JUNE 1997 $5.75 £3

THE INTERNATIONAL TECHNICAL MAGAZINE FOR PRO AUDIO, POSTPRODUCTION & BROADCAST

EXCLUSIVES
Martec MSS-10
AMS Neve AudioFile Prolog
Focusrite Channel Strip
CLM Dynamics DB400S
Soundtracs Virtua V2
Amek 9098 DMA
Fairman TMC
Brauner VM1
HSE EQ-1

BATMAN AND ROBIN
Bat-postpro with the Dynamic Duo

PAVAROTTI AND EUROVISION
The TONY VISCONTI Interview
MIC PREAMPS: THE GUIDE
CHANNEL 5 PRESENTS DAW ROUNDUP

www.americanradiohistory.com
MORE THAN A LEGEND...

VX MUSIC RECORDING & MIXING CONSOLE

VXS MULTI-FORMAT PRODUCTION CONSOLE

World's premier music production console
- Audio quality against which all other mixing consoles are judged
- Neve formant spectrum EQ and dynamics in each channel
- 8 mono/4 stereo auxes when tracking, up to 48 auxes when mixing
- Master status switching for tracking, mixing and broadcast
- Colour TFT screen in meter bridge provides sight-level automation data and Recall displays
- Encore automation/mix data interchange with AMS Neve digital consoles

VXS Multi-Format consoles additionally provide:
- Monitoring and output configurability
- Up to 8 discrete outputs/4 stereo pairs
- Monitoring independent of main outputs
- Support for three additional 8-track ATRs/dubbers, or 2nd multitrack
- Additional stereo guide track inputs
- Pec/Direct paddle switches for monitor select and record arm
- Optional music and dialogue dual track faders
- Optional assignable joystick panners
Editorial
Passionate editorial comment from the Studio Sound team

Soundings
International recording, broadcasting and posting news

World Events
The comprehensive and regularly updated guide to what's where

Features
47
The Guide:
Mic Preamps
Personal preferences and logical listings for critical recording

48
Technology:
Mic Preamps
The truth behind the panel; microphone preamps in the raw

52
Interview:
Tony Visconti
The master of 1970s production techniques takes on the 1990s

Broadcast:
EUROVISION
Irishe eyes are on the competition for the prize European singalong

Postproduction:
Batman & Robin
Dynamic action in postpro from the world of the graphic novel

Technology

95
Dr John
John Wilkinson studies corruption in mains power

99
DAWs
The state of the art in digital audio workstation developments

Recording:
Pavarotti
Classical location postproduction

Facility:
Middle Ear Studios
The Bee Gees' recording HQ

Broadcast:
Channel 5
Inside the fifth UK TV channel

Reviews
10
Orban Audicy
Exclusive: workable workstation

14
AMS Neve Prolog
Exclusive: DAW yet sets pace

19
Soundtracs Virtua
Exclusive: V2 software upgrade

25
ATI Pro 6
Overboard in American outboard

29
HSE EQ-1
Exclusive: Swiss EQ excellence

29
New Technologies
The latest in equipment launches

30
Brauner VM1
Exclusive: German valve mic

ABOVE: The latest incarnation of AMS Neve's stalwart AudioFile. The Prolog. See page 14

32
Zefiro ZA2
Clever card play in PC-10

34
Fairman TMC
Exclusive: classic compression

36
Focusrite Green
Channel Strip
Exclusive: latest Green outboard

38
TL Audio VP2051
Affordable valve voice processing

40
CLM Dynamics
DB400s
Exclusive: British M-S preamp

42
Amek 9098 DMA
Exclusive: pedigree M-S microphone preamp

44
Martech MSS-10
Exclusive: class American preamp

47
The Guide:
Mic Preamps
Personal preferences and logical listings for critical recording

48
Technology:
Mic Preamps
The truth behind the panel; microphone preamps in the raw

52
Interview:
Tony Visconti
The master of 1970s production techniques takes on the 1990s

60
Broadcast:
EUROVISION
Irishe eyes are on the competition for the prize European singalong

64
Postproduction:
Batman & Robin
Dynamic action in postpro from the world of the graphic novel

Good/bad guys/gals mass for the latest Batman Epic; Channel Five goes live; HSE EQ-1 and Fairman TMC exclusives

Broadcast:
Channel 5
Inside the fifth UK TV channel

Comment

92
Comment
International news analysis

93
Broadcast
Power plays in digital broadcast

106
Open Mic
Digital audio converters in bits

Studio Sound June 1997
Post needs to talk

MANKIND TOOK A MAJOR EVOLUTIONARY STEP when it got its head around the concept of currency and money. Freed from the need to take a herd of cattle or daughters along whenever he wanted to do a little shopping, early man soon enjoyed the benefits of dealing with something that could be exchanged directly for something else, that had its own integrity and worth, and that was also strangely portable and convenient. He may have missed the adrenaline rush of the hard barter or swap, but he replaced this with the thrill of the fast cash deal.

The studio community took a major evolutionary step when it got its head around the concept of transferable and interchangeable media. The adoption of 2-inch tape meant an artist could take the reels and travel comfortably in the knowledge that the next studio or mixing room could deal with the stuff. It’s a basic approach but it works and is based on the principle of a standard that has been (largely) preserved through the adoption of digital tape-based media.

Things have never been this straightforward in post since the arrival of digital. Despite the now almost universal use of removable media the chances are you’ll break something if you remove a drive from one DAW and stuff it in the slot of another. Small clusters of manufacturers have got together to ensure degrees of exchange in this environment and there have even been moves, most notably OMF, to instigate industry-wide interchange. However, most will have noticed the less than complete endorsement of this, and the selective implementation where it has occurred. On the whole, manufacturers remain keen to tie up their users into their own systems.

Clearly this is now as ridiculous as it is outdated. The post community and the manufacturers need to start talking seriously if the situation is not to fragment still further than it already has.

Passion play

IT’S DIFFICULT TO GAUGE PASSION. Until recently, the old line about turning up the ‘brilliance’ control on the guitarist’s amp to elicit the required performance from him was about as scientific as it got. Then came the recession. Here, suddenly, and most unwelcome, was a means by which the passion of studio owners could be reconciled with their business sense. Sadly, those who scored most highly on the pure passion scale were the ones most quickly out of business.

So what is it about music and technology that allows it such command of our feelings? That music is an emotive entity is not in itself the answer to question, since it often plays such a small part in the larger studio scheme of things. There has to be something more. Something that is powerful enough to determine our lifestyles, our ‘business’ ventures, our spending habits, our conversation and our dreams. Neither is it simply the ‘anorak’ factor—although it’s certainly at work, I don’t think there is enough in either the theory or the practice of analogue or digital electronics to cast as powerful a spell as the one we’re all apparently under.

I’ve been pondering this question for some time now, and I don’t feel any closer to finding an answer than when it first presented itself to me. Somewhere along the way, however, I realised something, that’s not more important, but is certainly more immediately consequential. Just as unravelling the real-world workings of an elegant ‘magic’ trick can destroy its attraction, the strict imposition of real-world values on the art of recording is certain to leave its mark. Although we have survived the recession with much of our old values intact, much that once was possible is no longer so—denied us by our accountants or our revived fear of failure.

Passion is one of our most essential muses. We must guard it with our lives.
The Console That Defines A World Class Recording Facility

Solid State Logic

International Headquarters: Biphroke, Oxford OX5 1RU, England  Tel: +44 (1865) 842110 Fax: +44 (1865) 842118
Paris +33 (1) 34 60 48 66 · Milan +39 (0) 2 262 24956 · Tokyo +81 (3) 34 74 11 14 · New York +1 (212) 315 1111 · Los Angeles +1 (213) 462 4444 · Toronto +1 (416) 431 9131 · Singapore +65 285 9300
http://www.solid-state-logic.com

421 West 54th Street, New York, NY 10019 · Telephone: 212 664 1000 · Facsimile: 212 307 6129
Fairlight announces exchange initiative

WORLDWIDE: DAW manufacturer Fairlight has announced co-operative agreements with Lightworks, Studio Audio and Video, Timeline and Doremi Labs to create a Direct File Exchange capability beyond the scope of OMF. The company's intention is to create a consensus between manufacturers for interchanging file formats and EDLs by a translation process built into the DAW software.

Fairlight is keen to disclose all information required to enable the playback of its files to any manufacturer it enters into an agreement with according to Fairlight director of European operations Nick Cook. 'We have positive indications that several other major manufacturers are interested in joining us in establishing a standards forum to explore the possibility of a common file implementation,' he said.

'Cross platform connectivity and exchange are vital for our industry,' added Doremi Labs' Camille Rizko. Customers like to pick the system they feel most comfortable working with. They however, do not like to be locked into a closed system.'

Fairlight, Europe.
Tel: +44 171 267 3323
USA, Tel: +1 310 287 1400

WORLDWIDE: U2 has bought six channels of Sony wireless mics for its PopMart world tour which was launched in Las Vegas. Including six WRT 860 belt pack transmitters, three WRR 850 diversity receivers and a variety of guitar leads, the wireless mics are used on the guitars of Adam Clayton and The Edge. Bass guitar technician Stuart Morgan said he was drawn to the Sony system's ability to use 64 different frequencies. The PopMart tour will take in more than 40 stadiums in the US on its first leg and is likely to top 100 shows on six continents in the next 14 months.

Europe: Plus XXX studios in Paris has completed the refit of its two main rooms following the installation of an SSL 9000 in Studio 2 last year and the augmentation of its Genelec monitoring systems with stereo subwoofers. Studio 1, with its Neve VR, now runs dual 18-inch subs underneath its triple fronted 1035As in an unprecedented move that is surprisingly civilised given the phenomenal power delivery possible.

'We still like the Genelecs but we’ve improved them because we wanted extra bass efficiency according to the wide variety of music and film scoring we handle here,' said Plus XXX owner Claude Sahakian. The smaller Studio 2 employs a similar, although slightly scaled-down, arrangement and Sahakian's objective to extend low end but not to over cook it was placed in the hands of acoustic designer Christian Malcurt. 'The sub bass is not only for the volume, but it's also for the frequency response,' said Malcurt.

'It's important that the room works well at low and high levels.'

Plus XXX, France. Tel: +33 1 42 02 21 02. Email: plus30@calva.net

UK: Beauty and the Beast which opened recently at the Dominion Theatre, London features two Cadac consoles—a 53-input F-Type with 17 specially designed stereo input modules and a 56-input J-Type. Costing more than £10 million and billed as the capital's most expensive musical ever, the show has a cast of 40 and a 25-piece band. Sound design is by Richard Sharritt with a system from Autograph Sound Recording. The desk's stereo inputs were designed specifically for the production and feature twin input meters, mic inputs and F-Type stereo EQ.
HBB in Toronto

Canada: HBB Communications has opened a distribution company in Canada based in Toronto with technical and warehouse facilities. HBB Communications Canada is headed by Dave Dysart, formerly of Studer Canada, and will handle the company's entire international product lines including the Gemini GX8000 MO recorder which Dysart believes holds much promise in the territory.

HBB Communications MD Ian Jones did not consider the move to be an expansion of the US market as he believes the country has its own identity. Canada has a thriving film industry, its music recording facilities rival anything available in the US and its broadcast companies produce programmes of the highest standard, he said.

HBB Communications, 260 King Street East, Toronto, Ontario M5A 4LF, Canada.
Tel: +1 416 867 9000.
Fax: +1 416 867 1080.
Email: hbbcan@istar.ca

IUTC supports HD-CIF

WORLDWIDE: The Inter-Union Technical Committee of the world's eight broadcasting unions has strongly supported the adoption of a unique standard for programme production and exchange of high-definition TV following a meeting in Ireland in April. This, it claims, will lead to easier and better exchange of HDTV programmes, lower equipment costs and will accelerate the move to high-definition television.

The IUTC recommends that the new standard should be called HD-CIF (Common Image Format) using the same image sampling matrices irrespective of the field rate and resolution, which has a 1080 line by 1920 sample size. HD-CIF systems are being encouraged to provide products to this standard and the Committee will invite them to explain their plans and timescales for making available suitable field rate (50 or 60 Hz) CIF equipment.

IUTC Tel: +60 03 282 3108.

Sound recordist Martin Wilson is using his Fostex PD-4 portable time-coded DAT machine on the dramatised documentary series War and Civilisation for Worldwide Pictures with shooting in Turkey, China and Mongolia. 'Despite the dust of central Turkey and the constant jottings in transit, the PD-4 performed flawlessly throughout,' said Wilson who has also used the machine for the location shooting of the Harry Enfield and Chums Tiger Aspect/UCC comedy which featured the 'Il Postino Pat' sketch shown—a spoof of the children's Postman Pat series.

Studio Sound June 1997

Graham Patton Systems, US.
Tel: +1 916 273 8412

London's CTS studios has opened a new digital mastering suite to provide greater production flexibility and reduced turnaround times. Central to the new room will be a SADIE SADIE editing system which can be used in conjunction with the facility's recently installed Pacific Microsonics HCD processing system—currently the only such system in London. The move increases the number of CTS' mastering suites to three.

CTS, UK: Tel: +44 181 503 4611

Studio Audio & Video, UK.
Tel: +44 1393 648866

Pacific Microsonics, US.
Tel: +1 510 644 2422

Chinese radio stations, China Radio International and China National Radio, have purchased AMS heve Capricorn digital consoles. CRI has installed a 48-fader Capricorn system for use in high-quality music and drama programming for sale to Chinese-language broadcaster abroad as well as for national transmission. CRI is set to commission a new 48-fader Capricorn installation for quality and drama broadcast production. In nearby Thailand, the new Fatima Studio setup has commissioned a 48-fader AMS Neve Lite console.

AMS, UAE, UK.
Tel: +44 1282 417282

French studio owner Dan MCEnroe has purchased a P&G PP10 audio multiprocessor system in his Paris facility. The PP10 has the Studio Suite from the Pythagoras range installed and will be used for audio restoration work as well as recording and mixing acoustically-oriented music.

Penny & Giles, UK.
Tel: +44 1495 20024

London's Metropolitan studio complex is the home of Planet Audio, a music programming and production suite which has recently installed two Yamaha 02R consoles to run with its three DADs and 16-track Pro Tools system. The digital desks replace an analogue DDA console where they accompany a selection of high-end outboard including units from Tube-Tech, Helios, GML and Dolby, along with Apogee A/D conversion.

Metropolis.
Tel: +44 181 742 4444

Yamaha-Kemble Music, UK.
Tel: +44 1908 366700

Hollywood post facility, Complete Post, has installed ten pairs of KRM M9000 monitor speakers. The post-production fraternity's acceptance of KRMs is further underlined by installations of M9000s in California at MusicWorks and KLiks at Universal Studios. Seattle's post people have also been installing KRKs, notably at Chatter & Din, Media Partners and Slice Editorial which is entirely operated by female staff.

IKP, Complete Post.
Tel: +1 714 841 1600

UK: Hard-core dance production house STD has installed a Tascam M1600 console in its studio at 24 Kanit Records in London. Made up of the keyboard playing and remixing duo of Tomye Durkin and Ivan Black, the outfit has a Doctor Who connection through programmer, arranger and engineer Alistair Lock who has com posed soundtracks for Doctor Who and Blake's 7 sci-fi appreciation videos.
June

*REPLitech International*
San Jose, California, US.
Tel: +1 659 279 1700.
Fax: +1 659 279 1999.

*ShowTech 97*
Ibiza, Spain.
Tel: +34 657 471 151.
Email: otba@montnet.com

*4th Annual Latin-American Pro Audio & Music Expo Mexico 97*
World Trade Centre, Mexico City.
Email: chris@sssexpos.com
Net: www.ssexpos.com

*Nightwave 97*
Roman Exhibition Centre, Italy.
Tel: +39 541 711249.
Fax: +39 541 786666.

*Musicom International*
Landmark London Hotel, London, UK.
Tel: +44 121 869 2731.
Fax: +44 121 869 3111.
Email: info@worldrg.com
Net: //worldrg.com

*International Conference on Consumer Electronics (ICCE)*
Westin Hotel O'Hare, Chicago, US.
Contact: Diane Williams.
Tel: +1 716 392 3862.
Fax: +1 716 392 4397.
Email: d.williams@ieee.org
Net: www.icce.org

*Lecture. Sound for television: The Letterman/Barrymore Experience*
Conference room, Baden Powell House, South Kensington, London SW7.
Tel: +44 1628 663725.
Email: AESUK@aol.com
Fax: +44 1628 667002

*20th Montreux International Television Symposium*
The Convention Centre, Geneva, Switzerland.
Tel: +41 21 963 52 08.
Fax: +41 21 963 52 09.
E-mail: vanhoom@symposia.ch
Net: www.montreux.ch/symposia/

*AES 14th International Conference*
Bell Harbou International Conference Centre, 101 Stewart Street, Seattle, Washington, WA 98101, US.
Tel: +1 212 661 8528.
Fax: +1 212 682 0477.
Email: HQ@aes.org

*Exposhow & Pro-Audio 97*
LENEPO Exhibition Complex, St Petersburg, Russia.
Contact: Irinn Neduma.
Tel: +7 812 325 6245.
Fax: +7 812 326 6245

*AES 8th Regional Convention 97*
Sunshine City Convention Centre, Ikebukuro, Tokyo, Japan.
Tel: +81 45 939 7091.
Fax: +81 45 939 7091.
Net: http://www.aes.org

*July*

*SMITE 97*
Darling Harbour, Sydney, Australia.
Tel: +61 2 9976 3245.
Fax: +61 2 9976 3774.
Email: conference@peg.apc.org

*International Television Festival & Market of India 97*
World Trade Centre, Mumbai (Bombay), India.
Contact: Kaivita Meer.
Tel: +91 22 215 1396.
Fax: +91 22 215 1269.
Email: saicom@bom2.vsnl.net.in

*New Broadcast Standards and Systems*
Eighth Residential course at the University of Surrey.
Contact: Neil Sharp.
Tel: +44 171 344 5421.
Email: rsharp@ieee.org.uk

*Pro Audio & Light Asia 97*
World Trade Centre, Singapore.
Tel: +65 227 0913.
Fax: +65 227 0913.

*September*

*PLASA 97*
Earls Court 1, London, UK.
Contact: Marcus Bernie
Tel: +44 171 370 8221.
Email: marcus.bernie@eco.co.uk
Net: www.harvard.co.uk

*MIDEM Latin America & Caribbean Music Market*
Miami Beach, Florida.
Contact: Jane Garton
Tel: +1 33 1 41 90 44 39.
Email: jane.garton@midem.paris.cmoal.compuserve.com
US tel: +1 305 573 06 58.
Net: www.midemcannes.com

*IBC 97*
Amsterdam.
Tel: +44 171 240 3839.
Email: show@icc.org.uk
Net: www.ibc.org.uk/foc/

---

### "In your time at Brüel & Kjær you created many breakthroughs."

"Most miniature microphones have a short working life - especially in theatre applications where they are subject to continual body contact - so I set myself the challenge of creating something better."

"The result is the DPA 4060, with superb sonic quality and impressive dynamic range. Although it will handle a broad range of applications, it is aimed primarily at the theatre and TV where invisibility, robustness and stability are crucial."

"Perhaps its most important characteristics are a significantly longer operational life, and the fact that it is astonishingly impervious to sweat, make-up, heat and humidity. I believe it to be the world’s finest miniature microphone!"

- Ole Brønlund, Sweersen

---

### "None as big as this."

*Danish Pro Audio*
Worldwide supplier of Brüel & Kjær Microphones.
Tel: +45 4814 2740.
Fax: +45 4814 2799.
PERFECTION IMPROVED

THE NEW JADE-S

Thos: clever engineers at Soundtracs had a challenge. How to improve on perfection?
That is, the Jade Console still is for many, the perfect production console. With un-coloured audio, endless intelligent features and total ease of use, could it really be improved upon?
Yes
Combining the finest sonic specification with digitally controlled dynamics, a proven (and reliable!) moving fader or VCA based automation system (with on or off-line editing), AES/EBU digital stereo and LCRS format mixing has culminated in those 'impossible' improvements. And a remarkable refinement of an already perfect design.
Challenge accepted, met and surpassed.
The new Jade-S Production Console.
Call for a free 16 page colour brochure, or better still book a private demonstration.
Producing a workstation that intelligently interprets the demands of real working environments has proven remarkably elusive to some manufacturers. Rob James reckons Orban has it...
Effects can be inserted in the channel, the submix or the main output, and where effects are inserted into channels, channel pairs can be linked for stereo. The standard DSP supplied gives 12 units of processing. A mono equaliser or compressor uses one unit while Orban has provided its own reverb algorithm that uses three units and is adequate for most purposes. If you need quality reverb, there are two additional Lexicon algorithms of the usual standard that use six units each. An additional DSP card can be fitted that considerably increases the available DSP. An obvious way of juggling the DSP resource is to use reverbs in the subgroup output rather than individual tracks or alternatively to bounce tracks with processing applied.

When an effect is inserted, it is inserted in the channel's parameter knobs to use to vary the desired function. The Patchbay menu allows mapping of any 10 of the 24 virtual tracks to the mixer channels or edit tracks. Tracks can be named or placed in and patches can be saved and recalled including effects assignments. The SMPTE time-code setup is also on this menu. A nice touch is that a Production done in one time-code format can be converted to another. Present there is no RS-122 (Sony P2 Protocol) control, but the Audity will change time code or generate it. It will also record against external time code.

The system appears to fulfill its brief and be thoroughly bullet-proof. I did manage to crash it during the test period despite the usual incompetence and attempting illegal acts. In fact, Orban tells me that, of late, they have offered their R&D staff a cash reward if they can make it crash—it remains unclaimed.

As a workstation this has one of the shallowest learning curves I have ever come across. Anyone who understands what a DAW is for, and has had a minimal acquaintance with the concepts should be able to sit down at an Audity and perform useful work immediately. I would say this workstation manages the difficult trick of allowing users to operate it at the level appropriate to them. An occasional user can put together a simple production without the technology getting in the way. For more serious users Audity offers a choice, if you need ‘quick and dirty’ then the workstation lets you do that, if you want to do a polished, complex production you can do that as well. The Intelligent Digital Interface removes all the bother of worrying about what sampling rate raw material on DAT was recorded at, or fiddling about getting CD music and effects converted when the rest of the source material is 48kHz. After a while you discover practically everything you might want to do in normal recording editing and mixing can be done using the keys on the controller—even the pull-down menus usually have alternatives on keys. In almost all cases there is no necessity to type in numbers. It is usually quicker and more intuitive to use the jog wheel. The next little QWERTY keyboard really is only used for naming things.

The really clever stuff—which will have some specifics salivating—is in the networking. There is just a hint of what might eventually be possible. The Holy Grail for major broadcasters is a complete networked system for acquisition, programme production and transmission. External feeds coming in to a central server with workstations taking material appropriate to them individually or simultaneously, editing and packaging it, and returning completed items via the network for transmission. Audity can already be configured to do the upload bit to the systems mentioned earlier. It will be very interesting to see how much further Orban takes the ideas and how soon.
When TC Electronic set out to make the innovative Wizard M2000 and Finalizer we knew we were in the process of creating something truly unique. But let's be realistic for a moment: That's a statement everyone could make!

**THE WIZARD FINALIZER:**

"Master Piece"
Hugh Rooijma, Sound On Sound, December 1996

Editors Pick 1996
Musician Magazine, December 1996

"My wife stole mine and put it in her studio"
Roger Nichols, EQ, December 1996

"- the Finalizer offers a tweaker's paradise"
Ty Ford, Pro Audio Review, February 1997

"Very few products have thrilled me like the Finalizer"
Florian Richter, MusikMagazin, February 1997

"Resistance is useless"
Peder Fyr, StudioMagazin, Oktober 1996

**THE WIZARD M2000:**

Editor's Choice 1997
Electronic Musician, January 1997

Editor's Pick 1996
Musician Magazine, December 1996

"- the Wizard stands up to the comparison with a machine costing more than twice as much"
Mark Fein, MIX, October 1996

"- The M2000 will put you just about anywhere you can think of, and a few you probably haven't"
Ty Ford, Pro Audio Review, July/August 1996

"TC scores big again!"
Karl Cordal, Bass Player, August 1996

"- the overall impression was 5 Stars"
Roger Nichols, EQ, April 1996
AMS Neve AudioFile Prolog

The oldest digital audio workstation around is still one of the postproduction industry's most widely used and best respected.

Rob James catches up with its latest incarnation

I AM REMINDED of a wonderful old British sitcom by the singularly inapt name AMS Neve has chosen for its new AudioFile. I am sure the marketing boys will justify the name because the machine is intended—among other things—to introduce new users to the wonderful world of AudioFile. But how marvellous it is that the company with the best claim to the invention of the digital audio workstation concept should now come up with the name Prolog.

For those of you who remember Up Pompei, the whole thing was anchored around Frankie Howerd telling us a story beginning with 'The prologue'. Part of the joke was that at the end of each episode, he had never managed to finish. But the audience had been magnificently entertained by the chance interruptions and tangents along the way which add up to a story in its own right.

Prolog comes as three 19-inch rackmounting hardware units, although the Spectra control surface will be more commonly used, with its legs attached, as a desktop unit. The largest box is the mainframe, at 9U and 40kg; this is a serious piece of kit and contains the majority of the processing, the mass storage and a plethora of interfaces (some of these have no function in Prolog, but are there to facilitate future expansion). All the audio, sync and machine control connections are made to this box.

A 'translink' cable connects the 2U-high Spectra interface to the mainframe. The cable can be up to 60m long which makes for very flexible siting. The Spectra interface has a diskette drive for loading and saving event lists, EDLs and software updates. There are connectors for GPS, printer, remote monitor (VGA) video editor, PC keyboard and key remotes. The Interface connects to the control surface via a D-connector and 4 BNCs. The control surface has a colour TFT screen, to the right and underneath of which are softkey 'Trigger keys'. These all control a variety of functions depending on which screen you are using.

Transport controls are bottom right with two jog wheels and associated nudge buttons above. Moving upwards there is a small status display then the numeric keypad and a group of six dedicated Function keys. At the top are small QWERTY keyboard used for naming things. Time displays can be in seconds, time code or film footages.

To understand Prolog you really need to know a little of the history of AudioFile.

When I first saw a prototype in the early 1980s, there was no culture of digital non-linear recording. The sampler had been with us a while and was beginning to find applications in areas other than music—for looping atmospheres and playing sound effects, for example; but no-one really knew what to do with the thing. Virtually everybody could see possibilities and applications if only it could do... Here you could substitute wish lists from people with considerable experience in a plethora of audio disciplines. The research done by AMS resulted in certain features which may appear strange to those brought up on the current generation of DAWs. The Trigger keys are a case in point—these are a legacy from one of the earliest applications to be identified, replacing tape cartridge machines for spot effects. They are still there partly because the original application is still valid, but also because they have had other uses superimposed on them.

If you compare the 'green-eyed monster' (original AudioFiles had 9-inch green screens) with a current Spectra you will find marked similarities.

AMS Neve seems to believe changing the look and feel of AudioFile too dramatically would bring howls of protest from their existing user base; however the improvements are dramatic. The colour TFT screen is excellent—you'll never want to look at a CRT monitor again. The speed of operation has been dramatically improved and the programmers are beginning to take advantage of the inherently multitasking parallel processing transputer architecture.

From the start, AMS Neve imposed certain constraints on AudioFile. All crossfading and play out would be done in real time, no rendered crossfades and so on. This remains the case today.

Tracks, outputs and data streams may need a little elucidation—a Track is simply a graphic representation of a data stream or streams. If a crossfade is taking place, track two data streams from disk are in use simultaneously for the duration of the crossfade. There is a Tracks icon; 16 tracks, 32 data streams are in use. Some DAWs do not allow crossfades of more than a few milliseconds within tracks or require them to be rendered. This means that in sound-for-picture work where most edits are crossfades of a few frames or so, you have to use two tracks or render (re-record) to disk. This uses up disk space and takes a little time.

One of the hardware limitations which necessitates these approaches is the number of data streams the device is capable of playing simultaneously, which in turn is dependent on factors such as disk bandwidth. There is an 8U AMS 192; 16 tracks, 32 data streams are in use. Some DAWs do not allow crossfades of more than a few milliseconds within tracks or require them to be rendered. This means that in sound-for-picture work where most edits are crossfades of a few frames or so, you have to use two tracks or render (re-record) to disk. This uses up disk space and takes a little time.

One of the hardware limitations which necessitates these approaches is the number of data streams the device is capable of playing simultaneously, which in turn is dependent on factors such as disk bandwidth. There is an 8U AMS 192; 16 tracks, 32 data streams are in use. Some DAWs do not allow crossfades of more than a few milliseconds within tracks or require them to be rendered. This means that in sound-for-picture work where most edits are crossfades of a few frames or so, you have to use two tracks or render (re-record) to disk. This uses up disk space and takes a little time.

One of the hardware limitations which necessitates these approaches is the number of data streams the device is capable of playing simultaneously, which in turn is dependent on factors such as disk bandwidth. There is an 8U AMS 192; 16 tracks, 32 data streams are in use. Some DAWs do not allow crossfades of more than a few milliseconds within tracks or require them to be rendered. This means that in sound-for-picture work where most edits are crossfades of a few frames or so, you have to use two tracks or render (re-record) to disk. This uses up disk space and takes a little time.

