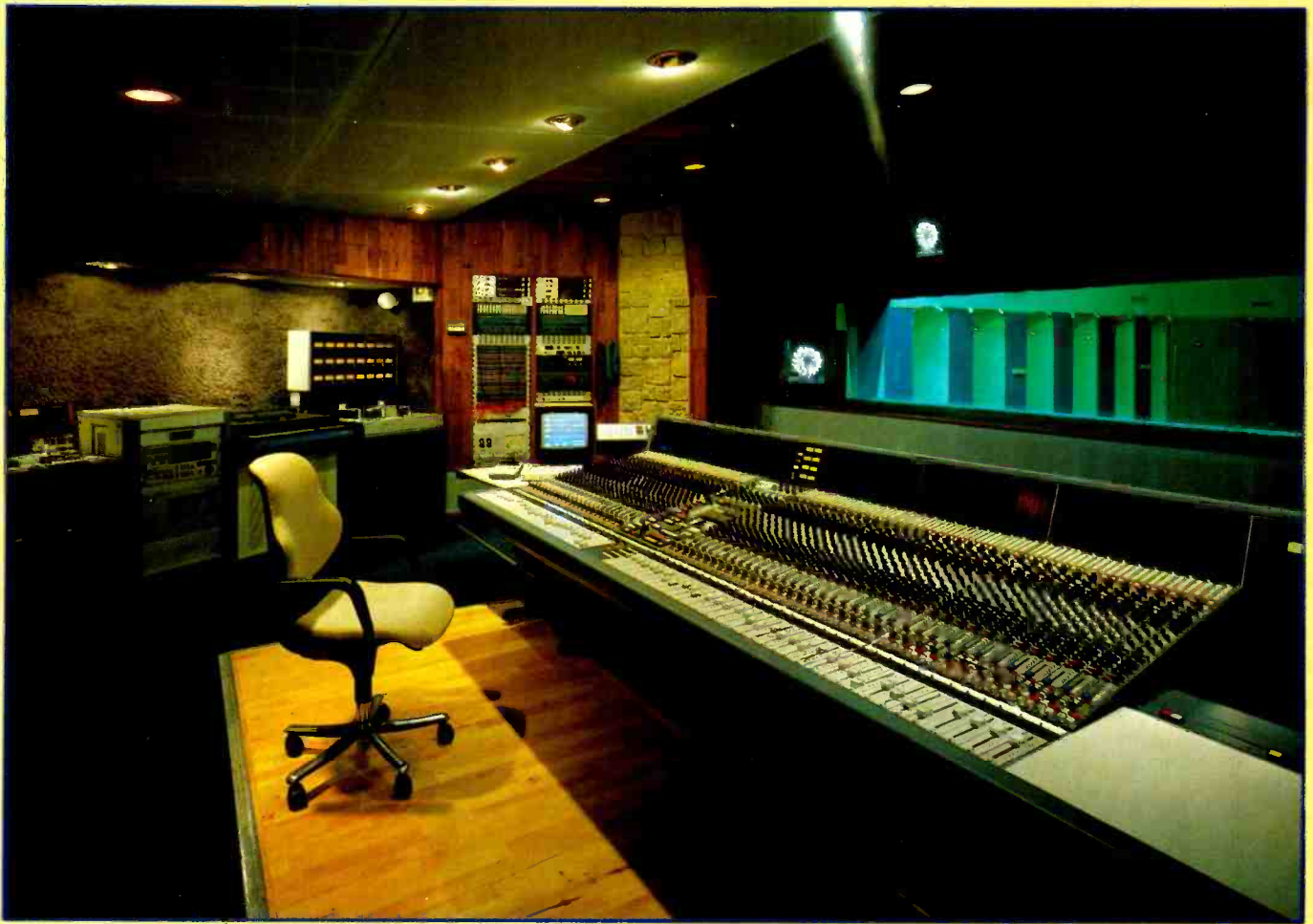
Functions

Described as a Digital Production Centre, the 01 combines signal processing, storage, mixing and editing functions, all of which are carried out in the digital domain. The 01 is the equivalent of an 8-channel mixer with full EQ and dynamics control, three stereo tape machines, a synchroniser and edit controller, timecode reader/generator, A/D and D/A converters, sampling rate converter and sync generator. The unit itself is very compact, 24x18 inches. It is connected by a single cable to the separate Processor Rack that houses the digital processors, 380 Mbyte hard disk drives and the power supply.

The control surface is laid out so that the mixing functions are to the left while the editing and storage areas are to the right. Looking at the mixing section you will notice that it looks 'traditional' or more like an analogue mixer than



Which console was chosen by London's top film scoring studio?



CTS STUDIO 1 – LONDON

“It’s versatile, flexible, totally transparent, extremely quiet and has superb musical EQ with generous headroom. I think I can say I like it!”

Adrian Kerridge –
Director Lansdowne/CTS.

“The V Series Console with Necam 96 makes my job even more of a pleasure – the results speak for themselves. Its the finest console I have ever worked with.”

Dick Lewzey – Director & Chief Recording engineer, CTS Studios.

V SERIES + NECAM 96

When only the best is good enough.



NEVE ELECTRONICS INTERNATIONAL LIMITED, CAMBRIDGE HOUSE, MELBOURN, ROYSTON, HERTS SG8 6AU, ENGLAND
TELEPHONE: ROYSTON (0763) 60776. TELEX: 81381. CABLES: NEVE CAMBRIDGE. FACSIMILE: (0763) 61886

THE 01

the digital products that we have seen so far. The controls are all standard in appearance, ie rotary knobs and standard looking faders. There are eight individual channels and a stereo master bus. All mixing functions apart from EQ and dynamics are dedicated to the channels although all the channels may access the central EQ and dynamics panels. The 01 can accept both analogue and digital inputs.

The EQ panel is a 4-band parametric design with separate high and low pass filters. What is unique is the use of continuously adjustable controls rather than the more common 'nudge buttons and digital readout'. All the knobs have a ring of LEDs in the control surface that indicate knob position although the knobs themselves are continuously rotating types. Changes made to the controls are fast so that there is no perceptible difference between the use of an analogue EQ knob and this digital control. The two mid range bands also have fully adjustable Q. Although these are continuously adjustable controls digital systems need separate steps in order to calculate the processing required. These controls are in 256 steps each and from the practical point of view this feels continuous. SSL have drawn attention to the fact that if we look at one of the mid bands with three controls (frequency, gain and Q), each with 256 steps, then this means that we have $256 \times 256 \times 256$ EQ possibilities just on that one band, which approximates over 16 million. With this number of possibilities it is not practicable to store the EQ coefficients in look up tables and the computation of values in realtime for multichannel use is not a processing reality. SSL have found a technique that combines the two methods maintaining realtime working, which is then coupled with the processing power of the 01 SSL-designed processors that apparently are able to execute up to 60 million instructions per second.

The dynamics section has five continuously adjustable parameters and a wide range of dynamics functions—limiting, compression, expansion, gating. The control knobs are like the EQ section with LED rings. There is further LED metering of the action of different dynamics sections.

Editing and recording

On the editing and recording side, the hard disk storage has been arranged as if it were three separate stereo machines. The disk system has all the standard abilities of such systems with instant access, electronic editing and trimming, and also full bandwidth stereo scrubbing, transcription editing between tape machines, time slipping and off-set, track bouncing, simultaneous playback and recording plus multiple supply bins. Basic storage time is one stereo hour but with potential for expansion.

The display screen is a menu-based system that helps users keep track of 01 functions. There is also provision for the programming of complex repetitive tasks into a single key stroke via softkeys. The system has the ability to synchronise with internal and external timecode.

There is also a system in development that will allow the user to download the stored programme material and all the commands and console setting for transfer to another 01. Although this is realtime downloading, the ability to transfer all the data in a single unit sounds quite useful.

In use

I had the opportunity to play with the EQ and the dynamics section recently and have to admit to being very impressed. It is not apparent that the controls are anything other than analogue in their action of sound. It is quite possible to sense that audio changes are not happening immediately but it was not obvious that this was the case at all. Digital EQ and dynamics always takes you by surprise because the distortion does not change at the extremes of the settings. You can set up the most extremes of EQ and dynamics and there is no sense that the distortion has increased or that the dynamics section is about to 'crack'. The 01 has all these attributes and I was most impressed with the sound of the EQ. I found myself wishing that I had this section of the 01 to use immediately.

SSL see applications for the 01 in traditional studios, broadcast, film and video post-production where it can be used either as a standalone unit or piggy back on a larger console where its disk-based facilities and digital processing would work in conjunction with the 'master' console. There must also be a case for its use as a mastering console particularly if the 01 finds use at the recording stage as a mixdown machine.

We will be undertaking a far closer look at this unit in the very near future when we hope to have some practical hands-on experience to report on. □

THE YAMAHA DMP7. RAISING THE INDUSTRY STANDARD (AND ITS EYEBROWS).

Introducing the Yamaha DMP7, the first all digital mixer, automatic system and effects processor in one compact, affordable 8 x 2 console.

But it has the powerful digital quality of something five times as big and ten times as expensive.

"Countless uses come to mind for studio use - especially for smaller studios not possessing full console automation. With the addition of a SMPTE - to midi sync box, timecode-based automation becomes a reality at a reasonable cost."

- Alan Parsons.

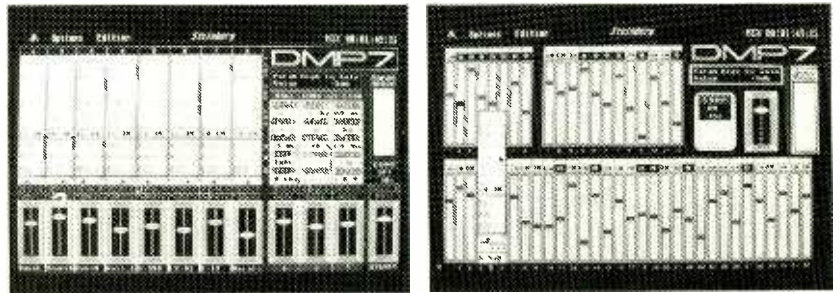
Not only does it automate your mixdown and effects processing as well as enhance equalisation and dynamic effects capabilities, but with its cartridge store facility and immediate recall, it cuts your set up time down to a minimum once you've stored a mix.

"The Eq and effects sound great and being so easy to use and programme, the DMP7 also saves expensive studio set up and programming time." Adam Williams, producer.

The DMP-7 is easy to use for improving home recordings; or pre-programming mix changes in TV or

theatre applications, mastering suites or top recording studios even in film and video post production suites.

And as for live sound, taking your studio mix on tour



Working closely with Yamaha, Steinberg have produced an excellent package of DMP7 control software for use with the popular ATARI ST 1040 computer.

is a breeze with the DMP7. In fact, in all areas of sound engineering, the digital DMP7 sets the standards for control and quality with ease. With spectacular effects, built-in memory, automated faders, remote controllability and optional MLA-7 mic/line amplifier its no wonder that Magmasters, Hans Zimmer, TVS, Adam Williams, Alan Parsons, Tape-I, Midge Ure, Complete Video and Fairlight's Roger Belton are using them.

"It's perfect for the Fairlight System and makes film dubbing faster with more flexibility. We soon hope to add to the four units already in use at Lillie Yard Studios." - Hans Zimmer, film score writer and producer.

Send us the coupon with your details and we'll send you a free leaflet on the DMP7.

Or come into your nearest Yamaha dealer and get this powerful performing and engineering tool raising standards, eyebrows and the roof!



You've 'raised' my interest in the DMP7. Please send me more information.
Send to: Yamaha-Kemble Music Limited, Mount Avenue, Bletchley, Milton Keynes MK1 1JL.

Name

Address

554/88

YAMAHA

THE YAMAHA DMP7 DIGITAL MIXING PROCESSOR

LETTERS

Many thanks for the chance to comment on Mr McCreadie's response (January 1988) to my letter (October 1987). I have spent the last five years, since my retirement, considering the Blumlein patents and other related matters. What I had to say was more tongue in cheek than a definitive statement.

I think Mr McCreadie missed the point that the M cardioid contribution can be added or subtracted. I do not think the subject of M&S, or any other method should be trivialised but more thoroughly understood.

We have the protagonists in the BBC and Michael Gerzon with the *Soundfield* microphone on the side of phase coherence and more recently the Bruel & Kjaer champions opting for omni techniques. We really need to be well informed about the strengths and weaknesses of these disparate philosophies and to refine and develop the techniques involved. With this in mind I enclose a circuit diagram of the Mk1 version of a microphone amplifier developed to explore fully the basic simple microphone techniques. The ideal being the current state-of-the-art. The final refinement allows any signals to be switchable to M&S processed, ie equalisation of M&S signals as appropriate à la Michael Gerzon, finally returning to XY, including post-production manipulation. The outcome is a valuable tool for *PCM-F1s*, *701s* or R-DAT recorder users, with the ultimate ability to explore the whole field of simple classical recording. A short, shortlist of *essential* reading includes papers by Ron Streicher and Wes Dooley: 'A Powerful Technique for Working in Stereo', Streicher and Dooley, *J Audio Eng Society*, vol 30 no 10, October 1982; 'Basic Microphone Perspectives, A Review', Streicher and Dooley, *J Audio Eng Society*, vol 33 no 78, July-August 1985.

To confirm my interest I use a transistorised version of the AKG C24, a C12 modified with two head amplifiers to produce back-to-back cardioids for matrixing. My present concern is to use two AKG C12 capsules at right angles arranged with

three 460UB amplifiers to produce the following signals: forward facing cardioid—M; leftward facing fig-of-eight—S; rearward facing cardioid—ambience.

Having said all this I am currently using two 460UB amplifiers fitted with forward facing ultra-linear cardioid capsule with a CK4 capsule to produce leftward facing fig-of-eight.

I am more than willing to make details of the microphone amplifier available for those wishing to improve their understanding.

Finally, after consideration, although I do not think my original letter to you was in any way helpful in the M&S saga, the text still stands.

Ted Nurse, Whornes Cottage, Bondend, Upton-St-Leonards, Glos GL4 8EG, UK.

In the September 1987 issue an article entitled 'Atlantic' appeared. I would like to correct several oversights.

First, with the exception of Studio A, the entire Atlantic complex, including the mix room, the two mastering suites, production rooms and ancillary rooms were designed by the architectural firm of Wasserman and Waterhouse, and the acoustic consultant was Alan Fierstein of Acoustilog. Studio manager throughout that phase of the project was Dave Tieg, just before Mr Sloman was hired.

This occurred some time ago, and although some room modifications have occurred in conjunction with equipment upgrades, the basic design of the rooms as described in the text and pictures is the same. Some of these include the adjustable acoustics in the mix room booth, the complete floating of all rooms, the polycylindrical diffusers shown in the pictures of the mastering room and Studio B, the UREI 813 speaker mounting and positioning, the lighting, glass, equipment built into the polys, etc. The application of some of these ideas is unique even at this time, and I am quite proud of our creation of that complex. I can assure you, Mr Sloman did not design Studio B

nor was the design of the mix room 'an in-house effort'. I know that in the last six years some acoustical modifications have been made but as I have said, most of it is still our 1980-82 design.

The November 1981 issue of *db* magazine included an article by me entitled 'The Atlantic Studios Project: An Update Report'. This detailed all of the important criteria of the project.

Thank you for the opportunity to set the record straight.

Alan Fierstein, President, Acoustilog Inc, 19 Mercer Street, New York, NY 10013, USA. Tel: (212) 925-1365.

(A copy of the plan for Studio and Control Room B, pictures on page 44, Studio Sound, September 1987, was included with this letter. Also included was the title page from the detailed specifications listing all the relevant organisations.)

Thank you for the insightful review of our *Type C Aural Exciter* by Dave Foister in the

December issue. It seems though, that over the last 12 years many misconceptions have been formed about the *Aural Exciter* that have never been set straight. Please let me do so at this time.

First, the Aphex leasing arrangement was developed to allow the studios to try this strange device that they had never heard of, and only pay for it if they used it! Hence, the \$30 per minute of finished product rate. Also, in the early '70s the studios preferred this arrangement as it allowed them to write off the *Aural Exciter* as a production cost. When Aphex moved into the broadcast market in 1980 units were then sold, and have been sold ever since.

Second, regarding our secrecy, I would think it reasonable to expect that anyone who had invented such a useful effect would keep it secret until patents were issued. Until then, we could only say that it was a new psychoacoustic process. And, as the review states it did what it claimed to do. It just bothered some people because they couldn't figure out how we were doing it! Since the patent was issued many years ago, there are no secrets. Owner's and service manuals have complete schematics and service information. I'm surprised that Mr Foister found the drive level critical. The current *Type C* has a 'window' of more than 30 dB for adequate drive, indicated by yellow on the LED.

His admitted scepticism is not unusual. Our company's founder, Curt Knoppel, was equally sceptical when he discovered the *Aural Exciter* principle back in the '50s. The science of psychacoustics was relatively unknown then, and he simply could not believe there was something that created such an effect that could not be measured! It took a good deal more research to understand what was happening, and how to control it.

The *Aural Exciter* has survived the test of time, detractors and attempts to duplicate its effectiveness, and remains a valid tool for any audio use. The fact remains that delicate audio harmonics are not properly reproduced by today's audio systems no matter how good (you can always tell live from reproduced sound). Even the latest digital systems are bandwidth limited by their sampling rates, some much more than others. The ability to recreate and enrich audio harmonic structure with an *Aural Exciter* will continue to be desired for some time to come. **Jon J Sanserino, Product Manager, Aphex Systems Ltd, 13340 Saticoy Street, North Hollywood, CA 91605, USA. Tel: (818) 765-2212.**

STEREO DISC AMPLIFIER 5

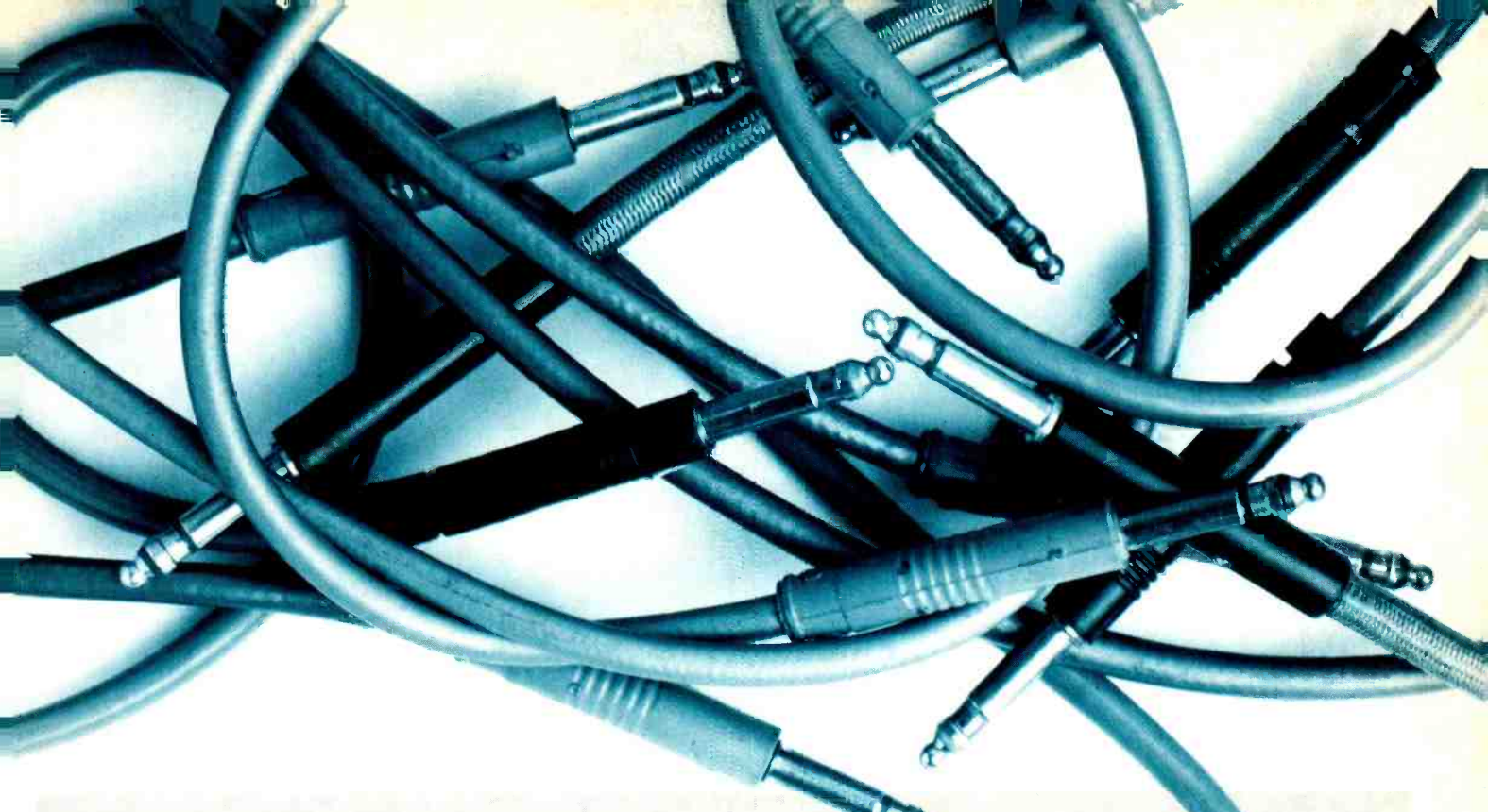
THE MOST THOROUGHLY RESEARCHED DISC AMPLIFIER THERE IS

For Broadcasting, Disc Monitoring and Transfer



Achieves the very best from analogue discs and includes the unique Response Variable Filter. A single control knob provides click free CANCEL and then a 13 to 4 kHz filter with appropriate phase and amplitude characteristics altering gradually between Chebyshev and Bessel.

