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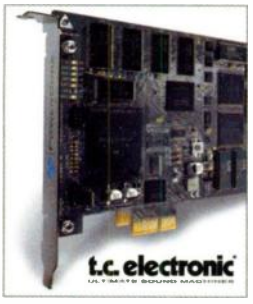

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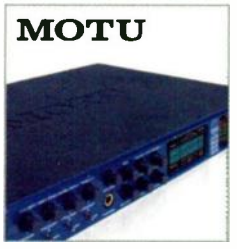

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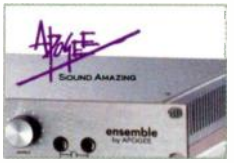

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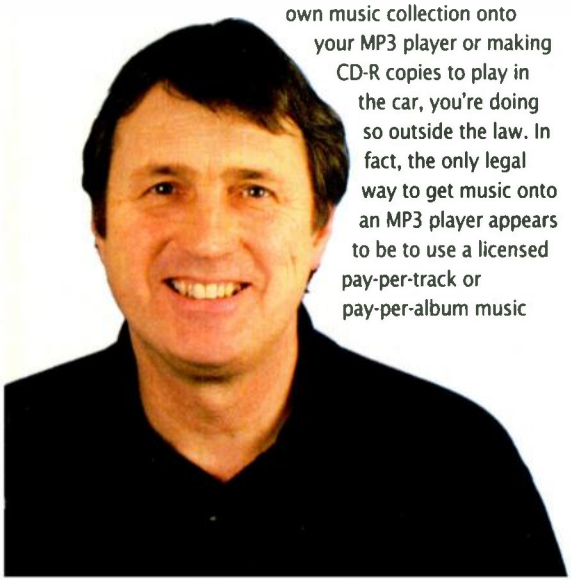
When Rights Are Wrongs

There's bound to be a conflict of interest between what musicians believe their rights over their music ought to be and what the music-using public thinks. Clearly, wholesale music piracy is a non-viable situation, but at the same time, does it really affect the record companies' revenue in the long term if you make a copy of one of your CDs for a mate to listen to? Most of us buy paperback novels and then pass them on to other people to read when we're done, and though no physical copying is involved in this case, it still amounts to a sharing of the same intellectual property. Of course you need to know where to draw the line, but the record companies' assertions that they lose the full value of a CD every time one is copied are also clearly ludicrous. It's more likely that the real loss of sales is more or less balanced by the free promotion music sharing gives to their artists — certainly something that anyone outside of the chart brigade desperately needs.

These are some of the issues being considered by the National Consumer Council, or NCC, who have pointed out that the present laws are not only unworkable but also very unclear. For example, how many of you knew that it was illegal to copy your own vinyl or CDs onto other formats, even if only for your own use? According to an NCC survey, over 50 percent of those interviewed believed that making copies of CDs you've purchased for your own use was fine. Apparently, though, the wording of the present rules implies that even if you're only putting your own music collection onto your MP3 player or making CD-R copies to play in the car, you're doing so outside the law. In fact, the only legal way to get music onto an MP3 player appears to be to use a licensed pay-per-track or pay-per-album music download site such as iTunes. The only other mitigation for copying music or other copyright material is apparently for critical or research purposes, but I can't imagine this gives every musician on the planet *carte blanche* to copy everything on the grounds that they need it to research their playing technique!



The NCC would like all these rules revised so that consumers know exactly what they are allowed to do with music they've purchased, and this would presumably include some provision for fair use copying. Their recent submission to the Government's Gowers review panel suggests that 'the law is out of step with modern life and discriminates unfairly against consumers, putting unrealistic limits on their private listening and viewing habits'. The NCC's submission also challenges the current long periods of copyright protection and suggests that the length of all copyright terms should be 'reduced to fit more closely the time period over which most financial returns are normally made'.

This is clearly at odds with the ongoing campaign by the record industry to extend the copyright period for sound recordings beyond the current 50 years. The NCC suggest that record companies generally make returns on material in a matter of years, not decades, and that even the current terms are unfair on consumers.

Obviously there are two sides to every argument, but my own view is that once I've paid for a piece of music in one form, there's no reason why I shouldn't copy it into any form I like as long as it is for use only by myself and my family. I even resent paying the copyright portion of a CD cost when I already own the vinyl version, because to me, that means I've already paid for the right to listen to that piece of music. As most of you are both musicians *and* music users, I'd be interested to hear your views on the subject.

Paul White *Editor In Chief*

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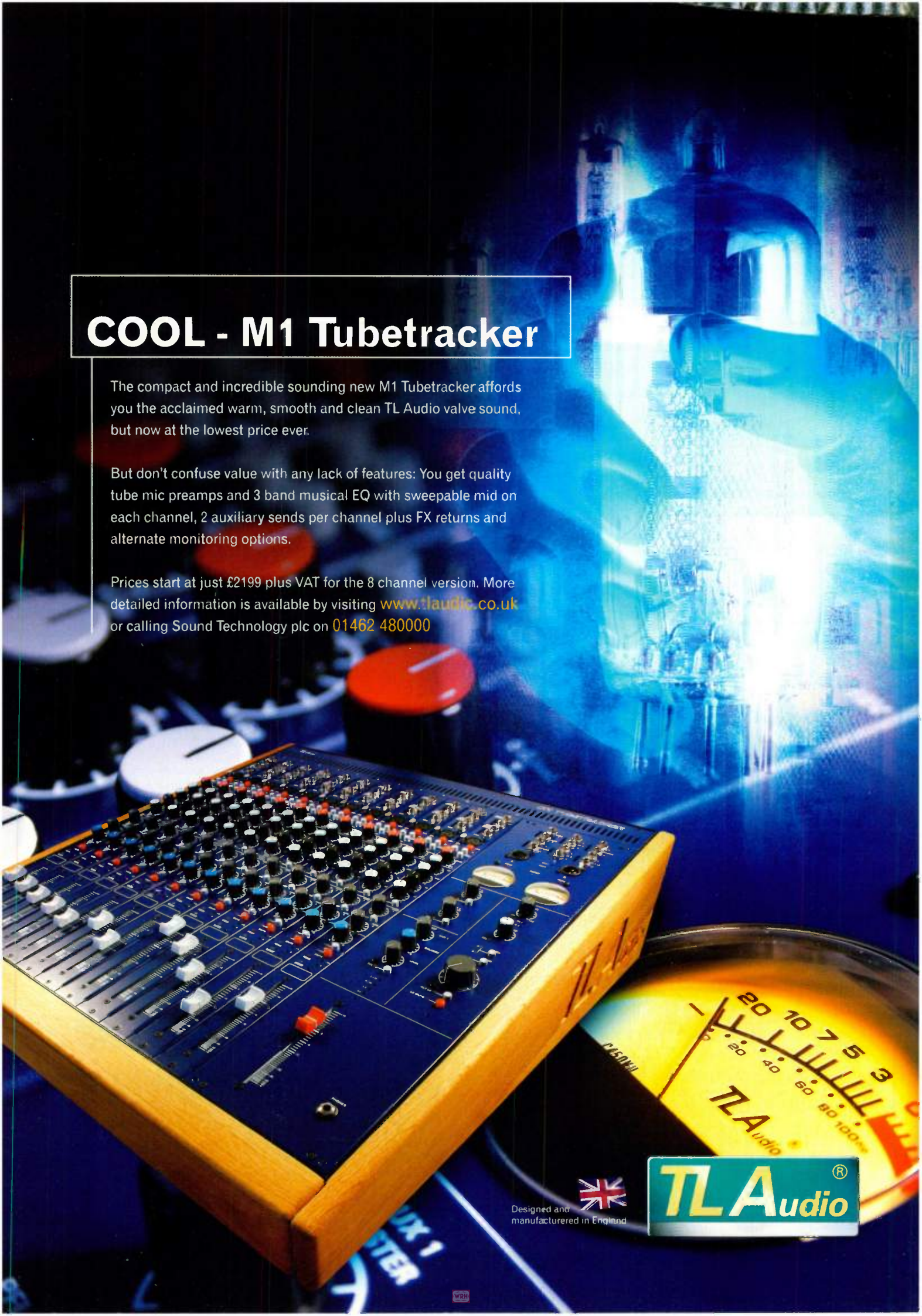
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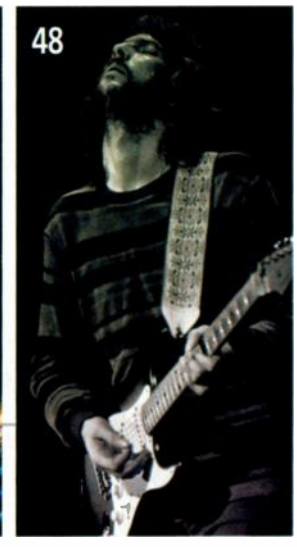

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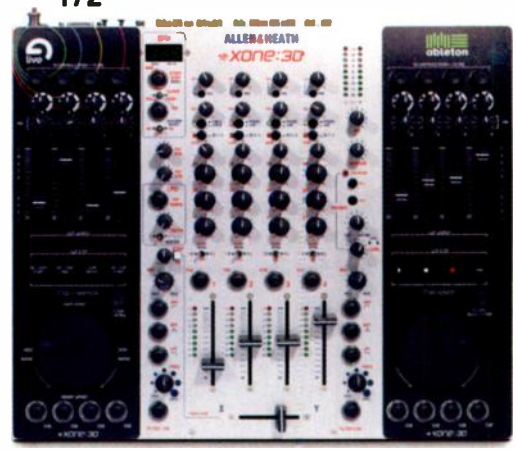

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Audio-Technica update Artist series

Audio-Technica have announced updates to their cost-effective Artist microphone series, adding three new models. The ATM450, pictured below, is an unusual side-firing small-diaphragm condenser, which boasts a frequency response of

40Hz to 20kHz and a dynamic range of 127dB. Its design is perfect for getting into tight spots, making it ideally suited for miking toms. It will cost £152 and should be available in September. The ATM650, below, which will retail for £93, is a hypercardioid dynamic model

designed for miking guitar cabs, snare drums and other percussive instruments. It handles frequencies between 80Hz and 17kHz, has a rugged, all-metal body and should also be available in September.

A cheaper version of Audio-Technica's unique AE2500 dual-element kick-drum microphone — which was reviewed in *SOS* December 2003 (www.soundonsound.com/sos/dec03/articles/atae2500.htm) — has also been added to the Artist series. The ATM250DE (below) features a similar configuration to that of the AE2500, with a large-diaphragm dynamic capsule and small-diaphragm condenser capsule arranged one above the other. The microphone has a frequency response of 40Hz to 20kHz and a maximum input SPL of 148dB. It will be available later in the year, at a cost of £234.

Lastly, new accessories have been unveiled for the ATM350 miniature cardioid condenser microphone, in the form of a violin mount, which supports the mic above the strings between the bridge and tailpiece of the instrument, and the Unimount clip-on gooseneck, which allows versatile positioning options. They both ship with the mic, which costs £211 including VAT. More information can be found on Audio-Technica's web site.

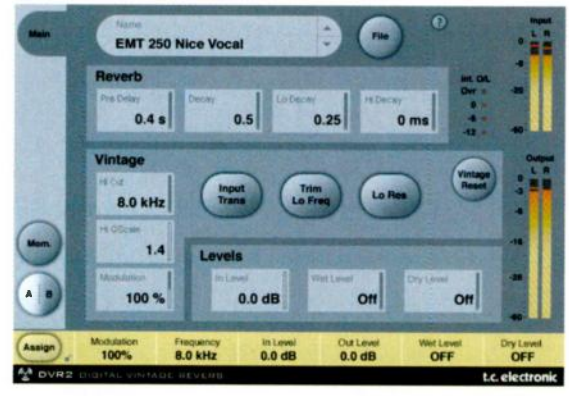
Audio-Technica UK +44 (0)113 277 1441 www.audio-technica.co.uk

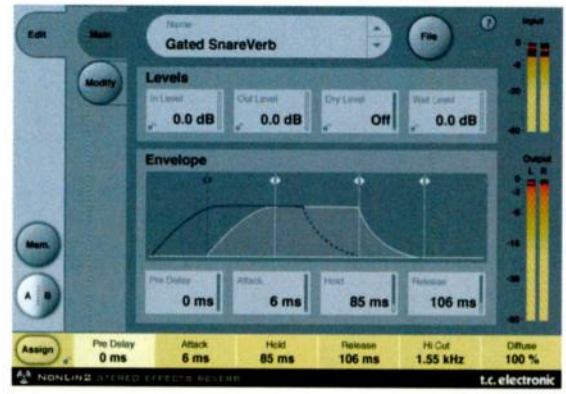
TC Electronic reverbs available for Pro Tools

TC Electronic have announced that two more of their Powercore reverb plug-ins, *DVR2* and *Non Lin 2*, are now available for use with Pro Tools HD systems. The plug-ins, which have been ported directly from TC's flagship System 6000, are compatible with Pro Tools HD on both Mac and PC and can also be used with Digidesign's Venue live sound environment.

DVR 2 (short for Digital Vintage Reverb) costs £529 and emulates the classic EMT 250 reverb unit, providing a sound that is popular for lead vocals. *Non Lin 2* is an 'effects reverb', which acts as a versatile effect on any track. It has a gate, a reverse function and a 'twist' parameter, which radically changes whatever sound it is processing. It costs £423 and is available now.

The latest addition to TC Electronic's hardware range is the C300, a 1U dual-engine dynamics processor, which has analogue and digital I/O and provides both full-band and multi-band compression. Each channel features 16 compressor/limiter presets and 16 gate/expander presets, alongside the usual line-up of threshold, ratio, release and make-up gain controls. There's also a mix knob that lets you blend the dry signal with the compressed signal for parallel compression. The unit can be used in either dual-mono or stereo serial mode — the latter allows you to chain the two engines one after the other. It's available now, at the very reasonable price of £187 including VAT.





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www.tcelectronic.com

Line 6 go wild in Texas

Following this Summer's NAMM show in Austin, Texas, we have information about new products from Line 6. The latest addition to their desktop studio range is the Toneport KB37 keyboard/interface, which is essentially a Toneport USB 2.0 audio interface with two phantom-powered mic preamps, packed into a 37-note controller keyboard. This retro-looking unit (pictured above) comes with the same *Gearbox* guitar-, bass- and vocal-effects software as the existing Toneport range, and is compatible with Mac and PC. The software includes 18 guitar-amp models, five bass-amp models and 30 stomp-box effects, along with studio effects and mic-preamp models. Further optional upgrades can be bought, to add all the Pod XT and Vetta models. The system makes use of Line 6's Tone Direct monitoring, enabling guitarists to monitor via the software without latency. The hardware includes stereo digital S/PDIF out, patch-select and transport buttons, and four assignable control knobs, as well as conventional pitch-bend and modulation wheels. There's also a pedal input for controlling *Gearbox*'s wah-wah and volume effects. Toneport KB37 will ship with Ableton's *Live Lite 5* and is projected to cost under £300. It is expected to be in the shops later this year.

Line 6 have also introduced the Floorpod, which combines Pod 2 modelling and controls with three footswitches and a pedal. The Floorpod offers 12 of the most popular amp and cab models from the Pod 2, alongside on-board effects processing. There are 64 custom-made presets, a tuner and stereo line inputs and outputs. It is expected to be available some time in the autumn.

Also expected around that time is the Guitarport XT, a basic USB audio interface for Mac and PC that ships with *Gearbox 2*. The Guitarport XT offers 18 amp models, 24 cab models and 28 studio and pedal effects, as well as a chromatic tuner, hum reducer, metronome and riff-looper, which has half-speed playback capability. Using an Internet connection, Guitarport On-line members can access a library of guitar sounds and play-along tracks.

Finally, for those computer users who would rather have Pod-like features in plug-in form, there will shortly be VST, Audio Units and RTAS versions of *Gearbox* available with a Toneport USB-equipped DI box, which doubles as a simple stereo line-level audio interface. Silver and Gold bundles will be available, with different numbers of amp and cabinet models on offer. The more costly Gold bundle comes with what amounts to all the existing Pod XT model pack upgrades. For more information, visit Line 6's web site.

Line 6 Europe +44 (0)1327 302700
www.line6.com

Micro BR four-track portable recorder from Boss

Boss have unveiled the Micro BR, a new portable four-track recorder that will cost just £169. It features MP3 playback and recording capabilities, with the ability to time-stretch files in real time without changing pitch, and has on-board multi-effects, a tuner and almost 300 rhythm patterns. Each of its four playback tracks has eight virtual tracks, allowing multiple takes to be recorded up to a possible total of 32. The unit can record two simultaneous inputs, with stereo line and mic connections on a single mini-jack, a quarter-inch instrument input and built-in microphone. Headphone and line outputs share a stereo mini-jack and there's a socket for a DC power supply (not included). The unit can be battery-powered.

The Micro BR records to the Secure Digital (SD) card format and a 128MB card comes as standard. Larger cards can be purchased separately. USB compatibility allows the Micro BR to be connected to a computer so that files can be uploaded and downloaded, and backups can be made to free up memory.

The unit measures just 136 x 81 x 22mm (WxHxD), so is ideal as a portable scratchpad for musicians on the move. More details are available from Roland's web site. The Micro BR should be shipping in October.

Roland UK +44 (0)1792 515020 **www.roland.co.uk**

Neve go Nuclear with new Powerstation console

Last month we reported on AMS Neve's new 8800 range of analogue outboard equipment and reviewed the 8816 summing mixer and 8804 fader pack. But it seems that Neve have had their fingers in other pies of late.

Their latest console is the DFC PS1 'Powerstation', a slimmed-down version of the DFC Gemini, which has become very popular for film and high-end post-production in the past few years. The Powerstation is designed for single-user operation and has flexible, high-resolution TFT metering on three large displays, located where a conventional meterbridge would usually reside. It supports sample rates of 48, 96, 192 and 384 kHz and has a comprehensive monitoring section with surround capabilities. It also handles machine control and can be configured to interface with Pro Tools systems, using the optional PT MADI converter.

Other configuration options are available, but the Powerstation ships as standard with a Neve 8800 A-D/D-A converter supplying 24 AES-EBU inputs and outputs, a quad MADI card that allows four MADI inputs and outputs — with a total of 224 audio streams possible, using additional converters — and two XSP cards with Mezzanine expansion, which provide the console's DSP capabilities. It also features 24 analogue inputs and outputs and Neve's Encore automation hardware and software.

Further DSP and I/O options can be fitted at any time, and all additional units slot into the 7U rackmount engine, which is also included.

We haven't mentioned the price yet, but it will come as no surprise that the standard DFC PS1 costs around £93,400 including VAT. For full details, contact Neve or visit their web site.

AMS-Neve
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www.ams-neve.com

SSL purchase Sydec Audio Engineering

UK-based hardware manufacturers Solid State Logic have announced the acquisition of Sydec Audio Engineering, developers of the highly regarded Soundscape range of PC-based DAW products. The partnership is set to bring further functionality to the companies' current equipment ranges, as well as new joint-venture products. It is possible that SSL will be able to use Sydec's PC platform-development expertise and audio interface technology with their digital consoles (such as the AWS900), while the Soundscape systems may benefit from a control surface from SSL. At this early stage, it's all speculation, but we'll keep you up to date on any future developments.

www.sydec.be
www.solid-state-logic.com

Share your samples on-line

Producers and sound designers from the KVR Audio on-line community have launched sampletorrents.com, a new web site designed for the legal sharing of audio software and samples. The site uses the Bit Torrent peer-to-peer file-sharing protocol and has very strict rules when it comes to content of the torrents. Users must obviously have permission to distribute their content and the standard torrent etiquette issues apply, such as leaving a torrent running for other users after you've used it. If you're interested, it's well worth checking out the rules at the Sample Torrents web site before you register.

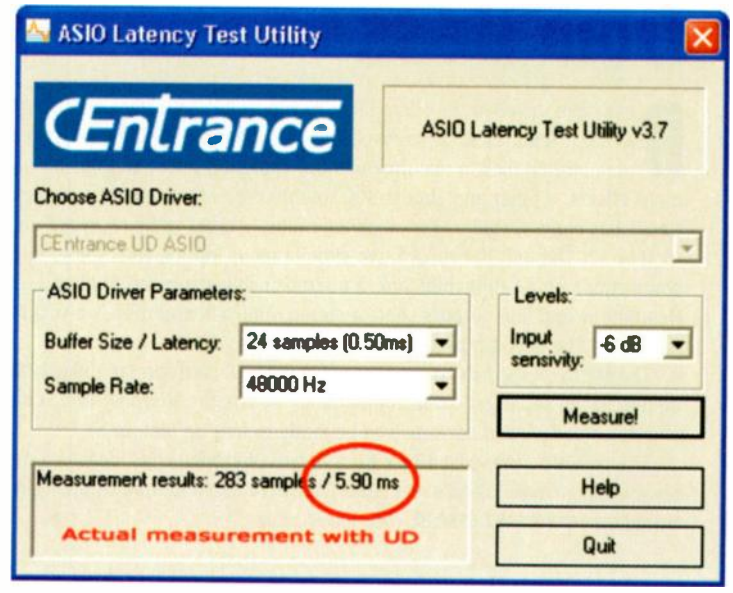
www.kvraudio.com
www.sampletorrents.com

Free PC latency test software from Centrance

So far, Centrance have gained a reputation as the brains behind *Universal Driver*, a software tool that allows PC users to use multiple Firewire audio interfaces simultaneously using a single driver (check out PC Notes from *SOS* January 2006 or visit www.soundonsound.com/sos/jan06/articles/pcnotes.htm). Centrance have now announced *Latency Test Utility* (*LTU* for short), another PC-only tool which, unsurprisingly, tests the internal audio latency of your computer setup. It measures the time that audio takes to make a round trip from input to output, and can be used to assess different hardware, drivers and applications.