One of the hardware limitations which necessitates these approaches is the number of data streams the device is capable of playing simultaneously, which in turn is dependent on factors such as disk bandwidth. There is an 8U AMS 192; 16 tracks, 32 data streams are in use. Some DAWs do not allow crossfades of more than a few milliseconds within tracks or require them to be rendered. This means that in sound-for-picture work where most edits are crossfades of a few frames or so, you have to use two tracks or render (re-record) to disk. This uses up disk space and takes a little time.

By contrast Prolog (and its sibling) works on a Cues and Events model. Each section of raw audio recorded into the machine becomes a 'Cue' which can be of any length up to the available storage capacity of the destination drive. Events are instructions to the machine telling it which Cue to play, how much of it to play, where to play it, what output to play it out of, what level and balance to play it at, and whether to fade in or out. Thus a complete project will consist of a number of Cues and an Events list that defines how the Cues will be played. Cues may be used once or many times in one or several projects.

There are usually several ways of carrying out any given operation with Prolog. Which you choose depends on what process you are doing at the time.

Recording can take place in a variety of ways and in different screens depending on circumstance. The simplest way to record Cues into the system is in the Source Record page. Recordings can be mono or stereo, and each is automatically assigned an assignment that can be changed to something meaningful either while recording or later. There are other ways of recording against time code.

Cues can be chopped and tagged (non-destructively) and be given sync marks to expedite use in projects—if the sound of an airplane landing has been recorded as a sin-
gle cue and there is silence at the start and finish, and a squawk where the tyres hit the runway which is the likely sync point, the head and tail can be trimmed to remove the silence and the squawk marked.

Cues are placed into an Event List in the Assembly page. Cues are initially placed on a default track or tracks and then moved to other tracks as desired. There are numerous options which define how a Cue is placed and what happens to other events on the same track—the acoustic effect could be placed with the marked ‘squawk’ as the sync point. Cues can also be looped to produce, say, long atmospheres from short sections.

If required, unused portions of Cues can be destructively erased by using the Discard Ends function. This recovers disk space and can be very useful where a long cue is recorded on tape and the required audio is very short—when auditioning sound effects you can save time by recording as you listen then discarding the unwanted ‘ends’ later.

Editing can be carried out in a number of ways, but the recommended method for most purposes is to use the Cut & Splitter and Subdivision Trim page. For the experienced user, the Trim page offers one of the most versatile and quick ways of refining a crossfade edit available on any DAW. The edit points can be slipped individually or together, and the fades can be adjusted individually or together. Fades from 200m-s to 20s duration are equal energy.

There is also a powerful, but potentially dangerous, Macro function. Sequences of key presses can be mapped to keys to perform complex repetitive tasks with a single keystroke. The danger lies in invoking a macro in a different screen to the one in which it was recorded. This can have unexpected and destructive consequences.

The new V2 software also contains comprehensive ADR functions. These allow the creation of loops for re-recording, and there are programmable countdown beeps and relay options for cueing.

The TimeFlex function, accessible from the Event Edit screen, allows the time compression or expansion of a piece of mono or stereo audio without affecting the pitch. The maximum squeeze factors are 50% and 200%. As with most time-domain effects, artefacts will be audible on some material and these will be more obvious on the higher percentages of squeeze. However, since you can audition the TimeFlex immediately, if there is a problem a small change in squeeze factor may cure it. Audio can be stretched to 1001h frame accuracy. The required length can be specified or you can shrink or expand to fit a given space.

Options divide into three groups: hardware interfacing, hardware storage and software.

Prolog comes as standard with four analogue inputs and 16 outputs which may be supplemented or replaced by AES-EBU cards. The limit is a total of 8 in and 16 out of whichever flavour at any one time. Further interfacing options cover more comprehensive machine control with the MCS Multi-Machine Control System which allows direct control of up to six external machines and links to external synchroniser systems. The latest software allows remote machines to record under the control of the AudioFile.

Standard storage is six-track hours of Winchester disk. Options include Exabyte for backup; Jaz, Maxoptic Tahiti 1.16G magnetic-optical and removable Winchester.

SOFTWARE OPTIONS ARE available for autoconforming, the EDL package, OMF which confers the ability to read disks from Mac-based non-linear picture editing systems such as Avid Media Composer. Transfer from Lightworks editing systems is part of the standard software. There is also a module available that allows the Prolog to hang off a VT edit controller as an additional VTR.

The EDL software is worthy of note as it is a very powerful tool for the postproduction of film and TV projects. It includes such luxuries as the ability to map source and destination tracks and to read multitrack lists. It also performs intelligent conforms.

Where it cannot find exact matches between Cues and the EDL it compares in-out times to find matching events.

Prolog is a relatively cost-effective way of joining the AudioFile club. It may be limited to 16-bit working, but for many applications this is all that is required. What you do get is a full 16-output device with the ability to tracklay over a total of 24 tracks for later replay on larger systems.

Prolog and other AudioFiles perform highly specific tasks with speed and precision. Trim is one good example. An experienced operator can go through an entire dialogue tracklay, sorting out edits, using Turbo Trim, at a speed that has to be seen to be believed. The main strengths of AudioFile lie in scalability and workflow. They are well suited to facilities where processes require work to be moved from, say, autoconform in one room, tracking in one or more other rooms and mixing in a third. Their connectivity and machine control functions are impressive—not to mention integration with the estimable Logic series of digital mixing consoles.

AudioFiles are not immediately intuitive to the generation brought up on PCs and Macs. They are not easy to make whole programmes five minutes after opening the box' machines. If you invest the time to learn to drive them instinctively they offer a range of comprehensive editing tools appropriate for people who are regularly going to do very serious work in a big hurry.

Over the many years AudioFile has been in production, there have been many tangential developments to the original concept which have enhanced it out of all recognition. The story is by no means complete—AudioFile will continue to develop, perhaps in ways we would not expect. So it only remains for me to say, The prologue...
Plug into the smartest audio
The new AUDICY was designed from the ground up to do what no other broadcast audio workstation has done: plug directly into the creative mind. Unlike complex workstations, it treats the editing process like an “inspiration with a deadline.” If you’ve ever watched an editor sit down and try to read a manual under pressure, you’ll understand why the new AUDICY is a study in “see it, get it, do it.”

The clean, uncluttered control surface was specifically designed to look smart, feel good, and be instantly productive. The screen interface combines simplicity with a brilliant use of “virtual hardware” graphics. And to keep pace with the endless rush of ideas and deadlines, AUDICY offers unrivaled speed and power. With RAM-based editing and mixing, you edit in real time—by ear—working on up to 24 tracks. Access to audio is instantaneous, even when using the complete suite of built-in effects including compression, EQ, and reverb. AUDICY even lets video people plug into advanced audio production with flexible SMPTE features. All of which means that creative minds can spend less time learning, more time creating, and still get on-air, on time. The genius of AUDICY is in making power simple.
Butch Vig, engineer, producer, co-owner of Smart Studios and the drummer for Garbage, relies on Summit gear for all his work. Vig engineered the group's latest platinum album, "Garbage," nominated for three Grammys this year, as well as producing albums for Smashing Pumpkins, Nirvana, Soul Asylum and Sonic Youth.

"Whether I'm working at Smart Studios or I'm on the road touring, I always use Summit tube gear. I particularly like using the DCL-200 Compressor Limiter for tracking vocals. It colors the sound very subtly, while retaining its warmth and transparency. Often I will compress a vocal performance quite a bit. This allows me to place it exactly in the mix while maintaining a lot of presence and natural dynamics without sounding too loud. This works especially well when the mix is very dense."

"Summit just keeps coming out with great gear. We can't wait to get our hands on the new MPC-100A Mic Pre-Amp/Comp-Limiter. It is a high quality and great sounding input device that will further enhance our music."

Hear the Warmth

Summit Audio
Soundtracs Virtua V2

Although digital desks represent the latest technology in a modernist pro audio industry, to maintain high performance standards regular software upgrades are becoming a necessary part of studio life. Zenon Schoeppe investigates the refinements of a major software upgrade for the Virtua.

After the confusion concerning the name of Soundtracs first digital console—which was launched as the Virtua, then recently and briefly became the Virtua-only to revert back to good old title of Virtua—and despite the attention that was grabbed by its new DFCI large scale digital desk, the Virtua continues to fulfill a price and functionality niche in a sector that is threatening to become more closely populated. Soundtracs has recognised the importance of its core digital product with the release of an upgrade to the system's software control. It's a sign of these software-driven times that a mere software upgrade should warrant close examination, but the Version 2 development is an important one for the product because it responds to many of the few shortcomings that the desk had on its first release (Studio Sound, November 1996).

The result of the most desired requests on a wish-list compiled from users feedback, Version 2 adds a number of significant enhancements and modifications, and is a pure software upgrade with no modifications to the hardware of the system. It is therefore relevant to the considerable number of existing Virtuas in the field and is now the state of the desk's abilities. However, you won't be able to spot a V2 Virtua by looking at the control surface as the majority of tweaks have been performed in the on-screen displays which have been altered to reflect the release of more of the system's power.

While the company originally marketed the console as having 8 auxes and 8 group buses supplemented by a large number of direct outs that could be addressed, V2 has placed the selection of the busing format into the hands of the user—something it alluded to in a brief introduction to the software control. Whereas before the desk would ask at setup whether you wanted to mix in stereo or surround, it now gives a list of group buses and permits the selection of how many mono groups, stereo groups, and surround stems are required, and similar options now also exist for the aux buses. A mixing bus setup can thus reduce the number of aux buses and employ more group buses with the balance reversed at mixdown. This amounts to more flexibility and is very welcome when mixing in surround where break-off groups can be created for things like dialogue. It's something of a philosophical difference in how Soundtracs approaches the business of allocating the Virtua's resources—rather than allowing the processing to be assigned it's chosen instead to make all the processing available on every channel and concentrated instead on allowing the free assignment of buses. It's a subtle distinction, but arguably significant.

V2 coincides with the arrival of extra control surface pods, essentially channel control sections of the master control surface, but without its massier facilities, which not only increase the amount of physical control available, but also allow operators to alter values and parameters simultaneously on their associated signal paths. Flexibility has also been added to the work surface as channels can be moved around and reorganised on-screen in addition to the touch-fader surface method of locking channels onto the surface.

Talkback can now be routed to external sockets in addition to the buses and auxes with latching and non-latching switch response while a dedicated top-end style auto cut function cuts the talkback when the desk receives talkcode and re-opens it when code stops. Solo buttons can now latch (and interlock) or be momentary.

MS input decoding on any stereo input is now possible with new width controls that are dynamically automated as are MS and AL leg reverse switching. Gates can be keyed from specified sources either before they are processed, or from fully processed named channels.

The rather excellent EQ has been augmented with a 12dB/octave sweepable high-pass filter that can be substituted for a channel's LF EQ band, and the switching of this function is automated. The desk now also supports multiple format mix outs in a variety of analogue and digital simultaneously.

Perhaps the greatest advances in V2 are presented in the desk's automation which are always looked promising, but suffered from some early blind-spots. These concern themselves with what is automatable on Virtua—now pretty much everything you could want—and how this extra data is page 20 >
display of automation data is not there for hard value editing—it is far easier to pick up and adjust a control from the desk surface—but rather it allows this data to be manipulated within the powerful offline mix editing functions and its cut and paste-style capabilities.

The business of showing the large number of channel parameters on endlessly vertical bars is facilitated by the breaking down of the automation screen display into blocks of inputs as they are arranged on the desk controller surface. This display will additionally track and keep up with any rearrangement to the physical controller surface. Access to these blocks of channels is added by drop-down buttons which are assisted by yet more drop-down layers within the desk controller sections. The display then remains splendidly detailed. Most will be content with this, those that aren’t should remember the price. You still get a phenomenal amount of hard control.

Whether you want to admit it or not there is no escaping the fact that Virtua has evolved one of the most powerful automation systems around. Despite threatened competition, Virtua still stands alone in its class. A good desk has just improved markedly. □

**Busing screen**

COPYRIGHT

$title: Soundtracs, Unit 23 D, Benheim Road, Longmead Industrial Estate, Epsom, Surrey KT19 9XW, UK
Tel: +44 1371 388 5000, Fax: +44 1371 388 5000, Email: sales@soundtracs.co.uk
In a world where new cinema sound formats have already rendered 16-bit a thing of the past, the Genex GX8000 24-bit 8-track MO recorder isn’t just the future of film dubbing, it’s the here and now. And the facility to record at up to 24-bit / 96kHz is only one of the reasons why the GX8000 will replace the tape or hard disk recorder in your machine room. The GX8000 locks instantly to timecode or bi-phase – forwards, backwards or even in varispeed. Each track can be slipped independently of the others and up to 16 GX8000s can be synchronised with sample accuracy. And if you’re scoring a movie, a built-in digital mixer allows a stereo CD master to be made at the same time as the multitrack master is recorded.

The GX8000 uses widely-available 2.6GB magneto-optical disks, so there’s no more timecode striping, no spooling time and no more head wear. What’s more, the MO format offers unparalleled safety and stability – the HHB MO 2.6GB disk, for instance, carries a lifetime warranty (100 years).

Amazingly, the Genex GX8000 costs less than some timecode DAT recorders. To find out how it will change the way you work, call HHB for the latest Genex GX8000 brochure today.
AFFINITY

Definitive digital consoles from Solid State Logic

Once we were limited by our own imaginations. Now, SSL technology helps us explode through barriers. See and hear an environment where boundaries have become a distant memory. SSL sparked a revolution by combining powerful DiskTrack and Hub Router technology with high speed proprietary digital processing. The result is a suite of totally automated, fully flexible and compatible studio systems for broadcast and post production.

The ultimate all-digital production system, with total reset and dynamic automation, for multi-format audio requirements. Its flexibility allows systems to be configured and expanded, providing specific application solutions. Ideally suited to large scale productions, and even multi-studio control, Axiom proves highly efficient in broadcast environments ranging from on-air applications through post production to music mixing.

Created for imaginative engineers who seek extraordinary power, speed and flexibility. This system combines dedicated advanced audio editing and mixing tools, with integrated video, for post production environments. All commonly used file interchange formats are supported. Altimix, truly multi-format compatible, is designed for the surround sound future.

SSL’s most cost-effective and compact digital solution for on-air broadcast or post production. Aysis integrates audio processing and multi-format mixing with large scale routing and switching. Inputs and outputs may be distributed freely within the facility, ensuring resources are fully maximised.

Solid State Logic

Our innovations are tomorrow’s standards
The potential of the 1U-high outboard continues to amaze—with ATI’s 8MX2 and Pro™ commanding increasing attention. Dave Foister checks out this highly-specified American channel strip.
Kickin' phat' npunchin' basstasticsoundin'
The appeal of a unit like this depends on two things: assuming of course that the grammar is up to the mark, a factor never in doubt here. The first is how well the individual circuit blocks operate; and the second is the selection of processes the manufacturer has chosen to include. Here approaches differ, with some apparently feeling that their products need an unusual twist in order to get noticed while others believing that going too far beyond the conventional signal path will put purchasers off as they don't want to pay for something they will rarely use. ATI has adopted the latter stance, with a comprehensive collection of standard facilities which most engineers will need every day. As to the first factor, the individual blocks within the Pro' are without exception worthy of consideration as processors in their own right, and to have them all provided in such a convenient format makes for a winning combination.

Studio Sound June 1997

< page 25 control signal is doing before the process is added, just to check that the control settings are in the right ball park.

The same option to derive the control signal pre or post the EQ is available as it is on the compressor, but here dedicated filtering is also provided, with 21dB per octave high-pass and low-pass variable filters, both spanning the range 50Hz-2kHz—drastic enough for almost anything. Again there is a key laser facility as well as a front-panel selectable external key input, which can be linked to the compressor's external control input with a rear-panel switch. Besides this, both dynamics sections have DC control links in and out available; on the back, so that two Pro' units can be set up as master and slave. Note that both processes work on the same VCA by summing the control voltages: the signal path remains the same whether one or both are in use.

The appeal of a unit like this depends on two things: assuming of course that the grammar is up to the mark, a factor never in doubt here. The first is how well the individual circuit blocks operate; and the second is the selection of processes the manufacturer has chosen to include. Here approaches differ, with some apparently feeling that their products need an unusual twist in order to get noticed while others believing that going too far beyond the conventional signal path will put purchasers off as they don't want to pay for something they will rarely use. ATI has adopted the latter stance, with a comprehensive collection of standard facilities which most engineers will need every day. As to the first factor, the individual blocks within the Pro' are without exception worthy of consideration as processors in their own right, and to have them all provided in such a convenient format makes for a winning combination.

Studio Sound June 1997

< page 25 control signal is doing before the process is added, just to check that the control settings are in the right ball park.

The same option to derive the control signal pre or post the EQ is available as it is on the compressor, but here dedicated filtering is also provided, with 21dB per octave high-pass and low-pass variable filters, both spanning the range 50Hz-2kHz—drastic enough for almost anything. Again there is a key laser facility as well as a front-panel selectable external key input, which can be linked to the compressor's external control input with a rear-panel switch. Besides this, both dynamics sections have DC control links in and out available; on the back, so that two Pro' units can be set up as master and slave. Note that both processes work on the same VCA by summing the control voltages: the signal path remains the same whether one or both are in use.

The appeal of a unit like this depends on two things: assuming of course that the grammar is up to the mark, a factor never in doubt here. The first is how well the individual circuit blocks operate; and the second is the selection of processes the manufacturer has chosen to include. Here approaches differ, with some apparently feeling that their products need an unusual twist in order to get noticed while others believing that going too far beyond the conventional signal path will put purchasers off as they don't want to pay for something they will rarely use. ATI has adopted the latter stance, with a comprehensive collection of standard facilities which most engineers will need every day. As to the first factor, the individual blocks within the Pro' are without exception worthy of consideration as processors in their own right, and to have them all provided in such a convenient format makes for a winning combination.
ULTRA-CURVE A 24-Bit Dual-DSP Processor Mainframe With Auto Graphic EQ, Real Time Analyzer, Parametric EQ/Notch Filter, Feedback Destroyer, Limiter, Gate, Input/Output Level Meter, MIDI Implementation, Delay Option And More.

PARAMETRIC EQ/NOTCH FILTER
3 bands per channel of parametric equalization with +16 to -48 dB of gain range, fine-tunable between 2 octaves and 1/60th of an octave.

DIGITAL STEREO 31-BAND, TRUE RESPONSE, AUTO-Q GRAPHIC EQUALIZER
Up to 100 EQ curves can be named, stored, copied, inverted, added and subtracted. True response ensures that WHAT YOU SEE IS WHAT YOU GET!

FEEDBACK DESTROYER
Any of 6 parametric EQ bands can "seek and destroy" unwanted feedback frequencies dynamically. A perfect solution for all live applications.

INPUT/OUTPUT METERING
The ULTRA-CURVE offers full input/output high precision metering capability. Permanent RMS and Peak reading as well as various reference levels are a matter of course.

REAL TIME ANALYZER
High-resolution RTA with Peak, Hold, Variable integration time and 10 user memories. A noise & sinewave generator enables for automatic room-equalization.

LIMITER, NOISE GATE
Limiter with variable threshold and IGC protects against overload without distortion. Digital Noise Gate with IRC provides a level-dependent expansion ratio for "jitter-free" performance.

These pictures only tell part of the story. If you're involved in sound installation, touring sound or simply looking for an ultimate digital signal processing "tool kit" for your musical suite, audition the ULTRA-CURVE.

UPDATE V2.0, NOW ON THE WEB! WWW.BEHRINGER.DE • MIDI-SYSEX-CONTROL & DATA DUMPS • TOTAL-REMOTE VIA PC • EQ-DESIGN • FASTER GATE & LIMITER • NEW 20-BIT CONVERTERS

BEHRINGER Spezielle Studiotechnik GmbH Tel. +49 (0)2154-92 06 0, Fax - 42 85 23
BEHRINGER UK Ltd. Tel. +44 1483 - 45 8877, Fax - 45 8822
BEHRINGER France S.A.R.L. Tel. +33 4 - 7804 4410, Fax - 7804 4429
BEHRINGER Espana S.L. Tel. +34 (9) 1 760 1398, Fax 1 383 5052
BEHRINGER AG Tel +41 (0)56 - 210 9555, Fax - 210 9556
BEHRINGER Austria Ges. mbH Tel.+43 7216 85181.
BEHRINGER Benelux b.v. Tel. +31 (0) 73 - 513 0000, Fax - 513 0778
SAMSON Technologies Corp. +1 516 364 2244, Fax 516 364 3888

Your Ear Is Our Judge http://www.behringer.de

www.americanradiohistory.com
HSE EQ1

Traditional Swiss sophistication finds itself at home in this new high-quality studio parametric equaliser. Terry Nelson puts it to the test.

The moment the HSE EQ-1 parametric equaliser comes out of its box you get the feeling that it means business. The stereotype of Swiss excellence in hand-crafted equipment made by small companies is borne out here, as the EQ-1 oozes the necessary indications of quality and functionality. But does the world need another parametric equaliser? HSE seems to think it does and after some fairly intensive testing, I think I would agree with them.

The EQ-1 comes in a standard high quality 2U-high rack chassis with a suitably thick 'champagne' front panel and custom-turned aluminium knobs (you won't get replacements for these off the shelf). It features four fully-parametric EQ sections per channel plus variable high-pass and low-pass filters and input gain controls.

The EQ sections are identical and with cut/boost control (+15dB) and centred Q position, variable Q (0.5-10) and sweep frequency control. In addition, there is an illuminated EQ IN-OUT push-button and a RANGE switch with three associated LEDs indicating Low (L), Medium (M) and High (H).

Repeatedly pressing 'sawtooth cycles through the LEDs and selects one of the three frequency ranges: 10kHz-300Hz, 300Hz-1kHz, 1kHz-30kHz.

The master section features low-cut and high-cut filters plus illuminated in/out push-buttons, input gain controls (+20dB with 0dB default), green signal present LED (threshold at 40dB), red overload LED, SW, LED (more later), master EQ detent for each channel and stereo unlink switch.

The overall impression made by the EQ-1 is very sober and workman-like. Admittedly, HSE says it prefers to invest in hand-picked components and advanced circuitry rather than frivolous cosmetics, but it's not the way I'd have styled it.

Connection is via balanced XLR connectors and there are two trim controls—factory set to unity gain—should any fine tweaking be required to balance the channels or suit studio operating levels. The EIC mains connector features an integral on-off switch so once the unit is in the rack, you turn it on and off and leave it. The final connector is a mono 6.3mm jack for a footswitch.

I used a variety of material to test the equaliser, from individual raw tracks through to masters DAT's needing a magic touch. My initial impression was one of extra depth and body to the sound and this is no doubt thanks to the EQ's low-fi band. In fact, the danger when first using the EQ is to over EQ as the sound tends to remain very smooth and it is only when you compare the uncalculated signal with the processed signal that you realise just what a difference it makes.

Rather than employ a hard bypass, the unit functions as if all gain pots are set flat—or as an extremely neutral line amplifier. It does, however, employ 'Fix Q Technology' which means that the Q factor stays constant whatever the gain setting, unlike equalisers that reduce Q with gain.

I found the equaliser very capable of picking out instruments that have been buried in a mix—or not been mixed high enough—and bringing them out without affecting the overall balance adversely. Some careful adjustment of the Q and gain produced some very interesting results. Setting two of the EQ sections close together in the same frequency bands and boosting one while cutting the other did not have any detrimental effects either—and proved useful with a female vocal track where I could take out some lower-mid while adding warmth just a bit higher.

Initially, I must admit to having cast the equaliser in the mastering category, but while it fits perfectly here, it has much more to offer. The EQ-1 works perfectly as both problem-solver for difficult tracks as well as enhancing good ones and manages to stand out itself and in overall 'shine' without any hint of being over-treatment lacking. And as a sound shaper it is great—was able to fine tweek sounds without any of the harshest or loss of depth that can be characteristic of other units.

The mono jack mentioned earlier gives access to the switch function and this allows two layers of switch status to be programmed and switched with a footswitch (or any other closed contact).

Programming is simplicity itself: set up Layer 1 and then Layer 2 (indicated by the SW LED). You can then toggle between the two layers for different EQ settings as required. All switch operations—with the exception of the LP/HP filters—are silent so you can change settings during recording, mixing, transmission or whatever.

The HSE EQ-1 represents what is virtually a custom-made parametric equaliser at an 'affordable' price—expensive but not ridiculously so. It looks good, sounds great and can be used in any application where creative or corrective equalisation is required—from single sources to finished product. Top of the class.
Brauner VM1

The choice of microphones available has never been wider; so the issue is now one of quality. Dave Foister tests a German valve mic

The rebirth of the microphone has had far-reaching consequences. It has spurred on the top manufacturers to rediscover their past, it has encouraged smaller players to re-invent themselves with much higher aspirations, it has brought us hitherto unknown delights from the former Soviet territories, and it has enabled a selection of very small companies to offer us their visions of the ideal microphone. One such is Dirk Brauner's VM1.

If you didn't know that the VM1 was German, you'd soon guess. Every detail smacks of precision and quality, and plenty of unusual details are there. It is (naturally) a valve microphone with a clearly-visible dual diaphragm capsule reminiscent of a well-known competitor, all the way down to the big screw in the middle. The capsule, like the rest of the microphone, is hand-built, and sits in an open-mesh cage atop a substantial cylindrical body, all with a familiar satin finish. Being a valve design, there are no controls on the microphone itself, any adjustment being made from the power supply.

Support attachment is by means of a large suspension mount, supplied as standard, with a novel means of holding the microphone. The body slides into a metal sleeve, and plastic collars top and bottom are turned to tighten internal circular clamps, making for a very secure arrangement. The mount's angle is adjusted with a lever-operated clamp, which the manual admits is so far over the top as to risk breaking something if it's over-tightened. The result is that even such a heavy microphone looks as reassuringly as it possibly could be, although the danger of a badly-arranged stand toppling over is still present.

A substantial white cable terminates in Tuchel multicore links the microphone to its power supply, which is itself quite eye-catching. It appears to be intended to form part of a modular rack, with all the connectors on the back and the necessary controls on the front. Connectors comprise IEC mains in with an illuminated rocker switch, microphone in and XLR out, the last having an associated 3-position ground lift switch. This provides hard grounding from signal screen to chassis, complete disconnection, and soft grounding via a capacitor.

The front is dominated by a single knurled silver rotary control for polar pattern adjustment. This offers the unusual luxury of being infinitely variable from omni to fig. 8 rather than a multi-position switch, a feature I can only remember seeing before on a very few top-end microphones. While the nine standard settings often provided elsewhere may be more than some people feel they need, the fine in-between adjustment offered by the VM1's arrangement can sometimes make all the difference. The only other control is a toggle switch for a 10dB pad, which when on turns the power indicator LED from red to green. No low-end filtering is provided.

The manual is a joy. It looks to have been individually printed on Brauner's ink-jet printer, and all the illustrations are pencil drawings. This is not to suggest that they are crude; in fact they are almost works of art, with a texture and detail that comes across better than a poorly-reproduced photograph would. Not that there's much to say in the way of instructions, other than to explain how to get the microphone into its mount, which without the manual's explanation of which screws and marks to line up is something of a challenge.

What the manual does do is go out on a limb with claims about accuracy, transparency and all-round quality which could leave it looking pretty silly if the microphone's performance was anything other than excellent. Happily it lives up to the claims, the moment I pushed the faders up I knew this was something special. Forget preconceived ideas about valves being warm at the expense of top, or present at the expense of clarity; the VM1 is as open and natural a microphone as you could wish to find. The top seems to go on forever, placing nothing in the way of a cymbal's sparkle when used over drums and delivering all the subtleties and air of the upper end of a good piano. The bottom never suffers, the piano retained all its depth alongside the transparent top.

With a pair of VM1's to try, the piano and kit had space on its own, and I was also able to rig 90° fig. 8's for an a capella vocal group. This worked immediately, showing a superb screen image, and the full clean vocal sound continued with a close vocal on candelabrum. One or two of the voices I recorded would have benefited from a bit more flattery than the VM1 provides, but that's not the microphone's fault; this is a marvellously delightful microphone that deserves close inspection by serious microphone users of every kind.

June 1997 Studio Sound
STATUS
SIMPLY INGENIOUS

These days, buying an audio console is far more complicated than it used to be. There was a time when console decisions were easy. Fashion determined which name to buy. Huge consoles with huge price tags ruled the day. Not anymore! We at Otari want to make today's console decisions painless. The top level of technology is available right now. At a truly amazing price!

Introducing the Status:
Digital control of analog signal path • Master Status Switching • EAGLE Automation with Snapshot Reset of routing and switch functions • Image Recall of all EQ, Aux busses, Panning & Mic trim potentiometers • Fader & Mute Automation on Mix & Channel paths • Metal TT patchbay versions • Optional Moving Fader Automation • Available in 3 frame sizes

Status is way more than a symbol! See your Otari dealer -

AND AUDITION A STATUS

Otari Inc. • Japan
Phone: +81-(0)424-81-8626 • Fax: +81-(0)424-81-8633
Otari Corporation • USA
Phone: +1-415-341-5900 • Fax: +1-415-341-7200
Otari Singapore Pte., Ltd. • Singapore
Phone: +65-284-7211 • Fax: +65-284-4727
Otari Deutschland GmbH • Germany
Phone: +49-(0)2159-50861 • Fax +49-(0)2159-1778

http://www.otari.com

And Consoles and more...

www.americanradiohistory.com
Zefiro Acoustics ZA2

So you need to get audio into your PC, but you're confused by the selection? Rob James does some of the leg work for you.

