Acoustic Energy AE2 Pro
tc electronic Finalizer Express
SPL Transient Designer
Tracer Diamond Cut
tc electronic M3000
Magtrax Music Box
Sonifex Red Series

RECORDING JUNKIE
Alanis returns to the studio

PUSHING THE SPEED OF SILICON
WIN A PANASONIC WR-DA7
SSAIRAs NOMINATIONS
PIG CITY POST

The PETE WATERMAN
Interview
When you’ve outgrown a PC

Professional audio post-production

AMS Neve’s Logic 3 provides a complete audio post production suite in a single powerful system. Unlike PC-based products, the Logic 3 is purpose-designed for audio post. Its award-winning control surface provides rapid access to all recording, editing and mixing functions. Just add a VTR and start billing!

Logic 3 Features include:
- 32 channel digital mixing console
- Full automation of console functions
- Menu-free, tactile mixing
- Output in any surround format
- Integral machine control
- User and network options
- Competitive pricing
- Same sound quality and processing as Digital Film Console

AudioFile 98
Logic 3 features the industry’s fastest editor – AudioFile 98
- Up to 24-bit recording
- Waveform displays
- Background ‘strip silence’
- OMF Import
- Optional off-line archiving/ restore and multi-system networking

Digital First

HEAD OFFICE – AMS Neve plc · Billington Road · Burnley · Lancs BB11 5UB · England · Tel: +44 (0) 1282 457011 Fax: +44 (0) 1282 417282 · LONDON – Tel: 0171 916 2828 · Fax: 0171 916 2827
GERMANY – Tel: 61 31 9 42 520 · Fax: 61 31 9 42 5210 · NEW YORK – Tel: (212) 965 1400 · Fax: (212) 965 3739
HOLLYWOOD – Tel: (818) 753 8789 · Fax: (818) 623 4839 · TORONTO – Tel: (416) 365 3363 · Fax: (416) 365 1044

e-mail: enquiry@ams-neve.com – http://www.americanradiohistory.com
Editorial
False economy and industry resolutions

World Events
The events listing for the travelling professional

Soundings
News on pro-audio, post and broadcast

SSAIRAs
First call for Studio Sound's 1999 awards

Letters
Words from the wise, the worried and the weary

1998 in review
Collective perspective

Competition
Win a Panasonic WR-DA7 digital 8-bus

REVIEWS

Roland VS-1680
Making the top line in Roland's workstation range

Ampetec Stone-D 001
Lifting the lid on the Belgian digital desk

tc electronic M3000
Exclusive: next generation reverberation

Magtrax MusicBox
Exclusive: surround monitoring controller

AE2 Pro
The definitive loudspeaker review

tc electronic Finalizer Express
Exclusive: affordable digital dynamics processing

Welcome to a New Year
Readers and advertisers please note that all our telephone numbers and fax number have changed from 1st January 1999. Our masthead on page 4 has been revised and direct lines to all staff have been included.

www.prostudio.com/studiosound
The economies of fail

THERE ARE ECONOMIES AND THERE ARE FALSE ECONOMIES. False economies are ones that have a grounding of reason on the surface but overlook a deeper glaring flaw. They are frequently driven by those who have a mission and their own agenda, and who work this agenda within the constraints set by someone far higher up the chain of command.

Thus we see the economic restriction of farm crops in order to keep prices strong and stable while a large part of the world’s population struggles to have enough to eat, we see cost-cutting and tightening-up in education condemn generations to ignorance and misinformation, and understaffing and lack of investment jeopardising people’s safety.

On a more trivial level there are those who enjoy driving miles for those few gallons of cheaper petrol; who insist on taking a week off work to do jobs around the house that they’re not very good at, and could have paid someone else to do in a day with the same materials; who spend a fortune on upgrading and customising a fairly ordinary plank of wood when the combined cost could have bought them the real Les Paul that they’ve always wanted anyway; and those who believe that TV sound can be done on the cheap.

Maybe my ears are beginning to fail me, but I’m finding it increasingly difficult to understand or hear a lot of what is said on television. The pattern is a familiar one—one man and his camera productions bring you yet another hideous five-part series on the lives and trepidations of the dustbin men; romance and weight-watching with the Idaho undertakers; undercover with the hookers of Murmansk; and the intrigue and flared tempers that characterise the build up to the annual North Chailey village summer stamp collectors’ fair.

The pictures are cut adequately within the constraints of what was shot, but no amount of fader riding and wizardry, if indeed the production ever got out of the video edit suite, can compensate for the fact that there are simply not enough mics on the shoot and the one that there is is perched atop the hand-held. This renders a poor, but admittedly cheap, idea unwatchable for the price of a soundman on location. As the air hours mount up we will be treated to more of the same.

But maybe it is my hearing, and maybe that’s a blessing.

Zeron Schoepe, executive editor

Higher resolution

SOMETIMES OVER THE CHRISTMAS PERIOD, a child’s dream came true. But it was not St Nicholas who made it so, it was TV presenter Gaby Roslin.

The setting was a kids’ TV show in which contestants able to demonstrate intimate knowledge of their pop, sports or other idols and a passing acquaintance with Lady Luck, get to go behind the scenes at a concert or football match, party with the famous, or otherwise indulge themselves in their icon’s celebrity. Imagine, then, a young girl winning the chance to meet pop stars Steps and discovering that she was also going to sing on their forthcoming album...

Steps, for those yet to read the interview on page 53, are producer Pete Waterman’s latest chart success—and in this detail, the picture begins to make sense. Waterman, you may recall, was regularly accused of using recording studio ‘tricks’ in securing the success of Kyle Minogue and her PWL stablemates during the eighties. Now it seems he is literally prepared to take someone with no proven talent and put them in the pop charts.

Of course it is not that shocking in reality. There is no shortage of ways in which a girl’s voice may be used on a record (ask Brian Eno), and the success of Steps’ next disc is unlikely to rest upon her contribution. So why the fuss?

Kevin Hilton’s comments on the media industry’s deconstruction are well made (pp 91) but there’s more. If, like me, you are inclined to relate part of the intrinsic value of a recording to the mystique behind its making, then to demonstrate that the charts are open to someone with no proven talent and no expressed wish to be a pop singer is to badly undermine your product. Pete Waterman would be justified in arguing that it demonstrates not only his ability as a producer, but his confidence, that he is prepared to take on such a task. But I remember the value of aspiration in my early musical days, and I remain to be convinced that anyone would choose a career based on such extremes of luck rather than skill, dedication and achievement.

Perhaps there’s still time for a New Year’s Resolution from the record industry—to re-establish its self respect?

Tim Goodyer, editor
Great Studios Of The World

PRODUCTION NOTES
Quad Recording's two SL 4000 Series consoles were used to mix the John Lennon Anthology for EMI/Capitol Records, as well as the Yenops Concerts. Single disc of highlights from the set. Bob Stevens, who produced and mixed the set with Yoko Ono, says, "Yoko and I had heard the tapes on a variety of top line consoles of various vintages. Some of the consoles brought out detail and clarity; others brought out an appealing warmth. From the SSL, we got both the exceptional clarity and classic warmth that we were looking for."

Solid State Logic
International Headquarters
Bergen, Oxford, OX5 1RU, England
Tel: +44 (0)1865 842300
Fax: +44 (0)1865 842118
E-mail: sales@solid-state-logic.com
http://www.solid-state-logic.com

www.americanradiohistory.com
The all new Alesis M20™ ADAT Type II 20 Bit High Performance Digital Audio Recorder was designed from the ground up for round-the-clock use in commercial recording and post-production facilities.

The M20 implements ADAT Type II, the only MDM recording format that writes 20 bits to tape - that's true 20 bit, no compression, no noise shaping. Its state-of-the-art 24-bit A/D converters yield an astonishing 117dB of dynamic range. So every time you hit Record, you'll be amazed by the M20's awesome sonic detail. Sixteen times more detail than the 16-bit format you might now be using.

And while the clock on the wall is ticking away, the M20's direct-drive, full-servo, industrial-grade tape transport will deliver the fastest chase and lock-up times of any MDM. Result: those ridiculous deadlines become a little more manageable. Plus, its robust ADAT Type II recording format offers the reliability that lets your tapes play as perfectly across town as they do in your studio.

We didn't leave anything out of the M20's incredible feature set. Built-in SMPTE/EBU synchronization with a separate time code track: A 9-pin input for edit control. A jog/shuttle wheel that works with a dedicated analogue aux track for scrubbing and cueing. All +4dBu balanced audio connections, plus MIDI Machine Control, video reference and word clock. Options including a built-in eight-channel AES/EBU interface card, the CADI® remote/autolocator that can be used hundreds of yards away from the recorder and the RMD™ digital remote meter display.

And if that isn't enough, the M20 is compatible with over 110,000 ADATs in use today. In other words, you'll have a direct link between your facility and thousands of project studios around the world.

As an audio professional, you can't gamble on unproven technology or intense learning curves while you're up-and-running 24 hours a day, seven days a week. Instead, look toward the format that gives you tracking, archiving and transferring... all in one incredibly affordable tape format.

For a free colour brochure please call
Sound Technology on 01462 480000
Sound Technology 30c, Letchworth Park, Letchworth, Hertfordshire, SG6 1ND
Fax: 01462 480800 www.soundtech.co.uk
DVD conference
UK: We are about a year behind. Not only does Europe need to catch up with the US but the choice of content and the way that it is used differs significantly for the European market,' says Tim Frost of the European DVD industry. In response, Frost is to chair DVD Production Europe 99, to take place in London during May. The conference is organised by Studio Sound publishing group Miller Freeman Entertainment UK.

SATIS surround forum
France: The major conference event of the 1998 SATIS event was the 1st International Multichannel Sound Forum, organised jointly by SATIS and Radio France. Studio Sound. SSL. Dolby Laboratories and Cabasse also sponsored the event.

The 2-day Forum was intended to provide information and debate on multichannel sound, though it could be said that the emphasis was more on broadcast than record production. However, many of the observations are relevant to all types of multichannel audio production. The emergence of the 5.1-channel digital audio format has certainly galvanised the audio scene and much needs to be done to provide universal consensus, the fact that we are talking about it and trying to clear the air of the folklore that already abounds can be viewed as positive.

The programme was under the direction of audio consultant, Christian Hugonnet, who brought together a team of sound engineers from Radio France. NHK (Japan), Danmarks Radio and the IRT (Institut für Rundfunktechnik, Germany). The presentations included examples and trends from the different countries participating as well as technical standards laid down by the EBU-IRT and other broadcast organisations.

It was both pleasantly surprising and encouraging to see that broadcast is taking serious interest in multichannel sound. Nevertheless, there were concerns from the floor during a debate as to whether the standards being recommended were too rigid, particularly the EBU loudspeaker configuration of 90° separation between LC and LR and 110° between C and LS and C and RS. NHK has been engaged in multichannel production for HDTV over the last 10 years and could be said to have the most experience. The format used is discrete 4-channel (LCRS), but the release of DVD has stimulated demand for D.1 and home theatre systems. Surprisingly, Danmarks Radio are ahead of their TV colleagues and have already broadcast in Dolby Stereo (11-81) with particular emphasis on classical concerts. Again, the potential demand for 5.1 is viewed as being positive. Radio France has made two drama productions in multichannel format—one in Dolby Stereo and the other in 5.1—plus orchestral productions. The station is also more flexible in terms of loudspeaker positioning and feels that what sounds right for the production is better than a fixed format.

Classical music was much to the forefront and a variety of microphone configurations were discussed. It was amusing to note that after MS microphone techniques were given the thumbs down from some people, the Danmarks Radio presentation used what could be called an MS Array for the main microphones and provided some of the most convincing results of the Forum.

Calibration levels were discussed and a good basis is felt to be a 3dB dynamic range of -21dB to +9dB. More than this appears to be excessive for the domestic environment. Reference levels for 0cu (+4dBu) as laid by the IRT are 78dBa per channel for a sum of 85dBa with all 5 channels.

The Forum was well attended and the presence of a lot of young people was noticeable—which is encouraging for the future. To give some matter for reflection, three types of surround were discussed: Direct (distance information), Reflections (space information), Ambient (envelopment). You can start experimenting now.

UK-Russia: Satellite broadcasts of British horse and greyhound racing are being fed to Russian betting shops courtesy of Kingston Satellite Services, which already serves the BBC World Service and News International. George Walker's Cyprus-based Telesport is at the centre of the operation, offering multilingual audio from Telesport's London studio to accompany the television pictures which are further supplemented by text information such as rider details, track conditions, and, of course, betting odds. Over 300 tote terminals will be installed in Moscow, with plans to extend operation initially to St Petersburg, Volograd, Nichiny Novgorod and Rostov on Don, and on to Yugoslavia, Azerbaijan, Kazakhstan and Estonia.

UK: The APRS' attracted the cream of the British recording industry when it held its second annual Awards Dinner. Entitled 'Islands Under Storm', the evening saw Ivor Drawmer (pictured with wife Lynne) receive the APRS-Studio Sound Award for Technical Achievement. Jon Jacobs receive the APRS-SSL Award for Most Exciting New Production (The Divine Comedy's Fin de Siecle), and Adrian Kerridge receive a Lifetime's Service award celebrating some 40 years as a recording engineer and producer. Rounded out by a hearty dinner, a little light comedy and music, the evening established the Awards Dinner as a night to watch out for in 1999.

A Europe: Mozart's Magic Flute is one of the opera productions currently being toured around Europe by Autograph Sound Recording. Sound design is venue specific and was handled by Autograph's Bobby Aitken, whose next project is the sound design for Raymond Gubbay's production of Tosca at London's Royal Albert Hall and Birmingham's National Indoor Arena. The European leg of the Magic Flute's tour, meanwhile, is to be designed by Autograph's Terry Sanders and begins in Amsterdam before moving on to Frankfurt and Dortmund.

A UK: Radio from audio consultant, ly communications are relevant to production. However, many of the observations are relevant to all types of multichannel audio production. The emergence of the 5.1-channel digital audio format has certainly galvanised the audio scene and much needs to be done to provide universal consensus, the fact that we are talking about it and trying to clear the air of the folklore that already abounds can be viewed as positive.

The programme was under the direction of audio consultant, Christian Hugonnet, who brought together a team of sound engineers from Radio France, NHK (Japan), Danmarks Radio and the IRT (Institut für Rundfunktechnik, Germany). The presentations included examples and trends from the different countries participating as well as technical standards laid down by the EBU-IRT and other broadcast organisations.

It was both pleasantly surprising and encouraging to see that broadcast is taking serious interest in multichannel sound. Nevertheless, there were concerns from the floor during a debate as to whether the standards being recommended were too rigid, particularly the EBU loudspeaker configuration of 90° separation between LC and LR and 110° between C and LS and C and RS. NHK has been engaged in multichannel production for HDTV over the last 10 years and could be said to have the most experience. The format used is discrete 4-channel (LCRS), but the release of DVD has stimulated demand for 5.1 and home theatre systems. Surprisingly, Danmarks Radio are ahead of their TV colleagues and have already broadcast in Dolby Stereo (11-81) with particular emphasis on classical concerts. Again, the potential demand for 5.1 is viewed as being positive. Radio France has made two drama productions in multichannel format—one in Dolby Stereo and the other in 5.1—plus orchestral productions. The station is also more flexible in terms of loudspeaker positioning and feels that what sounds right for the production is better than a fixed format.

Classical music was much to the forefront and a variety of microphone configurations were discussed. It was amusing to note that after MS microphone techniques were given the thumbs down from some people, the Danmarks Radio presentation used what could be called an MS Array for the main microphones and provided some of the most convincing results of the Forum.

Calibration levels were discussed and a good basis is felt to be a 3dB dynamic range of -21dB to +9dB. More than this appears to be excessive for the domestic environment. Reference levels for 0cu (+4dBu) as laid by the IRT are 78dBa per channel for a sum of 85dBa with all 5 channels.

The Forum was well attended and the presence of a lot of young people was noticeable—which is encouraging for the future. To give some matter for reflection, three types of surround were discussed: Direct (distance information), Reflections (space information), Ambient (envelopment). You can start experimenting now.

A UK-Russia: Satellite broadcasts of British horse and greyhound racing are being fed to Russian betting shops courtesy of Kingston Satellite Services, which already serves the BBC World Service and News International. George Walker's Cyprus-based Telesport is at the centre of the operation, offering multilingual audio from Telesport's London studio to accompany the television pictures which are further supplemented by text information such as rider details, track conditions, and, of course, betting odds. Over 300 tote terminals will be installed in Moscow, with plans to extend operation initially to St Petersburg, Volograd, Nichiny Novgorod and Rostov on Don, and on to Yugoslavia, Azerbaijan, Kazakhstan and Estonia.

A UK: The APRS' attracted the cream of the British recording industry when it held its second annual Awards Dinner. Entitled 'Islands Under Storm', the evening saw Ivor Drawmer (pictured with wife Lynne) receive the APRS-Studio Sound Award for Technical Achievement. Jon Jacobs receive the APRS-SSL Award for Most Exciting New Production (The Divine Comedy's Fin de Siecle), and Adrian Kerridge receive a Lifetime's Service award celebrating some 40 years as a recording engineer and producer. Rounded out by a hearty dinner, a little light comedy and music, the evening established the Awards Dinner as a night to watch out for in 1999.

A Europe: Mozart's Magic Flute is one of the opera productions currently being toured around Europe by Autograph Sound Recording. Sound design is venue specific and was handled by Autograph's Bobby Aitken, whose next project is the sound design for Raymond Gubbay's production of Tosca at London's Royal Albert Hall and Birmingham's National Indoor Arena. The European leg of the Magic Flute's tour, meanwhile, is to be designed by Autograph's Terry Sanders and begins in Amsterdam before moving on to Frankfurt and Dortmund.

January 1999 Studio Sound
The Westminster Forum opened with a keynote speech from the Rt Hon Chris Smith, Secretary for Culture, Media and Sport, and saw presentations from the likes of BBC chairman Sir Christopher Bland, ITN chief executive Stewart Parvin and head of BskyB news Nick Pollard and addressed digital broadcasting through sessions entitled 'Regulation in a Multichannel Environment', 'The Political and Social Implications of the Consumer Setting the National News Agenda' and 'An Opposition Perspective'. The forum was decided more political than technical, but contained much that informs the efforts of the broadcast industry — including proposed time scales for cessation of analogue broadcasting, regulation and copyright. Beyond these issues was a clear indication that the government is taking a positive and responsible stand on digital broadcasting, with assurances over issues ranging from its provision for the BBC to the industry's support to broadcasting. There was welcome recognition among the politicians of the increasingly important new media — 'sit-back' and 'sit-forward' programming and the 'me channel' — and increasing difficulties in regulation and copyright protection. Crucially, John Greenway, secretary of the All-Party Media Group, identified the importance of news broadcasting, as a true democracy requires an informed public — a sentiment that was endorsed by a number of speakers and not lost on those faced with the difficulties of managing a difficult and rapidly changing task.

EuroSurround Forum

An initiative shared by the University of Surrey and Media Sound to set up a UK surround sound discussion group to parallel other European forums such as the German Surround Sound Forum is now welcoming subscribers. The move is aimed to assist discussion and the sharing of knowledge and standards to ensure the introduction of new media such as ENMS-Audio and SACD and will incorporate music, music recording, broadcasting and film, but will also extend to reproduction of television and film. To subscribe to the mailing list, you should send a message to future <subscribe> @surround.media submissive New subscribers will be welcomed by every subscriber on the list. Please be prepared to contribute to this forum's formation.

US: Home of the Boston Ballet in the city's theatre district, the Wang Centre recently enjoyed an upgrade to its surround sound facilities. The facility regularly hosts productions ranging from drama and dance to pop and film, and now uses a pair of Tellex Merlin ISP-100 digital processors as its heart of control. Following the example of its smaller sister, the 1,100-seat Shubert Theatre that was refurbished in 1979, the ISP-100s facilitate complete system reconfiguration including control over routing, crossover, delay and EQ and uses 20-bit A-D/D-A conversion with a quoted -104dB noise floor.

Toramon-based Japanese radio production facility FM Sounds Inc has just delivered its flagship Milleniated, 20-fader Amek DMX console for on-air and off-line work. The desk has 12 dedicated EQ controllers and features multiple user password facilities to accommodate engineers. The 64-fader, 28-fader DMX has been installed in Osaka’s new Express Corporation studio. To meet the facility's image creation and information brief, the DMX is a 5.1-channel capable and incorporates Amek's Universal Switch Matrix for speaker switching. Also in the studio are Amek's System 9098 compact and dual mic preamps.

UK: When over 30 British politicians met with almost 100 major media players at the historic Gladstone Library of the Liberal Club in Whitehall for a debate described by Lord McNally as marking 'the exchange between the industry and politicians profitable instead of simply confrontational' it was on the issues arising from digital broadcasting. The Westminster Forum opened with a keynote speech from the Rt Hon Chris Smith, Secretary for Culture, Media and Sport, and saw presentations from the likes of BBC chairman Sir Christopher Bland, ITN chief executive Stewart Parvin and head of BskyB news Nick Pollard and addressed digital broadcasting through sessions entitled 'Regulation in a Multichannel Environment', 'The Political and Social Implications of the Consumer Setting the National News Agenda' and 'An Opposition Perspective'. The forum was decided more political than technical, but contained much that informs the efforts of the broadcast industry — including proposed time scales for cessation of analogue broadcasting, regulation and copyright. Beyond these issues was a clear indication that the government is taking a positive and responsible stand on digital broadcasting, with assurances over issues ranging from its provision for the BBC to the industry's support to broadcasting. There was welcome recognition among the politicians of the increasingly important new media — 'sit-back' and 'sit-forward' programming and the 'me channel' — and increasing difficulties in regulation and copyright protection. Crucially, John Greenway, secretary of the All-Party Media Group, identified the importance of news broadcasting, as a true democracy requires an informed public — a sentiment that was endorsed by a number of speakers and not lost on those faced with the difficulties of managing a difficult and rapidly changing task.

EuroSurround Forum

An initiative shared by the University of Surrey and Media Sound to set up a UK surround sound discussion group to parallel other European forums such as the German Surround Sound Forum is now welcoming subscribers. The move is aimed to assist discussion and the sharing of knowledge and standards to ensure the introduction of new media such as ENMS-Audio and SACD and will incorporate music, music recording, broadcasting and film, but will also extend to reproduction of television and film. To subscribe to the mailing list, you should send a message to future <subscribe> @surround.media submissive New subscribers will be welcomed by every subscriber on the list. Please be prepared to contribute to this forum's formation.

US: Home of the Boston Ballet in the city's theatre district, the Wang Centre recently enjoyed an upgrade to its surround sound facilities. The facility regularly hosts productions ranging from drama and dance to pop and film, and now uses a pair of Tellex Merlin ISP-100 digital processors as its heart of control. Following the example of its smaller sister, the 1,100-seat Shubert Theatre that was refurbished in 1979, the ISP-100s facilitate complete system reconfiguration including control over routing, crossover, delay and EQ and uses 20-bit A-D/D-A conversion with a quoted -104dB noise floor.

Toramon-based Japanese radio production facility FM Sounds Inc has just delivered its flagship Milleniated, 20-fader Amek DMX console for on-air and off-line work. The desk has 12 dedicated EQ controllers and features multiple user password facilities to accommodate engineers. The 64-fader, 28-fader DMX has been installed in Osaka’s new Express Corporation studio. To meet the facility's image creation and information brief, the DMX is a 5.1-channel capable and incorporates Amek's Universal Switch Matrix for speaker switching. Also in the studio are Amek's System 9098 compact and dual mic preamps.
Digital Synergy

**TASCAM TM-D8000**
digital mixing from the digital recording people

TASCAM understands how intuitive digital recording has to be, and they have built the TM-D8000 around that understanding.

- **Extensive “up-top” control surface** with multiple faders and controls, provides maximum degree of functionality at any time. While optimum use of assignability provides deeper access to functions and parameters when required.
- **Synchronization and control**: Direct digital interfacing (TDIF, AES/EBU, S/PDIF) and full function transport control (TASCAM sync I/O, Sony P2, MMC) enable desk and recorders to operate seamlessly. **High resolution A/D converters**, high-performance mic-amps and balanced line inputs. **Programmable** level, EQ, can, aux, solo/cue and dynamics’ processing operate under snap-shot scene automation, with on-line dynamic automation software also available.
- **Full scale monitor and comms facilities**.

LCD console/channel status and parameter values display, and full analogue and digital I/O metering give the TM-D8000 an operational status superior to far more expensive analogue recording and post production consoles.
1999 SSAIRAS NOMINATIONS

THE MUNICH AES Convention in May 1999 will serve as the setting for the second SSAIRAs—the Studio Sound Audio Industry Recognition Awards. This follows the outstanding success of last year's awards in which the readers of Studio Sound voted for products in 15 categories.

In response to popular demand we have expanded the number of category types this year to take in desktop duplicators, location-portable equipment, plug-ins, and communications products.

However, we first need to gather the nominations from which the winners will be selected. And quickly. This is where you come in.

In short, anyone can nominate a product for a suitable award category, but only fully qualified readers of Studio Sound, not manufacturers or related personnel, will be permitted to vote.

To nominate a product simply fill in the form and post it or fax it to us or send your nominations via email by listing the category number followed by the product.

To be eligible, a product should have been released since the Amsterdam AES Convention (held in May 1998) and obviously needs to conform to the description of a particular category.

The resulting nominations selection will be published in future issues of Studio Sound for postal voting and for interactive voting from the Studio Sound web-site.

With regard to the categories, it should be noted that, in the case of outboard equipment, this is described by function rather than product description—hence a 'voice channel' may legitimately be entered as a compressor if you feel it excels in this area. Not all the categories work this way, however, but all are explained in the table. There is also a special category in which you are invited to nominate equipment, people, initiatives or anything else that falls outside the other categories yet warrants acknowledgement.

NOMINATIONS can be made by photocopying or cutting out this page, filling it in and returning it to SSAIRAs Nominations, Studio Sound, 8 Montague Close, London Bridge, London SE1 9UR UK. Fax: +44 171 407 7102. Alternatively, you can email the category numbers and your nominations to SSAIRAs@unmf.com

1. Large scale console:
   Analogue or digital, recording, broadcast, post or film.

2. Medium to small scale console:
   The affordable end of the console business continues to see plenty of innovation.

3. Outboard dynamics:
   A 'by-function' category covering any outboard featuring dynamic processing.

4. Outboard preamp:
   A 'by-function' choice from outboard including microphone preamps.

5. Outboard equaliser:
   Graphic, shelf or parametric.

6. Outboard Reverb:
   The final 'by function' category addresses reverb processing.

7. Combined outboard device:
   Some units benefit from the combination of their processes.

8. Monitors:
   Big or small, unbelievably impressive or unbelievably practical?

9. Microphones:
   From unprecedentedly cheap to imitating yesterday's classics.

10. Convertors:
    Your choice can draw from CD-R, MD, DAT, HD, or HR.

11. Audio editor:
    Hardware or computer-based?

12. Audio recorder:
    Your choice can be CD-R, MD, DAT, HD, or HR.

13. Desktop duplication:
    The economies of rolling your own are now apparent.

14. Location-portable equipment:
    Gear for guys on the move.

15. Comms:
    Where would we be without fast modern communications tools?

16. Plug-ins:
    The list continues to grow but which has tickled your fancy?

17. Special category:
    Your opportunity to recognise anything or anyone that has benefited pro-audio. Think carefully and laterally.

Studio Sound January 1999
Pressure points

I READ YOUR EDITORIAL about review of products and the poor state of them and winced a little. However, I would like to try to defend the manufacturers as best I can by arguing a few points:

1. Magazines are usually the first to have products, usually a short (or sometimes long) time before customers have them, so it is unfortunately fairly likely that some part of the product-packaging-software may be incomplete.

2. Development life-cycles are becoming shorter and shorter and so too is the time allowed to test and develop the product before production release. Unfortunately, this pressure can lead to errors (especially where complex software is concerned) — for example, whenever Corel release a new version of Coreldraw, I always wait until the next version is released before moving onto the previous version because I’ve found that particular product to be buggy.

3. As a magazine you are naturally keen to review the latest products and as a manufacturer, I am also keen for you to review them. However, this does put pressure on the manufacturer to deliver a product which may not yet be in production, but which isn’t quite yet out of R&D.

4. Certain areas of the broadcast industry have the luxury of being able to ship large volumes of products. Most companies in the industry don’t though, and while I wouldn’t describe them as ‘cottage industries’, they certainly don’t have the resources of the Sony’s of this world, to test and systematically debug the products to the extent that they would probably like. In the end though, you are correct — you should be reviewing what the customer will receive and I’m sure that this isn’t always the case. Product should work out of the box and you haven’t found this to be the case. All I can suggest is that you’re probably getting beta versions, or the fast pace of technological change means that you want to review products that simply aren’t ready yet.