LTU works by sending a signal through your audio interface and measuring the time it takes to return. An on-screen result is then given, with an accuracy of 0.5ms. The simple GUI also displays the latency in samples, and has options for input sensitivity, sample rate and buffer size. Unlike *Universal Driver*, *LTU* is free, and you don't need any host software. You do need Windows XP and at least one ASIO driver, though. *LTU* can be downloaded for free from Centrance's web site.

www.centrance.com



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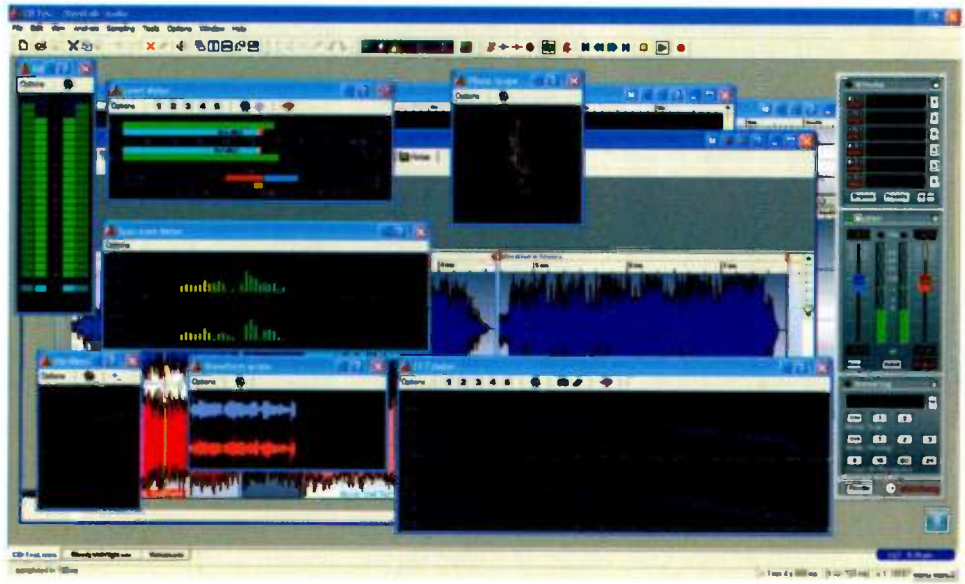

Steinberg have announced an upgrade to their *Groove Agent* virtual drummer software. The new version, *Groove Agent 3*, features two new player modules: Special Agent, which models a human studio drummer using real audio templates, and Percussion Agent, a tool for adding percussion to your groove. In its dedicated window, Percussion Agent has eight outputs, allowing eight simultaneous patterns (and variations) on different instruments including congas, bongos and claves. Each channel has its own shuffle, tuning and volume controls.

With version 3's new Dual Mode operation, any two of the three Agents can be used to create more complex rhythms, with parameters to control each sample's dynamics and variability. What's more, users can now import their own samples, and there's a new effects section, an updated compressor and a nine-band EQ.

The update has also tackled realism. With its Alternating Hits feature, *Groove Agent 3* automatically switches between samples to avoid repetition, while the Auto Fill feature generates fills to emphasise the natural feel of a human drummer.

Finally, there are now 10 stereo outputs to choose from, plus new styles and sounds from a range of genres of the past 50 years. *Groove Agent 3* will be shipping in September, costing £169.99. Registered users of *Groove Agent 2* will be able to upgrade to version 3 for £70.

Other news from Steinberg is the announcement of *Wavelab Studio 6*, a slimmed-down version of their popular audio editing and mastering software. It will contain a similar, but less comprehensive, range of tools to its more expensive sibling, and will use the same 32-bit audio engine. *Wavelab Studio 6* also has a selection of analysis tools (see screenshot above), alongside batch-processing and Red Book CD-burning capabilities. It will hit the shops in September, costing £230.

Arbiter Music Technology +44 (0)20 8207 7880
www.arbitermt.co.uk www.steinberg.net

Waves use Lord's presets

Audio processing software designers Waves have enlisted the help of Grammy award-winning producer Chris Lord-Alge to make new presets for the *SSL4000* collection plug-in bundle. Lord-Alge, who has produced hit records for the likes of Sheryl Crow, Green Day and Eric Clapton, copied the settings from his SSL 4000- series analogue console to create settings for the Waves bundle, which includes the *SSL G-Master Buss Compressor*, *SSL G-Equalizer* and *SSL E-Channel* plug-ins. The presets are available to all registered Waves *SSL4000* v1.1 users from the Waves web site.

Sonic Distribution +44 (0)1582 470260 www.sonic-distribution.com
www.waves.com

DP5 training on interactive DVD

Mac Audio Lab have announced a new tutorial DVD for MOTU's *Digital Performer 5*. The DVD is designed for users of all abilities and covers everything from arranging and recording to working with video. There are extra chapters on using *DP5* with *Mach Five*, BIAS *Peak* and *Cue Mix*, as well as TC Electronic's Powercore. The tutorial is authored in an interactive Quicktime format, so users require *Quicktime 7* or higher. It can be used on Mac and PC and costs $79.95 (around £43). For more information, and to order, visit Mac Audio Lab's web site.

www.macaudiolab.com

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Mackie bridge the gap with four-buss Onyx range

We first saw Mackie's four-buss Onyx mixer range at NAMM, way back in January 2005. Eighteen months later, it's ready to hit the shops. So far, the Onyx range has included the 1220, 1620 and 1640 Firewire-equipped compact mixers and the large-format 80-series live sound desks, alongside a handful of other gear including audio interfaces and multi-channel preamps. With the introduction of the new four-buss mid-sized desks, however, Mackie now have a full house of mixing consoles, spanning 12-channel desktop units, right up to 48-channel, eight-buss Behemoths for live-sound applications.

There are two products in the new four-buss range. The 24:4 features 20 Onyx preamps — which have a 60dB gain range, 'musical' EQ, individually switchable phantom power and phase-invert switches — and two stereo channels. The 32:4 (pictured) features the same architecture but adds an extra eight preamps to the 24:4's configuration.

Both desks feature four mono group busses, which are controlled by a set of long-throw faders; six auxiliary sends, which can all be selected pre- or post-fader; and a talkback and monitor section. There's also a 6x2 matrix for creating mixes from the subgroup outputs, alongside two stereo returns and the ubiquitous main mix fader. The master section also has a useful stereo buss compressor/limiter, the input for which can be routed from either group 1+2, 3+4 (both pre-fader), or from the main mix (post-fader). Its metering section shows input signal and gain-reduction on generous 12-segment LED bar-graph meters.

On the back panel, mic inputs are on XLR, with line inputs on TRS jacks. Unbalanced insert points can be found on all mono input channels, as well as on group and main outputs. Balanced direct outputs for each channel are on 25-pin D-Sub connectors, and are pre-fader but post-gain and post-insert. Internal jumpers determine whether they are pre- or post-EQ.

We don't have UK prices yet, but you should be able to get an idea from the US prices, which are $1850 and $2600 for the 24:4 and 32:4 respectively. We anticipate that the desks will be shipping by the time you read this.

Mackie UK +44 (0)1268 571212
www.mackie.com

TC-Helicon ship compact vocal monitor range

TC-Helicon, the sister company of TC Electronic that deals with all things vocal, have started shipping their Voice Solo range of compact vocal monitors designed for stage use. There are three units in the range: the passive VSM200P and the active VSM200 and VSM300, which both feature 150W amplifiers. All three have volume controls on the front panel, while the VSM200 has Line and Mic inputs and a line-level 'passthru' connection. The top-of-the-line VSM300 (pictured left) features an additional breakout box, which houses the connections for the mic and instrument inputs, an auxiliary buss and all outputs. It also features front-panel-mounted gain controls for line and mic inputs, high and low EQ bands and a switchable low-cut filter.

The VSM monitors can be mounted on a mic stand, and an extra boom arm can be attached to the top of each unit to allow close placement of a microphone. TC-Helicon's Voice Solo range is available now, costing £171, £259 and £341 for the VSM200P, VSM200 and VSM300 respectively.

Other news from TC-Helicon concerns an update to the software for their Voice Doubler vocal-harmony processing unit. Version 1.2 features new in-ear monitoring presets that aim to remove the unpleasant cranial resonance of a singer's voice. Also new with the software update is an edit control for the effect gate, alongside a portamento control, which adds realism to the Overdub voices. The update is free from the TC-Helicon web site, using the 'latest software' link on the Voice Doubler page.

TC Electronic UK +44 (0)800 917 8926 www.tc-helicon.com

Mike Elizondo interview correction

In our interview with Mike Elizondo in *SOS* June 2006, we stated that he 'single-handedly' produced Fiona Apple's album *Extraordinary Machine*. In fact, two tracks were produced by Jon Brion, while the rest were co-produced by Brian Kehew. Apologies for the confusion.

steinberg

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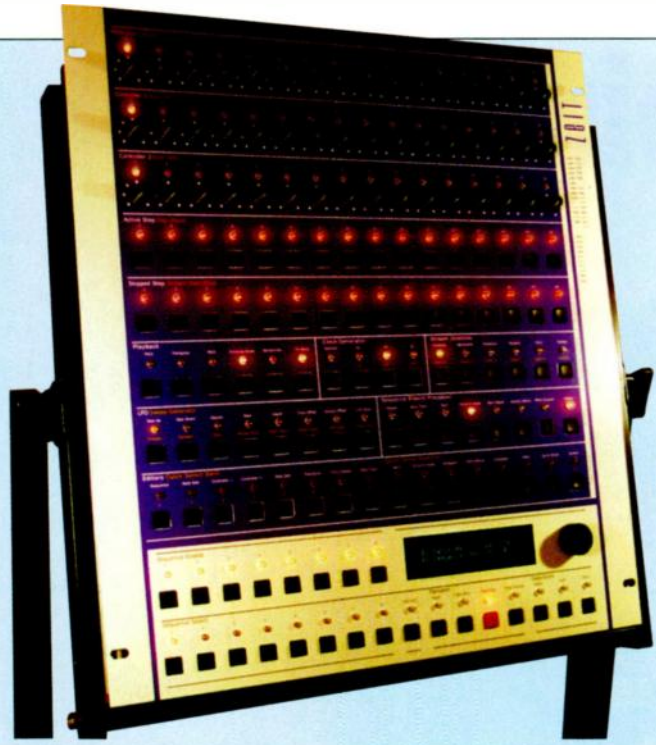


Holy Zeit!

A hardware sequencer

Hardware sequencers are becoming a rare sight these days, and the ones that do exist will set you back a bob or two. Infection Music's Zeit is an eight-track, 16-step MIDI sequencer that costs just over £1500: a bargain, if you ask us! Each track transmits three data streams: one contains note pitch and velocity data, and the other two MIDI Continuous Controllers. These can be derived from an LFO, a sweep generator or a multi-speed clock generator. Each step within the sequence can be routed to a MIDI effects processor, while note pitches can be transposed on-the-fly using any MIDI keyboard. There are 12 directional settings for each sequence, and the LFOs have a selection of wave shapes, as well as time and depth offsets. The sweep generator has a generous array of parameters and both LFO and sweep generator modules can be routed to note pitch and velocity, as well as the two MIDI CCs.

Zeit is still in beta-testing stages, but it is hoped that production models will be shipping soon. It will be available in two formats — as a 10U rackmount unit (above), or a neat desktop module with stylish wooden end-cheeks. A selection of expansion upgrades is planned, including a MIDI-to-CV converter and an additional MIDI output board. For the latest news, or to purchase the Zeit sequencer, head to Infection Music's web site.

www.infectionmusic.co.uk

VST 2.4 support for *SFX Machine*

In *SOS* July 2006, we announced that The Sound Guy Inc had introduced a *Pro* edition of their *SFX Machine* sound design plug-in. Sound Guy have now told us that both versions — v1.06 of the standard *SFX Machine RT* and v1.01 of *SFX Machine Pro* — will have VST 2.4 support, allowing native operation on 64-bit Windows machines. Mac versions are unaffected, as they run natively on both Power PC- and Intel-based machines. The latest versions are available from *SFX Machine*'s web site.

www.sfxmachine.com

Gateway opens in Clapham

The Gateway School of Recording have announced that they will be relocating to Clapham, South London from their current home at Kingston University in Surrey. The new premises, a four-storey warehouse building, have twice as much space as their current site, and its location will give students and staff easy access to central London. There will be a large live room servicing two control rooms — with two-inch analogue tape and Pro Tools TDM recording facilities — plus three smaller Pro Tools suites.

Various donations have been made, from the likes of McDSP, Abbey Road Studios and Wise Buddha Productions, and Gateway's goodie bag is now brimming with new stuff.

Gateway have revised their BA Honours Audio Technology and Music Industry Studies course, and are now validated by City University, which has a good record for graduate employment. Their relocation also makes them the only official Digidesign Certified Training Centre in South London, offering Pro Tools 101, 110M, 201 and 210M courses. What's more, as part of a promotion with Digidesign, an M Box 2 will be given to the student who gets the highest score for the Pro Tools Operator certificate.

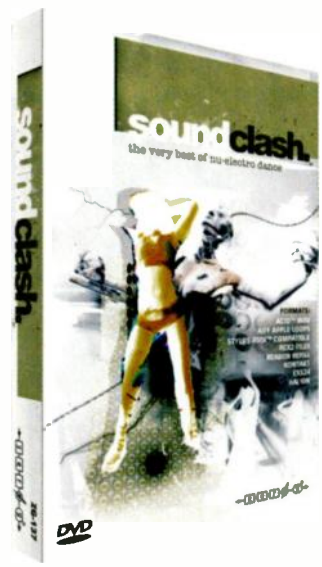
Gateway's new facilities will be ready in mid-September for the start of the new academic year. For more information, visit their web site.

Gateway School of Recording +44 (0)870 770 8816

www.gsr.org.uk

Zero-G release *Soundclash*

The latest offering from Zero-G is *Soundclash*, a collection of electro and dance loops and samples. *Soundclash* contains 1650 samples of live guitar, percussion, bass, analogue synths and programmed drums, plus countless single hits and sound effects.

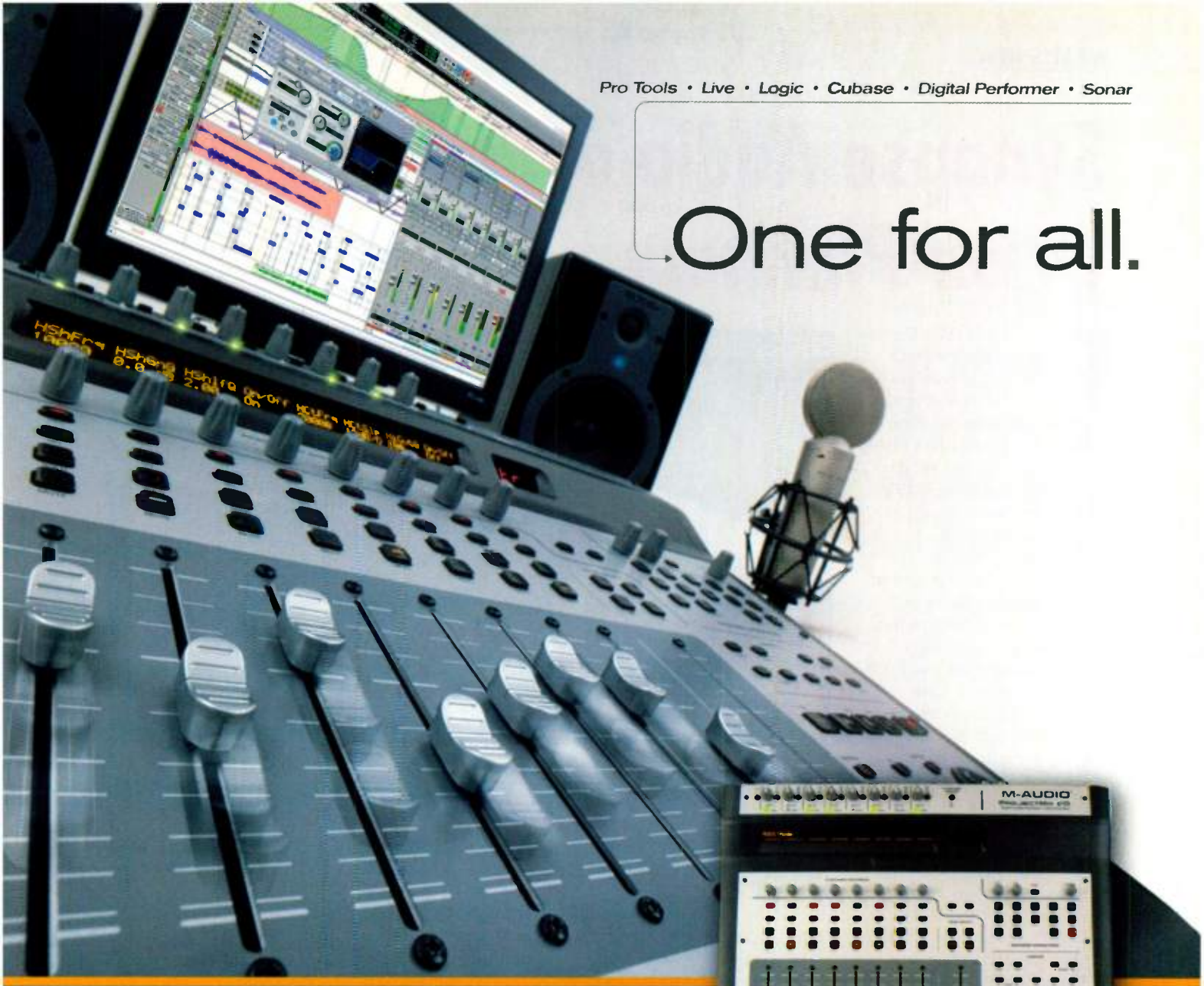


It's compatible with *Stylus RMX*, *Reason*, *Kontakt* and *Halion*, but also comes in *Acidised* WAV, Apple Loops, REX 2 and *EXS24* formats. The whole set costs just £59.95 and is a must for any discerning electro producer. Zero-G's range is distributed in the UK by Time + Space.

Time + Space Distribution

+44 (0)1837 55200

www.timespace.com **www.zero-g.com**



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Synapse Audio announce *Orion Platinum 7*

Synapse Audio's *Orion Platinum* software studio suite for Windows has received an update. *Orion Platinum* v7 now features an analogue-modelling distortion pedal, new multisampled patches for the sampler and drum rack modules and the new *Toxic III* FM soft synth, which replaces the previous model, *Toxic II*.

Orion is very much like Propellerhead's *Reason* in concept, in that it features a variety of different sound modules, such as the *Tomcat* drum synthesizer, *Ultran* 'wave-morphing' sampler and *Wasp* virtual analogue synth. However, it also has a convolution reverb plug-in with impulse response processor — allowing you to create your own responses — and Groove Slicer, a tool that lets you cut up drum samples and rearrange their position.

Orion only works on PCs running Windows, but has very low system requirements. You'll only need a Pentium 3 processor with 128MB RAM and 100MB of hard disk space.

The price is low, too. *Orion Platinum* costs just $299 from Synapse Audio's web site, which works out at around £162. You can find more information in our review of *Orion Platinum* v3.8.5 in *SOS* July 2003 (www.soundonsound.com/sos/jul03/articles/orionplatinum.asp), although for all the new features in version 7, check out Synapse Audio's web site.

www.synapse-audio.com

Sonic Reality get groovy

Sonic Reality, the company behind countless *Reason* Refills, have announced a new series of sample sets called REX Packs. As the name suggests, REX Packs contain REX files of drum and percussion grooves as well as instrument loops and construction kits. Each Pack has hundreds of carefully sliced 24-bit files for use with any REX 2-compatible DAW or sampler.

Initially, six titles have been released, with more to follow. The following are available now: *Vintage Soul Grooves*, *Dirty South*, *Drum & Bass*, *Sixties MTown Grooves*, *Vintage Rock Grooves* and *Nashville Pop Grooves*. They are available on-line from www.esoundz.com, costing $79 each, which works out at about £43.

www.sonicreality.com

Hitsquad launch new web site

Internet-based resource centre Hitsquad have launched a new site, Musician Tutorials, which has advice on everything from recording and songwriting to DJ'ing and band promotion. Hitsquad also have affiliations with other web sites for musicians — Musicians Available (www.musiciansavailable.com) and Musicians' Books (www.musiciansbooks.com). Check out the web site each week for the latest advice.

www.musiciantutorials.com **www.hitsquad.com**

Beyer team up with Dynacord in the UK

Beyerdynamic have become sole distributors of Dynacord products in the UK. Dynacord's equipment range mostly covers live sound and DJ applications and includes the popular Powermate powered mixer range and the COBRA series compact line array.

Beyerdynamic +44 (0)1444 258258

www.beyerdynamic.co.uk **www.dynacord.com**

AMG contact details correction

In last month's issue, we misprinted some of AMG's contact details. Here are the correct ones:

T AMG +1 561 282 6257
F +1 561 282 6905
E matt@amguk.co.uk
W www.samples4.com

Make Kontakt with *Kim*

I can't remember how many times I've wished for a multisampled Thai dulcimer at my fingertips. Now, with Sonic Couture's *Kim*, I shall fret no more. *Kim* is an instrument for *Kontakt 2* that contains 184MB of 24-bit/44.1kHz audio samples of the Thai dulcimer — which is similar to the Chinese yangqin — with a total of 137 files recorded at different velocities. *Kim* costs just £20 and is available for download from Sonic Couture's web site.

www.soniccouture.com

Roland tour with Fantom X

Roland have announced that they will tour the UK to demonstrate their popular Fantom X range of workstation keyboards, visiting 21 hi-tech equipment retail stores in England and Scotland during September and October. The Fantom X keyboard range — which consists of the Xa, X6, X7 and X8 — is popular on the professional circuit, with the likes of Embrace, Basement Jaxx and Pharell Williams using them on stage.

Those who attend the tour will automatically be entered into a prize draw, in which the winner will receive one of Roland's new SH201 synthesizers. For full details on tour dates and locations, and prize draw details, head to www.roland.co.uk/xtour.

Roland UK +44 (0)1792 515020
www.roland.co.uk

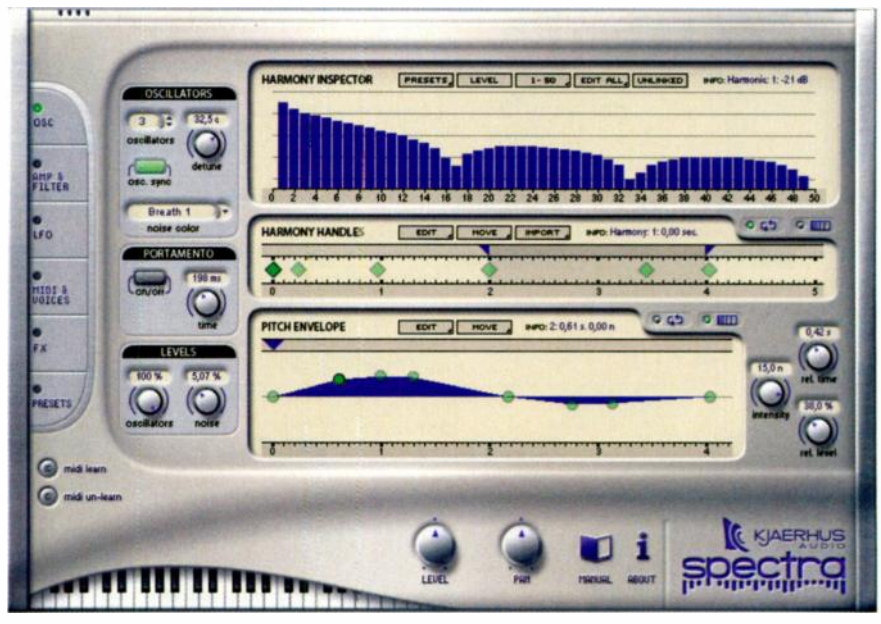
Kjaerhus update *Spectra*

Danish software developers Kjaerhus Audio have announced an upgrade to their *Spectra* synthesizer plug-in. *Spectra* is a tool created for sound designers that uses both additive and subtractive synthesis methods to make everything from plain vanilla synth sounds to resynthesized noises and unusual morphed effects.