There has been something of a deluge of interface cards to enable the PC literate to get sound into and out of IBM clone PCs of late. These range from simple 0I/0I soundcards that offer analogue input and output in consumer formats through to those with General MIDI and maybe Wavelet synthesis, to cards dedicated to I/O with analogue and/or digital interfacing. Simple cards offer record or playback, while more complex cards allow simultaneous record and playback, sample-rate conversion, and so on.

One newcomer to the field, the ZA2 from the American Zefiro Acoustics, is interesting for a number of reasons. For a start, it offers true AES-EBU interfacing in addition to the SPDIF and Toslink (optical) consumer digital interfaces commonly found on more affordable cards. There is also an analogue output for monitoring purposes. To digress for a moment, I have yet to find an internal interface card on which I would be happy to use the onboard converters for anything other than monitoring. A PC is a very noisy environment not designed with analogue audio in mind. Introducing analogue signal and expecting it to survive unainted is asking a lot.

The Zefiro hardware consists of a half-length ISA bus PC card with phono socket for SPDIF digital I/O, two Toslink connectors for consumer optical I/O and a 15-pin D-connector, and a breakout cable that terminates in two XLRs for AES-EBU I/O and twophanos for analogue monitoring. Future hardware developments slated are breakout cables with BNC connector for videodock and LTC SMPTE time code I/O. Drivers to enable 20-bit recording under DOS are already available. Basic software is included that allows recording and replay of WAV files and real-time playback of MPEG1 Layer 2 encoded files. The Crystal Semiconductor DSP engine (CS4290) that powers the ZA2 was originally designed as an MPEG1 Layer 2 real-time decoder, hence you get this function thrown in. The UK package includes the manufacturers' disk of drivers and an update disk from the distributor with any later versions since the card left the factory. Future software updates are obtainable via download or on a diskette.

There are Windows drivers to record or playback from a variety of popular editing packages such as Soundforge, the shareware Cool Edit. Cakewalk Pro Audio, Cubase, WaveLab, and so on. Although not currently endorsed by the manufacturers the ZA2 is reputed to be the card of choice for Soundforge programmers.

Also included is DOS software allowing data backup to an audio DAT machine. A 120-minute tape will store 1.2 Gigabytes of data. Additional Reed-Solomon error correction and a 32-bit checksum on each block should assure data integrity with anything less than calamitous tape problems.

I wish I could say installation is a doddlle—it can be, if you're lucky otherwise, unless you are familiar with DMA and IRQ, and the other horrors that lurk under the hood of a PC, then leave it to the company that supplies the card either to install or advise you. This criticism is not aimed exclusively at the ZA2 as, unfortunately, it applies to all the audio I/O cards I have come across. A further lurking nassiness, which Greg Hansen at Zefiro has researched, is the propensity of some manufacturers of graphics cards to use software drivers that 'illegally' lock up the PCI bus to enhance the performance of their products. For most normal applications this has no discernible effects, but for audio interface cards it can be terminal, resulting in glitching or channel swapping. In practice, although my PC has a graphics card from one of the offending manufacturers, I had no problems.

Also applicable are the usual caveats when using PCs for audio: you need the fastest CPU you can afford, at least 32M of RAM and a big, fast, hard disk drive to avoid disappoinment. I managed to install the ZA2 in about an hour after a few dramas over IRQ (interrupt ReQuest) conflicts. I first used the built-in test tone function to check channel assignment. Recording audio using the freebie Wave Recorder that comes with Windows is a doodle (I used a Yamaha O2I as a convenient digital source). The ZA2 immediately recognises the sampling rate and whether there is copy protection. If the destination file sampling rate is different to the source, the ZA2 automatically converts. When conversion is taking place, the card can only operate in simplex mode—either record or replay. Where rate conversion is not required it can operate full duplex. If you have sources connected to all three inputs you can switch between them from a Windows driver. The driver also allows AES-EBU subscales, and the SCMS and pre-emphasis bits to be set on the output. I also tried out the card with Cool Edit. The card performed without drama or fuss. If you need a simple no nonsense way of getting AES-EBU signals into and out of a Windows system at reasonable cost take a look at the ZA-2.

<page 30> 1024 inputs and five fully configurable outputs

Outputs have a choice of Linkwitz-Riley, Butterworth or Bessel crossover with slopes selectable between 6dB to 48dB/octave. Channels have high and low pass filters, HF and LF shelving, two parametric bands, phase alignment, limiting, compression and noise reduction. Delay is programmable in 21 microsecond increments to one second on the inputs and 300ms on outputs. Klark Teknik. Tel: +44 1562 741515

Rane on parade

Rane has introduced Engineered Conference Systems (ECS), a line of electronics for engineered and audio teleconferencing, distance learning, boardroom and courtroom applications, plus a new DSP multiprocessor, the RPM 26. ECS is RaneWare RW-32 software-controlled and features automixers, echo cancellers, telephone access (two-four wire), remote setup and diagnostics with password protection. It is a system rather than a selection of products, and was conceived as such from a field perspective.

The system is predominantly software programmed and controlled, using a serial port on a PC or Mac Power PC. There are currently five distinct products and others are slated for introduction in 1997. At the heart of the system is the Base ECB-6 unit which interfaces with all other ECS products and external devices. To dedicated the Base, the Modular ECM-R, which was designed specifically for teleconferencing and distance learning. Each can accommodate up to eight sources, and six autoximeters can be used with a Base ECB-6 to give a total of 48 inputs. The mixers interface with each other and the Base unit via a proprietary protocol and feature echo cancellers. The ECA-1, can form an internal part of the mixer. The ECS-6 stereo option allows the Base unit to process stereo programme material and mono signal sources while the ECT-1 telephone interface provides access to the telephone service and serves as an interface with the control system (such as AMX or Crestron), the Base unit and the programming computer. ECS integrates with other Rane products such as the RPE 228, equaliser and MA 65 multichannel amplifier.

The RPM 26 DSP multiprocessor contains all signal processing required between the mixer and amps in small to medium sized installations. Using preprogrammed configurations and RaneWare software, the RPM 26 provides signal-processing functions including high and low cut filters, compression, delay, crossover, parametric EQ, splitting, input summing, limiting, level control and sine wave or pink noise generation. It contains two analogue inputs and six analogue out-
The totally integrated digital recording, editing and mixing solution, by Fairlight.

If you’re searching for the world’s fastest 24-track workstation equipped with 36-input motorised fader mixing, total dynamic automation, assignable dynamics processing, integrated machine control, stereo and surround monitoring, then all you need is FAME.
For the times when your work demands the 'Fairchild' sound Zenon Schoepe examines a Danish solution to a long-standing problem

It's amazing what a bit of weight does to add substance to a piece of kit. Somewhat, a box that is slight and featherweight doesn't encourage confidence no matter how clever the chips and solid-state circuitry may be. But Fairman's latest creation, the TMC tube master compressor, weighs in as a super heavyweight.

This mass is one of its most surprising revelations particularly as the company's original unit, the TRC Tube Recording Channel, while large felt a little small-boned, and almost fragile. The TMC combines a Fairchild 670-650 compressor clone with Pulver EQ-PM mid and EQ-PIA high/low clone EQs in a single channel for mic, line and instrument inputs. The TMC is a rare simpler proposition presenting as it does a clone of the Fairchild 660-670—it's a stereo program compressor, and, for all intents and purposes, it's a copy. Inside there is an array of 16 valves awaiting your command—four per pair for the detector circuits on the VCA (claimed to be identical to the Fairchild 670's) per channel, plus a monser rectifier for the high voltages. The valves are ECC80s as the original 6668s are now extremely scarce. Fairman is taking this seriously.

The presentation is a substantial improvement over the look of the TRC, and the TMC benefits from flush-mounted mechanical VU meters, monser long-throw switches and whopping great knobs for the rotary switches that would rate well in a 1950's sci-fi B-movie's idea of high tech. The whole lot sits in no less than 6U of rack space and needs industrial-grade rear support if it's not to rip the rack strips from the cabinet. It's heavy because the chassis is heavy and it employs in and out transformers that are MU metal-cored Lundahl's.

The weight of the unit is all the more remarkable given that the device employs a separate power supply connecting via multipin umbilical. Power on and the box takes a few seconds to come up to temperature with the VU meter needles sweeping up to zero to tell you that it's about ready for you. Back-panel connectors are on XLRs and these are accompanied by four fuse slots, an earling bar and an ear-kill toggle switch.

Each channel is identically featured, but the two can be strapped together on a switch. Metering can be switched for +10dB operation and display gain reduction or output level and has zero adjustment screw access. Each channel has three rotary control switches under the control of a bypass switch which inexplicably is labelled +24V. You're presented with a 20-position gain make-up control, 20-position threshold control (both are 0.5dB steps) and six preset attack and release constant combinations. The last of these refers to the attack and release time settings with two letters giving an indication of their settings. Thus you get FF, FM, FS, MF, MM and SS with F standing for fast, M for medium and S for slow—not exactly specific—but then this is the sort of vagueness that builds the mystique.

This unit does wonderful and beautiful things to music. Musically, it is an expression that all manufacturers feel they have a right to use when describing their gear, but it's the word I would use to describe what the TMC is all about. There is enough variability available through the six presets to cover most eventualities and in those instances where they straddle the type of envelope you want, it still sounds so good.

The FF setting is a fine starting point although MM would be ideal for vocals and FS is the setting of choice for bass. It's all tremendous stuff, and so beautifully flattering on stereo programme material because the impression it gives is that the whole signal, and not just the hits you are most susceptible to, is being processed. It sounds the way you'd imagine compression ought to sound, but often doesn't in practice. Full and rounded, more of everything, and closer to you in the room.

About the only thing you won't get from the TMC is the smell of old valve gear and that horrible feeling of iniquity and underachievement you get when you ask the price of something that you really like, only to learn that it is so outside your means or capabilities as to make it academic.

At a US price of around $4500 (plus VAT) it will still make many wince, but you have to bear in mind what you would be expected to pay for an original in sound and working order. Bargain it may not seem, but it could be construed as value for money and it is a great thing. This is a wonderful and effective box, with a sound that is worth every penny.

NEW Technologies

Small mic cuts a dash

Designed for TV and broadcast applications, the compact Schoeps CMXY 4V stereo microphone can be used for single speakers, table discussions, on a boom or as a stereo spot microphone.

The microphone has three sections, the first of which consists of two rotatable cardioid microphones with lateral sound pick-up which are closely adjacent to one another. The second section consists of a swivel in which the two microphones are held, allowing the microphone section to be tilted into the desired direction. The third sec-

Octavia goes 96kHz with dCS

Studio Audio & Video has chosen Data Conversion System's 96kHz 24-bit converters to complement the new high resolution editing features of its SADIE3 software. The dCS 902 and 952 DACs and DADs have been designed for high speed operation, while a set of standard inputs and outputs enable them to be used in a wide range of digital audio applications. The units use a proprietary, multibit oversampling technique that achieves low differential nonlinearity and gain M. The dCS 902 and 952 DACs also have access to an on-board memory. The 902 is said to be able to achieve up to 96kHz at 24-bit.

Dynaudio surround

The C4A is the culmination of...
Compact functionality - STUDER 928

Analog Mixing Console for various applications in broadcast, sound recording and theater

STUDER 928 features a broad performance spectrum, high functionality and an amazingly low price. Due to the modular concept a great variety of mixing console configurations is possible which means that it can be accurately tailored to your specific needs. Upgrading to surround sound is possible. But there is more: The STUDER 928 fulfills our uncomprising quality and safety standards. This is ensured by STUDER transformers at all inputs and outputs and high-quality VCAs.

H A Harman International Company

STUDER Professional Audio AG, Althardstrasse 30, CH-8105 Regensdorf-Zurich Switzerland, Phone +41 1 870 75 11, Telefax +41 1 840 47 37, http://studer.ch/Studer

Direct-Subsidiaries:
Austria: +43 1 886 54-0 France: +33 1 45 14 47 86 Germany: +49 30 72 39 34-0
U.K.: +44 181 207 50 50
Canada: +1 416 510 13 47 Japan: +81 3 34 65 22 11 USA: +1 615 399 21 99
Singapore: +65 225 51 15

www.americanradiohistory.com
Focusrite Green Channel Strip

The latest item in this affordable coloured range, Zenon Schoepe investigates the direct to tape route

After the initial surprise generated by the cosmetics of Focusrite's Green series processors I have to admit that the look of these units has grown on me. There's actually something quite chunky and workmanlike about the high density of controls that this Channel Strip presents, although the centre detented pots still don't quite manage to line up the caps markers with the 12 o'clock position.

It would be tempting to think that Focusrite has simply re-packaged and recombined existing processing sections from other Green units in this single channel device, but closer inspection reveals that it's not quite the case. While it's highly likely that the preamp section is extremely close to that found in the rest of the range, the EQ and dynamics sections are subtly different. For example, EQ is 4-band ±18dB with swept peaking mids, high and low shelves plus high and low pass filters, and default 6m/s. This section is hypasseparable as it is the compressor which has Fast (1.5ms as opposed to the default 6ms) attack and Auto Release switches, variable threshold, variable ratio (1.5-10:1), variable release (100ms-4s) and a Gain makeup pot. Key input is also selected from this area. The input section can handle mic, line and instrument inputs with the selection of line or instrument instigated by a anticipetowel click on the mic gain pot. The instrument input is selected inconveniently on the back panel where you'll also find the high impedance jack socket and its selection is indicated by an LED on the front panel. Switches are also provided for phantom and phase reverse along with a centre-detented fine gain pot and an overall output level control.

Metering continues Focusrite's novel and useful implementation of combining bar graph VU display of the input in one mode with the simultaneous display of gate or expander activity and gain reduction in a dynamics mode. It sounds as if it would be confusing, in practice it really works well. Clever.

I have to rate the Channel Strip as a very rounded and complete single channel that is ultimately a little more flexible than the Voicebox, with the qualification that the Voicebox is more specific in what it aims to achieve. If you were to stereo link two Channel Strips together, which you can do with rear panel jacks, then this would amount to some powerful and slick processing.

The EQ really is excellent, less resolution admittedly than the Focus EQ offers, perhaps predictably, but still a good deal better than you'd likely get on anything less than a middle of the road board. Focus got very strong marks with the rare luxury of superb high and low pass filters. And it's a true all-rounder, and you can track and mix through it.

The dynamics are exceptional with so much variability and fine control afforded by the options of gate or expander selection and the various switches on the compressor plus internal or external key selection with or without the filters.

There are so many little twists and conveniences provided on this IU box, Focusrite should develop a Green console based around this unit.

Mic and line performance is predictably sound, but, as with the Focus EQ, you have to wind back heavily on the gain when using a guitar input as this stage runs unusually close to the limits of the overload LED indicator.

What I like about the Channel Strip is that Focusrite has not simply transplanted sections from other Greens, but has instead paid attention to the arrangement and capabilities of the unit to give it its own personality. It's incredibly versatile, and as such is the excellent processor in an outstanding range.

while this arrangement is similar to that found on the Focus EQ, the frequency ranges are certainly not the same. Low and high pass filters are 12dB-octave affairs covering 65Hz-25kHz and 15Hz-10kHz while the HF and LF cover 30-480Hz and 2.5-18kHz respectively. The mid cover roughly the same range as the Focus EQ (40Hz-1.2kHz and 600Hz-18kHz), but are available on the single travel of the frequency pots rather than employing the multiplier dividers switches of the Focus EQ.

Q is switchable between 0.7 and 2.5 on the low mid and 0.5, and 1.1 on the high mid. The filters can be bypassed on a switch and inserted into the side chain of the dynamics section.

Dynamics are not a done of the Voicebox, nor, for that matter, a direct lift from the dual channel Green Compressor-Limiter. Again the approach is unique to the Channel Strip. You have the option of a gate or an expander with variable threshold and release (100ms-4s) plus a Fast attack switch that activates 70 microseconds response rather than the

NEW TECHNOLOGIES

< page 34 12 months research and development resulting in a 3 or 4-way system designed to work in any control room without the need for special flush mounting or acoustic redesign.

The system uses an acoustically optimised asymmetric enclosure and modular Active Bass Extension System (ABES) units which are controlled by an analogue, or optional digital, active system controller. This technique means that a fully modular system can be created to suit almost any size control room or SPL requirement.

Each system can be customised for individual studios with three amplifier and crossover options giving expandable power configurations from 1kW to 5kW. Maximum SPLs of up to 126dB can be achieved at the missing position in typical rooms of up to 100m2.

Dynaudio, Tel: +45 86 523411

Tape saturation

Complementing its digital red products, SPL's Machinehead digital processor is claimed to simulate the tape-saturation effects of analogue tape machines. The sonic effect is said to increase loudness, power and warmth. Intended for use with solo instruments or complete mixes, controls are provided for input and output gain, drive and HF damping. I-Fs are AES-BDU and SPDIF with wordclock, MIDI control and a computer interface.

Beyerdyneic, Tel: +44 1444 256258

Mandozzi Electronics

The ME-DART portable digital-audio recorder and editor has built-in codecs and ISDN terminal adaptor and is designed for use by broadcast journalists. It records 7, 10 or 15kHz, mono or stereo audio in linear mode without audio compression. Recording is done on laptop computer PCMCIA hard disks and the machine features built-in CCITT G.722 and ISDN recorder and SPDIF II. Codecs as well as an ISDN terminal adaptor and transmits the edited contributions in real time via ISDN. It is battery operated and designed to be light, robust, splash-proof and easy to operate.

Mandozzi, Tel: +41 91 9452351

New cards for Akais

Akai has a number of card options for its DR8, DR16 and DDB family of hard disk recorders-editors starting with the IB809E ethernet interface which allows control of the aforementioned units by the DL1500 system controller. The facility was previously only available on the flagship DD1500.

The DL1500 adds remote control of multitrack recording, enhanced editing, a precision jog wheel, multilevel Undo, a QWERTY keyboard input and control of on-board mixing functions. An LCD and

June 1997 Studio Sound
The addition of a new Compressor/Limiter to any SYSTEM 9098 product family is justified by the continuing popularity of the famous old 2254 devices I designed in the late 1960s. More than 25 years later, their performance undeniably still brings benefits to engineers and producers seeking inconspicuous control over the dynamic range of microphone signals. Just as importantly, they are used today in digital recording to manage critical levels, to preclude the effects of hard, unforgiving clipping and to impart warmth.

In those days, the Compressor/Limiter had to be almost all things to all men. Controls had to be accurately calibrated for the broadcaster and have the right subjective 'feel' for the music engineer. Attack and decay times, the 'rate of change of slope', the order of harmonics generated by the non-linear transfer characteristic etc. were arrived at empirically after a lot of listening with golden-eared people. The result was a Compressor/Limiter, the 2254 and its later derivatives, which sounded right and over the years achieved an amazing reputation.

The same principles have been applied to the new SYSTEM 9098 Compressor-Limiter. Considerable advances have been made in technology and I am now able to provide a much more flexible device which retains all of the character and musicality of the original design while incorporating some exciting new features.

Ratio, Threshold, Attack and Release are familiar controls with recognisable ancestry but an important new feature called Ambience has been introduced.

Operating the Ambience switch does not affect signals above the threshold but reduces or mutes signals below the threshold level. The effect is rather like a Gate but is much more subtle. Not only steady background noise but fluctuating ambience and apparent reverberation time can be reduced at will with the Gain control. For example unwanted environmental sound can be re-balanced, or even eliminated, from speech recorded out of doors. The Ambience control will also regulate reverberation - for example, a large reverberant studio can be made to sound like a small speech booth.

The 9098 Compressor-Limiter has a totally analogue signal path which employs transformers at both the input and the output. For the highest possible performance, input and output interfaces must be insensitive to anything other than the signal we want to receive - or there is little point in striving for excellence in the unit itself.

The heart of a Limiter or Compressor is the gain controlling device. The original 2254 used a diode bridge in a classic balanced ring modulator configuration. A very similar technique is used in the 9098 Compressor-Limiter except that semiconductor devices and amplifiers have greatly improved in the last 30 years. For example the original 2254 design had a noise floor of about -55 dBu. Noise performance of the 9098 unit is 35 to 40 dB better.

I believe that the new SYSTEM 9098 Compressor-Limiter continues the rich heritage of earlier designs and its flexibility and extremely high standard of performance will find many satisfied owners in all areas of audio production, whether recording, post-production, mastering or live performance.
TL Audio VP-2051

The growing use of MDMs has created a demand for well-specified outboard processors. Tim Goodyer evaluates a valve contender

You cannot be serious about valve audio equipment and avoid TL Audio. You can be elusive, certainly, if your pockets are deep enough, but if you're looking to cash in on the crotchet of the vacuum tube without bashing the budget, you're going to have to weigh up the Indiago series sooner or later. And if you take into account the growing popularity of 'channel strip' processors—those that combine just about all the elements of voice processing in a single box—the VP-2051, although it's been out for a while, makes a timely study.

Having established its colour, its purpose, the nature of its circuitry and its general pricing, it should come as no surprise to learn that the 2051 is a single-channel unit incorporating a mic-line preamp, compressor and equaliser. It employs six valve stages: one in the preamp, two in the compressor, and three shared between the four EQ bands. The panel layout is cluttered and holds no surprises, more of a series of reassurances—running left to right, the sections follow the signal path and place the compressor before the EQ, but the inclusion of an up-mix button makes it possible to reverse these stages. The EQ and compressor can be switched in and out and, like all significant operational switching, their status is indicated by LEDs. Metering is via a peak indicator at the input and an 8-segment LED ladder which can be switched to display either the output level or the amount of compression. Compressor ratio and attack time are selected regardless of whether the compressor is switched in or out of circuit and reads in the same direction as output level, not with the scale reversed. To make this function a little easier to recognise, an orange LED indicates gain reduction metering.

The presence of an instrument input (on an unbalanced jack) on the front panel is an indication of the thoroughness of the 2051's design. The rear panel reveals the expected balanced mic input and output XLR connections, an additional XLR to accept a balanced line-level input, side-chain input on 2-pole jacks, a link jack for stereo operation of two 2051s, and two further jacks for unbalanced input and output connection. Signal levels are pro +4dBu on the XLRs, and sympro -10dBu on the unbalanced jacks, with the output metering set to correspond to 0dB on both. Between these audio connections and metering alignment, the unit can be readily run in just about any conceivable setup. Compare this with, for example, the more costly Focusrite Green Voicebox where you'll find just two XLRs for audio: a balanced mic in and balanced line out.

Returning to the front of the 2051, we find that as well as level trim, the input section includes 48V phantom power, phase reverse and a 901Hz high-pass filter. The compressor is a friendly affair operating a soft knee with the threshold variable between +20dB and -20dB, ratio variable between 1:1.5 and 1:30, and gain make-up of up to +20dB. Compressor dynamics are limited to slow and fast switching of the attack and release—0.5ms or 20ms attack and 40ms or 2s release. While the declared purpose of the unit is for vocal use, I found this up to everything I threw at it without wishing for manual controls. The EQ, meanwhile, offers 2dB of cut or boost in four bands—an LF shelf switchable between 80Hz and 120Hz, a lower mid band switched between 250Hz, 500Hz, 1kHz and 2.2kHz; an upper mid band switched between 1.5kHz, 2.2kHz, 3kHz and 5kHz; and an HF shelf switchable between 8kHz and 12kHz. Note the overlap and duplication of the 2.2kHz frequency. In operation, the EQ is smooth and ideally suited to enhancing a vocal, thanks largely due to the low (0.5) Q of the mid bands. You could find it wanting in more desperate situations—salvage jobs or difficult live situations, for example. The Green Voicebox EQ might have the edge in such cases as, although it has just one swept band, its frequency settings are not stepped and its Q is considerably lower. Indeed, it's easy to make a strong case for the Focusrite unit in the live situation as it is smaller and lighter than the 2051 and isn't full of glass.

The TL unit signs off with its output section containing output attenuator and the meter. It also contains the master 'up' button which, with the rear-panel jack, allows the control voltages of two 2051s to be commongröf for stereo operation.

I have heard it said that the value of an instrument processor is to Tony Larking—the 'TL' in TL Audio. I don't think I'd go that far, but it's hard not to recognise the appeal of the Indiago-series units. So the 2051 is probably better suited to life in the studio than life on the road, but then I'd have liked, if I'd not got quite enough between the valves, and it is now a regular part of Alanis Morissette's touring rig. Ultimately, everything it has is classy, up to, and including, the valves—which definitely give it a character over and above many competing units including its own Crimson solid-state stablemate. The 2051 comes out well featured, well voiced, well priced and well received.

NEW TECHNOLOGIES

< page 36 Large colour-coded keys are provided in addition to 8-VGA display connection in a package that allows to all the facilities offered by the DD1500. Software permits networking of six DD or DR units for a maximum of 256 tracks.

The IE880HG general purpose I-O allows the custom application of any remote control system using GPIs. A total of 16 GPI inputs are provided for talk arm and transport functions while 12 GPI outputs can be used for such things as reading talk tally.

The company has developed an 8-in/16-out ADAT interface for the H16, which has applications for users of Yamaha's O2R desk, an 8-channel AES-EBU I-O board and an 8-channel TDIF IO board. Akai UK: +44 181 897 6388

A&H 8-bus

Allen & Heath's WZ20.8.2 8-track recording console has stereo cue and effects routing plus a midtrack switch that reconfigures the multitrack signals to the channel facilities.

It has 8 mic-line inputs on balanced XLRs or jacks with inserts. Each of the six auxes are on individual controls and EQ is 4-band with two sweeps. Six stereo line inputs have 2-band EQ and full access and 100mm faders are used throughout. Additional features include an oscillator and talkback.

Allen & Heath. Tel: +44 1326 372070. E-mail: 106030.1426@compuserve.com

Libra Live

The Libra Live digital console has been specifically designed for broadcast production, but is based on the Libra music recording desk architecture. Using the same processor and I-O hardware as Libra, dynamic automation and music recording controls have been replaced with live production functions such as the ability to switch in a backup microphone. Input channels can route to console-wide output, auxiliary, mix-minus and subgroup buses. VCA-style groups can also be created and each input channel, group or output can be configured with filters, EQ, dynamics and inserts in almost any order.

New features for the 55 Series console include VCA faders and input preselectors. The VCA fader system now provides 8 group master faders to supplement the 8 audio groups which the 55 desk may be already fitted with. The input page 40 >
Sennheiser is the world's leading manufacturer of wireless systems.

But we don't stand still.

Sennheiser now introduces the next generation in radio microphone technology - outstanding, innovative new designs backed by an ever expanding sales and support network across the globe.

So, if you need the best radio systems and the finest service, talk to Sennheiser.

First for radio the world over.
You wouldn't think there could be many new tricks left for microphone preamp designers, unless someone's planning a hybrid clockwork/steam-powered one. CLM Dynamics has managed to spot a gap, however, and has produced a box of preamps with one particular feature aimed at the revitalised interest in M-S techniques.

The DB400s stars as a neat halfway house between the fully-featured mono or stereo units and the 8-knob-in-1U tweeter-operated multipacks. It has four complete preamps in 2U, all with a surprising amount of adjustment capability and metering. Three knobs and six switches on each provide everything expected of a preamp and a little bit more, while a seventh button on two of them takes the extra step into M-S.

In conventional operational mode, all four preamps are completely independent. Each has switchable phantom and phase, and a 2dB pad before the continuous gain pot. Of course, was plugged locally into the mains and hummed merely whichever way the DB400s switch was set.

Mid and Side microphone techniques have always had their adherents, and the advantages for mono compatibility, particularly important in broadcast, are readily acknowledged. Despite this, enthusiasm for M-S has generally been confined to a small minority of devotees—until, that is, the advent of stereo location sound for pictures. Suddenly the need to control a stereo image to match a picture you couldn't see using a monitoring system you couldn't hear meant that a technique that allowed such decisions to be made in post-production was a godsend. This was the hidden bonus of M-S: if the middle and side signals—a front-facing microphone of suitable pattern and a side-facing figure-of-eight—are recorded raw on a 2-channel recorder, the width of the resulting stereo signal can be determined at a later date.

However, the DB400s caters more for those who wish to employ an M-S configuration and convert to stereo on the spot, and allows two M-S microphone arrays to be set up independently of each other at the same time. Each pair of channels can be switched to M-S decode mode, where an incoming M-S signal is converted to left-right stereo with the image width controlled by the S channel's gain control. For reasons that aren't clear, the resulting left signal appears at the even numbered output with the right channel at the odd one; there would appear to be no reason for this illegality, as a simple phase reversal of the S signal would correct this.

Still, it works, and provides a simple means of doing the job. CLM doesn't mess a track, however, and has spotted that the presence of two sum and difference matrices means the two pairs can be chained together to form a general purpose stereo width control, for which detailed instructions are provided. Since the same process converts L-R to M-S and vice versa, the first two channels are used to derive sum and difference signals from a stereo source, which the second pair then converts back to stereo with the width controlled again by the S level. M-S fan Mike Skeet is credited with help in figuring this out, although the principle is pretty straightforward given the right connecting leads.

All this is icing on an already worthwhile cake: the DB400s' plethora of four high quality versatile preamps is attractive in its own right, with many potential applications in and out of the studio.
When "good enough" isn't good enough look to Harrison

Find out why the world's premier producers, engineers, film re-recording engineers, broadcasters and post-production professionals are flocking en masse to Harrison. For some, it's the incomparable sound quality behind history's biggest records and film sound tracks. For some, it's the rock-solid reliability, being able to run day after day, week after week, month after month, year after year without worry. Still others have come to rely upon the world's most comprehensive dynamic total automation system, another Harrison invention. They own Harrison SeriesTwelves - the most sophisticated fully automated mixing console in the world.