Did you also know that on the spine of Studio Sound it says ‘October’ instead of November? See, we all make mistakes.

Marcus Brooke, Sonifex UK

Zenon Schoepe replies

I SEEM to have touched a nerve here as you were not alone in feeling inclined to respond to my observations. Others have allocated blame with ‘relaxed’ distributors not keeping their side of the bargain with lackluster levels of support and an attitude that is totally obsessed and geared towards the business of shifting boxes. I’ll deal with your points in turn.

1. When this is the case then we take it into account but I wasn’t only talking about products that are new to market. Indeed some of the worst offences have been committed by the manufacturers-distributors of products that are already shipping in quantity. We’re not talking about hot off the production line here, we’re talking about products you could walk in and buy. Lack of the relevant bits therefore seems doubly serious.

2. Product cycles are indeed getting shorter and part of this is due to the manufacturer’s desire to keep on a roll with new product. I cannot accept that this fact in any way justifies the release of software before it is truly ready. They must simply ‘allow’ more time to test.

The interminable software revision cycle can be blamed in part on the fact that revisions not only add features but they also fix bugs that are present because the previous version was released before it had been adequately tested.

I also hold back on buying software until I judge it has stabilised but I still object to the unofficial beta testing agreement that everyone who buys a near first generation software-based product enters into when they think they are buying into new and exciting technology. The fact that we now seem resigned to this state of affairs does not make it right, we’re spending money on this stuff.

I do not believe that absolutely bug-free software is achievable but by the same token I believe that between this elusive goal and what we are often expected to endure there lies a far more acceptable middle ground.

3. Manufacturers also put pressure on us and when we do look at equipment that is not complete for shipment, we make its state of readiness clear in the article. Naturally, we do put pressure on manufacturers to get review equipment as soon as possible but there are no guns involved. Indeed I would say that the level of pressure we exert is commensurate with that exerted by the manufacturer’s sales team on the potential buyer.

4. Points taken but by the same token the smaller companies also do not have the resources to endure any brand bad-naming that may result from premature product release. They are the smaller companies, and there are many in audio, the more fastidious it needs to be in the testing and preparation of its products.

Finally, you are correct in identifying the repeat of the October Studio Sound spine on the November issue. This may look like an administrative error, the plain truth is that we had prepared the November spine, but had not completed testing it and therefore were not prepared to release it before it was completely and utterly rock solid and ready.
Gold Channel

DIGITALLY ENHANCED MIC PRE-AMP
The TC Electronic Gold Channel is a Digitally Enhanced Microphone pre-amplifier and a DSP signal refinement toolbox. Plug in your microphone, connect the Gold Channel's outputs to any analogue or digital recorder, and safely capture your signal in the best possible recording quality.

M2000

STUDIO EFFECTS PROCESSOR
The Engineering Group at TC Electronic was given carte blanche to create the optimal studio effects processor. Being musicians and studio engineers themselves, they have a feel for what is needed in modern high-grade processors. The library of effects includes: Reverb, Pitch Shift, Delay, Chorus, Ambience, Equalization, De-essing, Phasing, Compression, Gates, Expansion, Limiting, and Stereo Enhancement.

M3000

STUDIO REVERB PROCESSOR
Setting the new industry standard with the VSS3 technology the M3000 is the best sounding, most versatile and easiest to use professional reverb today and well into the future. Combining the ultimate control of directivity in the early reflections with a transparent and harmonically magnificent take, the art of reverberation is brought to a new and higher level.

Finalizer EXPRESS

STUDIO MASTERING PROCESSOR
The Finalizer Express is the last and efficient way to turn your mix into a professional master! Based upon the TC Electronic Multi-Award winning Finalizer Mastering Technology, it delivers the finishing touches of clarity, warmth and punch to your mixes, putting the world of professional mastering within your reach.

Finalizer PLUS

STUDIO MASTERING PROCESSOR
The Finalizer Plus gives you the extensive and complete range of controls you need to add the finishing touches to your mix. Compared to the Finalizer Express the Finalizer Plus offers an even wider range controls allowing you to fine-tune every aspect of the mastering process.

TC ELECTRONIC A/S, SINDALSVEJ 34, DK-8240 RISSKOV, DENMARK - PHONE: + 45 8621 7599 - FAX:+ 45 8621 7598
E-MAIL: INFO@TCELECTRONIC.COM - HTTP://WWW.TCELECTRONIC.COM
TC ELECTRONIC GMBH · FLUGHAFENSTRAßE 52B · 22335 HAMBURG · TEL (040) 5310 8399 · FAX: (040) 5310 8398
www.americanradiohistory.com
Instead of rushing to get a digital desk on the market ....

We were getting ours RIGHT.
Panasonic introduces

An intuitive new approach to the digital mixing console, Ramsa is the result of **observation** and **appreciation**. Designed to lay to rest the myth that more power means more complicated, we've persevered so that you don't have to. In fact, the interface is so **instinctive**, that mastering the console ‘hands-on’ is as easy as working the way you always have. With **no compromise**, and **no sacrifices**, Ramsa also boasts a feature list that sound engineers have been crying out for.
Roland VS-1680

Filling out the high-end spot in Roland’s VS digital workstation line, the VS-1680 needs to deliver power, flexibility and performance. Rob James gives it a thorough workout.

O F ROLAND’S TRICK of personal workstations, the VS-840 is the jack, the VS-880 the queen, and the VS-1680 the king. It remains to be seen whether it is a winning hand, but the 1680 is certainly a big card.

Built to the same formula as the others, the VS-1680 is the most complete design to date—a hard-disk recorder giving 16 tracks on playback (data compressed) each encompassing 16 virtual tracks. A maximum of 8 simultaneous record tracks is coupled to a digital mixer and a maximum of 2 effects boards, while 8 scene memories are complemented by onboard dynamic automation. The expression ‘fully loaded’ springs to mind. All of this is packaged in a remarkably neat and reassuringly solid box with a 3-year guarantee as some measure of the build quality.

Rear-panel connections are sparse yet adequate for the primary applications. Analogue Inputs 1&2 are on balanced XLRs (switchable 48V phantom) while the remaining 6 analogue inputs are balanced jacks. Input 8 has an alternative guitar input that takes precedence. Analogue outputs for Monitor LR, Master, LR and Aux A LR & B LR are all on unbalanced phons, the only digital I/O being SPDIF optical and coaxial. Apart from MIDI DINs and a 25-pin D-connector for SCSI, there is just the IEC mains and a headphone jack that would be more useful on the front. The standard internal drive is a 2Gb IDE, and the small, reasonably quiet cooling fan can be disabled in software if using a mic in close proximity to the machine.

The control surface is divided into blocks, both physically and graphically; although there is a considerable amount of interaction between blocks in use. The Mixer section consists of 8 identical strips for inputs and Tracks 1-8 with a fader, STATUS key, TRACK SELECT and INPUT SELECT keys, and a pot for input gain with a peak LED. The next 4 strips are stereo and cover the digital input, direct stereo input (which can use any of the physical inputs) effect returns 1&3 and 2&4 or stereo Tracks 9-10, 11&12, 13&14 and 15&16. Although clearly designed to be used with stereo sources the pairs may be decoupled and addressed individually by the same fader. The track and input selection keys are labelled accordingly. Above these strips are the monitor and headphone volume pots. The last strip is the Master with a fader, a FADER-MUTE key that determines whether the faders are controlling inputs or track outputs, and Edit SOLO, EZ ROUTING and AUTOMIX keys. In the Recorder section the screen dominates—a 520 x 240 matrix backlit LCD device, the same size as the screen on the Yamaha 02R, and its like. This large and clearly legible screen helps to raise the machine above its siblings, and is the key to the whole edifice. The higher resolution allows the use of meaningful icons to supplement the usual text. Transport controls are along the bottom with blocks of keys for the locator functions, edit preview, LOOP, AUTO PUNCH UNDO and the dreaded SHIFT key. The right-hand side has the parameter wheel with associated ENTRY and EXIT keys, cursor keys, varipitch and EXT SYC keys. Many of the keys have shifted functions, some of which are graphically signalled by labels in boxes. Less obvious are some of the ‘shortcuts’ which use esoteric key combinations.

Roland terminology differs a little from other manufacturers. A block of audio recorded on disk is termed a Take. That which is usually known as a Cue or Event—the data, which determines...
THE WORLD'S LEADING FACILITIES

"We were so impressed with our first DPC-II installed in SuperDupe, we have just ordered our 8th."
- Neil Karsh, New York Media Group

"The DPC-II is no compromise but the best for both location recording and post."
- Steve Williams, Scwed Moves

"With all new leading-edge technology you look for 'how fast?' and 'how much?' Nothing comes close to our DPC-II's on either price or speed."
- Scott Jackson, Magmasters

"I wish we had a DPC-II in all our dubbing theatres."
- Peter Brown, SD Post

The DPC-II's sonic performance, stability and comprehensive, yet user-friendly, automation has proven to us that we made the right choice.
- Rob Power, Salter Street

DPC-II, rapidly becoming the de-facto standard for digital production consoles.

THE INSTALLED DPC-II
Digital Production Console

- 160 Digital Channels
- Worksurfaces from 16 to 96 motorised faders
- 24 bit Conversion
- 96kHz operation
- Stereo, LCRS, 5.1, 7.1
< what part of a Take, will be played when and from where—is termed a Phrase. A project is a Song that will contain Takes referenced by Phrases in a Playlist. Events is used to cover the system pointers to Takes and automation changes. An important limitation is that the number of Events is limited to 18,000 per song. This may sound like a lot, but each record pass uses 2 and an automix marker can use up to 6. It is thus perfectly possible to run out of events even when the disk is far from full. There are housekeeping tracks to reclaim extra events if you are running short such as Song Optimise and erase of unnecessary automation data.

The main screen manages to display all 16 Tracks, smoothly scrolling together with 16 virtual bar-graph meters for the Tracks, and a further 4 for Monitor and Master outputs. A large time counter sits at the top, and Playlist information in the middle. This, together with the relevant track graphic going inverse video indicates the selected Track. If the warp key is pressed, a waveform window pops up with a zoomable waveform display. Scrubbing is of the constantly repeating short loop variety. Hitting a track or input select key brings up a window full of parameters associated with that mixer channel. Note ‘mixer channel’, because to all intents and purposes this is a 2-layer desk with inputs on one and tracks on the other.

Editing is basic but adequate. The waveform display offers better control than that seen on the VS-880. The manual still cautions about edit accuracy in some modes, but the test unit performs better than the manual suggests. Crossfade editing is, unfortunately, still missing. A useful feature that allows the ability to name musical phrases and multiply copy them, with quantisation if required.

A major advance over the 880 is in the EZ Routing functions. The earlier machine really can’t fathom to get to grips with until you get the map in your head. This new function allows 29 user-routing setups to be stored and recalled at will. Similarly the automation is far more visible and usable with off-line editing thrown in for good measure.

The mixer offers 2-band EQ on everything with the option of 16 3-band EQs on any of the Input or Track channels. Unfortunately, Roland has still not cured the nags, crackles and pops that accompany vigorous twiddling of parameters during playback.

The comprehensive effects of the 880 are enhanced here with a new card, the VS8F2. This gives 2 stereo effects units. One card is normally supplied as standard, but there are slots and routing for a second. Certain effects are only available on one of the two processors on each card. The library of presets is an impressive 200-strong with a further 200 memories for user-patches. New discoveries include a more than passable pre-echo and a bunch of analogue-style phasers, flangers and choruses. Anyone seriously into effects needs at least one Roland unit in the armory. They really do have a sound all of their own.

As with most units which try to do a great deal on a reasonable budget there are compromises. In this case most obvious is the traditional minimising of knobs and buttons. The result is, until you have a mental 3-dimensional map of how the architecture works and where everything is, the learning curve is ‘ballistic’. There are 5 manuals, and they are not slim—Quick Start, the Owner’s Manual and Appendices, supplemented by a Turbo Start sheet of A4 just to give you a quick ‘win’ audio out from one of the demo songs, and a quick canter through a few functions. I found the layout unhelpful. For example, the all-important index is half way through the Appendices. The manuals appear to originate in Japan with some interesting translations. I really think at this stage in the game there is little excuse for this sort of nonsense. On the other hand most of the information is in there, somehow. There are a large number of shortcut functions and ways of doing things without going through the screen menus, and alter-

SONIC ROCKET

There are many cards that give you I/Os.
There are some cards that provide mixing.
But there is nothing like PULSAR.

The man-made VS board brings together all the advantages of compact size, affordable price, and the latest technology in VS technology.

Ultra powerful DSP Engine.
• 32 bit for the PC and 40 bit for the VS system
• 32 dBW Dynamic Range
• Very high stability
• Very low latency

PULSAR is the ultimate audio engine to drive your audio sequencer.

 MUCH MORE THAN I/Os AND MIXING.

PULSAR is the ultimate audio engine to drive your audio sequencer.

 ALL FOR JUST $1,298 US MSRP!

You’ll never guess where our latest idea came from.

PULSAR


Sonic Rocket
creamware

A world of DSP models.
• Fixed parameters (500 internal mix source
• Dr. Brain DSP
• easiest-to-use in the market
• Reverb, Delay, Mute, Pitch,
• Flex, Tension, Sound, etc.

www.americanradiohistory.com
native methods of achieving the same result, but these will take time to become instinctive. The MIDI implementation and documentation is particularly comprehensive and accompanied by some useful suggestions for operational setups with other equipment, sequencers in particular. Software is easily updated since the system resides in flash memory. Roland makes updates freely available on its Web site—a recent example adds CD-R backup to the VS-840. I also had the Roland VS-CDR drive for review. The setup and operation of this with the 1680 is simplicity itself. Subjectively, the drive seems a little slow when used with the 1680, but this is greatly outweighed by the convenience of being able to backup and restore complete songs with no bother onto this cheap and convenient medium, not to mention allowing short-run production of demo discs or whatever. Roland states the VS-CDR is the only drive that will work with the 1680. The drive is supplied with drivers for Windows 95, Windows NT and Mac operating systems and Adapter software. This makes an attractive package for any 880 or 1680 owner who also uses a computer. The drive is actually a rewritable type, but Roland has not yet come up with software to enable this function to be used with the 1680.

Do not be fooled by the 24-bit hype. The internal processing of the unit uses 24 bits which gives a bit of headroom when using lots of EQ boost, and so on, but the audio is 16-bit linear in Mastering mode, which limits you to 8 playback tracks, or compressed to varying degrees in the others which give the full 16 tracks. (The convertors are 20-bit jobs.) Roland is secretive about its compression; it sounds fine, but I am still not keen on using it for broadcast material.

The 880 has a good blend of features combined with reasonable ease of use. The 840 ups the ante in the ease of use stakes, but drops a lot of features. The 1680 has the routing 'smarts' of the 840, the features of the 880, and then some. This is somewhat offset because the huge feature set is driven from a very sparse complement of hardware controls. For anyone prepared to invest the time in exploring it, making its operation instinctive, and who wants an 'all in one box' digital studio, the VS-1680 is probably leading the present pack. I can also see it finding a home in specific professional environments such as video games houses and certain low-budget, sound-for-picture applications. But the major attraction is just what can be achieved with the addition of an instrument, a mic and some means of monitoring. Once mastered, with a bit of thought and care, this setup is capable of turning out highly polished CD-Rs without getting in the way, physically or otherwise.

Studio Sound January 1999
Amptec Stone-D001

The frenzied activity surrounding development of small-scale digital desks has focused on general, rather than specialised applications. Paul Shure discovers the exception to that rule.

It is tempting to assume that there are now numerous digital equivalents for every analogue console application, but there are situations where this is not so. As if to prove the point, along comes a small digital console from a little Belgian company, almost unknown outside its own country, that does not fare very well on a cost comparison with the established Japanese small digital consoles. You would be entitled to think that they were on a major losing streak.

There are a host of mixing applications where what is really needed is a true digital equivalent of the analogue console. It may be the kind of application where multiple-functions-per-knob designs do not work very well or are too slow for real-time use—and there are plenty of them. Frequently these are applications where efficient, fast, ergonomic operation carries greater weight than cost savings over analogue consoles. In many cases such users may only be turning to a digital console because of the easier interface with other digital equipment and really still favour an analogue-type control surface. Such factors remove almost all of the digital consoles that you might perceive to fulfil small-to-medium-sized needs for such users.

The Amptec Stone-D001 takes a design route that aims to emulate an analogue console, but pragmatically uses digital control where there are advantages to be gained. With a target market of broadcast, classical and small-scale recording, and perhaps, theatrical work, Amptec has specified a fully modular console that parallels the facilities of the most common analogue consoles currently used in those fields in terms of channels, EQ, auxes and so on.

The company was started in 1990 by electronics engineer Bart Willems as a service and maintenance company, mainly working in the broadcast field. It quickly moved into customising and building equipment for installations, some of which became commercial products—such as the Yamaha 02R AES-SRC interface. It also has the Boulter range of large-format analogue consoles (derived from the Raindirk company which it acquired) and a smaller digital mix system currently under development known as Flinstone.

The Stone itself is offered in three frame types that encompass in-desk or on-desk use plus the Studio Frame—a larger free-standing unit with a meter-brige as standard. There is a choice of three types of input module, and a large number of group-master modules with differing facilities. Using the same components, it is possible to create a console that goes from two to four inputs up to the largest module capacity of 28 mono or stereo inputs, has four stereo groups, two master bus outputs, four aux sends, moving faders, and multiple snapshot memory of all console functions.

Amptec’s belief is that interconnection should be easy and to this end most modules have both analogue and digital inputs—the latter being AES-EBU with a 20-bit sample-rate converter on each input. The analogue inputs are followed by 24-bit, 128x oversampling A/D convertors, with all inputs feeding into 32-bit floating point DSP distributed throughout the console at module level. The internal word clock can operate at 44.1kHz or 48kHz, or lock to an external source. Each module has a direct digital output, and on mono modules that may be run in a clean feed mode.

It would be wrong to describe the input channels as totally knob-per-function, but they are very close, and if you can accept the philosophy of the control operation, it is probably as close to it as such a console need be. Firstly, there are dedicated buttons for all input functions such as line-mic select, phantom power, phase reverse, routing to eight groups, and two stereo master buses. You can select the module input feed from either the digital or analogue input or flip between them, the channel input gain being set by a single knob that sets and displays independent gain structures for the different inputs. Modules with up to four digital inputs are now available on the smaller Flinstone system and are being considered for use on new Stone modules.

Back on the control surface, every button is LED illuminated and all knobs have LED rings at their base to show set values. This is particularly important with the EQ section. Amptec chose to bring all three parametric EQ bands to the control surface at the same time, with access to each band’s functions being through the knob. So turning the HF band knob alters the gain ±15dB at the frequency displayed in the nearby dedicated numeric display. Pushing the knob as you turn it allows control of the frequency turnover from 20Hz to 20kHz, while pushing it twice before turning selects Q control. A separate high-pass filter can be switched in circuit. Its value is set on a channel-by-channel basis through the central control menu; although this value can be indicated on the module itself.

The aux sends follow a similar operational style to the EQ. Here two knobs control four aux sends meaning that turning the upper knob sets the gain for Aux 1 while pushing the knob as you turn it sets Aux 2’s level. A pair of the auxes can be set up as a stereo pair through the main menu, and in this case the knobs sets the level for both sides of the stereo aux while pushing the knob prior to turning accesses par control.

January 1999 Studio Sound
The lower section of the module has the remaining functions you would expect to see—pan, mute and solo, plus a rest button whose function is programmable centrally. In broadcast applications this might be used to select routes—either for external or hard signal sources, but it isn’t confined to this. The faders themselves are good quality, touch sensitive, moving faders that can be grouped in various ways through the central menu section.

Aside from the mono input channel, stereo input modules are offered in versions that are exactly the same as the mono channel, but with the obvious changes in pan-balance control, and the addition of a Width control mode on the balance knobs. Following the way that the DSP is configured, mono modules are always installed in pairs and these can be easily linked such that every adjustment on one module appears on the other—excepting the fader level, which is presently independent.

Input module types can be mixed as wished and selection of the remaining module types is also flexible. You must have the Master Control module plus a Monitor module, a Communications module, and a minimum of one Master Output module. If you have no use for auxes or the groups, those master modules can be left out and used to maximise inputs, but is will reduce flexibility. Whatever configuration is chosen, the software remains the same as it recognises the modules installed when configured.

Among this choice of modules there are group and master versions, with or without compressors. The compressor itself uses the dual-role knob concept to provide Threshold-Ratio and Release-Attack attack across two knobs in a fairly logical manner. While it is possible to add meter bridges to any of the frame sizes, most of the non-input modules have 50-element stereo or meters on them, to monitor dedicated levels in that module and so providing group and master output metering. The upper 10 segments of each meter are indicated as being in the province of the Dynamic Range Converter (DRC) feature of the console. Essentially this is an auto-ranging function within the DSP that recales the digital output should any levels exceed the abilities of a standard 24-bit AES output with the intention of preventing overload. This is a fixed function that is always operational.

The master modules contain all the controls that you would expect to see on a well-configured analogue console—full talkback capabilities with routing, multiple monitor sources including five internal selections, level control for four separate speaker outputs, oscillator functions, master solo controls for AFL-PFL-SIP functions, broadcast orientated on-air switch whose function can be centrally programmed, and an innovative combined studio playback level-source select control where turning the knob sets levels, while pushing it and turning selects the playback/monitor level. All of the central console functions are arranged in three levels, all of which are initially accessed through the LCD window, the data wheel and cursor controls. At installation you would bring up the System Level to configure word-clock settings, digital converter operation, system auxiliary and sub aux and other system functions, access to which would be password protected. Next would come User settings that are appropriate to specific users or jobs. These are readily accessible and include such features as the functions of the module sets and the on-air button, the most frequently used aux sends, clean feed status, MS decode functions, time delay—all settable on a channel by channel basis.

Last comes the Scene Memory level. You can store snapshots of every console function and level in scene memories, recall, and reset the console. On these pages it is possible to edit this function to exclude certain parameters or channels from being stored.

At present there is no automation available on the Stone, and although there is provision for the inclusion of time code, it is not currently implemented, as it is not seen as important to the target user. That said, it would possible to use external MIDI commands to trigger scene memories should the need arise. For the most part, users will probably be content manually recalling scene memories via the dedicated UP-DOWN and Recall keys with their own scene number display, at the foot of the control module, completely independent of these being available on the screen.

All the scene memories and user-settings can be stored on a PCMCIA flash memory card, the console having no internal hard disk of its own. Data on the PCMCIA card including scene memories can be accessed directly from the card through the memory recall buttons as if were in the console’s internal memory. The Stone’s integral diskette drive is just for software updates.

One of the most useful facilities on the Stone is the set of 10 programmable function buttons. These allow some of the higher function to be placed on dedicated buttons and enhance the power of the control surface operation. The most obvious functions include specific scene memories, but perhaps more useful is the ability to display all the hidden functions of the control surface. Although no control has more than a single hidden function, if you wish to examine the EQ values of Q, or the width controls on the stereo input modules, right across the console, these can be brought up on a single F-key and adjusted without the need to push knobs before turning.

Amp’tec’s origins are in the attention to professional reliability. Each frame size has a spare power supply capable of running the console in the event of failure. The distributed nature of the DSP means that a single module failure will not effect the rest of the console while the loss of the central computer will mean that the ability to alter settings will be lost, but audio will still pass. The console is equipped with four front-mounted fans that create a very slow movement of air through the tightly packed internal PCBs—but are inaudible in operation. It is worth noting however that the Stone is fairly heavy with the smallest frame size, fully-stuffed, weighing in at 68kg.

The company’s other digital mixing console, Flintstone, is being developed in parallel with Stone and carries the same philosophy, but it is simpler and made to fit within a standard 19-inch rack format. It lacks moving faders, tco, and several other facilities, but it is based on the same PCBs.

Sales of the Stone began in summer 1998 with an apparently promising response that includes several prestigious sales. Amp’tec has identified a clear market with the Stone. It is not aiming at the mainstream music recording market, but those areas where a small-to-medium-sized digital console with familiar analogue-type capabilities usefully supports real-time operation. The modular nature of the console and the way that Amp’tec has structured its operation means that it can be responsive to different user needs. While stopping short of customisation, many options and future possibilities in modules and software are available.

For example, a current omission is the lack of dedicated stereo returns but a forthcoming variant on the Aux module will correct this.

Amp’tec has opted to design a console that retains an analogue operational feel while not totally dismissing the advantages that a digital console can bring. The balance seems to be about right in terms of the speed of use in pressured situations being largely uncompromised by any doubling up on functions.

So while it may seem that the Stone is an odd beast, out of step with other small digital console manufacturers’ ideas, it has a carefully targeted market area that, while not vast, knows exactly what it needs to handle specific operational requirements. And for many, Amp’tec’s Stone probably adds a digital option to what otherwise might remain a predominantly analogue market sector.
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 buses, 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)2159-50891 • Fax: ++49-(0)2159-1778

OTARI
Consoles and more...
http://www.otari.com

httpl/www.otari.com
tc electronic M3000

They tell us the M3000 produces the most dense and natural acoustic environment simulation ever. We ask David Foister to see if he agrees.

No matter what other clever stuff you might have done, your success as a proponent of digital signal processing is measured ultimately by the quality of your reverberation. 'Twas ever thus, and today the giants of DSP are those that got their reverbs together best when it all began. Never mind chorus, flange, multi-tap delay, pitch shift and all the others we now take for granted; if your reverb does not transport us to another space then the rest counts for little. Curiously, tc electronic built its reputation on having the biggest and best delay lines when such things were news, and its reverbs came later; now it is out to remind us of how well it can do this most important job of all with the specialised M3000.

Reverb is not new to tc electronic, but a dedicated box like this is a break from the multi-effects platforms that the company pioneered and heralds the introduction of new proprietary reverb technology that tc electronic mysteriously calls VSS. Not wanting to turn its back on its roots, the M3000 also contains algorithms from its illustrious predecessors, but relies primarily on its new sounds. And it is a double whammy as the box contains two complete processing engines, operating entirely independently and in a variety of routing configurations.

Since each engine is a full-blown processor in its own right, this means that the M3000 is truly able to operate in two distinct effects units within the one box, without the compromises and trade-offs that usually implies. The only thing missing is separate outputs for the two processors, but in the conventional aux send and return configuration this is not a difficulty. In all other respects they act as two units, and nothing you can do on one undermines the other's capabilities.

The routing setups on offer encompass this dual stereo mode, with each of the two inputs feeding one of the engines; a Parallel mode where both inputs are fed to both engines to produce two stereo effects mixed together; a Serial mode where one engine follows the other and the effects are cascaded; Dual mono; a Linked mode that offers two identical mono processes ganged together; and a Special Glide mode that allows presets to be crossfaded into each other; although in this mode only one engine can be used at a time. Parallel mode offers a particularly powerful function called Dynamic Morphing, where the process will cross over from one preset to another as the input signal crosses a user-definable threshold. The obvious use of this facility is to make the reverb character grow with the dynamic of a vocal line. The speed and direction of the morphing are selectable as are the relative outputs of the two effects in use.

Whichever of these configurations is selected, any of the preset programs can be used in either engine, with full editing facilities available on both. Factory presets number no less than 250, which as this is primarily reverb is a hell of a lot. A familiar tc electronic feature is the Wizard, and on the M3000 it operates a bit like a database for finding suitable sounds for the job in hand; tell it what sort of material you are working on, what sort of broad effect you are after, and it will offer a selection from the 250 that it thinks will cover the possibilities. There is also a sort of simple index found by holding down the Recall button, serving as a reminder of the preset ranges that cover certain broad types of reverb.

Another impressive shortcut is a set of four snapshot buttons next to the banks of engine control buttons. Any preset or any user edit can be stored under these buttons for instant recall, adding considerable flexibility to the usual arrangements for comparing edited versions with various originals.

Of course just saving and loading patches into the engines individually is only part of the story, and there is also a selection of 50 presets that set up the entire combination, with all the routing, all the effects parameters—the works. A nice touch for automation is that the two engines and the combination patches can be assigned to three separate MIDI channels for program recall. User memories offer the same capacity again, as individual presets or combinations, and the card slot can be used to store more still.

This might seem a little excessive for a unit that specialises in reverb, but a few moments playing with the sounds makes it apparent just how versatile it is and how useful that kind of storage could be. Its strongest card is its new VSS reverb system, with a wealth of programmable parameters and a no-holds-barred commitment to making it, as the box says, 'the best sounding, most versatile and easiest to use professional reverb today and well into the future.' Very bold, considering the competition, but there's no doubting its right to be taken seriously.