Spectra possesses 12 analogue-modelling filters, two LFOs and five envelope generators with looping and time-stretching capabilities. Its graphical user interface has a 'harmony inspector' that lets the user view and edit up to 100 partials, and a 'harmony handles' pane, which shows the different harmony states on a loopable timeline. There's also an effects section that features chorus/flanger, delay, phaser and reverb modules.

The latest version (*Spectra* v1.1) features 318 new presets from professional sound designers, but also tackles bugs that were apparent in version 1.0. The update is free to all registered users of *Spectra*, and a full version can be purchased for around £110 from Kjaerhus' web site. A 14-day trial is also available, which lets you try the software before you buy. Like other Kjaerhus Audio plug-ins, *Spectra* is PC-only, and you'll need either Windows 2000 or XP to run it.

www.kjaerhusaudio.com



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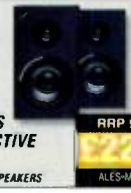

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Now having addressed that problem with the original AC-1 Audio Computer, we're going one step further with ***Total Integration*** We've used our reputation with suppliers to bring you the AC-1 ***ti*** – a world class audio PC with everything you need to make music from sequencing to scoring software, virtual instruments to controllers and top quality audio connections of all types totally integrated out of the box – just add a monitor. In addition to tweaking Windows to the max, we've optimised every PC component and application and ensured that everything works together completely smoothly and made it whisper quiet; and to get you up and running as quickly as possible, there's a comprehensive on-screen manual that covers the system as a whole including many easy to follow tutorials and troubleshooting guides. To top it all off, we've replaced the standard Windows desktop with our own super-clear interface that also keeps people from messing up your system.

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A Carillon FIX modem included with every system allows our engineers to direct-dial into your machine and fix problems live!

Perhaps the most remarkable thing about the ***ti*** though is the price. With configurations starting from only £799 including music hardware and software that would cost well over £1,500 if bought separately, and free support, it's an absolute steal – you can't say fairer than that. Call or check the website for latest specifications.

Sonar Studio

A World Class Music Creation Environment

Always the best selling sequencer in the States, Sonar is now finally being recognised in the UK for the great application it is, with a top-notch feature list including up to 500kHz /32bit recording, track freeze, full delay compensation, MIDI FX, Rewire compatibility, loop construction tools, genuine Lexicon reverb plus a bunch of synths and FX. And let's be clear here – this is the FULL version of Sonar Studio 4, not a cut-down 'lite' version. Above all though, we chose Sonar for the ti for its killer combination of class leading functionality and a superb user interface – it really is a cinch to learn.

SOFTWARE

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SampleLab Discography – another 5 star winner, full of house & breakbeat loops.

SampleLab Broken Beats – deep & dirty hip-hop, lo-fi & downbeat in full 24bit.

Sampling

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Keyboard Instruments

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Native Instruments FM7 Express – 64 great tweakable patches of classic FM.

Native Instruments Pro 53 Express – NI's first instrument - an utterly faithful reproduction of the classic Prophet 5.

Bread & Butter

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Emu MoPhatt X – All 512 patches from the MoPhatt - an urban legend!

Drum Machine

Rayzoon Jamstix SE – a software drum machine that actually plays along with your tempo and dynamics!

Synths

SampleLab Analog Archive – the rarest collection of vintage synths ever sampled in awesome quality.

Emu Vintage X Pro Volume 1 – over 2Gb of vintage classics from the legendary Vintage Keys.

SFX

SampleLab Spatial Awareness – 9/10 from Computer Music - chill-out and ambient sounds abound!

Orchestral

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Drum Hits

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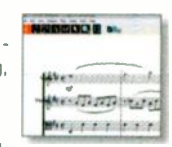

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N B Retail packaging is shown for illustration purposes only - all software and hardware is supplied pre-installed with on-screen manuals on

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HARDWARE

MindPrint Front End

To enable the *tl* to interface to almost anything though, we've commissioned a completely new drive-bay unit, the HP-Pre. This features a superb mic pre-amp and instrument level input designed by channel strip gurus MindPrint, which also supplies 48v phantom power to allow you to record with any mic you like, straight out of the box. In addition, there is also a very clean high gain headphone amp built-in, crucially featuring an 'audio thru' facility which means you can still have your main soundcard outputs available for speakers, and can switch between keeping them on if the headphones are being used for foldback, or turning them off if the rest of your household need a break from your latest masterpiece!

MIDI Controllers

Eight front panel MIDI control knobs are provided and are handily pre-set and labelled for the most popular synth editing parameters and also amp modeling controls for the included AmpliTube LE. Of course you can easily re-route these to control pretty much anything you like - really brings music making to life!

Transport Control

Front panel transport controls not only ensure you always have these vital keys immediately to hand, but also make the recording experience feel like you're using a dedicated piece of hardware.

Custom Keyboard

As well as the included optical mouse, there's also a QWERTY keyboard which we've custom made with all the Sonar shortcuts pre-printed in a clear colour coded system (Cubase and Pro Tools versions are optionally available) – great for getting to know your software quickly and easily.

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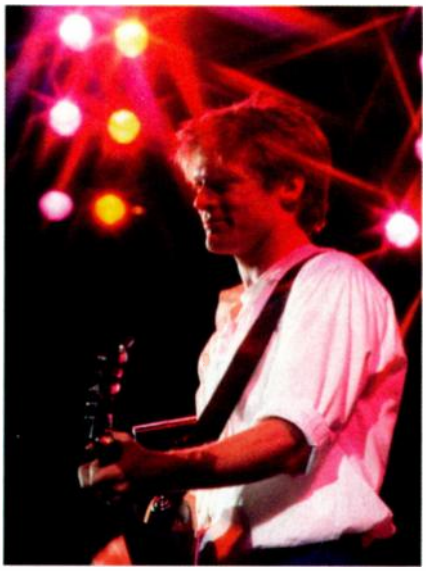
Visit the *SOS* Forums via www.soundonsound.com

Bryan Adams Writes...

I just read your excellent article on Bob Clearmountain's recollection of how 'Run To You' was recorded and how it ended up on the album. I just wanted to give you a minor update on how that song got recorded — as I remember it!

We had reached the critical stage on the album where we needed another song, and



Bob had asked me what others I had, so I pulled this song out while we were all together in the studio and we decided to give it a try. I taught it to the band and we went out and did a sort of trial take of the song. I can distinctly remember looking back into the control room and seeing Bob standing up smiling, so I went in to listen and it was really exciting. We decided to try one or two takes after that, but they weren't as good. Apart from re-doing my vocal (because I was shouting the changes to the band), and adding the odd guitar and percussion overdub, It's the first take of this song that you hear today. It was also the last song recorded for the album.

Hats off to Bob for producing me, and creating the amazing sound in that shit hole of a studio! I still to this day don't know how he did it, but that's Clearmountain for you.

On a musical note, 'Run To You' was co-written with Jim Vallance, and credit also has to go to Jim for the fabulous bass line in this song!

Bryan Adams

Mine's fine!

I enjoyed reading the latest issue of *SOS*, which arrived this morning. A reader was enquiring about the suitability of a Dell Inspiron 9400 as a music laptop and Martin Walker pointed out that it only came with a 5400rpm hard drive. I actually went down this route myself a couple of months ago and bought an Inspiron 9400, choosing a 7200rpm drive from the upgrade options that appear on Dell's web site. I'm pretty happy with the machine — not only does it have a great screen but it has a built-in subwoofer so the sound is of reasonable quality for a laptop. On the other hand, it took me several hours to remove all the useless bundled software that came with it. I then partitioned the drive the way I wanted it and it's working great.

The only problem I've had is with a Focusrite Saffire audio interface, which with a Macbook was absolutely silent, but with the 9400 has a hefty hum. This was almost certainly due to the Macbook having a six-pin Firewire socket which didn't need a wall wart to be used on the Saffire, whereas the Dell, in common with most PC laptops, only had a four-pin socket, and it was plugged into a four-way trailing socket that probably had lots of interference. I imagine that with a suitable six-pin Firewire PC card the problem will disappear. So, to summarise, if you can configure the Dell the way you want it and remove all the rubbish, it's a fine machine.

Jack Raymond

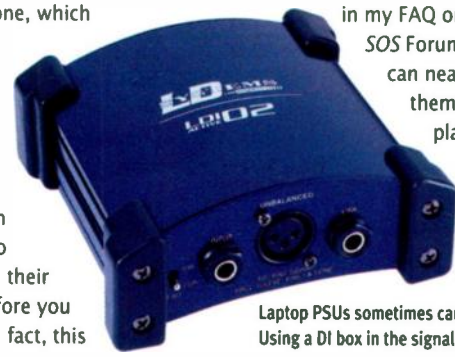
PC music specialist Martin Walker replies: Thanks for the feedback, Jack! All the reviews of Dell's Inspiron 9400 I read had an 80GB 5400rpm hard drive fitted, so I presumed this was standard. However, visiting Dell's web site confirmed that there are indeed various options available, including a 7200rpm hard drive of up to 100GB, optional 17-inch UXGA Wide Screen Ultrasharp display instead of the standard WXGA+ one, and a DVD+RW drive instead of the standard DVD-ROM one. Bear in mind, though, that fitting a 7200rpm drive is likely to reduce your battery life compared with that quoted in most reviews.

It seems that the days of a particular model number implying a certain specification are long gone, which also makes it even more important when seeking feedback on Internet forums. If, for instance, someone states that a Dell Inspiron 9400 works well for them with *Cubase SX*, you'd have to check what specification their particular model had before you got the whole picture. In fact, this business of customising laptops at the point of purchase can have other implications. For instance, I've known musicians to buy laptops from some dealers with a RAM upgrade that they had to fit themselves. This suggests that the RAM upgrade isn't supplied by the laptop manufacturer, which could have repercussions if you ever had to return the laptop to its manufacturer for repairs under guarantee. So, if you're buying a customised version of a laptop, always check that any modifications to the basic spec are still covered under your manufacturer's guarantee before handing over your credit card number.

Sadly, your experience of having to uninstall lots of trial software, special offers and so on (aka bloatware and rubbishware) isn't an uncommon one. Many laptop manufacturers are now pre-installing lots of largely unwanted items in an effort to provide better value for money, but they can prove absolutely infuriating, especially when they nag you to register, are pre-loaded into your system RAM without your agreement and have to be manually quitted.

Furthermore, some laptop models no longer ship with a Windows XP CD-ROM and driver CD-ROM. Instead they arrive with an image of the bloated install on a separate partition of your hard drive, making it more difficult to revert to a plain vanilla version of Windows. However, when you take the trouble to do this you may find your new laptop is noticeably nippier than it first appeared. One *SOS* Forum user I recently came across was convinced his laptop was faulty when he first tried it with *Cubase*, but was rather more enthusiastic about its performance after a software slimming regime!

To address your final point, about audio interface wall-warts resulting in hum, this may not be the case. Many wall-warts are double-insulated, requiring no mains earth connection, so plugging one in wouldn't result in ground-loop hum. The more likely culprit in this case is the earthing on the laptop PSU — Dell laptops are becoming notorious for causing such audio problems (I specifically mention other Inspiron models in my FAQ on this subject on the *SOS* Forums), although you can nearly always cure them with a DI box placed between the audio interface and whatever you plug it into. SOS



Laptop PSUs sometimes cause ground-loop hum. Using a DI box in the signal chain can cure it.

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Q&A

Your technical questions and queries answered

Q Are CDs suitable for long-term backup?

I'm wondering how reliable CDs are as a backup medium. Which are the best to go for and how do they differ? Also, how does the burn speed affect the quality of the CD? And what about using DVDs?
Enrique Fdez de Velazco Bernal

Technical Editor Hugh Robjohns replies: Well, there are quite a few issues to tackle here. Let's start with the first one — reliability. As far as I'm concerned, audio CDs are very reliable and they seem to have a relatively long and stable life. The format has been around since 1982 and the discs I bought over 20 years ago still play perfectly today, which is more than I can say for some old DAT tapes! However, audio CDs have relatively weak error protection, and if you are looking to archive audio masters, I would suggest storing them as audio data files on CD-R, rather than on their 'playable' audio CD equivalent. Besides being more robust, this would also allow tracks with word lengths above 16-bit and sample rates other than 44.1kHz. For archiving, make sure you have more than one copy, ideally stored in different places, and try to keep them at a constant (cool) temperature away from light — especially strong sunlight.

In response to your other points, the physical structure of CD-Rs is more or less identical, regardless of the recommended burn speed. The difference lies in the formulation of the dye layer — faster burn speeds require more reactive dye layers. Obviously, if you want to burn audio in real time you need a disc that can accommodate 1x speed, and slower burn speeds (below about 12x) generally produce more accurate discs with less data jitter, which work better as audio CDs. On the down side, the error protection is weaker in this format, so any help it gets from a sharper recording has to be good. Discs that can accommodate burn speeds between 12x and 52x are generally best used for data-only applications, where the stronger error correction can help counteract any deficiencies in burning precision.

Again, there is no physical difference, other than the chemical composition of the dye layer, but there are some CD-Rs specifically branded as audio CD-Rs and intended for use in consumer audio CD recorders. These differ from standard CD-Rs in that a code is stamped into the guide track on the disc. Some consumer CD recorders won't record unless they see this special code, which prevents the use of standard discs. The idea is that an additional levy would be charged on these stamped audio CD-Rs to raise funds to compensate record companies for lost revenue due to CD copying, but that's a topic to discuss on another day!

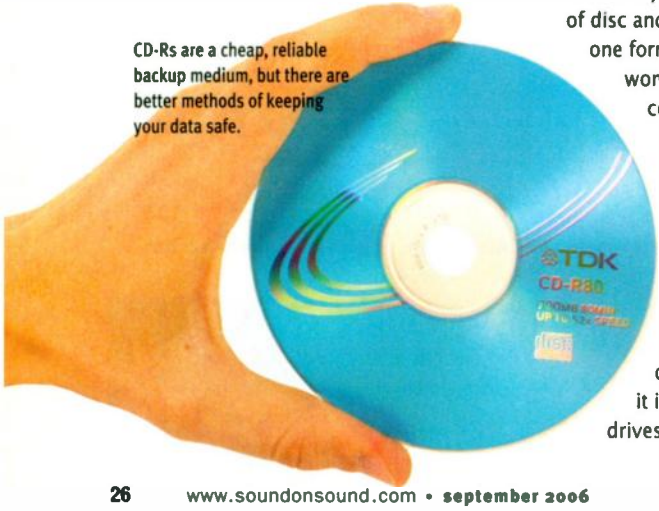
As for DVDs, the same issues affect them as CD-Rs, except that there are several different recordable DVD formats and not all machines are compatible with all types. Secondly, because a DVD can hold a lot more data, a corrupted disc will mean the loss of considerably more data or material, making it even more important to spread the risk by making multiple copies and storing them in different places. To be absolutely sure, I would use different types of disc and different batches, so that, should one format or batch prove unreliable, you won't lose all your safety backup copies as well!

Personally, I don't favour the use of CD-R or DVD-R for archiving and backups at all. The danger is that you will make an archive copy, put it on the shelf and never look at it again until the day you need it, by which time irreparable damage may have occurred. Also, it is possible that suitable CD or DVD drives might become rare in 20 or 30 years time. Try finding a working Philips N2000, multitrack Minidisc recorder or Betamax video machine these days!

Instead, I have taken to storing everything on hard discs in a RAID array with automatic backups. Hard drives are relatively cheap and reliable — Terabyte arrays are quite affordable, and copying data between drives is trivial and can be easily automated. Access to archive material is instant and can be done via networks or over the Internet if required. It is easy to copy material on to on-line storage facilities as well, for added security of external backups. And while hard drive types, sizes and interfaces will change — SCSI, SCSI II, IDE, SATA, for example — there will always be a sufficient overlap to allow data to be copied from the outgoing format to a new one. Data doesn't degrade through the process and so this approach is about as future-proof as it can be. Of course, how practical this is depends on how much material you need to archive, but it certainly works well for me and I know of many others who have taken the same approach.

For more hints, tips and problem-solving visit the *SOS* Discussion Forum via **www.soundonsound.com**

RAID arrays, like this one from Adaptec, offer ideal long-term backup solutions. But they come at a price.



CD-Rs are a cheap, reliable backup medium, but there are better methods of keeping your data safe.

Q How do I correctly connect my guitar to my PC?

I am a regular reader and consider myself fairly well informed, but I'm struggling to find the answer to a really simple query: Will connecting my guitar to my Marshall amplifier, selecting the undistorted channel and then connecting the amp's line output to my soundcard give me the same result as connecting my guitar to a DI box or guitar preamp, then plugging the output into my soundcard? I'm trying to connect my electric ▶

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* 80 note polyphony based on average patch load. Oscillator/filter model selection can result in slightly less or even more.

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Q&A

guitar to my PC so that I can use my amp-modelling software.
Bradley Howard

Editor In Chief Paul White replies: In theory there's no reason not to do the former of your two options, as long as you can adjust the level of your amplifier so as not to overload the soundcard input. However, the sound you hear won't be the same as that of the guitar cabinet, as the speakers filter and colour the sound in a very obvious way. Clean sounds may be fine but overdrive sounds tend to be thin and buzzy with too much high end if you simply DI them. However, there are several solutions, the first being to feed the line output from the guitar amplifier into your PC via a line-level speaker-simulator box such as the Hughes and Kettner Red Box, which we briefly reviewed in *SOS* November 2000 (www.soundonsound.com/sos/nov00/articles/sessentialsberklee.htm). Note, though, that if your amp is a tube model you shouldn't run it without either the speakers or a dummy load attached, as you could blow the output stage.

Another alternative is to DI the sound from your amp into the soundcard as you suggested, but then use your software guitar-amp simulator with just the speaker-cab simulation section switched on. This should get you back to somewhere near the miked sound of the amp. Of course, using your amp-modelling software you could do away with your Marshall altogether when recording, and instead use a cheap active DI box to match the impedance. You can pick these up from around £20. Cheaper still, if you have any guitar pedals you can use these between the soundcard and the guitar, though pedals that feature a true mechanical bypass won't act as impedance matchers in their bypass position.

Having mentioned some of the the lower-budget options, I'll skip to the higher end. If you really want to capture the sound of your Marshall without terrorising the neighbourhood, a combined power soak and speaker simulator is your best bet. The most convincing one we've tried so far is the Motherload from Sequis. You can read our review in *SOS* July 2005 (www.soundonsound.com/sos/jul05/articles/sequis.htm). It's not cheap but it does a fabulous job.

Sequis' Motherload — Get the sound of a guitar cab running at 11 without waking the neighbours.

Q Can you mount microphones inside a Leslie speaker?

A friend of mine who is a full-time professional musician has recently bought a new PA and now wants to fit permanent

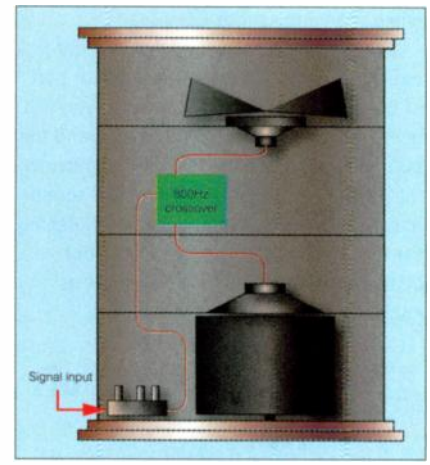
microphones inside his Leslie cabinet. The plan is to power them from the desk. Which microphones would you use?
***SOS* Forum Post**

Technical Editor Hugh Robjohns replies: Mounting mics inside a Leslie might seem a convenient solution, but there are a number of problems. I've been through this myself and, despite my best efforts, could never achieve a sound as good as that from three or four mics on stands outside the cabinet.

The first major problem is the turbulent air, so very good windshields are essential. The top rotors, in particular, travel very fast and whip the air up enormously! The cabinet louvres are there for a reason, and do a fine job of keeping the disturbed air inside while allowing the sound out. They also help level the sound out and reduce on-axis/off-axis variations as the horns rotate.

Perhaps a more important consideration is the actual sound. Moving mics in close to the horn rotor emphasises its movement considerably, particularly the tremolo aspect, and you will get a very exaggerated, choppy effect. Multiple mics (three or four) can mitigate this effect, but add complexity.

Something else to be wary of is the magnetic field radiated by the motors (especially the slow motor). This really rules out the use of any dynamic mics or capacitor mics with an output transformer (although there are few suitable ones around these days). However, if you fancy giving this method a try, mount the mics on the opposite side, away from the motors, to keep them away from the magnetic fields, but angle them as far as possible to avoid the mic 'hearing' the motor clutches engage ▶



Left: Legendary rotary speaker cabinet, the Leslie. Right: You should take care when close-miking a Leslie, as mechanical noise from the rotors can be an issue.

▶ when changing speeds.

Position the bass mic so that it is not directly on-axis to the curved reflector part of the drum. If you place it on-axis, you will get a very exaggerated effect again, and the bulk of the sound (basically anything below the 800Hz crossover frequency) will sound unnaturally choppy and modulated. Keeping the mic off-axis reduces this effect, but distance is what is really needed. Let us know if your attempt is successful!

Q Is Cardbus out of date?

I'm currently living in Ethiopia and my latest volunteer just brought me a new PC laptop, which I thought would let me change from my USB-equipped Focusrite Saffire to my Emu 1616M, which uses the PCMCIA Cardbus connection. The trouble is that the new laptop, a Dell, has no PCMCIA slot, just the new Express Card format. I was always worried about Emu using this out-of-date interface and now laptops like Macs are switching to Express Card slots.

Has anyone found and tested a PCMCIA to Express Card adaptor with the 1616M, or do PCMCIA to Firewire or USB 2.0 adaptors exist? I am about to cry — I may have to sell the laptop and/or Emu 1616M as well now!
Dan Harper

PC music specialist Martin Walker replies: I sympathise with your plight, Dan, and you're not alone — several other *SOS* Forum posters have bought new PC laptops to make the same jaw-dropping discovery. It doesn't help that most of us refer to the interface used by audio interfaces such as Echo's Indigo range, Emu's 1616 and1616M, and RME's Cardbus adaptor as 'PCMCIA', when in fact it was the Personal Computer Memory Card International Association that developed both the older Cardbus and newer Express Card formats.