SURREY ELECTRONICS LTD The Forge, Lucks Green, Cranleigh
Surrey GU6 7BG Telephone: 0483 275997



YOU NEED NEVER TANGLE WITH A PATCH BAY AGAIN

Until now, even if you put together the world's best studio, you'll have had to use the world's worst technology to connect it all up. Inserting patch cables into a jack board wastes time, effort and any amount of high quality studio equipment.

The Akai Digital Matrix Patch Bay System uses the latest digital technology to bring you patching at the touch of a button. It comprises: PG1000 Patch Bay Programmer with DP3200 Audio Digital Matrix Patch Bay (DP2000, an audio/video version is also available).

It offers you the kind of patching you and your studio deserve: an easily operated, reliable and expandable system, that remembers thousands of patches, instantly.



In the studio there'll be no more running out of patch cords, no more dirty jacks, no more backache! And as an integral part of a live MIDI based system the DP3200 offers speed, flexibility and dynamic distribution of effects.

For anyone mixing in the studio or patching for live performances, the Akai Digital Matrix Patch Bay System is patching perfection. And that's the only kind of patching worth having.

Call 01-897 2487 now for free brochure.

MARTIN POLON'S

PERSPECTIVE

How many of you want to believe that the life of an audio correspondent is glamorous? That armed with the shield of literary invincibility, we charge around the globe to experience the world of audio from the ridiculous to the sublime. Dream on, Dear Reader! My experiences are more like this story or one similar to it that is told on dark nights in winter over a bottle of good Tennessee sipping whiskey these days.

A member of the recording community finds himself in Nashville, Tennessee, staying in a 'Music City' hostelry, where the night manager warns the guest to watch out for the 'mean streets' and could only offer a wan smile when asked about 'real Southern cooking'. The visitor to Nashville sets out on his own and soon discovers a small bar just off the main drag that appears to serve meals. One of the little known facts about dining in America is that in many jurisdictions a liquor licence cannot be granted unless the establishment in question serves food as well. For that reason many bars especially, but not limited to, those in big cities, frequently serve inexpensive and well prepared regional specialities. The visitor sits down in the bar's dining section and quickly scans the menu. His eyes fall on the object of his night's quest.

"Chicken fried steak with all the trimmings," he said aloud, knowing full well it would not help either his arteries or his coquettish waistline.

The old man came out of nowhere. First the visitor was sitting alone in the dining area of the bar and then he noticed the old man in the far corner of the dining area drinking from his own bottle. It was as though the old man had appeared from the shadows in the dimly lit bar. The bar was all dark wood with the heads of unfortunate mammals mounted near the ceiling. The visitor thought: "We were all alone there, the old man and me with the moose and the bear. As I attacked the large platter of chicken fried steak, velvety 'drippings', cream gravy, real mashed potatoes, cheesy and buttered grits, fried okra, creamed spinach and basket of hot buttermilk rolls; I noticed he was looking hungrily at my meal. I also noticed that he looked familiar to me. Not a direct recognition but some instinctive sense of some past moment of his stored in my subconscious. He picked up his glass and his bottle and plopped himself down at my table. I fought my initial distaste at his forward assault on my privacy. But I knew that I hated eating alone, I had enough food for three people and I felt that somehow I could find out who the old man really was.

"Care to share some of this?" the visitor asked of the old man.

"Don't mind if I do," was the old man's rapid reply.

The barkeep-cum-waiter obliged instantly to the visitor's request for an extra plate and some

silver as if all their meals were made to be split by one or more and he had been waiting for just that contingency. The old man wolfed down his food and what was left of his host's. He offered a shot from his bottle, which was accepted, his host being partial to Tennessee sipping whiskey. The visitor realised at that point where he had seen the old man. "I was in high school at the time and just beginning my flirtation with the audio business. I was being toured through one of Hollywood's premier recording palaces and I saw him working. Except he wasn't old then and he was in his prime; laying down tracks for some of the top recording artists in this country."

The visitor asked the old one how he was. The old man turned to look at his benefactor and said, "How would you know? You're a young man. You still exist. I have ceased to exist. 'They' have erased my work off of the face of this planet."

The visitor to Nashville looked puzzled. El Viejo's tirade collapsed into a monologue. "Do you know how many records I engineered? I even mixed parts of several films when my recording artists were part of the picture. Do you know how many of my works are still intact and available? None. All of my work that is still available has been 'digitally remastered for improved sonic quality'. That means homogenised, noise reduced, stereo simulated and electronically enhanced. All of the nuances available to us in the studio at the time have been removed or masked. The 'sweetness' of the subtle harmonic distortions we introduced with our analogue vacuum tube equipment has been replaced with the harsh coldness of digital sound and semiconductors.

"We knew what we were doing back then," the old man continued. "It's so fashionable today for recording people to smirk about a pop record recorded on an Ampex 300 with a Collins 212S-1 console and RCA 77DX and 44BX microphones. But it was the 'sound' of the times—it had real soul. That was the sound we wanted to put into the recording, a tangible kind of musical body. If we wanted a particular effect we might use a Pultec limiter or a GE limiter or a Fairchild limiter or all of the above. Yes, we frequently used bathrooms for echo chambers and you would get a different sound if the bowl was exposed and the mic placed over the porcelain but it worked. We knew exactly what we wanted in making a recording then but that's what has been taken away in all these reissues today."

The old man and the Nashville visitor talked through most of the night. They talked about how this record and that record was made and how this artist and that artist wanted to record in a particular way and what was done to sweeten the sound of this recording and that recording. The old man kept complaining that all he wanted was to hear one of his 'greats' just one more time the way he had recorded it—not the way that 'they had fixed it'.

The visitor to Nashville found a recording in the

jukebox at 3am in the morning: "I put a quarter into the jukebox and the record came on. It was everything the old man had said it was. The balance between vocals and instruments was perfect. The exaggerated bass and the mid-high end peaking were perfect, especially for the saxophone solo. I turned to tell the old man how much I enjoyed the recording. But, I was alone. I looked all around me in the bar but the old man was nowhere to be seen. It was as if the old man had just disappeared. I asked the barkeep if he had seen the old man leave. The barkeep just shrugged his shoulders and stated that there had never been any old man. I had been alone all night as far as he could see. He wondered why I had been talking to myself and splitting my food up on to two platters all night long!"

And now for two resounding choruses of 'Yippee Ai Aay, Yippee Ai Aai, Those Ghost Mixers In The Sky (Frankie Laine singing the lead). One can only wonder how many great composers, recording artists, engineers and producers are in rotation somewhere on this planet over the changes that have been made to their music as it has been 'digitally remastered for improved sonic quality'. Are we in fact 'colourising' our recorded past in much the same way that the film industry is adding ersatz colour to black and white film classics. Are we rescuing poorly recorded classical works from anonymity or are we clumsily obliterating musical and recording history? What is the true status of elderly recordings that have been re-engineered with modern technology? Are they technological triumphs over cruder techniques of the time or has our computer digitalist Frank N Stein simply created more technological monsters for the software marketplace? And perhaps the most important question of all, does anybody who buys records really care what happens to these re-released 'golden oldies' as long as the perceived sound quality is increased over the quality found on the existing release?

No single event of the 1980s better sums up the problems raised by the reissue of previously recorded audio and/or visual material and the battle for creative control and direction occasioned by that reissue than the colourisation of classic motion pictures. This issue has become the moral and legal battleground of western civilisation for using computer and digital technology to give life to the concept that 'the whole is indeed more than just the sum of its parts'. Of course, colourisation is more than just a striking analogy for the reissue of classic recordings since the soundtracks of these colourised films are converted to 'stereophonic sound to provide sonic enhancement'.

The driving force behind the reissue of classic recorded materials in a visual format is the ability to use computer technology to hold and modify a series of 'snapshots' taken from the original film. These 'snapshots' are stored in computer memory and modified by adding colour and then using the computer to continue the use of specific 'cues' to colour an entire scene. The soundtrack is rolled-off at the high end to lose noise while various bands of low-end and midrange information are frequency divided and channel assigned to create 'synthetic' stereo from the monaural soundtrack. The actual modification of the original source material is handled by companies set up specifically to perform the colourisations, such as Hal Roach Studios and Color Systems Technology. In most cases, the

JOIN THE WINNING TEAM!



TS-1



1/3 Octave Hand Held Real Time Audio Analyzer

The model 30B is a professional 1/3 octave real time audio spectrum analyzer at an affordable price and the ideal machine for:

- THE STUDIO; to check room response and monitor the mix.
- LIVE SOUND; to eliminate feedback and easily set room EQ.
- SOUND CONTRACTING; to analyze rooms, set EQ and SPL levels, eliminate feedback, verify system performance.
- BROADCAST; to adjust cart machines and check line quality.

AVAILABLE ACCESSORIES: Carry case & remote instrument microphone with phantom power source.

FEATURES INCLUDE: built-in rechargeable batteries; built-in microphone, aux line input, SPL in A or C weight, Decay settings. FILTERS: 30 bands on ISO centers to ANSI Class II double tuned specifications.

SUGGESTED RETAIL \$599.95

Oscillator • Frequency Counter • dB Meter

Three audio test instruments combined in one unit. Features include:

- Low distortion audio oscillator with frequency range 10Hz to 30KHz.
- Frequency counter with response of 1Hz to 99.99 KHz.
- DB meter with range of -50 to 24dB from 20Hz to 20KHz.

MODELS: TS-1	- Balanced in	\$299.95
TS-IRM	- Rack Mount Balanced In	\$359.95
TS-IRMX	- Rack Mount Balanced In and Out with XLR Connectors	\$399.95



Loft Model 400B Quad Gate Plus Limiters

4 gates plus 4 limiters complete with 4 key inputs make the 400B the ideal machine for RECORDING, BROADCAST, or SOUND REINFORCEMENT application.

- You can GATE without LIMITING, or LIMIT without GATING. You can GATE and LIMIT at the same time to achieve a wide variety of special effects.
- The four Key Inputs allow you to use the limiters to suppress a sound with a separate sound source (Ducking). You can address the gates with a Key Input to emphasize a signal, open a gate for a sustained signal, or key ambient microphones.

MODEL 400A — Gates only at \$419.95
MODEL 400B — Gates with Limiters at \$599.95



1/3 Octave Spectrum Analyzer (A Growing System)

- Full 30 Bands
- Weighted Curves
- Printer Option with 30 Memories via Parallel Centronics Interface

The Model 30 features 6 memories, line level and microphone inputs, a pink noise generator, summing and averaging ability plus many other features.

Every Model 30 is supplied with 4 expansion ports to allow for growth. Now available for expansion:

- A card to provide 30 non-volatile memories plus printouts on low cost parallel interface printers.

BASIC MODEL 30	\$2150.00
WITH INTERFACE	\$2650.00

FOREIGN DISTRIBUTORS

AUSTRIA
Musikhaus für Musik, Vienna, Tel: (0222) 43 44 40-0

CANADA
Audionova, Tel: 514-484-9931

ENGLAND
Marquer Electronics Ltd., London, Tel: (01) 439-8421

FINLAND
StuudioTech, Helsinki, Tel: 358-0-592-055

FRANCE
Publison, Paris, Tel: (1) 43.60.81.64

HONG KONG
Jolly Sound, Kowloon, Tel: 3-620202

ITALY
Grisho Music prof. S.R.L., Ancona, Tel: (071) 781714-5-6

JAPAN
Kawamura Electrical Laboratory, Tokyo, Tel: (03) 260-0401

NEW ZEALAND
Audio & Video Wholesalers, Hamilton, Tel: (71) 73414

SPAIN
Letusa s.a., Madrid, Tel: 641-08 12 05 '86

SWITZERLAND
Gotham AG, Tel: 41-1-840 01 44

WEST GERMANY
Alphaton, Tel: (06195) 74032 74033



P.O. Box 115, West Redding, CT 06896, (203) 938-2588, FAX (203) 938-8740

MARTIN POLON'S PERSPECTIVE

modification of a given film work is done by trained specialists at these transfer houses but without the involvement of the creative individuals who actually made the film. Again in most cases, the transfer is done without access to the original source materials.

The central complaint of the world's film-makers about the process of colourisation and soundtrack modification is that the creative talent who produced, directed or otherwise helped to make the original is excluded from the process of reissue. Similarly, the creation of a stereophonic soundtrack is frequently done without any recourse to existing pre-mix soundtracks if extant or the services of the original composer or conductor if still alive. Several hundred films have been or are being colourised despite the presence of pending legislation to control the process and a seemingly endless agenda of legal sniping. Yet the rewards are large indeed. It is estimated from the revenues of films already colourised that gross income from a colourised re-release can exceed four times that obtainable from the original version.

Fortunately or perhaps unfortunately, the reissue of classic (and of classical) recordings has not raised the hackles in the audio community in the same way that colourisation has for the film community. The reissue business of the record industry has evolved to the point where not infrequently, the producer of the original record or someone else creatively involved with the original project makes at least some level of connection to the reissued CD effort. Some critics have suggested that audio consumers have less to lose than home video viewers from these applications of new technology. That is a curious response since the simple turn of a colour level control on any TV set in any home restores a colourised motion picture back to its original state of glorious black and white. The home consumer plagued with an inadequate re-release of a classic recording has few home remedies to consider.

In the world of recorded sound, the advent of the compact disc and its subsequent success forced the decision by most record labels to transfer at least some existing catalogue to the new medium of CD. Initially, a fear of failure motivated many record companies to approach reissue as a necessary evil: financially a bargain basement activity.

A producer active in the reissue of LPs as CDs describes the early activities: "Expense control and compounding of errors dominated the reissue scene during the early 1980s. The true master tapes would not be removed from storage because the 'deep' storage facilities would charge a fee going out and coming back in. Existing tape would often be used. Sometimes a tape would be requested without identifying that it would be used for a CD reissue. A duplicate would be provided and the result was nothing to write home about. That would mean sometimes a third

or fourth generation duplicate tape would be the basis of the CD transfer. 'Quick and dirty' was the credo for many early transfer sessions. Tapes without noise reduction would have their bass and midrange sections boosted and the treble registers reduced to kill the hiss.

"This 'Polish' noise reduction, as it was jokingly called, often left the CD with a hollow quality. The point was 'it's digital so there can be no hiss audible', no matter what happened to the overall quality of the recording. Monaural recordings were made into stereo by rechanneling selected groups of frequencies. Time was usually not available to listen to the material to be transferred over and over until a course of action became evident. Searching vaults in salt domes for useful out-takes was another expense unlikely to be vetted. To even think about remixing a record for stereo or just to improve overall quality could get you committed. Not everything done in this time frame was bad. Somebody would come in and get all fired up and sell management a bill of goods and do a fantastic job. Those recordings are easily identified today because they are still on the market and still selling."

On the other side of the coin, excessive re-release engineering can obliterate the creative statement that the artists and the producers were trying to make with the original recording. Engineers will sometimes use elaborate devices designed to add 'warm and fuzzy' to a transfer and then use a digital delay to shape the way a vocal section is placed on to the compact disc. A small amount of tape hiss will result in the use of so much equalisation as to change the very timbre and definition of a recording.

An engineer who formerly did transfer sessions provides some insight into the problems of 'over' engineering. "We would look upon a session as a challenge. We would work on our own time, making trial runs. We would try to use every gadget in the room. Very often it would sound better—at least to us, at least in that transfer room. One of the experiences that forced me out and back into school to learn more about music was hearing one of my transfers at a party. I was appalled by the CD being played at this party. I walked into the party and I couldn't stand it. It was awful: all over equalised and too much digital echo and so on and so forth. The hostess handed me the jewel box and I nearly croaked when I saw it was one of mine."

Yet the root of the problem may well be the whole concept of having to tamper with existing recordings at all. Must a CD be 'digitally pure' and is that perception of pristine acousticality necessary or just a marketing perception currently driving record company re-releases? Perhaps the desired condition is a minimum of modification of the original unless it is absolutely

necessary to correct some significant failing. Only then would a major technical effort be mounted and it would be by definition a first class endeavour. The reverence that the recording industry holds for the classical marketplace and the classical consumer is apparent in the number of careful and exacting reissues of 'great performances' that one finds in the record stores. In classical reissue, it has become very common for the producer of the original recording to work with the original master tapes and even the out-takes to produce a reissue that has often transcended the original LP. But even there, the danger of allowing the mists of time and the maturing hand (and ear) of the producer to change a performance that may have been perfect for its day is very real.

The ultimate question about reissue has to be, 'Is this all bad?' The profitable bottom line has enabled record companies to gain financially from recreating their LP catalogues on compact disc. Many observers were worried, with the advent of the CD, that record companies would not move significant segments of catalogue over to the new format due to the cost. In fact, the profit factor for reissue is so high that many labels are adding more to their CD catalogues than new recordings. There are no production costs associated, many of the talent expenses have been 'paid out' under the existing LP contracts, and works that had descended into the world of mid-price and budget offerings on LP are transfixed into newly glamorous top dollar CD releases. For better or worse, this profitability has saved the recorded history of music in the West.

The problem of badly engineered CD reissues also seems to be lessening. Record company executives have become aware that LP production duplicates cannot and should not be used for CD transfers. If the phrase 'a clone of the master' is used to justify the use of the CD, the transfer process must begin with the master tapes. The expenditure of time and money is relatively small in terms of the potential financial outcome of a given re-release so that cost squeezing, common in the early days of LP to CD reissue, is becoming less common and money is being spent to create the best possible transfer situation. Original recordings are being given the time necessary to remix original session tapes, evaluate all available out-take material and equalise existing cuts to emphasise the creative elements that make up a particular recording. Even where the vaults yield a disappointing melange or nothing at all, the emphasis on quality transfers is becoming the rule rather than the exception. The skill of the transfer engineers and the quality and flexibility of digital transfer equipment has also contributed to the enhanced quality available now.

That this emphasis on the quality of reissue must be so, is registered in the sales figures for reissues that receive positive reviews because of their quality. There is no excuse for reissuing an existing performance if it cannot improve upon the LP pressing or provide access to a 'lost' work. The record industry is only as good as the quality of its product and the trust and continued retail participation of the consumer is dependent on how good a product the CD is. A bad reissue hurts the entire industry just as a bad 'new' recording hurts the label and artist involved. If there is a greater issue to all of this, it may be the feeling expressed by many observers that human scale has been squeezed out of many recordings by today's technology. If it is the past that is being transferred, then perhaps it should be done as it was. Let's not rewrite audio history with a digital pen. □

Hundreds of Matchless consoles in use around the world testify to three years of continuous success in the 24 track studio market. A continual programme of innovative research and development has ensured that the console remains ahead of its competition.

The latest updates mean that it is now available with a range of VCA fader and mute automation systems. Disk-based on standard PCs and SMPTE/MIDI converters that you buy off the shelf, rather than expensive dedicated computer systems, they offer unrivalled facilities at an unbeatable price.



TAC MATCHLESS...