Part of what makes VSS different is its distinctive treatment of the reverberation as two sections, with more detailed control of the early reflections than normal and a strong emphasis on a natural-sounding tail. The early reflections come in no less than 11 types, mostly with name tags suggesting real room characters (Concert Hall, >
The M3000 is to be regarded primarily as an unusually elaborate reverb unit, but it should not be thought that it can do nothing else.

We do this with products from Aardvark, Dialog4, Glenayre, Intraplex and Z-Systems.

With more digits flying around the studio all the time Aardvark and Z-Systems provide the means to keep everything in perfect sync and under automated control.

Then, from simple studio to transmitter links to complex distribution of network programmes the Intraplex multiplexers are the gateway to telecoms E1 circuits, or Glenayre spread spectrum (licence free) radios. While Dialog4 ISDN codecs offer some unique features for dial-up links.

Today's world is digital! And beyond the established and accepted benefits of storage, manipulation and quality, come a range of new possibilities to embrace, refine and complications to overcome.

Our experience at The UK Office with complex wide area audio and data network design and specification, including ISDN & permanent circuits, as well as studio signal routing and clocking, means we can help you with the practical implementation of most of your digital interconnect requirements.

Make The UK Office Your Digital Connection

Now on-line at http://www.thel.ukoffice.com

cc electronic, Sindsalvej 34, DK 7840 Kgs. Næstved, Denmark
Tel:+45 8612 7599
Fax:+45 8612 7598
Net: www.cc electronic.com
US. Tel: +1 805 373 1828

January 1999 Studio Sound
"At this price, and in these times of digital mixing revolution, the Spirit 328 has got to be a winner."

Paul Mac, Spirit 328 Preview, The Mix, April 1998

"The sonic quality of the 328 is outstanding, the console makes light work of digital interfacing. The built-in MIDI controllers allow manipulation of external hardware and software synths from the surface, giving total control where it counts."

Sasha, DJ, Producer/Composer

"A brilliant desk, I use it all the time. The 328's sound is superb, for writing at home or in the studio as an automated sub mixer for the computer. Loads of professional features and sound to match. From high quality Mic amps, the clever E-Strip, proper size faders to analogue sounding EQ it has worked on many sessions for me. A brilliant product!"

Alan Branch, Engineer and Producer

"The E-strip is a stroke of genius and gives substantially more hard control than its immediate price competitor. Remember also that the TDF and ADAT I-Os are standard."

Zenon Schoepe, 328 Preview, Studio Sound, Feb 1998

"There's a lot to like about the 328 and the design of the user interface sets the standard for ease of use in the small digital mixer market."

"Interfacing the console digitally to tape or disk recorders is pretty flexible - in fact I would suggest that the 328 is the present market leader in this respect."

Paul White, Sound on Sound Magazine, December 1998

"The 328 gives me the ability to control 16 digital streams from my Pro Tools rig with the most intuitive user interface I have ever worked with."

Gaetan Schurrer, Producer and Programmer

"I must say that the board sounds fabulous...just taking the digital output from a CD player into the 328 gave the CD much greater depth and clarity than the CD's regular audio out...

"The EQ was designed by Soundcraft co-founder Graham Blyth and modelled on the fabled warm musical British EQ. And to my ears, this is one of the most musical-sounding Digital EQ's I've ever heard. My first impression was that it is in the league as some dedicated software plugins. Every input has an E-strip - including the aux returns and internal effects...

"This mixer packs a mighty punch for $5000. It sounds excellent, does an excellent job of untangling all the various digital formats in use, and has an excellent interface. A bold step forward in digital console design."

Christopher Ash, Recording Magazine, USA, August 1998

www.spirit-by-soundcraft.co.uk
Magtrax MusicBox

Burgeoning delivery formats and increased availability of high-spec, low-cost mixers are driving demand for comprehensive monitoring systems. Rob James auditions a controller

MusicBox is a recent entrant to the market for surround-sound monitoring controllers. As noted before, the need for such units is being driven by the availability of affordable consoles suitable for surround, and the burgeoning markets for surround mixes of DVD, DVD Audio, digital television, and computer and video console games. Magtrax, the company who manufacture this unit, has gained considerable experience in the field with its up-market, Ultima series of controllers found in a number of major film-dubbing theatres and broadcast installations. Through its close association with a film and television sound facility, Magtrax is well placed to field test products in real-world use and MusicBox demonstrates the involvement of experienced practitioners in its design.

The new unit is aimed at music studios making the transition to surround, and smaller sound-for-picture applications such as OB vans, multimedia producers and DVD production. The system consists of a 1U-high rackmounting 'mainframe' and a small remote controller. In the intended applications, space is likely to be at a premium and this is about as small as one could reasonably go without compromising the ergonomics.

All audio connections to the mainframe are on D-subs and are designed to make it possible to insert the unit between console and 8-track recorder. MusicBox then handles all the signal routing to the surround encoder-decoder and routes the appropriate signals to the monitors. Given this convenient approach I feel Magtrax may have missed a trick. There is no meter output, which leaves users to roll their own using patching or Y cables or by using the console and recorder meters. In a major installation, the metering is often arranged with the option of following what is heard on the speakers or looking at a large variety of other sources. This would probably be inappropriate on this unit, but a simpler approach would be of considerable use and should lead to better operating practice.

Despite its diminutive appearance the remote is heavy and should survive in demanding environments. It has a 2-line, 80-character, back-lit display that is used to keep you informed, and for programming. All the keys are internally lit, small, square items. Necessarily so, given the size of the remote. These are supplemented by three LEDs, which indicate the matrix mode, and a knob controlling a shaft encoder for volume control and data entry. The eight green keys below the display function as individual output channel Cuts or Solos depending on mode. The last two also work in conjunction with the setup key.

Zoom in & out of your sound...

Reshape your sound with the ingenious Transient Designer. You will never have heard anything like this before. A 4 channel dynamic-effect processor which

shapes the attack & sustain envelope to give level independent sound processing. This amazing concept product may change the way you record forever.
to change monitor modes and options. Cut keys illuminate when the channel is cut enabling the operator to see at a glance if this is the reason for a disappearing signal. This may seem obvious, but a surprising number of consoles and other kit use the reverse logic, making it far more difficult to trace a problem quickly. The second row of keys contains DIM, PRE (preset), MONO, NEAR (close field), CUT, SOLO, TRIM and SETUP keys. Adjacent to the shaft encoder knob are ALL CUT and REP (replay) keys. The latter toggles between DIRECT and REPLAY to allow film-style PEC-direct comparison checking. The knob visually obstructs the DIM and PRE keys, but this should not prove a major inconvenience. Ease of programming passes my usual `average operator' test—you can work it out without recourse to the manual.

The number of surround modes is prodigious. Discrete LCRS, matrix LCRS, 5.1, 7.1 and virtual 7.1 are all supported. There is also a System Bypass mode, which routes the console outputs from the stereo input to the main LR speakers. The matrix modes allow monitoring with the encoder and decoder in the monitor path or recording, with the encoder in the record send and decoder in the return. Bypass removes the encoder and decoder for discrete mixing. It is also possible to route the encoded Lt, Rt (Left total and Right total) encoded signals to the close field or >
<main_text>

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.

Since many smaller rooms use near-fields as main monitors the NEAR key is programmable to simply collapse the mix onto the main left and right speakers.

For real luxury I would like to see a programmable level for this as well.

With surround-sound production more common the only real answer is a purpose-designed system. Unbelievably, music scored specifically for film is still frequently recorded in stereo without any attempt at monitoring in surround. This leads to headaches for dubbing mixers and disappointment for composers, as the results are frequently very different from the intentions.

MusicBox provides an affordable answer all the way from matrix LCRR up to full-blown 7.1. It manages to do this without becoming too complex and offers a convenient solution for users of digital 8-track recorders.
Red Range by Focusrite has become an industry reference. Six products delivering the classic Focusrite microphone preamplifier, equaliser and dynamic processing in a range of combinations for a variety of applications.

All enclosed in the unique, machined, red anodised aluminium case.

Built to sound wonderful and last for ever.

"Studio and Remote Recording, Post Production, Rock, Opera, Theatre, etc.

Call for a brochure or ask your Focusrite dealer for a demonstration.

Red Range by Focusrite has become an industry reference. Six products delivering the classic Focusrite microphone preamplifier, equaliser and dynamic processing in a range of combinations for a variety of applications.

All enclosed in the unique, machined, red anodised aluminium case.

Built to sound wonderful and last for ever.

"Studio and Remote Recording, Post Production, Rock, Opera, Theatre, etc.

Call for a brochure or ask your Focusrite dealer for a demonstration.

Red Range by Focusrite has become an industry reference. Six products delivering the classic Focusrite microphone preamplifier, equaliser and dynamic processing in a range of combinations for a variety of applications.

All enclosed in the unique, machined, red anodised aluminium case.

Built to sound wonderful and last for ever.

"Studio and Remote Recording, Post Production, Rock, Opera, Theatre, etc.

Call for a brochure or ask your Focusrite dealer for a demonstration.
Acoustic Energy AE2 Pro

Studio Sound's 'bench test' loudspeaker reviews continue with the AE2 Pro. Keith Holland reports

The Acoustic Energy AE2 Pro is a 3-way, passive loudspeaker using five drive-units. The low frequency output is shared between a horizontally-spaced pair of 130mm diameter, alloy ceramic coned drivers which operate up to 1.8kHz; the frequency range from 1.8kHz to 8kHz is shared between a vertically spaced pair of 25mm silk-dome drivers and the high frequencies are radiated from a third, similar driver. The crossover network is specified as having 2nd and 3rd order slopes. External dimensions of the AE2 Pro cabinet are 385mm wide by 235mm high by 330mm deep, and the front panel houses two bass reflex ports. Power handling is specified as 250W unclipped peak programme, giving a peak sound pressure level of 115dB at 1m with one loudspeaker driven.

Fig.1 shows the on-axis frequency response and harmonic distortion at 90dB SPL for the AE2 Pro. Average sensitivity is about 89dB for 1W at 1m, and the response lies between ±3dB from 80Hz to 20kHz, which is a commendable result. The low-frequency roll-off can be seen to be roughly 3rd order, with the -10dB point at about 40Hz. Low frequency harmonic distortion is a bit disappointing, with the 2nd harmonic rising to -30dB (3%) at 60Hz; however, all harmonics are below -40dB (1%) for frequencies above 100Hz. Fig.5 shows the horizontal off-axis response. The dip in response between 1kHz and 2kHz is due to the horizontal spacing of the two bass drivers, and is inevitable with this type of driver layout. The directivity above 5kHz is very smooth, however, showing no sign of lobing or other irregularities. The vertical off-axis response (Fig.6) shows a similar dip between 3kHz and 9kHz, this time due to the spacing of the two upper-mid drivers. The step response of the AE2 Pro (Fig.3) shows a rapid rise and steady decay, which is characteristic of good driver time-alignment, and the acoustic centre (Fig.2) is seen to shift to a maximum of under 2m behind the loudspeaker at very low frequencies, a demonstration of a benefit of the quasi 3rd order low-frequency roll-off adopted in this design. The power cepstrum (Fig.4) shows an absence of any strong echoes; a fact that is borne out by the uniform on-axis frequency response. Fig.7 shows the waterfall plot for the AE2 Pro. The most notable features of this plot are the rapid initial decay of the low-frequency energy and a ringing at 140Hz. Overall, the AE2 Pro performs reasonably well. The on-axis frequency response and time-domain performance are very good, but the off-axis response suffers due to the physical spacing of the drive-units. The loudspeaker thus represents a good example of the trade-off between the benefits of the use of multiple drive-units, and the spatial problems that this introduces; the design is expected to perform at its best in acoustically 'dead' control rooms where off-axis response is of limited importance.

January 1999 Studio Sound
Spendor is consistently associated with the highest quality active monitoring systems as well as the World’s top Broadcasters and Production facilities. Facilities such as the world famous Superdupe dubbing suite in New York.

Spendor also recognize that to confidently create and mix natural, well-balanced audio in the 5.1 format, requires a monitoring solution specifically designed for the task.

It is with this in mind that we have developed a new range of dedicated 5.1 monitor systems.

Regardless of room size and budget, these systems simplify the task of installing definitive surround monitoring for both purist audio and audio-for-video mixes.

Call now for a full color brochure.

SPENDOR AUDIO SYSTEMS LTD
STATION ROAD INDUSTRIAL ESTATE
HAILSHAM • EAST SUSSEX • BN27 2ER
TEL: +44 (0) 1323 443474 • FAX: +44 (0) 1323 442254
web: http://www.spendor.mcmail.com
email: spendor@mcmail.com

Surround Yourself with Spendor
Summit Audio Presents:

The *Element 78* series from Summit Audio, designed by Mr. Rupert Neve, presents to the user a unique combination of "Class A," discrete and solid state, plus transformer coupled designs. Digital implementation of storage and reset capabilities enables comparison of 25 memory settings, copying of settings between units and MIDI control.

Two independent paths with transformer coupled output stages are provided in each of two channels, comprised of:

1. A high performance microphone amplifier with superb high and low pass filter sections.
2. A comprehensive four band equalizer.

Back lit rotary displays are enhanced by miniature LCD select/controls for an accurate status readout ... truly unique.

**Summit Audio**

TEL: 831 464-2448  
FAX: 831 464-7659  
www.summitaudio.com

email: sound@summitaudio.com  
patent pending © copyright 1998 Summit Audio Inc.
tc electronic Finalizer Express

The tc electronic Finalizer Express has given the power of its original digital dynamics processor to the masses. Dave Foister reports on the son of Finalizer.

It is often true that the more sophisticated and powerful a piece of equipment is, the more daunting is its interface, and the less likely it will be that some users will fully explore it. This may be the case with tc electronic's Finalizer, a comprehensive and versatile processor that has found favour in many mastering rooms, but needs time to get the best out of it. At the same time it is so powerful that a simplified version, besides being cheaper, would reach a bigger market of people who may currently be unaware of what it could do for them.

Hence the Finalizer Express. By removing some of the variables, automating others, and combining some parameters so as to simplify the setup, tc electronic has produced a box that looks almost analogue in its layout yet provides the fundamental elements of the full Finalizer in a much more accessible form.

The original Finalizer has a whole string of processors in it, including 5-band EQ and stereo image adjustment, but what gives it its power to radically alter the perceived loudness without the expected side-effects is multi-band dynamics processing. Compression, limiting expansion and gating take place independently on three bands of the spectrum; the advantage, particularly with compression and limiting, is that a big peak in the bass, for instance, does not make the rest of the signal suck. A vocal can compress the mid band without making the cymbals ride up and down, and those same cymbals can crash away without making the bass pump.

This, then, is the central concept that has been handed across to the Finalizer Express. Most of the other processes have been dispensed with, but the 3-band compression-limiting is retained, and the whole method of applying it has been dramatically simplified.

In the first place, the crossovers between the bands are fixed. Originally they were user-adjustable, although it would have been nice if many users actually adjusted them. On the Express the lows become Mid at 315Hz, and this rises over to High at 3.15kHz. These bands are led through compression and limiting stages, and whereas the original allowed individual adjustment of all the adjustment of all the adjustment parameters, the Express has adopted a remarkably simple and friendly approach where the user only knows what the numbers are doing by referring to a chart.

The assumption behind the system is that there are two essential variables at work in overall programme compression: speed and amount. The power of the 3-band compressor is therefore harnessed by a 3x5 LED matrix, each band's compressor will drive into the following limiter, making it possible to hit the limiter more or less hard, either across the whole range or on a band-by-band basis. Again this is not simple gain within the bands, but a control over how the dynamics will shape the spectrum. In conjunction with the rest of it all makes for a hugely powerful system that can be as subtle or as brutal as required while always minimizing the side-effects and responding quickly and intuitively to what you ask of it. A big downside is the absence of any kind of memory apart from the scissor charts in the manual. Do not be fooled by the presence of a card slot — this is only fitted to allow software upgrades to be loaded in it. On the other hand, the streamlined range of facilities and the easily understandable approach mean that unless absolute treatability is required, a given setup can be closely reproduced very quickly just by the use of common sense.

We must not forget the Normalize's gain makeup stage that attempts to keep the whole signal near the ceiling whatever else is happening. This and the main finalizer section each has its own soft clipper, switchable and indicated, separate from the main limiters.

This should be a winner. It gives you the bit that makes the Finalizer special on a plate, with a remarkable combination of control and simplicity that makes the word Express seem highly appropriate.
Sonifex Reds

Providing a one-box solution to interfacing problems is what the Reds are about. Neil Hillman takes three sisters

I T STARTED out in innocence; the way that most things do, I felt the need for something a little different in my life, so I wrote to, shall we say, a specialist magazine. 30 years young Male, happily married, but seeking that something special to give me an edge in life and a spring in my step, seeks a loose arrangement to connect with willing accomplices! You should be receptive to power, good looking, accomplished, enjoy music and the spoken word; ideally you would be unattached but not averse to a fixed arrangement, attractive, professional, accomplished, elegant and discrete. Our relationship will be based on mutual respect of each other's individual skills, business-like, but certainly no large fees should be involved. I am from Birmingham, but I have my health. Reply BOX 69 soon!!!

I posted the form with my VAT return, and a 'NO THANK YOU' reply to the time-share holiday I had apparently won (again).

What he actually delivered some days later was a large cardboard package housing three-sisters from Sonifex's 'Redbox' range of connection equipment. Initially I discovered that the 'Redbox' address label hadn't involved Ginger Spice at all, the sight of the three devices beautifully finished in red, anodised aluminium—to Sonifex's usual high quality standards—certainly lifted my otherwise downcast demeanour. While there are currently five models in the range, the dual microphone amplifier and the twin mono-stereo limiter remained at home, presumably to wash their hair. The Redbox range of connection equipment is designed for budget applications in radio studios, TV studios, video and recording suites and have housings that enable the string of the units either as free-standing, rack-mounted, or screwed to the underside of studio furniture.

The Sonifex RB-SM2 houses two indepen-
AM62 are valve condensers and use similar diaphragms that are precisely tensioned, and together with the internal polarisation voltage regular or boost a matched response that is said to be typically within 1dB between mics. Both have custom-designed dual-diode valves with the AM61 offering cardioid and the AM62 providing cardioid, hypercardioid, omni and fig-8 patterns. They come with a hard shell case, external diaphragm condenser, patterns selectable polar patterns, Alesis, US. Tel: +1 310 255 3455.

MBHO mics

Notable inclusions in the MBH-O mic range include the MBC608 switch selectable polar pattern: large double diaphragm condenser. Patterns are cardioid or fig-8. The suspension is said to be resistant to external hum. Much more diminutive in size is the MBC410 series of small condensers which include transformers. A feature is automatic current switching that renders the mic independent of operating voltage. High power input and 50dB pa: are available as options.

Sixpac, Germany.
Tel: +49 066 7a 8266.

Audio Duplication Made Simple by microboards Technology Ltd.

DSR 1000 Series

- Our one button, cost effective duplication series
- Simple sophistication

DSR 8800

- Copy, up to 320 CDs from one master image
- SP/DIF interface available
- DVD upgradable + 4 gig hard drive

CopyWriter A2D

- Copy existing or create original CDs with our new 1 to 1 duplicator
- Analog in / Digital out
- Track extraction

The CopyWriter A2D SP/DIF Ins & Outs, will be available soon!

Cedar CD Publisher

2 drive desktop CD duplication and full color CD printing all in one! Now with Macintosh and Audio software support.

Dealer Inquiries Welcome!
SPL Transient Designer

Rarely a manufacturer of the 'ordinary', SPL has put another spin on dynamics as Dave Foister discovers

NEVER let it be said that SPL is a dull company. There is almost nothing in its catalogue that is completely 'normal', and half of it is fairly off the wall. No surprise then that in the wake of the Spec tralizer, the level Maximizer and the Machine Head tape-saturation simulator we have the Transient Designer, a rather individual dynamics processor with aims and methods all its own.

To be precise it has four dynamics processes; such is the operational simplicity of this rather remarkable device that four of them sit happily in a 1U high rack space. This is not one of SPL's all-digital fairy-dust boxes, but a bluntly analogue processor designed to do one of the standard jobs of a compressor with the minimum of fuss. Once you know the name makes sense describing with commendable clarity its intended aim of manipulating the envelope of a sound, no more or less.

A compressor is often used to alter the front end of a sound, either to exaggerate its attack or to reduce it, and also as a convenient means of controlling the way a sound sustains. The Transient Designer has just two controls on each channel, marked up to do precisely those two things. It does nothing else - no overall level control, no limiting - but its approach to these two aspects is, perhaps, unique and certainly very powerful.

It all looks very simple. The back has XLR inputs and outputs for the four channels, and the front has rotary controls for Attack and Sustain, in-out switches and screenless. That is the lot, but behind it all is a set of four envelope generators for each channel that allow the attack and sustain of the source sounds to be adjusted both up and down in terms of dB via the centre-detented controls. The key is the envelope follower circuitry that is used in conjunction with program-dependent envelopes to drive a VCA.

The Attack stage follows the envelope of the original sound, and also generates a second envelope with a substantially slower attack time. The trick is to make the difference between these two envelopes and use it in varying amounts, both positive and negative, to control a VCA. When the difference signal is applied in a positive direction the level is increased for the time between the real envelope and the slow one, effectively boosting the attack of the sound. Similarly if it is used in a negative direction level of the attack will be reduced.

The Sustain circuitry does the same at the other end. Again an envelope is generated that is longer and higher in amplitude than the real one, with its shape influenced by the peak level of the incoming signal. This, too, can be added to, or subtracted from, the original envelope to lift the sustain part of the sound to reduce it. It sounds like of a sledgehammer to crack a nut, but the resulting effects, and the simplicity with which they can be adjusted, make it all worthwhile.

The results are quite spectacular. The obvious first candidate for treatment was drums, and here the control over the attack of a kick drum or tom was something I would have found hard to emulate with a conventional compressor. The amount of added bite could be precisely adjusted, all the way up to far more than you could ever want. The unit can generate an extra 15dB on the attack, which in the case of a drum sound is likely to end up too hot to handle on most systems. In these cases it would be useful to have some sort of gain compensation on the unit.

This much almost could have been predicted, but the effects on other instruments were more of a surprise. Piano was a prime subject for experiment and a severe test, and on both counts the SPL was very impressive. A decent basic piano sound could be given real power punch or smoothed out completely, or tailored to have any dynamic character in between.

Perhaps the biggest surprise was bass guitar, a sound that can test the attack behaviour of a lot of straightforward compressors and something that might have been expected to bewilder the Transient Designer. In fact it proved to be a real strength. The same raw bass sound could be treated very simply to produce a wide variety of effects without any additional processing; the attack was under full control to punch it through when required without a trace of distortion, and for the more open laid-back natural the sustain could be as long and smooth as needed and still sound completely natural. No doubt a noisy source would be made to pump a little with extreme settings, but with a reasonably clean original any side effects were undetectable.

This is a deceptively powerful unit that will win SPL new admirers, achieving remarkably short cuts to a whole palette of dynamic effects. Try one and you will want two.

Contact
SPL, Germany.
Tel: +49 21 63 8761.
Stirling Audio UK:
Tel: +44 171 624 6000.
USA: +1 516 293 3200.

NEW TECHNOLOGIES

More Meeks

JoeMeek's SC4 is an M/S compressor, adding a width control to the JoeMeek compression sound, and a claim to absolute image accuracy. The unit also has 24-bit 'tiny rate' converters that may run independently. The new, upgraded version of the VC1, transformer mic preamp, mono photo-electric compressor and enhancer channel is the third generation of the Studio Channel and has many extra features, while maintaining the same price. The unit has a larger meter, phase reverse switch, and improved, smoother-sounding enhancer. and now has the same compressor slope settings as its big brother - the SC2 compressor. This is as well as a more 'chunky' looking front panel.

JoeMeek, UK. Tel: +44 1626 333948.

Lawo demos real-time ATM audio transfer

Lawo demonstrated the transfer of audio data in real-time via ATM network as a WAN link at the Teemeisertagung in Karlsruhe.

The presentation of Lawo's mc2 technology was realised by Lawo (with two booths), Deutsche Telekom and Südwestrundfunk (SWR) with live transmissions from the radio house in Baden-Baden via WAN to the Congress Centre in Karlsruhe. So integrating the Lawo mc2 8265 in Baden-Baden and Karlsruhe together with the sources, integrated mixing consoles, video cameras and peripherals and formed a DSN (Distributed Studio Network).

Control of the sources at the SWR in Baden-Baden and mixing of the transferred audio signals in real-time were done on a Lawo mc2 92 production console at one Lawo booth with the signals transferred to the other Lawo booth via DSN. A video camera filmed a monitor at SWR and video and audio signals were semi-simultaneously via this network.

Apart from transferring audio and video signals all other services like file transfer, telephone, LAN and WAN can also be integrated in the DSN.

Lawo also showed its Diamond digital on-air console that has been extended in functionality and now uses mecanomioals. Signal processing and control surfaces are modular and complete setups with all audio parameters, assignments of console modules (sources to faders) and special functions may be stored and loaded from memory cards. This system can also be integrated with radio automation systems.

Lawo, Germany. Tel: +49 72 22 10020.

January 1999 Studio Sound
C-1 stereo valve compressor with mic pre-amps

£1299
ex vat £1526 inc

TL Audio products have been part of some of the most important records of recent years, and none more so than the C-1 stereo valve compressor. So when Portishead - who are without doubt one of the most influential and ground breaking acts of the 90s - came to choose some high end valve outboard to use on their latest 'PNYC' album, the decision was easy:

"There seems to be a real buzz about TL Audio equipment at the moment, and I've encountered so many engineers and producers using TL Audio products that it just seemed to be the obvious choice. The C-1 and EQ-2 were used to process the string and horn sections that feature heavily on the album - and they sounded great. The units just seem to add something special to the sound, even before you start to make any adjustments!"

Adrian Utley - Portishead
(Guitarist, Writer, Co-Producer)

So if you've always wanted to own a Classic, speak to your nearest TL Audio dealer today!

www.tlaudio.co.uk
Tracer Diamond Cut 32

Another package to offer sound restoration and more on the PC, Dave Foister reaches for the 78s

THREE THINGS in life are certain: death, taxes, and equipment getting cheaper. The black art of restoring damaged audio has been with us for long enough but only recently have such things come within the reach of ordinary mortals. Doing your audio thing inside your PC has made many things possible, including now it would seem full restoration, using Diamond Cut Audio Restoration Tools 32 (DC-Art32) from Tracer Technologies. This package of 20 restoration and enhancement tools for around $200 surely brings the holy grail of post-factor to new heights.

Restoration, like the damage it is trying to undo, takes many forms, and DC-Art32 has a full range of tools to cover all the usual problems. It has an impulse noise filter to deal with clicks and crackles, a continuous noise filter to deal with hiss, and a full set of more straightforward filters—high pass, low pass, notch and a dynamic noise filter. Both graphic and parametric equalisers are available, and these lead on to further processes for treatment rather than repair. Thus there is a speech processor, a valve simulator, a package of dynamics and a speed-conversion processor with programmable variation while playing.

Strictly speaking this is not a real-time package. Only one of the processes can be used at a time, and its output is saved as a new file for further treatment. However, each process has a preview button for real-time checking that will work with anything above a 480. The controls do not quite respond in real-time, but the facility for making adjustments while listening to the results is obviously useful. Having established a workaround setting, the process is done in non-real time, which on my Pentium 253 (quite hot these days) was much faster than straight playback.

Even noise removal, the most complex process, took about a third of real-time to run. The obvious disadvantages of the approach are that the processes can interact, the order of processes is important, and too much treatment at one stage can hamper a filter process, with care, foresight and a read of the manual, however, most pitfalls can be easily avoided.

The screen display is very straightforward and helpful. A very obvious set of toolbars and drop downs, complete with pop-up help, provide access to all the system's functions in a very small area. The bulk of the screen is taken up with the waveform display and this not only shows the effects of the restoration (particularly the removal of clicks), but allows simple cut-and-paste editing complete with crossfades. Zoom goes all the way down to sample level and can allow clicks and ticks to be dealt with manually if necessary.

But, of course, the power is in the automatic removal of such problems. In this respect the impulse filter is particularly impressive, working on the demo file of a snippet off '78. Three adjustable parameters tailor the process to the nature of the clicks, and the result is total removal of all the clicks without apparently touching the musical signal.