The Express Card is available in two sizes — 34mm and 54mm.

As you've found to your cost, these two formats are physically and electrically incompatible: Cardbus uses a 68-pin connector with a gold-coloured strip and eight tiny bumps on top, while the two different widths of Express Card (34mm and 54mm) both use a 26-pin connector. You can read more about the differences at the dedicated Express Card web site (www.express card.org/web/site/cons_faq.jsp).

There are certainly benefits to be had from the Express Card format, which supports both PCI Express and USB 2.0 standards, has a significantly higher speed than Cardbus, and can be used to add extra parallel, serial, USB, Firewire 400 and 800, or SATA ports to your laptop.

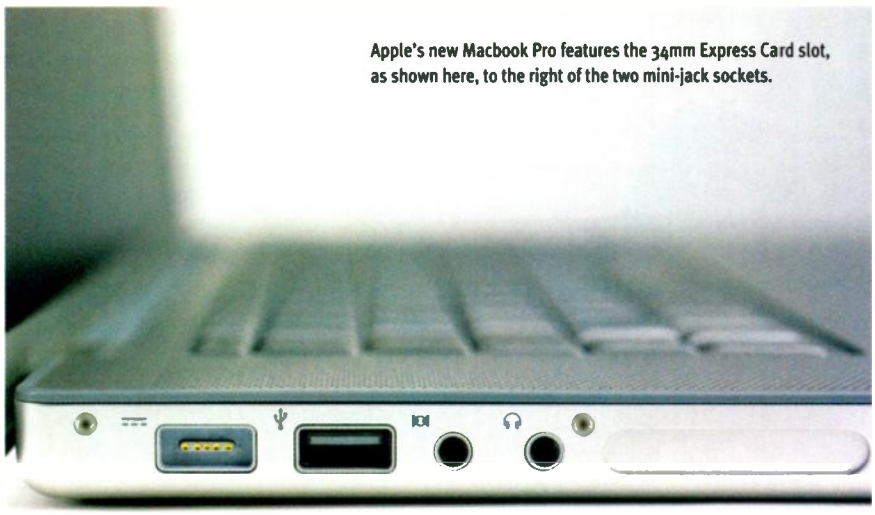
However, I don't feel it's quite fair to refer to Emu's Cardbus products as 'out of date', since although Hewlett Packard shipped a system featuring an Express Card slot in late 2004 — as did Lenovo with their Thinkpad T43 in 2005 — very few people had Express Card-equipped laptops when Emu launched their 1616 and 1616M products in mid-2005. Meanwhile, Apple didn't launch their Macbook Pro model until early 2006 when there were still very few Express Card peripherals available, and even as I write this, six months later, there are still far more products on the drawing board than there are in the shops.

Even when they eventually appear, you're unlikely to be offered a 'swap' for your existing Cardbus interface. However, help will soon be at hand, since various companies seem to be actively working on adaptors for connecting older PCMCIA Cardbus cards to the newer Express Card interface.

One example is from Duel Systems (www.duel-systems.com/products/adapters.aspx), who expect to launch theirs by August 2006. It will be compatible with both PCs and Macs, and any Cardbus card. Hopefully it will be available by the time you read this, but I don't know of anyone who's yet tested such an adaptor with an audio interface to see if there are any conflicts, so take care.

Incidentally, Emu 1616 and 1616M users can use a PCMCIA Cardbus to PCI adaptor to connect their interfaces to a desktop PC instead of a laptop. The most widely recommended adaptor is from Syba (www.syba.com/product/43/03/01/index.html), despite having a Ricoh R5C485 chipset (Emu specifically state that Ricoh R5C476 and R5C475 chipsets are incompatible with their 1616 series).

There are a few PCMCIA Cardbus to USB 1.1 adaptors, mostly to connect a specific range of 3G Wireless Data cards to PCs without Cardbus slots. For instance, Elan Digital Systems have one (www.elandigitalsystems.com/usb/u111530.php). However, these are probably only suitable for stereo devices such as Echo's Indigo IO, as they won't provide enough bandwidth for multi-channel interfaces such as the Emu and RME models. I haven't yet discovered a PCMCIA to USB 2.0 adaptor more suitable for audio purposes. Overall, I think your best bet is to continue to use the Saffire until you can buy a Cardbus to Express Card adaptor. SOS


Apple's new Macbook Pro features the 34mm Express Card slot, as shown here, to the right of the two mini-jack sockets.

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WRH

Across The Board

Troubled with ground loops and mains hum? The answer is to switch to a balanced power supply.

Roger Nichols

Spike, noise, surge, swell, transients, harmonics and sag are not the names of members of a new alternative rock group. They are characteristic problems encountered in power management.

AC power is often the most overlooked area in recording studio design. If you were a farmer and your horse was your livelihood, you would probably pay attention to how well he was doing. AC power is the main source of your income, and also the primary cause of all the hums and buzzes you must deal with on a day-to-day basis. They say that if you build a better mousetrap, people will beat a path to your door. Well, just wait until you have the quietest studio in town and see how fast everyone wants to work there.

Power Quality

Power quality can be measured by recording the duration and magnitude of any disturbances. Faults that are short in duration, like transients, can damage sensitive electronic devices such as diodes, transistors and ICs. Lower-level transients slowly eat away at internal semiconductor junctions within electronic equipment, eventually causing failures. High-frequency noise can cause digital data errors in both digital audio and computer equipment, and can interfere with clock signals causing timing errors and excessive jitter. Voltage fluctuations affect motor operation and electronic equipment that requires a steady power source.

Receptacle Load Centres

Receptacle load centres include the load centre feeding consoles and tape machine rooms. Connections and breakers should be inspected on a regular basis for loose connections, especially the feeders into the load centre. Feeder cables can go through temperature fluctuations with load changes, and these fluctuations can make cables swell and shrink, causing the connections to loosen. A loose connection can cause imbalances in phase currents, and even be a fire hazard.

At the load centre, harmonic currents can cause circuit breakers to trip. Thermal magnetic breakers may trip prematurely from excess heat in the panel caused by harmonic currents. Breakers may also trip erratically when non-linear currents with high peak values are present. A peak-sensing circuit breaker responds to the peak of the current waveform. Since the peak may be higher due to harmonics, this type of breaker may also trip prematurely at a lower RMS current.

Lighting Load Centres

Excess heat caused by harmonics in a lighting circuit conduit can cause conductor insulation to fail. In energy-saving electronic ballasts with solid-state power supplies, the phase and neutral currents can contain harmonics. Existing standards for the number of conductors in a conduit don't always account for the heat caused by these harmonics. To find harmonic overloads in lighting circuits, you can measure the current in the feeder neutral. If the levels are high, compare the measured currents to the ratings of the conductor, lugs and buss bars. Feel the conduit for excess heat. To determine the overall level of harmonics, measure the total harmonic distortion in the phase currents. The THD generally refers to the RMS value of all the harmonic currents, divided by the fundamental. The total harmonic distortion may be a problem if it exceeds 20 percent.

To prevent harmonics from affecting a lighting load centre, specify fewer conductors per conduit. Or you can install new high-performance ballasts, which produce lower harmonic currents and also improve Power Factor (the ratio of 'active' power to 'apparent' power, which is an indicator of efficient power use).

AC Harmonics

Harmonics on the AC line are usually caused by non-linear electrical loads. Some of these non-linear loads are: personal computers, certain types of lighting ballasts, electronic studio and office equipment, and adjustable-speed motor drives. These devices draw non-sinusoidal current in abrupt pulses when connected to a sinusoidal voltage source. These pulses form a distorted current wave shape which contains harmonics.

The harmonic current drawn by non-linear loads acts in an Ohm's Law relationship with the source impedance of the supplying transformer to produce voltage harmonics. The source impedance includes the supplying transformer and branch circuit components. For example, a 10 Amp harmonic current being drawn from a source impedance of 0.1Ω will generate a harmonic voltage of 1.0 Volt. Any load sharing this transformer or branch circuit can be affected by the voltage harmonics generated.

Roger Nichols has been professionally involved in the music business since 1968, working as a staff recording/mixing engineer at ABC Records and Warner Bros before becoming an independent engineer/producer in 1978. His work with Steely Dan in particular has led to a string of Grammy Awards and nominations, including a Best Engineered Album award for *Two Against Nature*. An advocate of digital recording since 1977, Roger designed and built the first digital audio percussion replacement device and has lectured on digital audio around the world.

Computers used in console automation or hard disk recording can crash or reset when there are excessive harmonic voltages in the supply power. Remember, the harmonics can come from devices anywhere on the same transformer or branch circuit.

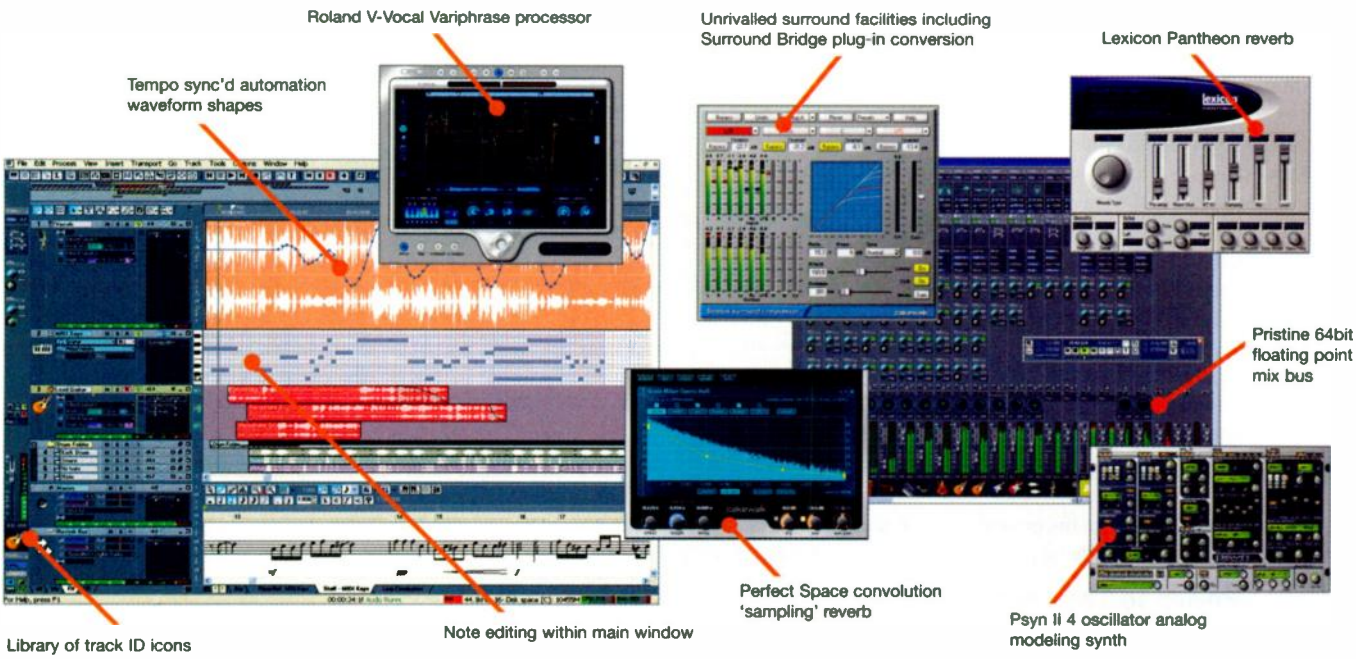
Grounding And Noise

As you can see from the above, AC power contains more than just that pure mythical 50 or 60 Hz sine wave that you read about in text books. In most cases, filters added to the power line add noise of their own. The capacitors in the filter circuit leak current into the ground system. This noise is usually in the form of a reactive, non-linear leading current. The same type of noise on the ground is caused by the switching power supplies found in most computers and digital audio gear. This ground noise usually shows up as hum in audio gear. Class-A tube amps and balanced mic pre amps are particularly susceptible to this ground noise.

All of the power-consuming devices in a studio are connected to unbalanced power. There are two wires supplying the 240V power, with the ground for safety (and noise). If you measure between the two feed wires the results will be 240V. If you measure between ground and one of them you will see 240V. If you measure between ground and the other lead, you will see zero V. Well, you are supposed to see zero, but because of ▶

TIME TO SWITCH?

For years the best selling sequencer in the States, Cakewalk's SONAR has long been at least the technical equal of the other major applications. Although less well known over here, with the release of Version 4 many professionals found that they could no longer ignore SONAR's persuasive combination of powerful features and a superbly easy to learn user interface. Now with the advent of Version 5, SONAR has taken a genuine leap into the lead with a host of new technologies, instruments and effects. This ad isn't nearly big enough to do justice to them all, but check out some of the major features below and make your own mind up - *is it time you switched?*



	Physical Inputs/Outputs	Audio plugin track inserts	Maximum Sample Rate	Audio engine resolution	Phrase Synths & Tracks	A/B Freeze, edit freeze data	Full Track Templates	Bus & synth/verb preview	Professional Scoring	ACID loop support	V-Vocal Var-iPhrase	Convolution Reverb	Lexicon Reverb	Synths	Audio hardware support	ASIO	WDM	DigiDesign	M-Audio	Edirol	Video output to Firewire DV	WMA lossless encoding
SONAR 5 Studio Edition	unlimited	unlimited	96kHz	64-bit FP	•	•	•	•	•	•	–	–	•	5: (2) Roland synths, groove sampler, SoundFont sampler, analog modeling	•	•	•	•	•	•	•
SONAR 5 Producer Edition	unlimited	unlimited	96kHz	64-bit FP	•	•	•	•	•	•	•	•	•	8: (2)rgc:audio synths, REX synth, (2) Roland synths, groove sampler, SoundFont sampler, analog modeling	•	•	•	•	•	•	•
Cubase SL 3.1	128	5	96kHz	32-bit FP	•	–	–	–	•	•	–	–	–	3: dual-oscillator, virtual bass, drum machine	•	–	•	•	–	–	–
Cubase SX 3.1	256	8	96kHz	32-bit FP	•	–	–	–	•	•	–	–	–	5: dual-oscillator, virtual bass, drum machine, surround pad, mono analog	•	–	•	•	–	–	–
Pro Tools LE 6.9 (and M-Powered)	Dig002:16 Mbox2	5	96kHz	32-bit FP	–	–	–	–	–	–	–	–	–	4: Reason Adapted 3, Ableton Live Lite 4, SampleTank LE, Fxpansion BFD lite	–	–	•	•	–	•	•

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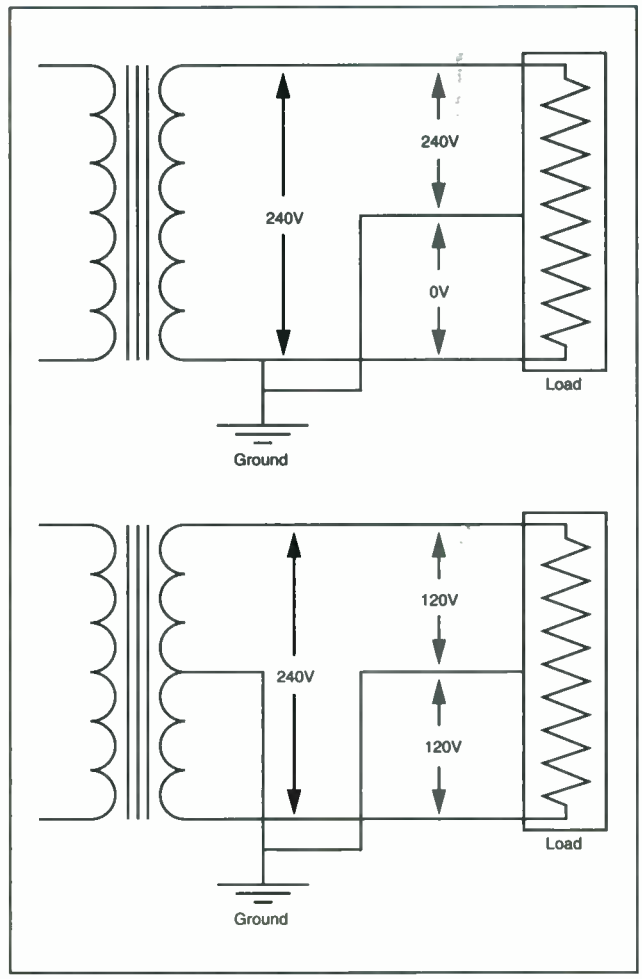
▶ ground noise and currents, you will measure a couple of Volts. Just remember, with unbalanced power, all of the power-generated garbage ends up in the ground.

Quiet grounding schemes in studios sometimes border on the occult. I asked one studio why they had a water cooler in the control room with no water in it. They said that for some reason, when the water cooler was plugged into the same branch circuit as the guitar amps, that there was less hum in the amps. I unplugged it once. They were right.

Grounding circuits were never meant to carry current except during a short circuit. Objectionable ground currents are those that will provide you with a shock. Anything less than that is OK as far as Underwriters Laboratories is concerned.

We have all experienced ground loops in the studio. The really bad ones, with hum levels above the signal level, we try to cure. The ever-present little hums that make the DAT meters stick one segment up from the bottom we try to ignore. We try breaking grounds in balanced cables at one end so that we do not have multiple ground paths for ground loops. We lift chassis grounds with special plugs and make sure that metal chassis do not touch each other. If we removed the currents from the ground, then we would have no current to loop.



In a conventional unbalanced power supply (top), there is 240V difference between the hot or live wire and the ground, but oV between ground and the other feed. In balanced power (above), by contrast, there is the same voltage difference between both feeds and the ground, but the polarity of one feed is inverted so that noise is cancelled out.

Balanced Power To The Rescue

Why have I been telling you all of this stuff about AC power? Well, because the more you know, the better you will be able to cope with AC problems as they occur. Although I have covered many factors dealing with power, the easiest problem to control is the most objectionable in the studio: ground noise. The solution is balanced power.

Balanced power is delivered using the same three wires that are connected to most studio equipment. If you measure the voltage between the two feed wires, you get 240V. If you measure between either one of the feed wires and ground you will see 120V.

If we take any of the noise-generating equipment and connect it to the balanced power source, the noise generated in each leg of the power will be out of phase with the other at the ground. The ground will be quiet as a clam. Balanced power provides the same common-mode rejection we are all familiar with in balanced audio.

With balanced power, you can use any type of grounding configuration you wish. Star, schmar. You can leave the grounds connected at both ends of your audio cables. You can throw away all of your ground-lift adaptors. You can finally plug everything in the way it was meant to be plugged in.

There is not much you can review about balanced power systems, because there are no knobs, no meters, no adjustments of any kind. There is only a power switch on the front and some AC receptacles with circuit breakers on the back. To install a balanced power system, all you have to do is plug it in to an AC supply, throw away all of your ground-lifting plugs and plug all of your equipment in to the receptacles in the back, and turn the front-panel power switch on. That's it. Nothing will hum, nothing will buzz. Your studio will be the quietest thing you have ever heard, or not heard in this case.

I have been using balanced power for about 10 years. I have had fewer digital errors when transferring signals between equipment. Electrical AES and S/PDIF work as well as optical now. On the analogue side, my transformerless tube mic preamp is 15dB quieter. As an average, all analogue equipment has measured 12 to 16 dB quieter just because of the balanced power.

A few weeks ago I had to record some piano and vocal overdubs at a studio that does not use balanced power. On the piano I was using a pair of Sony C800-G microphones (the ones with the heat sink). On the vocal I was using an Audio-Technica 4060 tube mic. Under normal circumstances, the electrical noise floor at the studio left something to be desired. I was about to change all of that.

I brought a balanced power transformer with me to the session. I fed the outputs of the microphones into the mic inputs of the Apogee A-D converter. The microphone power supplies and the Apogees were powered by the balanced power. I then fed the digital signal from the Apogees directly to the digital input of the Sony 48-track digital machine. Since the signal was digital before it got to the studio's power environment, the signals stayed 'balanced power' quiet.

The difference was amazing! I could finally hear what fantastic microphones sound like. When referenced to a quiet ground, even the low-level noise that you usually associate with tube microphones was gone. I couldn't even tell if the microphones were turned on until someone walked into the overdub room. This is the way recording was meant to be. No matter what I plugged in, no matter how I interconnected the audio, I could not force a ground-related hum or buzz. This was always a problem in the past when someone wanted to bring in their own piece of audio gear to patch into the chain. Now I encourage it.

I expect every studio I work in from now on to be powered by balanced AC. The units come in various power-output configurations and multiple units can be run in parallel. This is by far the least expensive way to rocket your studio into the digital quiet age. Balanced power has been used in hospitals for 20 years to lower the noise in medical equipment and lessen the possibility of shock from poorly grounded equipment. It is way past time for every studio and project studio to embrace this technology.