WITH AUTOMATION

...OTHER
SYSTEMS
COST
THOUSANDS
MORE



SOUND ENGINEERING

Total Audio Concepts,
Unit 17, Bar Lane Industrial Park,
Bar Lane, Basford, Nottingham NG6 0HU.
Telephone: 0602 783306.
Telex: 37329 AMEKNT G.
Fax: 0602 785112. E Mail: DGS 1947.

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

Power Station selects t.c.electronic. Installs 6 TC-2290 sampler/delays

“ I love the sound, the ease of operation, and the complete control over all parameters. With the three modulation parameters, speed, depth and waveform on the front panel, and the special key functions to access software TC. allows fine tuning of parameters that are predetermined in other units.

The combination of dynamic delay and pan modulation allow quite a variety of effects within a single processing device. T.C. was very smart about this. The 2290 does at lot more, and is more affordable than any other unit we've used.”

Engineer Don Rodenbach
Power Station N.Y.C.

“ I mostly use the sampling... flying in vocal parts is easy and great. I can fly in a whole chorus and verse. Error-free, no glitches, easier and more accurate editing of samples, and storing of edited samples in pre-sets are great features.”

Engineer Rob Eaton
Power Station N.Y.C.



A demonstration model of the new TC 2290 was sent to Power Station by Martin Audio. The first engineer to use the 2290 was Don Rodenbach, who was so pleased with the sound, and features of the 2290, as well as "the clarity of the 32 sec. samples," that he bought one for his own rack. His unit then started making the rounds of various sessions at Power Station. Today there are six TC 2290 units at Power Station and no waiting. Each unit has 32 second capability for sampling (and delay), can be looked in perfect synch with a second 2290 for stereo sampling (*The new stereo link update*), and has Sampling 2 software, along with "Fast Trigger," update.

Sampling 2 Features

- 1) Multi-layering of samples. Up to 16 samples on top of each other with no degradation of signal, into the same pre-set.
- 2) Fancy Dancing-samples triggering samples any order, or number, as many times as desired.
- 3) 32 sec. delay possibility.
- 4) Crossfade-After the first sample is triggered, a second sample can be triggered, and the first sample will continue to play simultaneously.
- 5) Note counter for pitchshift of samples.
- 6) 1 millisecond sample looping and sound on sound possible.

Less is More
The TC 2290 offers 2 bits more resolution, at a quarter the price of any truly competitive unit. TC's 18 bit resolution, 1 MegaHz sampling rate, and 20-20KHz bandwidth

(rolling off a 33KHz even out to 32 seconds) make the TC 2290 a remarkable unit for sampling, multi-effect delays, and panning programs. Send for literature.

OF DENMARK

t.c. electronic

Denmark: Grimhøjvej 3, DK 8220 Brabrand, Phone: (45) 6 26 28 00
U.K.: 24 Church St., Oswestry, Shropshire, SY 11 2 SP, Phone: 0691 658 550
U.S.A.: 120 County Road, Tenafly, N.J. 07670, Phone: (201) 568-1820

WEST GERMANY: 08157/7677, DENMARK: 06262800, GREAT BRITAIN: 0691 658 550, SWEDEN: (031) 134950
NORWAY: (033) 26798, HOLLAND: BELGIUM, LUXEMBURG: 003110-4588166, AUSTRIA: 0498157/7677
ITALY: (02) 5084.1, FRANCE: (91) 498728, SPAIN: 91-4426426, USA: (201) 568-1820, CANADA: (416) 727-1951,
JAPAN: (03) 329-8051, AUSTRALIA: (03) 241 2244, FINLAND: 90-592055, GREECE: 01-368541,
SWITZERLAND: 073/226616.

WE DIDN'T REACH No.1 BY BEING OUT OF STOCK OR EXPENSIVE!



TRADE COUNTER OPENS
8.30am - 5pm Mon-Friday.

**Today's
orders through
your door, Today
or Tomorrow**

The UK's largest supplier of
MICS + TAPES + CABLES
PLUGS + EFFECTS UNITS
CASSETTES + RECORDERS
ACOUSTICAL TREATMENT
MIXERS + ACCESSORIES
Wholesale prices all items



Save time - phone
STUDIO SPARES

TRADE COUNTER
Open 8.30am - 5pm (Mon - Fri)

TELEPHONE ORDERS: 01-482 1692 ADMIN: 01-485 4908
16 Stucley Place, Hawley Crescent, Camden Town, London NW1 8NS

first

Please send free 56 page catalogue

Please send account application form

NAME _____

ADDRESS _____



ESBUS: A PRACTICAL APPLICATION

As long ago as 1980 the European Broadcasting Union were working on the idea of a standardised remote control system for all the different types and makes of VTRs, ATRs, telecines, projectors and peripheral equipment, primarily with the broadcast environment in mind. Dave Foister looks at ESBUS and a practical unit

Clearly a common standard, bringing an end to dedicated remotes and interfaces, is as good an idea in this context as in any other. In 1981 the SMPTE became involved in discussions with the EBU, and in 1984, after a considerable amount of change and evolution, the first document (TECH 3245-E or SMPTE 207M depending on which side of the pond you were) was published setting out the basic details of the ESBUS system.

This was to be a network arrangement using distributed intelligence, with intelligent interfaces (known, in conjunction with their attached machines, as Tributaries) communicating with each other and with a master Bus Controller via a standard RS422 interface running at 38.4 kbaud. The Bus Controller, which could reside in any Tributary, would supervise the network and communication between the other tributaries. The initial document laid down little more than the software protocols and the electrical characteristics of the hardware for the bus itself, together with the connector type, which was to be a 9-pin D-type.

In 1986 the first supplement was published, laying the groundwork for the control language to be used and discussing the concept of the 'Virtual Machine'—a device that ESBUS could treat as a standard machine and which in turn would interpret ESBUS commands and translate them into machine-specific commands to be sent to an

actual ATR, VTR or whatever. It still did not discuss those actual machines and their individual problems and applications; this was left to later supplements, which published work largely developed between manufacturers using the 'Confer' computer conferencing network. These manufacturers included AEG, Ampex, Audio Kinetics, the BBC, Kudelski, Otari, Philips, Sony, SSL and Studer, which gives an idea of how seriously the whole thing is being taken.

It had become apparent early on that a single control language capable of addressing all possible types of machine was both illogical (because of their different capabilities and variable parameters) and impossible, and that different dialects would be required to address different broad groups of equipment. Thus in 1986 the next supplement appeared, defining the dialect for use with VTRs, which can cope not only with transport commands but also alignment control, which would clearly be meaningless to anything other than a VTR. This dialect is already in use, notably in Munich by Bavarian Broadcasting and by the BBC on modified Ampex machines. By now the ATR dialect should be published, with manufacturers already committed to using it, and other group-specific dialects are in preparation covering telecine, routers, communications, switchers and even cameras; mixing consoles and audio peripherals have as yet no committees to formulate their dialects.

Where two types of machines are required to perform similar functions but in different ways

(such as the different ways VTRs and ATRs find and lock to sync) the relevant commands can be mapped to the same logical place in the language, facilitating control and avoiding conflicts.

Obviously not all machines using a given dialect will be capable of implementing all the commands in that dialect, and this is not a problem provided the relevant tributary reports to the Bus Controller any commands it can't respond to.

So what we have is a system similar in some ways to a computer Local Area Network, featuring any number of tributaries all communicating via, and being controlled by, a Bus Controller. This Controller should not be confused with a machine controller, which could well be on a tributary of its own; there could even be more than one machine controller on the bus, but there can never be more than one Bus Controller, whose sole purpose is to supervise the network and distribute commands and communication as required. In practice, the Bus Controller might well be contained in the same box as a master machine control panel, for the sake of simplicity and operating speed, but they remain two separate devices.

The Bus Controller addresses each tributary in turn, sending any messages it may have for it and asking if the tributary (which never speaks unless it is spoken to) has anything to say. Hence the possibility of several machine controllers on the bus: each can in turn send its commands on to the bus to be sent by the Bus Controller to the required machine. Details of which controller is dealing with which machine(s) are held in memory in the Bus Controller in Linkage Directories, which may be reconfigured at any time. In addition, logical Groups of machines may be created that all respond identically and simultaneously to a common controller.

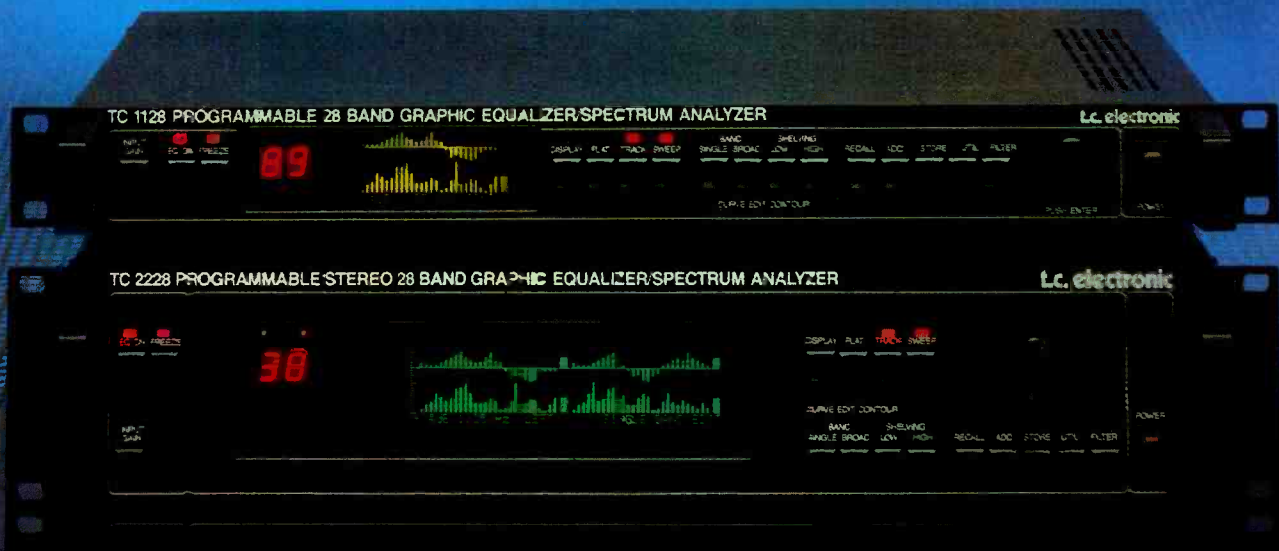
The flexibility and operational speed gained by a medium or large installation using ESBUS could clearly be considerable, making new ways of working possible and radically simplifying old ones. This is the kind of standardisation we need and which so rarely happens; let us hope that the atmosphere of co-operation and good intent continues, and that ESBUS survives the inevitable early hurdles to become established.

Audio Kinetics and the AK ESBUS

Audio Kinetics joined the ESBUS consultative process about two years ago. They had started to recognise that some customers were not buying their *Q.Lock* synchronisation system because of the limitations it imposed (in common with other systems) in terms of the number of machines it could handle. Having decided that what was needed was a system with a more open architecture and hence more flexibility for future expansion, they became aware of what was going on in the ESBUS discussions via the Confer network, including the important contributions being made by the BBC, and decided to espouse ESBUS as something they could use as a means to realise their ideas. Before long they began to feel that ESBUS was the way forward in more general terms, and that by championing the system they could introduce their own ideas and expand ESBUS into something more than just a remote control interface.

ESBUS, being basically a remote control bus for broadcast applications, incorporates little in the way of synchronisation facilities, apart from a concept of a so-called Time-Line, but it was

FRESH AIR NEW AUTOMATIC GRAPHIC EQUALIZER



When you switch on this new TC unit you will discover that you are in possession of an exciting innovation.

What we mean by this is that the new TC graphic equalizer is the first EQ that takes an active part in sound engineering whether in recording studio, in sound reinforcement or in sound contracting. The TC 1128/2228 gives maximum acoustic control like never before.

100 present offer you the ability to store your

favorite EQ settings facilitating high speed A/B tests. This TC EQ can also change settings by reading SMPTE code (optional feature) thereby killing unwanted clicks etc. and maintaining full dynamic control by negotiating the use of processing devices. ITS WHAT WE CALL THE FRESH AIR APPROACH.

The TC 1128/2228 has AUTOMATIC ROOM SETTING with a built in spectrum analyzer. For sound reinforcement it can be midi controlled

allowing any number of EQ's to be linked together, with a full status over AUTOMATIC FEED-BACK SEARCH AND DESTROY.

Dynamic range: more than 110 dB, THD: less than 0,002%, Frequency response: 10-100.000 Hz $\pm 0/-0.5$ dB, 28 bands 1/3 octave filters on iso centers, ± 12 dB or ± 6 dB, 1 or 1/2 dB steps, Highcut and lowcut filter.

Send for literature.

OF DENMARK
t.c. electronic

U.K.: T.C. ELECTRONIC
24 CHURCH STREET, OSWESTRY, SHROPSHIRE. PHONE: 0691 658550

WEST GERMANY: 081577677, DENMARK: 06262900, GREAT BRITAIN: 0691658550, SWEDEN: (031) 134950, NORWAY: (033) 26798, HOLLAND/BELGIUM: 003110-4588166, AUSTRIA: 004981577677
ITALY: (02) 5084.1, FRANCE: (91) 498728, SPAIN: 91-4426426, USA: (201) 384-4221, CANADA: (416) 727-1951, JAPAN: (03) 329-8051, AUSTRALIA: (03) 4805988, FINLAND: 90-814133, GREECE: 01-3628541, SWITZERLAND: 073/226616

www.americanradiohistory.com

ESBUS: A PRACTICAL APPLICATION

relatively easy to include extra synchronisation-related buses while retaining compatibility with the original specifications. To this end Audio Kinetics started adding extra lines to the system, ending up with four extra buses to meet the needs of the post-production and music recording industries.

The most important addition is the hardware necessary for the realisation of the ESBUS Time-Line concept. This distributes a synchronisation signal from a central clock, and introduces AK's concept of the one-machine synchroniser—a device that synchronises any machine to that master source, which would ideally be a video sync, removing the need for a real master machine. This provides perfect syncing of all machines on the bus to the central source, eliminating the

locking delays inherent in a conventional master-slave set-up, which is limited by the start-up time of the master machine. To retain system versatility, the central source can itself be referenced to any synchronisation source on the system, for instance to allow for a deliberately varispeeded multitrack master or a machine incapable of being slaved, but otherwise the sync source behaves as a perfect machine, with zero start-up time and absolute predictability.

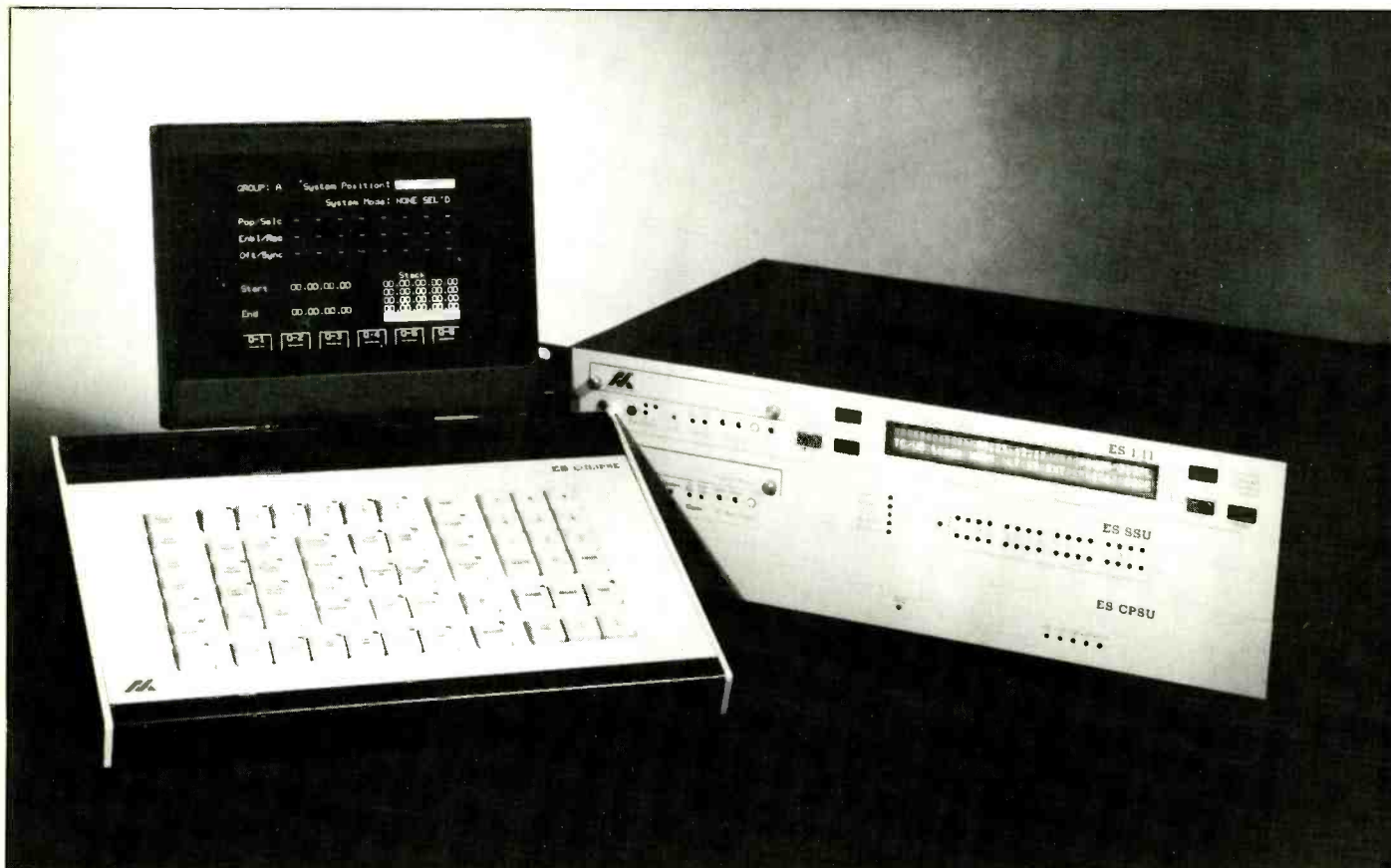
For installations requiring the use of conventional timecode in varying configurations, the second bus, the Time Code bus, was added. This distributes SMPTE or other timecode around the system but the choice of master and slave machines is under software control from the central control point, eliminating the need for

conventional re-patching of timecode signals when a different configuration is required. The third bus, the Frame bus, distributes video syncs or frame rate pulses in a similar way, and either of these buses can be used as a reference source for the Time Line bus.

The fourth and final bus is aimed directly at the music recording industry, and AK hope it will overcome the only problem ESBUS may pose in that area. While it is recognised that in some applications drop-in and drop-out points can conveniently be pre-programmed, there will always be circumstances, particularly in music recording, where manual drops will be required. Although ESBUS will handle most transport functions faster than the machines being addressed can react, or as near as makes no difference, the potential and unpredictable delay on a busy system of a few milliseconds could wreck a tight drop-in. For this reason AK have incorporated what they call the Crash Record bus, which puts any connected machines in Ready mode and Record Enabled instantly into Record, bypassing the conventional ESBUS command. This itself may also be pre-programmed, and can incorporate delays or advances in monitor switching and so on in order to make drop-in rehearsals sound exactly like the final result.

Audio Kinetics' expansion of ESBUS requires a larger connector—15 pins instead of nine—although converters will be available and all non-expanded ESBUS commands will function as usual. In addition, AK's hardware provides two completely independent ESBUSes (A and B), which can be locally or remotely selected. Thus a central machine room could have varying combinations of machines accessed from two independent control rooms—with this in mind wind limits can be programmed for the machines—or a pair or group of machines in one room could be split off from the rest to perform one task while work proceeded on the other bus.

AK's expanded system, with its extra sync



PARAMETRIC PERFECTION



Introducing the New Orban 642B Parametric Equalizer/Notch Filter

Orban's new 642B Parametric Equalizer/Notch Filter offers unmatched versatility, superb specs, and highly musical equalization in a new generation of our famous and widely-used 622 series. The 642B represents Orban's continuing dedication to the art of creating the "most musical" parametric equalizers through the use of carefully designed, series-connected "constant Q" sections which minimize ringing and stridency.