The continuous noise filter works on the principle of identifying a portion of the unwanted noise and using it as a fingerprint to drive the process. A small sample is all that is needed, and the resulting curve is shown along with a calculated process curve to deal with it. The process uses a 2,000 point FFT to divide the spectrum into 1,000 bands, each of which is effectively then operated as a dynamic filter. The display allows a 10-point curve to be manipulated around the spectrum to fine-tune the result, and attack and release adjustments determine how the filters will then respond. As is to be expected, it is very easy to achieve undesirable digital warbling with this setup, and, indeed, the suggested settings on the demo material gave very unsatisfactory results at first. With further experimentation I was able to produce something much more usable, making a fairly large effort at the most troublesome low frequency component of restoration. CEDAR it ain't, not by a long way, but it is significantly better than some more expensive systems I have heard.

Other less obvious tools include a median filter for tackling small crackles, a comb filter for hum and related problems, and an average filter, which is similar to the median filter and deals with crackles and hiss in a more subtle way than a straight low-pass filter.

The enhancement processes are surprisingly sophisticated and effective. The reverb is very reasonable, with a good selection of algorithms and adjustments, and the EQs are fast and flexible. The valve stage goes so far as to offer eight different circuit topology simulations and four adjustable controls, while the dynamics offer compression, limiting, expansion and gating.

From this it may be seen that to push DC-Art32 simply as a restoration package is underselling it. It does a good job of the restoration side, although there are more powerful tools available, but to do it this well with the bonus of good additional treatments makes it a pretty good all-rounder with something for everyone.

www.americanradiohistory.com
From bedroom demos to platinum-selling albums.

It's easy to see why Roland's VS-Series Digital Studio Workstations are the most popular hard disk audio recorders in the world. In one word, it's "integration." From all-digital recording, mixing and non-destructive editing to onboard Virtual Tracks and high-quality effects processing, the VS-Series workstations can quickly and easily take you from your initial idea to a finalized audio CD*.

Whether you record song ideas in your bedroom or produce albums in professional studios, there's a Roland VS-Series workstation that's right for you.

* CC recording/CD-R archiving possible using VS-880EX or VS-1680 models with optional CD Recording System. See your authorized Roland dealer for details.

** VS-880EX RRP £1499 **
Impressive features and powerful capabilities for pro-quality recording, editing and mixing.
- Record up to 8 tracks simultaneously
- Automated mixing capabilities
- Dual stereo multi-effects processor
- EZ Routing navigation
- CD recording/project archiving capability

** VS-840 RRP £949 **
The affordable digital recording solution for guitarists, songwriters and home recordists.
- 8 tracks of fully digital recording, 64 Virtual Tracks
- Built-in 2GB drive
- Dedicated Guitar input
- Onboard multi-effects including COSM guitar simulation
- Acclaimed EZ Routing navigation system

** VS-1680 RRP £2199 **
Roland's flagship professional digital audio workstation.
- 13-track recording capability
- 256 Virtual Tracks
- MT-Pro recording mode captures the full dynamic range of 24-bit audio
- Up to 8 channels of optional effects processing
- CC recording/project archiving capability

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 SA7 9FJ. UK web site: http://www.roland.co.uk
Now shipping

**COURIER**

The portable hard-disk recorder

V1.0 now shipping

Courier is the breakthrough in portable digital audio recording that journalists and sound recordists have been waiting for - V1.0 software is now in production.

Recording as a standard

Courier records to and plays back from PCMCIA hard-disk or flashcard. It records standard mpeg compressed, linear .wav, or broadcast .wav files which can be edited on the machine, or in your PC with your favourite editor.

Editing is easy

The Courier uses a scrub-wheel to make editing the easiest in the business - non-destructive and with an Undo facility. And, you can see the waveform on the graphical LCD.

So much power and so light-weight

Courier uses standard camcorder batteries or AA cells, and comes with a power supply/charger that can be used in any country. It's light in weight 1.5kg (3lb), so it's not going to be a burden in daily use, and has professional XLR connectors.

Free software for life

You also get free software upgrades, available from our website, for the lifetime of the product. So, you can upgrade your own machine to the latest versions of software which will include complex editing and transfer of

---

**A New Range of Connection Boxes**

Redboxes are a range of budget connection equipment for use in a number of different project areas - television and radio stations, recording and video suites. There are currently five products in the range:

- **RB-DA6**: 6 way stereo, or 1 x 12 way mono distribution amplifier
- **RB-MA2**: Dual microphone amplifier
- **RB-SM2**: Dual stereo to mono converter
- **RB-BL2**: Balanced to unbalanced bi-directional converter
- **RB-SL2**: Twin mono, or stereo, limiter

The Redbox units are housed in red anodised aluminium boxes which can be screw mounted to any surface, or rack-mounted by adding the Redbox rack-mount front-panel kit. Each Redbox has an excellent technical specification, is fully CE compliant and comes complete with handbook and IEC mains lead.

---

See what all the fuss is about on Stand No's 1 to 4
How was it for you?

Their words and experience have helped guide you through 98, but how did they find it themselves? From future formats to pseudo-science, there has been much to digest. As a catalyst for your own thoughts, *Studio Sound*’s editorial team reflect on the events and developments of the past 12 months, and offer a few observations for the year ahead...

**Barry Fox:** For me, 1998 will go down as the year when DTS continued to unsettle the DVD market. By promising DVD Videos with DTS soundtracks, and pepperings hi-fi shows with demo discs, the company pressured hardware manufacturers into building DTS decoders into their surround amplifiers, because consumers were frightened to buy anything without the DTS logo. But by the end of the year we were still waiting for the commercial release of big name movies with DTS tracks.

On a more positive note, DTS belligerently threatened the DVD Audio Working Group and Forum with legal action if they did not make DTS a mandatory part of the DVD-A standard. Then when the threat letter was leaked, DTS said it was not really threatening after all.

So the stage is set for 1999 to be make or break time for DTS. Will the company’s investors pay whatever it takes to keep the ship afloat to tilt at Dolby? Or will the DTS logo on those amplifiers remain the only lasting memory of another failed attempt to stop a juggernaut? If so, it will join the Dolby FM switch setting on some old radio tuners, the piles of unplayable BetaMax and V2000 tapes in cupboards around the world and the DCC decks gathering dust at the back of retail stockrooms.

**Tim Goodyer:** Maybe it is evolutionary. Maybe it is cyclic. Maybe it is even circumstantial. Whatever the reason, over recent years we have identified some Big Issues that we have to address. To date we have accepted high sampling rates, audio compression, digital broadcast, and, of course, the Millenium Bug as areas of consensual concern. What marks these subjects out from their lesser brethren is the immense potential they offer for debate, innovation, and, of course, sales.

Ninety-eight’s corner to the Big Issue table was multichannel monitoring. If you need any convincing that this is big enough, observe the studied manner in which people are setting out their positions. While the sincere players have attempted to address the issues in a constructive manner, the more devious ones have been littering the field with diversionary devices of every kind — misinformation, disinformation and proprietary solutions are all being offered with alarming sincerity. Best of all, some of the solutions appear to almost predate the problem.

That surround monitoring is going to play an important part in our future is assured. That it will be contentious, confusing and potentially costly, is equally so.

**Rob James:** The launch of DVD and Digital Television will eventually be seen as the most important events of 98 for this industry in the UK. DVD in both video and audio forms is the biggest opportunity for growth for years. Shame, then, the UK launches were such a shambles, more of a sneak out than a roll out.

My biggest disappointment is the continued non-appearance of any real rival to the Yamaha 02R. I had hopes for the Tascam, Panasonic and Spirit offerings, but none of them represent a real advance on Yamaha’s magic mixer, and we are still waiting for the Mackie. Yamaha provided the most excitement with the DSP factory. This really is one to watch in the coming months.

This year has seen ‘digital dubbers’ become standard kit with Akai’s DD-8 at last getting a bit of competition from DAR and Tascam, and maybe Sony. If proof were needed that film is finished as a postproduction medium I had it recently. A pile of Steenbeck film editing machines in a skip at a film school. They literally could not give them away.

**George Shilling:** Was that 1998? I thought we’d been blasted back to the seventies. Quadraphonic was re-promoted as 5.1-channel surround, (my first listen was disappointing, but I’ll reserve judgement). And watch out, because before you know it, home taping will be killing music. Seen the TV adverts for Philips’ CD Recorder? Wide spread CD-R, MiniDisc or MP3 owner-ship will definitely not spell the end of punters buying records, but let’s hope the record companies agree. As well as ‘new’ new technologies, there have, in this last year, been some genuinely interesting new pro-audio developments in good old-fashioned studio equipment. New valve microphones and compressors which are genuinely useful and not just faddishly retro. Especially comforting was the revival of the British cottage pro-audio industry by the likes of Thermionic Culture and Joe-mek. It was a quiet summer, but as well as engineering some dance remixes I had fun recording bands with microphones capturing performances in such institutions as Rockfield and RAK — just like it was done in the 70s, with not even a click-track in sight! And I had the honour of association with a Brit Awards nominee, having engineered Bernard Butler’s first album. So, if that was the seventies revival, let’s now have the eighties. On second thoughts, let’s not...

**Simon Trask:** This past year the MIDI + Audio software market has seen the arrival of increasingly powerful packages, the continued growth of the plug-ins market, and the advent of affordable but professional on-card effects and mixing solutions, notably Yamaha’s DSP Factory. And in a year of current or brewing format wars, the emerging de facto standardisation on Steinberg’s VST plug-in and ASIO audio streaming architectures by MIDI + Audio developers has been a rare outbreak of sanity.

One such format war is that brewing between next-generation audio disc technologies. This past year has seen the weaponry being designed, but 1999 will be showdown time between DVD-Audio and Super Audio CD. The days of recording and listening simplicity...
<with stereo 16-bit, 44.1kHz audio would appear to be numbered. Then there is online audio and the battleground of online music distribution. Ironically, as the record and consumer electronics industries prepare to introduce high-density surround audio, the online world has seen a ground-swell of popular support for MP3 and its 'near-CD'-quality perceptual audio compression. Superior compression formats beckon (MPEG AAC, NTT's TwinVQ), online bandwidth still restricts, walkman-style portable MP3 players are emerging, open music delivery systems are battling closed ones. The coming year promises interesting times all round.

Dave Foister: Is it too late for decent musical surround sound? With juggernauts rolling down the road that originated in the cinema, the music traffic seems likely to be the last to be considered. Since the technology and the market appear, in the broadest terms, to be driven almost entirely by home entertainment, this is, perhaps, not surprising. But surely, no one would pretend that a surround technology designed to make rockets fly behind your head is capable of retaining the subtle ambient nuances of a good musical recording.

The solution has been to hand for years—nay decades—and, although it still struggles for credibility thanks to political and historical difficulties, flags are still flying for Ambisonics. Enthusiasts are bending with the wind, and G-Format is the latest suggestion to use the technology, decoding B-Format with-height surround to conventional 5.1 loudspeaker layouts. 1998 will have been a bad year's work if its possibilities are ignored despite the much-vaunted flexibility of the emerging media. If music deserves 24 bits and 96kHz, it surely also deserves to have the move to surround done properly, not merely to be dragged along by the hair with the movies.

John Watkinson: For me, 1998 gave healthy signs that some progress is being made in the constant battle between reality and myth. It was a good year for debunking and the favourable reaction to my best efforts has been most rewarding. The following has become clear. One should be quite sure in one's mind whether the goal is accurate reproduction or the creation of an effect... people who monitor on poor quality speakers do not hear defects, and so do not fix them... time response is just as important as frequency response and anything resonant or which pretends that a delay and a phase inversion are the same thing is fundamentally flawed... the passive loudspeaker driven by a wide-band power amplifier is a dinosaur... audio objectivists and audio subjectivists are holding the same stick where each believes the other has the wrong end... lossy audio compression (bit rate reduction) does not work very well in stereo and lossless schemes are preferable.

For 1999, you might like to ponder why we have objective units of frequency response and distortion, but we do not have an objective unit of stereophonic imaging accuracy.

Kevin Hilton: Digital television, digital radio and windscreen have been the overriding topics for broadcasters this year, or at least that is the way it has seemed. While the industry—in the most nebulous sense of the term—has pushed along towards the future, the industry—in the individual, work-a-day sense—has been circumspect about what all this means and what it is for. The shift to digital TV has indeed meant more channels, but not necessarily more work or profits; there is a high demand for programming,...
but much of it is archive, replays of first runs or tightly budgeted.

Quality is an issue, but producers have angrily pointed out that they are being expected to produce to the same standards for the same money, if not less. As the year that it all happens, it has been an exciting one, but more in what has been promised, rather than what has actually occurred. The lag between the broadcasters and the domestic equipment manufacturers has brought about a situation where a lot is out there, but it is still beyond the reach of many. An elite is being created. It is no coincidence that the New Oxford Dictionary of English now features the word digerati.

Dan Daley: Time-Warner, Boeing-Lockheed, AOL-Netscape, MCA-PolyGram. The list goes on and on. The US corporate universe is in the throes of a massive consolidation, brought on by global competition and new technologies. And considering that the recording industry has increasingly become a cog in the entertainment business—America’s largest export these days—recording studios are experiencing the same phenomenon. Two examples—the acquisition of Masterfonics by Emerald Recording, two of the largest players in the pivotal Nashville market; and the purchase of Sterling by London-based Metropolis—under...

You know that the BSS Audio name means probably the ultimate in audio performance, so when it appears on a graphic EQ with all these features at such an affordable price, the choice, like the sound, becomes crystal clear.

Call us to get more information on your next graphic EQ.

...It comes from BSS Audio

BSS Audio
A Division of Harman International Industries Ltd.
Linkside House, Summit Road, Pattes Bar, Herts, England EN6 3BB England
Tel: +44 (0)1707 660667 Fax: +44 (0)1707 660755 e-mail: info@bss.co.uk
World Wide Web: www.bss.co.uk

BSS Audio USA
Harman Pro North America, Inc., 1449 Donelson Pike, Nashville, TN 37217 USA
Telephone: +1 (615) 360 0277 Fax: +1 (615) 360 0480

A Harman International Company
MediaFORM Introduces a New CD-R Duplicator Designed for the “Audio Professional”

**DAT’S EASY**

**CD2CD/PRO CD-R Duplicator**

MediaFORM’s CD2CD/POWER PRO is already the industry leader in CD-R copiers with one button burning of B CD’s simultaneously, expandable to 64 drives, and autoloaders ready. The CD2CD/POWER PRO offers an option bay which allows for the following: Jaz Drive, Zip Drive, Plextor CD-Rom Drive or virtually any SCSI device. So how do we top that? DAT’s easy! MediaFORM’s new Easi-DAT option allows audio users to interface their existing DAT player with the CD2CD/POWER PRO by way of SPDIF, Optical and AES/EBU ports. Audio professionals can also take advantage of the CD2CD/POWER PRO’s unique track extraction feature. Finally, a CD-R copier that’s flexible enough to meet all of your audio needs.

400 Eagleview Blvd. Suite 104 Exton, PA 19341
Phone: 610-458-9200 * Fax: 610-458-9554 * TOLL FREE in the USA 800-220-1215
email: info@mediaform.com * web: http://www.mediaform.com

CD2CD/POWER PRO is a trademark of MediaFORM, Inc. + All other trademarks remain the property of their respective companies.

---

**PRECIOUS METAL**

The digital world can be a cold one. Today's recording technology is capable of some incredible statistics but it can lack a certain warmth and character. Some things just sound better with valves. We know all about this and have created the Silver Series of Valve driven pre-amp & dynamics processors to help you retain that all important character & warmth without sacrificing the frequency response integrity of your recordings.

The 586 Dual Channel pre-amp uses 3 x 12AU7 tubes and features Semi Parametric 3 Band EQ, insert loop, +48 Phantom Power, built in filter, drive control for a wide range of great tube effects & a patent pending Peak Plus limiter. The 566 Dual Channel Compressor, also uses 2 x 12AU7 tubes & features hard knee & Overload compression curves, switchable full auto mode, selection insert, true RMS power summing & the drive control.

We have created the 576 which uniquely combines a single channel from both the pre-amp and the compressor to provide the cost effective solution to warming up your mix. Combine all this with the optional Type II 24 bit digital expander and you really can have your cake & eat it!

Call 0181 202 1199 or email dbx@arbitergroup.com for a full range brochure.

Arbiter Group PLC
Wilberforce Rd. London NW9 6AX
Tel: 0181 202 1199 * Fax: 0181 202 7016
www.arbitergroup.com * email: dbx@arbitergroup.com

---

www.americanradiohistory.com
A FEW YEARS AGO it was clear that digital-audio workstations were the future of recording. Today, with over 100,000 Digidesign workstations installed worldwide, they’re also very much the present.

Snappy rhetoric aside, this quote from Digidesign’s site does point up a reality of today’s world—namely the speed with which future technology becomes a present-day reality. The burgeoning market in plug-in effects software for recording and mastering applications is another example of rapid change from possibility to reality.

Today’s computer-based, digital-audio recording landscape is a wide and varied one, but the concept of plug-in effects has taken root at all levels. The resulting technological and commercial reality has attracted companies with no background in hardware effects unit production such as DUY, as well as established effects unit manufacturers like Focusrite and Lexicon, who have realised that they need to cater to this new software-based market. While the latter have gravitated towards high-end systems in order to reach a professional market and utilise the sort of processing power required to deliver top-notch professional effects quality, the former typically support MIDI + Audio-based formats as well as Pro Tools TDM.

Effects plug-ins are hosted in one of two ways: on a plug-in DSP card or on the computer itself. The former approach uses the processing power of a collection of dedicated DSP chips (a ‘DSP farm’) while the latter relies on the native processing power of the host computer. This distinction serves as a handy dividing line between high-end computer-based DAWs, which typically opt for the add-on DSP approach, and the MIDI + Audio packages, which typically go native. Except that the reality is not quite so clear-cut, as the top-of-the-range Macintosh packages from MIDI + Audio companies like Emagic, Opcode and Steinberg have long supported Digidesign add-on hardware and the company’s associated TDM plug-in effects architecture. However, Steinberg developed its now widely adopted VST (Virtual Studio Technology) plug-in architecture as a native format to give MIDI + Audio users effects processing without the need to buy expensive DSP-based hardware.

Since Studio Sound covered VST effects plug-ins last year, the VST architecture has further consolidated its position as de facto native plug-in standard, at least on the Mac platform, with both Emagic and Opcode opting to support VST in their latest software releases, while BIAS, which recently bought Deck from Macromedia, has announced that it plans to implement VST support in v3.0 of the Mac-based multitrack recording software. In addition, Cakewalk has introduced VST support in its new Pro Audio 8 MIDI + Audio package for Windows. During the AudioX conference at this year’s American AES Convention, Steinberg provided further encouragement of VST adoption by announcing that it would open up the host side of the VST plug-in architecture for any companies to implement support in their own software free of license fees. This development is primarily aimed at developers on the Windows platform, here the technologically superior VST is pitted against Microsoft’s widely used DirectX multimedia architecture.

Exemplifying the high-end, DSP card-based approach to plug-ins is Sonic Solutions’ Sonic HDSP. Plug-in Processor, a PCI card for the company’s SonicStudio audio production environment consisting of four 24-bit Motorola 56301 DSP processors and 1.5Mb of SRAM, designed specifically to run third-party plug-in effects from the member companies of Sonic’s HDSP (High Density Signal Processing) Partners group. The group includes George Massenburg Labs, Pacific Microsonics, Metric Halo Labs, Weiss Engineering, Spatializer Audio Labs, and Z Systems Audio Engineering.

The application of workstations has been greatly increased by the appearance of a universe of processor plug-ins. Simon Trask brings an update on what is available.

Pulling in the plug-in

Studio Sound January 1999
I ED0 illustrate the plug-in concept can be applied advantageously to hardware too. Sonic recently opened up its SonicStudio DSP architecture to third-party digital converter manufacturers.

The company that pioneered software effects plug-ins was Digidesign, back in the Sound Designer days. Today, the company has built up an enviable plug-ins base around Pro Tools, with plug-ins in both custom real-time (TDM) and file-based (AudioSuite) formats. TDM effects manipulate live audio streams in real time but do not change the actual data stored on disk, while AudioSuite effects are applied to 'stand-alone' audio files and change the actual file content. While AudioSuite processing is available on all Pro Tools systems (as no extra hardware is required), TDM processing is only available on Pro Tools III, Pro Tools 24, Pro Tools 24 MIX, and Pro Tools 24 MIXplus. TDM plug-ins running on Pro Tools v4 or higher systems can take advantage of TDM plug-in automation.

Up to the end of 1998, new buyers of the two systems received Focusrite's d2 and d3 (TDM equaliser and TDM and AudioSuite compressor-limiter) and tc Works' MegaReverb (TDM reverb) plug-ins free, while MIXplug purchasers also received Digidesign's DPP-1 (TDM pitch processor), D-Fx (AudioSuite reverb, delay, chorus and flanger), D-Fi (four TDM and AudioSuite effects offering bit-reduction 'retro' effects) and Maxim (TDM peak limiter) plug-ins free. These are in addition to the standard DigiRack bundle of almost 20 EQ, delay, compressor, limiter, expander and gate plug-ins provided free on Pro Tools III, Pro Tools 24, Pro Tools 24 MIX and Pro Tools 24 MIXplug systems.

Pro Tools v4.3 software introduced two new features for enhancing use of plug-ins: the DSP Manager optimises the allocation of DSP processing to the plug-ins, while the MultiShell allows different types of plug-in to share the same chip (though not all plug-ins are MultiShell-compatible). Digidesign offers the DSP Farm card for Pro Tools III and Pro Tools 24 systems and the MIX CoreFarm card for Pro Tools 24 MIX and Pro Tools 24 MIXplus systems. However, hardware and software optimisation on the Core-Farm card allows up to three times the processing power on a MIX (single-card) and up to six times on a MIXplus (2-card) system compared to Pro Tools 24.

The number of instances of a plug-in which can be handled per chip varies from plug-in to plug-in. Taking the Focusrite d3 as an example, a single DSP chip can handle up to 14 mono and 2 stereo instances of the compressor-limiter on a Core-Farm card, while the Compressor + Limiter configuration can handle up to seven mono or seven stereo, with all six chips available for use. For the tc electronics Works MegaReverb it has two mono or two stereo per chip on up to three chips.

CEDAR Audio offers its de-hiss, de-click and de-crackle audio restoration tools in TDM form. Also available is a TDM plug-in version of Apogee's UV22 mastering tool (now handled by Steinberg), while Aphex Systems has a TDM plug-in version of its classic Aural Exciter and Drawmer Dynamics offers a gate-compressor-limiter (complete with Side Chain Trigger functionality) and an expander-compressor-limiter. Line6 takes Pro Tools into the realm of guitar amps with its Amp Farm physically modelled tube amps TDM plug-in. The DUY plug-ins collection includes analogue tape and valve amp simulators, a spatial enhancer, a sound level maximiser, and a modular effects builder, while Arboretum Systems' Hypersim collection provides 26 effects including reverbs, delays, ring mod, time stretching, pitch shifting, and sonic decimator. Altogether there are some 25 companies offering Pro Tools plug-ins.

Plug-ins can also extend the functionality of a DAW into new areas. A good example is Liquid Audio's Liquid Mechanic Pro plug-in, which allows Pro Tools users to master for online music distribution and previewing in the market-leading Liquid Audio format. Meanwhile, Dolby takes Pro Tools >
ENTER A NEW TERRITORY...
THE WORLD'S FIRST 24 BIT / 96K SAMPLE RATE DIGITAL DYNAMIC PROCESSORS.

THE NEW DRAWMER DIGITAL SERIES OFFERS HIGHER SPEC, LOWER NOISE, AND THE WIDEST DYNAMIC RANGE THIS SIDE OF THE RAINBOW.
< into the realms of surround mixing with its Dolby Surround Tools encoder and decoder TDM plug-ins, while for 3-D (expanded stereo) audio processing Spatializer Audio Labs provides Spatializer PT3D in TDM and AudioSuite versions and Qsound Labs has QX-TDM.

Soundscape Digital’s SSHDR1 also has a range of real-time and non-real-time plug-in effects running on card DSP. Plug-ins are available from Soundscape as well as on electronic Works and Wave Mechanics among others. For general use, Soundscape provides Time Module (time stretch, pitch shift, sample-rate conversion) and Audio Toolbox (chorus-flanger and dynamics processor), while from electronic Works (the plug-ins subsidiary of electronic) come reverb and level. Dynamics andbean plug-ins, and from Wave Mechanics a reverb plug-in. For CD Mastering there’s Soundscape’s CIW and the PDAE CDR mastering software, while for sound-for-picture editing there are AVI Player, EDL Processor, Auto-conform, and RDG Software for remote control of ADAT, DA-88 or VCRs.

Another high-end DAW company that has implemented an architecture for third-party plug-ins is Studio Audio & Video, with its Windows-based SADIE and Octavias systems. CEDAR Audio has an extended version of DeNoise available as a plug-in for the SADIE 24-96 system. Available for SADIE and Octavia is the Apogee UV22 Super CD Encoding plug-in and Studio Audio’s Mastering Limiter. Other plug-ins available include stereo reverb, stereo width, and dither.

A more recent entry into the computer-based DAW market is Ensoniq with its PARIS PCI card-based multitrack recorder package for Macintosh and Windows computers. PARIS employs high-quality on-card effects drawn from its own hardware effects units. Also available are four native PARIS plug-ins from Intelligent Devices: IQ-2 spectrum matcher, De-SERT noise remover, Marshall Time Modulator flanger and double-track, and The Mangler sound scrambler-distorter. However, the latest software release of PARIS, v. 1.8, also introduces support for VST (Mac and PC) and DirectX (PC) native plug-ins.

PARIS points to a new trend, namely the integration of card-based and host-based effects support (previously an either-or choice) within digital-audio recording packages. This is being driven from two directions.

On the one hand, the PARIS approach of adding support for host-based plug-ins increases the flexibility, desirability and marketability of a high-end system which does not have a big plug-in effects base of its own (unlike Pro Tools). On the other hand, MIDI + Audio packages can use the effects functionality of new sub-$1,000 PCI cards such as Yamaha’s DSP Factory and Creamware’s Pulsar to take some of the processing strain off of the computer.

Enagic is sticking in terms of DSP Factory support within Logic Audio before the end of the year, and Opcode are currently working with Yamaha on support within Vision. Cakewalk and Steinberg are leading the pack however, with support for DSP Factory (to be more specific, the DS2416 digital mixing card) within Pro Audio 7 and Cubase VST 3.6 respectively (both for the Mac—PC support is lagging behind). Steinberg’s integration of DSP Factory’s virtual O2R mixer and effects into the Cubase VST-24 environment exemplifies the new trend for combining internal and card-based capabilities. Steinberg have developed graphical mixer and effects editing windows which allow control of every parameter from within the Cubase environment, including automation of the mixer. What is more, any Cubase standard or group channel or VST effects return can be routed to any combination of inputs on the DS2416’s virtual O2R via 24-bit signal paths. Yamaha’s mixer card, then, gives you the dual advantage of superior effects and a lightened processor load on your computer. So, instead of using up your computer’s processing power on master reverb effects, you can let DSP Factory take the strain, leaving the host processor free to handle VST-based insert effects or more audio tracks.
Break Down the Barriers to Digital Audio Connectivity

- Multiple Realtime Multichannel Networks
- Simultaneous Store-and-Forward Operations
- Cost-Effective 100Base-T Fast Ethernet Architecture
- NT-based Digital Audio Server with Fault-tolerant RAID

MediaLink is Fairlight's high-speed communications pathway for MFX3plus and FAME workstations, delivering a high-performance solution for realtime multichannel and store-and-forward networking.

Fairlight ESP Limited
Unit 12, Spectrum House, 32-24 Gordon House Road, London NW5 1LP
Tel (0171) 267 3323  Fax (0171) 267 0919

Sydney  Tel + 61 2 9975 1230  Fax + 31 2 9975 6744
Los Angeles  Tel +1 310 287 1400  Fax +1 310 287 0200
New York  Tel +1 212 819 1289  Fax +1 212 819 0376
Paris  Tel +33 1 4610 5050  Fax +33 1 4610 5012
Berlin  Tel +49 331 721 2930  Fax +49 331 721 2933
Tokyo  Tel +81 3 5490 1515  Fax +81 3 5490 1516

www.fairlightesp.com.au
Welcome to an oasis of real satisfaction, where your thirst for the Whole Truth and Nothing But the Truth will finally be quenched.

For Nearly 20 years we’ve been known for our active monitoring systems, particularly our compact, nearfield bi-amplified ones. But outside the nearfield, where the heat really gets turned up, Genelec's S30C, 1037B and 1038A integrated tri-amp* active monitors are designed for bigger spaces - mucho grande.
STUDIO SOUND PRESENTS A CHANCE TO WIN!

A PANASONIC WR-DA7

Answer five simple questions and the Panasonic WR-DA7 digital desk could be yours!