Note: the voltages mentioned are appropriate for European studios — halve the numbers for US studios. SOS

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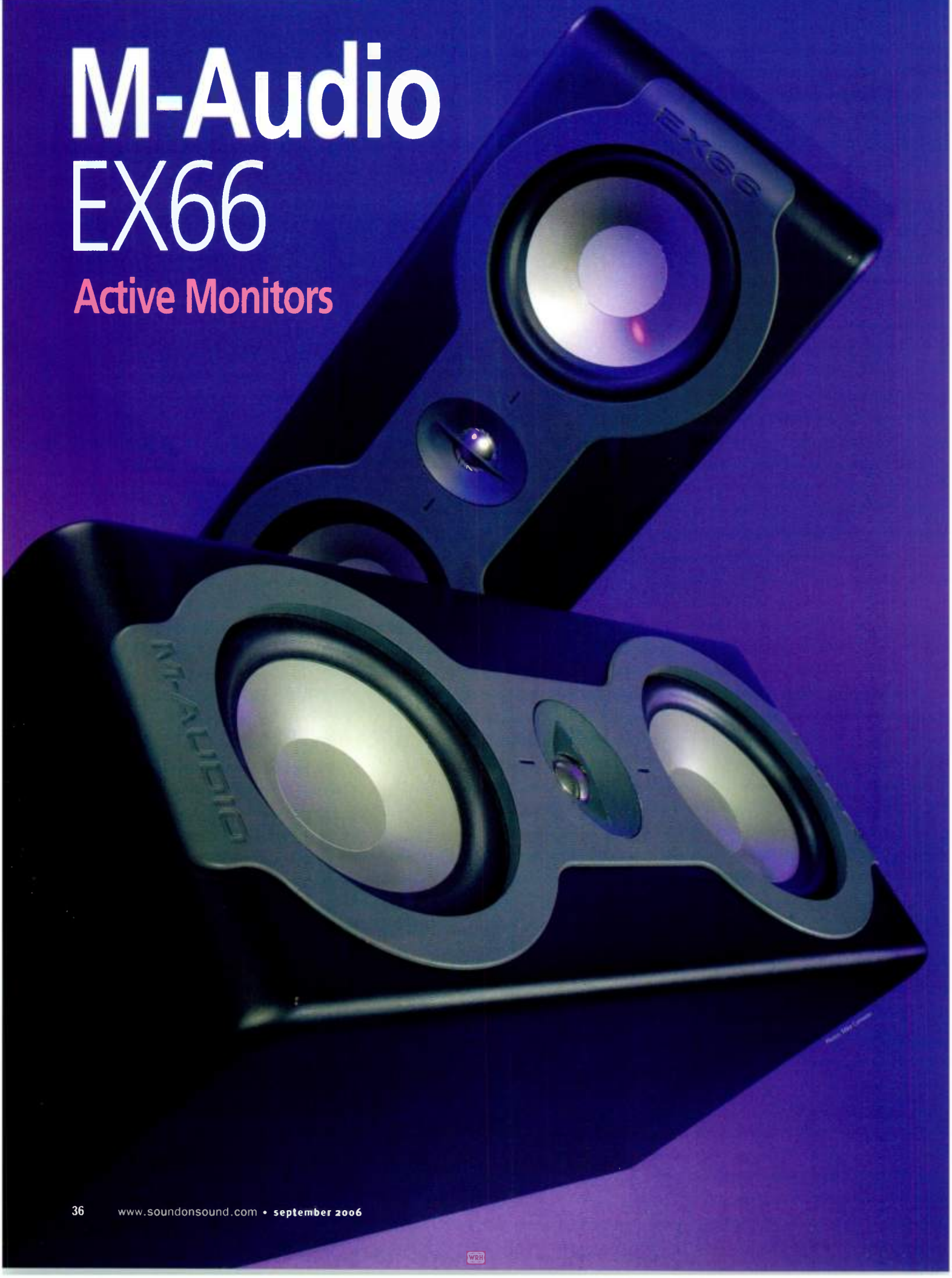


With their latest monitor design, M-Audio are aiming higher than ever before. We put the EX66 to the test...

Paul White

Although they are by no means new to the studio monitor marketplace, with their new EX66 monitor M-Audio have set out to compete with the kind of big-name monitors found in professional facilities as well as project studios. This aim is reflected in the EX66's UK price, although, given what it offers, it's still very competitive within its market sector. The EX66 is a rear-ported, two-way active monitor, but it uses a less commonplace dual bass/mid-range driver topography and features internal DSP-powered signal processing. Having the port on the rear panel reduces audible port wind noise, but it does mean you need to leave some space behind the cabinet — placement less than six inches from a wall is not recommended.

The tweeter sits centrally between two identical bass/mid-range drivers. Though this looks like an invitation to site the speakers horizontally, they are in fact designed to be stood upright. The two bass/mid-range drivers are six inches in diameter while the titanium-dome tweeter is one inch in diameter and sits in a shaped waveguide to control the horizontal and vertical dispersion angles at the crossover frequency.

Specifications

Measuring 209.6 x 482.6 x 241.3mm (WxHxD), the monitors can produce a peak SPL of 109dB each or 115dB for a stereo pair. The monitors have a specified nearfield frequency response of 37Hz to 22kHz at -3dB with a pass band flatness of ±1dB between the two extremes.

M-Audio have used their own proprietary driver technology, where the crossover and equaliser functions are handled by the onboard DSP rather than analogue circuitry. Because the crossover and filtering are done in DSP, this also made it relatively easy for M-Audio to add a digital input for those who need it. The DSP also uses IIR (Infinite Impulse Response) filters to counter any remaining cabinet resonances, though the box seems to be very rigidly built anyway and incorporates internal bracing.

For the bass/mid-range driver, M-Audio worked with UCLA's Department of Materials Science to develop a cone structure that was light and yet resistant to breakup modes within its frequency range. The EX66's crossover is set at 2.56kHz and the designers claim that the first breakup mode occurs at around 6.5kHz where the signal level is already down by over 30dB thanks to the steep, fourth-order Linkwitz-Riley crossover. The drivers have an inverted dust cap and silver/grey-coloured cones that seem very well damped.

The front edges of the MDF cabinets are radiused to minimise diffraction and the cabinet has an attractive black satin finish. Two blue LEDs show when the speakers are powered up and a chunky moulded driver surround gives the whole front baffle a very stylish look.

Placement

Normally, studio monitors are set up at head height and angled in towards the listening position, but in this case the recommended orientation (unless the speakers are very widely spaced) is to have them facing directly ahead, as this widens the perceived stereo image while still providing a solid centre image thanks to the wide horizontal dispersion characteristics that have been designed into the speakers.

Early reflections from walls and equipment, particularly mixing consoles, also affect what you hear, which is partly why M-Audio went with the arrangement of two identical bass/mid-range drivers wired in parallel with the tweeter midway between them. This setup, in conjunction with the asymetrical tweeter waveguide, deliberately constrains the monitors' vertical dispersion into a narrower-than-usual angle, reducing the amount of audio energy being sprayed onto your mixing console or work desk. At the same time, it produces a wider horizontal dispersion pattern, which results in a wider sweet spot. These directional characteristics also make the speakers suitable for multi-channel (surround) systems and should help avoid problems in rooms with lower than ideal ceilings.

Amplifier Technology

Each EX66 monitor is driven by two 100W PWM (Pulse Width Modulation) amplifiers, one to drive the two six-inch drivers and one to drive the tweeter. Normally you need much less power to drive a tweeter than a woofer, but having plenty of headroom can't hurt. Each amp feeds into a 4Ω load, where the damping factor is matched to the impedance characteristics of the drivers so as to tightly control the amount of overhang or ringing that is particularly evident on low notes in systems with insufficient damping. In practice this should allow deep bass notes to be reproduced with clean transients and accurate decays.

The circuitry features RF interference filtering, output current limiting, over-temperature protection and suppression of turn-on and -off transients, though I did still notice a small amount of noise when powering up the speakers. A subsonic filter takes care of frequencies below the design range of the monitors.

Rear Panel

As with most active monitors, the rear panel is a pretty busy place, with an IEC power inlet and mains switch, analogue and digital inputs and a number of switches to adapt the performance of the monitors to various physical environments. Balanced XLR and ▶

SOUND ON SOUND

M-Audio EX66 £898

pros

- Balanced sound with adequate bass extension.
- Very good stereo imaging.
- Good separation between instruments.
- Wide, shallow sweet spot helps minimise problems caused by room acoustics, studio furniture and mixing consoles.

cons

- Not exactly cheap, but at the same time the price is comparable with the competition.
- The strong low end can sometimes obscure the detail in bass instruments.

summary

M-Audio wanted to create a serious studio monitor that would make people sit up and take notice, and I think they might just have succeeded. The EX66 is a great monitor for most musical genres and has the benefit of a digital input where that is a requirement.

Audio Test CD

One very practical inclusion with each monitor is a reference audio CD, which includes a set of calibration signals to aid setting up the monitors in the user's room. To make the best of this you'll need some means of measuring levels or frequency spectrums, but most DAW software includes metering that could be used to do the job providing you have an omni-directional microphone with a flat frequency response.

There's pink noise (both in and out of phase), single tones at ISO standard third-octave frequencies and constant-level sine-wave sweeps. By checking how consistent low frequencies sound (or measure) at the listening position using the slower-frequency sweeps, you can quickly see if you have bass-end problems that need to be corrected by moving the speakers or treating the room.

M-AUDIO EX66

▶ TRS jack analogue inputs are present, along with a level-control knob. The digital input can be handled in either S/PDIF or AES-EBU format, with a sample rate up to 216kHz (set by the incoming source). When the analogue inputs are being used, the converters run at 24-bit/96kHz. Rear-panel switches determine whether the speaker should respond to the left or right channel of a stereo digital source and a link cable between the two speakers can be used to distribute the same digital source to both in as straightforward a way as possible.

The Acoustic Space switch, which has full, half and quarter positions, allows for placement in free space, close to a wall or close to a corner. High-frequency adjustment is possible via a slide switch offering +2dB, flat or -2dB options. There's further control over the mid-range (flat or +2 dB) and a choice of low-cut filter frequencies (37, 80 or 100 Hz). Normally the 37Hz setting would be used, but to check what a mix might sound like on domestic speakers with a limited low end, there are the 80Hz and 100Hz options. These would also be useful if using the speakers in conjunction with a subwoofer that didn't feature its own crossover.

Listen!

In my own studio, with the EX66s set up in place of my usual monitors, I got very good results straight out of the box, with the Acoustic Space switch set to half space, the bass at maximum extension and all the other settings flat. The low end is surprisingly strong and well extended, to the extent that I began to think it might be a little larger than life, but it isn't so exaggerated as to present a serious problem. In any event, the bass end can be tamed somewhat by switching to quarter-space mode.

As expected, the titanium tweeters have a slightly forward quality about them, but stop short of sounding harsh, and the EX66s score very highly on enabling you to separate the different instruments in a mix. I noticed that the level of background noise is slightly higher than I would expect from conventional analogue active speakers, especially at high input-gain settings, and I suspect the use of DSP filtering may have something to do with this. However, at sensible input-gain settings (around 50 percent is fine and still allows the speakers to be driven to full volume), this should be unnoticeable from the listening position, unless you are fortunate enough to have an extremely quiet studio!

The stereo imaging is particularly good, with a stable centre image, while the overall tonal balance seems smooth and free of obvious vices other than the aforementioned slightly larger-than-life quality of the bass. M-Audio are right to recommend that the speakers be mounted vertically, as they sound a hint phasey when used on their sides. The sweet spot also becomes very narrow and tall with more energy than is ideal being directed towards the desk and ceiling. When stood the right way up, they do sound like very 'grown-up' monitors.

Having the option of a digital input is useful for those who need it, though I'm still a little cautious insomuch as there's always the possibility of your computer locking up and firing full-level digital noise into the monitor system. The monitors could probably survive, but the experience wouldn't be a pleasant one!

Summary

I have to admit that I didn't quite know what to expect from M-Audio, as they aren't known for high-end monitors, but the EX66s might just fast-track them into the big boys' league. Within their price range, these monitors come across very well in terms of clarity, presentation of detail and bass extension. I'm particularly impressed by their ability to cut through the clutter within a mix and present each sound source as a clearly separate entity. There are occasions on which the extended low end tends to hide the detail within sounds such as bass guitars and kick drums, but as mentioned earlier, you can always tame the bass using the filter and Acoustic Space switches. I've noticed the same tendency for the bass end to obscure other aspects of the mix in larger studio monitors designed for greater bass extension, so it may well be unavoidable.

The EX66s meet pretty much all the requirements of high-end monitors. Their ability to let you hear individual elements within a mix is amongst the best I've heard and they seem very well suited to analytical listening. Mixes done on these monitors also appear to travel well, which, when it comes down to it, is what really matters. SOS

Alternatives

Given the EX66's price, M-Audio are going up against the smaller Genelec, Dynaudio, ADAM and Mackie monitors, so this is where to look for the obvious alternatives. Also consider Event and Quested monitors as well as less obvious models such as the AVI Pro Nine powered version.

Information

£ £898 per pair including VAT.
T M-Audio +44 (0)1923 204010.
F +44 (0)1923 204039.
E info@maudio.co.uk
W www.maudio.co.uk

Axe Battle

Music Lab *Real Guitar 2L* & Steinberg *Virtual Guitarist 2* Virtual Instruments

There have been some famous twin-guitar line-ups in rock history and, even if you can't strum a note, you can now have the virtual equivalent — both of these software instruments will play on time and in tune, and won't want a solo in every song! But are they both equally good?

John Walden

When it comes to guitar virtual instruments, Steinberg's cunningly named *Virtual Guitarist* would probably be the first product to spring into the minds of most *SOS* readers. However, Steinberg are not without competition and, for acoustic guitar sounds at least, the recently released *Real Guitar 2L* — a collaboration between Music Lab and Best Service — provides a competitively priced alternative.

At first sight, these two products would seem to be direct competitors. However, a brief comparison of the respective feature sets reveals some obvious differences. For example, *Real Guitar 2L* only provides acoustic guitar samples, while *Virtual Guitarist 2* (combining what was in the original *Virtual Guitarist* and *Virtual Guitarist Electric Edition*) provides both acoustic and electric guitar options. The other major difference is in the 'engines' of the two products. *Virtual Guitarist 2* is very much based around Parts, essentially a set of pre-recorded phrases in a wide range of styles, which are pitch- and tempo-shifted to

SOUND ON SOUND

Music Lab Real Guitar 2L £133

pros
- Can produce very realistic guitar parts.
- Easy to use.
- A fully playable multisampled instrument.

cons
- Only offers acoustic guitars at present.

summary
This instrument lets you easily create a range of excellent-sounding acoustic guitar parts from a large library of included MIDI files, but also affords the flexibility to edit any aspect of these parts to match your track.

Music Lab *Real Guitar 2L*'s main screen, with the plug-in in Solo mode — note the Capo placed on the fifth fret.

The main Play Page window of Steinberg *Virtual Guitarist 2*, showing some of the acoustic guitar options.

fit the chord and tempo needs of the project. In contrast, *Real Guitar 2L* provides a series of multisampled guitar instruments and, while it includes preset playing patterns, these are MIDI-based and can be edited as such. Via keyswitching options, *Real Guitar 2L* is a 'playable' instrument.

Of course, the aim of both products is to achieve credible guitar parts within a musical project, so we figured that a comparative review might be in order, to find out which virtual guitarist is best at this in practice?

Real Guitar 2L

SOS readers will be familiar with the Music Lab name through a number of products, but most notably the *Rhythm'n'Chords* MIDI plug-in that provided a way of creating realistic guitar parts from keyboard-based MIDI data. This technology eventually evolved into Real Guitar, the original version of which was released in early 2004. This new version adds a number of new features and comes in two flavours: a basic version and the top-of-the-range 2L version reviewed here.

The sample library is based entirely around acoustic guitars, and its primary aim is to provide a sample-based acoustic guitar instrument that can be played via a MIDI keyboard. The sampled guitars include two different steel-strung guitars, a nylon-strung instrument, a 12-string, and a stereo steel-string. Picked, fingered, and 'doubling' options are provided amongst these. As with the original version, *Real Guitar 2L* features a number of different performance modes; Solo, Harmony, Chords, Bass & Chords, and Bass & Pick. Some of these are described a little more fully below, but their names clearly indicate their functions. For each guitar type, the different performance modes result in a different set of sample keyswitch options appropriate to that style of playing.

However, common to all modes is that *Real Guitar 2L* responds to your MIDI keyboard in three distinct zones. Note ranges C1 to D#1 and C5 to C6 form two Repeat Key zones, while all the keys in between form the Melody zone, where notes or chords are played. The exact function of the Repeat Key zones changes in the various performance modes. For example, in Chord mode the white keys simply play a strum of whatever chord is being held in the Melody Zone, allowing complex strumming patterns to be played with ease. The black keys generate a muted version of the same chord, allowing more percussive elements to be added to the strumming pattern.

The end result of these various control options is that each mode provides a 'playable' sampled guitar instrument which, with appropriate practice with the keyswitches, can be used to create credible real-time performances directly from a MIDI keyboard. *Real Guitar 2L* recognises some 26 different chord types, including seventh and ninth chords and inversions, so even jazz fans ought to be reasonably well catered for.

Perhaps the key new feature in the 2L version is the Pattern Manager. This provides over 1200 preset MIDI patterns for use with *Real Guitar 2L*, and these cover a wide range of musical styles including simple strumming, picking, blues, jazz, Latin, pop, reggae, rock, and a number of others. While *Real Guitar 2L* is not compatible with styles from *Rhythm'n'Chords*, this feature is not dissimilar in function. The individual MIDI performance patterns can simply be dragged and dropped into your sequencer to an appropriate MIDI track to build a complete performance. Of

SOUND ON SOUND

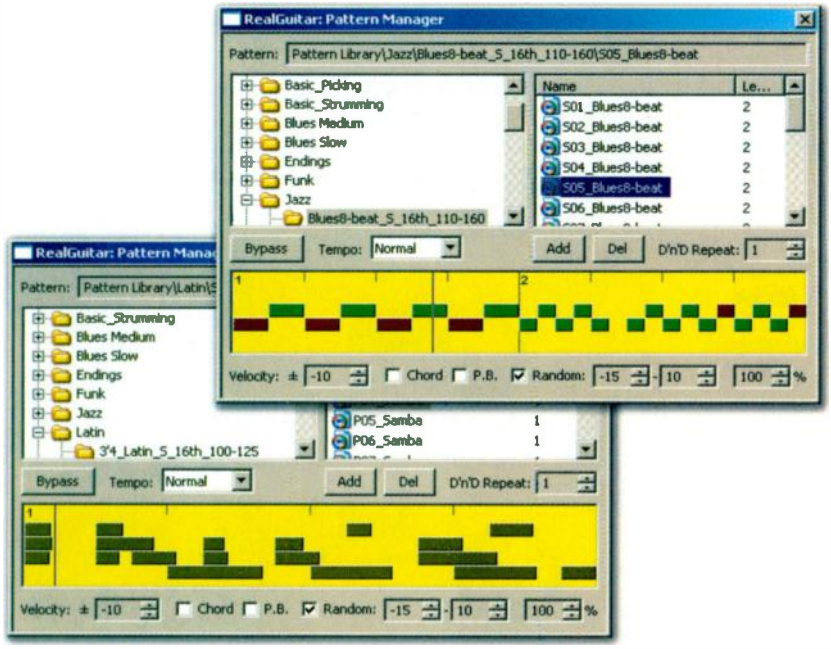
Steinberg Virtual Guitarist £170

pros
- Can produce very realistic guitar parts.
- Easy to use.
- Covers both acoustic and electric guitar styles.

cons
- Minor editing aside, you're limited to the Styles and Parts provided.

summary
A range of professional acoustic and electric guitar performances are available here, although some users may feel a little restricted by the limited potential for editing the built-in Styles.

Test Spec
- Music Lab *Real Guitar 2L* v2.1.
- Steinberg *Virtual Guitarist 2*.
- Athlon Dual Core 4400+, 4GB RAM, Echo Mia 24, XP Pro (SP2).
- Steinberg *Cubase SX* v3.1.1.



Real Guitar 2L's Pattern Manager window. The graphical area at the bottom of the window depicts the contents of the pattern. In the upper window you can see a two-bar strummed pattern displayed — the green bars produce full strums, while the red bars create muted strums. The lower window shows a picked pattern.

course, because the performance is controlled entirely from MIDI, the parts created are fully editable.

Installation of *Real Guitar 2L* from the dual Mac/PC CD-ROM proved straightforward, and the short printed manual is supplemented by a PDF document that contains the most up-to-date documentation. I'd hesitate to say that the documentation was the best I'd ever read — it explains the basics of the control set and not much else — but for a real insight into what *Real Guitar 2L* can do, Music Lab's video tutorial is excellent. This is included on the installation CD, and there are further video and audio examples on the company's web site. These are well worth looking at for new users and potential purchasers alike.

Interface Overview

The main window of *Real Guitar 2L* is perhaps not the slickest looking of software interfaces, but it does manage to cram a lot of features into a relatively small amount of screen real estate. The display is split into three main areas. The upper half of the window provides controls for the selection of the guitar and various options for modifying the sound. For example, under the Noises tab the user can adjust the simulation of the noises generated by the handling of the guitar in various ways, while the Tremolo and Chorus provide the expected effects, although the options are fairly limited. The centre panel of this upper section also displays the current chord arriving via the MIDI input.

The centre section features a guitar neck display which shows the fingering being simulated by *Real Guitar 2L* during playback. *Real Guitar 2L* features samples from every fret of every string, and it is therefore possible to simulate the differences created by playing particular chords or notes in different neck positions. One way of controlling this is to change the virtual Capo position on the neck, although an Auto mode also tries to simulate this variability depending upon the part being played.

"*Real Guitar 2L* is, quite simply, the best implementation of a multisampled guitar instrument I've ever played"

The bottom section of the display allows the user to select the performance mode, change elements of the MIDI control (for example, the velocity curve response), and adjust some aspects of the velocity switching, and also provides access to the Pattern Manager. The exact controls featured here vary depending upon the performance mode selected. For example, in Chord mode the user can control the neck position in which chords are voiced. In Solo mode, the user can specify four

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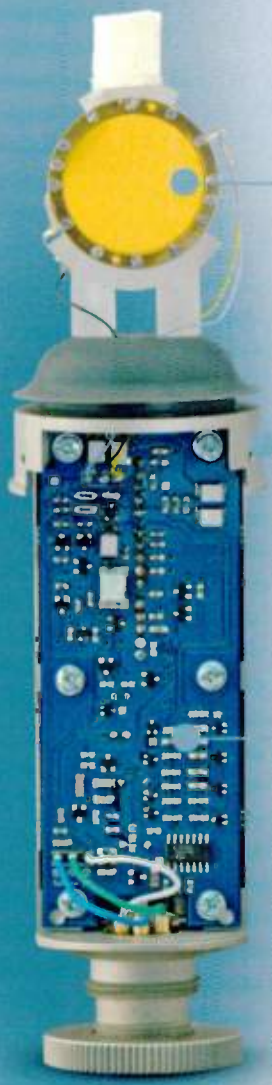

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performance articulations (such as harmonics, muted, palm muted, smacks, velo mute, slide, and tremolo) to be controlled by keyswitches via C1 to D#1. Combined with the various other real-time control options available using the pitch-bend, modulation, sustain pedal, and velocity control, it makes for a very expressive solo instrument.

The only additional window is for the Pattern Manager, opened by pressing the PM button. The upper portion of this window provides a browser to search through the preset patterns provided, while the lower window provides a visual impression of the MIDI data within the currently selected pattern. It might have been nice if this window could have been resized for easier browsing, but, this minor gripe apart, auditioning patterns is simply a matter of activating the Pattern button in the main window, selecting a pattern in the Pattern Manager window, and playing a chord via your MIDI keyboard. The patterns cover both strummed and picked playing in a wide variety of musical styles.