The 642B's superiority over conventional parametric equalizers is particularly apparent at the extremes of its boost/cut parameter and at narrower bandwidths on difficult program material. In situations like these, the 642B's performance provides consistently satisfying results without complications or unpleasant surprises.

	Band 1	Band 2	Band 3	Band 4
Model 642B (Same in both channels.)	25-500Hz	80-1.6kHz	315-6.3kHz	1-20kHz

Special Application Versions

Model 642B/SP	80-1.6kHz	80-1.6kHz	315-6.3kHz	315-6.3kHz
(Same in both channels. Limited frequency range for speech processing, forensic work, notch filtering/feedback suppression, and similar applications.)				
Model 642B/SPX Frequency ranges of 642B in channel A; 642B/SP in channel B (For combined full-frequency range broadband shaping and restricted-range narrowband notching.)				

Features include:

- Dual 4-band or mono 8-band configuration selectable by the front-panel Cascade switch
- Each band can be tuned over a 20:1 frequency range; tuning ranges of bands overlap significantly to maximize versatility; +16dB boost/-40dB cut in each band; "Q" variable from about 0.29-5.0
- Vernier frequency control to facilitate fast, precise tuning of sharp notches
- Frequency-selectable 18dB/octave high-pass filter and 12dB/octave proprietary "Automatic Sliding Besselworth"™ low-pass filter to provide full flexibility with maximum musicality
- Noise and distortion specs significantly better than 16-bit digital

Call or write today to discover more about Orban's new, ultra-quiet, 642B Parametric Equalizer/ Notch Filter— a new generation of parametric excellence from the leader in parametric EQ.

Orban Associates Inc.

645 Bryant St., San Francisco, CA 94107
(415) 957-1067 Telex: 17-1480 FAX: (415) 957-1070



SCENIC SOUNDS EQUIPMENT LIMITED
Unit 2, 12 William Road, London NW1 3EN.
Tel: 01-387 1262 Telex: 27939 SCENIC G



ESBUS: A PRACTICAL APPLICATION

Now! A Single Channel BBE with Mic Level, Line Level and Phantom Power!



The clarity, definition, presence, texture and voice intelligibility for which BBE has become world renowned is now in a single channel format. For *all* microphone uses—from vocalists to instrumental soloists and lecturers to distributed sound systems, the BBE 401 will become indispensable.

High or low impedance mics and musical instruments can plug directly into the front or rear panel jacks. The BBE 401 has its own preamp with gain controls, can be used as a direct box and will accept -10 dBu line levels. 24 volts of phantom power are available from the low impedance mic output.

The BBE processors achieve time alignment of harmonic and fundamental frequencies that were present in the live performance but became reshuffled in the often convoluted paths of recording, playback and broadcast of audio.

The BBE 802

For use in broadcast, recording and large concert systems and industrial audio. Balanced and unbalanced lines $+24$ dBu headroom, hard wire bypass. The ultimate BBE for professional use.



The BBE 402

For use in home recording, clubs, discos, and systems using unbalanced lines.

$+14$ dBu headroom -10 dBu levels. Home audio and cassette copies are greatly improved.

BBE

5500 Bolsa Ave., Suite 245, Huntington Beach, California 92649

714-897-6766 • 800-233-8346 (USA) • 800-558-3963 (CA)

(In Canada contact Daymen Audio, 3241 Kennedy Rd. #22 Scarborough, Ontario M1V2J9 or call 416-298-9644

facilities, is available as a standard for other synchroniser manufacturers to use but they are the first to put hardware on the market incorporating even ESBUS, never mind AK ESBUS, as their system is called. The hardware comprises an updated version of the *Eclipse* controller (existing *Eclipses* can have ESBUS software added), which incorporates a basic ESBUS controller, and a universal ESBUS synchroniser called the *ES 1.11*. This extends the ESBUS idea of the virtual machine by having two microprocessors: one feeds ESBUS commands into a shared RAM from where the second translates them into machine-specific actions. The old idea of a machine-specific interface is eliminated by having the second processor refer to a look-up table, stored in ROM, to convert ESBUS commands into the required commands for its connected machine. This ROM can store look-up tables for a few hundred specific machines, and can be updated when necessary without opening up the box since it is mounted on a slide-in tray accessed from the front panel. The *ES 1.11* knows which machine it is supposed to be talking to because of links in the interconnecting cable, which means that this cable is the only machine-specific part of the installation.

Audio Kinetics will be looking to dealers to replace the ROMs with updates covering new machines when required, and possibly to a Modem link to a central database so that dealers can download updates into their local computers and blow their own replacement ROMs. There are also plans for front-panel access to the interface programming so that the inevitable occasional unknown machine can be accommodated on site by someone with the necessary programming expertise.

Closely related to the *ES 1.11* is the *ES SSU* (System Services Unit), which provides ESBUS-driven relay switching, a MIDI interface, and service functions like mimic LEDs and beeps.

Since several machine manufacturers have already committed themselves to incorporating on-board ESBUS interfaces on future products, devices like the *ES 1.11* should eventually become necessary only on older machines. AK therefore hope to target future work on ESBUS controllers since they feel that is where their background and experience lie, and in fact they already have further controllers in the pipeline. However, they have not ruled out the possibility of supplying ready-built interfaces to machine manufacturers to be fitted to their products.

It has been easy recently to get the impression in many areas, not just audio, that interfacing is a growth industry in itself, relying on a multiplicity of standards and demands to provide a market for hardware and expertise to overcome the problems they pose for the end user. Thus we have not only several so-called standards applied to one task but also so much diversity within each standard (look at the various ASC I protocols and MIDI) that configuring apparently compatible devices to talk properly to each other can be difficult and time-consuming. This does not help promote the image of new technology. How refreshing then to see a major portion of our industry conferring on and agreeing to a single unambiguous standard to meet most foreseeable needs of its users. If, in addition, Audio Kinetics can gain acceptance for their work in expanding ESBUS to cover virtually all the interfacing and control needs of the audio industry, then perhaps ESBUS will have scored a first in providing a worry-free genuinely standard system to allow us all to get on with our real work. It is to be hoped that manufacturers will see that such a system benefits everybody. □

Mitsubishi X-86

2 Channel Digital Audio
Master Recorder

4 Additional subtracks: 2 cue,
auxiliary digital & time code

Switchable 44.1 & 48 kHz
Sampling

Cut & Splice Editing or new
XE-2 Electronic Editor

Insert Recording (individual
or simultaneous Punch-
in/Punch-out)

Varispeed ($\pm 10\%$)

Autolocation/Time Code
display

Remote Control Parallel
Interface—RS232C/RS-422
SMPTE/EBU "ESbus."

Fully compatible with
PAL/SECAM TV NTSC/
standards: Sync
to: 9.6/8 kHz.
External clock:
50/59.94/60 Hz
or Composite
Sync.

14" Reels



Three models:

X-86 standard

X-86LT extended four hour,
half-speed recording

X-86HS extended bandwidth
(96 kHz Sampling)

Now appearing in World-
Class studios everywhere.



MITSUBISHI PRO AUDIO GROUP
DIGITAL ENTERTAINMENT CORPORATION

Headquarters: 225 Parkside Drive, San Fernando, CA 91340 • Phone (818) 898-2341 • FAX (818) 365-8310

New York: Suite 1321, 555 W. 57th Street, New York, N.Y. 10019 • Phone (212) 713-1600

Tennessee: 104 Eastpark Drive, Suite 306, Brentwood, TN 37027 • Phone (615) 371-6602 • FAX (615) 371-6644

Canada: 260 The Esplanade, Toronto, ONT. M5A 1J2 • Phone (416) 365-3363 • FAX (416) 365-1044

United Kingdom: Unit 13, Alban Park, Hathfield Road, St. Albans, Hertfordshire AL4 0JL • Phone 0727 40384 • FAX 0727 67684

www.americanradiohistory.com

PRACTICAL X86

Patrick Stapley looks at the Mitsubishi X86 2-channel digital recorder

It's almost 10 years since Mitsubishi brought out the first razor-edit, 2-channel digital machine. There were two types: the X80, the more common transportable model that came in two cased halves; and the X80A, a more permanent version with a stand and penthouse section. In my opinion the X80 always suffered from poor cosmetic design making it appear old fashioned. The X86 on the other hand has been brought right up to date and looks a very presentable machine.

The X86 comes mounted in a steel, waist-high trolley stand and includes a penthouse section. There is no transportable version but there are two other models available—the X86 HS and X86 LT. The HS doubles the sampling rate to 96 kHz, which makes it possible to record frequencies over 30 kHz, and the LT extends the maximum playing time (14 inch reels) from two hours to four hours by reducing the tape speed to 7½ in/s from the standard 15 in/s. Due to an increase in deck size all machines will now accommodate 14 inch reels and both deck and penthouse can be tilted up or down to give a number of different working angles. Underneath the transport section, and accessed from the front of the machine, are the power supply and card cage. With the incorporation of VLSIs (Very Large Scale Integrated circuits) the electronics have been further miniaturised to allow the system to be controlled by six PC boards. The DIF-2 board that controls AES/EBU and XE2 editor interfacing is optional while the SMPTE reader generator is now standard.

Formats and tracks

The X86 uses the PD format over 12 tracks which are divided into six PCM tracks, two parity tracks, two editing cue tracks, one timecode track and one auxiliary digital track (see Table 1).

The cue tracks, which are sometimes referred to as the analogue tracks, are in fact digital. They use a system called PWM (Pulse Width Modulation), which is supposed to alleviate the problem that analogue encounters with very narrow track widths. However, the system was not very satisfactory and I will discuss it in greater detail when I get on to editing.

The auxiliary digital track is identical to the code track and will accept low speed TTL data up to 20 kHz. It can be used, for example, to record a different timecode standard.

There are four ferrite heads—two playback, one erase and one record—which the manufacturers claim have a life of some 10,000 hours. (I'm afraid we didn't have time to test that!) The reason for two playback heads is to enable insert drop-ins. By having a playback (sync) head before the erase and record heads it becomes possible for the machine to crossfade incoming signals in and out of the existing recorded programme. Crossfade enter and exit times are controlled by normal

drop-in/out operation, and the crossfade time can be adjusted between 2.7 ms and 82.7 ms with PCB switches. Insert drop-ins were tested by locking the X86 to another machine with identical programme and sections were then dropped in and out. There were no noticeable defects and the crossfade points were audibly imperceptible. It is possible to perform single-channel drop-ins and any changes made to the main digital audio will be duplicated to the cue tracks. The second playback head comes after the record head and, like a conventional analogue machine, it allows read after write monitoring.

Controls and functions

The usual array of transport controls are found on the front right hand side of the deck: rewind, fast forward, stop, play and record. When pressing any of these buttons, except record, the button will flash until the mode is fully engaged. Record is entered by hitting play and record together and exited by either pressing stop or play. To the left of these controls is another row of buttons: reel, slow, dump and cue. Reel should be used to adjust tension for small spools. Slow halves the fast winding speed and consequently produces a more evenly spooled tape, which is important for storage. Dump disengages the take up spool motor so that tape can be played off either for editing or scrapping purposes. Cue prevents the tape from being lifted from the heads and automatically switches the cue tracks into the audio output ready for editing. To the right of the cue button is a shuttle control lever that gives selective forward or backward speeds of between 1½ in/s and 250 in/s in cue mode.

Directly behind the main transport controls are six buttons used for autolocation. By pressing any of the four numbered LOC buttons a location point is stored, and to relocate that point the same numbered LOC button is pressed together with the master LOC button. If the master LOC button is pressed by itself the machine will return to the last play start position and if the rollback button (RLB) is selected the machine will locate 4 seconds before the most recent play start point. Play may be selected after a locate command, in which case the machine goes instantly into play

Cue—left channel	} PWM	Sub-track	4
Cue—right channel		Sub-track	3
Parity	}		8
PCM			7
PCM			6
PCM		Main track	5
PCM			4
PCM			3
PCM			2
Parity		1	
Aux digital		Sub-track	2
Timecode		Sub-track	1

TASCAM European Distributors

Hi-Fi Stereo Centre,
Muencher Bundesstrasse 42,
5013 Salzburg,
AUSTRIA.
Tel: (0662) 37701
Inelco Belgium Sa,
Av. Des Croix de Guerre, 94,
Oorlogskruisenlaan, 94,
1120 Brussels,
BELGIUM.
Tel: (02) 216 0160
So & Hoyem A/S,
Bulowsgaarden,
Bulowsvvej 3,
1870 Frederiksberg C,
DENMARK.
Tel: (01) 22 44 34
Studiovox Ky,
Atomitie 5C,
SF-00370 Helsinki,
FINLAND.
Tel: (80) 562 3411
Harman France,
Peripole 243,
33 Av. de Lattre de Tassigny,
94127 Fontenay s/Bois Cedex,
FRANCE.
Tel: (01) 4876 1144
Elina SA,
59/59A Tritis Septemvrius St.,
Athens 103,
GREECE.
Tel: (01) 8220 037
Greenlands Radio Centre,
PO Box 119,
3900 Godthab,
GREENLAND.
Tel: 299 21347
AEG Nederland NV,
Aletta Jacobslaan 7,
1066 BP Amsterdam,
NETHERLANDS.
Tel: (020) 5105 473
GBC Italiana spa,
TEAC Division,
Viale Matteotti, 66,
Cinisello Balsamo, Milan,
ITALY.
Tel: (02) 618 1801
Hljodriti — Hot Ice,
PO Box 138,
Hafnarfirdi,
ICELAND.
Tel: (01) 53776
Audiotron A/S,
Seilduksgt, 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 Profesional SA.,
Paseo Maragall 120,
Entlo 3a,
08027 Barcelona,
SPAIN.
Tel: (93) 349 7008
Erato Audio Video AB,
Aeogatan 115,
116 24 Stockholm,
SWEDEN.
Tel: (08) 743 0750
Telion AG.,
Albisriederstrasse 232,
8047 Zurich,
SWITZERLAND.
Tel: (01) 493 1515
Harman Deutschland GmbH,
Huenderstrasse 1,
7100 Heilbronn,
WEST GERMANY.
Tel: (07131) 480202

TASCAM

THE ATR80-24



**Don't just note
check out**

**the good looks,
the features!**

The ATR80-24 is more than just a pretty face.

Yet with all the features you would expect of a Professional 24 track recorder/reproducer, it is easy to overlook one of the most essential: the quality of the heads.

The fact is that we don't trust anyone else to make them for us. So for the last 30 years, we have designed and manufactured our own record/sync, reproduce and erase heads.

This resulted in TASCAM being the first multitrack manufacturer to achieve full playback frequency response in sync mode.

SYNC EQUALS REPRO – means no quality loss during track bouncing or overdubbing.

- * High density permalloy record/sync and repro heads with contourless configuration for hard wearing heads and optimum tape to head contact.
- * Erase head with overlapping tracks and glassbonded gaps for erasure precision.
- * Non magnetic ceramic capstan with high torque motor.
- * Smooth transport, controlled by three 8 bit D to A converters, even in varispeed.

- * 14 inch reel capacity and a wind speed of 375 ips.
- * Interface for external noise reduction system.
- * Optional serial interface for external control.
- * Sophisticated remote includes rotary shuttle, rehearsal and "sync lock" function enabling simple use of reference codes, such as timecode.

Run in to the '90s with an ATR80!

For a demonstration or more detailed information, contact your nearest TASCAM Professional dealer or TEAC UK Limited.

Professional Dealers UK and Rep. of Ireland

London	– S.S.E. Marketing Limited	Tel: 01-387 1262
	– Rapier & Wayman	Tel: 01-359 9342
Stockport	– Audio Services	Tel: 06636-4244
Belfast	– Sound Control	Tel: 0232-772491
Dublin	– Control Techniques Ireland	Tel: 0001-966 866

TASCAM
PROFESSIONAL

TEAC UK LTD, 5 Marlin House, The Croxley Centre,
Watford Herts WD1 8YA

Tel: 0923 225235. Fax: 0923 36290.
Contact: Martin Capp – Sales Manager

THE OPTO-SWITCHER



The OP-1 is a small rugged box that allows optically-isolated, interference-free switching of mains devices from an input of 5-50vDC. The maximum mains load is 6 Amps. XLR and IEC sockets allow easy connection.

OP-1 £55 + VAT



TOTALSYSTEMS

41 Windermere Avenue
Basingstoke, Hants RG22 5JH, UK
Phone: 0256-468555
Telex: 858893 FLETEL G
Fax: 0252-620729

AUDIO JACKFIELDS & JACK SOCKETS

Mosses & Mitchell are the largest manufacturer of Audio Jacks and Jackfields in the UK. We are approved suppliers to the BBC, British Telecom, and many other major telecommunication companies throughout the world. We manufacture a complete range of Audio Jacks & Jackfields and offer a design and manufacturing service geared to meet your specific requirements. For further information and technical data on our products contact:

MOSES & MITCHELL

Plasmec Systems Limited
Weydon Lane, Farnham, Surrey GU9 8QL
Telephone: Farnham (0252) 721236
Telex: 858820 Plasmec G
Fax: (0252) 712718

INSERTERS · V.I.T.C. · SYNCHRONISERS · L.T.C. · MULTI-SLAVE EDITING SYSTEMS · COMPUTER

SYNC BOXES

READERS

AUDIO/VIDEO TIMECODE GENERATORS



GET IN SYNC WITH THE EXPERTS



CONTROLLED ADR · VIDEO EDITING · DIGITAL SIGNAL PROCESSORS

NOW YOU CAN AFFORD THE BEST.....AND WE ARE JUST A PHONE CALL AWAY

g.t.c.

g.t.c. limited
Malby House
5, Fulmer Drive
Gerrards Cross
Bucks. SL9 7HH
Fax: 0753/889133
Phone: 0753/884319

g.t.c. Film- und Fernseh-
Studiotechnik GmbH
Wöhrendamm 19
D-2070 Großhansdorf
West Germany
Fax: 0 4102/64907
Phone: 0 4102/620 62

g.t.c.

on location, both mechanically and audibly. If play is selected with the machine in stop there is an approximate gap of 800 ms before audio is heard.

The 8-digit tape counter gives the option of reading out timecode or tach using the tach and code buttons but the display can only be changed with the machine in stop. The tach reading goes down to $\frac{1}{10}$ s, which is displayed as 1-9. Tach values before zero are expressed as minus times.

Situated to the left of the tape counter is the varipitch display and controls. The pitch of the machine can be flattened or sharpened by a maximum of 10%. The up and down buttons shift the pitch in 0.1% steps and the fix button returns the machine to normal pitch.

Penthouse

On either side of the penthouse are built-in Foster speakers with associated level controls. The quality of these $3\frac{1}{2}$ inch speakers is actually quite good and they were useful as an alternative monitor check; the only complaint I would have, and it is a small one, is that the level pots are continuous rather than notched, which would have made setting up left and right sides easier. Also controlled from these pots is the headphone output.

The metering is via standard analogue VUs and digital peak bargraphs. The digital meters have a peak hold facility operated by the hold and reset buttons. Below the bargraphs are two indicators that light up when signal is detected on the code or aux digital tracks.

Level controls for both record and replay can be calibrated or uncalibrated. In the calibrated mode the levels are factory adjusted to +4 dBm but they can be adjusted with the level screws next to the cal/uncal buttons. When using the uncalibrated mode the left and right record and repro pots come into circuit.

There are four ready/safe switches, each with its own ready and record light, that control the left and right channels, code track and aux digital track. The cue tracks follow the left and right switches and also duplicate level settings. Below these switches are the monitor status buttons. The first of these, Repro, puts the machine into normal read after write monitoring. Sync switches monitoring to the first replay head and allows the machine to perform insert drop-ins as discussed. Input re-routes the incoming signal back to the output after initial digital processing and cue switches the cue tracks to monitor either in Sync or Repro.

The last group of controls on the penthouse section are the three system switches. The top switch allows Emphasis to be turned on or off for recording or playback, lighting up the Emphasis indicator. This light will flash during playback if the Emphasis flag on tape differs from the switch position. The Synchro switch enables the machine to synchronise to a 9.6 kHz FM signal via the remote connector at the back of the machine and its indicator will flash if sync deviates by more than $\pm 10\%$. External Clock synchronises the machine to 44.1 kHz or 48 kHz from the External Clock Input, and the indicator will light when machines are locked and flash when sync is lost. The machine is compatible with all the usual sync sources and has its own NTSC (DF or NDF)/PAL timecode generator.