STUDIO SOUND is delighted to offer this opportunity to WIN a Panasonic WR-DA7 digital desk exclusively to our readers. Commercially launched late last year, the WR-DA7 is a major contender in the small-scale digital mixing stakes. It features 16 balanced analogue inputs; 24-bit A–D convertors; onboard EQ and dynamics, snapshot and dynamic automation, and surround-sound facilities. Together with its smart styling, it's an extremely attractive package, and it can be yours for the sake of the answers to a handful of straightforward questions.

1. How many buses does the WR-DA7 have?
2. Where is the headphone output socket located?
3. What is the total number of inputs?
4. What is the dynamic range of the inputs?
5. What is the largest multichannel panning format that the desk supports?

Answers can be submitted by email to panasonic.competition@unmf.com; or by fax to +44 171 407 7102; or by post to Panasonic Competition, Studio Sound Magazine, Miller Freeman Entertainment Ltd, 4th Floor, 8 Montague Close, London SE1 9UR, UK. To arrive no later than 1st March 1999. Entries are restricted to one per reader. Please remember to include your name and contact details with your entry.

Thanks are due to Panasonic UK Ltd for providing the competition prize.

Studio Sound January 1999
THE AMEK DIFFERENCE

A UNIQUE APPROACH TO AN INTEGRATED POST-PRODUCTION SOLUTION

At Amek, we understand that all production facilities are not alike. And that every editor has his own style. It is this belief that is the foundation for the Amek DMS Digital Mixing System.

In hardware, the DMS control surface is a user-configurable, small-footprint console for facilities that, until now, could not support large-format consoles.

In software, the DMS core allows console configuration on-the-fly: no valuable creative time is lost to reformattting. Multiple TFT screens can be placed at the discretion of the editor, not the manufacturer.

Amek's unique STARGate™ command system provides transparent control of most Digital Audio Workstations. We don't lock you into our format, we work within yours. In fact, the DMS is supplied to leading manufacturers of Hard Disk Recorders as their proprietary control surface.

Production facilities around the world are already using the DMS as their centrepiece. Call us at Amek, and let us configure a DMS for you. You design it and we'll build it.

That's the Amek difference.
As he prepares to vacate the famous hit factory of the eighties, producer Pete Waterman has new premises and a new working strategy already in place. The Hitman makes no apologies to Caroline Moss.

Whatever your opinion of him, Pete Waterman prides himself on being an iconoclast. "Whether you want to pat me on the back or shoot me, I took studios out of the domain of the white-coated bloke," he roars. "I took away the idea that studios should be a stand-alone business and said that record producers should own their studios and be responsible for their equipment, and the artist should not be charged with hiring all the equipment."

As a producer, Waterman certainly changed the face of recording back in the early eighties. His all-inclusive production packages, which to his pride he has kept at the same rate for 15 years, are a lasting legacy to the record companies. And his enormous self-belief is undoubtedly one of the reasons he's managed to bounce back after spending the early nineties in a period of
Watermanetcnotifications. He talks about the engineers and producers with the strategy of a football manager. 'At the top of the premier division in London I've got Karl and Mark

learned a lesson or two over the last decade and has brought his business full circle. He's clear about his current role in the hit-making process, which is that of a record producer, not a studio owner or label executive. Today's PWL Empire consists of a tight-knit circle of engineers including his son Paul; a coterie of devoted support staff who've been behind him for 15 years; and his own determination to run a tight ship.

'Not that I'm a control freak, but every time I let something out of my control it falls apart,' he explains. 'You need somebody overseeing things, keeping it focused. Particularly when I'm being offered so much work I can hardly move.'

Waterman surrounds himself with staff whom he believes are genuine innovators. He talks about his engineers and producers with the strategy of a football manager. 'At the top of the premier division in London I've got Karl and Mark

the cost of a single is going to be between £25,000-£30,000 per track!'
De-everything
The world's most effective range of tools for noise removal and audio restoration

Clean it up
< are slow to grasp the huge gap between project studios and top end facilities. 

'It's interesting, since we've had the Libra we've had upwards of a dozen big producers come and look at it, and they all work the way I work,' he says. 'There is no desk really available for the way we're working. We are all overengineered in the desk department and it keeps coming down to this whole argument about the digital quality. It's all bullshit. I've tried telling them what we want and they're not interested. The first thing they talk about is quality and I'm not interested in quality and neither are 95% of my customers. The kids that buy my records play them off tape recorders. They don't care if it sounds crackly, in fact we put crackles on the records now with Pro Tools. I talked to the guys at Neve about this, but they've got their Capricorn at the top end and they're not going to pitch a desk lower than the Libra. So it's the nearest thing to what I would class a sensible price range. It's still too expensive, but there's no £60,000 console that you can plug into Pro Tools and charge £15,000 for your hit singles.

The problem is whenever you talk to the desk manufacturers they think about a piano player, a drummer, a bass player, two guitarists and a vocalist. They never think about my world where we're running 48 channels of Pro Tools and 18 synthesisers live. We have 96 inputs and that's Chinese to them! I've always admired the way Trevor Horn works with his big live rooms—that's his thing and he's brilliant at it—but I would be brave enough to say that more people world wide record like I do now. So why isn't there a desk which reflects this?

Despite this beef, Waterman is unselfish in his praise for the Libra, which he describes as being as revolutionary as the SSL was when he discovered it. 'Let's get one thing straight, it's the best desk I've ever worked on,' he asserts. 'The price range kills every other desk. This year we've probably worked on records which have sold a total of 11 million and without the Libra I couldn't have done it, it's changed my life completely. AMS Neve are giving us updates constantly, the desk does more than it did when I bought it, it's fulfilled its role, and some, and it still gets better and better, it's phenomenal. We've had to add lots of things to it to get it where we wanted because what I wanted was a digital SSL. I'm quite happy with four faders because it makes me listen and not watch, but I know engineers like to see the faders go up and down, so we had 48 faders and they're £1,800 a fader, and we had to have lots more D-A converters because of the way we work. It's slightly more difficult than using a conventional SSL, but only slightly, so there's no quantum leap of skill between using the SSL.>
"When we changed to SM 911, 7 or 8 years ago, we got that sound back. It has a really good musical edge.

When BASF SM 900 maxima came out we started to use that on the 24 track – it gives me that sound I want."

Producer of the Brit Awards "Album of the Year" 1997 "Everything Must Go" by the Manic Street Preachers and Winner of the Music Week "Producer of the Year" 1997, Mike Hedges has produced hits of artists such as Texas, Everything But The Girl, Siouxsie and The Banshees, The Cure, The Beautiful South, Geneva and McAlmont and Butler.

EMTEC Magnetics

For more information contact +44 01295-227838 or visit EMTEC Magnetics' web site at http://www.emtec-magnetics.com
Another of PWL's eighties successes was the big soul voice of Rick Astley

and the Neve; although there's a quantum leap when it comes to quality and permutations.

Such is the extent of Waterman's conversion to the Libra that a year ago he made the decision to carry out all mixing on it. This has now given me a problem because I want to do a quick mix. I have to get the tapes to Manchester and the boys have to go up and stay in a hotel, he says. This is unfortunate for me, but fortunate for AMS Neve as it's almost certain the new studio's going to have to have another Libra. I didn't particularly want to do that because I'm trying desperately to bring the studios to a level I believe they should be at by not investing more in hardware but making the hardware better adapted to now used for recording. But he hasn't forgotten the contribution SSL made to his career since he first came upon the desks in the early eighties.

'Luckily for me I met Pete Wandless who was then working for SSL and suggested I buy one. I had never heard of leasing, I bought everything cash. Pete told me I needed a 48-channel. I didn't have a clue what he was talking about, so I asked Mike Picking, the maintenance engineer at the Marquee where SAW were working, if it was a good desk. He said, 'Oh yeah, fantastic, it's what Trevor Horn's got'. I remember it was about £230,000 so I said, 'Okay, I'll go and get the money out of the bank', and I've never seen anything like Pete Wandless' face in my life. Then I told him I wanted it in a flight case so I could just take it into the studio and set it up and he sat me down and explained I'd need to have it installed, with a room for the computer, and so on.'

Waterman was persuaded to sort out some leasing and his first SSL was installed into The Vineyard in 1983. Now the lease is up on those premises and a purpose-built facility is being constructed opposite. How does he feel about leaving the old building behind? 'I do have regrets, but I'm not frightened of moving on,' he muses. 'Unlike these studios, which we inherited, the new facility will be completely purpose built, with a writing suite, a Libra studio and an SSL room, plus two cutting rooms.'

So the future is looking bright for Waterman, and it is obvious that he could have continued expounding his opinions for the rest of the day, but he had to leave to make a football match with Zomba director Steve Jenkins, with whom he's had a working relationship for 28 years.

'He's a great business man and great mate; he gives me freedom to worry about making the records while he runs the record company,' he says. 'We have our board of directors meeting in the car on the way to the football and then listen to the product on the way back.'

And with this he's bounding out of his chair, eager to be off, issuing his staff with instructions vis-a-vis the Christmas decorations as he leaves the building.
A NEW MULTI FORMAT RECORDER
FOR A NEW MULTI FORMAT WORLD

A simple stereo mix no longer cuts it in the brave new world of audio production. The modern facility must be ready to produce work in stereo for CD release, in hi-bit for archiving, and in multi channel surround for DVD, TV and cinema applications.

One recorder is equipped to handle it all: The new Genex GX8500. Full compatibility is ensured by a wide range of disk formats, file formats, bit and sample rates – up to 24-bit / 96kHz simultaneous 8 channel recording and 24-bit / 192kHz simultaneous 4 channel recording. And, with an eye on the future, the GX8500 is the world's first DSD (Direct Stream Digital) compatible recorder.

It's a multi format world out there. So call HHB today and find out more about the Genex GX8500.
THE FIRST HAZARD for the returning hero is fame,' states the narrator at the start of Babe. Pig in the City. In bringing our porky pal from the land Down Under back to the big screen, director George Miller—who produced and cowrote the original—seems to have pulled out all of the stops.

Accordingly, no fewer than 799 animals appear in the new Babe, which sees the champion shepherding pig attempting to save his and everyone else's bacon after Farmer Hoggett falls into a well and the farm is plunged into bankruptcy. Babe and Mrs Hoggett set out for the state fair in order to earn some much needed prize money, yet, when she is arrested en route for supposedly smuggling drugs, the two of them are stranded in a fictitious metropolis that incorporates such notable landmarks as the Statue of Liberty, the Sydney Opera House and the Hollywood sign. So it is that their less-than-childlike adventure begins, using four times as much animatronic and computer-generated special effects as the original movie, and, in so doing, nearly tripling the production costs.

The whole film was a challenge, says Steve Burgess, a highly experienced freelance engineer who took care of the Foley work at Sound Firm in Melbourne, while the actual filming took place at Twentieth Century Fox Studios in Sydney. 'I don't think I've ever worked on a film that was harder.'

'A major reason was that it featured hardly any people and there was no sync sound. We were often creating sounds that were bigger than the real-life sounds, and we were always trying to heighten the track, so nothing was straightforward.'

For its part, Sound Firm invested in a DSP Poststation system in early 1998, having evaluated editing alternatives such as Pro Tools, Fairlight and Sonic Solutions over an 18-month period. 'DSP were the most responsive in terms of addressing the needs of the whole facility,' says in-house engineer Ralph ortner. 'We sometimes have up to ten editors with as many as four different projects running at the same time, and so it is important for us to be able to mix and match systems, make smaller or larger systems, transfer tracks to backup, get tracks from the editing stage down to the sound mixing stage.

'At the time that we approached DSP they hadn't completely solved a lot of those issues, but they were very open to input from us to help develop a systems approach to postproduction. We wanted something that wasn't just an editor, wasn't just a mixer, but started to bring those worlds together a bit more and made the transition between the two a lot easier. DSP are very progressive and what impressed me was their response to our needs. A lot of the computer editing systems have been designed by computer boffins without really understanding the postproduction process but DSP spent a lot of time actually sitting and watching how we work in order to understand what we want. So, rather than us conforming to their particular software they ensured that their software would meet our needs. The result is a 4-station setup comprising a fully automated 32-track Poststation, with a control surface featuring touch-sensitive faders, an 18Gb local memory and NVL (Non-Linear Video); a 24-track desktop system with NVL that is used principally for Foley and ADR; a 16-track desktop system that is used for ADR as well as sound effects and dialogue editing; and an 8-track desktop system that is used for effects editing.

A central server, the DSP Team, connects the four stations together, and has 36Gb of memory providing 4/5 days of continuous recording.

'This means that for a particular project we can have somebody recording Foley on one system, another person recording ADR, someone doing sound effects editing, and still be mixing,' says Ortner. 'So, you can be doing pickups or changes as the project is progressing, instead of transferring to a backup tape, and then unloading from a machine and carrying across. It's really an integrated network, and that's been fantastic for the sort of high-end episodic television work that I've been mixing.'

'The DSP is far easier to use than Pro Tools,' adds Steve Burgess. 'I found Pro Tools to be a little too awkward for a studio setup when you're recording live. I mean, with the DSP sys-
ten you literally have the 24 tracks in front of you running in time, and you're recording straight into that track as you would on a multi or any other system, it looks and works more like an old multitrack recorder. At the same time I suppose the other great advantage is the ability to splice, cut and move sounds very quickly and very easily.

'There again, when comparing the DSP to the Fairlight, the first time that I jumped on the DSP system I didn't like the way the recording function would happen on the cue-like start position. That's because I like to have the microphone open at different degrees depending on what we are doing. I phoned them up and said, 'Look, this isn't the way I want it to operate', and the next morning when I walked into work there was an email with an attachment that provided me with a wider parameter of opening it earlier or shutting it or having it on the line. Generally their backup has been fantastic. Every time I've asked for something it pops up within a day, not weeks or months.

'A major part of what I like about the product is the NLV. With the hard disk drive I can scroll across and look at everything. It has a cueing system in it which gives you a lot of variables, you can have streamers, beats, counts, and everything changing according to the way you want it to function, and that's especially important when you're working with actors. Some actors might like a cue beat, some might not. They all have their different tastes, and it's nice to be able to sit there and change things instead of getting into an argument with them. In fact, the system initially didn't have cue beats, so again I rang them up during the day and the next day I had an email with the appropriate software.'

For Babe's Foley work, Burgess was using the aforementioned 24-track desktop system, boasting 30Gb each of both audio and video memory, together with a Yamaha 02R. 'The DSP is absolutely fantastic for recording Foley,' he asserts. 'It's also great for ADR, and extremely handy in a mix room where you run it as your playback machine. We have a Harrison Series 12 here, and rather than use the 02R to do my mixdowns I lock the DSP up to the Harrison, and, if certain sounds are a little out of sync or there's something that I want to move or grab from somewhere else, I can even move it on the screen and continue to mix.'

Sound Firm's post work on Babe: Pig in the City started in July of 1998 and ended in November. Roger Savage took care of the rerecording, and, being that a large proportion of the voices was emanating from the mouths of animals, he certainly had more than enough looping to keep him busy. Nevertheless, given the nature of the animatronics work, it was very much a case of the digital effects people fitting the lip movements to the dialogue rather than the other way around.

'I think this film provides a benchmark for the future in terms of the ability to now change a dialogue line after the "actor" has been filmed,' says Savage. 'You change the line and then you change the mouth. I think that will eventually be applied a lot to live action with humans, because it will give the director the freedom to change lines without having to worry about how good the lip-syncing is.'

Steve Burgess, meanwhile, worked alongside Foley artist Gerry Long, while Craig Carter reconformed their Foley to the different versions and assistant Andrew Neil took care of backup support in order to keep everything running.

'Babe's Foley track required quite a lot of detail in it, and we ended up recording about 3,500 clips of sound,' confirms Burgess. 'You see, we were looking at a film that had no sync track to it, and George's requirements amounted to a high degree of accuracy. A good example is the sound of the dogs' feet — because they are four-legged animals and they were running so fast, it was impossible to record all four feet at once and maintain a high degree of accuracy. So, what we did was record a guide track with Gerry just tapping his fingers in sync with the dogs' front feet, and a second track tapping his fingers to the back feet, and then I cut these two tracks on the DSP against the image, tightening them up and getting the rhythm right. I noticed that if you slide the front versus the back you can change the rhythm, and it was great with the DSP because I could easily toggle on the hard drive. We were literally cutting down to a half-frame accuracy or less.'

EXT WE would record the pads of the dogs' feet. George needed the dogs to feel heavy and big, and the sound to be strong, and in order to put that much weight into the sound we couldn't do it in sync at all, because it was way too fast. So, for the pads, we would do one track first using either sandbags or boxing gloves or sometimes Gerry running on the balls of his feet, and I'd feed him the guide track of the front feet that we had done with the finger-taps and he would then try to stay in sync with it. That, of course, was impossible, so we would always varispeed and then I'd cut those pads back in time to the guide track against the front feet and then against the back feet.

On top of that, at times we wanted to get a flesher sound, so in those cases we would use boxing gloves or even pads of hands to get some slap and put that up against the pads and the guide tracks. Then there would be another two tracks for the toenails, again doing back and front, so literally every time a dog moved we would have two guide tracks for the taps, two tracks for the heavy-type feet, two tracks for the fleshy-type >
feet and two tracks of the toenasid; eight tracks running every time a dog moved. What I found was that by varying the levels in association with each track we could get a lot of good motion in there; and we really needed to do that in order to get it. A lot of the time, when I couldn’t get the weight that was required, I used the DSP’s varispeed and then its Dilate function; I’d varispeed it and slow it down, and then dilate it back to its original length. I’d make each individual footstep a clip and then position it on top of the template.

While the dogs’ feet serve as an example of the degree of sync quality that was required, every single sound effect in the film necessitated an enormous amount of effort. Sample something seemingly as simple as the ratting sound of the dogs’ chain—if Burgess and Long thought that a 12-foot chain with 12-inch links would suffice they were wrong; it actually sounded more like a crate of milk bottles.

George really wanted to hear those links clinking together, but if you really grab a chain and move it there is not much attack in the signal on each link,” Burgess explains. So, what to do? Well, once again 16 tracks came in handy to create the desired effect courtesy of a hefty chain, some pulleys and winches all being ground together, along with a metal bar being run along a cast iron grate. On the other hand, the sound of the duck’s feet were altogether easier to attain.

‘All we used were two kids’ flippers, and it was a one-element pass every time,’ says Burgess. ‘However, when the duck would fly away there were 500 wing-flaps left and right, and for that we had to cut every single wing-flap, each running five to ten frames in length, and checker-board them in order to be able to mix them. Again, at certain times we would use two different types of feathers and vary the levels in order to help achieve the movement of the bird.’

‘Because we’ve had three dogs running in a scene I’d end up using 32 tracks on the DSP just to create the dogs’ feet. So on every spool I had three or four premixes to bring down, and we were averaging between 60 and 100 tracks per reel. That is far too difficult to mix all at once, especially with a Foley reel where you have a sound happening every two seconds or less. Eventually I supplied the final mixes on the dubbing stage with a 16-track split of the Foley.

In the end, around 400 hours were spent on recording and between 150 to 200 hours on the mix. Roger Savage did the main mix on a Harrison console at the Sound Firm facility located on the Fox lot in Sydney, and the film was finalised there using various formats; DA-88, Akiy and Sony digital dubbers, 2-inch multitrack and Pro Tools. Meanwhile, just to add to Steve Burgess’ workload, there were also around 200 hours spent on reconfiguring.

‘If we were locking off reels and finishing they would cut the picture again,’ says Burgess. ‘So we were consistently reconfiguring to the new pictures. I’ve never worked so many hours before on a film, but George Miller was adamant that he wanted the best possible results out of it… We were running Sony STD 9000 data backups, and at night 1 would have my assistant Andrew backup everything that I had done during the day while 1 would walk into the other room and keep mixing until 4 am. I tell you, I was averaging between 80 to 100 hours a week.

‘On the first day of the mix George actually rang us here, and he just said, ‘The work is absolutely bloody brilliant.’ That was Reel 1, and after he’d said that 1 then had to keep the quality up there until the end. The pressure was really on.’
THE HHB CDR800.
NO.1 IN CD RECORDING.

When we launched the world's first affordable pro quality CD recorder, we thought we might have a hit on our hands. But even we've been amazed at the popularity of the CDR800. Thousands of machines are now in daily use around the world in every conceivable application (and some we could never have conceived of!). You're kind enough to tell us how you love the way it sounds, that superior build quality makes the CDR800 exceptionally reliable, and that pro-features like balanced analogue inputs, an AES/EBU digital in and 5 simple record modes with built-in sample rate conversion are essential for the ways you work. So we'd like to say thanks for making the HHB CDR800 No. 1 in CD recording.
Calrec Range

- Over 35 years of experience
- Open natural sound
- Proven ergonomic designs
- High standard of construction
- Excellent sales support

There is only one UK based audio manufacturer who can offer you all of the above. For broadcast consoles there is only one place where you can believe everything you hear... Calrec Audio.
If going for gold is sport, then audio for the Ashes is a science. And it is a science that the team at the Nine Network in Australia has sought to perfect over the past 20 years. Among the early achievements of the then audio director Colin Stevenson, was the start of the art of stump miking.

'We shoved a Sony ECM30 into a condom—a non-lubricated one,' he recalls, 'and tried to bury it near the stumps, but the groundsmen wouldn’t hear of it. The well-intentioned groundsmen were overruled by the commercial preferences of some network heavies and the broadcast techs were soon digging under a hot sun in a cloud of blow flies. 'A condom swelled up in the sun one day,' Stevenson continues, 'and Rod Marsh jumped on it. It nearly blew my headset off my head.

Today, the stump mics are still Sonys, but now ECM77s, when on a line. Most stumps have conduits now; there are no stump mics are used, but the pitch is covered whenever rain threatens.

For some time the Network Nine sound department experimented with transmitters in hollow stumps. This had a shaky start, when the first model was destroyed by the very first Test ball launched by Denis Lilley. The move to hollow stumps came about because national broadcaster ABC had reciprocal rights to broadcast the Ashes regionally and started installing multiple microphone systems. The groundsmen decided that too many holes were appearing in the pitch and digging was promptly banned. More recent hollow stump projects have given mixed results as the transmitters did not enjoy the experience when subjected to a direct strike, for some reason.

Today, the hollow-stump mic is pretty well standard issue in the world of cricket, but remain a poor second choice where ground mics could be used instead. These are placed on the ground just behind the stumps, and two are used if on a cable feed. Where cables are not available, Sennheiser 800MHz wireless lapel mics are used. These are powered with a Lithium battery, which is good for about six hours' use. Previously, a 200MHz wireless system had been used, but this had to be abandoned due to RF interference. Ground mics offer better pickup, catching pitch banter—observed as being somewhat 'blue' during the recent Perth Test—as well as the sound of stumps getting smashed by the ball at 50 miles per hour. 'The acoustics of the stumps aren't great,' comments Peter Fragar, Audio Director of ABC's outside broadcast.

Almost 48 inputs arrive at the Calrec Assignable Console in Fragar's OB Van One. Aside from the four stump mics, there are eight crowd effects mics (a mixture of Sennheiser 816s and 416s), the odd MS mic (like a Shure VP88, >

Stump up the volume

Ten pieces of wood connected by a chain and surrounded by a sea of grass—that's cricket. Julius Grafton discovers that deriving sound and vision from the edge of the field of an Ashes broadcast is more confounding still.

Studio Sound January 1999
< typically placed on the roof of the grandstands) plus a couple of dropper mics. In addition, there are outputs from nine video replay units, four studio lapel mics (ECM77s), three ribbon mics for the commentators and a couple of SM63 interview mics. Some of the camera mics are also fed into the mix, and occasionally used.

The dropper mics gave rise to a memorable incident several years ago at The Gabba in Brisbane. The game had settled down to a dull roar, and was into its third day——during a particularly dull period of play, an unauthorised commentary appeared at the mixing desk. The offending channel was quickly identified and a Policeman was dispatched to the appropriate mic position. He climbed onto the roof of one of the stands and arrested two Poms (as they call the English) who were using one of the dropper mics to add their own dubious commentary.

The MAN mixing the stump mics has to mix the audio from the wicket such that the audience is not subjected to expletives or other inappropriate language. He also has to try to mix the levels so that the sound effects are somewhat in perspective. It’s easy to imagine the difference in position of a wicket, keeper, keeper keeping for a spin bowler and keeping for a fast bowler——about 20m, in fact. The AD searches for the return of the ball effects and the umpires calling the overs. He virtually plays his own game on the faders.

The Senior Audio Director mixes the rest of the coverage, including the slow motion replays. Here, the trick is to search out the 'hits, snicks, and flicks' of the ball on bat and pad, while trying not to make the slow motion audio sound as though it is grinding. The commentators have come to rely on the stump and replay FX substantially to assist with their commentary, as a ball passing the batsman at speed may often be heard rather than seen to have touched bat or glove. The public too benefit from the inclusion of this aspect of the audio coverage, not noticing its presence so much as being aware of its absence.

This Ashes series was played in Brisbane, Sydney, Perth, Adelaide and Melbourne at the height of summer—the weather typified by images of audience and players baking under a hot sun flattered before the envious northern hemisphere. Meanwhile, those lucky enough to reside down under are contemplating cold grog and good food from the barbie.
The Network Nine crew arrives at each ground a day prior to the match and puts up a whole shift setting up the van and the ground mics. These days many of the grounds are prewired, which saves a lot of time as the longest cable run can be 300m. The console takes a lot of time to set up and there may be up to ten on-site feeds in addition to all the multilateral feeds — so the matrix outputs and auxiliary sends are virtually all used up. The on-site feeds go to crew and studio foldback, and programme on the talkback.

Three crew and one communications crew member do the setup, then on the day, two audio directors and two assistants work on the coverage. One assistant works around the commentary booth and studio, some distance from the OB van, while the other is roving, being available for trouble shooting, pitch reports and interviews. The OB skills of the Network Nine crew are legendary, especially considering the conditions under which they work. If the climate is not extreme enough, then there is the Barmy Army to cope with — the English contingent that seems somewhat under the weather often in more ways than one.

Regional coverage of the Ashes requires a lot of audio feeds alone, but international and radio feeds are also needed. To this end, a mix of crowd effects and the stumps is sent back to the studio in Sydney, for editing into the highlights cut. Radio gets a mix of stumps and crowd, less the replays. BBC Sky B in Europe takes the main composite mix and all pre-fader and post-fader splits covering less the local commentary. It also takes an independent split from the replays, which comes in stereo from up to nine video players.

Currently, the match audio is produced in stereo, but in 2001 the Australian networks will commence transmission in 5.1-channel surround, in readiness for HDTV.

'We are looking forward to mixing in 5.1' says Peter Fragar, and as an exercise we mixed the Grand Prix (held in Melbourne in 1998) in surround. Initially we'll go with the existing consoles, and add equipment to generate the mixes — which will restrict us a bit. We've got a hell of a lot to do with monitoring and routing first.'

Among the new considerations for surround are the MS crowd mics. These are ideal for surround as they produce out of phase signals from some areas in the pickup zone, and the surround decoder sends out of phase material to the rear as ambient sound.

A Legend in the Making

Superlative Power Amplifiers

From Abbey Road to Air Lyndhurst, from Quad Studios to the Royal Opera House, Covent Garden, the world's most discerning listeners are discovering the secret of Chord power amplifiers. The critics are united in their praise; 'Perhaps one day, more if not all amplifiers will be made this way,' concluded one recent review.

Audition Chord for yourself and find out why.

Chord Professional Systems

Head Office: The Pumphouse, Forleigh Bridge, East Farleigh, Kent ME16 9NB, United Kingdom.
Tel: 01622 721444 Fax: 01622 721555 email: sales@chord Softnet.co.uk
London Office: Tel: 0171 403 3808 Fax: 0171 403 0957
Contact: Dave Harries
A family that offers award winning excellence, revolutionary sound and technical specs formerly unseen in tube microphones.

What are your highest expectations?
We want you to meet them...

Dirk Brauner Rohrengärtsmarfabrik, Kreuzstrasse 2, D-4649E Fees/Germany,
Phone +4E (0)2851 986088, Fax +49 (0)2851 986089, eMail dbrauner@t-online.de, www.dirk-brauner.com
On ITS WAY to 25m sales, Alanis Morissette's debut album exposed a remarkable working relationship between the artist and producer. "I don't want to get too intellectual about a second record, because I think that what was special about Jagged Little Pill was the fact that we were kind of channeling this wonderful energy," Glen Ballard told Studio Sound in December 1996. "We weren't trying to be trendy, we asserted, we weren't trying to do anything other than what we do, and so every few months we've talked and tried to remind ourselves of what is important about how we made that first one. I certainly don't want to spend a year and a half in the studio, going over 10 or 12 songs, dotting every "i" and crossing every "t".