Keep in mind that before they all switched to Harrison, they used to own something else.

Harrison

Headquarters
7104 Crossroad Blvd, Suite 118
Brentwood, TN 37027
Phone: 615-370-9001
FAX: 615-370-4906

European Operations
11 Chapel Street
Berkhamsted, Herts HP4 2EA
UK
+44 (0)1442-875-900

Email: sales@glw.com
Web Site: www.glw.com
Amek 9098 Dual Mic Amplifier

The 9098 range now has an MS-capable dual-channel preamp. Zenon Schoepe reports on Amek’s new front end.

Those who have explored the original Amek, Rupert Neve-designed Amek outboard unit, the 9098 EQ, will remember that one of its strongest points was a rather fine mic preamp. Although this could be used in isolation from the device’s elaborate equaliser, the unit could handle just one channel at a time. Recognising the opportunity, Amek has released the Dual Mic Amplifier that combines two preamp sections drawn, like the 9098 EQ, from the lineage established by that mother of all analogue boards the 9098. The DMA also includes a couple of extras, most notably in how it approaches stereo mic processing and also includes, for the first time on an Amek unit to my knowledge, front panel.

The fact that there are two of them means you can take in stereo and even play around with MS as an exercise. However, the lack of an output level control necessitates a little more caution when recording directly to digital media.

I have to admit to feeling a certain scepticism towards the inclusion of DI sockets on this unit—Rupert Neve, the grandpapa of the mixing console, and the electric guitar did not sit together comfortably in my audio universe. But I was surprised with the reality, plug in your guitar and it’s instant new strings. This can only add to the versatility and worth of the DMA which does considerably more than bringing a mic level up to usable.

If you are convinced you could do with some output channel preamps—because you don’t think you have a desk of great distinction, don’t have a desk at all or because you just fancy some—then investigate these. This is particularly the case if stereo is a dimension you’re interested in and if you want the prestige of a ‘name’ brand unit.

The DMA is a well-featured, high-quality unit offering outstanding performance.

NEW TECHNOLOGIES

Dialog4 hails its new miniature MPEG recorder

Dialog4 has extended the choice of location recording recording with the C(Concertos) TAXI which measures 140 x 200 x 40mm. Using Flash-EPROM, the machine can record 40 minutes of stereo with ISO-MPEG. Material is stored in Broadcast Interchange Format (BIF).

Offering mic, line and headphone connections, record parameters like level and limiter settings can be locked in during operation, while an index key allows access to different takes. Finished material can either be transferred as a file or in real-time using the Digital Audio Library interactive program.

Dialog4. Tel: +49 7141 22680
E-mail: dialog4@praudio.de

Crown adds SLM

The IQ PIP SLM module is designed to provide full audio system control and load monitoring for IQ PIP2-compatible amps. With a built-in sine wave generator and data acquisition system for the measurement of load impedance and test voltage levels for real-time testing, the unit fits onto the back of amps without extra cabling and connects via the Crown Bus port.

K series amps are now available in 13 different colour finishes.

Meanwhile, Crown has introduced the PCC1368W phase coherent cardioid mic which is a miniature version of the PCC1768W. It can be programmed for touch on-off and a high intensity LED signals status. Capable of withstanding 120dB without distortion, the mic’s electret-condenser capsule has a frequency response of 50Hz to 20kHz.

Crown. Tel: +1 219 294 8000

newt add ons

A-D preamp

Audio and Design’s MDA System 4 dual-channel mic preamp with 20-bit A-D converters and optional remote control is designed as an accessory to the company’s DMM1 digital mixer. The RS484 control permits gain and phantom power alterations to be made remotely.

Analog Mike inputs are electronically balanced and mic input levels can be calibrated into the A-D while aux analogue outputs are available for local foldback or headphones monitoring. The page 44.
The Penny & Giles Audio Multiprocessor System - universally acclaimed for its sonic purity. A unique approach to audio processing - delivering exceptional transparency, accuracy and clarity. The system's software-based processors can be used many times in a single patch, and on multiple channels if required, with the ability to save and recall all settings.

Construct processor chains and signal routes with complete freedom of choice, selecting the optimum blend of processors for each application. More power, more control and more potential. Access a new sphere of digital audio with the complete multichannel processing system from Penny & Giles.
Martech MSS-10

Martech's new mic preamp has just three things going for it: class, class and class. Dave Foister proclaims it a winner.

For a microphone preamp to be worth having, it must offer something extra compared to a typical console input stage. Some add a specific character: some offer additional facilities, building towards the channel strip in a box concept. For some, the USP remains the sheer quality of the audio path, trading on the assumption that most console preamps are less than ideal and therefore compromise your signal before you've even started. New to this camp is Martech's MSS-10.

Its intentions are clear from its outward design, which is simple, uncluttered and stylish. And it looks expensive, which it is. The shape suggests that it constitutes a module for a racking system, and indeed it is descended from Martech's Mic Pre 1.0d, which with the Equaliser 1.0d formed the basis of just such a range. Here the presence of a big carrying handle on the top, and the absence of the original modules' rear-panel linking, suggests that the MSS-10 is intended for stand-alone use, although a rack for four such modules is available (free with four MSS-10s, and I should think so too).

A huge vu meter dominates, viewed through a shaped and contoured window in a chunky front panel. Two rather elegant knobs control levels, one a switched preamp gain setting, and the other an output fader. These are flanked by six push-buttons in what looks like frosted acrylic, all of which illuminate from within when engaged, some green and some red. The usual preamp facilities are provided by the left-hand three—phantom, 20kHz pad and phase reverse. The former’s situation is not quite as simple as it seems: the unit also has a line input, which can be connected directly to the line driver and controlled with the output fader. Unusually, the mic preamp output is still available on the back when the unit is being used in this mode, tapped off before the line driver.

A call switch bypasses the output fader, and there is a mute switch on the output, which I found particularly useful when using the preamp to feed a multitrack direct.

That's it for facilities: a little more than the bare minimum, but not much. Clearly, then, the appeal of the MSS-10 must lie in its quality, and when such a simple unit carries such a substantial price tag it's more terminal than ever. I've searched and found out what you get for your money. What is revealed is a joy to behold, a superbly designed piece of equipment built to the highest audiophile standards. The earlier Mic Pre 1.0d was available in both solid-state and valve versions, and although Martech started a preference for the valve it also recommended its solid-state circuitry to the valve enthusiasts for its musicality.

The MSS-10 here is strictly solid-state. The basic building block is an all-discrete 14-transistor amplifier board notable for the presence of a yellow LED, invisible from the outside. This is in common with some other high-end designs I have seen, where LEDs are used in preference to conventional Zener diodes simply because their noise performance is better. Four of these boards are used as gain blocks, two in the mic pre and two in the line driver. Other signs of the audiophile approach are electrolytics with Martech printed all over them and a huge can for the input transformer, which again is a custom Martech component produced after careful comparisons of classic transformers and based on a design which had not been made for 25 years. Other notable touches include the obvious high-quality preamp, the meter illumination, which instead of filament bulbs uses 15 yellow LEDs arranged around its edge. The visual effect is the same, but presumably it will never pack up.

Indistinguishable meter lights apart, the thrust of all this careful and expensive design is the sound. The specs themselves are impressive, with figures little worse than a piece of wire, but Martech clearly intend the performance to be judged by the ear rather than the meter. Nonetheless, the line driver's claimed frequency response from 10Hz to 20kHz (sic) within a quarter of a dB is worth mentioning.

But the sound alone is what Martech expects to justify the asking price, and it would certainly seem so to do so. Rarely will you hear such a quiet preamp, or one with such a complete frequency response and low distortion that it seems to open a window on the microphone. The MSS-10 is therefore doing exactly what any preamp should attempt to do, it is delivering the maximum that the microphone is capable of producing to whatever follows. This is certainly what I want from a preamp, and the Martech comes as close as any I have heard to achieving it.
Leading edge performance has been a defining feature of Audio Precision products since the inception of our company in 1984. Thousands of our System One audio analyzers are in use worldwide, selected by design engineers for high performance and by test engineers for our comprehensive programmable analog and digital audio measurement capabilities.

Now, our System Two true Dual Domain audio analyzer joins the System One, setting a new standard for performance and flexibility in audio frequency test & measurement.

System Two is a true Dual Domain analyzer. Other test instruments may have both analog and digital inputs and outputs ... but they're not true Dual Domain! They rely on performance-limiting converters to pass analog signals back and forth to a DSP core of digital-only hardware. Passing signals through A/D or D/A converters for every measurement robs the test instrument of performance. System Two includes separate, independent hardware for direct audio measurements in both domains, plus additional and extensive interface measurement capability including jitter measurements, eye patterns and all other parameters described in AES3, the serial audio interface standard.

The new standard of System Two is represented by performance specifications such as guaranteed analog generator a/d analyzer residual THD+N of -108 dB, guaranteed analog signal flatness of ±0.01 dB for the generator and analyzer, and 24 bit digital signal generation with 48 bit FFT dynamic range.

From aircraft to automobiles, satellites to cell phones, headsets to hearing aids, System Two represents a new standard for audio frequency test & measurement applications. Compare for yourself - our worldwide force of representatives will be pleased to provide comprehensive specifications and a true Dual Domain on-site demonstration.

Audio Precision
PO Box 2203
Beaverton, Oregon 97075-5070
Tel: (503) 627-0832 FAX: (503) 641-8906
US Toll Free: 1-800-231-7350

Audio Precision is a registered trademark of Audio Precision
ACTIVATE YOUR SURROUND SOUND

SUBWOOFERS 1094A & 1092A ARE PART OF THE COMPLETE COLLECTION OF OUR ACTIVE MONITORS

5 CASTLE ROAD, LONDON, NW1 8PR
TEL: 0171 428 9700 FAX: 0171 428 9699
Mic Preamps

The microphone and its means of amplification is enjoying renewed and worthy interest. **Studio Sound** polls its reviewers for their favourite mic preamps looks at the selection on offer.

Despite an alarming period where it seemed that mixing consoles were doomed to become line input only devices, microphones have bounced back and enjoyed a resurgence in interest. Indeed, mic awareness is at something of high. With this has come a commensurate rise in interest in the specific means of their amplification and this has produced a wealth of outboard preamps that attempt to prick the conscience with matters of quality. These units would like to suggest that their performance is better than that of the average desk's amps and users clearly like the freedom to adapt the mix and match approach of employing valve or other specific circuitry to impart a variety of flavours at the mic stage.

Obtaining a wide selection of outboard pres is an expensive proposition particularly as the manufacturers have almost invariably targeted the deluxe sector of the market. However, owning at least a couple of channels of outboard preamp for special occasions is now commonplace in recording, post and broadcast facilities.

One of the most interesting developments is the advent of large numbers of dedicated 'voice channel' processors that combine mic pres with EQ and dynamics sections. Devised originally for users running hard disk workstations who had a need for a single channel of processing with which to input audio in to their systems, these boxes have now been recognised as good outboard supplements for all environments.

Here are the comments of the **Studio Sound** reviewers' jury.

**George Shilling:** The GML Microphone Preampifier comes as a 4 channel unit, with a simple and straightforward switched gain control for each channel. George Massenburg equipment is always very pure sounding, and I use these for vocals and other instrument overdubs, especially when working on SSL E-series or G-series consoles. I recently recorded The Wannadies vocals and some other instruments (such as melodica) with GMLs—they gave a superb smoothness when combined with the right mic. (a U67 in this case) and a good old Urei 1176. A natural sound was achieved without EQing, just a little HF was added to the vocals at mixdown.

The Focusrite ISA 851 is the original superb Focusrite EQ and mic-line amplifier. I recently used one when recording vocals with Teenage Fanclub's Norman Blake using an AKG C12VR reissue, and Raymond McGinley, using an SM57. The difference between the Focusrite and the very high-quality, cleansounding SSL 8800 G Plus was page 48>
In a sense, the quality of the audio signal is determined by the mic preamp because it is the first electronic stage in the chain. Getting things wrong at this point means there is no hope of putting them right later. While consoles almost always contain preamps and appropriate routing, this often results in a lot of circuitry and switching between mic and recorder. An alternative approach is to achieve the simplest and cleanest path from mic to tape and this requires an outboard preamp. If the recording is digital then a preamp with integral ADCs, or an ADC with mic inputs, should be considered.

Mic preamps exist because microphones sacrifice efficiency in the interests of quality. Microphones can never be efficient because the diaphragm will always be heavier than the air trying to move it. A microphone that has an appropriate routing, and this requires an outboard preamp. If the recording is digital then a preamp with integral ADCs, or an ADC with mic inputs, should be considered.

Mic preamps exist because microphones sacrifice efficiency in the interests of quality. Microphones can never be efficient because the diaphragm will always be heavier than the air trying to move it. A microphone that has an appropriate routing, and this requires an outboard preamp. If the recording is digital then a preamp with integral ADCs, or an ADC with mic inputs, should be considered.

Dave Foister: I've been fortunate to use a lot of different microphone preamps in the course of reviewing them for Studio Sound, and strangely it's often the simplest ones that have left the strongest impression. It surprises me how many people are prepared to dismiss quality outboard preamps, despite having no hesitation in using special equalizers or dynamics in preference to those in their consoles. There can be little doubt that a well-designed high-end preamp is just as likely to be an improvement over the couple of op-amps in the desk as the fancy EQ is for me the experience of bearing the right microphone fed to a tape machine via a grown-up quality-conscious preamp is the kind of thing that makes my job worthwhile and the hairs on the back of my neck stand up.

And I have to say that one of this month's review items had just that effect. The Martech MSS-10 is exactly the kind of preamp I like: an audiophile design with neither frills or compromises. Using a good microphone with a preamp like this is like fitting the best possible lens to a camera, and reveals just how much of the raw material we work with gets lost through anything less.

Preamps in a nutshell

John Watkinson outlines what is and what is not important in a mic preamp.
A simple potentiometer between stages is not a solution as this leaves the input stage un-optimised. A measure of the engineering quality of a preamp is the way in which the dynamic range is preserved over the full range of the sensitivity control.

Device noise is not the only issue. The preamp and the mic are often remote from one another and connected by a balanced cable. The ability of the input to reject interference has a significant effect on the in-service noise performance.

The user's expectations of dynamic range continue to increase with the development of ADGs with longer wordlength, yet the electromagnetic environment continues to deteriorate. A quality unit will have addressed electromagnetic compatibility issues as part of the design process. It will have metal XLR connectors with pin 1 and the body firmly bonded to the metal case so that screen currents are shunted harmlessly away.

Measuring the common mode rejection ratio within the audio band is only part of the story as this tells nothing about the sensitivity to RF. Unless the two input pins have absolutely identical impedance at all radio frequencies RF rejection will suffer. If the impedance is different the interference undergoes mode conversion and appears as a differential signal which is amplified. The balanced transformer input has a lot going for it as it can offer extremely good RF rejection. With the very low signal levels involved hysteresis distortion is unlikely to be significant.

Generally poor RF immunity is due to poor layout and poor layout is also one of the dominant causes of distortion. Consequently a unit which has poor RF rejection will probably not sound very good even in the absence of interference. Incidentally with the incessant growth of RFI the use of star-quad cable is a useful weapon. In theory and in practice the geometry of star-quad causes the interference picked up on the two signal legs to be more similar than is the case with ordinary twisted pairs. This gives better cancellation at the differential input.

Interference can also enter via the AC supply and it is important that supply is suitably filtered. Safety is also paramount because nearly all microphones will be used hand held at some time. With a metal cased preamp it's easy to prove that the case and the cable screens leaving it are securely grounded so that any fault won't use the performer as a fuse.

The same is true of the enormous DW Fearn VT-1, another single-channel straightforward preamp, this time using valves. Despite appearances, I'm no plausibly-valve valve fanatic, but it does sometimes seem easier to do something special with valves than with solid-state circuits, particularly around the mid-price range—look at TL Audio. The Fearn six considerably higher up the budgetary range than that, and is a shining example of what can be achieved in terms of musicality and transparency. Having said that, the Maritech shows that if the same kind of care and dedication is lavished on a box of transistors the result can be equally special.

I very much enjoyed Amek's ROMA system, partly because of the huge versatility and control, and partly because the sonic page 50 >
Demeter

< page 49 performance remains the number one priority—it is after all, the reason for the remote control facilities in the first place. The combination of the eminently practical remote control concept, the solid engineering and Rupert Neve sonic standards made the Amek system something I was more than usually sorry to part with.

Among all the preamps with extra processing in them, a format becoming ever more popular, the Studer D19 MicValve stands out. As ever, all depends on the quality of the initial preamp, which in the case of the Studer is never in doubt. The surprise inclusion of a valve-based enhancement section could have swung it either way for the D19, but I found it hugely enjoyable and capable of very distinctive yet subtle results.

Last but not least, I’ve always found John Oram’s designs compelling listening, and the Orum Sonic Microphone Work Station warrants inclusion here. Its microphone preamps have an extra something, in common with all the others on my list, and the addition of the simple, beautifully sweet EQ makes it a joy to use.

Zenon Schoepke: Although I’ve never been able to get one with its peak LED indication, I’d have to mention Tl Audio’s Classic range dual mic preamp/OI for solid performance at an affordable price. Combining valves with solid state circuitry, the company’s range of boxes has given tube character to more people than any other brand. It’s the same preamp as that used in the other units in the range and while it won’t make a lousy mic sound like a piece of vintage erotica, it will make a decent mic sound special by balancing thickness on the gain pot.

Demeter’s VTMP-2, the version of the old standard which received a pad, low cut, phase reverse and 10dB extra gain, employs fancy transformers, capacitors and resistors and adds up to a dual-channel 2U with a decidedly high-quality feel and enormous rotary faders for fine gain. It’s also got one of the nicest clean electric guitar DI’s I’ve heard. Mic performance isn’t as soft and mudy on the front end as some tube preamps can be. Strangely I like this because it sounds quite contemporary.

A bit of an odd one this, but Night Technologies PreQ3 is worthy of mention for being different. It’s a modular 1U rackmount that can house up to four channels and each has the company’s Airlund five-frequency boost-only shelving EQ which the incoming mic signal hits before it enters the unit’s gain circuitry. This is unusual and reveals that processing at this stage allows mic characters to be altered in a way that is distinct and legitimate.

If I was restricted to choosing only one preamp then the Studer Mivelove would be the one I’d go for. For some it has valve circuitry that can be varied with subtlety but quite fundamentally from front panel pots. It produces a wonderful sound on mic and line signals plus you can additionally bypass the valves completely to give the best of both worlds. Best of all you can fit MDM digital interfaces and route the two channels individually to the eight buses. It’s so self-contained, ingenious.

Signal matrix == Flexibility

Every client has special requirements for his „dream“ mixing console, but most of the consoles you can buy will not meet your requirements in one way or another. Instead of getting used to such deficiencies take a look at the LAWO „Signal matrix“ — a perfect tool to create your personal console. No customized software needed and open for future adaptations!

The signal matrix will manage anything you need in the studio — including the coffeemaker, if required...

The signal matrix is a programming language for mixing consoles which not only can handle control I/O like pushbuttons and relays but also directly has access to all the DSP settings and matrix setups. Therefore the system will easily give you all the faderstart and signalling features you may ever need. And there is more...16 stopwatches...automatic talkback systems...machine control with parallel and serial interfaces...custom monitoring systems for digital and analog audio...surround monitoring systems...you just have to drink the coffee yourself.

If you are interested to learn about the world of „Sigma“ — ask the experts at LAWO!

MC 50 - Digital On-air console
MC 80 - Digital mixing console
MC 82 - Production console
The Preamp Listing

Alice
Mic-Amp Pak Single and dual-channel mic preamps

Amek
9096 DMA Dual-channel mic preamp
9096 RCMA Remote-controlled dual-channel mic preamp

AMS Neve
1081 Modular mic preamp

Anthony DeMaria Labs
C/L1500 Dual-channel valve mic preamp

ATI
BMX2 8-channel mic preamp with stereo mixer

Apex
107 Dual-channel Tubeessence mic preamp

Avalon
AD US Single-channel line amp DI

Beyerdynamic
MV100 Dual-channel battery powered mic preamp

Canford
Mic Preampifier Dual-channel mic preamp

MS Mic Preampifier Dual-channel M-S mic preamp

CLM Dynamics
DB400s 4-channel M-S mic preamp

Crookwood
Paintpot Dual-channel remote-controlled mic preamp

DAAS
MicAmp Dual-channel mic preamp

dbx
dbx 786 Dual-channel mic preamp

Drawmer
1962 Dual-channel valve preamp with A-D convertor

Demeter
VTMP 2B Dual-channel valve mic preamp DI

HM1 Dual-channel valve mic preamp DI

DW Fearn
VT-1 Single-channel mic preamp

VT-2 Dual-channel valve preamp

Event
EMP-1 Single-channel mic preamp

FM Acoustics
Class Amp M1 Single-channel class A mic preamp

Focusrite
Red 1 4-channel preamp

Red 8 Dual-channel preamp

Green 1 Dual-channel mic-line preamp

LA Audio
MLX2 Dual-channel preamp DI

Manley
MP40/1 Single-channel valve mic preamp

MP40/2 Dual-channel valve mic preamp

MP60/1 Single-channel valve mic preamp

Martech
MSS-10 Single-channel mic preamp

Millennia Media
HV-3 Dual-channel mic preamp

MTA
Intermix 16-channel mic-line preamp

Signature Series 4-channel mic-line preamp

NTI
PreQ3 Multichannel mic preamp

SPL
MikeMan Dual-channel mic preamp

Studer
Studer D19 Mic Valve valve valve preamp with A-D convertor

Summit
TPA2008 Dual-channel valve preamp

Symetrix
S202 Dual-channel mic preamp

Tascam
MX4 4-channel M-S mic preamp

TL Audio
2002 4-channel valve preamp

Classic Dual-channel valve preamp DI

Tube-Tech
MP1A Dual-channel mic preamp

Yamaha
HA8 8-channel mic preamp

£2.99 EACH

Top quality, Pioneer CD-R media at previously unpublishable prices

Minimum quantity 10 discs

Price excludes VAT

Call Sue Webb on 0181 962 5000

Sole UK distributor:
HHB Communications Ltd
73-75 Scrubs Lane, London NW10 6SU, UK
Tel: 0181 962 5000 Fax: 0181 962 5050 E-Mail: sales@hhb.co.uk
Visit HHB on line at: http://www.hhb.co.uk

PIONEER

CD-R DISCS

Studio Sound June 1997
Without the production work of Tony Visconti, the pop and rock music of several decades would sound markedly different. And the story is not over yet, as Richard Buskin discovers.
It's easy to listen to one of Tony Visconti's productions and not hear him. On this basis you can, if you wish, choose to discount him as a producer of note. Alternatively, you can regard it as an example of the most seamless production work around. People say that working with me is effortless, and I think that's an important factor in record production: it's how Visconti himself explains it. I am transparent in the studio and everything about the artist is fully realised on tape. And he's right, of course - listen to T. Rex, David Bowie, Thin Lizzy, Iggy Pop, Joe Cocker, Paul McCartney, U2, The Stranglers, and The Moody Blues for confirmation.

During the 1970s and 1980s, Tony Visconti produced and engineered for an eclectic array of rock icons, and to each project he brought his technical know-how, sharp ears for arranging, and ability to insinuate the best performance out of the available talent.

There's nothing standard about my approach, he says. Every time I arrange for an artist it's a unique situation.

As indicated by his distinctive mid-Atlantic accent, Visconti is originally a native of New York but spent several highly successful years living in London - 25 years, in fact. He made his musical entrance here playing with a hand by the name of Mike Dee and the Dukes, made his first recording at the age of 15 and, on leaving school, worked in A&R at RCA. His first ventures behind the console occurred in the UK during the late-1960s, when he worked for Essex Music and produced artists such as Cocker, The Move, and Procol Harum. Then, in 1974, he formed his own company, Good Earth Productions, and bought a 16-track facility in West London, before upgrading to Zodiac Studios in Soho a couple of years later and also renaming that Good Earth. He would remain there until 1980, I got really pissed off with being in the studio business, Visconti now admits. When I started off with the SSL board there were only about two or three SSL facilities in the Greater London area, but when I sold Good Earth there were leads. That was a sign of the times, and some SSL facilities were dropping their prices to under £500 a day. I thought. This is ridiculous, if I'm not producing all year long I have to be a studio owner.

Visconti sold Good Earth to a jingles company but still uses the facility today. Now, however, he has to travel by plane to get there because about six months after off-loading the Soho operation he moved back to New York. Initially he was busy working on both sides of the pond, but then the assignments started to thin out and Visconti took advantage of the hiatus to study the Alexander Technique, a mind-and-body method of focusing on the precise coordination of head, neck and spine in order to attain economy of movement, physical comfort, and peak artistic performance. Sting and Paul McCartney are two of its more notable advocates.

Now a qualified teacher in the AT, Visconti asserts that he can now only sit at a mixing console all day long without developing stiffness and backache but also help the artists who is he is producing to improve their singing and playing. Of late, there have been plenty of them for Tony Visconti to deal with.

Things have really picked up incredibly well, he says, referring to recent projects with Sparks, Alex Forbes, Air (aka Arvingarna in their native Sweden) and The Sea Horses, the new outfit of former Stone Roses lead guitarist, John Squire.

Visconti spent eight weeks recording 15 tracks with The Sea Horses in the vintage Neve room at Royalton Studios in Hollywood. The mix took place in the adjacent SSL room and the engineer was rob Jacob.

I loved being able to just concentrate on the music, comments Visconti. Some of the songs were far too long, or in a strange kind of sequence, and so I had to sort all of that out. Also, three members of the group were recording for the first time in their lives, and that created some problems which I don't usually encounter. It was quite a task to coach them and get them up to studio-playing standards in a very short period of time.

Which meant resorting to the Alexander Technique, perhaps?

Actually no. I just had to use my Gestapo technique and wave the stick a few times. As one of the guys said, I didn't use the stick, I just let them know it was there.

In terms of production, Tony Visconti's earliest influence was George Martin. In terms of arranging it was Phil Spector. His first hit was T Rex's 'Ride a White Swan.' and looking back he now can hardly distinguish the difference between the quality of, and working approach towards, that record page 55 >
For 25 years musicians the world over have made it with Roland instruments.
No others sound as real. No others have the warmth and the depth.
When you want to make music, make it with a Roland.

Make it with a Roland

In 1996, the Roland VS-880 Digital Studio Workstation revolutionised the
hard disk audio recorder market. New for '97, the V-Xpanded package is even more dynamic.
On-board auto-mixing function. Built-in effects board: COSM, Mic simulation,
Voice transformer, 19 band vocoder, 1.4MB byte hard drive. 64 virtual tracks.
Editing with 999 levels of undo. SCSI port as standard.
Linear and Compressed recording. All in the digital domain. Make it with a Roland.

For details of this and other new Roland products call the Roland brochure hotline: 01792 515020
Roland (UK) Ltd. Atlantic Close, Swansea Enterprise Park, Swansea SA7 9JU. UK web site: http://www.roland.co.uk

www.americanradiohistory.com
caught in the studio: a young Tony Visconti and Marc Bolan

Bondage.
A subject close to our hearts.

A specially developed formulation bonds the ultra-fine magnetic particles of HHB DAT Tape to the base film, ensuring that block error rates stay consistently low — even after 100 passes. It’s just one of the reasons why HHB is independently proven to be the most dependable DAT tape that money can buy.

HBB Advanced Media Products. Don’t record on anything less. Phone. 0181 962 5000

HBB Communications Ltd. 73-75 Scrubs Lane, London NW10 6DU, UK. Fax: 0181 962 5090 - HBB on-line: http://www.hhb.co.uk
HBB Communications USA. 626 Santa Monica Boulevard, Suite 110, Santa Monica, CA 90401, USA. Phone: 310 319 1111
HBB Communications Canada Ltd. 260 King Street East, Toronto MSA 4L5, Canada. Phone: 416 887 9000

Studio Sound June 1997 55

www.americanradiohistory.com
Appearance is of major importance in today's highly competitive market. Control knobs provide much of your customers vital first perception and you can trust Re'an knobs to deliver the distinctive style needed to give your product the competitive edge.

The current range of collet & control knobs manufactured by Re'an is the result of 25 years continual development and experience gained supplying the pro-audio industry. Latest plastic moulding and production techniques ensures tightest possible tolerances, consistently high standards and allows us to offer highly competitive prices.

Our team of skilled engineers and design staff are ready now to help with your specific requirements, so why not call them today and find out how your product will benefit from the many features of control knobs manufactured by Re'an.

Main Factory:
Springhead Enterprise Park, Northfleet, Kent DA11 8HB
Telephone: +44 (0)1474 328807 Facsimile: +44 (0)1474 320285
T

HEN there was the aforementioned Bowie, with whom Visconti ended up working on 13 albums, starting with Space Oddity and ending with the music to a 1982 BBC TV drama named Bad. In between there were some seminal works—including Young Americans and Scary Monsters—and a fair few in-studio innovations.

The harmonised snare drum sound made its debut on Low, cites Visconti. We then kept that up on Heroes and used the harmoniser for a few other little things too. The secret, however, was that the harmoniser was played live. Dennis Davis heard what he was doing in his

was coming through the arteries in his neck. He also had to shave to prevent the sound of his whiskers scratching.