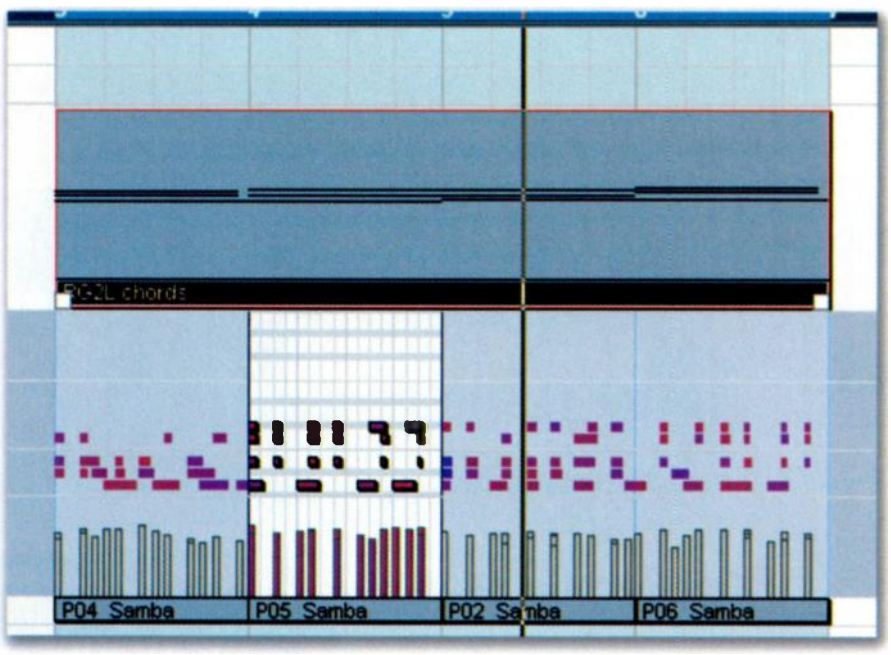
Playing *Real Guitar*

In use, there are two approaches to getting an acoustic-guitar performance out of *Real Guitar 2L*: either enter a basic MIDI chord progression and then use the extensive list of supplied patterns and the Pattern Manager to create the performance you need; or, for more specific control, play *Real Guitar 2L* directly in one of its five performance modes, making use of the various keyswitch and control options to add the realistic nuances required of a believable guitar performance.

The Pattern Manager can be thought of as a collection of pre-programmed MIDI performances for *Real Guitar 2L*. Placing a pattern onto a sequencer track is simply a matter of selecting the required pattern in the Pattern Manager window and then dragging and dropping it onto the appropriate MIDI track. Within *Cubase SX*, I found it easiest to have two MIDI tracks routed to a single

"If there is something that fits in terms of style, then *Virtual Guitarist 2*'s output is right on the money — it is, frankly, scarily easy to create a credible guitar part."

instance of *Real Guitar 2L*. In the first, I had recorded my basic chord sequence, while in the second, I dragged and dropped the required patterns. As can be seen when the patterns are inspected within a MIDI editor, they contain various combinations of notes from the Repeat Key zones. With basic strumming patterns, for example, this simply defines the rhythm of the full or muted strums and — as it is simple MIDI data — it can easily be quantised or edited by the user. This system is both easy to use and very flexible.



Here are two MIDI tracks controlling *Real Guitar 2L* within a Steinberg *Cubase SX* project. The upper track contains the basic chord sequence, while the lower one contains four different Samba-style picking patterns copied from the Pattern Manager.

From a technical point of view, creating your own performances with *Real Guitar 2L* works in exactly the same fashion, but you have to play both the chord sequence and the various Repeat Key options. Doing this in one recording pass (or trying to do it 'live' in a performance context) does take a little practice. However, this is no different from keyswitching with any multisample-based virtual instrument (such as those found in many orchestral libraries), and very realistic results can be created with a little practice. It is also possible to record the chord data and the control data in two separate passes and, initially at least, I found this easier to do while I found my way around the *Real Guitar 2L* control system.

The technical side of the plug-in's operation aside, how does it actually sound? While it bothers the guitarist within me somewhat to admit it, *Real Guitar 2L* sounds very good indeed. The samples themselves have been very well recorded — crisp highs and full, solid lows. The 'doubled' steel-strung produces a wonderfully full sound that can be made to fill the stereo spectrum, as does the stereo steel string, although the two instruments obviously produce very different characters. When used with some suitable picking patterns, the 12-string evokes an instant '60s pop vibe. For me, the only slight weakness was the 'picked' version of the nylon-strung guitar, which sounded just a little too aggressive to my ears, although the 'fingered' version sounds absolutely beautiful — especially coupled with some slow picked patterns and a little reverb.

Despite the somewhat retro look of the user interface, Music Lab have created an acoustic guitar instrument that is easy to use and very playable. This last point is worth emphasising: *Real Guitar 2L* is designed from the bottom up to be a 'playable', MIDI-controlled, sample-based instrument. Whatever the mechanism, however, the end results can be totally believable.

Virtual Guitarist 2

Steinberg's *Virtual Guitarist* will be well known to *SOS* regulars, and the original version was reviewed in *SOS* December 2002. The basic structure of *Virtual Guitarist 2* is the same as that of its predecessor, and it's also similar to *Virtual Bassist* (reviewed in *SOS* September 2005), so there is little point in repeating too much detail here, other than for the purposes of a basic recap. At *Virtual Guitarist 2*'s heart is a large collection of pre-recorded rhythm guitar performances (7GB in total) arranged in a series of over 80 Styles — a significant increase in the number of Styles over the original. Each Style includes a number of variations (termed Parts) and, via some clever beat-slicing, these loops can be

The Riff Page in *Virtual Guitarist 2*, showing a basic strummed Part. You can make edits here to add further variety to the performance options.

made to fit the tempo of the host sequencer and the chord pattern fed to *Virtual Guitarist 2* via MIDI. In essence, *Virtual Guitarist 2* is a sophisticated, musically intelligent, loop-manipulation engine.

The Styles cover everything from basic steel-strung acoustic strumming through to low-slung Nu-Metal power riffs, with stops covering nylon-strung acoustic, funk, pop, rock & roll, blues, and reggae amongst others — there are even a couple of Styles based on Mandolin and Dobro thrown in for good measure. *Virtual Guitarist 2* comes with an improved guitar-orientated effects section, so it's easy to customise the basic guitar sounds if required. As with *Virtual Bassist*, a nice bonus of *Virtual Guitarist 2* is that the effects section is also supplied as a separate plug-in, so you can apply the same effects to other audio tracks in your projects.

Aside from the expanded Style set, another improvement in *Virtual Guitarist 2* is the new Part Editor. As described more fully below, this allows the user to tweak the preset Parts, within certain limits, to add some further variability to the performance options. This includes the ability to Groove Match the beat-sliced performance to incoming MIDI data. Part variations created by the user in this way can be saved for later recall.

Installation of *Virtual Guitarist 2* was straightforward, although the plug-in does require a Steinberg key. Aside from the installation DVD, which covers both Mac and PC versions, the box includes a small printed manual that covers the basic operation of the plug-in. All the major plug-in formats are supported including VST, DXi, and AU, with Rewire compatibility as well. A stand-alone version is also supplied. As with *Real Guitar 2L*, I did all my testing of *Virtual Guitarist 2* using the VST plug-in within *Cubase SX*.

Hey, Good Looking!

If visual image is important for the members of your virtual band, then *Virtual Guitarist 2* probably has the upper hand over *Real Guitar 2L*. The key controls are spread over three main screens. The first of these, the Play Page, is split into two areas; a Browser on the right can be toggled between Style selection or Part selection, while the main part of the screen contains *Virtual Guitarist 2*'s key controls, many carried over from the earlier versions. The circular 'orb' displays incoming MIDI activity, including the chord being played.

A number of the controls are self-explanatory, but a few are worthy of further comment. The Presence control adjusts the gain in the upper-mid frequencies; add a little for extra 'ching', or cut a little for a warmer sound. The Decay control alters the sustain of the individual slices (strums or notes), with shorter values giving gradually ▶

The effects options available within *Virtual Guitarist 2*.

▶ more muted notes and values towards normal letting the notes ring out, options that add a surprising amount of flexibility to *Virtual Guitarist 2*'s performance loops. A MIDI Learn function allows any of these controls to be mapped to a hardware controller for real-time adjustment. Of the rotary controls, Inversion is a bit of an oddity. The manual suggests its effect is rather like changing the scale length or body size of the guitar, but the end result is actually quite hard to describe — a picked guitar part might go from something that sounds very bright and like it is being played at the upper ends of the neck to a fuller, rounder sound from the bottom end of the scale. However this is achieved, it does add some further variability.

Switching Doubling on creates a doubled-tracked guitar part and this, along with the Stereo Width control, can create a big, wide guitar sound. This is a bit addictive, however, and in some mixes bigger is not always better. The Fret Noise and Speed switches do what is expected, while the Latch switch simply keeps *Virtual Guitarist 2* playing even if you release the MIDI keys that triggered it. With Latch mode off, *Virtual Guitarist 2* will only play while keys on your MIDI keyboard are held down.

The contents of the FX Page don't require too much by way of explanation, and a 'virtual stomp box' approach has been adopted throughout. Three amp models are provided (solid state, tube, and rectifier), with increasing amounts of distortion available through the range. Four different speaker cabinets are simulated, and there is a choice of two microphone types and two positions. Effects presets can be loaded, and user configurations saved, via the browser section. The stomp-box effects all work pretty well and, while the amp/cabinet modelling is not as versatile or sophisticated as a dedicated unit such as the Line 6 PodXT, the whole package is very easy to use.

Controlling The Performance

As with *Real Guitar 2L*, when controlling a *Virtual Guitarist 2* performance, the MIDI keyboard is split into zones. The keys between C1 and B2 form the Key Remote Range, and it is from here that the different Parts that make up the current Style can be selected. By default, all the Styles have different Parts allocated to the white keys from C1 to B1, while the black keys control the addition of slide or stop noise, trigger a Fill (a slight variation of the current part), duplicate the sustain pedal, or switch Latch mode on and off. Keys above B2 form the Pitch Range, and it is here that notes and chords can be played for *Virtual Guitarist 2* to follow.

The third main window is *Virtual Guitarist 2*'s new Riff Page, which contains the Part Editor. The upper portion of this shows the beat-sliced version of the current part within a window that looks something like a mixture between a waveform editor and a piano-roll editor. However, given the way the *Virtual Guitarist 2* engine works, it's not quite either of these! The lower portion shows a groove map, and provides various ways of adjusting the detailed timing of the Part or matching it to a particular MIDI groove — great for getting *Virtual Guitarist 2* really tight to other elements in your arrangement.

Given that *Virtual Guitarist 2* adjusts the pitch of the playback to suit the MIDI chord, the pitch within the waveform display is more representative than absolute. For strumming patterns, only the top half of the waveform display is used, but for those parts based on picked notes, both the upper and lower lanes are used to display alternate notes. While the technical details are not explained in the manual, my impression is that the audio engine is processing each lane separately in order to construct the overall performance.

The various Riff Page options do take some experimentation to become familiar with. However, it is well worth the time invested, as it does mean you can expand upon the various performances within each *Virtual Guitarist 2* Style — even just muting one or two waveform sections can totally change the feel of a part. Using the Copy and Paste buttons, edited versions of parts can be placed into one of the blank slots within the C2 to B2 section of the Key Remote Range.

Playing *Virtual Guitarist 2*

In use, *Virtual Guitarist 2* is a very different beast to *Real Guitar 2L* and it is perhaps easier for the new user to obtain a performance from. Essentially, as *Virtual Guitarist 2* is fed a MIDI chord progression, it will perform that progression in the chosen Style. The user can switch between the

various Parts for that Style using the Remote Key Range. These two stages could, of course, be done in two recording passes, but even for someone with my modest keyboard skills, this soon becomes something that can be done in a single take and then edited accordingly. *Virtual Guitarist 2* does cover a wide musical palette, and there are enough 'bread and butter' strumming options to cover most musical situations. That said, editing aside, you are pretty much tied to the Styles and Parts supplied and, good though these are, the options will eventually run out if you create several songs that fall into one particular musical area.

As ought to be expected given that *Virtual Guitarist 2*'s output is based on pre-recorded guitar performances, the quality of the sounds is first rate. If there is something that fits in terms of style, then *Virtual Guitarist 2*'s output is right on the money, and I've no doubt these performances will appear in any number of commercial releases — it is, frankly, scarily easy to create a credible guitar part. Through both the effects options and the various Play Page controls (Doubling, Stereo Width, Timing, Dynamics, and so on), it is also easy to customise the qualities of the guitar sound so that it will work in the context of your mix.

Which One Should You Go For?

So, if you are in the market for a virtual guitar plug-in, should it be *Real Guitar 2L* or *Virtual Guitarist 2* that passes the audition? This is exactly the question I was asking myself when both boxes arrived in my studio but, without wishing to sound like I'm copping out, I now think it is entirely the wrong question. While both of these products will enable you to add a professional-sounding acoustic-guitar backing to your latest composition, that is perhaps their only similarity. This end result is actually achieved in very different ways, and the designs of the two engines mean that these plug-ins will suit different tasks and different types of user.

If you want a playable instrument, then *Real Guitar 2L* is a clear winner. This is, quite simply, the best implementation of a multisampled guitar instrument I've ever played and, with suitable practice, I'm sure some users will be tempted to play it live. Admittedly, at present, it only caters for acoustic guitars, but it would be really interesting to see if Music Lab decide to explore this same approach with an electric guitar-based instrument. The fact that all the performances are fully editable as MIDI data gives complete control over the musical style and the parts played, while the collection of parts supplied with the Pattern Manager does provide a route to more instant results, more than justifying the additional cost of the '2L' version of the plug-in.

On the flip side, *Virtual Guitarist 2* has the edge when it comes to sheer ease of use and musical breadth. If one of the provided Styles happens to suit, then a thoroughly professional guitar part — acoustic or electric — is so easy to create that you might still be tuning up your real guitar by the time *Virtual Guitarist 2* has finished the job! I could imagine composers who work in a broad range of styles and to tight deadlines would find *Virtual Guitarist 2* a very useful addition to their virtual instrument collection, particularly if they are not guitar players themselves.

Conclusions

Despite professing to be a guitarist, in the course of this joint review I used both of these products within a couple of my own projects. Frankly, when I just wanted a bed of strummed chords, either of them made it easier to achieve than miking up my own guitar. And when I wanted a rapidly picked part (never my strength!), both of them did it more accurately than I would have done without a multitude of takes.

That said, I'm not going to be putting my guitars up on eBay just yet — a virtual performer has their virtues, but there are times when the life, energy, and human error of a live guitar performance is exactly what is required to make the music real. However, both *Real Guitar 2L* and *Virtual Guitarist 2* are capable of excellent results and, while both can be described as guitar virtual instruments, the route by which polished guitar tracks are achieved is very different. I suspect this will be the key factor in deciding which plug-in might most suit your own needs. SOS

Information

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Classic Tracks

Derek & The Dominos 'Layla'

Artist: Derek & The Dominos
Track: 'Layla'
Label: Polydor
Released: 1970
Producers: Tom Dowd, Derek & The Dominos
Engineers: Ron Albert, Howard Albert, Karl Richardson, Chuck Kirkpatrick, Mack Emerman
Studio: Criteria

Inspired by a Persian classical poet and a certain Mrs Harrison, 'Layla' went on to become Eric Clapton's most enduring hit.

Richard Buskin

OK, so you probably know the story: Eric Clapton and George Harrison were bosom buddies, playing guitar together and appearing on each other's records. However, Eric also had the hots for Mrs. H, former model Patti Boyd, and in a state of emotional turmoil he penned a musical love letter about his pain and his yearning.

Having read and identified with *The Story Of Layla And Majnun* by 12th-century Azerbaijani poet Nizami, in which a young man goes crazy over his unrequited love, Clapton put pen to paper and came up with his own 'Layla', one of rock's all-time classic love songs. In it, the audibly pained singer urges his elusive sweetheart: 'What'll you do when you get lonely and no one's waiting by your side? / You've been running and hiding much too long / You know it's just your foolish pride.'

What is less well known is the story of exactly how the song came to be recorded in three separate parts, featuring virtuoso guitar contributions by both Clapton and Duane Allman, and a piano coda written and performed by drummer Jim Gordon. In essence, its creation blended serendipity with artful improvisation, as concocted by the musicians and their behind-the-board team of executive producer Tom Dowd, sibling engineers Ron and Howard Albert, and to a lesser extent, Karl Richardson, Chuck Kirkpatrick and Mack Emerman.

Derek & The Dominos (left to right): Eric Clapton, Bobby Whitlock, Jim Gordon and Carl Radle.

Meeting Criteria

Dowd, the legendary engineer and producer of countless rock, pop, jazz, soul and R&B artists, had first met Clapton when working on Cream's *Disraeli Gears* album in 1967. That same year, 14-year-old Ron Albert claimed he was 16 in order to land a job assisting at Mack Emerman's Criteria Studios in Miami, and soon thereafter he made the jump to engineering. Big brother Howard, a musician who'd previously used Ron to take care of his band's sound and lighting, joined him there in 1969 after returning from active duty in Vietnam.

"I got out of the Army in San Francisco and I flew to New York for a wedding before I came back to Miami," Howard recalls. "Well, Ron sent me a whole list of microphones to study on the way home, along with descriptions of what they looked like, and finally when I got to the studio some of the first things that I did prompted those around me to say 'I don't know why you're doing it like this.' Basically, I would do crazy stuff just because I didn't know any better, and that worked out to our advantage a little later on.

"At that time, engineers were just using one overhead and a bass drum mic and a snare drum mic, if they used that much, whereas I miked every cymbal, every drum, everything, because to me that's the way it should have been anyway. And so we did a lot of experimenting, even using microphones for drumsticks... That didn't work."

"We were fortunate at Criteria to have Mack, who was a bit of an equipment junkie," adds Ron. "He would travel to Austria and Germany and buy all these beautiful condenser microphones, and they were locked away for exclusive use on strings, horns and orchestra recordings. They were never used for our late night rock & roll recordings. However, when Howard came to the studio, he'd say 'Well, why don't we try this mic on that and this mic on that?' We were like 'Oh no, that's not allowed,' and he'd say 'Why not?' So, we started using condenser microphones on tom-toms and things like that, which was unheard-of back then, and we developed what came to be known as the Fat

Albert Drum Sound. This really was based on having some wonderful, beautiful European condenser microphones, and lots of them as opposed to the usual two or three on the drums. Howard basically developed the whole multi-mic drum technique single-handedly."

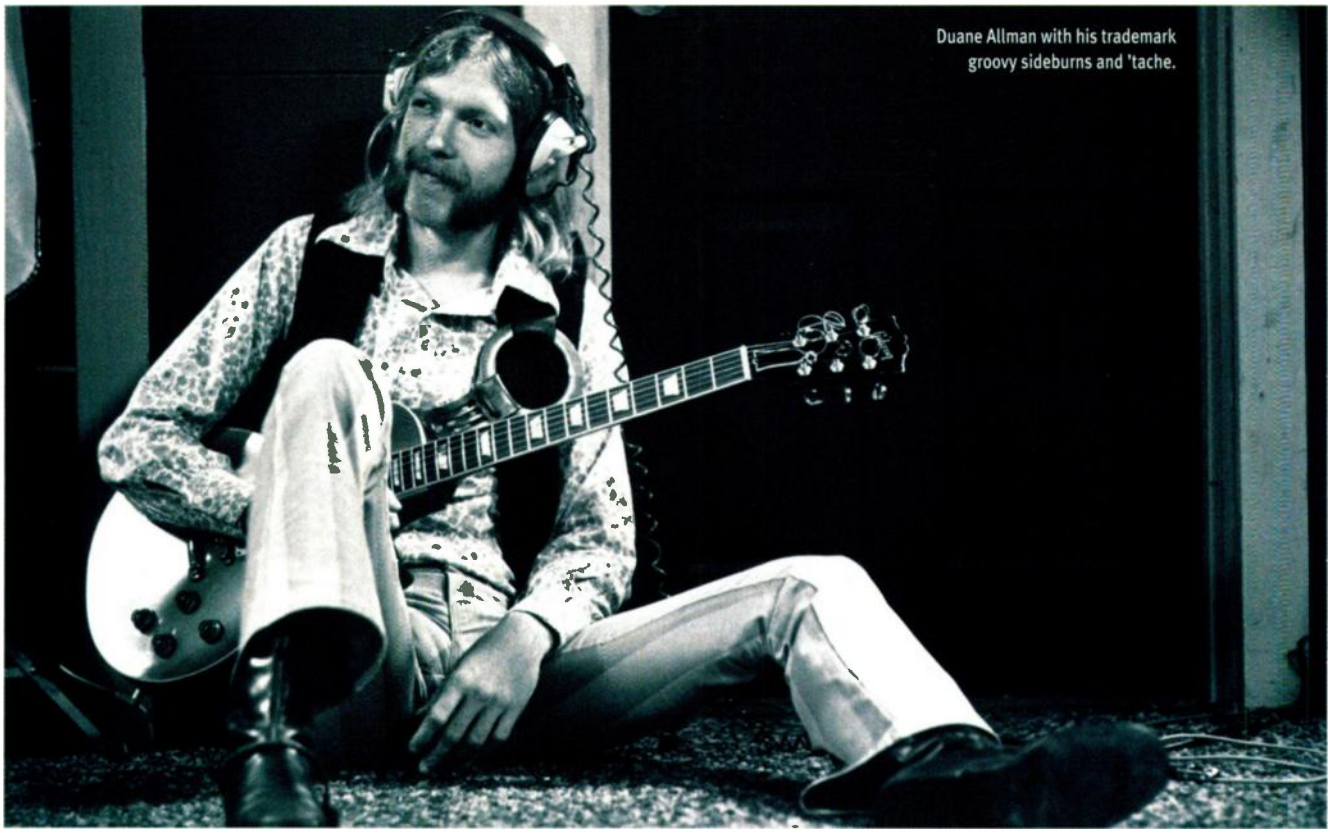
Two Heads Are Better...

It was in 1970 that Ron and Howard engineered together for the first time, recording the *Everybody's Talkin'* album by R&B tenor sax great, King Curtis, produced by Curtis, Jerry Wexler and Jimmy Douglass, with arrangements by Arif Mardin, and featuring the likes of Billy Preston and the Memphis Horns. It was an invaluable musical education, and one that would pave the way for the Alberts' joint production and/or engineering credits on records by, among many others, Aretha Franklin, Frank Zappa, the Rolling Stones, Jimi Hendrix, Joe Cocker, Jimmy Page, Johnny Winter, James Brown, Joe Walsh, Wishbone Ash, the Average White Band, Buddy Miles, Crosby, Stills & Nash and, of course, Clapton and the Allmans.

"Sometimes I would go out into the studio, woodshed with the band and arrange the song while Ron was getting the sound together," says Howard, explaining the brothers' unique collaboration. "Then, at other times, I'd be out there setting up the mics and Ron would be sitting at the board. We worked pretty much hand in hand, there was no set approach. When we were both at the console there were four hands on the board, and we worked so well together that, if something had to be done, Ron knew what had to be done before I could say 'Hey, do this,' and it was the same the other way around."