Titled Supposed Former Infatuation Junkie, the new album presents the self-motivated Canadian artist in uncompro­mising mood, denying any notion that she and her coproducer are trying to clone the success formula. The sound is a little more intricate than the first time around while the lyrics fly thicker and faster than before, so does Ballard feel that the method of making the record tied in with his aforementioned intentions?

"I really do. We certainly made it very quickly. We spent 25 days together writing 25 songs and a lot of the recording was done during that time too. Then we spent two weeks with her band in the studio and another two weeks finishing it. So we did it in just under two months.

The only difference between this record and the first one is that from a lyrical standpoint she was exploring some different issues and different structures, and that was something which I think she had been thinking about over the last few years. So, the music sort of conforms to a lyrical excursion that she's taken which is much less structured and has a lot of words, but the process was essentially the same."

A musician and engineer in addition to being a composer and producer, Glen Ballard has worked with artists ranging from Michael Jackson, Aretha Franklin, and Natalie Cole to Aerosmith and Van Halen. In the process, he has earned several Grammy Awards, topped the pop, R&B, alternative, adult contemporary, country and jazz charts, and clocked up more than 100 million sales. Of course, a healthy chunk of these were accrued courtesy of Jagged Little Pill, the upshot of which was a slight change in the creative spin on Supposed Former Infatuation Junkie.

In some cases she had somewhat complete lyrics,' Ballard recalls, 'but in most cases she just had journals of ideas—poems, fragments, observations, travelogues—and out of that wealth of material she sort of formed the words. So, in certain instances it
< was a pretty complete lyric, but in most cases it was a matter of her processing that in a musical context. Without question the lyrics completely shaped the music, whereas that was probably a little less so on the first record.

"For my part I came in cold on the project. You know, I'm always trying to grow as a musician, I'm always listening to all kinds of music from all over the world and trying to get better, and some of those influences are probably reflected in what I was able to bring to the record to whatever degree. However, it was mostly about what she wanted to do lyrically and me trying to serve that, because I think she is all about what she has to say. My first job as a writer with her is to serve that interest, and as a producer it's to make it all kind of fit together.

Ballard's home setup in Encino, California houses a Euphonix console, Sony analogue JH24 multitrack and numerous ADATs, in addition to an assortment of outboard gear and vintage mics, synths, guitars, drum machines, sequencers and a wide variety of other instruments.

I've gotten some new guitars during the past year, he says, and I've acquired a Korg Trinity synth which I love. You turn it on and everything in there is good. We're also always creating new samples—I do that on almost a daily basis—with drummers, with percussion, with guitars, backward loops; whatever we've got, we're always tinkering. So it's a matter of trying to create new sounds all of the time.

Composing their material in this environment, Ballard's and Morissette's general approach was to start by finding a musical theme. This would amount to him running several such themes by her, and when one of them grabbed her attention they then both set about expanding it into a song.

In most cases she'd hear some music that she liked, she'd sing something that she liked, she'd have a chord that she liked, a sequence of notes, whatever, and once she found something that she felt good about she'd go into a trance and was really able to write lyrics on the spot," Ballard explains. A lot of them were based on ideas that she'd been exploring, but at that point it was also really a kind of channeling, and a case of her getting lost in the music. We'd have a cassette machine rolling the whole time, and often we'd do stuff and say, "What did we just do?" You know, she'd sing a line that was incredible, I would do a chord change and I'd just be trying to channel with her.

Ballard previously claimed to particularly enjoy working with new artists, for he is particularly adept at recognising talent at an early stage and providing it with the chance to blossom ('I take pride in doing that and I really enjoy it, because in every case I think that I learn as much from new artists as they do from me.') So, what was it like working with a former new artist-cum-infatuation junkie? "Obviously she's no longer an unknown artist and there clearly is an expectation among millions of people who like her music," he responds, 'but I have to say that Alanis was true to her artistic inspiration and she first really wanted to say something and not worry about that expectation, especially the commercial expectation. You know, could we sell 28 million records? If that had been the goal then we would have approached this whole thing differently. However, it wasn't her goal and it really wasn't my goal. She had made a startling kind of statement on her first record that really did define her as an artist in a certain way, but it would not be appropriate for me to keep her right there and say, "Okay, let's do something that is very similar to Jagged Little Pill so that we can sell 28 million records." That would have been the last thing that she would have responded to. She was really interested in trying to do what she does and to speak what's on her mind, so making this record was not unlike making a record with a new artist.

'She was stretching so far lyrically that she was constantly exploring new avenues, as opposed to capitalising on her fame and recreating what she's done for the next 10 years of her career. You know, that's what a lot of people do, and so I think you have to know up front what the goals of the artist are. Her goal was not to do that and as a result it certainly wasn't unlike doing something really new, because she didn't want to write 'Ironic' sideways.

'She's a very strong artist, and she's got a very clear idea of what she does and does not want to do and how she wants to represent herself, and I took my cue from her. It was also the case that she coproduced this record with me, and so her approach to it was different from exactly what I would have done had I been doing it on my own. There again, what I would have done without her influence is probably irrelevant. She as an artist wanted to have more of a contribution on the production side because I think she wanted to make sure that the musical expression was in sync with what she wanted to say, and I welcomed that and embraced it. To me it represented growth of an artist, and that's always good. The more she wants to express something the better, as far as I'm concerned, I'll try to enhance that, and on this record that was my job, no question.

'Working with Alanis is always really quick. I mean, we go in the room and if we don't have a song by the end of the day we feel pretty bad. Usually the basic track—if not everything—has been recorded, and in almost every case her lead vocal is the finished version. She sings it once, maybe twice, and we've got it. She's the most extraordinary singer. We never comp the vocals and we only punch in maybe once or twice to change a word. She's so capable of singing a song that she's just written, on the spot, for real, forever, and she's fearless in doing that. It's truly remarkable.

'On this record there are probably twice as many words, and so I'm
In just two rack spaces, the ACP88 has eight of the most musical compressors and transparent gates you will ever hear.

- Total Dynamics Control.
- Compressor parameters include: attack, release, ratio, threshold, hard/soft knee, auto/manual attack/release curves
- Gate parameters include: attack, release, threshold, and two position gate range (-60db-20db)
- Full metering: Compression Gain Reduction, threshold above/below and gate open/close LED's on every channel
- 2 to 8 Channel Linking Capability
- Side chain and gate key send/return on every channel
- Balanced/Unbalanced T/P/S Inputs and Outputs
- Clean up vocals and drums
- Fatten acoustic instruments
- Crystal clear compression
- Made in the USA
always pushing the vocal up and she's always pulling it back, but to me it's like we're predetermining everything on this and we certainly want to communicate that to the listener. She realises the value of clarity in the vocal, but I particularly like hearing what she has to say because that's what this is about and not having her voice out there would be missing the point.'

In terms of the overall sound, Morissette was constantly pushing for different colours and different flavours, and one of the results of this is that there are more keyboard parts on the new record than on its predecessor. The songs that she wrote alone were generally composed on a keyboard, and this suited Ballard just fine as, in spite of all of his guitar work on Jagged Little Pill, he is more usually a keyboard player. There again, having spent some time in India, Morissette also decided to incorporate some of that nation's musical textures into her current work. Hence the appearance of tabla, sitars, and so on.

'Whatever she wants to write about dictates to a certain degree where we want to go,' says Ballard. 'So, maybe there are more influences apparent on this record than on the first, but these came naturally in every case.'

'I love good grooves and we probably spent as much time messing with the drums as with anything else. When we put the hand on we would usually then go into Pro Tools and tighten up the drums, even though Gary Novak keeps excellent time. With sequenced elements we would pull it into a little more precision, because I think at that point it takes up less room in the track and therefore leaves more space for the vocalist. That's something which we're pretty strict about, in that we want it to be tight and we want some definition there, so we probably spent more time doing that than almost everything else on the record. It's a tedious process and I have a programmer named Shaad Scott who spends a lot of time with the Pro Tools after the fact, pulling it all together. Actually a load of programming and recording in the initial phase of this I do myself, but Shaad is more fluent with Pro Tools than I am and it's also a very time-intensive thing, so we would cut a drum track and he would spend a day tightening it up while we'd be on to the next thing.'

The band was recorded at Royaltone Studios in Hollywood, and the fact that the room there allowed for two guitarists, the bass player, the drummer and, when necessary, the singer to be separate while remaining in visual contact meant that most of the group performances could be retained intact.

'When Alanis and I are working together at my place I'm creating the track one component at a time and then she does her vocal,' says Ballard. 'However, once we get that process out of the way we go into the studio with those tracks, and the band played over about half of the tracks that we had. They've already got the lead vocal there, which is great, and so she doesn't have to sing it 20 times. We would adjust and do some arranging and so on, but it was important to her that they had the same energy as they have on stage. That's always fun for me. We would do like one or two songs a day; they're all pros, they were prepared and we were ready to rock.'

After that it was back to Glen Ballard's studio for the mix, which, as with Jagged Little Pill, was taken care of by Chris Fogel, who also recorded the drums and various band parts. 'All of the really difficult recording was left to him,' asserts Ballard. 'To record an ensemble is much harder than what I was doing, putting a synth part on tape and then another bass part. I don't have those kind of recording chops, and he gets one of the great drum sounds in the business, which is probably the hardest thing to do well.'

With his Capitol-based record company, Java, serving as his main focus, Glen Ballard's days and nights are taken up with film soundtrack work, as well as album projects with any number of artists signed to his label, one of whom just happens to be a certain Lisa-Marie Presley. 'I've been writing with her and we're developing the material for her record,' he says. 'We're taking it slowly, but she's really, really good.'

As for Alanis: 'Whenever she is ready the door is always open to her in my life. As I told her after the last record, "Just rattle my cage when you're ready". It took about 18 months to two years but then she said, "I'm ready", and I respect that, because she goes off and does this whole other thing that is performing. She does it so beautifully, but it's a different energy, a different process, and I think she has to kind of give herself a bit of time after she's done that to find a different rhythm in her life where she feels like she can write.'
If you think all CD-R media are the same, think again.

If you think all CD-R media are the same, think again.

(Yes, they're real discs. The upper surface of each disc was cleaned for the same length of time with a lint-free cloth soaked in 91% isopropyl alcohol—a recommended cleaning technique for CD-R media. Ours, of course, is on the right.)

Frightening, isn't it! Your CD-R master could be reduced to a pile of gold dust, leaving a transparent disc, as the reflective layer and dye is rubbed off—and all this while using an approved cleaner!

The simple act of wiping off a fingerprint could result in the catastrophic failure of some CD-R media, such as the disc on the left.

And all because, despite the tens of thousands it cost you in studio time, you skimmed when it came to the master CD-R.

You saved a few pennies, and now your master is lost forever. Is that false economy, or what?

Here at Apogee, we understand the technology of CD-R. You should too... because not all CD-R media are the same.

Our discs may sometimes cost a little more—but in the long run, isn't your master worth "a little more"?

Your most valuable recordings deserve the Apogee treatment— we care as much about your masters as you do.

Apogee digital media. Ask for us by name.

Understanding the Technology...

The Apogee CD-R Advantage

- Gold phthalocyanine dye layer: proven to be more durable than green cyanine or blue ao dyes.*
- Significantly lower Block Error Rates
- Archive life in excess of 100 years—compared to 25 years for green discs*.
- Two reflective layer options:
  - GOLD—The longest life of any CD-R on the market. Ideal for archiving;
  - SILVER—Highest output for lowest error rates. Ideal for mastering applications.
- Unique DataSaver and new mirror-smooth Datasaver II resin films shield the reflective and dye layers from damage, protecting the disc from handling, solvents, markers and labels (unlike the disc on the left).
- Higher reflectivity means higher output: CD-writer laser power is reduced for longer operating life of your mastering system.

Apogee digital media. Ask for us by name.

Apogee Electronics Corporation, 2145 Donald Douglas Loop South, Santa Monica, California 90405, USA.
Tel: +1 310/915-1000 Fax: +1 310/391-6262. Find our international dealers on the Web: www.apogeedigital.com or Email: info@apogeedigital.com.
Apogee is a registered trademark of Apogee Electronics Corporation. Other trademarks are the property of their respective owners. *Measured in artificial aging tests.
Digitally compensated studio monitors from ROISTER is a new, superior species. Century-old limitations imposed by conventional analog design theory have been overcome. All ROISTER studio monitors can be driven by the Acoustica Compensator, ROISTER’s powerful Digital Speaker and Room Processor. The results:

JUST ACTIVE? OR DIGITALLY ACTIVE?

- Singular, spike-shaped, impulse response
- Precise time alignment of drivers throughout the audio spectrum
- Pinpoint stereo imaging
- Exceptional frequency and spatial accuracy

But in ROISTER, we have not simply relied on a digital panacea, in our pursuit of perfection. Analog technology has also been mastered for an uncompromised sonic and aesthetic result:

- Rock-rigid cabinet construction
- Massively built, long-throw woofers and delicately powerful tweeters
- Abundant amplification for each driver, for compression-free operation and maximum dynamic range.

Only the truth and nothing but the truth!

SONY GearBox
SOUND AND VISION EQUIPMENT HIRE

24 HOUR SERVICE 7 DAYS A WEEK

Avid AudioVision • Avid Media Composer
Pro Tools 24 Mix • Otari RADAR • Digital Multitracks
Digital & Analogue Mixers • Equalisers & Dynamic Processors
Digital Effects Processors • Sony Time Code DAT’s
CD & MiniDisc • Akai Samplers • Modules • Synchronisers
Microphones & Monitoring • Apple G3/9600 Computers
Sony Digital Betacam & Beta SP • ISDN

Avid • Akai • AKG • Alesis • Apple • Avalon • BSS
Denon • Digidesign • Emagic • Eventide • Focusrite
Fostex • Genelec • HHB • Lexicon • Mackie • Neumann
Neve • Otari • Panasonic • Sennheiser • Shure • Sony
Summit • Tascam • TC • Telos • Yamaha • 360 Systems

Audio & Video Post Production, Film & Television, Broadcast, Music Recording, Editing and Cutting Room Equipment hire.

Tel: 0181 449 6555 Fax: 0181 449 5252
e-mail: sales@gearbox.com
website: www.gearbox.com

Once a year we present to you the biggest stage in Europe.

From 3rd to 7th March the light, sound and event technology trade turns up the volume in Frankfurt – 600 exhibitors from 48 nations present to you their latest developments and products. There is also the broad range of trade seminars and the two new halls, hall 7 for DJ and discotheque equipment and hall 4.1 for ProAudio technology.

Collins & Endres
Messe Frankfurt Representatives
in the United Kingdom
2nd Floor, Clareville House
26 - 27 Oxendon Street
London SW1Y 4EL
Tel. 01 71 4604090
Fax 01 71 4604091
info@collins-endres.co.uk
www.musikmesse.com

Musikmesse/ProLight+Sound
Frankfurt am Main, 3.–7.3.1999

January 1999 Studio Sound
Investing in computer audio systems is a tricky game depending on a heady mixture of business and technology. Martin Polon probes the future for signs of progress and indications of choice times to invest.

**WHAT DOES future technology offer the computer?**

How might these enhancements—however implemented—improve the virtual studio? Is it possible to recognise the watersheds that invite sound investment in technology? The difficulty of answering these and similar arises from the pace of computer development—conversely, buying current technology gives a kind of freeze-frame of a work in progress.

One of the key issues is processing speed. Although raw speed does not necessarily improve functionality without reworking of the computer’s hardware and software architecture, it is a significant issue. Millennium (Year 2000) problems notwithstanding, higher clock rates herald the most dramatic changes in computer design yet seen—they threaten to make real any number of potential innovations. Shrinking microprocessors in size—one spin off—reduces heat and power consumption. Being able to place more semiconductor units in the same physical space, has seen unit speed increase from 200MHz to the edge of 400MHz this past year alone. By using better conducting metal substrates (such as copper) to mount and connect the various semiconductor components on the microprocessor chip, processor speed is also improved.

The use of enhanced Level 2 cache (providing the processor with a memory scratchpad) and operating at a speed either parallel to the processor itself or at half of the processor speed, has provided another avenue of increasing speed. Increasing the bit rate allows greater speed as well, by moving more data with the same number of steps. Today’s 32-bit processors are on the verge of being replaced by whole new families of 64-bit chips. Meanwhile, optimising new processors for specific operating systems is another way of increasing the overall speed of computation.

Let’s look at the basic specifications of future microprocessors, most of which were discussed at several recent semiconductor industry seminars in Silicon Valley, California. We will focus on the G4 PowerPC chip from IBM-Motorola (with design input from Apple) and look at developments in the PC chip world, but the essential issues of moving forwards in microprocessors are essentially the same and more or less parallel regardless of platform. Major innovations such as chip die size reduction, increased transistor capacity per chip, improved multimedia...
Either the Merced and/or the McKinley chips could prove to be a more significant challenge to the G4 but these chips are 18 months away at best and much could happen to the G4 in the interim. As to die size and power dissipation, all chipmakers are working hard to reduce both and everybody in the industry is supported by the same semiconductor fabrication companies. Intel’s response has been to reduce manufacturing costs to reduce processor prices to its PC maker customers. Intel’s strategy may be to ‘lose’ the very low-price, low-margin market, and focus on reducing size, costs, and heat while adding features on mid and top end microprocessors.

Intel’s competitors, including but not limited to AMD, Centaur Technology, Cyrix, IBM, and RIM Technology, all have announced either new chips for 1999 or enhancements of current chips. Manufacturing advances will yield reduced size, costs (some predict under $100 per chip), speeds starting at or in excess of 500MHz, larger than currently configured Level 1 cache and other enhancements.

Intel also is in danger from competition for the very high-end portion of its microprocessor line. With the IA-64 Merced and McKinley processors at least temporarily stalled, many users are awakening to the potential of Digital Equipment Company’s (DEC) Alpha chip, the best-kept secret in the microprocessor Business. Digital and its Alpha chip—having been purchased by Compaq Computers—is now in a setting of both horizontal and vertical integration. The Alpha chip is now being manufactured by Intel (Intel having absorbed DEC’s chip-making capability) marketed by Compaq and is the subject of a joint venture with Samsung.

The newly announced Alpha chip 21364 is scheduled to ship in the year 2000 with a clock speed of 1GHz or more and could field an amazing 100 million transistors, of which at least two thirds will be devoted to upwards of 1MB (and possibly as high as 2MB) of integrated Level 2 cache. Also connected directly on the chip will be direct processor-to-processor interconnect facilities perhaps capable of transfer rates as high as 10GB/s for multiprocessing systems. Current Alpha chips offer speeds in the range of 700MHz.

The Motorola G4 chips will be manufactured in a Motorola plant using the company’s proprietary techniques (HIPS). The chip on its die of 0.20-micron size is reduced from the 0.25-micron manufacturing standard found with most processors in use today, and that reduced from the 0.30-micron process still prevalent at the beginning of 1998.

In redesigning the G4, the Motorola and IBM semiconductor manufacturers had choices as to what went...
Accurate monitoring used to be expensive. Not any more. Available in both active and passive versions, the new HHB Circle 5 incorporates a number of unique breakthroughs in loudspeaker technology to create a compact, high performance studio monitor that's ideal for use in a wide range of professional applications. An investment of £150,000 in research and development has produced a loudspeaker of exceptional clarity, with a sound that doesn't fatigue the listener, even after a long session. So if you're looking for a great sounding studio monitor, listen to the Circle 5 at your nearest HHB dealer and prepare to be impressed. Then ask the price and prepare to be amazed.

**Varied cone thickness minimises low frequency distortion**

**Low Q filters deliver an unfringe sound during long listening sessions**

**Detailed and accurate on and off axis sound**

**120W LF / 70W HF integral amplifier pack (active version)**

**Delivers 'large monitor' performance from a compact loudspeaker**

**Individually tested and matched ferro-fluid cooled soft dome tweeters**

**Magnetically shielded for use near computer and video monitors**

**Solid State Polyswitch® tweeter overload protection**

HHB Communications Ltd - 73-75 Scrubs Lane, London NW10 6QU, UK
Tel: 0181 962 5000 - Fax: 0181 962 5050 - E-Mail: sales@hhb.co.uk

HHB Communications USA LLC - 626 Santa Monica Boulevard, Suite 110, Santa Monica, CA 90401, USA
Tel: 310 319 1111 - Fax: 310 319 1311 - E-Mail: sales@hhbusa.com

HHB Communications Canada Ltd - 260 King Street East, Toronto, Ontario M5A 4L5, Canada
Tel: 416 867 9000 - Fax: 416 867 1080 - E-Mail: sales@hhbcanada.com

http://www.hhb.co.uk

British sound at its best
78

conventional manner with high-speed transfer buses. Some chip makers are actually bringing the Level 2 cache and its requisite memory controller onto the microprocessor itself (as in the new Alpha chip) enabling even faster transfers between processor and caches without conflict. The Motorola-IBM G4's isolated Level 1 512-byte memory caches for instructions and data (the same as the G3) coexist with Level 2 cache capacity measured in increments of 512-byte, 1MB, or 2MB (the G3 is limited to 1MB).

Both Intel and Motorola are segueing to copper interconnect technology to overcome potential future problems for speed on the current aluminum interconnect substrates technology. The G4 chip will be an early entrant for Motorola to making production processors on copper. IBM, possibly the major innovator of copper, has already produced some commercially available chips on the orange metal. Changing to copper promises an unlimited future of chip development and further speed increases in chips built with advanced technology. The Motorola G4, includes a full instruction set of Altivec multimedia commands.

The Altivec part of the Motorola G4 chip IBM has opted to decline offering separate multimedia instruction sets on its chips, includes two vector operations units, which can operate in parallel with the integer and floating-point arithmetic units. The Vector unit can perform arithmetic in as many as 16 operations in a single clock cycle. A single Altivec instruction can perform bit manipulations equivalent to as many as 50 standard PowerPC instructions.

Needless to say, the G4, with its separate, isolated 128-bit register for vector data, offers significant improvements in audio, video and multimedia performance even above and beyond that which the new chip's speed offers. It is not clear at this time how much of that Altivec capability Apple will offer on their future higher-end machines and via software rewrites—perhaps in the yet to be released OS X.

What does all this mean to the audio, video and multimedia professional thinking about a new computer? First, it means that computers bought during 1999 will have increasingly fast microprocessors starting at 400MHz clock speed and gradually working up to 1GHz or better during the next 12 or 18 months. Second, it means that PC makers (Apple and Wintel) will be optimising the rest of their systems with 100MHz overall speed for system buses, Fast RAM operating at 100MHz or better (up from current 70MHz), faster hard drives, memory controllers, and so on.

Third, while it is true that true multi-tasking operating systems such as Windows NT 5.0 and the forthcoming release of Linux for either platform (in fact, any platform) could handle most aspects of the new speeds and so might Mac OS-X upon release mid-1999, the software optimisation issue will not become a major speed advances being easily absorbed as they are released.

The bad news is that operating systems and application software including audio, video and multimedia software are going to have to be optimised for higher speeds, especially those over 500MHz, and that is not going to happen until the operating systems are upgraded. Current audio software will benefit from the higher speeds of the first of the new chips to hit the streets but as chip progress continues, that old axiom 'speed kills' will become fashionable again.

---

A Dual Classic
TUBE-TECH CL 2A

The TUBE-TECH CL 2A is a dual opto compressor with the same features as two of the well renowned TUBE-TECH CL 1B, but only taking up two units of rackspace.

World wide representation:

Austria (02) 336 3123 Australia: (02) 9975 1360 Belgium: (011) 23 23 55 Brazil: (011) 604 8339 Czech Republic: (455) 62293 Denmark: (43) 99 98 57 Finland: (09) 512 3500 France: (03) 87 74 80 00 Germany: (089) 505 7670 Greece: (1) 82 38 230 Holland: (010) 414 705 Norway: (01) 214 9494 Italy: (011) 375 249 Japan: (03) 5489 248 Korea: (02) 665 3568 Norway: (55) 937 975 Poland: (022) 446 4609 Portugal: (01) 353 8331 Russia: (09) 468 1826 Slovak Republic: (07) 214 05 Singapore: (225) 5115 Spain: (3) 319 5385 Sweden: (040) 32 02 30 Switzerland: (01) 840 0444 Taiwan: (2) 719 2388 Thailand: (226) 230 8 UK: (011) 689 50 USA: (803) 373 1828

LYDKRAFT
Lydkraft Aps • Ved Damhusen 38
DK 2720 Vanlense • DENMARK

January 1999 Studio Sound
Talk to Total Audio
Multtrack Mobile, Location and studio Sound professionals & Expertise.

Talk to Total Audio
Installations, Repairs, Advice

Talk to Total Audio
64ch Minimum State of the art Radio Mic Systems
By Sony. From £750 per Channel

Talk to Total Audio
TEL 07000 45 6000  FAX 07000 45 5000

Need a New Point of Reference?

If you've ever wondered why, for nearly 30 years, so many hits have been mixed on Westlake Monitors - now is the time to find out. Go straight to your dealer and demand a demonstration.

Westlake Audio Speakers are designed as reference tools for the most demanding of audio engineers and golden-eared audiophiles. The no-compromise manufacturing process includes extensive internal cabinet bracing, hand built crossovers with precision matched components, and drivers that are meticulously selected, tested, measured and matched. Cabinets, drivers and crossovers are also thoroughly dampened to eliminate any resonance or vibrations. You have to listen for yourself. We know you’ll be impressed!

MANUFACTURING GROUP
2696 Lavery Court, Unit 18, Newbury Park, CA 91320 USA • 805-499-3686 FAX (805) 498-2571 • http://www.westlakeaudio.com

If you already own a pair of BBSM-10s and want to extend the bottom end, or if you’re looking for a full range speaker system, you have to listen to the BBSM-10s with the BB10-SWP subwoofer system. Awesome!!!

Lc3w10 • The 10" 3-way monitor done the Westlake way. Perfect for the higher end project studios that demand a little more.

Lc265.1 • Multi-use system for dedicated center channel.
LOUD in 5-channel configurations. Dual 6.5" 3-way.

Westlake Audio

http://www.americanradiohistory.com
Talk to
Total Audio

TEL 07000 45 6000
FAX 07000 45 5000

64ch Minimum State of the art Radio Mic Systems
By Sony. From £750 per Channel

RICHMOND
FILM
SERVICES

Tel: +44 (0)181 940 6077 Fax: +44 (0)181 948 8326
THE HIRE COMPANY
OTHER HIRE COMPANIES HIRE FROM

NAGRA-D

Only £60 per day
£240 per week

96 kHZ SAMPLING FREQUENCY
NOW AVAILABLE!

MediaFORM's

CD-3706P

Standalone Automatic Duplicator Printer

- 700 CD-R's Online
- Frame Accurate Recordings
- Audio Verification on Input and
  bit for bit on copies
- Digital S/PDIF, IEC958 AES/EBU
  Via DAT & PRO CD-A Player
- Full Analog Audio Input
- One Touch Copying
- 1, 2, 4 and 8X Load Up Speed

Call 01256 681186 for details

we have CLICK FREE input on T.A.O. recording.
YES it really works!

UK Distributor: Magellan Group plc, Concept House, Bell Road, Basingstoke, Hampshire RG24 8PB
Phone 01256 681186 Fax 01256 681133 ISBN 01256 812711 Website: www.magellangroup.com
It may not be hard to spot Lou Gonzales in Manhattan. At six foot and dressed in a rhinestone-studded denim jacket, western shirt (preferably with pearl buttons), tight-fitting blue jeans, and Cuban-heal cowboy boots, he looks more Nashville than New York. Add a shock of white hair and a pair of rimless spectacles, and he has the air of a wizened cowpuncher. Yet the only thing he has ever punched is millions of nail holes in the walls of scores of recording studios. Gonzales is a throwback to a time when studio owners were also engineers and also swung hammers, built and repaired their own equipment, and fixing their own equipment. Age indeterminate, he goes back far enough to have been in the business in New York when people actually built their equipment, too, cobbling consoles together from parts, achieving unique sounds from one-of-a-kind desks which made the studio business circa 1970 an industry of singular technologies.

Late last year saw Gonzales swinging a hammer again, preparing one of the five studios that now comprise Quad recording for the digital age with the installation of the first SSL Axiom-MT digital console in a music environment.

"I always figured that if I could run a piece of equipment, then anyone could, and that meant that people would use it," he says. He took that same approach when he became the second New York studio to put in an SSL 9000i, and two years later the first in the US to put in a second one. Each move was calculated as a business proposition, but it does not take a deep scratch of the surface to see that Gonzales actually likes messing with sheet rock, concrete nails, hammers, tubes and diodes.