Running in a column beside the system indicators are seven coloured indicators that give information on digital dubbing, clock mismatches, the sampling frequency (44.1 kHz or 48 kHz), playback and record servo lock, drop frame

PRACTICAL X86

timecode, PCM errors and mutes.

Connections

The main left and right inputs and outputs are via *XLR-3* sockets at the back of the machine. Also on *XLRs* are the timecode, aux digital and AES/EBU digital in/out connections, which permit different digital formats with this interface to communicate with the X86.

D connectors are used for the Mitsubishi dubbing input/output ports, the *XE2* editor, the remote/synchroniser connector the RS232C and the RS422 SMPTE/EBU control ports. Both RS ports are provided for future software development. External clock in, internal clock out and composite sync in, are all on BNC connectors. The IEC mains plug is also on the back.

PCB switches

There are a number of different switches accessible on the PCBs but I will not mention them all as I doubt whether the average reader would find it particularly fascinating. There is the A/D mute switch that creates digital silence and is useful for inserting blank sections. The timer switch will give a readout on the tape counter display of the total number of hours the machine has been operating. As discussed, crossfade time for drop-ins can be changed and there is also the provision to change the crossfade time of edits. All timecode and clock rates are switched from the PCBs including the machine's two sampling frequencies.

Editing

Editing can be achieved either with a razor blade or electronically using the *XE2* editor. Unfortunately at the time of writing there was no editing system available to us, so for now it will be left uncovered.

Before I undertook my first edit I consulted the manual for guidance and it said: "Wear gloves to

protect tape and handle it very carefully. Use only the supplied Mitsubishi editing block and mark tape with a video tape marking pen. Cut both sides a few centimetres away from the marked edit to prevent damage to the edges. Place both pieces of tape in the editing block and align marks on top of each other. Cut through both tapes simultaneously and join together leaving a slight gap. Apply splicing tape (as in multitrack edit) making sure there are no bubbles and cut it so that it is just short of the tape edge. It is very important that no splicing tape protrudes. Before and after editing make safety copies of your master."

Having taken all this in I switched on the cue tracks donned my surgical rubber gloves, which are of course standard issue to all *Studio Sound* reviewers, and proceeded. The first problem was the poor quality of the cue tracks. They were extremely noisy and sounded on the verge of breaking up but worse still was the fact that at slow rock and roll speeds the signal kept cutting in and out making the job of marking the tape very awkward. Mitsubishi admit there is a problem here and advise me that new electronics will be available shortly to improve quality and to considerably lower the reading speed, which at present is $\frac{1}{12}$ of the play speed. Having eventually marked my edit points I carried on as directed but found the design of the editing block was such that the tape would not sit firmly in place and kept falling out. This made cutting the tape and applying splicing tape fiddly to say the least. I also found trimming the splicing tape back from the tape edges an extremely awkward procedure.

Anyway, after what seemed an inordinately long time, I ended up with an edit that sounded fine. I then decided to try another but this time treating it like analogue. I removed the gloves, found myself a chinagraph, an Emitape block and some standard $\frac{1}{4}$ in splicing tape. The edit took a couple of minutes to do, which included handling the tape delicately, and gave identical results. I then repeated this process a number of times to make certain I hadn't just been lucky, and found I got consistent results. What I don't know is how each method compares after storage, but then if one is making safety copies perhaps this is unimportant. On the face of it I would say that the editing instructions given by Mitsubishi are over-cautious and unnecessarily time consuming.

Conclusion

The machine was tested using Ampex 467 at both sampling rates and I could find nothing to criticise in the sound. There was no problem with PCM muting except when recording over edits, which did seem to cause some confusion. All controls worked as stated in the manual and the machine was easy to use; it has a well thought-out robust design. The cue tracks were unsatisfactory at the time of writing but, as mentioned, they should be put right soon. The insert drop-in function worked well and was glitch free. The overall mechanical noise (mainly from the fan) was louder than expected and I think this could be irritating in the control room. Mitsubishi are considering the development of a remote control unit but they are at present waiting for customer feedback before committing themselves. □

UK distributors comment: The cooling fan is a special low noise type and we are surprised that this aspect has been criticised. It is quieter than any personal computer that might be in the room.



The X86 on display at an AES show

BARRY FOX'S BUSINESS

A straw in the wind. As I've previously mentioned in this column, University College School in North London has a small, purpose-built theatre, superbly equipped and with excellent live acoustics. The piano is a grand, tuned for each concert. Classical and jazz music concerts are held there regularly with the public welcome. The school can afford to book name performers, and charge only a few pounds entrance fee, because the project runs as a charity and all the work is done free by older pupils, many training for a career in the theatre.

Recently UCS staged a jazz concert, by the Oliver Jackson Trio. Jackson is one of America's best drummers, and his piano trio is so tight and highly rehearsed that it sounds at least twice the size. For the UCS concert, Oliver Jackson was joined by a guest British woodwind player who shall remain anonymous, to spare his blushes.

The trio were using only the lightest touch of house PA. But throughout the concert 'Mr Sax' kept asking for more level on his mic. When the time came for a flute solo, Jackson could stand it no longer. He addressed the audience, asking the sax player how much his flute cost. It was worth between £15,000 and £20,000.

Then, gently but very firmly, Jackson picked up the microphone stand and carried it off the stage. He went to the piano, swung out the boom mic, and switched off the bass player's amplification.

"Now let's hear what that flute *really* sounds like," said Jackson and counted the quartet into a wholly acoustic and soft-as-silk *Embraceable You*. The beautiful tone of the flute filled the theatre with ease.

But halfway through, Mr Sax could stand it no longer. He walked off stage, carried back the microphone and blew the rest of this solo hard into it.

Oliver Jackson's face would have sunk a thousand ships. Of most significance, the audience spontaneously bellowed, "No, no, don't use it." But the sax player insisted on using his security blanket, thereby spoiling the sound of a beautiful instrument, annoying the musicians who had invited him to guest with them, and disappointing the entire paying audience.

The delay on a CD Video launch in Europe gets worse and worse. Heads look likely to roll soon. There has been the usual appalling lack of communication both inside Philips and between Philips and the PDO disc pressing factory in Blackburn. For six months, engineers in Holland and Belgium have been struggling to iron out the bugs in the prototype Combi CD-V player—which looks suspiciously like a revamped version of the unsuccessful NTSC dual function LV/CD player once sold by Philips and Magnavox in the USA.

The Pioneer LV/CD and Combi CD-V players—which work well—use two turntables, to cope with the wide mechanical disparity between the 5 inch, 8 inch and 12 inch discs. But the Philips factory

at Hasselt in Belgium has been trying desperately to make the system work at a lower cost with a single turntable player. They have misled the company's PR people and middle management into promising players long before they are ready. Those misled were either too scared, or had insufficient nous, to smell a rat.

The top management inside Philips and Polygram have been too remote. And they have been fooled by the warm but hollow noises made by the rest of the software industry who pledged support for CD-V but failed to deliver the goods. Naïvely Philips thought that Europe would follow the experience in Japan and the USA.

In Japan around 4.5 million *Laservision* players have now been sold, most of them CD/LV Combis. The rival VHD videodisc system, is now outnumbered 9:1 and clearly on the way out. It was a small manufacturing step from an NTSC CD/LV Combi to an NTSC CD-V Combi, with just the added function of playing a five minute pop clip from a 5 inch CD-V.

In America, the population of *Laservision* players is around 360,000 and Pioneer's factory in California churns out around 0.3 million discs per month. Not dramatic but still healthy compared to 15,000 PAL *Laservision* players sold across the whole of Europe—and most of them now under beds or up in attics.

"Europe is a completely different ball game. In Japan you have Pioneer, Yamaha and Sony all making Combis. The VHD firms, like Panasonic, Sharp and even JVC are starting now," a top Japanese told me recently.

Leather on willow, but upon pad. Jolly old cricket, no game for a cad. The odd game of cricket suddenly became very exciting towards the back end of 1987, when English captain Mike Gatting finally lost patience and swore at umpire Shakhooor Rana during the second test at Faisalabad. TV viewers not only saw, but heard Gatting sounding off.

So how were the BBC and ITV able to pick up intelligible conversation from the middle of a cricket pitch?

The British TV stations were getting live sound and picture signals by satellite from a Pakistan TV crew, overlaid by BBC or ITV commentaries. At first the word went round that the TV crews had used a long gun mic to eavesdrop on the wicket. But as time wore on, that theory lost favour. Apart from the difficulty of getting a gun mic long enough to home in on such a distant target it turns out that Australian cricket promoter Kerry Packer has pioneered a different technique which is now catching on round the world.

A small slot is cut out of the turf, just behind the stumps, and a radio mic (eg Micron) is buried there. This is run at high gain, with heavy compression and it continually broadcasts live sound effects to receivers at the boundary. Batteries are changed during the lunch break.

Using a buried effects mic solves sync problems.

because the sound picked up by a distant gun mic would be around 10 frames out of sync with the picture. The buried mic is if anything too effective. Unless levels are carefully controlled, it makes leather on willow sound too loud and immediate. Also, the buried mic is too efficient at picking up the sound of players routinely swearing. This hardly makes for good family entertainment.

But when it was in the interests of the TV crew to prove that someone on the pitch was abusive, the wicket mic proved ideal for the job.

After the test match, there was much talk of a mystery tape that captured the whole conversation between Gatting and Rana and proved who swore first. For a while it looked as if there might well be a re-run of the Nixon White House tape saga, with audio experts called in to advise cricket experts on whether a tape had or had not been edited to distort the evidence of who swore first—and whether someone's secretary had just happened to erase vital sections by accident.

Sadly, Christmas came to the rescue. As usual Britain shut down for two weeks, and by the time anyone surfaced, only a few people gave a damn any more for what Gatting and Rana said to each other and who said it first.

Clint Eastwood is now producing and directing a film about the life and times of Charlie 'Bird' Parker—who died in 1955 at the age of 34 through too much living. The film has been shot at Warner Bros in Burbank. The music press has been buzzing with excitement, not just because it looks like being a good film, but because of the plans for a soundtrack.

Hollywood composer and arranger Lennie Niehaus has written some new string arrangements for Parker solos and trumpet players Jon Faddis and Red Rodney, sax player Charles McPherson, pianist Monty Alexander, bassist Ray Brown and drummer John Guerin are re-recording the original Parker group music. The US press reports that they will be backing Parker's original solos, which have been digitally cleaned up, and stripped from the original recordings. This could be interesting.

It is relatively easy to strip centre front solos from a stereo mix, with sum and difference matrix. But Parker died before stereo recording came in.

There is vague talk about 'state-of-the-art digital technology' being used to isolate the solo sax from the backing musicians. But by Clint Eastwood's own admission, his film *Bird* is a low budget labour of love. Will the budget run to laborious digital analysis of all the old Parker recordings, and creation of intelligent software to try to isolate Parker's sax?

If they do it the cheap way, with bass and top cut and boost at a few kHz to emphasise the sax, there seems little chance of retaining Parker's characteristic tone.

One way of blending ancient and modern would be to dub the original mono group tracks at centre front in a stereo mix, and overdub the re-recorded accompaniment at left and right. The sax solos might then stand proud.

But Dolby Labs confirm that *Bird* is not being shot in stereo. Clint Eastwood is very much a one channel man. All his blockbuster cop films, from *Dirty Harry* through to *Sudden Impact* were shot in mono. Whatever magical tricks the Burbank engineers manage to play with the re-recording, it does seem a penny-pinching shame for such a long-awaited musical film to be made in mono. □

Segovia never used amplification. He hated it. That's why any orchestral works for Segovia had a small orchestra playing very quietly. John Williams, on the other hand, always uses amplification. That's how he was able to perform Steve Gray's *Guitar Concerto* (commissioned for the first night of the Barbican's 'Celebration of British music' season with the London Symphony Orchestra) with an orchestra stage full to overflowing. It would be interesting to know how many people in the audience realised that the solo guitar out front was being amplified. Only once or twice was there an audible hint.

John Williams worked for years with the Sky classi-rock group, where amplification was of course essential and expected. He is also an audio enthusiast who knows exactly what he wants and how to get it. And he now wants it on the classical stage. If po-faced factions in the 'legitimate' music world don't like the idea, that's too bad, because John Williams now carries more than enough clout to call the shots.

Details of the system he uses aren't secret but, as they could warrant an article of their own, I'll keep it brief. The mic is usually an AKG C414 in fig-of-eight mode with Quad power amp and Klark-Teknik 30-band graphic equaliser set to dip the mid range and so avoid a metallic sound. The lynch pin is use of just a single pair of neutral speakers. For small or medium sized stages, it's a pair of BBC Rogers, one at each side of the stage. They both face in to fire directly towards each other, and thus towards the solo guitar in the middle—like a giant pair of headphones or low level foldback. That way only a very few people in front row seats are aware of any sound from the speakers.

For the Barbican, where the stage is wide and the front row of seats very close, Williams uses a larger pair of Harbeth speakers, spaced in from the sides of the stage, and back from the front—buried amongst the violins on one side and violas and cellos on the other. To avoid feedback with the asymmetrically aimed mic, one speaker has to fire at 45° out into the audience.

As audiences become accustomed to hearing amplified classical guitar, and works written for guitar and large orchestra, they will grow to expect an amplified sound—even if they do not realise that amplification is being used. Other guitarists will then face an interesting problem.

If they do not use amplification, they will not be able to play works like the new *Guitar Concerto*, which relies on beefing up the instrument's natural sound to compete with the orchestra.

Audiences may also grow to expect the beefier sound of amplified guitar on a classical stage, and feel subconsciously disappointed when they do not hear it.

For better or for worse, it looks as if classical guitar is now past the point of no return. Or, as TV reporters say mysteriously to hold attention, is it?

The text books will tell you how jazz began in bars and brothels, long before amplification was either needed or available. The rock and pop boom has pushed jazz musicians into using high power amplification, whether they like it or not. Concerts and festivals often put jazz and rock groups on the same bill. If a jazz group relying on natural acoustic sound takes the stage directly after a jazz rock fusion group, the difference in levels is just too marked.

Also jazz concerts and festivals are getting larger all the time and an acoustic band is

Audiences may also grow to expect the beefier sound of amplified guitar on a classical stage, and feel subconsciously disappointed when they do not hear it.

inaudible past the first few rows. Benny Goodman inadvertently proved this point a few years ago, when he refused to use the amplification provided at one of Capital Radio's open air jazz festivals. Hardly anyone could hear how nice and pure he sounded.

Inevitably, things have got out of hand. Having bought a sound system, some jazz groups feel they are obliged to use it, even for the smallest club date. Or they may be at the mercy of a booker who insists on using his own house system.

Now Michael Webber, who promotes the Jazz

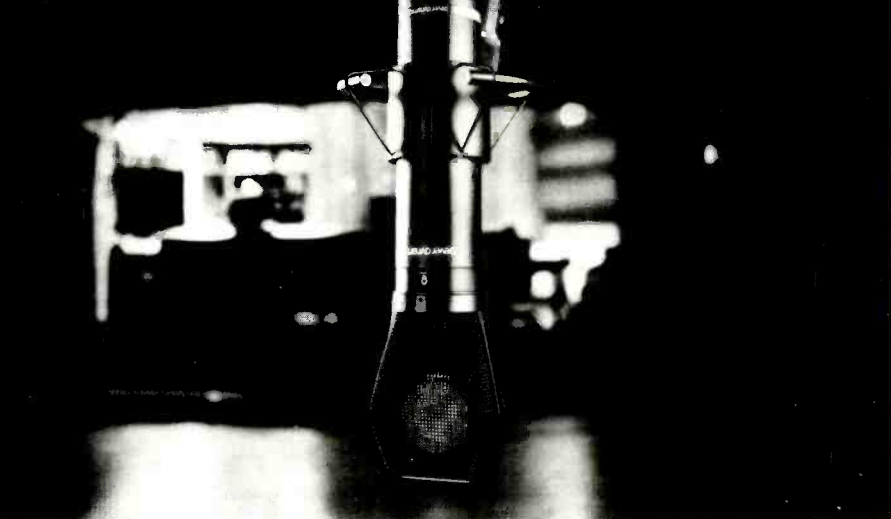
Heritage concerts at the Queen Elizabeth Hall and Purcell Room on London's South Bank, is striking back. For Thursday, November 17th, Webber has booked Keith Nichols and his Red Hot Syncopators, to do a concert featuring the music of King Oliver, Jelly Roll Morton and Fats Waller. The idea is to recreate the happy fun feel of the '20s. The concert will be in the Purcell Room, and Webber's advance publicity makes a point of promising 'no amplification will be used at this concert.'

"How authentic can you get. I hear you ask," says Webber. "If the experiment is a success who knows what might happen in the Queen Elizabeth Hall in 1989?"

Will the audience on November 17th feel that the music sounds thin and anaemic—or will they welcome the chance of once again hearing what real live musical instruments sound like? It should be an interesting experiment.

Never forget that the unmuted sound of a trumpet can produce sound pressure levels well in excess of those available without distortion from most domestic hi-fi systems. □

SIX ADVANTAGES OF THE STUDIO CONDENSER WITHOUT A SOUND OF ITS OWN



1 The MC 740 Studio Condenser is ideal for critical "on-air" and recorded voice-overs because it is virtually inaudible — no self-noise or sonic coloration of any kind.

2 All five of the MC 740's polar patterns have equally uniform and identically transparent frequency response, for consistent performance throughout the production process.

3 Effective "P" popping suppression for clean takes when close miking.

4 The MC 740's exceptional sensitivity captures "soft" copy with clarity and intimacy. Yet it withstands up to 144 dB SPL with the user-adjustable 10 dB attenuator in circuit, to transmit all the impact of a "hard" delivery.

5 A three-position low frequency rolloff filters out air conditioner and boom generated noise. The optional EA 740 shockmount provides a further degree of isolation from stand and boom-borne rumble.

6 The MC 740 captures the subtle inflections that reveal vocal character with world-renowned Beyer accuracy.

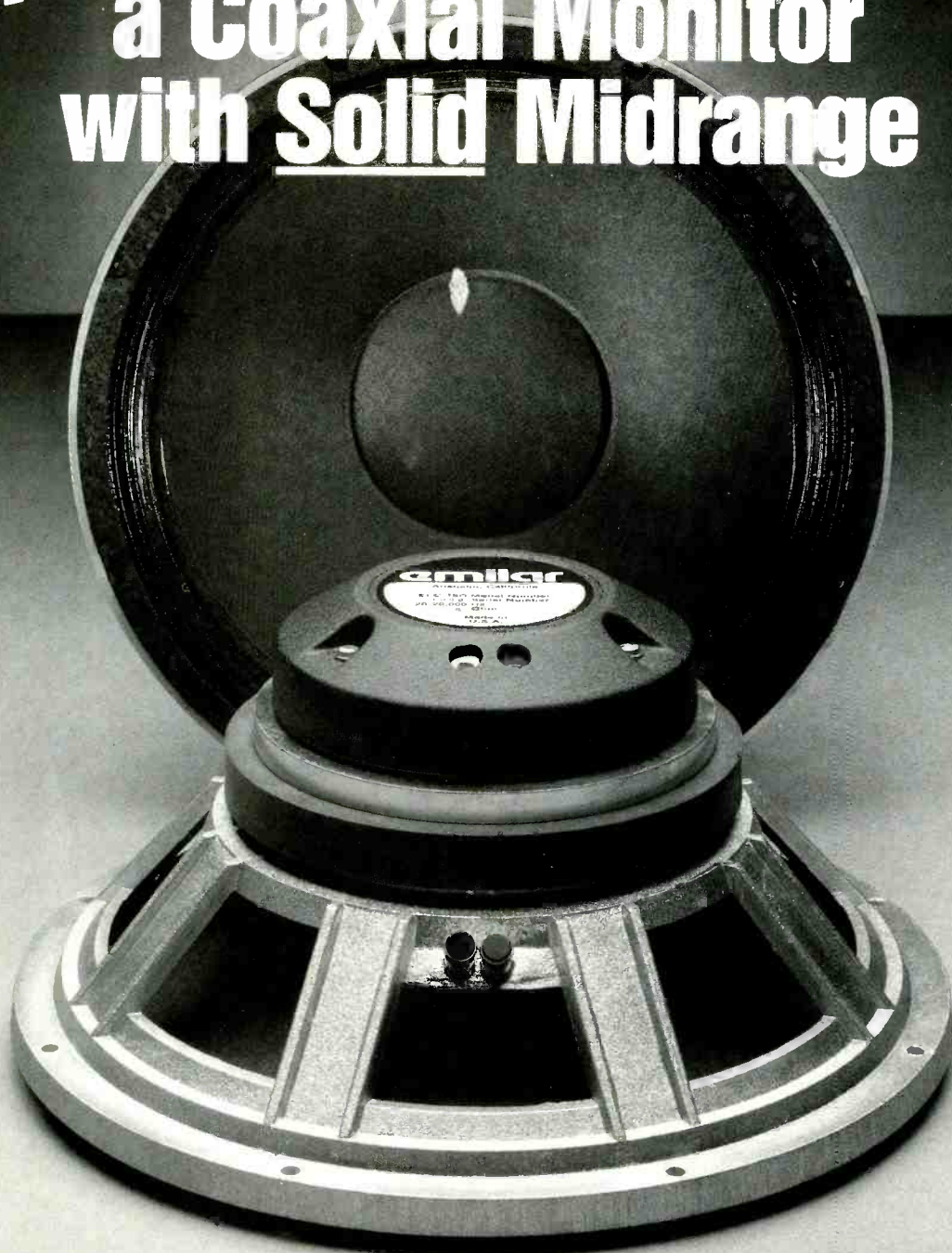
If you want cleaner, quieter, more natural-sounding voice-overs, narration or replacement dialogue, arrange for a hands-on audition of the unconventional MC 740. Contact your Beyer dealer or: beyerdynamic, Ltd.,

Unit 14, Cliffe Industrial Estate
Leaves, Sussex BN86JL
Tel. 0273 479411

ACCURACY IN AUDIO

beyerbroadcast)))

Finally a Coaxial Monitor with Solid Midrange



Giving you the benefits of point source monitoring and much more . . .