"We always felt we had an advantage," adds Ron. "When working with a lot of different groups, if the guitar player or the drummer had a personal connection with, say, Howard, and the singer or keyboard player connected with me, that enabled us to keep the group involved in the recording as opposed to 'Well, I'm working on the vocals now, the rest of you go get a burger.' That really worked in our favour. One of our early mentors, Tom Dowd, always said he had taught us that making records with a band is a little like being a lion tamer — you have to learn to keep the lions in a different cage to the tigers, and you have to learn to treat everyone with respect and dignity ▶

Eric Clapton performing live at the time of 'Layla'.



Duane Allman with his trademark groovy sideburns and 'tache.

Photo: Michael Ochs Archive / Redferns

even if they're not the lead singer.

"Tom had a philosophy that he didn't push on us but which applied in his own studio, and also in one of the studios at Atlantic in New York. He believed that if you like something, you pull it closer to you, whereas if you don't like something you push it further away. You know, if you're sitting at the dinner table and you don't like the food, you push the plate away from you, you don't bring it closer. Well, he had his console faders set up that way — they were actually reversed, with louder closer to you. If we had to go and mix a record at Tom's house, it was very difficult, whereas I guess in audio terms he was ambidextrous — he was perfectly comfortable sitting at a regular console pushing the faders up or, in his own facility, pulling the faders down. The same at Atlantic — MCI had to build a console for him with the faders backwards. I've never seen this mentioned in writing, I've never heard anybody talk about it and I've never seen a studio like that, but that was a Tom Dowd original.

"We were fortunate to have a unique situation at Criteria back then concerning the studio's relationship with MCI [*founder and designer*] Jeep Harned, where we were the test site for all of the MCI equipment. As fate would have it, Howard is right-handed and I'm left-handed, and when we would sit at the board together, if the console was laid out with, say, the percussion on the left-hand side and the guitar overdubs on the right-hand side, it would be kind of awkward for me to reach over and get to the percussion, just as it would be awkward for Howard to reach over and get to the guitars. Up until that time, all of the sub-groups were on the right-hand side of the console. So, MCI actually came up with a prototype for us where we had the sub-groups in the center, and that became the 500-series console. With the faders in the center, it was easy for Howard with his right hand and me with my left hand to reach the middle sections. And while we thought that was unique for us, it became the format for the rest of the world. It really did make more sense to have the sub-groups in the sweet spot in the center of the console."

Creamed

Meanwhile, trying to escape the supergroup rigours that he'd experienced with Cream and Blind Faith, Eric Clapton found a sweet spot in the spring of 1970 by hooking up with several of the sidemen (aka 'Friends') who, like him, had played with Delaney & Bonnie; keyboardist/singer Bobby Whitlock, bass player Carl Radle and drummer Jim Gordon. Calling themselves Derek & The Dominos — in line with an announcer's mispronunciation of their intended name, Eric & The Dynamos, at the band's first live appearance — they quickly undertook a summer tour of England and then flew to Miami, where they just as quickly recorded the superb *Layla And Other Assorted Love Songs* double album, at what the Alberts jokingly refer to as 'Bacteria'.

When I spoke with him in 1998, the late, great Tom Dowd described how this came about while he, Ron and Howard were working on the Allmans' *Idlewild South*:

"One day I was in a session and the band was doing a take, and the secretary came in and said 'There's a Robert Stigwood on the phone for you.' I couldn't deny Robert, so in the middle of the take I picked up the phone, and when the band finished and came into the control room I was still speaking to him. When I put the phone down I apologised and said 'Look, that was Robert Stigwood. He's Eric Clapton's manager, and I haven't spoken to Eric for some time, but he wants to record here,' and Duane said 'Do you mean the guy...' and he started playing these Cream licks. I said 'Yeah.' He said 'Oh man! Is he going to record here?' and I said 'Well, that's what we were talking about.' Duane said 'Man, I'm going to call you when we get back here, because when he's here do you think I could come by and watch him?' and I said 'Well, the two of you are so congenial that I'm sure it'll work out, not a problem,' and I just let it go at that.

"A couple of weeks later, Eric, Bobby Whitlock and the guys all showed up. They started running songs by me because they hadn't formulated the final concept on them, and so I was recording everything they were doing, and saying 'This should be the intro,' 'This doesn't belong in this song,' and we were just rapping. In the middle of doing this the phone rang and it was Duane saying 'Hey, we're going to be in town the day after

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tomorrow. We're doing a concert. Are they there?' Then he heard Derek & The Dominos in the background and he said 'They're there! Can I come by?' Eric was in the control room and I said 'Eric, I have Duane Allman on the phone and he's asked if he could come by and watch you record...' Eric looked at me and said 'You mean the chap who played...' and he played me the back end of 'Hey Jude' from the Wilson Pickett record. I said 'Yeah, that's him.' He said 'They're going to play a show here? Then we're going to see them play!'

"That's how that all materialised. That night I took Derek & The Dominos down to the Miami Beach Convention Center, where the Allman Brothers Band was playing outdoors, and when the concert was over everybody came back to the studio. They started jamming and trading licks, and Duane was holding Eric's guitar, Eric was showing Duane how he did this part, Duane was showing Eric the bottleneck [*slide technique*], and it was like they had known each other all their lives. Duane had to leave that night because the ABB had gigs, but two or three days later he came back when he was free of whatever obligations they had and the rest is history."

Music Non-Stop

For his part, Howard Albert recalls the Allman Brothers' standard of living at that time.

"They were starving, poor musicians, living in an old Winnebago tour bus," he says. "It was quite literally parked outside the studio, and they lived in it even when they weren't making the record. Their home was the studio parking lot and they didn't have anywhere to go. That's why they were always in the studio and Duane was playing on everybody's sessions. They were young and hungry, they were very gracious about us doing whatever we wanted, and the opportunity to have them around us all the time led to some very creative moments. After all, there was no protocol at that point for recording a band with two lead guitarists, two drummers, a [*Hammond*] B3 and a magnificently melodic bass player. What's more, Duane Allman was the greatest slide guitarist of his day.


The Albert brothers today, at their Audio Vision Studios facility in Florida.

"The uniqueness of the situation was that not only did we have all this experimentation in us, but Tom Dowd was also wonderful in terms of trusting us and seeing in us what he had been in his early days as an engineer/producer. He'd had to be very inventive, and when he saw the same in us he let us run with it. It was a case of 'Anything you want to do is great so long as I check it,' and that arrangement led to some phenomenal opportunities for us, because 10, 11 o'clock at night — for sure by midnight — he was out the door. However, the session with the Allmans didn't end, because they didn't know where to go. We'd record through the night on many, many nights and then around noon Tom would come in, listen to what we'd done, and either give it his stamp of approval or redo it. That was the safety net that allowed us to be totally creative."

"In those days there was a lot of camaraderie," adds Ron, "and it wasn't unusual — especially on Atlantic sessions, because we all knew each other — for Karl Richardson to come in and work on a project that we were doing or for us to go in and work on a project that he was doing. Karl was certainly a big part of 'Layla', although he wasn't there 95 percent of the time, and the same applied to Chuck Kirkpatrick as well. Since the sessions would go on all night, it wasn't unusual for either of them to come in at some point and do an overdub.

"It was all hands on deck, because even if Duane went home and Eric wanted to play or Eric went home and Duane wanted to play, there had to be bodies to handle the recording. Mack Emerman also did a few things, I can't remember what — he probably did an overdub here, an overdub there, something like that, but primarily it was Howard and I on those sessions, with our fellow staff engineers Karl and Chuck also there for that historic recording. Everybody contributed. In fact, if you look at any of the box sets of the reissues of 'Layla' and they have those famous track sheets, the handwriting on there is Chuck's because his penmanship is beautiful. We would scribble on the track sheets and he would come in the next day and re-copy them all! It was kind of funny, but you know what, it was also great because it's documented forever. You can actually read those things!"

Songs From A (Small) Room

At the time of the 'Layla' sessions, the small Studio B control room at Criteria necessitated its 24-in, 16-out custom-built MCI console being positioned sideways to the window, while the Altec Lansing 9844 speakers, soffit-mounted to the cement wall, provided

Souped-up Leslie

"Something that was unique to the 'Layla' sessions was our Fender guitar Leslie. Eric was enamoured with it and we used it a lot," says Ron Albert.

"We had a great big Variac speed control on it," adds Howard, "so we could actually change how fast it went."

Ron: "The way that Leslie was designed, it had two foot pedals. One enabled you to switch the cabinet on or off so that it was just guitar amp or guitar amp and Leslie amp, and the other pedal was the rotor on or off, making it spin or not. By clicking it on and off you could change the intensity or shut it down. However, that wasn't quite good enough for us, so we came up with this ability to control the speed on a constant basis with this big Variac that probably weighed about 30lbs. It controlled the voltage to the motor, so we could have it running at half-speed or any speed we wanted, and that was unique as up until then it couldn't be controlled. Howard being a B3 player, he was familiar with the slow spin of the B3 Leslie and turning it on and off with the left hand, making it spin and stop, spin and stop. Well, we tried to create that within the guitar sound by having it at a speed that was not too fast or slow, and therefore using the pedal to turn it on and off would produce the same kind of start and stop effect. Eric loved that."

Both the Fender Guitar Leslie and the Hammond B3 now reside in the Audio Vision Recording Studios facility that Ron and Howard co-own with partner Steve Alaimo in North Miami.

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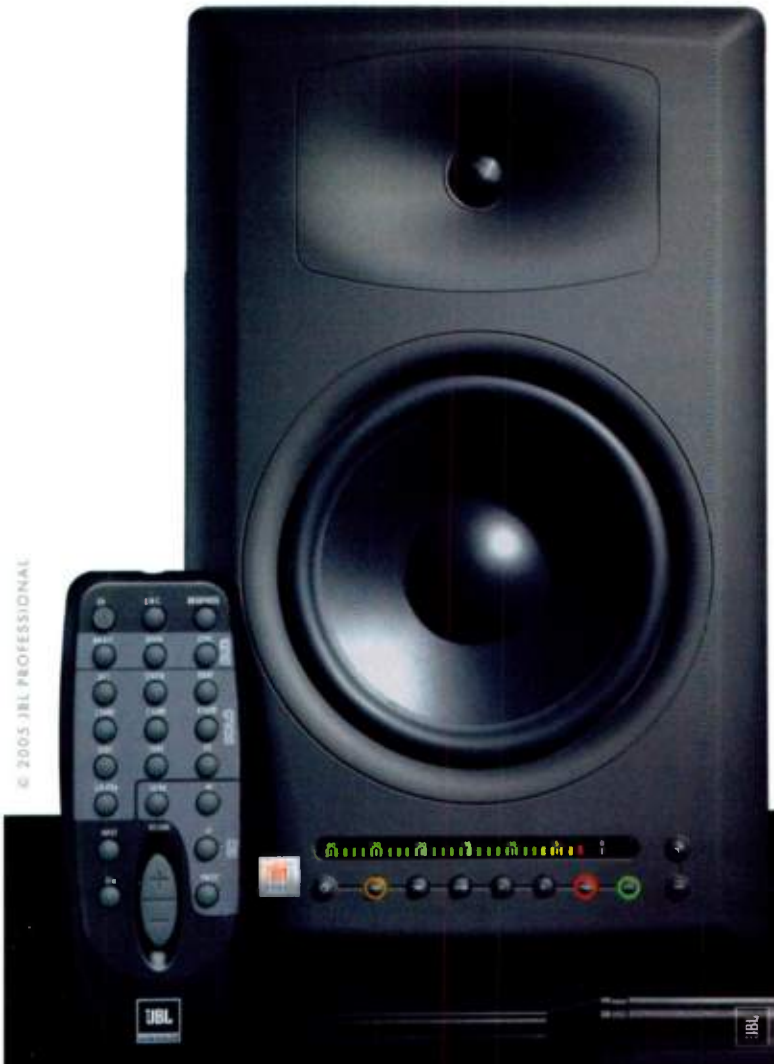

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a lot of bass in a room that also housed a huge black 16-track MCI JH16 tape machine, affectionately known as 'Dumbo'.

"The MCI board was actually built as a remote and studio console," says Howard. "The centre section and meter bridge would slide out and could be used in a remote truck, and it was also one of the first boards to have push-button matrix switching."

"It was built in three sections," adds Ron. "An input section on the left; the centre section which was actually the mic inputs, track assignments and echo sends and returns; and then there was a very traditional mix section off to the right. It was a very, very forward-thinking design — that was the console that we not only recorded 'Layla' on, but also the Average White Band and Aretha Franklin in the studio as well as Jimi Hendrix, Joe Cocker, the Allman Brothers, Johnny Winter and Leon Russell when the centre section was in the remote truck.

"Years later [*in 1976*], when we were in England recording a band called the Sutherland Brothers & Quiver, the drummer introduced us to his best friend, a gentleman by the name of Dave Gilmour. Dave used to come over and play on the sessions, and one weekend we were invited to a barbeque at his farm, where he took us to the barn that housed his studio, and lo and behold when he opened the doors we saw the old Studio B console from Criteria sitting in his control room! He certainly didn't know that it was our old console and we didn't know that he had it — bizarre!"

These days, the aforementioned Altec Lansing 9844s are utilised as TV speakers in Howard's living room, while the Studio B control room has been transformed into a lounge at what is now known as the Hit Factory.

"Acoustically that room was unique and it worked so well," says Ron. "It was phenomenal, one of the greatest acoustic spaces we've ever worked in at any of the studios all over the world."

Photo: Hit Factory / White Mark

Criteria as it is today, after being bought by the Hit Factory and extensively refurbished. Studio B, where 'Layla' was recorded, is now a lounge for clients.

When Duane Allman first became involved with The Dominos, they had already recorded three tracks: 'I Looked Away', 'Bell Bottom Blues' and 'Keep On Growing'. Allman debuted on 'Nobody Knows You When You're Down And Out', and thereafter he contributed some superb slide guitar to the rest of the album, inspiring Clapton's own playing, and even adapting a T-Bone Walker vocal riff to help contrive the classic guitar lick — one of the most famous in rock history — that kicks off 'Layla' and then underpins the track's entire first section.

With their backs to the nine-foot Baldwin piano, Clapton and Allman sat side by side during the session. And what with the three other band members and all of their equipment, conditions were pretty cramped inside Criteria's Studio B live room.

"If you looked through the control-room glass, the piano was to the left," Howard Albert recalls, "and on top of the piano, which had the lid closed, were our [*Fender Tweed*] Champ amps that Eric and Duane both used."

"We had to be inventive," adds Ron. "The room was not a large space, so what we had to do was figure out a way to get everybody in there. The piano took up most of the space along one wall, and cue systems in those days were pretty basic. We only had one stereo send and it was hard for everybody to hear themselves, so for acoustic purposes we used the little Champ amps because they wouldn't make a lot of sound in the room, enabling us to get isolation between the drums and the piano and the guitarists. However, since Duane and Eric couldn't hear themselves with the live drums, live piano, B3 and so on, Howard or I came up with the idea to place [*AKG*] 414 mics inside the piano on some foam, close the lid and then completely encase the piano with three layers of quilts and a roll of gaffer tape."

A combination of Shure SM57s and Electrovoice 635s were employed on the guitar amps, while on the other side of the room sat Bobby Whitlock's Hammond B3 and a sole Leslie speaker, miked with a couple of SM57s at the top and another at the bottom. In the far-left corner of the room was a round drum booth — likened by the Alberts to a space capsule — inside which Jimmy Gordon's kit was recorded with a telescopic Sony ECM51 on the hi-hat, a pair of Neumann U47s overhead, a Neumann KM84 on the snare, an Altec 633 'Salt Shaker' on the bass drum and Neumann U87s on the toms. Carl Radle was positioned next to the booth, his bass DI'd.

The Art Of Tape Splicing

Aside from the aforementioned guitar Leslie, the only effects employed on 'Layla' were EMT echo and tape loops, with backwards cymbals overdubbed alongside Jim Gordon's percussion parts. "There weren't a lot effects you could have back then," says Ron Albert, "there weren't any plug-ins. And I tell you what, living in a world with plug-ins, living in a world with digital, I don't know how we did half the stuff we did, but we did it somehow. Just in terms of editing, Howard was incredibly good at splicing multitrack tape — of course, Tom invented it, and Howard was a latecomer in that regard, but Howard became very good at splicing tape and creating effects along those lines.

"The trick to that was the way we laid out the tracks when they were recorded to the tape. Typically, and even now today, on 95 percent of the sessions you will see track one is bass drum, track two is snare drum, whereas in the days of analogue with tape, Howard and I always put the bass guitar and bass drum — which would provide our downbeat to cut to — in the middle of the tape on tracks eight, nine or 10. That way, when you made the vertical slash at a 45-degree angle and then butted the two pieces together, the downbeat was still in the centre of the tape."

"The transients would carry over," Howard explains, "so if you had any kind of noise there it would cover that up."

"If you looked at the tape horizontally, things like piano would be on tracks one, two, three and four, and they would be there before the splice," Ron continues, "whereas things like guitars would be on the bottom of the tape after the splice, and the transients — the kick drum, snare drum, bass — would be in the centre of the tape where the splice was."

"There was a lot of controversy among engineers of that era about miking of the bass cabinets," says Ron. "Some people swore by it, but even if we appeased them by recording that way, we very rarely used this in the mix. In the mixes we'd just use the direct. It never really seemed to make any sense to have a miked cabinet unless it produced a unique or special sound."

Recording Non-Stop

"In those days we recorded everything," Ron continues. "It wasn't like 'OK, take one, play it once. Take two, play it again.' We recorded everything and always had tape rolling."

"We'd go out in the studio, someone would have a riff, someone would start playing something, and it would be a case of 'Try this here, try this there,'" adds Howard. "We were recording this all the time, and then finally we'd get to the point where everybody said 'That's it, that's great. That's the take,' and after that we'd just fix things here and there. Usually, we only went through a song three or four times, max, having previously played the thing for three or four hours."

"Sometimes the only thing that remained from the chosen take was the rhythm guitar and the drums, whereas with other tracks nothing was redone or overdubbed," Ron says. "But with a band like the Stones or Derek & The Dominos there's so much interaction amongst the musicians playing live that, unless necessary, you don't want to go back and change a lot of things, because then you're almost defeating the purpose of having the band play together."

Conversely, Eric Clapton overdubbed his 'Layla' lead vocal over the course of several nights, standing in the live room and singing into a [*Neumann*] U87. This was then comped from numerous takes and treated to Urei 1176 compression.

"Tom [*Dowd*] was phenomenal at reading people's moods, and he would know pretty quick whether or not the vocal was going to come tonight," Ron Albert recalls. "He was magnificent as a producer at being able to allow the artists enough space to, even if they were not getting it, think they were getting it, and then come back another day and do it again. He would never put the artists in the position of 'You suck tonight, let's not record this,' even if he knew 'You suck tonight, we're not going to get it.' He was very, very good at getting them to come back in and try again another night.

"Eric is very underrated as a singer. The emotion with which he sang 'Layla' was, of course, very personal to him, but 30 years later it's still heart-wrenching, even though it took lots of takes to get what was wanted. We only had 16 tracks to play with, but we were pretty good at finding ways of having four or five tracks at any given time to overdub 20 or 30 vocals. So, we would always do comps, and we were very good, if I say so myself, at making those comps."

Coda

It was after 'Layla' had been completely recorded that drummer Jimmy Gordon began noodling around on the piano and came up with the song's exquisitely tender, loving and wistful coda, the perfect counterpoint to the intense blues-rock that precedes it.

"It sounded so good, everyone said 'Why don't we just stick that in there?'" Howard recalls. "There was no piano on what we now refer to as Part One of 'Layla'. Part Two commences with Jimmy playing the piano, and Part Three came about when everybody thought it sounded so cool that it would be a good idea to bring the entire band back in to play over the end of the piano solo, making the transition between Parts One and Two smoother."

After the *Layla* album took about three weeks to record, a week was spent on the mix, the Alberts and Dowd providing plenty of fingers to push the faders in the days before automation.

"The emotional and sexual tensions involved in the recording of that album made it kind of an interesting time to say the least, and sprinkle that in with a good dose of drugs," says Ron. "There was some serious drugs going on during those sessions..."

"But at that time it didn't appear to hamper them," adds Howard.

It would later on, not only for Clapton but for bass player Carl Radle, who'd die of drugs and alcohol-related causes in May 1979. That was all in the future during the last quarter of 1970, when Derek & The Dominos toured England and America while the *Layla* album, 'Bell Bottom Blues' and an abbreviated version of the title track climbed the US charts. There was no such initial success in the UK, yet in March 1972, following The Dominos' dissolution, Clapton's temporary retirement due to his heroin addiction and Duane Allman's untimely death in a motorcycle accident, the *History Of Eric Clapton* compilation album gave rise to a re-release of 'Layla' in its full, seven-minute form, and that summer the single made the top 10 in both the US and the UK, where it would repeat the feat a decade later.

As for Eric and Patti, his persistence eventually paid off. She left her hubby and they finally tied the knot nine years after 'Layla' had been recorded. The marriage ended in 1988, but that paean to their once-illicit love would live on, its coda used to great effect in Martin Scorsese's classic 1990 gangster movie *Goodfellas*, and the main body of the song successfully reworked in acoustic form for Clapton's 1992 appearance on MTV's Unplugged. Still, it's the original version that endures, its agonised lead vocal, timeless guitar riff and engaging piano and slide-guitar outro marking it as a solid-gold classic.

In Clapton's own words, "To have ownership of something that powerful is something I'll never be able to get used to. It still knocks me out when I play it." SOS


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Universal Audio Solo Series

Microphone Preamps

The Solo 110 and Solo 610 are a pair of high-quality, no-frills preamps — one solid-state, the other valve.

Hugh Robjohns

There can be very few people interested in recording sound that have not come across the name of Bill Putnam, Senior. He was a legend, not only as one of the great recording engineers of the '50s, '60s and '70s, but also as a designer of studios and recording equipment. In 1999, Bill Putnam Jr. and his brother James re-founded their late father's Universal Audio company and today the company focuses on two main lines of work: authentic hardware reproductions and innovative software emulations of classic analogue equipment.

The subject of this review is a pair of very neat, single-channel preamps based reasonably closely on existing UA technology. The first is a single-channel version of the Precision 110 series Class-A solid-state preamps found in the 4110 and 8110 units, while the second is yet another incarnation of the classic Putnam 610 valve preamp. The two units form the Solo series, and are called the Solo 110 and Solo 610, respectively.

Construction

The unique aspect of these preamps is really their form factor — they are compact, portable, single-channel units, with a refined feature set offering just the essentials. Both units share exactly the same rugged steel chassis and have identical features and facilities, but the internal electronics are obviously completely different. The chassis measures 146 x 127 x 355 mm (WxHxD), with a strap handle on the top, and the top and sides extend beyond the chassis frame to protect the switches on the front and back panels. The sides have stylish cooling slots cut in the shape of the UA logo. The solid-state Solo 110 weighs 2.4kg while the valve Solo 610 is heavier at 4kg, thanks to the additional transformers the latter model contains.