Given the constant metamorphosing of Bowie’s professional persona and the wildly eclectic nature of his songwriting, Visconti’s major contribution was to impart a sense of direction to his albums, in terms of the sound and arrangements. Another was his occasional playing of bass and various other instruments.

‘I think I helped David by getting him a little more focused that he would have normally been,’ he says. Certainly, with The Man Who Sold The World we paved the way for the Ziggy Stardust sound. That identical sound was used

The Project Studio

EVEN though he no longer owns his own commercial studio, Tony Visconti is still a compulsive shopper when it comes to some of the latest gear. To help economise on certain projects he will often record in his largely digital facility, which is equipped with a 32-track ADAT machine, Macintosh hard-disk recording, and Notator and Sound Designer for editing and pitch-correction. There is also a MIDI-addressable 32-channel Soundtracs board, and Alesis 1, KRK 6000 and Genelec 1050 monitors, as well as a good collection of microphones, including a pair of Neumann U87s that were retained from Good Earth.

Having performed on many of the records that he has produced, Visconti also has a collection of vintage guitars, including a ’95 Fender Strat, a couple of Tony Zemaitis electrics and the original Fender Precision bass that he played on Bowie’s ‘The Man Who Sold The World’ album. Then there are the keyboards, ‘too numerous to mention’, of which TV’s favourites are his old MIDI-reinforced Jupiter 8, a new Jupiter 1080, a Wave ST, a Roland D50, an Akai S1000 and a Roland digital piano.

As for the toys, ‘I’ve got loads of receive units and so on, but I rely more and more on my Macintosh for special effects than outboard gear now. Compression, gating, you name it. I’d much rather do those things on a Mac than in an automated mix.’

Consumers. Take their formats (but let them keep their error rates).

Block error rates on H&H professional MiniDiscs are 10 times lower than those of some consumer media.

H&H Advanced Media Products. Don’t record on anything less. Phone: 0181 962 5000

H&H Communications Ltd, 73-75 Scruton Lane, London NW1 6UG, UK. Fax: 0181 962 2505 H&H on-line: http://www.h&h.co.uk

H&H Communications USA, 606 Santa Monica Boulevard, Suite 110, Santa Monica, CA 90401, USA. Phone: 213 319 1111

H&H Communications Canada Ltd, 260 King Street East, Toronto M5A 4L5, Canada. Phone: 416 887 9000

Studio Sound June 1997 57

www.americanradiohistory.com
**Check Our Vital Signs...**

**Totally Digital**
When we say all digital, we mean all digital. Mix and match AES/EBU, TDIF-1® ADAT® ODI or 20bit Analog I/O.

**Unequaled Sonic Quality**
48bit Equalization and Filtering (an X exclusive). 20bit converters, 128X over sampling. RSP's award-winning DSP designers and software writers have years of DSP experience.

**Surround Sound**
Circle Surround® matrix encoding in DSP is included. Assignable automated joystick can be used with either matrix encoding or 5.1 channel discrete surround outputs.

**Dynamics Processing**
Two internal DSP effects processors. Hi and Lo Cut Filters, 4-Band Parametric EQ, HUSH®/Gating, Compressor, Delay Line, Stereo Linking, Sicleain Filter Insertion to Compressor and HUSH, Phase Reverse, ALL on EVERY channel strip! Plus—award-winning Chorus, Delay, Reverb and Pitch Shifting on two of the Aux. Returns.

**Full Dynamic Automation**
EVERY mix function is dynamically automated. 128 snapshots.

---

**RSP Technologies**
World Wide Web Site: www.rsptech.com
email: info@rsptech.com  phone: 248.853.3055
2870 Technology Drive, Rochester Hills, MI 48309

RSP Technologies®, HUSH® and Circle Surround® are registered trademarks of Rocktron Corporation.
TDIF-1® is a registered trademark of Tascam, TEAC America. ADAT® is a registered trademark of Alesis Corporation.
Warning.
Too much slack in your pack can hit you where it hurts.

Slack windings can result in tape snapping. HHB ADAT tapes use precision engineered cases and hubs to minimise tape pack slack and ensure accurate tape handling.

H HB Advanced Media Products. Don't record on anything less. Phone: 0181 962 5000

H HB Communications Ltd, 73-75 Scrubs Lane, London NW10 6GU, UK. Fax 0181 962 5050. H HB on-line: http://www.hhb.co.uk

H HB Communications USA, 656 Santa Monica Boulevard, Suite 110, Santa Monica, CA 90401, USA. Phone 310-319-1119

H HB Communications Canada Ltd, 260 King Street East. Toronto, M5A 2S5, Canada. Phone: 416 867 9009

Studio Sound June 1997
Terry Wogan and Katrina. With a smile and a song, Terry Wogan brings his own brand of humour to the proceedings as he provides the UK commentary to the 42nd Eurovision Song Contest, held for the seventh time in Ireland

The current technical team became involved and devised the methodology that has served it so well over a long, unprecedented run. Linda Martin's winning song in 1992, prophetically titled 'Why Me?', kicked off Ireland's domination of the competition, with further wins in 1995 and 1999. Norway broke the chain in 1995 but it was still a spiritual win for Ireland, as the Norwegian band Secret Garden was fronted by an Irish singer performing a decidedly Celtic song. (Then again, Celine Dion won for Switzerland in 1988 and American-born Katrina Leskanich represented the UK this year.)

Ireland entered the weakest song it could find this year, "Mysterious Woman" by Marc Roberts, (really a country singer from County Mayo called Sean Hegarty), but still found itself joint favourite with the UK and Italy. So we're favourites again, asked one technician off-handedly, perhaps giving the impression that with Eurovision, it's the means that is important, not necessarily the content.

It's easy to understand, as many at RTE had been working towards the big show on 1st May since January. The centre of the action, as far as the audio crew is concerned, is not the auditorium of the Point with its impressive, futuristic, metal set and stage; but the sound distribution room, an orderly jumble of cables and racks sited down one of the former railway depot's long concrete corridors.

The planning of the sheets started in January, says sound supervisor Jack Peoples. We use the old ones as a base—it's similar year to year, we find.

The racks in sound distribution were designed and built for the 1988 Final and have been in and out of cold storage ever since. Each cable carries seven microphones, organised in split pairs so that primary users have access, including foldback and the front of house sound system. In all 68 BSS splitters are on site, with only 62 or 65 fully employed. The phrase most often heard around the Point, in technical terms at least, is redundancy. Pairs of splitters are held back just in case of emergency—when you're hosting a showcase broadcast, the last thing you want is dead air or a blank screen.

All feeds appear on the patchbays, organised so that there is as little congestion as possible and quick access. We feed to users from both the front and back of the racks, comments Brendan Lyons, head of sound distribution. Everything is using the BSS splitters, except the foldback. For turnaround purposes we've set up A and B feeds on the vocal mics, so that while one country is performing, the next country is setting up.

Each main sound section is defined in sound distribution: the house system, foldback, monitor output, main stereo and main mono (with stand-by stereo and mono). Mixed programme sound from RTE's OB Truck + comes into sound distribution and then is mixed back to the broadcaster's headquarters in the Donnybrook area of Dublin, together with all the voting feeds and visuals.

June 1997 Studio Sound
using sound-in-sync.

This year's Finals have been hosted by RTE, but, ultimately, Eurovision is an EBU event. Hence the EBU room just up the corridor from sound distribution. It's an RTE facility, explains Conor O'Loughlin, head of television sound, "but we work to an EBU representative. This room that handles the information that decides the Final—the votes from the juries of all the competing countries. Incoming are four satellite feeds, designated B, C, and a stand-by in London. These work in conjunction with four independent sound circuits: X, Y, Hilversum and London. All switched through a centre in Frankfurt. The final jury, at RTE headquarters, is brought in through a fiberoptic connection.

This year's Finals marked the third time invasion juries have been used, something pioneered by RTE in 1994. With or without this, the procedures for making sure that the juries hear the songs, and that each jury comes in at the specified time are complicated.

It takes two minutes to set up each country's jury, explains Bernard Gibson, overseeing the EBU room for RTE. Each one has to power down before the next one powers up. Otherwise...

If there are any problems with the satellite feeds, the circuit is switched over to a caption slide of the relevant country, with the votes cast in sound only. For this reason there is 100% redundancy built into the audio system. If the main sound circuits fail, then three telephone lines are standing by. If they go down, two talkback feeds are in reserve; if the unthinkable happens, and one line is lost, the votes can be gotten through somehow; for extra security no one knows the number of this machine until the day of the show.

The main jury audio signals are mixed through a Soundcraft K1, with a Spirit Live as a stand-by. Both have backup power supplies, to be sure. Another Spirit Live controls mixes of the music to the jury secretaries, with the EBU co-ordinator needing to speak to these officials. While the juries received a mono feed, each country broadcast is in stereo, calling for the use of a separate satellite—eurovision distribution is normally in mono. Which is provided under-reach this particular Spirit Live, with a battery-powered Shure submixer as a final fail-safe.

The EBU leased RTE six Symetrix noise-reduction units, while lip synchronisation is ensured by a Klark-Teknik time delay.

The job of presenting the Eurovision Song Contest is a coveted one—this year the task is split, falling to up and coming RTE TV and radio presenter Carrie Crowley and Ronan Keating, lead singer of Irish boy band Boyzone, who appear during the interval performing a decidedly Riverdance-influenced new song—the show is carried by each country's commentator. The UK's stalwart for this is Limerick-born Terry Wogan, whose blarney and ironic asides can lift the Contest out of its doldrums.

The commentators are positioned at the back of the auditorium, each equipped with a 15" TV monitor, script light and combined microphone/headphone headset. From here audio feeds are sent to a cabin containing at Glensound mixing stations, overseen by four operators (taking ten countries each). It can be bedlam here, Conor O'Loughlin remarks dryly, because a lot of the circuits aren't booked until just before the show starts.

In front of this cabin are the various outside broadcast tracks for sound and vision. Oh!, with its relative new Calrec Q-series console, is where the overall audio mix is assembled by Ian Pike. Just as the distracting job of dealing with any mix or cable failures are split off and isolated in the sound distribution room, other elements are delegated elsewhere to allow Pike to concentrate on putting together the production sound.

We found over the years that the vocal mix took nearly all the rehearsal time, explains Pike, because we separated it off. This, and the stage instruments, is dealt with by Jack Peoples in a truck borrowed from BBC Northern Ireland, known during the show as the Mobile. 'This means that I don't have to deal with the stage crew,' Pike continues. Three stereo mixes come in from the Mobile, lead vocals, backing vocals and the stage instruments. I can then concentrate on blending those in with the orchestra.

Another element broken away from OH! is the string section, which is mixed on a Soundcraft O200 located in the sound distribution room. A total of 24 microphones is divided into five mixes, which are sent to OH!, with two going to the front of house system. These mixes come up on the left-hand side of the 60-channel stereo Q-series, with the woodwind/eight microphones) on four channels. The right-hand side of the desk holds the so-called hardware, including a number of backing tracks. About 19 countries are using backing tracks,' says Pike, 'for various elements. Only about four of them contain full orchestras, the others are just bits of percussion or other things.' Also located here are the presenters' mics, the outputs of the voting desks and effects. All the feeds from the Mobile come in dry, with Pike adding reverber in OH! (a Lexicon LX15 is used for the main vocals).

All processing equipment is under MIDI control, as is a wall-mounted Yamaha DM100, which handles percussion mixes. MIDI patches are assigned to recall levels and effects parameters for each country. It makes it an awful lot easier than trying to follow with fader moves,' Pike observes.

The main desk is similarly fitted with a recall system, a very sophisticated one, as Pike and O'Loughlin are at pains to point out. It's total recall, or total Fornica,' Pike smiles. A strip of the material, once a common site in rural Irish bars, is prepared for each country, with fader positions written on it. The relevant strip is placed in the space above page 62.

From the top, 1: Sound supervisor Jack Peoples prepares the vocal mix on the Yamaha O2R, with the Calrec M-Series in the background, in the BBC Northern Ireland mobile. 2: Katrina and the Waves, left to right, Vincent de la Cruz, Katrina Leskanich and Alex Cooper. 3: Bernard Gibson sets up the EBU room, waiting for those votes. 4: Presenters Ronan Keating, left, and Carrie Crowley. 5: Radio Mic position (Can you guess whose system RTE was using?)

Studio Sound June 1997
The reason we've done this,' explains Peoples, 'is that in the event of the 02R having a problem, I can release the insert switching and take everything back again onto the Calrec.' The 02R is used to store the individual EQ and level changes for each country, which are then recalled as needed. 'I might have to do a bit of pushing and pulling during the songs,' says Peoples, 'and maybe a bit of extra EQing during the choruses but it gives me a good starting point. Like others working on this year's event, Peoples is a veteran of the Eurovision Song Contest, having performed the main mix in 1988 and prepared the vocal mix three years ago, although on that occasion he was using an analogue Neve desk. In addition to the vocal mix, the Mobile's secondary function is as emergency main mixer. The rhythm section is submixed on a Soundcraft console, which can be sent to the Calrec, along with the string instrument mix from sound distribution and the percussion, and the windwood and brass, which comes through a Calrec 16:2 rack mixer. The job itself Peoples describes as: 'Mixing the stage sound, but totally in isolation, without reference to lan's mix. I'm mixing it dry because I'm trying to balance the three groups so that in theory lan doesn't have to push or pull the faders at his end and he can add whatever effects he wants. The idea is that lan won't have to touch those three faders.' Entering the truck as this point, Conor O'Loughlin, referring to the link up of the M-series and the 02R, remarks, 'I don't know whether this has been done before. Nice lateral thinking, Jack.' Peoples modestly replies: 'If you start thinking about something in January, you're bound to come up with something nearly original.' Peoples also works with a deputy, although he says that the job is more than just being there in case of heart attacks. 'There's a lot of fader grabbing that goes on and the main mixer needs to concentrate on just the music,' he says. This also counts for OI. O'Loughlin was in charge of the presenters' mixes, postcards and feeds from the Green Room, where artists wait for the votes to come in. By the nature of the organisation, both Pike and Peoples are isolated from the activity going on around the stage area. As Pike observes, 'If a radio mic fails, somebody else deals with it.' The wireless mic area is positioned behind the orchestra, stage right. Technician Gerry Malone operates a strict regime in handling out mics, with each one colour-coded and assigned to the correct artists and positions on stage.
When we launched the B800 last year, we didn’t exactly broadcast it.

Our customers, however, most certainly did.

In today’s climate of shrinking budgets and increasing accountability, choosing the right console has never been more important.

Enter the Soundcraft B800. A broadcast console so intrinsically right and offering such value that even before we’d built the first one, we had a list of orders as long as your arm.

Happily, and thanks to the efforts of our untiring work force, we’re making an impression not just on our customers, but on the waiting list too.

So maybe now is the time to tell the world about the advantages of choosing the B800.

The Mono and Stereo Mic/Line Inputs and Groups with 6 mono and 2 stereo Auxes for instance.

The choice of mono or stereo groups. Or the comprehensive and flexible monitoring, including Surround Sound. And that every input channel features a clean feed/direct output.

But there again, perhaps we should leave that to the hundreds of audio professionals around the world that rely on the Soundcraft B800 day after day, night after night.

Thank you.
The Dynamic Duo returns to the big screen, championing high-profile sound design. Mel Lambert talks to the co-supervising sound editors and the rerecording crew at Warner-Hollywood about Batman and Robin.
confides director Joel Schumacher. "For a movie that I can best describe as a living comic book, there are extensive sets and costumes that need to be detailed with sound. It's a pop opera, with sound used to heighten the fantasy. Sound effects have become as essential to the storytelling process as the visuals."

It's obvious that movie audiences today expect a film like Batman and Robin to sound as good as it looks," considers John Leveque, who with long-time colleague Bruce Stambler handled the complex task of selecting and editing the thousands of sound elements used in the film.

This experienced sound editor has a clear blueprint of how he will develop the various elements required to complete a film's soundtrack: "Big, bold, loud, emotional—that's how I like my sound. The helicopter screams as it careers off the deck of the USS Missouri in "U-505." The bus wrapped around the front of the train screams along the track in 'The Fugitive.' The Batmobile zooms. The Batboat flaps. The Batwing clangs. All of these—and hundreds of others—are a sound-editor's dream.

What Joel Schumacher puts on the screen is the blueprint, explains Stambler. "We design the sound around the action, so that it reinforces the focus of a scene, yet without being distracting. There's a very fine line between too much and too little; we carefully select the right combination of sound effects to draw the audience into the film."

The process of designing sound for Batman and Robin began, Stambler explains, with their first meeting with picture editor Dennis Virkler. "Since most of the action material had been shot without sound, there was very little audio for Dennis to use when he did his first cut of the film. He wanted us involved early because he is under pressure to show a first cut to the director, producer and the film company, and he can be more productive if he has a rough soundtrack to work with. We received a list of specific sounds that Dennis wanted to hear, so we went back to SoundStorm, pulled effects and then cut a rough track for him."

This sped up the process of temp dubs which culminated in the 6-track Temp #3 being produced for test screening of the film during early May. "Normally, we receive a rough cut as the starting point for our sound design," Leveque continues. "Here, because we had this unique opportunity of working with Dennis so early in the movie's development, we could get a good sense of what would be needed for such a sound-heavy movie."

To handle the spectrum of sounds, the co-supervising sound editors divided up the assignments, while Stambler looked after 95% of the sound effects and handled liaison with the editorial crew, Leveque was responsible for Foley, ADR and dialogue, plus the remainder of the effects. In all of their productions, Leveque and Stambler favour the use of natural sounds that they record specifically for the movie they're working on.

To create the sound of the Batmobile, Leveque and Stambler visited the Rocket Dyne Space Shuttle facility in Canoga Park, California, where they recorded the intense blast of an Atlas rocket engine.

"The core of the Batmobile sound is an 800-horsepower Buick Grand National with a wonderful turbocharger whistle," recalls Stambler, "whose rare off-hours are often spent around high-power automobiles. All in all, we used 60 different individual sounds: a race track near to Los Angeles was also rented to record various sounds of a Ducati motorcycle and a rare Porsche 917 12-cylinder racer. Both elements were to find their way into the new Batmobile sound creation, which we see Robin riding early in the film."

One of the favourite sounds used in the film came about by accident, as Bruce Stambler recalls. "We had already made a number of recordings of hot wings that were very good but we lacked a sound that . . . page 66 »
Above: George Clooney as Bruce Wayne meets Uma Thurman as Pamela Isley prior to her transformation into the lethal beauty Poison Ivy.

Left: The crew during production of the final Temp Dub #3 at Warner Hollywood Stage "D" in late April. Left to right: sound effects re-recording mixer Frank A Montano; producer Peter MacGregor-Scott; co-supervising editor John Leveque; music mixer Jeffrey J Haboush; and lead-dialogue mix mixer Donald O Mitchell.<br>

As fate would have it, at Warner Bros Studios in Burbank, north of LA, the facility’s world-famous water tower had been covered in a massive tarpaulin. ‘During a windy rainstorm,’ Stambler recalls fondly with a smile, ‘the tarp came loose and ended up streaming into the air held only by a single tether. We snuck under the tower with our microphone and a portable DAT recorder. What you hear in the movie is the sound of this enormous tarp flapping, whipping and snapping around in the gale-force wind.

Most effects tracks were edited on SoundStorm’s series of Fostex Foundation digital workstations, which were used to prepare 6-track reels for the series of temp dubs. Fairlight MFX3 workstations were used for Foley editing, primarily because that was the format delivered to the team from Warner-Hollywood’s Foley stage.

With the sound elements coming together under the direction of Stambler and Leveque, Foley, ADR and dialogue editors at SoundStorm in late March, the focus of activity moved to two dubbing stages at Warner-Hollywood’s facility. Because of a time crunch, Stages C and D were pressed into service during production of a series of three temp dubs. Unlike what has become standard Hollywood practice, Stambler and Leveque do not consider temp dubs a necessary evil as they move towards the final rerecording of the soundtrack. Rather than use the expression temp dub, offers John Leveque, we prefer to refer to them as experimental mixes—the first step in the process of producing the final mix, and one that lets us develop the soundtrack as the editing process continues, and we begin to develop the look and feel for the soundtrack. We select and cut sounds that will appear in the final film, not ones that will be replaced later. In this way we can concentrate on the
Jeff's was that with Harrison the onsole. Because I've tent finally and Halush -music Mitchell The pent also back D preds two weeks of dialogue, similar C Stad )der until Golea for we are also working on opti pull finis tors. Details about the closer sound in Donald didn't begin the scoring process in. Through the dialogue on Stage, Montano- effects and Jeffrey sounds.

Enthral didn't begin the scoring process in. While Frank Montano took over the rerecording crew of Warner-Burbank. All, including ambient, environmental, and dialogue, were placed in D for the finals and print mastering.

I prefer to remain in one room for the finals, Mitchell explains, to ensure a consistent mix. Even though they measure similarly, I've found that mixes from the smaller Stage C sound softer than those made in D, because of the closer location of the screen to the console. Both rooms feature identical Harrison PP-1 rerecording consoles equipped with proven fader automation.

Lead-dialogue mixer Don Mitchell recalls that 99% of the dialogue on Batman and Robin was looped. "We have so much steam, prop and other noises on the production track, that we had to replace most of the lines. Also, in certain scenes, Arnold was difficult to hear clearly, because of his costume. During the predubs, we pitch-shifted George Clooney's voice down by page 68 > Right: Arnold Schwarzenegger as the treacherous Mr Freeze. Below: Rerecording mixer Frank Montano at his extensive sound-effects section of the Harrison PP-1 console in Warner-Hollywood's Stage D, during predubs of Batman and Robin in early May. To accommodate the high number of sound-effects elements required during these sessions, a pair of outboard or 'sidecar' automated consoles had been placed to the right and behind his main mixing position.

Z Series
XLR Cable Connector

NEW!

High quality combined with cost effectiveness - the connector offers improved applications oriented features:

- Reduced assembly time up to 60%
- New self-clamping cable retention principle
- Gold plated "tuning fork" contacts
- "Digiproof" coaxial locking version available for shakeproof and noiseless connections

Studio Sound June 1997
SoundStar digital machine-room system

SoundStar was formed in 1994 to develop a digital record-playback system that would combine all of the advantages of the mag film with the speed and expanded functionality of a nonlinear digital workstation. A basic system consists of a Stage Interface (SIU), Master Control (MCU) and multiple hard-drive dubbers. A DMS system can be configured from a stand-alone 16-channel system to a virtual machine room of 1,500 or more, using hard disk or optical drives. The SIU handles all time code I/O and transport control from the console automation system via conventional 9-pin serial protocols, Timeline Lynx 2 command, or a Ketcham Box.

DMS is based on the Euphonics-Spectral Prismus Digital Audio Engine, with highly modified software that handles file management and disk interface. Spectral’s Translator 8-channel digital audio format converter handlesthes A/D, D/A, Optical, Spectral SMDAI, Tascam TDE-2 and Yamaha Y2 digital I/O. Systems are configured for network operation from a single controller for a stand-alone use, or multiple controller points for larger systems requiring access from the machine room as well as each mix position, using SoundStar’s proprietary TCP/IP, Ethernet-based protocol; custom WAN configurations are also available.

System outputs can be quickly configured as mono or grouped as stereo, 4-track, 4-track or 6-track units. Once configured, the tracks can be advanced or delayed as a unit. Internal patching of tracks to outputs with the graphical user interface and automated track patching speeds up reel changes, and is as easy as using a traditional patch bay. Output channels are routed through conventional patchbays, allowing DMS to be run transparently with other source machines.

Either 650Mb and 1.2Gb MOs are currently used to transfer material from editorial rooms into the DMS hard drives, which are capable of handling real-time playback of eight channels per drive configuration. Subsequent versions will offer direct OMF-compatibility, in addition to direct importing of standard digital-audio file formats.
This Way.

Today's Digital Audio Workstation is an indispensable tool for Post Production, CD Premastering, and Music Production. With each new twist and turn in the maze of technological possibilities, some systems lead, others follow, and many fall by the wayside.

Through it all, one system has consistently emerged as the technology leader – delivering an impressive list of achievements that have taken our users where they need to be to stay ahead of the competition.

The Path To Success
Follow the path we've blazed in digital audio with achievements such as:

- Best Sound and Best Picture Oscar® winner The English Patient posted on Sonic by The Saul Zaentz Co.
- Emmy® award-winning NoNOISE® system for professional audio restoration
- First non-linear DAW for music production and CD premastering
- Sonic MediaNet™ - the first (and only) real-time network for media workgroups
- Sonic High Density Studio - the world's first multitrack 96kHz 24-bit audio system
- DVD-Ready™ - the first audio system to support all DVD formats (Dolby Digital, MPEG-2, PCM)

And as you find your way to the future – 96kHz and DSD High-Density Audio™, Surround Sound and DVD Audio – don't get stuck with yesterday's tools. Count on only one company to lead the way – Sonic Solutions.

Don't Get Lost in the Maze, Get on the Right Path...with Sonic.

www.sonic.com
1.888.SONIC.4U

Sonic Headquarters 101 Rowland Way, Novato, CA 94945
tel: 415.893.8000 • fax: 415.893.8898
Sonic Europe, 72 Soho Square, 2nd Floor, W1V 7FJ London, UK
tel: 44.171.267.6108 • fax: 44.171.267.6156
Sonic Pacific Rim tel: 81.3.5439.7171

©1997 Sonic Solutions. All rights reserved. The Sonic, Sonicware, Sonic, SonicDelivery, SonicMediaNet, High-Density Audio and DVD Ready are trademarks and NoNOISE is a registered trademark of Sonic Solutions. All other trademarks and registered trademarks are the property of their respective owners.
When Pavarotti took off for Barbados with a Decca recording crew, the location presented no distraction from one of the world’s greatest tenors. Simon Croft discovers that life with a portable editor is on the beach.

With the power of today’s laptop PCs rivalling that of desktop machines, its perfectly possible to take an audio editing system like the SADiE and work on the beach. ‘Another Pina Colada Sir?’ says the bartender in the beach hut. ‘No thank you,’ you reply, perched pertly on a bar stool. ‘At least, not until I’ve tidied up a couple more of these crossfades.’

Technically possible perhaps, but does anyone ever really work that way? The answer for editing manager Nigel Gayler and technical manager Roy Hankinson of The Decca Recording Company is ‘Yes’—well almost.

They did take a SADiE portable audio editor to Barbados in order to play and re-edit sequences for the approval of Luciano Pavarotti. Editing actually took place in a private house, but Gayler, Hankinson and producer Ray Minshull did deliver an analogue cassette of the final edit sequences to the great man himself on the beach.

Given the stature of the artist and Decca’s long involvement with audiophile digital recording (see side bar) the edit sessions represent a significant thumbs-up for PC-based editing in general and the SADiE portable editing system in particular.

Gayler, who first cut his teeth on analogue editing with Decca 23 years ago, explains that while some artists are sent a tape for approval, Pavarotti prefers to see the material, so he arranged to have the editor and producer when the takes are chosen. With the artist’s busy schedule, location tends to be a secondary consideration and editing has often taken place at the Pavarotti’s home in Italy.

‘With Pavarotti, we will go to a location with editing and playback equipment, so it’s all done with him.’ Gayler confirms. He was in Barbados on holiday after giving a concert at the Holders Festival. For the last five years it’s been held on the island, it’s an arts festival run by Johnny and Wendy Kidd.

The Kidds kindly offered us facilities in their house, so we set ourselves up in a bedroom and there was a dressing room en-suite and that’s where I set up the SADiE portable...
Pavarotti takes a break from the Three Tenors tour to record in Barbados.

The rest of the setup was hired locally from Norman Barrow of A&B Music Supplies, who Gayler and Hankinson say was extremely helpful. The bulk of the system comprised two DAT recorders, an analogue cassette machine, a small Mackie mixer and a pair of active Genelec speakers. Talkback and monitoring for the SADIE consisted of a combination of opening the door between the two rooms and using headphones.

The other important consideration was acoustics, as Hankinson explains. "We had to do some work to the room obviously, because it was a bedroom. We took all the furniture out of the room and, there was a wooden floor with high plaster walls, so we had to do some treatment. Fortunately, they had heavy drapes on the windows, so we could adjust the acoustics by opening and closing the drapes, and we hired some drapes for the other side of the room. We also treated the floor which helped to improve the room acoustics.

The sessions in Barbados were exceptionally well, says Gayler, who feels that the ability not only to edit, but also to play out alternative takes on-demand is a major bonus.

Roy Hankinson explains. "Where possible, Nigel was using the SADIE portable to play back as well as doing the edit. It’s a lot easier to cut up sections. On a DAT machine, the thing spoons so quickly, you can’t stop it unless you have an ideal point."

There was a very good example where Pavarotti hit a top note in Act II and he wanted to hear the alternatives, Gayler offers. "We were able to play them immediately, which would have been impossible otherwise. So it’s an extremely good playback format."

The way we conducted the sessions, Gayler explains, was as follows:

Pavarotti arrived on the Saturday and listened to part of Act II. He then listened to alternative takes and selected a new sequence with Ray and asked me to edit this new sequence straight away, so this is editing while you wait.

I went into the dressing room and edited it up while he sat in his armchair and listened to the next piece. I was able to edit without disturbing him because I was using headphones. Ray was able to play the DATs of the next section and then when I had finished editing I would call out to Luciano and Ray and he would then listen to these edited sections and make his comments. At the end of the first day we had completed the Act II section and he had listened to his parts in Act III and Act IV.

Pavarotti felt that there were preferable selections available for Act III and the team therefore arrived in advance of the artist to compile a new editing sequence.