- Uniform frequency response to 25 kHz.
- Ultra smooth, phase coherent crossover within 1dB.
- High reliability — up to 1000 watts program.
- World's first coaxial monitor using a large diaphragm compression driver.
- Easily interchangeable with standard studio monitor enclosures.

© 1988 Emilar

emilar

4570 E. Eisenhower Circle • Anaheim, CA 92807

714-779-8394 • FAX 714-779-6696

Sales Agents Worldwide: Argentina: Interface, Buenos Aires, 821-1269. Australia: Sound Genesis, Pty. Ltd, Mascot NSW, 327-5630. Belgium & Benelux: Eurocase, Berchem (Antwerpen), 03-239 6995. Denmark: Musictronic, Copenhagen, 122-3036. England: Acoustics International Ltd, London, 579-2872. Finland: MS Audiotron, Helsinki, 410-688. France: Societe Etelac, Neuilly Sur-Marne, 4300-9630. Germany: Alphaton, Kelheim-Taunus, 95-74032. India: G. M. Audio Technics, Madras, 87505. Italy: LEM Electronics SRL, Forli, 965-252. Jamaica & Caribbean: Audiofon Systems Ltd, Kingston, 926-2569. Japan: Kozy Studio, Shizuoka City, 542-52-2537. Norway: Nordtek Equipment A/S, Oslo, 233-1590. Portugal: Garrett Musica, Lisbon, 575-272. Singapore: Yamaha Music (Asia) Ltd, Pte, 747-4374. Spain: Arwen, Madrid, 233-7055; EXEL, Madrid, 247-5905. Sweden: Prophon Audio, Stockholm, 816-5500. Taiwan: Lyh Corporation, Taipei, 721-1940. Venezuela: Sound Power, Caracas, 291-2714.

REVIEW

After the success of the Mirage, Ensoniq now bring us a new sampler. James Betteridge reports

In 1985 Ensoniq were first to bring us sampling for the masses in the form of the *Mirage* sampling keyboard. The *Mirage* and all subsequent Ensoniq products have been built around their own VLSI chip known as the *DOC-I*. The *EPS* (Ensoniq Performance Sampler) is the first product to use the newly developed *DOC-II* chip containing over 50,000 components, as opposed to the *DOC-I*'s 22,000, and offers some new and innovative facilities. It is to run concurrently with existing Ensoniq models and will not only work with the *Mirage* sound library but, by putting the data through its oversampling system, will actually improve the reproduction quality.

Performance loading

A unique and very striking feature of the *EPS* is its ability to load new sounds from its onboard disk drive into one part of its internal memories



while simultaneously playing samples from another. This greatly reduces the importance of memory size, because there can be a continual rotation of sounds available as and when they're needed, and also of loading speed, because it is no longer 'down time'. The memory can be divided into as many as eight sections, quickly accessed via eight buttons in the centre of the control panel. Any one or more of these can be loaded into whilst any of the others are played from. The commands needed to access and load data can be made over MIDI, or as part of a sequence on the internal sequencer. This offers very significant

benefits for both live performers and studios using MIDI-based systems as, save for the occasional disk change, all the donkey work can be pre-programmed as part of a sequence.

The poly-key aftertouch

Another important feature, previously only found on very much more expensive instruments, is 'Poly-Key' pressure response, not dissimilar in terms of performance to that found on the Sequential *T8*: the effect of key pressure is isolated to whichever note is pressed, rather than affecting all notes sounding. This undoubtedly offers a significantly higher level of expression. Sensitivity of the touch response is programmable with four settings for velocity, and four for pressure.

The system uses over-sampling with 13-bit quantisation, 24-bit internal processing and a floating point output that is said to equate to a

24-bit linear system. It certainly sounds very good and is quoted as having a 20 Hz to 20 kHz audio bandwidth and a 96 dB dynamic range. Irrespective of the original sampling rate, it is possible, at the touch of a button or two, to make a trade-off between polyphony and playback audio frequency response: you can have 20-note polyphony with a 15 kHz response, 16-note polyphony with a 19.1 kHz response or 12-note polyphony with a full 20 Hz to 20 kHz response (naturally, the playback response can't go beyond that of the original sample). Another excellent feature on this machine is that you can take a sample at the maximum sampling rate, and then very quickly audition it next to a 19.1 kHz version of itself, or

Recently a few dealers have complained about our second-hand and ex-demo list. It seems they are losing too many customers. Being the largest single supplier of 8- and 16-track equipment in Britain we've decided we can afford to give away a few secrets!

We simply tell customers that if any new equipment you purchase breaks down in the first two months, we won't fix it. We will replace it! RESULT. Yet another customer who knows that Thatched Cottage can be relied on, and a second-hand list full of the latest gear, factory repaired in mint condition, and with full guarantee. SIMPLE? We didn't become the biggest without being the best.

Some of our secondhand & ex-demonstration stock

8EL BDE 3200, 32 sec, 99 window super-sampler, as new, silly price	£999
Sony PCM 501 digital mastering (new)	£495
Fostex E16 w/remote - Mint	£3,250
Slapback scintillator (exciter) (new)	£125
Yamaha 31 band graphic eq. (2 only)	£160 each
Symetrix quad expander gates	£325
Drawmer DS221 compressor/limiter	£275
AHB Keymix computer mix down system (fits any desk - routing & muting - 16T)	£750
24 channels 8el Noise Reduction	£1,000
Yamaha NS10's	£160
Drawmer DS201 Gates	£255
Symetrix 511 Noise Reduction	£399
Aphex Dominator	£875
Digitech 1900 delay 2 seconds full bandwidth	£165
Seck 18/8/2	£1,100
Tascam 3340S mint	£500
Yamaha RX5	£699
Art pitchtransposer inc. display	£399
Drawmer multitracker	£250
Linn LNI	£299
Midiverb 2	£199
Korg DRV 3000 multiprocessor (20k bandwidth)	£599
Roland D50	£650
Neumann U87 ex demo (2 available)	£750
Oberheim DPX1 Sample Player	£799
Casio FZ1 Sample	£1,075
AKG C451 gun microphones	£125
Nomad SMC1 SMPTE reader generator	£199
RSD Series 2 16-16 + 2	£2,750
TAC Matchless 26-24-8-2 with patchbay + stand	£8,000
Plus loads more - give us a ring!	
All prices exclude VAT	

Complete 24-track system, 2 Akai MG14D + auto-locate + Adam Smith Zeta 3 synchroniser. £7,500 + VAT

Just some of the new products we stock
Akai S900, S700, X7000 and the brand new 24-track Yamaha - RX5, DX7II, TX81Z, SPX90II plus
RSD series II desks, TASCAM, Fostex E16, Tannoy and loads more.

From Fostex to Neumann, Tascam to Yamaha, we are main dealers for all the latest high quality products, most of it on permanent demonstration in our three 24-track studios.

If you have any audio requirements, give us a ring

Axxeman - at last a No Noise Studio Quality Guitar Processor with chorus, filters, ADT, overdrive, compression and gate. Money back if not satisfied - £260 + VAT

BASSMAN AT LAST AN INCREDIBLY LOW NOISE STUDIO BASE PROCESSOR WITH COMPRESSOR, OCTAVER, CHORUS, FLANGING, ACTIVE CROSSOVER ETC..... £399 PLUS VAT

PRODUCER'S MASTER CLASS

From March we will be holding a series of one day master classes featuring some of the world's leading producers. Each seminar will consist of a comprehensive question and answer session and a practical demonstration of Production techniques in our own 24 track Studio. In order to allow maximum flexibility classes will take place at weekends and will be limited to the first 15 applicants. Those taking part will include

Hugh Padghan (Phil Collins, Police, Etc)
 Rupert Hine (Tina Turner, Howard Jones)
 Stephen Hague (Communards, Pet Shop Boys)
 John Porter (The Smiths, The Alarm)
 Mike Howlett (OMD, Joan Armatrading)
 JJ (Art of Noise)

For anyone interested in producing, these classes will present a unique opportunity. Tickets are £35.00 plus VAT each, details of dates & timetables are available from the organiser/Paul Tingen on 01-249 1876 or from Thatched Cottage. Book early to avoid disappointment.

Special offer computer package, Atari 1040 i Steinberg Pro 24 C labs and Nomad SMPTE/MIDI reader generator £799 + VAT

• EXPORT • FULL CREDIT FACILITIES AVAILABLE • MAIL ORDER •

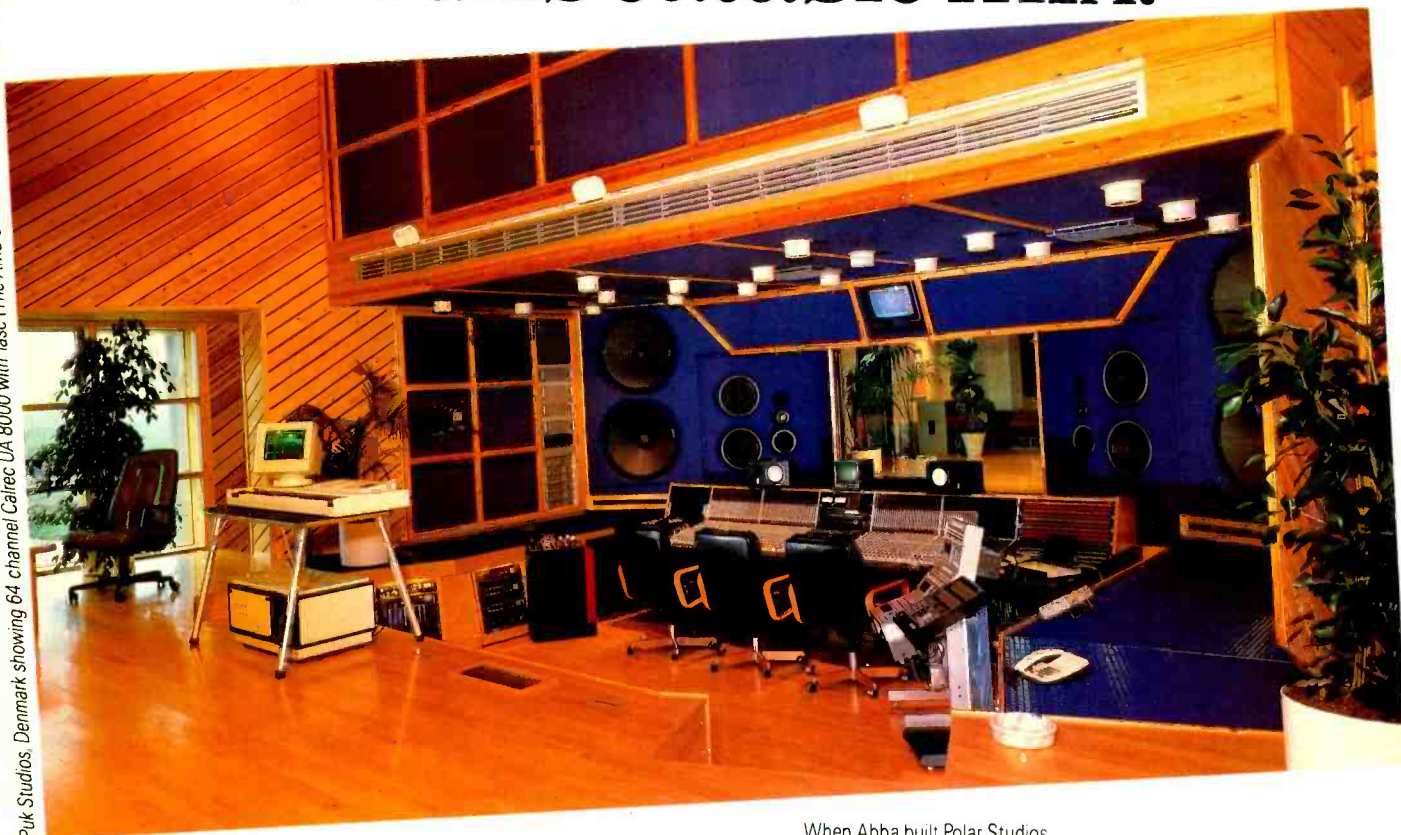


Telephone
Cambridge (0223) 207979 (3 lines)
Thatched Cottage Audio,
North Road, Wendy, Nr. Royston, Herts.



The UA8000 with TASC an unbeatable mix.

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



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

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

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

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

When MasterMix of Nashville decided to spend whatever it took to offer their clients the very best automated mix facility in America, they commissioned a survey and did some tests. On these results they sent their studio manager and chief engineer to spend some time at EMI Abbey Road. It didn't take them long to know they had found what they were looking for - and the competition didn't come close.

There are very few world class studios, Polar, PUK, EMI Abbey Road and MasterMix are amongst the few.

Take up our offer to have a closer look and find out why AMS and Calrec make the unbeatable mix.

The UA8000 with TASC - one of the AMS family.



Hard Disc Editor



Digitally Assignable Consoles



DMX/RMX Digital Audio Processors



Calrec Standard and SoundField Microphones



Custom Broadcast Consoles



AMS Industries plc

AMS/Calrec. AMS Industries Park, Burnley, Lancs. BB11 5ES. Tel (0282) 57011. Telex 63108 AMS-G. Fax (0282) 39542.
AMS/Calrec. USA. 3827 Stone Way North, Seattle, WA 98103 USA. Tel (206) 633 1956. Fax (206) 547 6890.



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

REVIEW

a 15 kHz version, and so on down, until you reach the lowest response subjectively acceptable. In this way you can secure the option of the best possible quality, while also being able to save memory space where a lesser bandwidth is sufficient.

The *EPS* comes as standard with stereo outputs but the optional *OEX-8* provides an additional eight individual assignable outputs, which can be configured as stereo pairs and/or mono outputs. The USA price is \$249, though no UK price is yet available.

Powerful onboard sequencer

The onboard sequencer operates in a similar way to that of the Ensoniq *ESQ* but is far more sophisticated. It has eight tracks, 20 voices per track dynamically assigned, and allows very detailed editing at a level normally associated with upmarket standalone models. Each of the eight tracks can be assigned to a separate MIDI channel and can be used to play internal voices and/or voices from an external instrument.

Having chained your eight tracks of sequences to form a song, you then have a further eight 'song tracks' which run the length of the entire song. With these you can record complete performances rather than having to play everything within the boundaries of each sequence. In this way it could be seen more as a 16-track sequencer.

The *EPS* is very musician-friendly and operationally intuitive so in many cases, completion of one operation will automatically take you to the next likely stage and offer you a probable default value. A wide array of automatic onboard routines and expert systems allow all the basic operations including sampling, truncating, looping, enveloping (there are a number of preset envelopes for different types of voices) and keyboard mapping, to be accomplished to a very usable level with very little specialist knowledge or skill. There is an impressive array of creative features including 'loop and release' to preserve the natural release of a looped sound and a variable 'second release' parameter to create a simulated reverb effect. Up to 127 samples can be used to create an 'instrument', and rather amazingly, each of these can have a realtime, 2-band, envelope-controlled, digital filter applied to it. For each band you have a choice of three types (increasing steepness) of LPF or HPF with adjustable cut-off frequency.

The disk format is 800 kbyte double-sided 3½ inch. A MIDI system exclusive facility allows data from any MIDI device to be saved on disk. The standard 480 kbyte internal memory is shared dynamically between the sample and

sequence data and has capacity for 80,000 notes or between 41.7 and 4.95 seconds, depending on sampling rate. Three memory expansion cards are available: x2, x4 and x4 plus a hard disk interface and SCSI port for use with an external computer (no prices yet available). Though a program for the Atari *ST* range is in the pipeline, the only visual editing package currently available is for

the Apple *Macintosh*. Called *Alchemy* it comes from Blank Software in the US and retails there for \$495. By the time you read this it should also be available through Ensoniq UK, although no UK prices have been given yet. The program is to include facilities for waveform editing, waveform resynthesis with FFT-based harmonic editing and resampling, which will allow any sample to be made compatible with any other format at the same time providing a single central storage medium for all your samplers.

Conclusion

The *EPS* appears to be an excellent instrument offering a powerful combination of high quality sampling, sophisticated multitrack sequencing, a number of useful and unusual performance facilities and the rather revolutionary performance loading, all for an extraordinarily reasonable price. □

Ensoniq Corp, 155 Great Valley Parkway, Malvern, PA 19355, USA.

UK: Ensoniq UK, PO Box 806, London NW3 1HL.



Just another PA manufacturer.

We are not American or British. So we have to try that little bit harder. We started four years ago with advanced controller technology and combined this with the best of conventional system approaches. Add our experience, research capabilities and production expertise and you have the legendary German quality that has kept us a step ahead. Check for yourself - contact our UK representative Michael Stevens & Partners Ltd. on 01-460 7299 or talk to us directly. d&b audiotechnik, Steinstraße 40, D-7054 Korb, Tel. 0 71 51/3 10 18, Telex 7262241 db-d.

d&b
audiotechnik



REVIEW

James Betteridge looks at Roland's S-550—the expander version of the S-50 sampling keyboard—with more features

While the S-550 is the 19 inch rack-mounting expander version of Roland's existing S-50 sampling keyboard, it is actually substantially more than that. Retailing at the same price it makes up for its lack of keyboard with a number of significant extras including a doubling of memory size which provides a total of 28.8 seconds at 30 kHz sampling rate or 57.6 seconds at its alternative rate of 15 kHz. As with the S-50 the input A to D is 12-bit, the output is 16-bit and the subjective quality of the samples is very high, although no audio bandwidth is specified.

Mouse control

Another major difference is the use of a mouse and VDU as the primary means of control. The S-50 offers the option of directly connecting a video monitor for graphic assistance with sampling and wave editing, although no mouse is involved. The S-550, however, actually requires the use of either a mouse and monitor or the optional RC-100 remote controller (similar to the control panel of the S-50) to achieve anything more than loading, saving and playing sounds. The S-550 is supplied with a mouse that plugs straight into a multipin socket on its front panel, or into the R-100 should you use one. Separate RGB and video outputs are provided for connection of a monitor but you will need an RF modulator to use it with a standard television. Anyone who's used one will know how easy and immediate a mouse is in operation. The large, colour display provides a very clear picture of what's going on at all levels of playing and programming, and having used such a system it is very hard to go back to a relatively small LCD display in the centre of a control panel.