Gonzales got his start in the audio business as a disc jockey in the mid-sixties, spinning rock 'n' roll records on WGLI in Babylon, a suburb on Long Island about 40 miles from Manhattan, near where he grew up. He later switched over to WTHE, one of the first country-music-format stations in the New York metropolitan area, where he suspects he acquired his penchant for country. Working in radio earned him his first-class radio-telephone license, which enabled him to work both as a DJ and as the station's technical engineer. This was when the recording studio business was just a decade away from records being made at radio studios. The pioneers of independent recording studio in New York—people like Bob Lifton at Regent Sound, and Bob Goldman at Mir Studios—were beginning to steal music recording from the major label studios. It was, in fact, Goldman, who gave Gonzales his first studio job, though unintentionally. Gonzales was working at a Manhattan radio station, WADO, on East 42nd Street and sitting in his boss's office when the latter took a bathroom break. During that time, the office phone rang and Gonzales answered it. Before he could say much more than "Hello," an exasperated voice on the other end barked, "We can't get the studio to work. You gotta send someone over right away." Gonzales replied, "No problem. I'll send my best man over", and walked into the world of recording studios both literally and figuratively.

Getting the console fixed earned Gonzales the role of chief engineer at Mira from that day on.

By 1970 he was chief engineer at The Hit Factory, when it was still owned by its founder, composer-producer Jerry Ragavoy. Gonzales started getting some music time at The Hit Factory as well, and he worked. He recorded several tracks for, and mixed, The Band's eponymously titled second album, working first on a console built by Bob Lifton, and later on one that Gonzales himself built from API components.

In 1973, Gonzales partnered with a local engineer to build a studio from scratch in Manhattan that would ultimately become Coordinated Sound. The pair split after a business disagreement and Gonzales went on to a similar situation with noted commercial single engineer Don Elliot after which he decided he did not like partnerships.

"In the old days, everyone had custom-made consoles, so you had to have staff engineers because they were the only ones who knew the consoles. And the staff engineers developed followings, which was what brought business into the studios."

He also watched the demise of staff engineers from this vantage point, as the industry was shifting to off-the-

At 21, Quad Recording is one of Manhattan's elder statesmen. Dan Daly reckons that new technology, including the world's first SSL Axiom-MT, is keeping it young.
Ampex was an innovation in reel-to-reel tape recording. The company carved out of what had been a music retail operation on Seventh Avenue in Manhattan, several blocks off Times Square and around the corner from the Music Row of New York. The single-room studio—still in operation and the first of five—was carved out of what had been a voice-over studio for film-sound facility Magnasonic. Gonzales literally ripped a hole in the wall between two rooms to construct a control room—and fitted it with what he could afford at the time, which was an API 16-channel console, and an Ampex MM-1000 16-track deck. His original clientele were culled from his freelance days, enough so that six months after opening he purchased another API desk and an 8-track MM-1000. He took the electronics out of the second multi-track, set them in a rack next to the 16-track deck for which he had custom headstock manufacturer Lipps make a set of 2-inch 24-track heads, and now he had a 24-track studio.

Quad Recording acquired a cachet in the 1980s among producers and musicians. While rock and pop moved towards multi-tracked bands, the bands were moving towards personal recording. R&B, on the other hand, still used studio musicians.

Quad expanded starting in the mid-eighties: ironically, a good chunk of that time when Gonzales took over two of Raggay's studios (which had been named Counterpoint Recording), rebuilding the rooms to his specifications. Another expansion came from a demo room opened at one point by Sam Ash in the same building, yet another time when Associated Studios went out of business. A fire in the 12th-floor studio in 1991 prompted another rebuild, and the studio has been in a state of constant renewal ever since.

Part of that ongoing construction flux is due to Gonzales' demand that Quad, which is comfortable, but hardly palatial, always remains on the cutting edge technologically. The first API, Harrison 3232C and Neve 8068 consoles (and a Trident Series 70 acquired in one of the take-overs in the course of expansion) gave way to a decided preference for SSL desks. Gonzales bought the first pre-owned SSL sold in the US, a 4000E-series bought from Ken-Don Recorders in Los Angeles, in 1983. A second one was purchased new a few years later. While Gonzales expresses a preference for SSLs, he was riding the crest of a marketing wave that saw advertising agencies choosing studios that had SSLs. While Quad did not specialise in angles, SSL's proliferation in New York during this period fuelled Quad's growth. "There was definitely a period when you had to have an SSL to be hot in New York," he says. "Although I don't know if having the SSL made you hot or if you had to be successful in the first place to be able to afford one."

Gonzales bought the second SSL9000j console in New York in 1994, and two years later bought a second after their...
The growing number in the city was causing rates to drop. The thinking, he says, was that with two 9000s clients could move between studios seamlessly instead of having to wait for the one room to become available.

The move paid off, with Quad’s bookings and revenues increasing significantly in the last year, with a particularly busy summer season. The same thinking goes for the decision, reached last August, to install the first SSL Axiom-MT digital desk to be sold into a music studio. (The first went into a broadcast truck on the West Coast.) While Gonzales has spent considerable time on the desk, testing it to his satisfaction, its installation is nonetheless a chess-like gambit in the competitive, high-stakes world of upper-tier recording facilities.

‘On one hand, this is an economic business decision—you have to crunch numbers and weigh the cost against what you can bring in terms of new business and rates,’ Gonzales explains. ‘On the other hand, you’ve got to have a sense of whether engineers are going to like to work on this board. That was the same balanced approach I took when I bought my first 9000 console four years ago. You can’t make a wise decision unless you consider both aspects. The first 9000 was a risk, too, but I believed in the console and it turned out to be the right decision.’

Last year Gonzales felt he had to make the next move, and he believed it would have to be a digital one. Asked if the increasingly short periods that expensive platforms remain relatively exclusive is a problem, Gonzales replies, matter of factly, ‘Nothing lasts as long as it used to. What gives me an edge is the control surface. The Axiom-MT is basically a digital 9000; the control surface is the same. That means I have a reliable, familiar control surface and one with a very short learning curve—I was running it by myself within 15 minutes. So there’s no lost time educating engineers on how to run it.’

Thinking strategically, Gonzales made a ‘very large number’ of A-D converters part of the sale terms. These will allow him to run the console in the analogue domain, as a ‘third 9000’ for clients who neither want nor need digital. That also will allow him come pricing flexibility, as well, with the projected 20% premium he expects the Axiom-MT to be able to get initially from digital clients. Also, the console’s digital nature meant not having to replace the existing air conditioning in Quad’s Studio B, where the Axiom-MT would be replacing an older SSL 4000. The room, though, will be outfitted for 5.1 surround mixing capability, using the same DynaudioAcoustics M4-Plus monitors that Gonzales has added to two other studios at Quad.

‘There’s a million little and not-so-little things to consider in a move like this,’ says Gonzales, who began this particular quest over a year ago. ‘You can’t just look at the sticker price. You can negotiate, sure, but you also have to look at all the angles in terms of what it’s really going to cost and how you can maximise its ability to make money for the studio. This is not a simple equation. It just looks that way.’

Gonzales says he’s been able to maintain his rate structure, based on the technology and on service, and his tightly booked schedule, and ability to afford new leading-edge consoles testifies to that. But a hard-headed attitude towards finances contributes, as well. Which is why he’s the one swinging the hammer instead of smoking the cigar.
Microphone University

Do you want to learn more about microphones?

Visit the Microphone University on the Internet at:
www.dpamicrophones.com

The Microphone University features:
- General Microphone Techniques
- Application Guide
- Technical Corner

The Microphone University is offered to you by DPA Microphones - Manufacturer of the famous Series 4000 Microphones.

DPA
Haagnerg 11
2450 Albert, Denmark
Tel: +45 4814 2828
Fax: +45 4814 2700

Prism Sound
produces the USA-1 hand-held AES/EBU analyzer, the Decope FFT analyzer and high-quality A/D and D/A converters. The USA-1 is the only hand-held tool that measures carrier parameters and data content. With programmable go/no-go limits and Watchdog or Channel Check modes it solves interface problems fast.

For more information on Prism Sound range of products, call:
Tel: +44 (0) 1223 424988
Fax: +44 (0) 1223 425023
William James House, Cowley Road, Cambridge CB4 4WX

The tools of the trade!

Palmer

Adam Hall Ltd
3 The Cordwamers, Temple Farm Industrial Estate
Southend on Sea, Essex SS1 3WJ
Tel: 01702 613922 Fax: 01702 617168 E-mail: mail@adamhall.com

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.

DK-AUDIO
Marielundvej 37D
DK-2730 Herlev • Denmark
Phone: +44 44 53 03 55
Fax: +44 44 53 03 67
e-mail: dk-audio@dk-audio.dk
Internet: www.dk-audio.dk

For an immediate response either FAXBACK Rebecca
Rebecca directly or mail to Studio Sound, 4th Floor,
8 Montague Close, London SE1 9UL
Fax: +44 171 401 8035

Circle
the number you require further information about
1 2 3 4 5 6 7 8 9
JANUARY 1999

For your PRO-AUDIO BUYER
Call 0181 8008288

Analogue Perfection
For Information on John Oram's stunning range of Consoles and Rack equipment, return details or visit our Web site.
http://www.oram.co.uk
E-mail: sales@oram.co.uk

ORAM
ORAM PROFESSIONAL AUDIO
Tel: +44 (0) 1474 815300
Fax: +44 (0) 1474 815400

THE SOURCE
Now featuring 14,000 + audio and video related products!

Free

RAPER WAYMAN

PRO AUDIO BUYER

For your PRO AUDIO BUYER

Call 0181 8008288
DigiDesign Product Specialist

The UK's leading supplier of professional recording equipment require a DigiDesign product specialist to join their UK sales team.

A good understanding of Computer-based DAW products, with specific knowledge of all Avid-based audio products is required. Sales experience in the professional audio sector, and good communications skills, would be a definite advantage.

An attractive salary package with a number of benefits is available to the successful candidate.

Please send CV's to:
Lycrome Management Consultancy
23 Lombardy Drive
Berkhamstead
Herts HP4 2LQ

MARK GRIFFIN
CUSTOM STUDIO FURNITURE

Design and installation of racking, storage and accessories

Please call for a brochure
Contact: MARK GRIFFIN
Byrebrook Studios, Lower Farm, Northmoor, Oxford OX8 1AU. UK.
Tel: 01865 300171 Fax: 01865 303071

Mark Griffin Furniture

MARK GRIFFIN
CUSTOM STUDIO FURNITURE

Creative Sound - Shaping sound

Call: Mike Reading
Apt Finance, 25 Queen Street,
Maidenhead SL6 1NB
Tel: 01628 799760 Fax: 01628 771257
E-Mail: aptfinance@msn.com

FINANCE SOLUTIONS FOR BUYING AUDIO EQUIPMENT & SOFTWARE
All products (new and used) from Soundscape to Scenaria
Payments tailored to your budget, eg: Nothing to pay for 3 months after installation
Or matched to your contracted income
Raisa cash by refinancing your existing kit
Sales and packages for equipment suppliers
10 years in the industry, APRS & PLASA members

Call: Mike Reading
Apt Finance, 25 Queen Street,
Maidenhead SL6 1NB
Tel: 01628 799760 Fax: 01628 771257
E-Mail: aptfinance@msn.com

23 NEW MONT ST, MANCHESTER M4 4DE

A New Control Room?
- Whatever the scale of your project, almost any control room can benefit from the design principles of the Early Sound Scattering room.
- Instead of relying on a single, reflective live area, this new configuration allows the unobstructed reflections from the front of the room, allowing a more accurate response and imaging throughout the most critical sections of your equipment layout.
- This means that very different rooms can be made subjectively identical, providing the closest thing yet to acoustic performance monitoring.
- If you're serious about your new control room, you should be nothing less than

ANDREW J PARRY
tel: +44 (0)7081 786 136

Electro-Acoustic System Specialists

MARK GRIFFIN
CUSTOM STUDIO FURNITURE

AM BELGIUM REPLACEMENT HEADS FOR TAPE AND FILM
PROFESSIONAL HEAD REFURBISHMENT

SUMMERTONE LTD
98 SCATTERDELLS LANE
CHIPPERFIELD
HERTs W4 9EZ, UK
TEL: (44) 01923 263220
FAX: (44) 01923 260606

HEADS FOR EUROPE

AM BELGIUM REPLACEMENT HEADS FOR TAPE AND FILM
PROFESSIONAL HEAD REFURBISHMENT

SUMMERTONE LTD
98 SCATTERDELLS LANE
CHIPPERFIELD
HERTs W4 9EZ, UK
TEL: (44) 01923 263220
FAX: (44) 01923 260606

MACELL - QUANTITY
Do you use 456, 499, DAT's or DTRS. We offer these and much much more on free next day delivery. Call for a catalogue.

CAROUSEL TAPES

CALL: 0800 731 6964 - FREE

To place an advertisement contact: Studio Sound (Classified), Millar Freeman Entertainment Ltd., 8 Montague Close, London SE1 9UR, UK
Tel: +44(0)171 620 3636 Fax: +44(0)171 401 8036
All box numbers reply to the above address.
Copy deadlines: contact Rebecca Reeves, Classified Advertisement Manager

RATES: Recruitment £35 per single column centimetre. All other sections £30 (minimum 2cm x 1) Box number £18 extra per insertion. Published monthly.

Air 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, VAV, VRF, split, unitary or centralised feed
Call Mike Hardy of Ambthair Ltd on
01403 250306 or Fax 01403 211269
Web http://www.ambthair.com
Email: cool@ambthair.com

The Digital Village

Macintosh and Outboard Specialists
New G3 in stock.
Call Gavin Beckwith - London's leading Mac guru.
Avalon - Focusrite - Lexicon - Summit - TC Electronic - TLA - Eventide - Massenberg - Alan Smart - AKG Solid tube in stock
Mackie Main Dealer
Call Nick Melville-Rogers 0181 440 3440
FOR ALL YOUR RECORDING NEEDS
AMPEX-BASF-MAXELL-3M-SONY-KAO
AUTHORISED NATIONAL DISTRIBUTOR
Spools, boxes, blades, splicing and leader tape
Custom wound cassettes C1 120, labels, library cases, index cards.
Bulk audio C-1, cases, pinokolls, broadcast cartidges.

SOUND & VIDEO SERVICES
Shentonfield Road, Shenton Industrial Estate, Manchester M22 4RF. Tel: 0161 491 0500
FOR QUALITY PRICE AND SERVICE

STOCK LABELS FOR COMPACT DISK
VHS VIDEO & AUDIO CASSETTE
• On A4 sheet for computer printing by laser printer.
• As continuous roll with holes for dot-matrix printers.
• Supplied blank white with next day delivery from stock.
• 48 hour delivery on a wide range of coloured labels.
• Custom printed labels supplied to client specification.
• Telephone for overnight delivery of FREE samples.

Unit 19, Church Road Business Centre
Sittingbourne, Kent ME10 3RS England
Tel: (01795) 424255 Fax: (01795) 422365
World Wide Web: http://www.supertags.com/Infer

1999 ... BLAH!

blahblahblahblahblahblahblahblahblandy good
deals ... blahblahblahblahblahblahaahad
blacksheepblahlahlahlahlahlahlah blah...

Blaahsts from the pahst and digiblah. Funky Junk, the musical asylum
Phone, email or fax now for MEGA sale price list.

WANTED!

ANY CONDITION...
WE WILL PURCHASE WORLDWIDE

THE 'VINTAGE' NEVE SPECIALIST!!

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

WORLDWIDE DELIVERY

TONY LARKING
PROFESSIONAL SALES LIMITED
CALL OR FAX FOR OUR LATEST LIST OF USED EQUIPMENT OR VISIT OUR WEB SITE
WANTED!
NEVE • SSL • OTARI • STUDER

Tel: +44 (0)1462 680888 Fax: +44 (0)1462 680999
http://www.tlaudio.co.uk/used.htm
(WEB SITE IS UPDATED ON 1ST OF EACH MONTH)
"Nick Ryan is the first person I call when I want quality used equipment"

Terry Britten, Producer - Song Writer

25 YEARS OF EXPERIENCE COMBINED WITH FIRST CLAS KNOWLEDGE AND PERSONAL ATTENTION. NICK RYAN IS THE FIRST PERSON YOU SHOULD CALL.

TEL +44 1892 810699
FAX +44 1892 638485
WEB http://www.soundsinc.co.uk

DAA-AMR-24
60 Channel Console with Automation

$30,000 or
Better Offer

Call Rick Camp: +1 818 700-1277
+1 888 927-7908 Pager

www.americanradiohistory.com
STUDIO SOUND - THE FIRST CALL IN PROFESSIONAL AUDIO.

Now celebrating its 40th anniversary, Studio Sound has consistently charted the course of audio technology from its emergence to its present day sophistication. Currently offering a balanced diet of news, reviews, interviews, and features, Studio Sound is the only truly international magazine serving the pro-audio community.

From recording through radio and television broadcast, feature films and on to next-generation audio applications, Studio Sound's team of experienced writers offers a first-hand insight into the workings and applications of today's technology. Topical and subjective comment is complemented by regular 'bench tests' to deliver comprehensive coverage of the most technically refined applications of technology. With these ingredients, Studio Sound has consistently recognised key achievements and developments, and developed an agenda-setting style that has helped inform generations of professional audio personnel throughout their careers.

Studio Sound is the most widely recognised and read title in audio. Take it from us.

TELEPHONE NUMBER: +44 (171) 940 8524 Fax: +44 (171) 491 8036 EMAIL: STUDIOSOUND@UNMF.COM
Create. Communicate. Innovate!

You do it every day. How can you do it better?

NAB99 is your one-stop shop for ideas, innovations and solutions. If you've never been to NAB, ask anyone who has and you'll learn that it's more than just a trade show. NAB99 is the industry rally point where digital comes into focus and you can explore the entire convergence marketplace.

Celebrate creativity. Spark innovation. And decide what "out-of-the box" technologies and business solutions to buy, and from whom — all in one place, all at one time.

This is the power and spirit of NAB99!

Start planning today!
www.nab.org/conventions/
Call 1.202.429.4194
or fax 1.202.429.5343

April 17-22, 1999
Exhibits/April 19-22
Las Vegas
Nevada/USA
US: Merging into the future

The new year's message is for studios of the world to unite, they have nothing to lose but their shirts, writes Dan Daley.

We know well that as the pro-audio industry becomes more reliant upon computers, it becomes more and more like the computer industry. When the price of RAM goes down, so does the price of products that use it, such as的工作stations. And there is every reason to think that similar links exist between studios and the rest of the world of business and technology. Certainly, the trend towards corporate consolidation seems to be well under way in the States in recent months.

As examples, there is the acquisition of Sterling Mastering by London-based Metropolis, and by the first of the year four significant Nashville facilities will likely have become two—Mastertronics, which had been in a reorganisation/bankruptcy situation since the beginning of last year, was slated to be acquired by neighbouring Emerald Recording Studios, concurrently, Seventeen Grand Recording, which had the first dedicated 5.1 surround control room in Nashville, as well as the first viable Euphonix console in a commercial facility,

was angling to acquire most of the business and technology assets of nearby Love Shack Studios. Other, similar scenarios are potentially pending in other US cities. If you include how other studios are expanding by acquiring assets from other studios, such as the sale of Room With A View's 9000c console by Unique Recording when the former decided to get out of an increasingly unprofitable business market, then the consolidation picture becomes panoramic.

Consolidation taking place in the States among recording studios is a phenomenon long predicted and anticipated. It is a no-brainer to realise that the studio market had become over-saturated, and that the proliferation of personal recording technology was siphoning off too much of the work, particularly the overdub and demo projects that had historically been the bread and butter of studio revenues. But why now, and why so many seemingly at once?

The answer is the same as for when similar things happened in other industries in recent years here. A few years ago, the computer industry saw a wave of mergers. Initially, they simply reflected the fact that that market had grown incredibly large incredibly quickly—simply a faster version of what has happened to the music industry. Consolidation, larger fish eating smaller ones, is a natural market reaction. Later on into this phenomenon, acquisitions became tactical defensive moves: you bought smaller companies either to prevent them from growing up to compete with you, to retain and build market share, and to enter new fields to add new revenue streams. Sound familiar, Metropolis?

Europe: Much ado

The pieces are all in place for 1999 to host a rerun of old format dramas, and to add a new chapter of its own, writes Barry Fox.

The coming year looks likely to be an exciting one in Europe. Philips is launching a new CD recorder that is guaranteed to upset the record industry. Several companies will follow Diamond Multimedia's Rio with solid-state personal data storage devices that can download compressed audio from the Internet, for music playback on the move. Sony and Philips have said they will launch Super Audio CD (SACD), with DSD bitstream recording, they will also launch their DVD+RW erasable disc. Panasonic, Toshiba and Hitachi will be pushing DVD-Audio the 'official' Forum format. And the same companies will be promoting DVD-RAM, the 'official' Forum format for erasable disc. Pioneer backs DVD-A but remains out on a limb with DVD-RW, an erasable version of write-once DVD.

America's Hollywood studios are mounting a last-ditch effort to block the import of Region 1 DVDs into Europe, by trying to prosecute companies which dezone European Region 2 DVD players, and pressuring the computer companies to regionally coding PC DVD-ROM drives.

Meanwhile television in Europe is going digital, with viewers in several countries (Germany, France, UK) receiving digital satellite signals and the UK first with a digital terrestrial service—a remarkable achievement. There are two terrestrial broadcast groups, the BBC and other existing analogue broadcasters are providing free-to-air programming, and OnDigital, a newly formed consortium of the Carlton and Granada media groups, is providing digital pay TV. If viewers subscribe to the pay service for one year, they get a set-top box for under £200, which is half the price they are asked if the box is used to receive only free-to-air programmes. There is nothing to stop the viewer buying a subscription for one year, to win the subsidy, and then watching only free programmes after the year is up.

The European approach to DTTV, as pioneered by the UK, is radically different from the North American policy. The US system is based on computer display standards, and intended primarily to deliver high-definition pictures. This oblige viewers to buy new receivers, costing several thousand dollars.

Europe now has HDTV in the early eighties, with the MAC system, and found that viewers were reluctant to buy new sets. So Europe's digital TV system was developed by the Digital Video Broadcasting group, is based on existing 625-line standards. This is why viewers can simply connect a new digital set-top box between their existing aerial and TV set. The box then sends five minutes scanning the UHF bands for all available digital channels, and finds 36 channels with no trouble, some free-to-air and some pay. Small wonder that dealers in the UK now have long waiting lists for receivers. And hats off to Philips for being first to the market with boxes made at the Hasselt factory in Belgium that made the first CD players.

It is unlikely, though, that the record companies will be taking their hats off to Philips for being first with a dual-well, double-speed CD recorder. The CDR-765 also plays a remarkable trick. So remarkable, in fact, that some of Philips senior bosses did not know about it, or at least preferred not to know of it.

Like a twin-cassette deck, one CD well can play a CD at double speed while the other copies it onto a blank CD running at double speed, halving the time it takes to make a dub. In line with the so-called Athens agreement, reached 10 years ago when the music and electronics companies were arguing over DAT, the '765 has Serial Copy Management System circuitry to stop the recorder making a digital copy of a disc that is itself a copy.

Although SCM does not stop someone making a series of identical digital discs, onto a series of blank discs, it does stop...
2,000 played radio stations, more than any other music genre in the US. While the numbers are not public, and assuming it could come to desirable terms with Masterent's credits, it is safe to say that Emergency was able to pick up a fraction of its original physical space and technology base at a fraction of what it otherwise would have cost. In the case of Seventeen Grand, owned by two canny Nashville studio veterans who had pursued a strategy of two high-end (Neve VR and Euphonics), their acquisition of Love Shack gives them the budget overdub room that their present facility could not physically accommodate.

The fact that both of these studios picked up new spaces that are not contiguous with their original facilities (in the case of Metropolis there's a small ocean in between) is an indication that the studio business is beginning to think outside the box. More. If the personal studio phenomenon has given back anything to the traditional studio business that it decimated over the last decade, it is perhaps the attitude that digital is conceptually rather than as fixed, immutable ideas. The best businesses America has produced are ones that have been able to reinvent themselves periodically. Consolidation hurts, but what we are seeing here and elsewhere is more than likely the new foundation of a much healthier business overall.

A DUTCH reviewer who tried one of the first samples made a remarkable discovery: although the '76 dutifully refuses to make a digital copy of the compilation disc, it still sends an analogue signal between the two wells, converts it back into digital code and makes a copy.

Ten years ago, when SCMS was developed, the record companies had agreed to an extra generation of analogue dubbing, thinking that the loss of quality involved in digital-to-analogue-to-digital conversion would make it a non-starter in hi-fi terms. But the quality of converter chips is now so good that the final CD sounds as near as makes no difference as clean as the digital original. The feature is not advertised, and was not even mentioned when Philips announced the recorder. Company bosses seemed surprised at what their engineers had built into the recorder. Now someone outside the company has discovered it, Philips will never need to advertise the feature. Word of mouth will do the rest. But the launch has been held up while Philips checks and doubles checks with lawyers in case the IFPI or RIAA serves a writ as soon as it goes on sale. The last promised date was 'in time for Christmas'.

Here's one I unmade earlier...

Kevin Hilton takes Deconstructionism to pieces to find out how it works in the digital age

DeConstructionism is a peculiarly modern phenomenon. The world appears to have reached such a level of sophistication—or, perhaps, boredom—that people, events, and things are broken down into their component parts, examined, re-evaluated, and then put back together again in the hope that they will be better understood or seen in a different way to before. So heroes are now villains and villains, if not re-born as heroes, are regarded as less villainous.
The media has been a prime mover in this process, and, with the increasing need for things to deconstruct, has itself been pulled apart. Technology has had a role in this: look at the number of TV programmes where cameras and boom arms come into shot, floor managers or technicians always wander around the sets, by the wacky presenters or much of the action takes place in the gallery.

Like many trends, it is nothing new. Back in the fifties, George Burns and Gracie Allen unwittingly helped create today's deconstructed television by breaking the fifth wall. When cameras looked directly at the audience, taking away any pretense that what was going on was a representation of real life. This was television and Burns and Allen revealed in the whole unnaturalness of the medium.

These techniques have continued and evolved through material that has been walking in and out of the action during the pre-Twilight Zone supernatural series One Step Beyond to the eighties comedy It's Garry Shandling's Show, which resurrected the Burns and Allen gimmick and was generated, more recently, Shandling deconstructed that most flimsy of TV creatures, the chat show, under the guise of Larry Sanders.

Just about every aspect of television has done this. Having the newsroom as a backdrop during a bulletin is a common ploy to give the broadcast even more immediacy and dynamism. Seeing people working away at computer terminals gives the impression that something is going on and that at no moment something will fail, which does have its problems, however. During the seventies, a production assistant at a UK-based news organisation worked out that by standing between two specific desks in the newsroom, she would be in clear view behind the newscaster during the main broadcast. Each night she would stop and stand on one leg, executives eventually realised and went back to having a plain background.

Until recently the hardware was merely a participant in all this. In the time of digital, Deconstructionism is increasingly being used to help pad out the long hours on new channels. The 'making of...' film has always been a useful filler in late-night schedules that are aimed at security guards, insomniacs and the small, strange band of people who do want to watch this stuff and don't have a VCR. This has now been taken to its illogical extreme. Whole programmes, even channels, now take a 'behind the scenes look' at everything from how the news is prepared (interesting) to the making of gardening programmes (about as interesting as the shows they are about). Without this kind of material, channels like BHC Choice would have hardly anything to put on air.

This is not to say that there is not something intrinsically fascinating in finding out how a thing works or is done. A few years ago there was a fashion for demystifying magic and conjuring, as true magic is a completely different matter from making people think you have just seen another lady in half. There was a purpose to what the likes of Penn & Teller were doing. Sure, maybe they had not made it as straight magicians, but the acts of David Copperfield and others floated a level of smug affront that they needed to be revealed as tricksters—skilled tricksters undoubtedly—but not shamans.

Critics said that the deconstruction of magic took away the romance and sense of wonder. To a certain extent this is true, but it replaces that feeling with admiration for the skill of how it is done. Deconstructing the magic of television is a different issue. Because technology is only explained in the very broadest terms, it can come across as showing off: This is kind of how it's done—you probably wouldn't understand the whole process, but aren't we clever for being able to do it? Which is an extremely arrogant attitude.

The latest example of this is a demo tape used by digital compression specialist NDS for its new electronic newsgathering link, that can be used to send reports from inner city areas without the need for high powered, large antennas. One of the test sites was Australia's Channel 9, whose Hey, Hey It's Saturday Night show (dangerously close to The Simpson's Saturday Night Crapehrama parody) used the system to hook up with a reporter in the bustling market area of Melbourne. The comparison between the digital and analogue pictures was a no-contest in favour of the new format, but everything was barely explained and came across as exactly what it was, a way to fill up five minutes of airtime in a 2-hour show.

Which is not what technology, or Deconstructionism, should be about.