"He didn’t listen to that straight away. He wanted to listen to the Act II aria. He made one final change in that, listened to the whole of this aria again, and was pleased with it," Gayler recalls.

Ray then listened to this new editing sequence for Act III. He was extremely happy with that, and preferred it to the sequence we made at Decca’s postproduction centre in London. He then proceeded to listen to the remaining sections and was very pleased. No further work was needed.

At the end of that, he requested an analogue cassette to be made of all the new editing sequences so that he could listen at leisure. We made the cassette and dismantled the equipment and went to deliver his cassette to the booth, Gayler explains.

Hankinson picks up the thread. "Pavarotti said his goodbyes to Ray Minshull the producer, who has worked with him for many years. Ray signed Luciano Pavarotti to Decca and came out of retirement for this, and some recordings which will be released later. Pavarotti said his goodbyes, and said that he was very happy with what we had done. We returned to London the next day."

"Having obtained Pavarotti’s approval for the editing sequences, Gayler needed to make only small refinements once he was back in the superior acoustic environment of a Decca editing suite in London.

Everything had gone very well but then again, that was also due to work undertaken in advance of the sessions. After all, the team was going a long way from home with their precious material and editing gear."

Below left to right: Roy Hankinson, Luciano Pavarotti and Nigel Gayler.
Decca and digital

Decca has a long history of development in digital audio recording equipment, including recorders, editors and mixers. The equipment Decca develops also helps to give sister companies Philips Classics and Deutsche Grammophon a competitive edge. For this reason, Decca some years ago took the strategic decision that it would not licence its technologies to organisations outside the group.

Roy Hankinson has been involved in Decca's digital development from the start. He joined Decca in 1973 in the R&D department, working first on Telec video discs and then designing the Decca digital audio recording system.

'We still have in-house development,' Hankinson confirms. 'The editing system that's used here was built in-house. We are about to start recording on our optical recorders, which were designed in-house. We're just finishing a new set of software for that.

'One of the things we find is that because we are a location recording outfit, we are not quite the same as most studios. Our equipment has to fit different parameters. The market doesn't often provide equipment that fits our uses.

'Complex mixers are usually quite big. They are either a big mixer or a small mixer. They're not modular in construction. The philosophy behind in-house design is first that you look outside and if it's there, you use it. Otherwise, if it's required, you design it. There's always an area where equipment is required to interface with other equipment, so you find you need a small design department.

'We are still using the digital recording system that was developed in 1978. That was developed as an 18-bit, 48kHz system, but by the end of this month, we will have a 20/24-bit, 96kHz, whatever you like, system. It's a 4-track 20/24-bit 48kHz recorder, which, of course you can use for two tracks of 96kHz if you want to.

'Resolution greater than 16 bits is required in order to deliver a true 16 bits to the consumer. Higher resolution is needed because each time the signal is processed it is degraded. We record using 16-bit at 20-bit word lengths and use a minimum of 24-bit resolution within the postproduction equipment. A programme might be copied 10 or 11 times before it actually gets out to the consumer.'

Hankinson is cautious about claims for 96kHz sampling; although the new Decca optical system supports this sampling rate.

'We're always interested in anything that improves audio quality,' he says. 'Certainly with DVD coming along, there is the possibility to issue 96kHz recordings; that is one of the things we will look at. It's not clear at the moment that there is a vast difference between 48kHz and 96kHz, although some people claim there is.

'The most critical area of digital equipment is the analogue to digital converter. As far as Decca is concerned, we sell digits, because we sell programme on CD. Once it is converted to digital, it never goes back to analogue. That has been the case here for 17 years. Our production has been totally digital right from day one.

'You have got to be careful what you do digitally. You have to understand the processes that go on, but the converter is the most critical element.

'One thing about 96kHz that is an advantage is that you can have a much shallower filter. We've always worked at 48kHz, from the early days because we knew that that would fit with the television systems. Also we felt that it gave us a little area to have a less steep roll-off. We didn't need such a brick wall filter—we could angle the wall slightly.

'Some of the major problems early on were the converters. Some were not even near 16-bit, and some people were still using analogue vu meters and therefore did not monitor that signal properly, hence tended to record at a lower level than they had to. They were giving themselves headroom they didn't need. There are probably quite a few 12-bit recordings out there, but I wouldn't like to say hows!
With the introduction of the Blue 300 Mastering Controller, the Focusrite Mastering System is complete, providing all the functionality you need outside your Digital Audio Workstation. Recent improvements to the Blue 315 six band equaliser and Blue 315 Compressor with look-ahead limiter are complemented by the latest version 20-bit AD and DA converters, Blue 245 and Blue 260. To find out how it all fits together in your mastering room, contact us for a comprehensive brochure.

The Focusrite Blue Range. The Complete Mastering Studio.

Focusrite Audio Engineering Ltd. Tel. (0)1494 462246 Fax: (0)1494 459920 Home Page: http://www.focusrite.com
Relatively few people have been inside the studio that's been the Bee Gees' home base for some 17 years. **Dan Daley** drops in on Miami's oldest recording facility and one of the world's first personal recording studios.

I am sure that it was a coincidence that 'Stayin' Alive' was blaring from the Tannoy FNM monitors the moment I walked through the portals of the control room at Middle Ear in Miami. Practically, Studio Manager John Merchant is far too guileless to have set something like this up—soft-spoken, genial and pleasant to the point that you wonder what he's doing in the recording studio business. Merchant is running the multi-track of the 21-year-old classic and the four-on-the-floor groove that helped define disco a generation ago is more than intact—it's eerily contemporary. And just as John Travolta has undergone his own renaissance in film in recent years, the Bee Gees are back with a vengeance. The second break Merchant takes during our visit is a call from the chart trades in London to tell him that 'Alone' the group's first single from its new Still Water album, has just hit No 5 in the British charts and No 15 in the German listings in its second week out. America, he nods knowingly, is still to come.

The reason that the track is rolling purely as a matter of commerce: telemarketing label K-Tel Records has requested it as the new theme song for its next round of disco commercials. But its presence over the speakers underscores the history of Middle Ear Studios as one of Miami's oldest recording facilities, and as one of the world's first personal recording studios.

Middle Ear opened in 1980 after the Bee Gees followed their 1979 So You Think You Can Dance single to record 'The Boys,' as Merchant sometimes refers to them, were charmed by the city and had moved there permanently in 1977. During preparations for their 1979 Spirits Having Flown tour, they rented a large warehouse, owned at the time by TK Records, home of KC & The Sunshine Band, located a mile from the South Beach area and converted it into a stage for rehearsals for the tour. By the time they were finished rehearsing, they realised that the location and building were perfect for the studio they had been considering building in Miami. During the tour, their co-producers at the time, Carl Richardson and Ahilie Galutien, oversaw the design of a large-space, single-studio facility within the building. Assisted by Seth Snyder and the Recording Studio Equipment Co of Miami, the studio was ready for the Bee Gees upon their return. The first project done there was the mixing by the Bee Gees for Barbra Streisand's Guilty.

Originally an all-MCI facility with a JH-24 multitrack and an MCI 500-series console like many studios in Miami (where MCI was founded) at the time, the studio implemented a 56-channel Neve V3-series console with Flying Faders automation in 1985 along with a redesign of the acoustic space. The slatted-wood-covered walls are dotted with indentations into which amplifiers and microphones can be positioned to create a wide diversity of niche space ambiances. The acoustical qualities of the sizable—28 x 38 x 12 feet with a 6 x 6-foot isolation booth—main recording room can be augmented by opening doors at the rear that lead into an all-concrete room that is cabled to the 20 x 18 x 12-foot control room for additional reverberation. Other equipment includes a pair of Mitsubishi X-850 with Apogee filters, an MCI JH-24 24-track,
The Bee Gees used Middle Ear exclusively for their own projects and productions they were involved in until 1993, when they decided to make the studio more widely available. "In a very real sense, the studio has been broken-in in the best way a studio can be," says Merchant. "The boys developed the studio into a warm, personal and creative space. And that is part of what comes with the studio. There's nothing cold or impersonal about it. It's a single-room facility, so when an artist rents it out, it's all theirs. And everything comes with it; there are no additional rental charges.

Those who have taken up that offer include Extreme, R. Kelly, Antonio Sandoval, and Capitol Records artist Nil Lara, as well as a number of projects by leading Latin artists, including Ilan Chester, Ricardo Montaner. Plus, the Bee Gees continue to use the studio for their own recordings and production projects, which have included a Kenny Rogers-Dolly record, Diana Ross co-produced by Michael Jackson, and a Donna Warwick album.

The most notable recent project is Still Water, which not only marks the Bee Gees' return to the pop charts but also their first multi-producer outing—tracks were directed by Hugh Padgham, Anf Mardin, David Foster and Russ Tietelman. And Middle Ear was not the only studio used—various facilities in New York (Right Track and Unique), London (The Townhouse), Los Angeles (Record Plant) and Miami (Carrera) were used in the production. The first time the Bee Gees had been back at that studio, where they had recorded so many of their hits, since 1980 were also visited. But Merchant, a native of Virginia who came to Middle Ear while working on a graduate thesis at the University of Miami's studio programme, and who describes himself as chief engineer, studio manager, and I still change light bulbs, says that the Miami studio was always the central clearing house creatively and operationally for the project. It was a more current project than a 1993. The boys would be listening into the mixes in real time as they were being done there, too.

The system was put into Middle Ear about halfway through the project, its benefits became apparent when the schedules of the various producers were requiring the constant FedExing of DATs tapes back and forth from state to state.

They'd get the DAT from Arif, who had finished the night before in New York, listen to it, make comments, phone then him and then start that whole process all over again, recalls Merchant. "It was taking three or more days to get mixes finalised and approved. With the Fax system, they were coming directly out of the digital outputs of Right Track's Capricorn console, so the signal was never digital until it got to the converters here. It made a huge difference and ultimately I think it gave them better mixes."

Despite the sometimes nature of the recording, Middle Ear remained creative central for the entire project. Merchant engineered the demos of the songs that Barry, Robin and Maurice wrote at the studio, all of which served as frameworks for the final tracks, and in some cases provided elements of those tracks, such as lead and background vocals. "That's the nice thing about them having this place," he observes. "It's very comfortable here and that shows in their vocal performances. They can really relax when they're doing a take."

Recording a Bee Gees vocal is a pretty straightforward affair, Merchant says. Typically, we set up a single microphone—a Neumann U87 or this restored 449 that we now have—and they group around it and balance themselves for harmonies. For the first single, 'Alone,' Robin's chorus parts came from the demos we did here.

When composing, the Bee Gees prefer to play and sing simultaneously as though it were a vintage recording session, with Barry on acoustic guitar and Maurice on keyboards, each with their own microphones and with Barry using a Futuresonic microphones.
They pioneered the notion of the drum loop," says Merchant. "When they were working on 'Saturday Night Fever' in France their drummer had to leave mid-project, but they still wanted grooves to write to. So they took a 4-bar piece of drums off the 2-inch machine and cut that into a physical drum loop. The trouble was, it was too long to fit properly in the tape path of the machine; so they used a bunsen stick to extend the tape path. The intent was just to use it to compose to. But in the end I think that loop actually became part of the drum track for 'Saturday Night Fever,' as well as several others like Barbra Streisand's 'Guilty', and on the first record of theirs that they cut here, 'Children of the World.' That's what got them so deeply into playing with drum loops and later with drum machines. It got to the point where they would literally spend a week on a kick drum pattern. It also got them more deeply into the Boys still get first crack at it. And even though 'The Cariel remix of 'Stayin' Alive,' takes priority over an outside booking. (Although the Dolby Fax and ISDN lines have increased the studio's potential as a commercial facility—that same week Sylvestor Stallone was scheduled to come in for a voice-over on a film project.) Discussing a track sheet that he seems to have memorised, Merchant notes that the 24-track master from that song had the drums on two tracks and two tracks of automation data, with everything else sandwiched in between. The entire drum track was on only two tracks, he says. 'When you listen to it, you hear their impression of what drums should be and it was quite different for the time. They were the first to really put the kick drum out in front. Up to that point, people were still mixing for AM radio, which couldn't handle much of the low-frequency information. But with disco coming in, their drum mixes to multitrack helped define how music would sound.' Also on those tapes you can hear a combination of real strings and early analogue synthesizers, such as the Prophet 5, and a Rhodes electric piano all blended together. You can also hear things that no one has ever heard, such as the brass parts that were replaced in the second chorus by the 'life goin' nowhere' vocal parts. There are also numerous instances of vocal ad libs scattered across the tracks, and from what Merchant calls track-scraping effects that were combined via automation.

Middle Ear will undergo another redesign sometime in the near future, Merchant says. There is no sense of urgency to that project, which reflects the laid back nature of the studio and of Miami itself. But the genesis of that does come, interestingly, from The Boys' experiences in using multiple studio and producers on this most recent record. The experience of using other studios seems to have had an effect, Merchant says. Especially at Record Plant in LA, which really sounded amazing. This record had a real eye-opening effect on them. No designer has been retained yet, but Merchant says it's likely that they may go for a name this time. Other recent enhancements that bring Middle Ear forward include the implementation of black burst video sync.

If this Bee Gees record is a monster, then I'd expect that we'll have more enquires about this studio. Merchant figures, 'I don't know that it's going to be able to be rented any more than it already is, which isn't that much. But if that happens, then we want to be ready for that. But mostly, the upgrades we've done over here the years are to make the place more functional for The Bee Gees themselves. It's not to attract others and it's nice to hear them and this studio hunt on the radio together.'
beyerdynamic is the only manufacturer of headsets that can offer a dedicated range for on-air announcers, communications and cameramen that is designed and constructed specifically for the application.

**Why the DT 200 Series?**
- Compact, low profile design
- Broadcast quality microphone
- Reference quality monitoring
- Closed back for isolation
- Long term user comfort

These lightweight headsets are designed for on-air announcers where low profile, broadcast quality and long term comfort are imperative. Dynamic or condenser microphones offer the ideal solution to all announcer scenarios.

**Why the DT 100 Series?**
- Modular construction permits field serviceability
- Novodur® housing materials withstand rugged use
- Noise cancelling boom mics
- Unmatched intelligibility

To meet the tough demands of communications in broadcasting, theatre and film, the DT 100 series of headsets have long been the choice of professionals. Every component is field replaceable should the unforeseen happen, so the show will go on.

For more information, please call: 0800 374994
WE’VE COMPROMISED ON PRICE, SO YOU DON’T HAVE TO COMPROMISE ON QUALITY

* PREVIOUSLY £1099 EX VAT, NOW £935 EX VAT (£1099 INC VAT). SUGGESTED SELLING PRICES.

Legendary sound and build qualities have made Panasonic Professional DAT Recorders the choice of countless major recording studios and broadcast facilities around the world. And features like 20-bit DACs, 44.1/48kHz sampling rates and a full complement of consumer and professional digital I/Os have made the excellent SV3800 the most popular model in the current Panasonic range.

Remarkably, its also the least expensive. Just £935* (excluding VAT) now buys you the mastering DAT recorder that professionals swear by.

So why compromise with an ‘uprated’ consumer DAT recorder when you can have a fully professional Panasonic SV3800 in your rack?

For details of your nearest HHB DAT Centre, call HHB Communications today.

For consistently low block error rates and superior archival security, always use HHB Professional DAT Tape.

Panasonic SV-3800

Distributed by: HHB Communications Ltd 73-75 Scrubs Lane, London NW10 6DU, UK
Tel: 0181 962 5000 · Fax: 0181 962 5050 · E-Mail: sales@hhb.co.uk · HHB On-line: http://www.hhb.co.uk
Some 15 years after the launch of Channel 4, the UK has acquired another terrestrial television channel.

Kevin Hilton investigates the kit and controversy of C5.

On 30th March, Channel 5 finally lived up to its name and became the UK’s fifth terrestrial TV channel. This, after several false starts and continued doubts about the validity of such a service, competing against the two public service stations, BBC1 and BBC2, the commercial TV network, the more specialist commercial Channel 4 (S4C in Wales) and a host of satellite and cable services.

Regardless, C5 launched in a flurry of publicity, posting advertisements around the country, pushing its returning capability and draging in the already over-exposed Spice Girls—on the grounds that they are a powerful symbol of five—for the opening ceremony. This just gave the press something to hassle the new arrival with, homing in on C5’s high proportion of bought-in material and the trouble some people were having receiving the signal.

What everyone seemed to miss was that a fifth service had launched at all, given the idea was put forward towards the end of the 1980s and has taken this long to come about. One person who remembers the initial plans is Chris Collingham, now controller of engineering and operations at the new channel.

In 1987 he attended an Independent Broadcasting Authority committee meeting in his capacity as chief engineer of TV-am, the then rival commercial breakfast TV contractor. The idea for a fifth channel was mooted then and was eventually included in the 1990 Broadcasting Act. Collingham, whose CV also includes the BBC, left TV-am in 1989 to become a project management consultant and then became technical director designate for one of the groups interested.

This consortium did not bid when the Independent Television Commission (which replaced the IBA as regulator and licensing body for UK commercial TV) advertised the licence in 1992. Only one group, C5 Holdings (Thames TV, Pearson TV, Time Warner, Associated Newspapers and City TV) put in an offer, which was rejected by the ITC on the grounds that it did not think that the bidder could sustain a service of acceptable quality. The rest of us said to the ITC that a fifth channel would work one day, but not with the plan put forward at the time,” Collingham recalls.

The cause of concern was the frequency slated for the proposed fifth TV service, because whatever was suggested could cause interference to domestic VCR machines. As Collingham says, the aim was to reduce the amount of interference from the beginning. Channel 36 was initially offered up, but this was seen as unsuitable.

Collingham explains, ‘If the original plans had gone ahead, the transmission polarity would have been opposite to existing services, vertical polarisation as opposed to horizontal. This would have reduced interference, but meant that virtually everyone would have needed a new aerial.’

Most experts regarded Channels 35 and 37 as better bets, but when the relevant authorities came up with a second plan—Channel 37 for nine of the main sites plus Channels 48 and 56—Channel 35 was not included in the package as it had been reserved for a proposed BBC satellite single frequency network.

In 1995, the current Channel 5—a consortium of CIT, MAI, Warburg, Pinus Ventures and Pearson—won the tender race although there was a judicial review as it had bid the same amount of one of the losing. Page 80 >
full studio complex.

Required making publisher contractor play-out centre it went for sighted; most for four channel comes to it already 6dB are from it.

There, only Goldfield its came on. there was effective for covering up to 80% coverage terrestrially.

In our studio complex.

We've got the returning programme up and running and in place,' Gollingh responds. The Department of Trade and Industry has now agreed to the use of Channel 35 for at least the next five years—they're talking about using it for possible digital mobile TV on trains and coaches—but we will have to be re-tuned by then. We're building another nine Channel 35 transmitters at the moment and they should be ready by the summer. That will bring us up to about 80% coverage terrestrially.

This 80% is conventional UHF transmission, while the rest is a mixture of satellite feeds. C5 is now on Astra, and distribution through cable head-ends. On its terrestrial network, C5 has been accused of moving away from the policy of co-siting, where broadcasters transmit from one antenna for a given area, thereby doing away with the need for multiple domestic aerials.

'Channels didn't have to co-site before we came along,' Gollingh replies, 'but they generally did. With some of the existing sites it's not physically possible to get another antenna on the mast, for example Sutton Coldfield and Crystal Palace. In both cases terrestrial and satellite transmission service providers said that it had another mast, the old VHF site, only five miles away.'

While C5's London transmitter at Crayford is only a matter of 3° away from Crystal Palace, which houses the other terrestrial channels, there are still complaints that the new service's pictures are prone to the snow effect.

In London, for example, most people should be able to put up the worst of aerials and get away with it because it's only 6dB down on Crystal Palace,' Gollingh explains.

'There are other problems with aerials. Some are not designed to cover up to the frequency we're on—for example a Group A aerial goes from Channel 20 to Channel 34. We're on 3° and already 6dB down so an existing aerial may be 15–16dB down. Newer aerials extend to 3°. Group B is only fall off at 38. When it comes to it, it was pretty difficult to get a fifth channel in. During the 1960s the UK allowed for four channels, which was pretty far sighted; most other European countries only went for three.'

Encouraging viewers to buy proper aerials is all C5 can now do, having made the best provision for transmission and reception that it could. At the same time it had to prepare its play-out centre ready for launch. As a publisher contractor as opposed to programme making and production licence holder, C5 required a transmission facility rather than a full studio complex.

Gollingh observes that such
More professionals use Pro Tools than all other workstations combined. Why?
Because Pro Tools provides powerful features for recording, editing, mixing, and mastering. With up to 48 tracks of record and 64 channels of digital and analog I/O, Pro Tools has become an industry standard with unsurpassed price performance.

Patch in your favorite gear from Apogee, dbx, Dolby, Drawmer, Focusrite, Lexicon, and t.c. electronic, — or expand Pro Tools' capabilities with software Plug-ins from these companies and 100 others.

And now Pro Tools 4.0 has arrived. Among the dozens of new features are:

- **THE MOST POWERFUL MIX AUTOMATION IN THE WORLD AT ANY PRICE**
- **PROFESSIONAL DIGITAL VIDEO**
- **MULTIMEDIA AUTHORING TOOLS**
- **EDITING—DURING—PLAYBACK**
- **LOOP RECORDING**
- **SPEED, SPEED, SPEED — POWERMAC NATIVE!**

Whether you’re using Pro Tools III, Project, Audiomedia, or PowerMix systems, you can rest assured that Digidesign’s new Pro Tools 4.0 software will take you to new heights in creativity and productivity.

To remodel your studio with Pro Tools 4.0 or any of Digidesign’s audio solutions for music, post, multimedia, and radio broadcast, call 0800 898 331. And ask about our free Pro Tools video.
Neotek consoles are part of the success of leading post houses. We know your industry, and we've got the products to get you to the top.

Our Encore® consoles are designed specifically for film-style re-recording. "It's flexible, and it sounds great—just what we need for The X-Files," Dave West.

"Sonic performance is important to us, sure, but we bought a Neotek® Essence™ console because it's the only one compatible with the LarTec® ControlPro® and it's easy to operate—essential for quality in our one-man ADR/ Foley operation." Mike Morongell, EFX Systems.

Neotek and Martinsound® bring over 50 years of film and post industry experience to your door. Just pick up your phone or mouse.

Neotek
A Martinsound Company
1151 West Valley Boulevard
Alhambra CA 91803
800-582-3555
+1 (818) 281-3555
www.martinsound.com

Getting five; switching on Channel 5

< page 80 decisions come down to cost. "We decided to contract out our programming as much as possible," he says. So ITN (Independent Television News, which already supplies ITV and C4) makes our news programming (which, unusually for TV, has bulletins on the hour every hour, as well as main programmes at specified times) and other live shows are produced by various companies, while the rest is bought in from independent producers.

The play-out centre is based at the new Pearson Television building in the West End of London, housing Pearson's own studios, which have been moved up from the old Thames TV centre in Middleses, as well as new technical facilities for other publisher broadcasters (including Disney and Discovery). Collingham says that Pearson being one of its parent companies was not necessarily a factor. "We looked at a number of facilities companies before settling for Pearson," he comments. "It was a brand new building but had it still been in Teddington we wouldn't have gone because we wanted a central London facility. Now we're only a few minutes walk from our programming and administration offices.

Cost-effectiveness also defined the nature of the play-out centre. "It meant that the facilities had to be highly automated," explains Collingham, "and serial digital throughout, so there was no lining or drifting on the output. It either works or it doesn't. Also, from day one it was a 24-hour service with four separate outputs (each one corresponds to a specific region for more directed advertising), so we had to be careful how it was built. We also wanted to run with as few people as possible.

In putting this together, C5, like other UK commercial broadcasters, is bound by its licence to provide a reliable service with good quality output and programming. The ITC had to approve the installation, Collingham continues, ensuring that it meets the Code of Practice. Since we're not making programmes, we have to check everything that comes in to us from our suppliers. If we do it ourselves, we know we can trust our staff, but in the long term we need to trust the independent producers as well.

While the independent programmes are checked in-house in two dedicated technical viewing rooms (where technicians look for colour balance, sound quality and overall production values), acquired material—TV movies, feature films, overseas programming—is checked by the IFPC facility, which started out as the technical checking centre for the ITV Network, but is now a stand-alone company. It is also here that films and programmes are edited or graded for content and panned and scanned.

The main transmission suite is where programmes are played out and the overall output monitored. Central to this is a Pro-Bel TX200 vision mixer, which handles the serial digital signal output as a single stream (with embedded audio). Around this unit are three stand-alone Sony digital Betacam VTRs. There are a further three such units in a FlexiCart automation loader, but in general programmes are loaded into the stand-alones, because if there are any failures it is would be easier to swap machines. Also built into the..."
*(page 82)* control console is a small Soundcraft audio mixer to bring up the continuity announcer’s microphone. For overnight services the announcer will pre-record all the necessary links onto Minidisc. Two Denon MD players and the output of the Soundcraft are taken into the TX20, and then digitised.

Live programmes, including the news and the afternoon show 5x Company (produced by Pearson subsidiary Grundy TV in the downstairs studio), come in either as land lines, line links or from circuits via the Telcom Tower if they originate outside London.

Other important inputs are the commercials, which arrive at C5 either on digit Betamax or, more usually, down feeds from various agencies. Technicians record these onto tape, top and tails them and check them for quality. The clips are then recorded onto tapes already loaded into a Sony LMS (Library Management System) 1000 machine, with the information relating to each commercial entered into a database. 'It's the only way to know exactly what's in the system,' observes Collingham.

From here the commercials are cached onto Tektronix Profile disk play-out machines, with one assigned for each of C5’s four regions. Both the commercials and the main presentation output are under automated control, with Pro-Bel’s two specific software packages being used: Compass for programming and MAP for the advertisements and caching. Compass runs the majority of the output and instructs MAP when a commercial break is scheduled.

The output of the main transmission suite—programmes, promos, captions, voice-overs—is split to four small Pro-Bel 2-input vision mixers stored in the equipment room, one for each region. This is fed into one input of each submixer, while the relevant Profile player takes up the other. The main programme feed goes straight through, outlines Collingham, but during a break the submixers switch to the Profiles to feed the break. At this time the main mixer is doing nothing, but it does stand-by with captions in case of failure.

This arrangement was decided upon to keep down the amount of equipment used and for easy expansion. As each of the four submixers has its own Profile, we could just add on if we ever wanted to go to more regions,' says Collingham. 'It would have been unmanageable with four big presentation mixers and them trying to add a fifth or sixth. Although this is a high level of automation, there is still a human over-ride, as Collingham acknowledges: The transmission controller is ultimately responsible for it all happening. They have to make sure that the eight tapes are in the machine and that the correct feeds are selected.

Downstream of the four vision submixers is a Tektronix inserter for subtitles and data services. A feature of C5’s ad breaks is a colourful station ident that pops up between each clip, this 12-frame animation is generated on a lenticular device and is inserted as a cached trigger.

Like the transmission suite, the other technical facilities used by C5 are leased from Pearson. These include a graphics area with a Quantel Paintbox, a miniscule camera, a Mac and caption generator. Two edit suites, one a digit Beta room, the other an off-line, nonlinear facility with a Quantel Edithbox and the technical checking areas. Pearson also offers a stand-by transmission room when the on-air suites require maintenance and is currently building an audio dubbing booth.

In C5’s equipment room the four outgoing feeds are prepared for distribution. The channel is confident that it is the first terrestrial TV service that distributes its signal to its transmitters using satellites. One set of two is sent to an MPEG compression system at the nearby NTI, Oxford Street. Teleport and thence to the Orion satellite. The other feed goes to a compression hub in the basement of the NTI building and then onto the company’s headquarters in Hampden, from where it is sent to Inmarsat 725. Both feeds are sent out over cable links.

Collingham explains that this split serves two purposes: any one of the four regions can be isolated if the station wishes to target a particular area of the country for marketing reasons, while there is redundancy built in if one of the uplinks were to fail. It also means that all the regions can be transmitted onto one satellite if the other is about to experience a sun-out (when the bird is caught directly between the sun and the earth).

Like any new service, C5 has taken its fair share of knocks since the launch, but it is consolidating and looking towards the future. Being so new, it has seen the proposals put forward for digital terrestrial TV and planned accordingly. 'We've been gifted half of a multiplexer,' says Collingham, which means we have 12NP to use, some of which will go on simulcasting our existing terrestrial signals. Because we're a serial digital, we could take the existing service as it stands, put it into another multiplexer and go. All we've got to do is build another 50 transmitters and, ultimately, it depends on people buying the new receivers and aerials. The frequencies will be within the existing aerial groups, but there will still be people out there with inadequate aerials.'

Some things never change.
### Sound Check 2

**The definitive Audio Test Disc.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soundcheck 2 plus analyser</td>
<td>£62.50 (+VAT (+£2.50))</td>
</tr>
<tr>
<td>Soundcheck 2</td>
<td>£24.50 (+VAT (+£2.50))</td>
</tr>
</tbody>
</table>

**Remittance Enclosed**

Cheques made payable to Miller Freeman Entertainment Ltd.

Please debit my credit card as follows:

- Access/Mastercard
- Barclaycard/Visa
- Credit Card No.
- Expiry Date.

Name:

Organisation:

Address:

Post/Zip code:  Country:

Telephone:  Fax:

Date:  /  /

Signature:

---

**Analog?? – Digital!!**

The GHIEMETTI Digital Distribution Amplifier – easy handling like *in the analog world*!