Memory

The S-550's memory is divided into two parts called Blocks, and each Block is split into two Banks A and B. One rather limiting factor for certain studio applications is that the length of



any single sample is limited to one Bank, ie 1/4 of the total memory capacity. Nor is it possible to sample in stereo. Voices are loaded from an onboard 3 1/2 inch (2DD) disk drive. Each Block has a capacity equal to one disk, so that two disks are required to completely fill the memory. Each disk takes a little over 30 seconds to load, this is not an unusually long time but it is still possibly rather slow for live performance. The idea is, however, that with the large amount of internal memory, downloading from disk will be kept to a minimum. Having established what a Block and a Bank are, there are a few more terms to absorb: the original sound sampled into memory is called Wave Data. Once this has been truncated, filtered, enveloped and looped etc, it becomes an Original Tone, and the details of these modifications are stored as Tone Data. Tone Data only determine how the Wave Data are read, they don't actually change them. Therefore, by applying different sets of Tone Data to a set of Wave Data and storing it in a different memory location, any number of variations can be created, and these are referred to as Sub-Tones. By adding a set of Patch Data to a Tone, eg key assignment, performance control settings, etc, a Patch is born.

A total of 64 Original Tones/Sub-Tones can be stored in internal RAM as against the S-50's 32, and 32 patches as against eight. There are eight individual outputs as against four, each individually addressable on a separate MIDI channel, and any combination of Tones can be assigned to any combination of outputs irrespective of MIDI channel assignments, whereas with the S-50 it is only possible to assign the MIDI channels to the outputs—a far less flexible arrangement. The instrument is multitimbral and 16-note polyphonic with dynamic voice assignment.

The S-550 is supplied with two voice disks plus a utility disk containing the programs with which

you can carry out various operations including sample, truncate, mix, combine, filter and loop, etc. With the S-50 all these are automatically loaded as part of each voice disk but in this case the voice disks contain only voices and you have to load whichever utility you want from the utility disk when you want to use it. There is no official explanation of this, though Roland may have wanted to save the memory space for other new software facilities. Once a utility has been loaded it stays in memory and the function can be repeatedly returned to without reloading, until you load another utility. The Convert Disk utility allows S-50 voice disks to be converted for use with the S-550 but once processed they can't be reconverted for the S-50. Probably a more likely approach is to use the Convert Load utility allowing data from an S-50 disk to be converted for use as it is loaded, preserving the existing disk format. This process takes no longer than the standard Load function.

After switching on and inserting one of the program disks the S-550 boots up into Play-Standard mode with a screen providing a range of information, including which sounds are assigned to which outputs, on what MIDI channels, at

what volume levels and with what voice assignments. At the top of the screen is a row of six 'windows'. The lefthand two are always Mode and Menu, the next two, when in use, are generally Sub-Menu and Command, and the final pair generally show the functions of the two buttons on

the mouse. Selection of the Mode window will produce a list of the six basic modes, through which the S-550 is operated: Play, Edit, Disk, Function, MIDI and Utility. Having selected a Mode, you open the Menu window for a list of the relevant functions, and then possibly the Sub-Menu to home in on the precise parameter you want.

Sampling

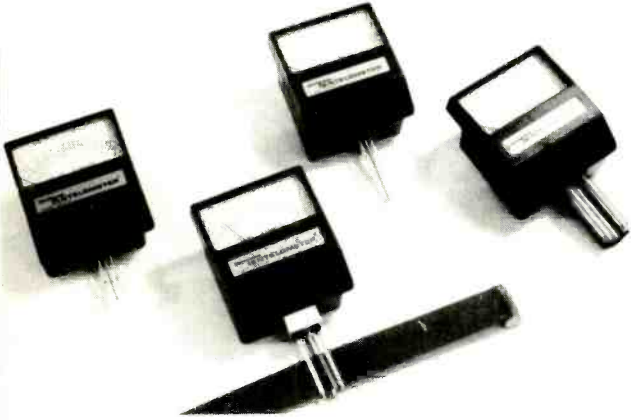
Sampling and Wave data editing are functions of the Utility disk, and so this must be loaded, and 'Sampling' selected from the resulting menu. A single 1/4 inch jack socket, together with its associated level control and Line/Mic switch, serves to accept a wide range of sources, and a fixed parameter limiter can be switched in to guard against overload. Before you sample a sound you must specify a memory location, the sampling frequency and the original key. A 'Pre-Trigger' time of 10 ms, 50 ms or 100 ms can be entered, which ensures that the complete attack of the signal is captured. It does this by using the realtime signal as a trigger while putting a delay on the sample path. The signal level and auto-trigger threshold point are clearly displayed on a 2-colour, horizontal bargraph meter at the bottom of the screen. Memory is not dynamically assigned, you must specify how much you estimate you'll need before you start then any not used can be freed afterwards.

Wave data editing is quick, easy and accurate with the mouse and full colour display. Using the mouse to increase or decrease values through a wide range is made faster by being able to select two speeds of travel, although it would be useful if this could be accomplished through a combination of the two buttons on the mouse (as is the case with some nudge button arrangements), rather than having to select it from the screen as a separate facility. The screen

YOU NEED A TENTELOMETER!

For good recording, ensure the tension of your tape machine is correctly adjusted. Tentelometer* tape tension gauges are available for machines handling tapes from 1/8" to 2" wide.

*TM Tentel, Campbell, California, USA



Full details from Adrian Leach at U.K. stockists:
Crow Broadcast Systems Ltd.,
 TV House, 10 Arnhem Road,
 Newbury RG14 5RU, England.
 Tel: (0) 635 33477
 Fax: (0) 635 30606 Telex: 847056

Probably the most cost effective way to upgrade your Studio is to call us!

Entire studio projects undertaken — nothing too big or too small. Also let us find buyers for your unwanted equipment at no cost to you!

PROFESSIONAL
STUDIO
SALES

For full details write, phone or fax:

Phone +44 (0) 58 283 4517

Fax +44 (0) 727 58829

55 High Street · Wheathampstead · Hertfordshire AL4 8DA

Drawmer

Ingenuity

M5000

A TIME OF CHANGE

THE M500 DYNAMICS PROCESSOR... UNNERVING CAPABILITY



Auto levelling, Auto Fade, De-Essing, Compression, Expansion, Limiting, Auto-Pan, Filter-Pan and probably the most comprehensive Noise-Gate in the world... simultaneously

DRAWMER DISTRIBUTION LTD

CHARLOTTE STREET BUSINESS CENTRE
 CHARLOTTE STREET
 WAKEFIELD WEST YORKSHIRE
 WF1 1UH ENGLAND

Telephone: 0924-378669 Telex: 556649



REVIEW

Chris Jenkins provides a description of the XR300 SMPTE-to-MIDI converter from XRI

Audio-visual professionals will be familiar with the SMPTE standard, which allows pictures and sound to be synchronised with the precision required for broadcast work. In the music world, the MIDI (Musical Instrument Digital Interface) standard is equally well established, but is often criticised, especially for the relative difficulty involved in synchronising MIDI instruments to tape in multitrack recording.

The obvious solution is a system that converts SMPTE timecode to MIDI, also allowing MIDI systems to be synchronised to film and video. Such systems are becoming cheaper and more accessible, even to the smallest studios. The XRI XR300 looks set to make SMPTE available to a whole new market.

Existing non-SMPTE

1U 19 in rackmounting device, based on a successful free-standing version, the XR03. It operates on either film 24, EBU 25, SMPTE 30 or drop frame standards.

There are three MIDI out sockets at the rear of the unit and, just for good luck, the XR300 has a 5 V DIN sync socket, so it will also synchronise non-MIDI devices using the 24, 48 or 96 pulse per ¼-note (PPQN) systems. Obviously, these devices will start playing on receiving a start signal, and will play at the correct tempo, but they will not respond to SPI data by jumping to a particular position in a song.

The XR300 should be set up as the central unit of your studio, with the audio input/output connected to your multitrack tape machine or SMPTE video machine, your master MIDI

to lock onto the SMPTE code, then it generates the correct MIDI start signal, song pointers, clock rate, and DIN sync for your sequencers and drum machines.

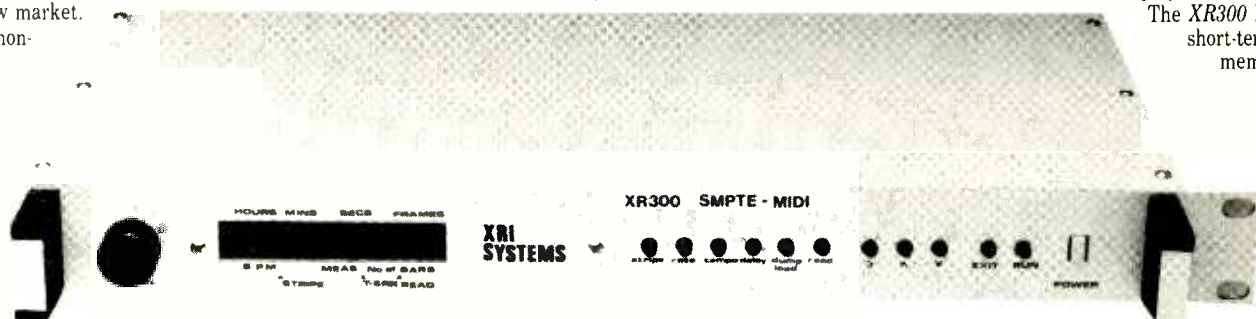
This allows you to wind to any point on the tape and drop into record, secure in the knowledge that your sequencers and drum machines will receive the correct SPI and move to the right position in the song.

The XR300's TEMPO function allows you to program up to 10 MIDI tempo changes during a song (the default is 120 beats per minute), together with the number of bars for which the tempo lasts up to a maximum of 250. If you want a tempo to last for more than 250 bars, just program the same tempo in twice. While this system limits the XR300's song length to 3,000 bars, it's unlikely to be a limitation which will inconvenience many users. The programmable tempo function puts the XR300 one step ahead of more expensive rivals like the Nomad SMC 01, which allows only a single tempo setting for each song; obviously with the XR300, you can if you wish change the tempo of a whole song without having to re-stripe the tape.

A function of the MODE control lets you introduce a delay or advance into the synchronisation between the SMPTE code and the MIDI clock generated. The minimum offset is 1 bit (1/80 of a frame) while larger offsets can be introduced by altering the Start Time on the TEMPO page. By creating timing differences between recorded and sequenced music, this allows you to produce all sorts of effects from slight double-tracking to full-blown echoes.

As the XR300 operates in READ mode, you can input additional MIDI information such as performance data from a keyboard, and have it merged into the output. Therefore it's possible to record information on your sequencer even when it is locked into the XR300 for playback.

The XR300 has a short-term memory



synchronisation devices, such as the Korg KMS-30 and the XRI-03, have one major drawback: the sync tone laid down on tape consists of a start signal, and a continuous clock pulse. To retake a track, you must rewind the tape to a point before the sync code; unlike SMPTE, such codes contain no information about their position in the song.

The latest MIDI equipment is capable of reading and transmitting Song Pointer Information (SPI). SPI is basically a counter which records the number of 1/16-notes which have elapsed during a song. A drum-machine or sequencer in Song mode can therefore be told to jump to any position in a song without having to play through the rest. Bear in mind, though, that while drum machines such as the Yamaha RX series, the Akai and Sequential studio machines, and software sequencers such as Iconix and Steinberg Pro-24 will respond to SPI, many older units will not. If they don't, consider upgrading, as you will not be able to take advantage of SMPTE-to-MIDI conversion without this facility. The XR300, then, generates and reads SMPTE code, and converts it into MIDI SPI and clock speed information. It's a

keyboard connected to the XR300's MIDI in, and the MIDI outs and DIN sync connected to your drum machines and the sequencers.

XR300's functions are all controlled using a 6-position red LED, six function control keys, and a pair of cursor keys. The left/right cursors select a parameter from the LED display, and the up/down cursors increment and decrement the values. The RUN key enters values, and EXIT returns the XR300 to control mode and allows you to select a new function or clear the memory. The RATE control lets you set the required SMPTE rate, and if required a PPQN speed.

Striping the tape with SMPTE code is straightforward. The TRIM knob is used to adjust the volume of the output signal (about -5 vu is recommended). The SMPTE start time can be adjusted to any figure you require, and on pressing RUN the XR300 stripes the tape as the time counter runs. The start point can be set to any required frame, bearing in mind that some frames are not allowed if you are using the Drop Frame standard.

In READ mode, XR300 requires a little over 1 s

store, the duration of which is dependent on the period for which the device had been operated. For longer-term data storage, the operation parameters can be dumped to tape, or to any system-exclusive MIDI filing system such as a disk drive or software package.

The prototype features an external 9 V power supply but in response to feedback from XR03 owners, the finished version will have it built in. There will also be better noise-gating to completely eliminate interference from the LEDs. Future versions may feature the ability to memorise MIDI patch changes, and will have more sophisticated MIDI merge functions. It should be possible to update the XR300 simply by inserting a new PROM chip.

Inexpensive, easy to use yet powerful, the XR300 may be the breakthrough for SMPTE in small studios. While we will no doubt soon see more powerful or cheaper such units, at the moment this looks like a good buy in the budget market. □

XRI, 10 Sunnybank Road, Wylde Green, Sutton Coldfield, West Midlands B73 5RE, UK.

WHAT'S IN A NAME

Allen & Heath, the original name of one of the longest established innovators in sound mixing technology, is the name we are returning to. Our commitment to quality and originality has never been stronger.

It's reflected in a range of consoles that are designed to work *with you* in the creative process.

Every Allen & Heath product is designed, manufactured and sold by engineers. Our world-wide dealer network and technical support, and our research and development programme, are now better-equipped than ever to supply a demanding market with the value and performance that's made us our name.

And as we are about to show you throughout 1988, some great new ideas are on the way as well...



69, Ship Street, Brighton, BN1 1AE, East Sussex.
Tel: (0273) 24928. Fax: (0273) 821767.
5, Connair Road, Orange, Connecticut 06477
USA. Tel: (203) 795 3594. Fax: (203) 795 6814.

CLASSIFIEDS

Advertisements for this section must be pre-paid. The rate is 70p+VAT per word, minimum £17.00+VAT. Box Nos. £6.00+VAT. VAT (UK only) \$ rate \$2.00 per word, minimum \$50.00, Box No. \$10.00 extra. Semi-display rates on application. Copy and remittance for advertisements in MAY issue must reach these offices by 8th MARCH addressed to: The Advertisement Manager, Studio Sound, Link House, Dingwall Avenue, Croydon CR9 2TA. Cheques made payable to Link House Publications (Croydon) Ltd. 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, Link House, Dingwall Avenue, Croydon CR9 2TA, and the Box No. quoted on the outside of the envelope. The district after Box No. indicates its locality. **SEX DISCRIMINATION ACT 1975:** No job advertisement which indicates or can reasonably be understood as indicating an intention to discriminate on grounds of sex (e.g. by inviting applications only from males or only from females) may be accepted, unless (1) the job is for the purpose of a private householder or (2) it is in a business employing less than six persons or (3) it is otherwise excepted from the requirements of the Sex Discrimination Act. A statement must be made at the time the advertisement is placed saying which of the exceptions in the Act is considered to apply.

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 a trader or a private seller.

SERVICES

NEW HEADS FOR OLD!

All makes relapped

TAPETEK: 01-254 5203 or
0836 215900 (car)

APPROVED BY



CASSETTE DUPLICATORS

SCS

Specialists in the supply and service of cassette duplicators, bulk custom wound cassettes, and accessories

GRAFF SONY TELEX WOLLENSAK

Main Dealers UK and Export

SOUND CASSETTE SERVICES LIMITED
BODEN STREET, CHARD, SOMERSET

0460 67237

CASSETTES TO LENGTH!

Exact length cassettes supplied FAST!
Also library boxes and dot matrix shell labels.
Inlays produced from your artwork,
as well as 1 to 1 cassette copying.

Write or phone for further details

STEWART ORR SOUND SERVICES
CHURCH LANE, METFIELD
HARLESTON, NORFOLK IP20 0LH
037986 370

RAINHILL TAPE SPECIALISTS

High Speed and real time high quality duplication

Printed inlays and side labels
AMPEX Distributors
Studio Accessories
Full mastering suite

Music House
369 Warrington Road
Rainhill, Prescot
Merseyside L35 8LD
051-430 9001



jbs records MUSIC-SPEECH-DATA

REAL-TIME/HIGHER-SPEED Quality Cassette
Duplication and Blanks from 1 1000 - Computer printed
Labels Solo, 1/2 reel, Sony, Betamax recording.
Fast security Delivery service
FILTERBOND LTD, jbs records div. FREEPOST
19 SADLERS WAY, HERTFORD SG14 2BR. 0992-500101



THE CASSETTE DUPLICATING SPECIALISTS

Real time & high speed loop bin duplication,
printing & packaging. Blanks wound to length

TEL: 061-973 1884

MULTI-TRACK COPYING

24-track - 24-track

NON-DOLBY/DOLBY 'A'/DOLBY 'SR'

- HIGHEST QUALITY TAPE STOCK
- FREE COLLECTION/DELIVERY IN CENTRAL LONDON
- FAST TURNROUND

01-734 9901



REAL TIME CASSETTE COPYING

All work carried out on Nakamichi machines to the highest standard. Normal or chrome tape available.

We also supply blank cassettes wound to length.
AGFA and BASF chrome tape available

GATEWAY CASSETTE SERVICES
1 GAUDEN ROAD, LONDON SW4 6LR
TEL: 01-627 4758

OUR FAX NO. FOR
STUDIO SOUND IS
01-760 0973

Check It Out...



DIRECT FROM
OUR MODERN
U.K. PRESSING
PLANT

- CUTTING - PRESSING
 - TEST PRESSING
 - LABELS - SLEEVES
 - CASSETTES
 - ARTWORK
 - COMPETITIVE PRICES
- MARKET LEADERS

SRT

01-446 3218

CASSETTE DUPLICATION & BLANK CASSETTES

Telephone: 0827 310052

WNE, Unit 8A, Mariner

Lichfield Road Ind. Est., Tamworth, Staffs B79 5UL

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: 01-231 0961

CLASSIFIEDS

SERVICES

**HIGH SPEED HIGH QUALITY LOOP-BIN
DUPLICATING BY SRL TAPE SERVICES**

REEL REEL [DOLBY A
NAB
IEC] IN...OUT [QUALITY CASSETTES]
 F1 PCM DIGITAL [] QUALITY CASSETTES
 AUDIO CASSETTE [DOLBY C
DOLBY B] QUALITY CASSETTES

THE BETTER THE MASTER, THE BETTER THE COPY!
 HOW MANY WOULD YOU LIKE? 100 5000
 01-868 5555 01-366 5555 PHONE FOR PRICE CHECK

QUALITY CASSETTE COPYING + processing any quantity. Video duplication. PAL/NTSC/SECAM systems transfer. While you wait service. Open 24 hours, 7 days a week. G.W.B.B. Audiovision, 42 Lancaster Gate, London W2 3NA. Tel: 01-723 5190. (X)

**pcb design
cad and manual
sparkes designs**

0296 25801

audio
exp

TAPELINE
 REAL TIME CASSETTE DUPLICATION
 BLANK CASSETTES & ACCESSORIES
061-336 5438

THE COMPLETE SERVICE. Disc cutting, pressings, duplicated cassettes and blanks. Bin Masters. Location Recording. Free Brochure. Tam Studio, 13a Hamilton Way, London N3 1AN. Tel: 01-346 0033. (X)

FOR ALL YOUR RECORDING NEEDS

AMPEX AUDIO AND VIDEO TAPE MAIN DISTRIBUTORS
 Spools, boxes, blades, splicing and leader tape. Blank precision wound cassettes C1-120, labels, library cases and cards, C-zeros, pancake, etc. Broadcast Cartridges.



12 Britannia Road
 Sale, Cheshire M33 2AA
 Tel: 061-905 1127

FOR QUALITY, PRICE AND SERVICE

SITUATIONS VACANT

ECANDO SYSTEMS LTD

require a
SOUND ENGINEER
£12,500 p.a.

Main duties involve audio/visual presentation at the new Olympia Conference Centre. Also assisting throughout Earls Court and Olympia Exhibition Centres. Some unsocial hours.

Must have relevant experience in audio/visual or allied fields. Experience of theatre lighting, music and electronics desirable. Ability to work on own initiative as well as part of a team essential.

Write with CV or phone for an application form:

THE PERSONNEL DEPARTMENT
 Earls Court Exhibition Centre
 Warwick Road
 London SW5 9TA
 01-385 1200

ECANDO

My client, world leaders in their field, design and manufacture products for the broadcast industry. They currently have openings in the following areas.