Without this kind of material, channels like BHC Choice would have hardly anything to put on air.
The world beyond 20kHz

Using a study of the human hearing mechanism as its foundation, Earthworks' president David E Blackmer presents his arguments for, and his vision of, high-definition audio.

There is much controversy about how we might move forward towards higher quality reproduction of sound. The compact-disc standard assumes that there is no useful information beyond 20kHz and therefore includes a brick-wall filter just above 20kHz. Many listeners hear a great difference when 20kHz band-limited audio signals are compared with wideband signals. A number of digital systems have been proposed which sample audio signals at 96kHz and above, and with up to 24 bits of quantisation.

Many engineers have been trained to believe that human hearing receives no meaningful input from frequency components above 20kHz. I have read many irate letters from such engineers insisting that information above 20kHz is clearly useless, and any attempts to include such information in audio signals is deceptive, wasteful and foolish, and that any right-minded audio engineer should realise that this 20kHz limitation has been known to be an absolute limitation for many decades. Those of us who are convinced that there is critically important audio information to at least 40kHz are viewed as misguided.

We must look at the mechanisms involved in hearing, and attempt to understand them. Through that understanding we can develop a model of the capabilities of the transduction and analysis systems in human audition and work toward new and better standards for audio system design.

What got me started in my quest to understand the capabilities of human hearing beyond 20kHz was an incident in the late eighties. I had just acquired a MLSSA system and was comparing the sound and response of a group of high quality dome tweeters. The best of these had virtually identical frequency response to 20kHz, yet they sounded very different.

When I looked closely at their response beyond 20kHz they were visibly quite different. The metal-dome tweeters had an irregular picket fence of peaks and valleys in their amplitude response above 20kHz. The silk-dome tweeters exhibited a smooth fall off above 20kHz. How could this be? I cannot hear tones even to 20kHz, and yet the difference was audible and really quite drastic. Rather than denying what I clearly heard, I started looking for other explanations.

When viewed from an evolutionary standpoint, human hearing has become what it is because it is a survival tool. The human auditory sense is very effective at extracting every possible detail from the world around us so that we and our ancestors might avoid danger, find food, communicate, enjoy the sounds of nature, and appreciate the beauty of what we call music. Human hearing is generally, I believe, misunderstood to be primarily a frequency analysis system. The prevalent model of human hearing presumes that auditory perception is based on the brain's interpretation of the outputs of a frequency analysis system which is essentially a wide dynamic range comb filter, wherein the intensity of each frequency component is transmitted to the brain. This comb filter is certainly an important part of our sound analysis system, and what an amazing filter it is. Each frequency zone is tuned sharply with a negative mechanical resistance system. Furthermore, the tuning Q of each filter element is adjusted in accordance with commands sent back to the cochlea by a series of pre-analysis centres (the cochlear nuclei) near the brain stem. A number of very fast transmission-rate nerve fibres connect the output of each hair cell to these cochlear nuclei. The human ability to interpret frequency information is amazing. Clearly, however, something is going on that cannot be explained entirely in terms of our ability to hear tones.

The inner ear is a complex device with incredible details in its construction. Acoustical pressure waves are converted into nerve pulses in the inner ear, specifically in the cochlea, which is a liquid filled spiral tube. The acoustic signal is received by the tympanic membrane where it is converted to mechanical forces which are transmitted to the oval window then into the cochlea where the pressure waves pass along the basilar membrane. This basilar membrane is an acoustically active transmission device. Along the basilar membrane are rows of two different types of hair cells, usually referred to as inner and outer.

The inner hair cells clearly relate to the frequency analysis system described above. Only about 3,000 of the 15,000 hair cells on the basilar membrane are involved in transducing frequency information using the outputs of this traveling wave filter. The outer hair cells clearly do something else, but what?

There are about 12,000 'outer' hair cells arranged in three or four rows. There are four times as many outer hair cells as inner hair cells! However, only about 20% of the total available nerve paths connect them to the brain. The outer hair cells are interconnected by nerve fibres in a distributed network. This array seems to act as a waveform analyser, a low-frequency transducer, and as a command centre for the super fast muscle fibres (actin) which amplify and sharpen the travelling waves which pass along the basilar membrane thereby producing the comb filter. It also has the ability to extract information and transmit it to the analysis centres in the olivary complex, and then on to the cortex of the brain where conscious awareness of sonic patterns takes place. The information from the outer hair cells, which seems to be more related to waveform than frequency, is certainly correlated with the frequency.

Fig.1: Impulse responses of Earthworks QTC-1 and the B&K 4007

92 January 1999 Studio Sound

www.americanradiohistory.com
domain and other information in the brain to produce the auditory sense.

Our auditory analysis system is extraordinarily sensitive to boundaries (any significant initial or final event or point of change). One result of this boundary detection process is the much greater awareness of the initial sound in a complex series of sounds such as a reverberant sound field. This initial sound component is responsible for most of our sense of content, meaning, and frequency balance in a complex signal. The human auditory system is evidently sensitive to impulse information imbedded in the tones. My suspicion is that this sense is behind what is commonly referred to as 'air' in the high-end literature. It probably also relates to what we think of as 'texture' and 'timbre'—that which gives each sound its distinctive individual character. Whatever we call it, I suggest that impulse information is an important part of how humans hear.

All the output signals from the cochlear transform on nerve fibres as pulse rate and pulse position modulated signals. These signals are used to transduce information about frequency, intensity, waveform, rate of change and time. The lower frequencies are transduced to nerve impulses in the auditory system in a surprising way. Hair cell output for the lower frequencies are transduced primarily as groups of pulses which correspond strongly to the positive half of the acoustic pressure wave with few if any pulses being transmitted during the negative half of the pressure wave. Effectively, these nerve fibres transmit on the positive half wave only. This situation exists up to some-what above 1kHz with discernable half wave peaks riding on top of the auditory nerve signal being clearly visible to at least 5kHz. There is a sharp boundary at the beginning and end of each pulse group, approximately at the central axis of the pressure wave. This pulse group transduction with sharp boundaries at the axis is one of the important mechanisms which accounts for the time resolution of the human ear. In 1929 Von Bekesy published a measurement of the human sound position accuracy which translates to a time resolution of better than 10µs between the ears. Nordmark, in a 1976 article, concluded that the interaural resolution is better than 2ps; interaural time resolution at 250Hz is said to be about 10µs which translates to better than 1° of phase at this frequency. The human hearing system uses waveform as well as frequency to analyse signals. It is important to maintain accurate waveform up to the highest frequency region with accurate reproduction of details down to 5µs to 10µs. The accuracy of low frequency details is equally important. We find many low frequency sounds such as drums take on a remarkable strength and emotional impact when waveform is exactly reproduced. Please notice the exceptional drum sounds on The Dead Can Dance CD Into the Labyrinth. The drum sound seems to have a very low fundamental, maybe about 20Hz. We sampled the bitstream from this sound and found that the first positive waveform had twice the period of the subsequent 40Hz waveform. Apparently one half cycle of 20Hz was enough to cause the entire sound to seem to have a 20Hz fundamental.

The human auditory system, both inner and outer hair cells, can analyse hundreds of nearly simultaneous sound components, identifying the source location, frequency, time, intensity, and transient events in each of these many sounds simultaneously and develop a detailed spatial map of all these sounds with awareness of each sound source, its position, character, timbre, loudness, and all other identification labels which we can attach to sonic sources and events. I believe that this sound quality information includes waveform, embedded transient identification, and high frequency component identification to at least 40kHz (even if you can’t ‘hear’ these frequencies in isolated form).

Our goal at Earthworks is to produce audio tools which are far more accurate than the older equipment we grew up on. We are certainly pushing the envelope. For example, we specify our LAB102 preamp from 2Hz to 100kHz ±0.1dB. Some might believe that this wide range performance to be unimportant, but listen to the sound of the LAB102, it is true-to-life accurate. In fact the 1dB down points of the LAB preamp are 0.4Hz and 1.5MHz, but that is not the key to its accuracy. Its square wave rise time is one quarter of a microsecond. Its impulse response is practically perfect.

Microphones are the first link in the audio chain, translating the pressure waves in the air into electrical signals. Most of today’s microphones are not very accurate. Very few have good frequency response over the entire 15Hz–40kHz range which I believe to be necessary for accurate sound. In most microphones the active acoustic device is a diaphragm that receives the acoustical waves, and like a drum head it will ring when struck. To make matters worse, the pickup capsule is usually housed in a cage with many internal resonances and reflections which further colour the sound. Directional microphones, because they achieve directionality by sampling the sound at multiple points, are by nature less accurate than omnis. The ringing, reflections and multiple paths to the diaphragm add up to excess phase. These microphones smear the signal in the time domain.

We have learned after many measurements and careful listening that the true impulse response of microphones is a better indicator of sound quality than frequency amplitude response. Microphones with long and non-symmetric impulse performance will be more coloured than those with short impulse tails. To illustrate this point we have carefully recorded a variety of sources using two different omni models (Earthworks QTC1 and another well-known model) both of which have flat frequency response to 40kHz within —1dB. (Fig. 1; QTC1 vs 4007). When
played back on high-quality speakers the sound of these two microphones is quite different. When played back on speakers with near-perfect impulse and step response, which we have in our lab, the difference is even more apparent. With significant difference we have been able to identify between these two microphones is their impulse response.

We have developed a system for deriving a microphone's frequency response from its impulse response. After numerous comparisons between the results of our impulse conversion and the results of the more common substitution method we are convinced of the validity of this as a primary standard. You will see several examples of this in Fig. 2.

Viewing the waveform as impulse response is better for interpreting higher frequency information. Lower frequency information is more easily understood from inspecting the step-function response which is the mathematical integral of impulse response. Both curves contain all information about frequency and time response within the limits imposed by the time window, the sampling processes and noise.

The electronics in very high quality sound systems must also be exceptional. Distortion and transient intermodulation should be held to a few parts per million in each amplification stage, especially in systems with many amplifiers in each chain. In the internal circuit design of audio amplifiers it is especially important to separate the signal reference point in each stage from the power supply return currents which are usually terribly nonlinear. Difference input circuits on each stage should extract the true signal from the previous stage in the amplifier. Any overall feedback must reference from the output terminals and compare directly to the input terminals to avoid interaction of ground currents and cross-talk with the signal. Failure to observe these rules results in a harsh 'transistor sound'. However, transistors can be used in a manner that results in an arbitrarily low distortion, intermodulation, power supply noise coupling, and whatever other errors we can name, and can therefore deliver perceptual perfection in audio signal amplification. (I use 'perceptual perfection' to mean a system or component so excellent that it has no error that could possibly be perceived by human hearing at its best.) My current design objective on amplifiers is to have all harmonic distortion including 1kHz and 2kHz twin-tone intermodulation products below 1 part per million and to have A-weighted noise at least 130dB below maximum sine wave output. I assume that a signal can go through many such amplifiers in a system with no detectable degradation in signal quality.

Many audio signal sources have extremely high transient peaks, often as high as 20dB above the level read on a volume indicator. It is important to have some adequate measurement tool in an audio amplification system to measure peaks and to determine that they are being handled appropriately. Many of our available peak reading meters cannot read true instantaneous peak levels, but respond to something closer to a 300μs to 1ms averaged peak approximation. All system components including power amplifiers and speakers should be designed to reproduce the original peaks accurately. Recording systems truncate peaks which vary beyond their capability. Analogue tape recorders often have a smooth compression of peaks which is often regarded as less damaging to the sound.

Many recordists even like this peak clipping and use it intentionally. Most digital recorders have a brick-wall effect in which any excess peaks are squared off with disastrous effects on tweeters, and listener's ears. Compressors and limiters are often used to smoothly reduce peaks which would otherwise be beyond the capability of the system. Such units with RMS level detectors usually sound better than those with average or quasi-peak detectors. Also, be careful to select signal processors for low distortion. If they are well designed, distortion will be very low when no gain change is required. Distortion during compression will be almost entirely third harmonic distortion which is not easily detected by the ear and which is usually acceptable when it can be heard.

A look at the specifications of some of the highly rated super-high end, 'no feedback', vacuum tube, power amplifiers reveals how much distortion is acceptable, or even preferable, to some excessively well-heeled audiophiles.

All connections between different parts of the electrical system must be designed to eliminate noise and signal errors due to power line ground currents, AC magnetic fields, RF pickup, crosstalk, and dielectric absorption effects in wire insulation. This is critical. Loudspeakers are the other end of the audio system. They convert electrical signals into pressure waves in the air. Loudspeakers are usually even less accurate than microphones. Making a loudspeaker that meets the standard mentioned above is problematic. The ideal speaker is a point source. As yet no single driver exists that can accurately reproduce the entire 15Hz-40kHz range. Multidriver speaker systems involve trade-offs and compromises.

We have built several experimental speaker systems which apply the same time-domain principles used in our Earthworks microphones. The results have been very promising. As we approach perfect impulse and step response something magical happens. The sound quality becomes life-like. In a live jazz sound-reinforcement situation using some of our experimental speakers and our SR71 mics the sound quality did not change with amplification. From the audience it sounded as if it was not being amplified at all even though we were acutely aware that the sound was louder. Even with quite a bit of gain it did not sound like it was going through loudspeakers.

Listening to some Bach choral music that we recorded with QTIC1 microphones into a 96kHz sampling recorder, and played back through our engineering model speakers is an startling experience. The detail and imaging are stunning. You can hear left to right, front to back and top to bottom as if you are there in the room with the performers. It is exciting to find that we are making such good progress toward our goal.

I have heard that the Victor Talking Machine Company ran ads in the 1920s in which Enrico Caruso was quoted as saying that the Victrola was so good that its sound was indistinguishable from his own voice live. In the seventies Acoustic Research ran similar ads, with considerably more justification, about live vs recorded string quartets. We have a long way to come but we can see perceptual perfection? I suspect that truly excellent sound, perhaps even perceptual perfection, especially in large spaces must await the development of a high accuracy, high power, direct radiating 40kHz tweeter system with inherently good impulse response, which is integrated into a system that gives good impulse and step-function response over the entire listening area.

As a point of reference you should assemble a test system with both microphones and speakers having excellent impulse and step response. From an ideal perfect frequency response, together with low-distortion amplifiers. Isn't such a system impossible?

It is not. Test it as a sound-reinforcement system and—or studio monitoring system with both voice and music sources. You, the engineers, the performers, and the audience will be amazed by the result.
The DVD Conference

DVD Production Europe 99


Miller Freeman Entertainment in association with the International Recording Media Association presents the definitive European DVD conference, targeting everyone who is and should be involved with DVD, creatively and commercially.

DVD Production Europe 99 will be the event for European companies well established in publishing, authoring, mastering and manufacturing DVDs for the European marketplace.

The two day conference will be held at the prestigious The Conference Forum, on the edge of The City of London, and will provide up to the minute information from key industry professionals and commentators in a comprehensive collection of presentations and panels – European experts talking about European DVD.

AGENDA

- Software content issues
- Authoring, production and technical issues
- Consumer hardware issues
- Consumer and PC hardware issues
- Retailing and rental

Priority registration for DVD Production Europe 99

Price: £550 (before 1/3/99) £600 (after 1/3/99)

I enclose a cheque made payable to Miller Freeman Entertainment.

Please invoice me/my company ....................................................

Please debit my credit card by ....................................................

                      Visa  Mastercard
                      American Express

Card number .................................................................

Expiry date ................................................................. Signature .................................................................

Please return to Sam Achagra, CCW, Communications House, Curtis Road, Dorking, Surrey RH4 1EJ, England.

Fax: + 44 1306 500960

DVD PRODUCTION EUROPE WILL COVER CREATIVE AND COMMERCIAL ASPECTS OF:

- DVD-Video
- Music on DVD
- DVD-ROM and games
- and all their respective production chains.

THE PACKAGE

Delegate pack, buffet lunch and two coffee breaks each day, plus party for all delegates on day one. Hotel packages available, including weekend rates.

FURTHER INFORMATION

UK Freephone 0800 917 3596
Non-UK Tel: +44 1306 501 530
Fax: + 44 1306 500 960

Miller Freeman

Solid State Logic

IRMR

TOOLEX

ONE TO ONE

ProSound News

Studio Sound

TVB Europe

The International Master Manufacturing Magazine

un

music week
Time constants

The ability to predict what electronic circuits will do is essential to designers the world over. John Watkinson extends his look at components by connecting them together.

Resistors are essentially frequency independent in that the current flowing through them is always proportional to, and in phase with, the voltage. The power dissipated is the product of the current and voltage. In contrast, the current flowing through a capacitor is proportional to the rate of change of voltage, and so clearly it cannot be in phase with the voltage. The rate of change of voltage of a constant amplitude signal, also known as the differential or derivative of that waveform. The differential of a sine wave is a cosine wave whose amplitude is proportional to frequency. Doubling the frequency corresponds to one octave, whereas doubling the amplitude corresponds to 6dB. Hence the well-known response slope of 6dB/octave which is equal to 20dB per decade.

In an earlier article the decibel was explained (Studio Sound, May 1997), and we saw that it is a logarithmic unit. If we want an insight into what is going on, using a logarithmic unit on one axis of a graph will turn proportional functions into curves unless the other axis is also logarithmic. Thus in audio we always use log-log graphs—logarithmic level in dB against logarithmic frequency in octave or decades. In this case 6dB/octave becomes a straight line.

Fig 1 shows that if we calculate the `resistance' we find an expression with frequency in the denominator, indicating an inverse proportion to frequency, or 6dB/octave as we might have guessed. We also find a sine function divided by a cosine function of the same frequency. What this means is that the current through a capacitor is leading the voltage by 90° (phase angle). The current and voltage are said to be in quadrature.

We cannot use the term resistance because this is only correct for in-phase currents and voltages. Instead we can use the old term 'reactance' or the more modern term 'impedance' which allow any phase angle between the current and voltage. Thus some impedances can be resistive, but resistors cannot be reactive. Mathematicians use the idiosyncratic term 'complex' to describe the behaviour of reactive circuits. This has nothing to do with how complicated things are, but indicates that complex arithmetic based on the imaginary square root of minus one can be used for analysis. On second thoughts, maybe it does mean how complicated things are.

The power dissipated in a device is given by the vector product of the current and the voltage. As the current through a capacitor is always at 90° to the voltage, the vector product is always zero, so an ideal capacitor cannot dissipate heat. It is only possible to dissipate power in the resistive part of impedance.

The old-fashioned term 'wattless current' is sometimes found to describe that component of a current which is in quadrature with the voltage.

If a resistor and a capacitor are put in series with an AC voltage source as shown in Fig 2, the same current must flow through both, so it is going to be interesting. The capacitor wants the current at 90° to the voltage, whereas the resistor wants the current in phase with the voltage. As there is only one current, the only possible solution is that the voltages across the two components must be in quadrature.

If we take the case where the impedance of the capacitor is numerically equal to the resistance, the voltage across both must be the same because we have a potential divider. However, these voltages must be at 90° phase to one another as Fig 2 also shows. The voltage across each component is somewhat more than half the input voltage, so that the vector sum can equal the input.

Compared to a resistive divider, the voltages have increased by the square root of two, which happens to be twice the cosine of 45°. Thus if 1V rms is applied across the series pair, the voltage across each will be 0.707V rms. Compared to the applied voltage, the phases across the components will be 45° away, one leading and one lagging.

This situation can only arise at one frequency. At very low frequencies, the impedance of the capacitor is very high, so most of the applied voltage appears across it. At very high frequencies, the impedance of the capacitor is very low, so most of the applied voltage appears across the resistor.

Thus we have stumbled across the filter. Fig 3a shows that we can rearrange the circuit to take the output across the resistor, creating a high-pass filter, or across the capacitor, creating...
To capacitor and (in which all the capacitor are known, but phase response
network, the frequency where the half of power and where
input, input voltage capacitor output example of solving
corner hypotenuse. Thus the voltage across the pair remains constant. Thus
between a resistor have
Fig. 4: LFP phasor diagrams
...c.f
Rt
...c.f
LFP phasor diagrams
a low-pass filter.
Fig. 4 shows that the phase angle between the voltage across the resistor and
the voltage across the capacitor must remain at 90°, and the voltage across the pair remains constant. Thus
the phasor diagram will be any right-angled triangle with a constant
hypotenuse. It will be seen that the third corner of all such triangles falls on a
circle of which the hypotenuse is a radius.
This gives a neat graphical way of solving RC problems. Fig. 4 shows the
typical example of a low-pass filter where the output is taken across the capacitor. At
low frequencies, the impedance of the capacitor is so high that almost all of the
input voltage appears across it. The output voltage is nearly in phase with the
input, and almost independent of frequency. This is the passband. At high
frequencies, the impedance of the capacitor is low and inversely proportional to frequency. This is the stopband
where the output falls at 6dB per octave, and lags the input by nearly 90°.
The -3dB point is of importance in electronics because it represents the half power point and also, in a simple RC network, the frequency where half of the phase shift has taken place—the phase response is 45°. It is also the frequency where the impedances of the capacitor and the resistor are equal magnitudes. The frequency is easily found if the values of the resistor and the capacitor are known, but in practice all that matters is the product of the two, which is known as the time constant.
Fig. 4 shows that the -3dB frequency (in radians per second) is simply the
reciprocal of the time constant in. To convert this to hertz, simply multiply by 2π. To
plot the response of an RC circuit, find the -3dB frequency, and the response will be flat on one side, and sloping at 6dB/octave on the other.

In the case of the simple RC low-pass filter, the response may be only required to go down so far, and then level out to make a shelf filter. This is easily done with the configuration of Fig. 5a. Here it will be seen that an
additional resistor R/2 has been put in. The two resistors are in series and so the time constant will be
(R1 + R2).
When the impedance of the capacitors gets very low at high frequency, the series combination of the capacitor and R2 cannot fall below the value of R2. As a result the frequency response levels out at frequency where the descending -6dB octave curve intersects the level which would be obtained with R1 and R2 alone used as a potential divider.
If the two frequencies are well apart, the slope between will reach 48dB/octave. However, if the two frequencies are brought close together, the slope between will have a lower value and will tend to an s-curve. In a simple high-pass filter, the gain is
non-proportional to frequency. This response can also be shelved by adding another resistor as is shown in Fig. 5b.

Filters of this kind only perform as advertised if two conditions are met:
1. Firstly the output impedance of the signal source must be low so that it is essentially a voltage source. This is because the input impedance of these filters varies with frequency. Secondly the input impedance of the load must be high because the output impedance of these filters also varies with frequency.
2. If these conditions are not met, the expected result will not be obtained because the impedances of the source and load will affect the low and high frequencies. A solution is to use some of those funny triangles, which seem to be drawn all over analogue circuits.

It has been shown that it is possible to predict the performance of simple RC networks with no more abilities than to multiply by π or to draw a circle. Maybe this stuff isn't so complex after all. 

Fig. 5: Filters can be shelved by fitting an extra resistor to stop the impedance of the capacitor dominating the response.
Is all property theft?

A freelance sound recordist is having a spot of money-trouble with a client, so he visits a lawyer. 'How much do you charge for advice?' he asks. 'Five hundred pounds for three questions' says the lawyer. 'Wow, that's a bit steep isn't it?' cries 'Maybe—so what is your third question?' retorts the learned friend.

POCRYPHAL, yes, but it can at times feel like there are many services to cross to recover money from a client who engages us and then steadfastly refuses to pay with fanciful excuses for the delay. There are several areas in the nature of freelance life that leave the location recordist exposed to financial risk—bookings can be relatively short-notice affairs secured by a telephone call, and, of course, at the end of the day the client goes away with the fruit of you and the cameraman's labours. While the location industry generally gets by in operating on this 'phone-call and handshake basis, it is a situation that gives rise for concern with Professor Anthony Arnall of the School of Law at Birmingham University who recommends that while the verbal engagement may be construed as a contract between you and your client, at the very least 'given the sometimes short-notice nature of the industry, a written confirmation faxed back to you with details of the booking and the agreed rate would take up very little of your clients time and certainly strengthen your position should a dispute arise that requires you to resort to legal proceedings'.

If you do find yourself in this position rest assured that you are not the only one having to pursue errant clients through the courts. Last year, the Broadcasting, Entertainment, Cinematograph and Theatre Union (BECTU) recovered well over £100,000 for its members ranging from low hundreds of pounds for a day or two's work up to thousands of pounds for larger projects. 'A significant proportion of the Union's time is taken up by the recovery of fees owed,' says Trish Lavelle, a National Official of BECTU. 'Our advice to members is to always obtain written confirmation of a booking, including details of agreed rates and hours, so that no misunderstanding can occur. She continues, and if a member is uneasy about some aspect of the work we are only a phone call away.'

But while it may not be possible for you to retain possession of your material physically—a Director will probably want to take those shoot tapes straight away to begin editing—you do by default become the owner of something very precious indeed: the copyright on the soundtrack that you made, and, as Thomas Aldrich dryly observed from a time long before television—'The possession of gold has ruined fewer men than the lack of it.'

Copyright law can be complex, and it is a specialised legal area, but there are some basic principles that can be established. In Britain, the Copyright, Designs and Patents Act 1988 starts out by defining a number of categories of work that are afforded copyright protection. These are: original literary, dramatic, musical or artistic works; sound recordings, films, broadcasts or cable programmes and typographical arrangements of published editions. The act further strengthens your protection as a recordist by outlining that the principle of ownership of a sound recording rests with the person who facilitated the necessary arrangements for the recording to be made. In this instance, the copyright may be considered as property, to be sold, assigned or licensed like any other form of property.

For the Sound Recordist, the ideal contract would enable them as the owner to license the use of the soundtrack, in the case of a television programme, to one television broadcast with a continuing royalty for future repeats; for your client the ideal contract is often known as a 'buy-out'.

Neil Hillman.

For the Sound Recordist, the ideal contract would enable them as the owner to license the use of the soundtrack, in the case of a television programme, to one television broadcast with a continuing royalty for future repeats; for your client the ideal contract is often known as a 'buy-out'.

'Buying' is a term that comes from the world of history and generally means purchasing something that is held under a certain legal description. The advantage of a buy-out in the context of a freelance contract is that you can fix the territory of your property and the client pays for the use of that property. A 'Buy-out' is a contract stating that the property purchased is entirely paid for, and that the future royalty fees are not owed.

For example: a client who engages a recordist to record a soundtrack for a television programme pays a fee for the service. The recordist will record the soundtrack and deliver a master tape to the client. The client keeps the master tape and pays the recordist for their services. The recordist is left with a master tape that has no further value to them and they have no further control over the use of the master tape. The client, on the other hand, can use the master tape for future repeats.

In this case, the client would be paying for the use of the property for an agreed number of repeats. The agreement would state the number of repeats that the property can be used for and the client would pay for the use of the property for that number of repeats. The recordist is left with a master tape that has no further value to them and they have no further control over the use of the master tape. The client, on the other hand, can use the master tape for future repeats.

For example, if a client engages a recordist to record a soundtrack for a television programme and pays a fee for the service, the recordist will record the soundtrack and deliver a master tape to the client. The client keeps the master tape and pays the recordist for their services. The recordist is left with a master tape that has no further value to them and they have no further control over the use of the master tape. The client, on the other hand, can use the master tape for future repeats.

In this case, the client would be paying for the use of the property for an agreed number of repeats. The agreement would state the number of repeats that the property can be used for and the client would pay for the use of the property for that number of repeats. The recordist is left with a master tape that has no further value to them and they have no further control over the use of the master tape. The client, on the other hand, can use the master tape for future repeats.

For example, if a client engages a recordist to record a soundtrack for a television programme and pays a fee for the service, the recordist will record the soundtrack and deliver a master tape to the client. The client keeps the master tape and pays the recordist for their services. The recordist is left with a master tape that has no further value to them and they have no further control over the use of the master tape. The client, on the other hand, can use the master tape for future repeats.

In this case, the client would be paying for the use of the property for an agreed number of repeats. The agreement would state the number of repeats that the property can be used for and the client would pay for the use of the property for that number of repeats. The recordist is left with a master tape that has no further value to them and they have no further control over the use of the master tape. The client, on the other hand, can use the master tape for future repeats.
INTRODUCING THE MACKIE D8·B.
DIGITAL MIXING DEFINED.


Woodinville, WA, USA
Phone 800/898-3211
www.mackie.com
"I knew it could be all over one day...

...until I used the Aphex Dominator."

As a musician, you’ve got to take care of your ears, which is why I always insist on guaranteed protection for our in-ear monitor systems - for myself and my band.

The Dominator allows the audio to hit an exact maximum point above which the level does not go any higher. Other devices may effectively limit the signal, but the resulting sound may not be a faithful reproduction of the original. If you’re looking for complete protection, as well as true fidelity, the Aphex Dominator is the only choice for ear monitors. Don’t gamble with your ears— they’re your most precious instruments.