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES/EBU SPDIF wordclock</td>
<td></td>
</tr>
<tr>
<td>Easy matrix configurable</td>
<td></td>
</tr>
<tr>
<td>Signalisation with LED</td>
<td></td>
</tr>
<tr>
<td>Transformer balanced</td>
<td></td>
</tr>
</tbody>
</table>

GHIEMETTI Communications AG
CH-4562 Biberist
Phone: +41 (0)32 672 50 11
Fax: +41 (0)32 672 13 24
The new SoundField SPS422 Studio Microphone System

**no other microphone listens like a SoundField**

Conventional studio microphones use one or sometimes two capsules - the SoundField SPS422 uses four. These are arranged in a precise tetrahedral array, collecting sound from a three-dimensional field at a single point in space.

Reaching far beyond the capabilities of normal microphones, the SPS422 is a complete system in its own right. From the control room - the optimum listening position - all microphone parameters can be adjusted via the 1U processor to create 'wide image' effects.

Neither the microphone or musician need move whilst you produce the ultimate 'big' vocal sound, spread a piano across the whole stereo picture, or create 'wrap around' acoustic guitars - the accuracy of response is breathtaking.

---

**Soundfield**

Charlotte Street Business Centre, Charlotte Street,
Wakefield, West Yorkshire WF1 1UH, England,
Telephone: (0) 1924 201089, Facsimile: (0) 1924 201618
E-mail: sales@soundfield.co.uk, Web site: http://www.soundfield.co.uk/soundfield.htm

www.americanradiohistory.com
Have you seen the new catalogue from Danish Pro Audio covering the complete range of Bruel & Kjaer Series 4000 Professional Microphones and accessories – the Microphones that are famous for keeping their promises about superb transient response – clarity – high SPL handling – low distortion – wide dynamic range. If you want to learn more about Bruel & Kjaer microphones and microphone techniques then get the new catalogue.

Danish Pro Audio ApS
Lackgade 10
3450 Allerød • Denmark
Tel: +45 4814 2928
Fax: +45 4814 2700
E-mail: smarines@image.dk

The V10 is a fully digital "Direct to Disk" video recorder/player designed to replace any VR, as a stand alone with front panel controls including Jog/shuttle. Add to CCR-601 4/2, two digital audio tracks and all formats are recorded and can be loaded later from any edit controller connected to the Sony P 6RS-422 ports or from the front panel controls. A proprietary Motion-JPEG compression is configurable from 2.1 up to 34.1.

European Sales Office: Doremi Labs Europe
Place J. Bernay 84119
France
Fax: +33 (0) 4 93 32 30 30
Phone: +33 (0) 4 93 32 30 23
Email: 16637.247@compuServe.com
URL: WWWDOREMILABS.COM

eurocable range includes audio, video and control cables. Main characteristics are the extreme flexibility also at lowest temperatures, the highest quality of materials and the excellent features. Among the audio cables, multipair cables from 2 to 46 pairs are available along with instrument, microphone, sturuar and wiring cables both analog and digital AES/EBU, besides speaker cables from 2 to 8 conductors, 2.5, 4 and 6 sq mm, with coaxial, twinaxial and parallel manufacturing.

LINK S.r.c.
00156 - Roma - Italy
Via Tiburtina, 912
Tel: +39 6-4072331
Fax: +39 6-4073138
E-mail: LINK.PRO@iol.it

Audio covering the needs of the professional sound industry in Italy – for concert halls, clubs, theatres, audioroom, recording studios, music producer. Domestic and International sales.

FUTURE FIRM DEVELOPMENTS

The new April '97 Product Guide from FFD is now available. 160 pages packed with 6000+ products.

FFD distribute: Canare and Supra high quality cables and connectors, Switchcraft, Neutrik, Edac, Hirose and cannon connectors. Microphones and headphones from Sennheiser, Beyerdynamic, Shure.

Carbon boom poles from VDB.

Plus much, much more. Get a copy today!

For an immediate response either FAXBACK Rebecca Reeves directly or mail to Studio Sound, 4th Floor, 8 Montague Close, London SE1 9UR.

Harbeth Acoustics Ltd.,
UK: 01444 440955 fax: 440688

The Canford catalogue provides professional audio users throughout the world with direct access to a range of 9000 items. This latest edition of the industry's essential source details an added 500 NEW items to the extensive range. With headquarters in the UK and sales offices in France, Germany, Switzerland and Ireland, Canford offers a service which caters for the urgent needs of audio industries wherever in the world. For more information, or a copy of the Canford catalogue contact:

Canford Audio plc, Cannon Close, Washington, Tyne and Wear NE38 0BW, UK.
Tel: +44 191 417 0037 Fax: +44 191 416 0592
E-mail: canford@canford.co.uk

Circle the number you require further information about
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
JUNE 1997

www.americanradiohistory.com
Contact: Adam Hall Ltd
Tel: 01702 613922
Fax: 01702 617168

**PRODUCT & BROCHURE SHOWCASE**

**ESSENTIAL READING**

THE 1997 HHB CATALOGUE

Call now for your free* copy of the definitive guide to everything that's important in professional audio.

HHB Communications Ltd, 73-75 Souchs Lane, London W10 6QJ, UK
Fax: +44(0)181 962 5050 E-mail: sales@hhb.co.uk http://www.hhb.co.uk

---

**smooth&creamy VAC RAC™**

The modular vacuum tube system, with:

- Mic Preamp
- Limiter
- Step Equaliser
- Instrument Interface
- All valve power supply stage...giving you the power of legendary tube technology for live recordings, tracking, mixing, sweetening and mastering.

**Anthony DeMaria Labs**

These precision-built devices are made in the U.S.A. to 'all-tube' designs for those who want the best. Their well-earned reputation for quality and reliability is backed by an impressive list of owners and users on both sides of the Atlantic. Want to find out why?

Now available in the U.K.

For Sales, Service & Rental Call
tickle music hire ltd
0181 964 3399

---

**Essential Reading: The 1997 HHB Catalogue**

Call now for your free* copy of the definitive guide to everything that's important in professional audio.

---

**Equipment Wanted:**

Neve, Calrec, Audix, Neumann, AKG, and Telefunken equipment.

Top prices paid.

Dan Alexander Audio, San Francisco.
(415) 546-0200 fax: (415) 546-9411
E-mail: da.audio@internetMCI.com

---

**Appointments**

**Studio Sound Engineer**

with experience

**Audio Post Production Engineer**

with experience

Knowledge of Soundscape Software, Tracmix II Automation.

Tel: 0171 386 0386

---

*To respond to any of the advertisements appearing in this feature, or to book your space in Studio Sound's Product & Brochure Showcase, Faxback Rebecca Reeves on +44 171 401 8036*
MISCELLANEOUS

Audio Tape & Cassette players.

NEVE 8036 with 48 frame 32ch.

Ampex ATR 80 24 track, 16 track.

Midas 02R - £10,000

Orpheus MTR 90 Mk II.

Various CD players.

Sennheiser HD 250.

New kick bass pedals.

New no. 7.

For sale.

Gold foil.
Studio Systems

"The home where the Soundtracs room!"

Need to buy a new mixing console?
Why buy new, when there are so many good quality Soundtracs around?
Have you thought about a Soundtracs?
We can provide over 20 different console types from £500.

"14/9/98" to a £0.00 Quoit's C456!
We can deliver, install and guarantee for a year, a Soundtracs console with a much higher quality specification than most new consoles at a similar price.
Maybe you're worried about after-sales service!
We're still giving five back up sales over five years ago!
Cone and demo a Soundtracs in our new purpose built Studio Showroom.
Call Tim Jones at Studio Systems, the Soundtracs specialist.
01923 483 3506
www.studiosys.demon.co.uk

We're always on the lookout for Soundtracs consoles!

Sale Items

CD Mastering
CDRs from just £7.50
Real Time Cassette Copying
Copy Masters and Editing
CD Manufacturing

Digital Audio Systems

Soundscapes
Power

FAX: 01246 275479
TEL: 01246 550421
www.studiosys.demon.co.uk

The Digital Village

Adventures in Audio
Outboard Specialists
TLA & Joe Meek II Lexicon & Focusrite
Soundcard Specialists
Dynamic £5 KRK £500 ProTools £500 Yamaha

.fs - Main Dealer MACKIE - Main Dealer
Call Nick Melville-Rogers 0181 440 3440

Digital Audio Systems

Soundscapes

Repeat Performance Mastering
6 Grand Union Centre
West Royal
London W10 5AS
Tel: 0181 960 7222
Fax: 0181 968 1378
www.repeat-performance.co.uk

RPM

CD Mastering

CDs from just £7.50
Real time Cassette Copying
Copy Masters and Editing
CD Manufacturing

CDs from just £7.50
Real time Cassette Copying
Copy Masters and Editing
CD Manufacturing

CD Mastering

CDs from just £7.50
Real time Cassette Copying
Copy Masters and Editing
CD Manufacturing

FILM/VIDEO EQUIPMENT
FOR SALE

Request details by fax to W.F.S. Ltd 0171 439 0372

Amek, custom built film/videodisc desks 24 into 6 with stereo pairings.

Ranger tone 35/16mm high speed projector complete with xenon lamp, rectifier. Lenses.

Ranger tone 35/16mm high speed recorder 35mm x 3.4/6 track 16mm x 2 track E.B.U.

Wrestex/Filmex replay w2 in one cabins
35/16mm.

Filmex B Phase master drive unit.

GTC Ercion 2, A.D.R. Computer with visual cueing, Maxivideo Projector pal nts silent running.

AKG 568B Microphones x 2.

Quad Amplifiers 500 x 4 x 15A x 1.

Eventide SP 2016 signal processor.

Hollywood Moviola.

For Sale

EUPHONIX CS2000M

Fully automated with SnapShot Recall
96 automated faders
96 four band EQs
56 dynamic processors
Additional ypes with 12 aux sends
Electronic blackboard setups
1 year old

Tel: 0171 426 5100 Fax: 0171 426 5102

SSL 5000 FOR SALE

32-channel equipped 24, 4 Groups, 4 VCS-Groups,
Instant Reset Computer, best condition
£25,000

Contact: Lutz Neumann +49 40 43 10 43

PRODUCTS & SERVICES

Lockwood Audio

THE

TANNY

SPARES AND REPAIRS

Long established dealer in used equipment

Phone: +44 (0) 181 - 207 4472
Fax: +44 (0) 181 - 207 5083

CONTACT MICROPHONES

FOR DETAILS CONTACT US ON:

TEL: (01428) 658775
FAX: (01428) 658438

www.c-cruer.demon.co.uk

Optical Drive Repair Ltd.

All optical drives, including CD ROM, CD writers,
5½", 3½" and PD drives are repaired.

ODR also offers the sale and repair of Optical and Tape Drives including DAT, Disk Drives, On Site Maintenance, Data Recovery, Data Transfer and Optical Media.

Tel +44 (0) 1737 379999 or Fax +44 (0) 1737 350386

Peter Keelung

International Studio Design

Tel: +44 (0) 1737 356161
Fax: +44 (0) 1737 359292
Mobile: 0888 5494076
Email: po1074z.l62@compuserve.com

www.americanradiohistory.com

Studio Systems

"The home where the Soundtracs room!"

Need to buy a new mixing console?
Why buy new, when there are so many good quality Soundtracs around?
Have you thought about a Soundtracs?
We can provide over 20 different console types from £500.

"14/9/98" to a £0.00 Quoit's C456!
We can deliver, install and guarantee for a year, a Soundtracs console with a much higher quality specification than most new consoles at a similar price.
Maybe you're worried about after-sales service!
We're still giving five back up sales over five years ago!
Cone and demo a Soundtracs in our new purpose built Studio Showroom.
Call Tim Jones at Studio Systems, the Soundtracs specialist.
01923 483 3506
www.studiosys.demon.co.uk

We're always on the lookout for Soundtracs consoles!

Sale Items

CD Mastering
CDs from just £7.50
Real Time Cassette Copying
Copy Masters and Editing
CD Manufacturing

Digital Audio Systems

Soundscapes

Repeat Performance Mastering
6 Grand Union Centre
West Royal
London W10 5AS
Tel: 0181 960 7222
Fax: 0181 968 1378
www.repeat-performance.co.uk

RPM

CD Mastering

CDs from just £7.50
Real time Cassette Copying
Copy Masters and Editing
CD Manufacturing

CDs from just £7.50
Real time Cassette Copying
Copy Masters and Editing
CD Manufacturing

CD Mastering

CDs from just £7.50
Real time Cassette Copying
Copy Masters and Editing
CD Manufacturing

FILM/VIDEO EQUIPMENT
FOR SALE

Request details by fax to W.F.S. Ltd 0171 439 0372

Amek, custom built film/videodisc desks 24 into 6 with stereo pairings.

Ranger tone 35/16mm high speed projector complete with xenon lamp, rectifier. Lenses.

Ranger tone 35/16mm high speed recorder 35mm x 3.4/6 track 16mm x 2 track E.B.U.

Wrestex/Filmex replay w2 in one cabinets
35/16mm.

Filmex B Phase master drive unit.

GTC Ercion 2, A.D.R. Computer with visual cueing, Maxivideo Projector pal nts silent running.

AKG 568B Microphones x 2.

Quad Amplifiers 500 x 4 x 15A x 1.

Eventide SP 2016 signal processor.

Hollywood Moviola.

For Sale

EUPHONIX CS2000M

Fully automated with SnapShot Recall
96 automated faders
96 four band EQs
56 dynamic processors
Additional ypes with 12 aux sends
Electronic blackboard setups
1 year old

Tel: 0171 426 5100 Fax: 0171 426 5102

SSL 5000 FOR SALE

32-channel equipped 24, 4 Groups, 4 VCS-Groups,
Instant Reset Computer, best condition
£25,000

Contact: Lutz Neumann +49 40 43 10 43

PRODUCTS & SERVICES

Lockwood Audio

THE

TANNY

SPARES AND REPAIRS

Long established dealer in used equipment

Phone: +44 (0) 181 - 207 4472
Fax: +44 (0) 181 - 207 5083

CONTACT MICROPHONES

FOR DETAILS CONTACT US ON:

TEL: (01428) 658775
FAX: (01428) 658438

www.c-cruer.demon.co.uk

Optical Drive Repair Ltd.

All optical drives, including CD ROM, CD writers,
5½", 3½" and PD drives are repaired.

ODR also offers the sale and repair of Optical and Tape Drives including DAT, Disk Drives, On Site Maintenance, Data Recovery, Data Transfer and Optical Media.

Tel +44 (0) 1737 379999 or Fax +44 (0) 1737 350386

Peter Keelung

International Studio Design

Tel: +44 (0) 1737 356161
Fax: +44 (0) 1737 359292
Mobile: 0888 5494076
Email: po1074z.l62@compuserve.com

www.americanradiohistory.com
1000 CD Albums £999 + VAT!
(from EQ DAT and separated artwork on film)

1. Includes 4 page booklet, 2 colour on-body print and case.
2. Digital Editing/DSP £25 per hr.
3. Cover Mastering to Exabyte DDP, Sleeve Design, Cassette Duplication, Vinyl: Call for details.

01992-505001

MARK GRIFFIN FURNITURE
CUSTOM STUDIO FURNITURE

Design and installation of racking, storage and accessories

Please call for a brochure
Contact: MARK GRIFFIN
Byrebrock Studios, (Lower Farm), Northmoor, Oxford OX1 1AU, UK.
Tel/FAX: 01869 300171

A New Control Room?
• Whatever the scale of your project, almost any control room can benefit from the design principles of the Early Sound Monitoring room.
• Located 43ft away on a reflective free area, in this new configuration of volume the unwanted reflections are masked by many undisturbed low level reflections from the front of the room, allowing versatility in accenting and imaging throughout the room regardless of equipment layout.
• This means that very different rooms can be made subjectively similar, providing the clinical thing just to another acoustic requirement.

ANDREW J PARRY
on 0161 861 0857

DAT SERVICE CENTRE
Even DAT recorders that record and playback perfectly may fail to meet the Sony DAT specification. As a result many may "sound different" or even produce glitches when played back on another machine.

To guarantee quality have your machine professionally calibrated by Music Lab Complete calibration, service and repair facilities from £75 plus VAT. Contact Jason Sulk for calibration prices/quotations on most models.

Tel: 0171 388 5392 Fax: 0171 388 1953

AIRC CONDITIONING & VENTILATION TO SOUND STUDIOS IS OUR SPECIALITY

We provide design only or design and installation for many well known clients.

Whether it be for displacement free cooling, V.A.V, V.R.V, split, unitary or centralised.

Call Mike Hardy of
Ambthair Services Ltd on
01403 250306 or Fax 01403 211269
Web: http://www.pcl.co.uk/kevinhardy
Email: mhardy@pcl.co.uk

NEED U.S. PRODUCTION OF YOUR AUDIO OR ROM PRODUCT?

CD AUDIO, CD-ROM Replication
Vinyl Records - 12' & 7" with DMM Mastering
Neve DTC & Sonic Solutions Digital PreMastering
Lyrec Dolby HK Pro Cassette Duplication
Graphics Design & Printing

All Manufacturing In-House, Since 1977

EUROPADISK LTD.

75 Varick Street, New York, NY 10013
(212) 226-4401 (000) 456-8555 Fax (212) 226-8672

HEAD TECHNOLOGY

NEW TAPE HEADS
Supplied for most makes,
Tape Head Re-Lapping-Re-Profilig,
Same day turnaround.

HEAD TECHNOLOGY
11 Britannia Way, Dianwell, Staines, Middle TW19 7HU
TEL: 01784 256046
when only the best is good enough...

**NEVE 8068**
Configured 32 / 16 / 32 Remote Patchbay
Bargraph Metering 32 x 31102 Modules 32 x 32430 / 32 x 32431 Modules Console Mk11

**NEVE 8036**
Configured 24 / 8 / 16 Right Hand Patchbay
PPM Meters 24 x 1081 Modules 1272 Line Amps 1943 / 1 Group Modules

**NEVE 8036**
Configured 24 / 8 / 16 Right Hand Patchbay
V.U. Meters 24 x 1095 Modules 1272 Line Amps 1900 Group Modules.

**NEVE 8026**
Configured 20 / 8 / 16 Right Hand Patchbay
PPM Meters 20 x 1107 Plus 4 x 1073 Modules 1272 Line Amps 1943
Group Modules 4 x 110734A Comp / Limiter

**NEVE 8014**
Configured 16 / 8 / 16 Right Hand Patchbay
V.U. Meters 16 x 1066 Modules 1272 Line Amps 1883 / 1 Group Modules.

**NEVE 5016**
Configured 48 / 8 / 2 + 1 Remote Patchbay PPM Meters

A large selection of NEVE EQ MODULES / GROUP MODULES / PSU / FRAMES.

take the gamble out of purchasing your 'vintage' NEVE equipment...

We will purchase your NEVE / SSL Console anywhere in the world.
Please note all stock owned by AES Pro Audio.

Telephone 01932 872672 Fax 01932 874364
Telephone International 44 1932 872672 Fax International 44 1932 874364

A UNITED KINGDOM BASED COMPANY
US: Post-it notes

With punishing overheads and a declining market, the temptation is strong to jump ship from music recording to postproduction. But the waters between are deep and dangerous writes Dan Daley.

T

here has been considerable record industry concern in recent months over the flat performance of the US music market. Last year's growth was pegged at less than 1%, and the first crossing of what could turn out to be a wave as high as 40% of retail returns of independent labels could ultimately make 1996's true net a negative one.

What this upheaval has obscured, though, is the robust health of postproduction. Europe provides an acceleration and advancement abounds. Todd A/O is adding new stages and is reportedly looking to add new geographical locations, Creative Cafe, a venture started by Record Plant owner Rick Stevens and Academy Award-winning sound designer Steven Hunter Flick, just opened its third location in Los Angeles, several high-end, high-profile studios, such as Imad Animals in Seattle, have made visible transitions from music recording to post in recent years, Orlando, Florida, which once threatened to become the White Elephant of post when it was realised that technical talent—the key element in all post-production—was reluctant to leave California and move there in the 1980s, is now a busy place indeed, with Universal and Disney expanding their operations there and several independent post facilities thriving.

Like most of the trends that have affected virtually every aspect of professional audio in recent years, the prime motivators behind the burgeoning of audio post come not from within but without. The expansion of cable systems in the US and their voracious appetite for programming has put the already production-line nature of Hollywood onto a virtual war footing, churning out movies-of-the-week and features, some of which were never meant to linger long in the cinema before shooting over to slots on HBO and Star TV. Not that Hollywood was lacking for work already—foreign distribution and rentals now account for more revenues for some major American-made films than their US showings, and overseas markets are hungry for America's most visible export: really big, really loud movies (Banana Forever was mixed at 112dB.!

The home video market rivals the cinema in its demand for programmes, and its catalogues are swelled by compilations of anything from rock videos to best-of shows to the peculiarly American obsession with replaying World War II, which on video is now longer than it was in reality. Finally, the needs of an inceptent 500-cable future has meant that as fast as post houses seem to be expanding, it is not fast enough, more audio scoring and post is being sloughed off onto project-type studios.

In addition to lots of work, audio post facilities can take advantage of the economies of technology more readily than can music studios. Post suites can proliferate and go on-line quickly with GUI-based DAW's and that cost a fraction of what new large consoles and scarce vintage equipment can cost, and post suites' acoustical design requirements are often less intense than those of large music studios.

And when high-priced technology is needed, such as 100-plus-input mixing consoles, the 3-digit hourly rates that many post houses can charge helps defray those costs. Considering that many well-equipped music recording studios can often be squeezed by only slightly more, and that some of those studios need to keep adding new levels of technology to heat off the horde of home studios that are nipping at them from below, it's a wonder that any of them stay in music at all.

However, easy as postproduction sounds, Costs to keep technical post talent are spiralling upward as the number of new facilities and suites grows.

Europe: Welcome to DVD, the digital volatile player

DVD's international soap opera continues—integral to the development of the plot are subversive issues including copyright, increasing technical complexity and the growing political consequence of failure writes Barry Fox.

I

VD MOVIE in Europe remains an extraordinary mess and a serious risk for any company investing in software production. Of all the companies that promised to launch DVD Movie in Europe this year, only Panasonic is pressing ahead. Panasonic's players are on sale in Germany, Denmark, Spain and France, with sales in the UK promised by June. But this is despite the fact that there is just one, yes one, PAL disc available (Twelve Monkeys) and it has an exclusively German-language soundtrack.

The strength of software that will play on European players is on NTSC discs from Japan which falls into the same Regional Code zone Q2 as PAL Europe—but only 12 of the Japanese discs have English language sound. NTSC discs from the US will not play because they are coded for region 1. Under British law anyone selling them risks prosecution because they are not certified (or rated) by the UK censors.

Back on the hardware, the Panasonic player connects only to an AC-3 Dolby Digital surround decoder, not a decoder for the MPEG-2 digital surround system required by the DVD standard for PAL discs. All the other companies (except Thomson which is bidding Panasonic players and using them for in-store demonstrations of wide-screen TV) have now shelved plans to launch DVD in Europe until the Berlin Funkausstellung at the end of August. They are waiting to see if there is any software available and, if so, what digital surround system it uses. If it uses MPEG2 surround, all the Panasonic players so far sold will be obsolete; if it uses Dolby AC-3, the DVD standard is obsolete and MPEG2 surround is dead in the water. Either way, early commitments to DVD programming in Europe risk being suicidal.

As one trader put it, there is only one real hope for DVD, and that is to put a record button on the player and make it a disc-based VoD that plays pressed discs as well as its own recordings. This is now possible.

As expected, the Working Group setting the standard for DVD-RAM voted in favour of the compromise brokered by Hitachi (the WG Chair) between the rival proposals from Panasonics-Toshiba and Philips-Sony.

The DVD Forum now defines the new erasable disc as coated with phase-change recording material, pre-grooved with a wobble tone to provide a clock signal, and pre-pressed with bursts of pits which provide address headers for the erasable data. Although the pressed pits are robust, and do not degrade with use, the fact that they are in short bursts makes them susceptible to any blemish on the surface. Hence the DVD-RAM standard provides for caddies to protect the disc. And here things get very complicated.

The DVD-RAM standard says that caddies are optional for single-sided discs but obligatory for double-sided discs. This raises two questions: how, as the standard suggests, can a DVD-RAM be played on a standard DVD player if the disc is in a caddy and DVD players use tray loading for bare discs? And why should it be necessary to protect the double-sided discs but not single-sided discs?

Simply the promise of DVD-RAM playback on standard DVD players is misleading. Owners of first-generation DVD-Movie players and DVD-ROM drives will not be able to play DVD-RAM discs. The optics will probably not read the low reflectivity disc and certainly the tray will not physically be able to take a disc in a caddy.

What the DVD Consortium should be saying is that they have seen ways of making future generation DVD-Video and DVD-ROM players capable of playing back DVD RAM recordings. Whether this happens, on what timescale and at what price and whether all
it's not a piece of cake. Costs to keep technical post talent are spiralling upward as the number of new facilities and suites grows, creating a pariah-like class of increasingly affluent and finicky mixers, sound designers and engineers. Music studios learned long ago the pitfalls of building rooms to suit the tastes of one major client, a Nashville studio once built a room for producer Jimmy Bowen that had no wall between control and recording rooms, a situation that ultimately gave Bowen, not the studio, the most leverage. But that's precisely the model of post, in which the suite is built around the technical talent, who is, in essence, the client. So while the technology may cost less than in music, that's being offset by personnel costs.

Secondly, the same personal studio issues that plagued conventional recording studios and making themselves felt in post as affordable technology encourages more small but very capable facilities and those increasingly affluent technical talents go off and open their own factory. In addition, as the number of suites grows, so does competition; there are reports of, if not the wars seen in music, then at least rate skirmishes as new post facilities vie for clients.

In short audio post is on an upward swing. But it is becoming, as did music recording, a more complicated business. The US postproduction industry is the world's most evolved and will be the leading field upon which future paradigms for that business are cast.

DAB hand in radio

With the dawn of practical digital radio broadcasting finally upon us, the inevitable political power plays have begun for the British broadcast market writes Kevin Hilton

D—REMEMBER THAT? Now there was something that caught the attention for a while, not that it should have done of course. All those people who thought DAB would be ultimate_engineering_ and nothing else_knew 147 Project tried very hard to play things down, saying that September 1995 wasn't a launch, it was just the start of pilot schemes.

That didn't stop broadcasters like the BBC having big get-togethers where executives spouted ill-informed soundbites about the new golden era of radio. Everyone outside of the groups immediately involved in DAB were bemused—and that included a couple of BBC journalists who interviewed me about what it all meant.

The conversation ran along these lines: So there's this brand new radio system that nobody can receive at the moment because there's no affordable equipment on the market? Yes. So what are the benefits of DAB, then? And so on, and so on. And I still haven't been paid for that interview...

Every so often the subject pops back onto the agenda, but the reaction is still pretty much the same: everyone is underwhelmed and just a little fearful that the idea has gone. The BBC, for example, trying to work out how practically and where they will have to fork out money for new equipment, with the sinking feeling that something else may come along in five year's time.

Despite all the talk there has been the feeling that it was something that was still a way away and therefore might not happen. Like all things one tries to forget about, DAB has snuck up on us, because, later this year, digital audio broadcast will be here

Behind this bullishness there is financial and commercial expediency

Whether they will be able to compete with the centrally-funded public broadcasters, which also have the advantage of being national services, something that makes more sense in the implementation of DAB multiplexes.

A way round this could be the joining together of commercial services to create a viable national 'network', something that has recently happened in the UK. Two of the country's biggest groups, Capital and Virgin, were merged when the former bought out the latter for a reported £97 million (a £65m price tag plus £22m of Virgin debt).

The deal depends on approval from the Radio Authority, but, if it is passed, then the former fierce rivals, which were fighting for supremacy in London particularly, intend to take on BBC Radio 1FM. Richard Branson, who founded Virgin Radio four years ago, explained that the merger would enable the company, which would be the largest commercial group in the UK, to challenge what he sees as the BBC's dominance in DAB.

Looking behind this independent bullishness, giving the impression of noble privateers taking on the establishment, there is financial strategy. And another format that means they'll have the infrastructure in place for what one observer described as the 'era of premium', where the receiver electronics is fighting for air in the 15-34 age group, directly at the revitalised R1.

As the AM station has already been promised a place on an independent DAB multiplex, as amplitude modulation status will no longer be a barrier to taking on the BBC's nationwide service directly.

The only stumble could come from the RA deciding that it is not in the public interest for Capital to have three local licences in London, although the body has allowed the UK's one-time-independent local radio structure to become neither independent nor local, with a few big groups each controlling a large number of stations.

There should be a commercial alternative to the public service plans for DAB, but if the financial markets are anything to go by, the apathy towards the new technology, caused by a mind-numbingly long gestation period, appears to be spreading. On the night the Capital-Virgin deal was announced, Capital's shares fell by 5p. Hardly a welcoming sign.
Introducing the Front Access Patchbay Series...
an exciting new reason to make Switchcraft your source for audio panels.

Our innovative front access patchbay gives you space where you’ve never had it before and convenience you’ve never dreamed of, in a quality package you’ve come to expect from Switchcraft. Our heavy duty slide-out tray gives you access to the 96 nickel-plated steel frame jacks from the front of the unit.

But that’s only the beginning! See the photo above for all of the features and benefits, which make this panel ideal for use in studios, tape editing rooms, mobile facilities and anywhere space is limited.