Software Engineer to £17K
Hardware Design to £17K
Service Engineering to £16K

For further information contact
 Mike Jones on
(0256) 470704

SPAIN'S LEADING FIRM in professional audio and broadcasting requires senior electrical engineer with at least two years experience in analogue design, low frequency and low signal, with capacity to work in a team, organisation ability, knowledge of components. Salary negotiable. A.E.Q. S.A. C/re y Pastor 36, Pol Ind. De Leganes — Leganes — Madrid — Spain.

UNIVERSITY OF EAST ANGLIA
 Norwich

TEMPORARY TECHNICIAN

Applications are invited for this post in the Recording and Electro-acoustic Music Studio, in the Music Sector of the School of Art History and Music. The successful candidate would be expected to assist in the development, construction, testing and maintenance of analogue and digital audio equipment, to contribute to the organisation of, and provide support for, the teaching and research programme. The Recording and Electro-acoustic Music Studio has a wide range of recording, sound synthesis and signal processing equipment, both digital and analogue, and is developing work stations based on MIDI and the Atari 1040ST computer. Applicants will be expected to have experience with professional recording studio equipment, and possess appropriate qualifications (HNC, Advanced City and Guilds or Higher TEC equivalent) in modern analogue and digital electronics. Some computer hardware and software experience and knowledge of MIDI would be an advantage. Salary will be on the scale £7,696-£8,266 per annum. The appointment will be for one year.

Further information is available on request from **Dr. D. Smalley, School of Art History and Music, University of East Anglia, Norwich NR4 7TJ**, to whom applications should be sent within two weeks of the appearance of this notice.

PROFESSIONAL AUDIO ENGINEERS

We are major suppliers of professional audio equipment to the recording and broadcasting industries and have vacancies for both Engineers and Technicians in our expanding professional audio laboratory in Boreham Wood.

Relevant electronics experience is essential.

Apply in writing, or telephone Christine Melhuish, on 01-953 0091 for an application form.

BAUCH

F.W.O. Bauch Limited
 49 Theobald Street
 Boreham Wood
 Herts. WD6 4RZ

CLASSIFIEDS

EDUCATION

SOUND RECORDING & PRODUCTION TRAINING

ADVANCED SOUND RECORDING & PRODUCTION

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

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

3-month intensive or 6-month part-time CERTIFICATE courses in

ANALOGUE SOUND RECORDING & PRODUCTION

Modern 24-track sound recording & production, introduction to digital audio; analogue/digital sound synthesisers & sampling keyboards, studio work with bands & individual artists; music for TV & film; song arrangements for record release

DIGITAL SOUND RECORDING & PRODUCTION TECHNOLOGY

Digital sound recording; DASH & PD formats, digital multi-track operation; SONY PCM-3324 & MITSUBISHI X-850; rotary heads digital recording tapeless recording; AUDIOPFILE & SYNCLAVIER; digital synthesis/sampling incl. FAIRLIGHT digital audio processing, mixing, electronic & manual editing; computerised sound mixing consoles; automation & assignable consoles, MIDI & SMPTE timecode, their practical application in creative music production; MIDI controlling, networking, triggering & sequencing; ATR/VTR synchronisation

CREATIVE MUSIC RECORDING & PRODUCTION TECHNIQUES

Music notation & song/music writing; rock, funk, jazz, soul, reggae, TV/film theme & background music, song & orchestral arrangement techniques; arrangements for strings, brass section, woodwind, etc. creative use of instruments & microphones, working with artists & artists recording vocals & choirs; local radio operation

Also courses in Programming FAIRLIGHT SERIES III

Many former students are now employed in TV/video and audio industries

MEDIA PRODUCTION SERVICES

BON MARCHE Building, Ferndale Road, London SW9 8EJ
Tel: 01-274 4000 x.328 or 01-737 7152 * Telex: 8955126 BRIENT G

FOR SALE TRADE

EXCHANGE RATE BARGAINS! Dolby A-type, MH series, 48 channels \$16,000. New Mitsubishi Westar 36x32 automated console \$110,000. MCI JH-542 42x32 automated console \$69,000. Ardent Studios, 2000 Madison, Memphis, TN, 38104, USA (901) 725-0855.

TASCAM/SENN/BEYER, trade counter. Erricks VCD, Brighthouse 722121. (X)



NEUMANN	JBL	LEXICON	SOUNDCRAFT
SENNHEISER	TANNOY	DRAWNER	STUDIOMASTER
SHURE	REVOX	DBX	BEL
BEYER	TASCAM	YAMAHA	APHEX
UREI	QUAD	AMPEX	APPLIED MICROSYSTEMS
TRIDENT	ROLAND	AKG	AUDIO KINETICS

18-42 Charlotte Street, WAKEFIELD, W. Yorks WF1 1UH
Tel: (0924) 371766. Export Enquiries welcome Telex: 656649

DISC CUTTING EQUIPMENT and systems bought, sold, installed and manufactured by TAM/ENGLAND, 13a Hamilton Way, London N3 1AN. Telephone: 01-346 0033.(x)

RECORDING HI-TECH EQUIPMENT. Cash paid, collection arranged. Contact Studioline 0273-729120/421138. Studioline for all new used pro-audio requirements. (M)

USED ON INCH TAPE. Some only once £3 per reel. Great British Spring Mk2 £35. Harmonium, good condition, in tune £75 o.n.o. 0295 720873 Tim.

MOBILE STUDIO excellent condition, built on Bedford Luton truck with outstanding acoustics by Kenneth Shearer. Fully wired with 20/8 console. Many acts recorded including Communards, Redskins and Mike Nesmith. Only 4,000 miles on clock. VIEWING STRONGLY RECOMMENDED. 01-262 9066.

24-TRACK DBX NOISE REDUCTION SYSTEM. MODEL 410 IN A 158 RACK
£1,000 PLUS VAT. TEL: 0372 379 444.

LOCKWOOD, TANNOY, etc., new and used equipment always available and wanted. Lockwood Audio Sales 01-866 0671. (X)

TECHNICS SL1210 MkII quick start turntables. New unused and boxed in maker's cartons. 'The' turntable for community and hospital radio use. £150 each (current price £270). Tel: 0282 691756 evenings.

STUDER B62 quarter inch two track, good condition £750 o.n.o. Tel: 077382-6363/3805.

CASSETTE DUPLICATOR. Otari DP 4050 OC (Reel-6 bay cassette) in good condition and working order. However some rubber 'bits' do need replacing to bring to spec. Bargain £700 o.v.n.o. + VAT. Graham 021-445 2757.

A1 PRO AUDIO

SPECIALIST SUPPLIER OF PROGRAMMING SUITES AND ANCILLARY EQUIPMENT

* ATARI * MACINTOSH * HYBRID ARTS * DR T * STEINBERG *
* OPCODE * MARK OF THE UNICORN * ROLAND * YAMAHA *
* KORG * AKAI * KAWAI * ELECTROVOICE * TANNOY *
* SENNHEISER * FOSTEX * TASCAM * DENON * TC ELECTRONIC *
* PLATINUM * BEYER * JBL * SECK * SWITCRAFT *

1 NEW WAKEFIELD STREET, MANCHESTER M1 5NJ
TEL: 061-228 1335

STUDER A62 stereo in wooden case, recently overhauled, including heads £450. 031-557 1672.

DUE TO STOCK CLEARANCE Studioline require recording, Hi-tech equipment. Cash paid. Collection arranged. Contact Studioline 0273-729120/421138. Studioline, for all your new, used pro-audio requirements. (M)

STUDIOS FOR SALE

DETACHED SIX BEDROOM SPACIOUS VICTORIAN HOUSE including many period features, fully carpeted, and burglar-alarmed with garden and nearby garage. Has professionally built control room in cellar which has housed private 24-track linked with stage boxes to upstairs secondary-glazed lounge area. Situated in Blackheath/Greenwich. £300,000 for Freehold. Enquiries ring Kathy 01-858 0984.(m)

W. CORNWALL. Converted school + mod. house, sep. annexe flat. All in walled det. location. Village 1/4m. Town 2m. Present use Local Record Co. & accom. Main studio (8Tr) approx. 48' x 18' x 15'. Lge control rm. Established label & catalogue. In-house cass. prod. Plenty of room for expansion, up-date or sep. enterprise. Reason: owners coming retirement. Offered complete with Company, or as property only. Ring (0736) 731246.

AUDIO AMPLIFIERS

TURNER ELECTRONICS IND (Est 1966)

POWER AMPLIFIERS 100-700 Watts, 2u, 3u, 4u rackmount. High stability, ultra low noise and distortion, flat response. Linear class AB1 70% efficient triples complementary circuitry design by our engineers from Plessey, Fluke, Dolby and Mullard. No noisy fans, thermal limiting of Mosfets, mechanical relays, fuse blowing or overload trips. one million watts in use by artists and sound establishments. Sales, service, export engineering advice and sales of most UK electronic audio products. PO Box 49, Etchingam, East Sussex TN19 7NZ (STD) 0435-882581.

FOR HIRE

35 BRITANNIA ROW LONDON N1 8QH

BRITANNIA ROW 01 226 3377

Multitrack, 4-Track,
Dolby SR + Telcom

WORKING IN THE USA?



"THE BEST THAT MONEY CAN RENT"
Complete selection of pro audio equipment for hire.
Outboard Equip * Digital Recorders * Walkie Talkies
599 Eleventh Avenue, New York, NY 10036
Phone (212) 582-4400

FOR SALE TRADE
CONTINUED
OVERLEAF

CLASSIFIEDS

FOR SECOND HAND & NEW EQUIPMENT SALES

MULTITRACKS

OTARI MTR90 MK II P.O.A.
STUDER VU24 TRACK n/b 12,750
STUDER VU24 TRACK w/b TLS P.O.A.
3M-79 16 TRACK 2" (NEW HEADS)
EXCELLENT CONDITION 3,750
SOUNDCRAFT MK III WITH AUTO,
10 MONTHS OLD P.O.A.

OUTBOARD

AMS-RMX 16
WITH REMOTE
3,500
LEXICON 224XL
WITH REMOTE
P.O.A.

MIXING CONSOLES

SOUNDCRAFT TS24
32 CHANNEL &
40 CHANNEL P.O.A.
CHOICE OF
NEVE CONSOLES P.O.A.

PRICES SUBJECT TO V.A.T.
SHIPPING & INSTALLATION ARRANGED WORLDWIDE

TEL: 093287-2672
FAX: 0932-5-61675

CALL FOR OUR MONTHLY MAILSHOT!

TAPEHEADS

TAPE HEADS

REPLACEMENT..
OF ALL TYPES OF
MAGNETIC RECORDING HEADS

REFURBISHMENT..
OF WORN HEADS
TO AS GOOD AS NEW STANDARD



CALL US NOW ON:-
01 864 1577
01 864 1601

BRANCH
APPLEBY
LIMITED
STONEFIELD WAY
RUISLIP, MIDDLESEX HA4 0YL

TO ADVERTISE
IN THIS SECTION
PHONE:
ANDREW KNOX
ON
01-686 2599
EXTENSION 489

STUDIO SOUND

AND BROADCAST ENGINEERING

CLASSIFIED ADVERTISEMENTS ORDER FORM

Please use this coupon for all your sales and wants.

Rates: 70p+VAT per word. Min £17.00+VAT.

Box Nos. £6.00+VAT extra. VAT (UK only) \$rate \$2.00
per word, minimum \$50.00, Box No. \$10.00 extra.

PLEASE PRINT IN BLOCK CAPITALS

To: STUDIO SOUND, please publish the above advertisement for insertions under the heading Cheque/P.O. to be made payable to LINK HOUSE PUBLICATIONS LTD, LINK HOUSE, DINGWALL AVENUE, CROYDON CR9 2TA. Is a Box No. required Yes/No. If no, please include remittance to cover name and address and/or tel. no.

Name Address

CLASSIFIEDS

PROFESSIONAL VIDEO

INTERNATIONAL YEARBOOK 1987/88

TENTH EDITION PUBLISHED BY
BROADCAST-SYSTEMS-ENGINEERING

10 YEARS SERVING THE PROFESSIONAL BROADCAST INDUSTRY

A must for your bookshelf!

For 1987 the Professional Video International Year Book is published in the popular A4 magazine format. With its successful editorial coverage of equipment and services covering the international broadcast industry with 1,000's of listings by manufacturers, brand-names and in many cases their UK and Overseas distributors, plus a summarised text of product lines.

All this invaluable information is classified under sections, ranging from aerials antennae and masts to video cassette storage and cases, therefore ensuring that looking for the equipment you need can be found in our comprehensive easy to use publication.

Published in association with Broadcast Systems Engineering the international magazine for the broadcast industry.



Professional Publications Group, Link House Magazines Ltd, Dingwall Avenue, Croydon CR9 2TA, United Kingdom.

Please send me copies of
Pro Video International Year Book 87/88.

£14.00 (UK) £16.00 Europe \$27 USA Airmail
£19.00 World Airmail. *Includes Postage and Packing.*

I enclose a cheque/postal order/International money order
payable to **Link House Magazines** for the amount _____

Or debit my credit card



Credit card No.

Credit card holders can order by simply ringing 01-686 2599
ext 550, quoting credit card No.

Signed _____

Name _____

Address _____

(please print)

Please return the completed order form enclosing full
remittance (including delivery) or giving your credit
card number to **Professional Publications Group,
Link House Magazines Ltd, Dingwall Avenue,
Croydon, CR9 2TA, United Kingdom.**

Please allow 28 days delivery in Britain, extra overseas depending on
country and delivery method.



BOOMERANG Sounds

**SEYMOUR HOUSE, 382 CHESTER ROAD,
MANCHESTER, M16 9EA 061-873 7770**

Boomerang Sounds is a technical based audio equipment supplier. For seven years we have provided maintenance and installation services to recording, broadcast and public address clients. In recent years we have become increasingly involved in the supply of equipment.

Due to several studios and a pro-audio dealer in our area selling up, we have acquired a large quantity of new, ex-demonstration and second-hand equipment which we are able to offer to you at advantageous prices.

SALE NOW ON

Here is a small selection - please phone for the full list.

Tascam 388 8 Track 1/4" with built in mixer - New	£1900
Revox B77 1/4" 7.5/15 ips NAB immaculate - S/hand	£650
Studer B67 1/4" 7.5/15/30 ips in trolley - S/hand	£2,200
Tascam M216 16/4/8 - New	£655
Tascam M320B 20/4/8 - New	£1,585
Yamaha DMP 7 Digital - as New - S/hand	£1,950
AudioLogic RDS 2001 digital delay/sampler - Ex demo	£200
BEL BD80 digital delay - S/hand	£425
Korg SDD 3000 digital delay - S/hand	£425
ART Proverb digital reverb - Ex demo	£240
VestaFire RV-2 spring but one of the best - S/hand	£75
Symetrix 544 Quad Expander Gate - Ex demo	£360
Audio and Design Gemini Comp/Lim - S/hand	£225
Rebis RA201 Gate (other modules available) - S/hand	£45
Tascam DX2B 2 Track DBX - Ex demo	£150
Teac V210C Cassette - Quantity Discounts - New	£67
Tascam PE40 Quad Parametric - Ex demo	£325
Isopatch CP44J Jackfield 44 mono jacks - New	£70
ex-BBC PO type Jackfield 20 holes per row	£20
10.5" NAB metal spools 600 available - S/hand	£1
5" Plastic spools 1000's available - clean but S/hand	25p
Nomad P2M MIDI trigger - Ex demo	£115
Atari/Steinberg package 2 available - S/hand	£669
Nomad Axxeman (Bassman also in stock) - Ex display	£245
Roland D50 - only 3 months old s- MINT - S/hand	£950
Yamaha DX7 MkII FD immaculate - S/hand	£1,150
Rauch DVT25S 2 x 125W - Ex demo	£300
JBL Control 1 - New and S/hand from	£95
JBL 4312 ABK as new - Ex demo	£625

Please add VAT to all prices

NEW AND SECOND HAND EQUIPMENT IN STOCK FROM

**AKG, ART, Agfa, Alexis, Ampex, Apex, Atari, Audio Logic,
BEL, DOD, Drawmer, Fostex, Isopatch, JBL, Klotz,
Korg, Neutrik, Nomad, Quad, Rauch, Rebis, Revox,
Roland, Sennheiser, Shure, Soundtech, Steinberg,
Studer, Studiomaster, Symetrix, TC, Tascam,
Teac, Technics, Yamaha.**

**10 FREE CHROME C30
CASSETTES WITH EVERY
£100 YOU SPEND WHEN
YOU QUOTE THIS ADVERT**

FULL DEMONSTRATION FACILITIES
Well Equipped Workshop for the Best in After-Sales Service

061-873 7770

INDEX TO ADVERTISERS

AMS Industries plc	76
Akai	55
AKG	19
Allen & Heath	83
Amek Ltd	59
Ampex GB Limited	IBC
Barcus Berry Electronics Inc	66
Beyer Dynamic Ltd	73
Crow Broadcast Systems Ltd	79
D&B Audiotechnik	77
D&R Electronica	4
DDA	47
Don Larking Audio	49
Drawmer Distribution Ltd	79
Eela Audio	25
Emilar	74
Focusrite Ltd	41
FWO Bauch Ltd	11, OBC
GTC Ltd	70
Goldline	57
HW International (Shure)	6
Harman UK Ltd	12, 13
Harrison Information Technology	81
HHB Hire & Sales	20, 21, 23
JBL	22
Kemble Yamaha	53
Media Products	11
Mitsubishi Pro Audio Group	67
Mosses & Mitchell Ltd	70
Neve Electronics Labs Ltd	51
Olson Electronics Ltd	11
Otari	15
Panasonic/Technics	29
Pangbourne Musical Dist.	7
Professional Studio Spares	79
Publison Audio Professional	10
RTS Systems	27
Rane Corporation	35
Rebis Audio	80
Scenic Sounds Equipment	65
School of Audio Engineering	48
Sony Broadcast Ltd	31
Soundcraft Electronics	IFC
Soundtracs plc	8, 9
Stage Accompany	39
Stirling ITA	17
Studio Spares	61
Surrey Electronics	54
Syco Systems Ltd	33
Symetrix	7
TC Electronic	60, 63
Teac UK Ltd	68, 69
Thatched Cottage Audio	75
The Professional Recording Co	43
Total Systems	70

INTRODUCING



**The ultimate
Low Print tape for
broadcast and recording.**

AMPEX MAGNETIC TAPE DIVISION
Acre Road, Reading, Berkshire RG20QR, England (0734) 875200

Pure ingenuity



Much of what we see today was shaped by tools. And by ingenuity. When the two come together, the result is often a universal, all-in-one device.

Now Studer presents the multi-purpose tool for audio: powerful, compact, and affordable. Constructed on a rugged die-cast aluminum chassis, this remarkably fast machine features servo controlled spooling motors, a brushless DC capstan motor, a shuttle controller, and one-hand cueing. All tape deck and audio functions are microprocessor controlled, including digitally controlled, phase-compensated audio electronics and audio alignment through D/A converters. Among other features, the A807 provides switchable NAB/CCIR equalization, phantom-powered microphone inputs, monitor speaker, parallel remote control, serial RS232 port, and vari-speed.

Studer A807 – professional ingenuity in the 19" rack format.



STUDER INTERNATIONAL AG

Althardstrasse 10, CH-8105 Regensdorf

Sales Offices:

Australia, North Sydney 4064700. **Austria**, Vienna 4733 09 / 4734 65. **Belgium**, Hasselt (011) 229 664. **Canada**, Toronto (416) 423-2831. **Denmark**, Gentofte 451652340. **Finland**, Helsinki 80/742133. **France**, Paris (1) 45 33 58 58. **Germany**, Löffingen 07654-8030. **Great Britain**, London/Herts. 01-9530091. **Hong Kong** 5-441-310 / 5-412-050. **Italy**, Milano (02) 25390121. **Japan**, Tokyo 03-320-1101. **Netherlands**, Gennep 08851-96300. **Norway**, Oslo (02) 356110. **Singapore** 2507222/3. **Spain**, Madrid 2317840. **Sweden**, Solna 08/7340750. **USA**, Nashville (615) 254-5651. **Worldwide**: Studer International AG, Regensdorf, Switzerland, +41 840 2960.