While you’re at it, check out the patching products below. Don’t forget our high quality patchcords, and industry-standard Q-G® microphone connectors.

Switchcraft is your one-stop shop for all of your broadcast interconnect needs. Call today for a copy of our Audio Video Products catalog.

Switchcraft®
C/o Raytheon Marine Europe • Anchorage Park
Portsmouth PO3 3TD • United Kingdom
Tel: +44 (0) 1705 661579 • Fax: +44 (0) 1705 694642
www.switchcraft.com
Switchcraft®-Consistently Excellent Since 1946®
AC power explained

With virtually every component in a studio requiring electrical power, understanding the principles is essential. **John Watkinson** gives a tutorial on a neglected subject

**Electricity** is an excellent servant but a dangerous master. Used wisely, it's an essential ingredient of music recording. Used wrongly, it can kill, either directly or through fires. Even if you escape the fire, the loss could kill your business. A poor electrical installation can cause hums, crackles and hiccups on the audio, making your output quality lower than the studio next door that has fixed all its problems. Still not interested?

Electricity is a convenient way of transmitting power from one place to another. For our purposes, the power source can be considered to be the output shaft of a steam turbine. This shaft drives a generator which converts mechanical power to electrical power. The power is transmitted elsewhere by wires, and these suffer from two problems.

_Fig.1a_ shows that a complete circuit is necessary so that current flows in a loop to the load and back. The first problem is that the wires must be insulated to prevent the current flowing from one to the other, forming a short circuit. The second problem is that some of the power is lost because of the resistance of the wire. The power loss is proportional to the current.

_Fig.1b_ shows a 1kWatt generator driving a motor with a nominal 100V Volts. From Ohm's law this requires 10amps. If the wiring resistance is 1Ohm, then 100W is lost in the wiring. _Fig.1c_ shows a 1kWatt generator which has a 1kV output. Now the current is only 1amp and the wiring loss is 1Watt. So going to a higher voltage has improved the efficiency from 90% to 99.9%: hence the use of incredibly high voltages on electricity pylons.

Fortunately using 12,000V to drive a cassette deck is not really on, and a lower voltage is needed for local distribution to consumers. In order to change voltage, a transformer is needed, and these only work on alternating current (AC). _Fig.2a_ shows that a transformer is the electrical equivalent of a gearbox. The voltage ratio is the same as the turn ratio between the primary and secondary windings. In a practical power generation system shown in _Fig.2b_ the AC generator, or alternator, works at a few kiloVolts to allow the use of moderate amounts of insulation. This is stepped up to a phenomenal voltage for transmission, and then dropped again in a substation for distribution at a safer voltage.

_Fig.2c_ shows that the voltage waveform of an ideal AC power source is a sine wave. Clearly the voltage and the power fall to zero twice per cycle. _Fig.2d_ shows that the instantaneous power is proportional to the square of the voltage, so the average power is given by the mean of the square of the voltage. The DC voltage which would produce the same power is given by the square root of the mean of the square of the AC voltage. This is the origin of Volts RMS (Root Mean Square). Ten Volts RMS delivers the same power into a resistor as 10V DC. The peak voltage is obtained by multiplying the RMS voltage by the square root of 2. Thus if you are dumb enough to stick your finger in a 250V RMS socket, you will actually find out what 325V peak feels like.

When the power involved is measured in megawatts, as is the case with the alternator shaft, the power fluctuations of a single phase AC system would tear the machine apart. The solution is to use a three phase AC. _Fig.3a_ shows that 3-phase AC has three wires with 120° between the voltage waveforms. If the same peak current flows in each phase, the total power turns out to be constant even though the power fluctuates in each phase. _Fig.3b_ shows a three phase transformer; the windings can be connected as a star or a delta configuration. The delta configuration is ideal for loads such as motors that must take exactly the same current from each phase. The star configuration produces an additional terminal at the star point, which is called the neutral point. Note that because of the 120° phase relationships the phase-to-phase voltage is somewhat more than the phase-to-neutral voltage. In the UK the phase to neutral voltage is typically 240V at 50Hz whereas in the USA it is 110V at 60Hz.

The star configuration is used for domestic distribution because each house can be supplied with a single phase and neutral. _Fig.3c_ shows that the phase selected rotates from one house to the next so that the phase loading is more or less balanced. If the loading is not balanced there will be a net current flow in the neutral wire at the substation transformer.

Larger premises will be fed with all three phases and the wiring within the building must be arranged so that a reasonable load balance is obtained.

When the load is resistive, like an electric fire, the current is in phase with the voltage and the maximum power is delivered. However, many loads are reactive, mostly inductive, and in this case the current and the voltage will not be in phase. Take the case of a powerful class-B audio amplifier with no audio input. Very little current will flow.

---

**Fig.1a:** Complete circuit is needed to pass current. _Fig.1b:_ 1000V working gives 90% efficiency. _Fig.1c:_ 1000V working gives 99.9% efficiency

**Fig.2a:** The transformer is an electrical gearbox. _Fig.2b:_ Practical power system steps up to high voltage for transmission.

**Fig.2c:** Single phase power is not constant

**Fig.2d:** Single phase power sin² wave form. Mean power is the same as that delivered by DC voltage equal to RMS voltage

---

Studio Sound June 1997

John Watkinson
AES/EBU?

....DSA-1

The Prism Sound DSA-1
AES/EBU interface test system provides unique generator and analyser capabilities enabling the most comprehensive assessment of AES/EBU interconnections.

For example, the DSA-1 can measure differences between source and cable jitter, or it can simulate either sort with its signal generator.

To find out more, call or fax us now for a full information pack, or look up the latest DSA-1 V2.0 specification at our web site.

Fig.3a: Three-phase power has overlapping waveforms so that total power is constant.
Fig.3b: Three-phase transformer has three limbs, can be connected in star, with neutral, or delta without
Fig.3c: Domestic single phase supply rotates between phases from one house to the next.
Fig.4: Although capacitor dissipates no power, full current still flows, causing transmission losses. Transformers are rated in VA not Watts to protect against this.
Fig.5: Ring main system used in the UK is only legal with 13A sockets because plugs must be fused to protect the load, not the ring. Ring has its own fuse

< page 95 be drawn from the power supply and the reservoir capacitor voltage will rise almost to the peak voltage of the transformer secondary. So secondary current flows for most of the cycle as the rectifier is reverse biased. The primary current is limited by the inductance of the winding and the phase of the current will be nearly 90° to the phase of the voltage.

Although little power is being used, the Ohmic loss due to the current in the entire transmission system is undiminished and its heating effect is unchanged. This is why transformers still get warm even if the secondary is unloaded. Fig.4 shows a transformer driving a capacitor. The secondary current is at nearly 90° phase to the voltage so the power delivered is almost nil. The term 'wattless power' is sometimes used to describe the situation. The ratio of the power delivered to the power which would be delivered into a resistor is called the power which is given by the cosine of the phase angle. As the Ohmic heating is due to the magnitude of the current, and independent of the phase angle, transformers are rated in VA (Volt Amps) rather than Watts. Clearly using a transformer at its maximum VA rating with a near zero power factor is pretty stupid, but is what happens in many practical cases, including our idling class-H amp.

Your household electricity meter does a vector multiplication of the current and the voltage. So you only pay for the actual kilo-Watt hours, irrespective of the phase angle. If you run at a miserable power factor, the electricity company has to supply all of the quadrature current and sustain all of the losses. In larger installations, this situation is wasteful, and if the load is predominantly inductive, it will be necessary to install capacitor banks to improve the power factor.

As a fault in an electrical device can result in its resistance or inductance falling, the result is high dissipation and a temperature rise, leading to burnout. This is avoided by fuses which are the equivalent of the weak link in a chain. If the normal current is exceeded the fuse link melts and interrupts the current. The fuse must be in the live wire as an open neutral fuse would leave most of the circuit live, but with no power flow to indicate the condition.

The traditional way of installing single-phase power wiring was to run a separate set of wires back to a terminal box for each socket. The wires need to be able to carry the full-rated power of the socket, whether it is in use or not. A more efficient system is to use a ring main. Fig.5 shows that within a given floor area, an unlimited number of 13A sockets can be connected with the live, neutral and earth wires in a ring. A fully loaded socket at the furthest point on the ring will be supplied by both halves of the ring in parallel, allowing thinner wire to be used. For every powerful device in typical use, such as a kettle or fan heater, there will be lots of low-powered devices such as radios. If the power supply bricks, PCs and so on, so the ring main can operate with a 30A fuse, even though there are enough sockets to supply much more. A 30A fuse only protects the ring wiring, so it is essential that each plug has a fuse suitable for its connected appliance.

June 1997 Studio Sound

www.americanradiohistory.com
THE TRUTH
CAN YOU HANDLE IT?

If you're looking for a monitor loudspeaker to flatter your work, then frankly you should look elsewhere. Because at ATC, we dedicate ourselves to hand-building the most accurate studio reference monitors that money can buy.

Our soft dome midrange driver is the envy of the industry, with exceptionally uniform dispersion ensuring even balance at all listening positions and the elimination of the 'hot spot'. Unique phase correcting circuitry in our active crossovers maintains the timing integrity of your source material and presents a stereo image of unparalleled accuracy. And by winding shorter, denser voice coils from flattened copper wire (we couldn't find any we liked incidentally, so we designed and built a machine to mill our own), ATC monitors achieve greater linearity than conventional loudspeakers, with a vastly extended dynamic range.

So if your mix genuinely is 'stunning' -- or any of the other adjectives that seem to be so popular in loudspeaker advertising nowadays -- then prepare to be stunned. But if it's anything less than perfect?

Well we hope you can handle the truth.

CALL 0181 962 5000 FOR A BROCHURE

NEW SCM20A PRO

Drawing on 20 years of experience in professional monitor loudspeaker design, ATC has developed the ultimate transportable active monitor system, the new SCM20A Pro. The radical cast aluminium cabinet houses ATC's legendary bass/midrange driver combining a 150mm bass cone with a 75mm midrange soft dome, and a 25mm tweeter along with independent 200 watts RMS and 50 watts RMS power stages with a phase corrected active crossover.

Pictured right: SCM10 PRO, SCM20S SL PRO, SCM50A PRO, SCM100A PRO, SCM150A PRO, SCM200A PRO, SCM300A PRO (left to right).
Take your recording and editing facility with you wherever you go. Now you can have a portable, multitrack studio by combining Digigram's Xtrack™ with our revolutionary new PCXpocket™. Just imagine a production studio in your laptop, the possibilities are boundless!

Xtrack plus PCXpocket editing and processing features

- PCM-linear and MPEG Audio compressed modes
- Simultaneous record and playback
- Up to 16 MPEG Audio monitracks on 2 inputs/outputs*
- Punch in/Punch out
- Time-stretching
- Pitch-shifting
- Noise reduction
- Track merging/Track mixing
- Sound library
- Unlimited number of undo

PCXpocket

- PC Card type II (PCMCIA)
- Two balanced mic/line inputs
- Two unbalanced outputs at line or headphone level

* Performances depend on the PC used.
Station to station

From buzzword to byword, DAW systems have steadily gained in reliability and desirability, and they now define postproduction.

Yasmin Hashmi gazes into the future of workstation solutions

WITH THE PROMISE of broadcasting entering the digital era, the past year has seen much talk of convergence. This is understandable when manufacturers and service providers begin to give demonstrations of audio accompanied by pictures and text, or when telephone companies show how pictures, text and audio can be broadcast over the Internet. However, the term convergence seems to apply to media rather than applications. In practice, the gradual digitisation of virtually all forms of media has seen manufacturers responding by addressing increasingly diverse markets, ranging from cart replacement for radio or theatre, to postproduction editing and surround sound mixing for video, television, film and DVD (Digital Versatile Disc), to production for the Internet or mastering for multimedia CD.

There will inevitably be a certain amount of crossover between these markets in terms of technology, and this potentially offers new opportunities for multifunctional studios. However, whether this will lead to the digital audio workstation market converging into the 'stand-alone studio', based on a handful of standard platforms differentiated only by software applications and customised controllers, remains to be seen. According to Hazel Simpson, group commercial director for SSL, "Digital audio markets have been migrating towards an integrated system model and away from the 'stand-alone box' approach of the past." Given the special needs of the professional audio industry and the more general goals of the computer industry, must such a model rely on proprietary solutions? Or can off-the-shelf platforms be adapted appropriately?

As personal computers become more powerful, a reasonable assumption would be that the days of the proprietary platform are numbered. Indeed this has been said ever since Digidesign, now well known for its Mac-based systems, took the audio industry by storm with its 2-channel Sound Tools card and software package. When the multichannel Pro Tools arrived, established players certainly felt a dent in their sales as many users understandably chose the cheaper alternative.

Nonetheless, while Digidesign has been one of the most successful digital audio workstation companies in terms of packages sold and the number of third-party software products developed for its cards, it could also be reasonably argued that with the arrival of built-in audio capabilities for computers, the days of such cards are also numbered. Silicon Graphics, for example, recently demonstrated its professional digital audio board which is built into the Octane and Onyx2 platforms, as well as being available as an option for the O2 workstation. Supporting eight channels of 24-bit ADAT optical and two channels of AES-EBU, the technology is apparently already being beta tested by Steinberg. According to Noel Taylor, audio marketing manager for Silicon Graphics, developers are recognising that the speed increase curve for CPU-based processing is flatter than that of dedicated DSP chips. This may be true, but not everyone is in the market for an SGI platform.

In fact, Macintosh computers have had built-in audio capabilities for some time, and there are a number of software packages such as the Macromedia Deck II which already take advantage of this. Deck II was one of the first software-only multi-track recording and mixing applications available, and the recently launched version 2.5 now claims support for playback of up to 64 tracks in real time. It also features multi-processor support for increased real-time effects processing, and has addressed timing problems associated with the Apple Sound Manager.

Indeed, Digidesign itself responded to audio-capable Macs by launching the software-only Pro Tools Power/Mix, and also began to address the even lower-cost IBM-compatible market with a PC version of Session 8.

Although the Mac is generally considered to have a more friendly operating system, the PC wins hands down in terms of cost and availability of peripherals, accessories and software. There are many PC-based audio editing software packages to choose from, which only require the addition of low-cost sound cards. Furthermore, as PCs begin to offer audio capabilities in the form of MMX technology for example, there will be a surge in the number of software-only products developed as a result, promising to make the digital audio workstation even cheaper and more accessible to the wider market.

While on the surface, software-only solutions sound like the answer to many people's dreams, the reality is that off-the-shelf computers are still not generally mass produced with the audio professional in mind. If professional audio and sync I/O are required for example, then hardware with appropriate interfaces must generally be page 100 >
THE OKTAVA MK319 CARDIOID CONDENSER

The preferred mic of choice for a rapidly expanding group of producers, engineers, and artists worldwide. We gave one each to the producer Edwyn Collins, the engineer Edwyn Collins, and the artist Edwyn Collins, to see what they thought...

"It produces outstanding results" 
"Alto, very well engineered" 
"A real work of art"

...all three agreed

THEY'D NEVER KNOWN A MIC LIKE THIS BEFORE!

TEL 01633 206 511 FAX 01633 206 536 SALES 01633 834 6747

A & F MCKAY AUDIO LTD

< page 99 added. Macromedia has always recommended Digidesign Audionina, Sound Tools or Pro Tools cards for audio I/O, although version 2.6 now supports the new Kong SoundLink DRS 1212 I/O multichannel audio interface PCI card. In fact the SoundLink DRS range of products also includes the dedicated DRBRC recording console, and the 880 converter units, which provide conversion between analogue and 8-channel ADAT optical.

Apart from the I/O issue, relying solely on the personal computer platform can have other drawbacks. For example, the overall performance of audio software can vary, depending on the host CPU: amount of RAM, and disk throughput. This means that there will still be a demand for proprietary engines geared specifically to handling and processing audio, such as the Spectral Prisma, the Sonic Solutions SonicStudio and the Windows 95 NT-based Merging Technologies Pyramis. These products are provided as plug-in cards accompanied by proprietary software applications, although Sonic Solutions recently introduced the SonicStudio Engine application programme interface for third-party software developers such as Opcode.

However, not all engines consist of plug-in cards. The SoundScape Digital SNHDSR-1 comprises modular rackmounts with all required processing, I/O, storage and sync interfaces. Provided that the specified drives are used, the new version 2.0 supports up to 12-track playback per unit, and the new SSAC-1 accelerator card, which retrofits existing units, allows each channel of theGUI-based mixer to run any number of real-time processes, while also providing an extra eight channels of TDM I/O.

Some people are quite prepared to mix and match software and hardware products, and to source a platform and peripherals with the correct specifications but for many especially those seeking guaranteed performance, the turnkey proprietary system is a far more convenient and attractive solution particularly if supplied with an integrated control surface. Manufacturers obviously agree, since the number of such systems is on the increase, ranging from low-cost, compact self-contained desktop units such as the Roland VS-880 to high-end systems such as the new SSL Altair, which includes integrated nonlinear video and surround sound mixing for the emerging new television formats.

Proprietary hardware is an expensive route for a manufacturer to take, particularly if the product is not intended for mass production, and with so many companies competing for the lower volume, higher cost end of the market, these are bound to be casualties. The most recent was the Fostex Foundation which was officially withdrawn from sale in March. The StudioFrame has changed hands yet again, having been sold off by Timeline which after a restructuring process, is now concentrating on its MR-8 modular recorder. Nonetheless for those established systems which remain, the market over the past year appears to have been fairly buoyant.

Having been purchased by Managing Director Mike Parkin, Digital Audio Research (DAR) is keen to re-establish itself in the US, and recently showed its Sound-
With over 3,500 systems in use worldwide in just 3 years, you could say we've got some experience in hard disk recording.

**NEW V2.0 features:**
- Powerful 32bit editing software
- 12 playback tracks per unit (expandable to 192 physical tracks)
- Custom digital mixer featuring 16 internal busses
- "Audio Toolbox" (chorus, flanges, delay, compressor, limiters, phase shifters)*
- High quality Reverb from Wave Mechanics Inc.*
- ADAT/TDIF Digital I/O
- 256 virtual tracks
- Up to 192 physical outputs
- Punch in, Punch out
- Upgrade for all existing users

* Optional software plug-in if required

The SSAC-1 accelerator card for Soundscape Hard Disk Recorders adds TDIF digital I/O and the enhanced processing power required for Version 2.0 software. The SSBO-1 connects via TDIF and adds 8 XLR in's, 8 XLR out's, 2CBit converters, ADAT Optical I/O, Super/Word Clock in/out and peak level metering.

**internet:** http://www.soundscape-digital.com
Fairlight dubber—part of a trend
< page 100 Station Gold and Sabre Plus at the NAB Convention in Las Vegas. The company also showed a beta version of its OH8R modular recorder, which is fully compatible with other DAR systems and supports recording to hard or MO disc.
In fact, an increasing number of manufacturers now offer recorders or dubbers aimed at providing cost-effective record or replay capabilities to complement their existing editing systems. Most of these are aimed at replacing mag machines or multitracks for film and video postproduction, a specific area of the professional market that until recently has not been well served. However, having announced the availability of the DAD dubber, a 24-track unit that can play back files created on Fairlight MX3 series workstations, Fairlight USA chief executive John Lacaisse confidently expects to have 'well over 1,000 tracks of playback in Los Angeles by the end of June.' While the DAD promises to satisfy the demand by MX3 users for a cost-effective playback system, there is also a need for more general purpose units which can record as well as playback.
The Akai solution is the DDR. Designed as a modular 8-track machine, the unit can use hard disk or removable media and supports a range of I/O options including TDF and ADAT. It can be controlled via its front panel, RS422 or the DE1000 edit controller, and is compatible with other Akai systems such as the DD1500 editor and DR8 and DR16 recorders. Furthermore, according to Akai, the DDR can sync to virtually any timing reference, including biphase, in forward or reverse, at any speed—a feature that will no doubt be particularly welcomed by film makers. The Genex 8000 8-track recorder also supports this feature.
Following on from the DMT-8 low-cost compact workstations, Fostex launched the D-90 8-track and D-160 16-track series of low-cost recorders. Using removable hard drives, both products include SPDIF and ADAT interfaces, selectable 44.1kHz or 48kHz sampling, and variable positioning. For the larger multitrack replacement market, Otari has launched a 48-track version of page 104.>
Setting a new standard of audio excellence to which others can only aspire.

The Complete Microphone Solution
Technica House, Royal London Industrial Estate Old Lane, Leeds LS15 8RG
Tel: 0113 277 7144 Fax: 0113 276 6856 E-mail: sales@audio-tecchnica.co.uk

audio station
DIGITAL CONTROLLER

- 8 Assignable Motor Faders with mute keys
- 6 Assignable Rotary Controls
- 12 Function Keys
- Transport Control Keys
- Assignable Shuttle & Scroll Wheel
- Control Matrix Software (assign any control to any function)
- Interfaces to most leading Digital Workstations
- MIDI, GPI & ADB Interfaces

UK & EUROPE
TEL: +44 (0)1207 529444
FAX: +44 (0)1207 521518

USA
TEL: +1 904 446 2989
FAX: +1 904 446 1016

www.americanradiohistory.com
Some companies have been cooperating on a one-to-one basis in order to provide at least some form of transfer capability between their respective systems and those which they see as natural partners. Orban for example, which recently launched its new generation Audity workstation already provides direct file transfer capabilities between its DSE-7000 radio production system and the Enco DAD and Broadcast Electronics AudioVAULT air delivery systems. AMS Neve, DAR and SSL support audio files created by end network video editor, and Fairlight recently announced an initiative for direct file interchange with a range of companies including Studio Audio & Video (S&V). Doremi, Timeline and Lightworks. However, this is seen as an interim step, in the hope that the industry will eventually agree on a standard format such as WAVE or the new BWF, a version of WAVE designed for broadcast applications.

Already supported by Merging Technologies and S&V, BWF is apparently straightforward to implement, and contains the minimum information considered necessary for all broadcast applications. It accommodates both linear and MPEG audio, as well as higher level descriptors which can be used to refer to other files containing more complex sets of information.

While the computer industry as a whole can barely be expected to address specific needs of the digital audio workstation market, it is clearly driving its overall direction. Hardware will become ever more powerful, costs will come down, and software will increasingly support cross-platform operation. However, just as advances in other industries have led to a certain amount of homogenisation in terms of design, there will always be a case for individuality and proprietary solutions.

Indeed, there is a striking similarity between the reasons for purchasing a particular type of digital audio workstation, and those for purchasing a computer. Some people will be satisfied with limited functionality, so long as the system is within their budget. Some are more concerned with how it handles, others rely on a proven track record and support from the supplier, and yet others make their choice for reasons of prestige. As the owner of a high-end post-production facility recently pointed out: "My clients are paying a lot of money and expect to see a lot of impressive kit—I couldn't get away with just having a computer screen on the desk. Whether or not a peek beneath the bonnet will, in future, reveal a standard engine, remains to be seen."
We at Spectral have been designing digital audio editing systems with features and performance that has set the industry standard since 1987. We were the first to use a PC card for multitrack digital recording and editing. We were the first to visualize the entire studio process in a workstation, and now StudioTracks XP™ our new Windows® based software is about to set the standard again. We are proud to introduce you to the product of 10 years of digital audio editing software development and user feedback. Our users told us that what is most important to them is a system that will work every day without fail. To have powerful editing and processing tools and fast operation with a minimum of mouse clicks.

We heard them loud and clear......

**StudioTracks XP allows our users to:**

- **Work faster with “hot keys” assignable for every function.**
- **Customize their interface** for how they like to work.
- **Lock to picture with true chase sync and integrated machine control** (RS422 or MMC).
- **Design sounds and effects** with our Segment Editor, including an envelope editing for pitch and amplitude, pitch shifting, silence stripping, reverse, and more.
- **Manipulate their sounds with on-board processing** including dynamics, time compression/expansion, click detection and removal, spectrum analysis, and more.
- **Protect their investment** because XP (cross platform) runs on our AudioEngine™ and Prisma™ hardware platforms.
- **Network their Spectral workstations** with standard LANs.

*We literally put hundreds of new features and enhancements into StudioTracks XP.*

To appreciate how we can make it easier to get your jobs done, give us a call or send us an e-mail to find out where you can see it for yourself.

Spectral also offers Producer™ software for music production, and Express™ software for radio production and news editing.
Assessing digital conversion systems in terms of numbers of bits is at best misleading and potentially disastrous. Prism Sound's Graham Boswell asks a few key questions and offers a few answers.

One of the most pernicious habits in our professional audio industry is the propensity of product marketers to use engineering specifications to justify products to a market that is often confused in understanding digital audio technology. There are few better ways to spin a pile of technical bumf than to use the remote possibility of a non-existent problem that could be caused by digital noise or clipping.

The most common problem is the non-existent distortion. In analogue recording, there was a residue of noise, but it was very low-level indeed. In digital recording, however, it is a completely different beast altogether. As we enter the twenty-first century, the digital audio revolution is well established and complete. However, there are still uncharted waters ahead that may cause shipwrecks if not navigated with care.

The bane of digital recording is not the lack of distortion (apart from the consumer audio card with its wretched integrated dither). What can be done to make the situation better? To begin with, we must address the most important fact: that digital audio hardware will inevitably be more sensitive to noise than its analogue counterpart.

When we record 16-bit material, we have a recording format that imposes no significant noise as a result of wordlength limitation; noise is usually dominated by the A-D process itself. Do manufacturers claim 24-bit performance or 24-bit output wordlength? Does anybody offer a 1-bit dynamic range? If the sound is perceived as a recording flaw, then it is a significant problem. There is a case for using recording formats that are designed with better performance.

In the digital domain, the dynamic range is much narrower than in the analogue domain. In the analogue domain, the dynamic range is determined by the limits of the analog-to-digital conversion process. In the digital domain, the dynamic range is determined by the limits of the digital-to-analog conversion process.

In analogue recording, 1-bit recording is common. In digital recording, 1-bit recording is not possible. In the analogue domain, the dynamic range is determined by the limits of the analog-to-digital conversion process. In the digital domain, the dynamic range is determined by the limits of the digital-to-analog conversion process.

In the analogue domain, the dynamic range is determined by the limits of the analog-to-digital conversion process. In the digital domain, the dynamic range is determined by the limits of the digital-to-analog conversion process.

The key issue is that digital recording is inherently more sensitive to noise than analogue recording. This is because the digital recording process is inherently more sensitive to noise than the analogue recording process. The digital recording process is inherently more sensitive to noise than the analogue recording process.

The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes.

The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes. The key question is whether or not digital recording is inherently more sensitive to noise than analogue recording. The answer is yes.
Never before has so much been so affordable.

Using the automated manufacturing processes and design expertise that established our 8x8 bus and SR Series, we've created a no-compromise, 40x8x3 large-format live sound console that's equally suited for sound recording.

- 4 extra stereo line channel strips for aux returns, which include: 4-band equalization with 12kHz Hi shelving EQ, 3.5kHz Hi-Mid EQ, 800Hz Lo-Mid EQ and 80Hz Lo shelving EQ, plus 150Hz fixed low cut (high pass) filter at 18db/ octave, low cut in/out switch, other features as same mono channels.
- 8 submix section bus strips feature 100nm log-tapered faders, "Air" EQ controls, center & L-R assign switches, pan controls, mute & solo switches with LEDs.
- Center-mounted master section includes fader link L/R switch, center master fader, center solo + LED, L/R & L-R master level faders, L/R solo switches + LED indicators.
- Independent L/R/Center bus assignment.
- On-board snapshot group muting with external computer control capabilities.
- 12x4 matrix mixer w/CENTER, L & R input controls, matrix mute button + LED, matrix master level control, and matrix solo + LED.
- 40 (or 56) mono channel strips with Mackie's renowned high-headroom/low-noise discrete mic preamps, polarity switches & sweepable 30-600Hz low cut (high pass) filters at 12db/octave.
- Flip switch for stage monitor applications exchanges the master control of any selected aux send with the corresponding subgroup fader and routes the aux send to the sub insert jacks, slide master fader, "Air" EQ, and balanced output connectors.
- UltraMute section has 99 mute groups and 99 snapshots capability, mute select switch + LED indicators. Store/Preview/ Snapshot/Clear/Do it switches + LEDs, 10-unit snapshot indicator, group indicator, Mode/Up/Down switches.
- Talkback section includes talkback mic input (phantom powered), assign switches for Matrices A-B-C-D/Aux 1-4/Aux 5-8. Ext. /L-R talkback level control, solo level control, program level control, talk button, recessed phones jack (there's one on the rear panel, too). and 400 Hz/pink noise source with separate level control (uses talkback routing switches).
- All inputs & outputs fully balanced (except RCA tape inputs & outputs).
- Each channel has rear panel XLR mic & TRS line in jacks, insert with separate send & return (balanced), & direct out.

5-8/Ext./L-R talkback level control, solo level control, program level control, talk button, recessed phones jack (there's one on the rear panel, too), and 400 Hz/pink noise source with separate level control (uses talkback routing switches).

- All inputs & outputs fully balanced (except RCA tape inputs & outputs).
- Each channel has rear panel XLR mic & TRS line in jacks, insert with separate send & return (balanced), & direct out.
TASCAM

DA-20
High quality DAT mastering

DA-P1
Professional portable DAT

DAT Control
Pro performance DAT

DA-60 MKII
Advanced timecode DAT

DA-30 MKII
Professional studio DAT

TASCAM 5 Marlin House, The Croxley Centre, Watford, Herts, WD1 8YA Brochure Hotline 01923 819630