The rear-panel facilities for both units comprise a pair of XLRs for a mic input and balanced output, plus the ubiquitous IEC mains inlet with a separate mains on/off rocker switch. In keeping with its vintage styling, the 610 features a pair of metal toggle switches associated with the output XLR, which provide a ground lift and adjust the output level between mic and line settings. The Solo 110 has identical facilities but uses illuminated blue push buttons.

The Solo 610's IEC inlet includes a fuse-holder-cum-voltage-selector catering for 115 or 230V operation, while the 110 model has a switched-mode power supply that can accommodate any mains voltage from 90 to 250V. Both units consume a maximum of 18W of power.

Moving around to the front panel, both units have identical facilities, but the 610 controls them with metal toggle switches and large, vintage-style knobs, while the 110 uses the same illuminated blue push buttons and modern knobs as are found on the 4110 and 8110 units.

In both cases, the left-hand knob controls the input gain, while the right-hand knob sets the output level, and both are scaled arbitrarily from 0 to 10. The first of the five switches selects between the rear-panel mic input and front-panel DI input, while the second configures the input for high or low impedance. Next is a phantom power switch, followed by a 100Hz high-pass filter switch and, finally, an output polarity reverse switch. A blue LED shows when the power is switched on, and a tri-colour LED gives a crude indication of signal level. The LED shows green when the signal is at a nominal signal level, turns amber as the headroom limit is approached and the amount of distortion increases, and turns red when the amplifier clips.

The front-panel DI input is joined by a parallel-wired 'thru' output (both are on quarter-inch jacks) allowing the preamp to take a 'sniff' of a guitar signal *en route* to the guitar amp, for example. The DI input is about 20dB less sensitive than the mic input, which is pretty much ideal.

The switchable input impedance affects both mic and DI inputs. When the DI input is used, the options are 47kΩ or 2.2MΩ, while the mic input can see 500Ω or 2kΩ. The high-impedance mode could be considered the default condition, being ideally suited for 90 percent of circumstances, but the lower value provides an alternative flavour that may prove useful. In particular, dynamic mics often sound more interesting when loaded with 500Ω or so.

As might be expected, the all-valve Solo 610 has a lower maximum gain than the solid-state Solo 110, the figures being 60dB and 77dB respectively. These figures are both with the low-impedance mode selected — the gain drops a few dB in high-impedance mode — and the maximum gain is roughly 20dB less when the DI input is selected, as already mentioned. Similarly, the audio bandwidth of the two versions differs, with the valve model spanning a respectable 20Hz to 20kHz (±1dB) and the solid-state version comfortably beating that with 10Hz to 60kHz (±0.2dB).

The maximum input levels for the Solo 610 are +4dBu for the DI input and -12dBu for the mic input (at 1 percent distortion). The output level is dependent to a degree on the loading because of the output transformer, but it can produce +18dBu into a 100KΩ load, falling to +14dBu into 600Ω. The solid-state Solo 110 can accept up to +3dBu on the mic input and produce +19dBu into a 600Ω load, rising to a massive +31dBu into 100KΩ.

Solo 610

The Solo 610 is a pretty faithful recreation of the original 610 preamp design, also found in the Universal Audio LA610 and 2-610. The Solo ▶

SOUND ON SOUND

Universal Audio Solo 110 & 610

pros

- Stylish, practical design.
- Extremely rugged and well built.
- Classy sound.
- DI input with loop-through.

cons

- Metering is rather superficial.

summary

Universal Audio have capitalised on their strengths with these two preamps, and the only way they could improve upon them would be to combine both technologies in one box. Simple and straightforward to use, they are equipped with all the essential features and devoid of unnecessary frills. Choose either the valve 610 for that classic rich, but very controllable sound, or the solid-state 110 for a more modern, open and transparent sound.

610 uses the same dual-triode 12AX7 and 6072 valves — the former to handle the input, and the latter to drive the output — and the output transformer is also the same as that used in the 2-610. I believe the input transformer is slightly different, though, to suit the revised input circuitry. WIMA capacitors are used throughout alongside conventional components set out neatly on a relatively spacious circuit board, roughly half of which is given over to the linear power supply with a generously sized mains transformer. There are only two ICs in the whole box — one is a voltage regulator in the power supply and the other drives the signal level LED. The audio signal only passes through the two valves and two transformers — the way Putnam intended!

Unlike its peers, the Solo 610 has a single, continuous Gain control instead of the rotary 5dB stepped switch of the original and its subsequent recreations, and there is no line input facility or 15dB pad to accommodate high-level sources.

The characteristic aspect of the 610 circuit design is that to increase the input gain, the amount of negative feedback around the input 12AX7 valve is reduced. This inevitably results in an increase in harmonic distortion, which affords the user the ability to juggle the Gain and Level controls to optimise both signal level and sound quality. Crank the input gain up for a slightly crunchier sound, back it off for a cleaner sound, and adjust the Level control to provide the appropriate peak levels at the output. It's simple, elegant and surprisingly versatile.

Solo 110

By comparison, the internal layout of the Solo 110 seems ultra-modern and complex. Most of the passive components are surface-mounted with just a few conventional WIMA capacitors thrown in where it matters. The power supply is a compact switched-mode module, with additional regulation and filtering on the main board — the whole lot taking up about a quarter of the internal real estate.

The same input transformer is used as the Solo 610, but there is no output transformer.

Alternatives

At the expensive end of the market, the single-channel preamp format is not a particularly popular one — at least not without EQ and dynamics thrown in. I can really only think of two direct alternatives: the SPL Gain Station 1 and the Avalon M5. The Avalon is an impressive all-discrete Class-A solid-state preamp, while the SPL is a hybrid, incorporating a switchable tube stage to add that special thermionic character when required. Both are excellent preamps in their own right, with the M5 leaning more towards the neutral and transparent end of the range, and the Gain Station being a little more colourful when required, but still capable of very faithful reproduction when appropriate.

The audio path is via an all-discrete Class-A, DC-coupled design using matched FETs as the active devices, and a lot of them! The Precision 110 series is famed for its superb dynamics and clarity, while still retaining something of the warmth that characterises the vintage Putnam designs. Again, the few ICs in the box are power regulators and the signal level LED driver.

The Precision 4110 and 8110 preamps

feature a switch labelled 'Shape' which is absent from the Solo 110. On the Precision models, this switch alters the transformer and input circuitry loading in three stages to provide a range of harmonic colourations. It's absence from the Solo 110 is basically a cost-cutting move, and the unit is effectively permanently set to the 'Vintage' position. Of the three modes, this is the most flexible and best-sounding in my opinion, providing a wide range of sonic control from the mildest of mid-range presence to a fairly obvious rich character, just by adjusting the input gain — just like the 610.

In Use

While both Solo models are able to provide a range of sonic colours, the two units also have a fairly distinct 'signature' character of their own. The Solo 610 has a slightly rounder, fatter, richer character, and it sounds slightly more closed at the top end compared to the 110. This is not a criticism, though. Rather, it is an essential part of the preamp's vintage personality. The 110 sounds more modern and open — a little more detailed and crisp, and with a more up-front dynamic, yet without the clinical harshness that many would associate with generic solid-state preamps. The gain and headroom provided by the 110 is quite substantial — making it virtually bomb-proof in that regard — although I had no problems with the 610 in terms of running out of gain or headroom, even when using a modern ribbon mic.

Given that the majority of the recording work I do involves mostly classical music, I generally favour accurate, transparent and characterless preamps, and given the choice I would probably opt for the Solo 110 as the closest to that ideal for me. It is quite capable of usefully neutral results, but it also has the flexibility to introduce some subtle richness and body to the sound when driven harder — something that worked well when DI-ing some 'clean' electric guitar parts.

The Solo 610 is noticeably darker and richer in character from the off, and wouldn't be my first choice for most classical recording, but is ideal for recording vocals and percussion parts, and sounded great as a DI for guitars and basses. There's plenty of scope for dialling in loads of character here, and it's almost impossible to make a nasty sound! There is a subtly forward quality to the sound, helping it to cut through the mix nicely.

Conclusions

The Solo units aren't cheap as single-channel mic preamps go, but they are very solidly built using quality components. Consequently, I would expect them to be providing sterling service in 20 years without any problems at all — and that's saying something in these days of cheap-and-cheerful disposable equipment.

They offer simple facilities, yet are able to condition and tailor the signals to meet most if not all technical and sonic requirements. The convenience of a reasonably compact and portable mic preamp should not be underestimated, and the Solo units will appeal to a wide range of users and applications, spanning location recording engineers, to commercial studios, to stage vocalists with deep pockets. If the format suits your needs, and the budget allows, these are both worthwhile additions to your shortlist. SOS

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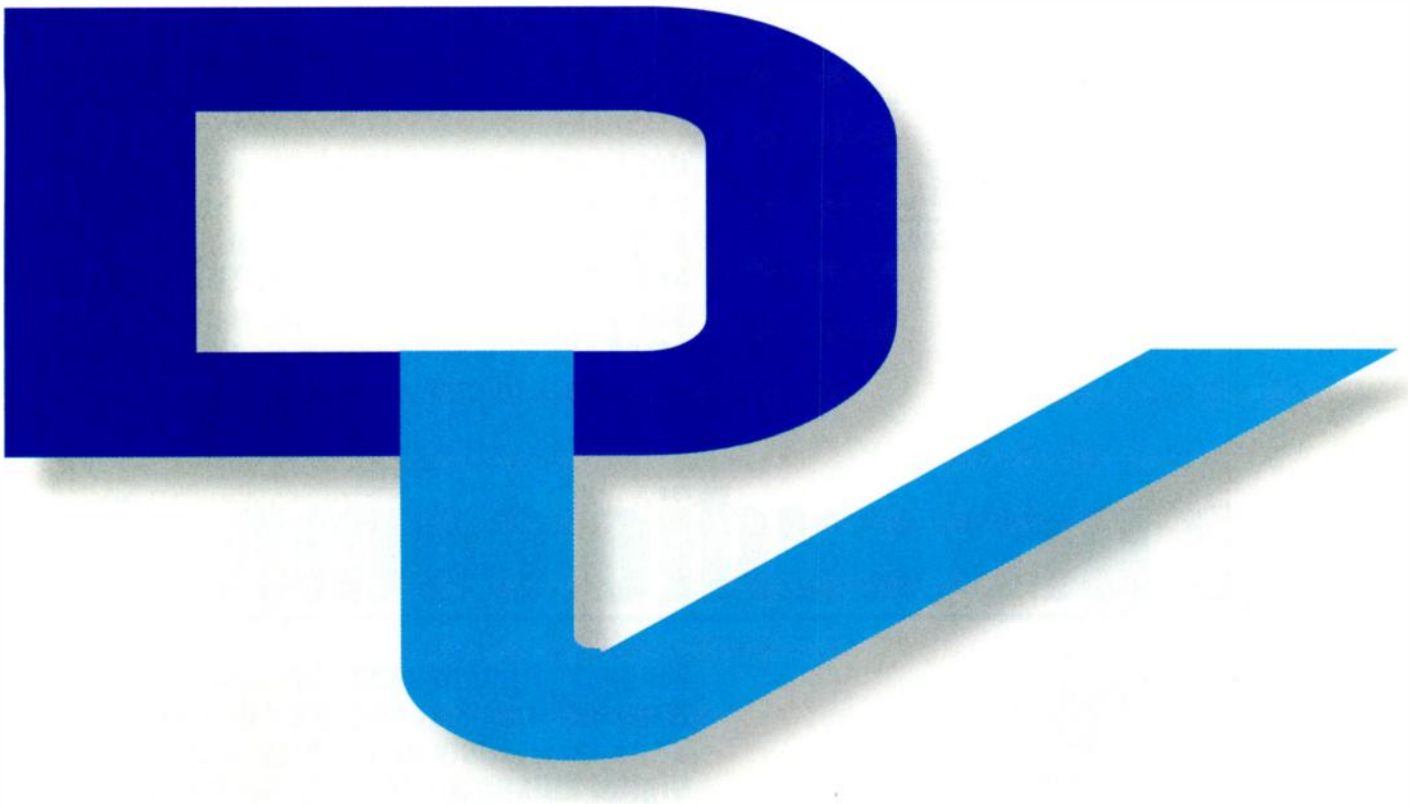

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DV installation has recently completed the supply and installation of Chase Animation's Digidesign Pro Tools Editing / Recording facility. A full 24-input Pro Tools HD3 system including a D-Command Icon Console with expanded fader options was installed.

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Mix Rescue

A top-notch jazz session is given a touch of class at mixdown.

Paul White

This month's Mix Rescue was sent to us from a group of extremely talented and enviably experienced US jazz musicians who had recorded their band Volcano playing live in a large rug warehouse with 14-foot high ceilings. The track, called 'Mr EP', is part of their in-progress album *Bridge*, and guitarist Yavuz Akyazici approached me with the challenge of working on his mix. However, this turned out to be not so much a 'rescue' as a polishing job, as the musical performances were truly virtuoso and Yavuz had already done a very respectable mix himself.

Recording Setup

The recording was made directly into Digidesign *Pro Tools LE* using the Digidesign Digi 002 interface. The live performance was recorded directly onto 11 tracks. The drums were recorded using a Focusrite Octopre fed into Digi 002's ADAT inputs. The overheads comprised a pair of Oktava MK012s with Scott Dorsey modifications. The kick and toms were recorded using an Apex DP1 drum-mic set, while the snare was picked up using another mic from the Apex DP1 set, as it seemed to suit the sound better than the Shure SM57 they tried originally. According to Yavuz, slight limiting was used on the Octopre to prevent digital clipping, but other than mild compression on some parts that was the only processing on the tracks.

The double bass was miked using an Audio-Technica clip-on ATM35 mic attached to the bridge of the bass. A second mic, a Rode NT1, was set up between 18 and 24 inches away and directed towards the sound hole. However, Yavuz mentioned that Joe moves around so much he can't swear where it was pointing during the actual recording! Both mics were fed into Seventh Circle J99 preamps which Yavuz had built himself.

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The drum parts benefited from some light limiting and the judicious application of Noveltech's *Character* plug-in.

▶ The Sax was recorded using a single Sennheiser MD421 MkII, this time fed into a different Seventh Circle preamp, while the guitar was DI'd using a Line 6 PodXT fed into a Seventh Circle N72 preamp. The song was written by Yavuz out of respect for Eric Person's sax playing, hence the title 'Mr EP'. On listening to the band's mix, I could tell right away that everything was recorded very cleanly with mostly decent separation — though there's always a significant amount of spill into double-bass mics and also into tom mics on the drum kit. To me the reverb used over the mix was slightly obvious and the sax had a rather close-miked quality about it that robbed it of some of its natural warmth, but it all sounded pretty good anyway. On closer listening, I also felt the kick drum sounded a bit too lightweight. It was clearly tuned high for jazz playing, but I felt this track needed a bit more depth.

Mix Polishing Tactics

For the bass track, I used the bridge mic and the distant mic tracks together, dipping a little 1.3kHz out of the bridge mic using the SSL Duende *Channel Strip* to round out the sound. I also used the *Channel Strip* to add some very gentle compression with a ratio of 2.7:1 to even things out, as I felt the bridge mic had a somewhat unnatural presence to it. For the more distant mic, I used no processing at all — I just balanced it with the bridge mic to give a nice lively sound. There was quite a bit of spill on this mic from the rest of the band, but it didn't cause any problems when the rest of the faders were brought up.

For the drum kit the kick drum was my only real cause of concern. It was well recorded, but seemed a bit short on weight due to its high tuning. Again I used the trick ▶

Rescued This Month...

Volcano are a four-piece Jazz outfit. Taking care of drumming duties is Matt Wilson, who was nominated as a rising star of jazz for three years running in Downbeat magazine's poll and was voted outright winner in the third year. He also plays with Charlie Haden and has played with a number of leading names in US Jazz including Dewey Redman, Cecil McBee, and Lee Konitz. On sax is Eric Person, also boasting an impressive recording and performing track record with the Dave Holland Quintet and Ben Harper, as well as being a member of the Chico Hamilton Band for many years. Joe Fonda plays double bass with a unique percussive style and has played with Anthony Braxton for several years, in addition to touring Europe many times with The Fonda Stevens Group. Yavuz Akyazici completes the line-up on guitar. During the original recording sessions, Brian Pinneo looked after the engineering duties, while Tony Kirman took the wonderfully detailed pictures printed with this article.

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of getting *Logic*'s Audio To Score function to create MIDI notes corresponding to each beat, and then assigned these to Toontrack's *EZ Drummer* kick drum. By bringing this up beneath the original kick, I managed to add weight without losing the feel and character of the original drum. *Logic* also managed to follow the dynamics of the original kick really well when it assigned the MIDI notes. As I was clearly dealing with serious jazz musicians here, I asked them what they thought of the mix before confessing what I'd done... Happily they liked it!

The snare also sounded really good left just as it was, so I simply inserted a limiter to tame some of the extreme playing dynamics. As usual I muted the tom tracks between hits, by destructive editing in the case of the floor tom and by using a gate on the smaller tom. As always, the action of the gate sounds quite alarming when you hear the track soloed, but once you mix in the overheads, the unnatural decays and odd bits of breakthrough simply disappear. Again I applied no EQ to the overheads or the toms, but I did group the entire drum kit and use Noveltech's *Character* plug-in to add a bit more high-end definition to the whole kit mix. This was followed up by a *Waves L1* limiter to keep a lid on any peaks, though the gain-reduction meter barely flickered, and only on peaks.

The raw sax recording sounded rather thin, but some EQ and compression from SSL Duende's *Channel Strip* plug-in set things straight.

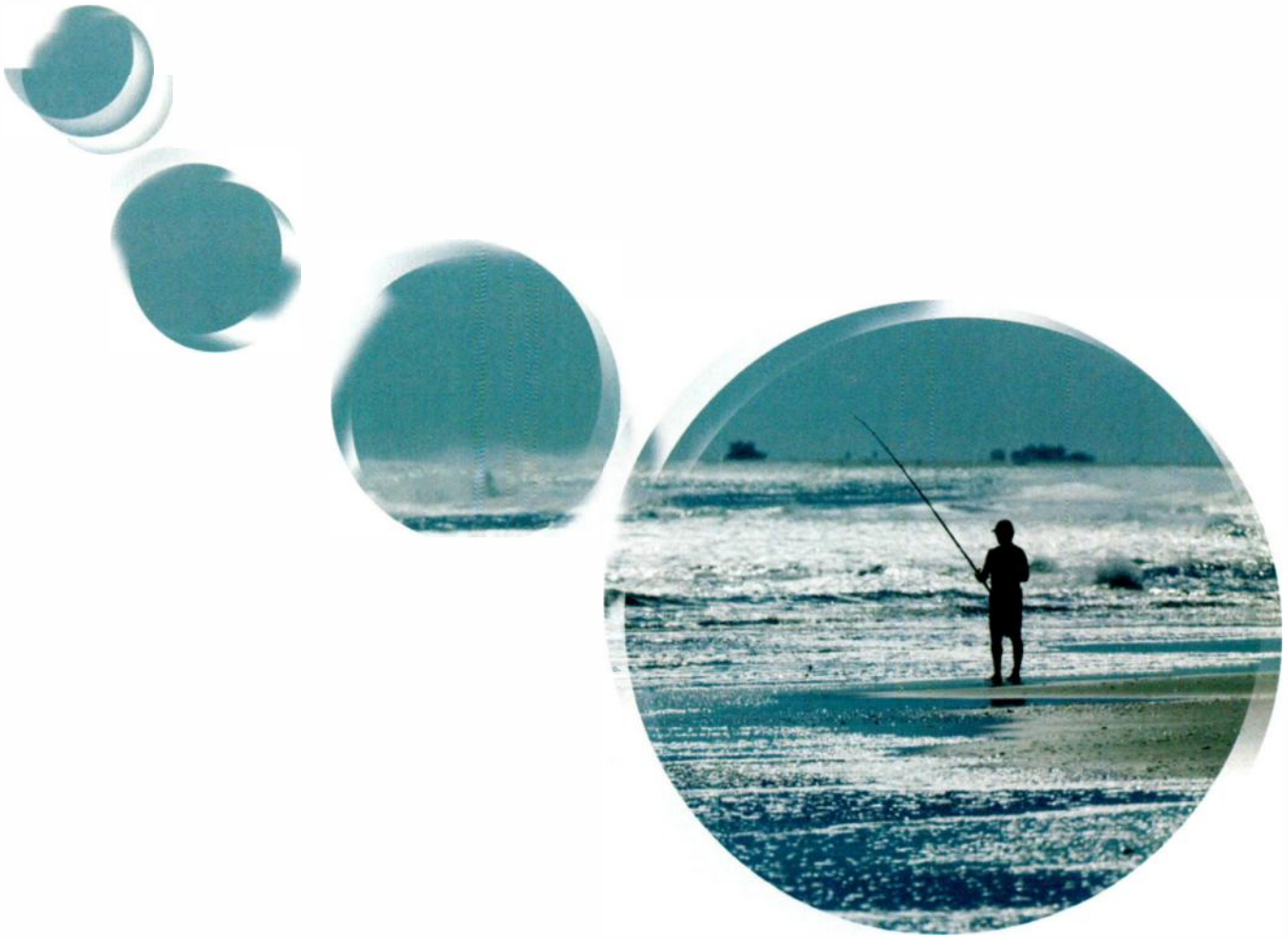
I felt the guitar sound was a little dull, and Yavuz told me he'd EQ'd it in his mix, so I called up another instance of *Character* and dialled in more upper-mid definition without it becoming too obvious. I could have used EQ, but the dynamic processing in *Character* seemed more sympathetic.

The sax needed slightly more work, as I wanted it to sound a bit thicker and more organic. I achieved this using some gentle EQ courtesy of the SSL Duende *Channel Strip*, though any good parametric EQ should be able to a similar job. Essentially I added some lower mid-range boost at around 240Hz to put back some of the warmth lost by close-miking, while dipping ▶

Hear The Differences For Yourself!

Listen to the changes I made by checking out the following audio examples available for download at www.soundonsound.com/sos/sep06/:

- /audio/mixrescue/BassOriginal.mp3
The original recorded bass sound.
- /audio/mixrescue/BassProcessed.mp3
The same track with processing courtesy of SSL Duende's *Channel Strip* plug-in.
- /audio/mixrescue/DrumsOriginal.mp3
The original recorded drum sound.
- /audio/mixrescue/KickOriginal.mp3
The recorded sound from the kick-drum mic, which sounded rather lightweight.
- /audio/mixrescue/DrumsProcessed.mp3
My processed sound, complete with a subtle Toontrack *EZ Drummer* kick sample underpinning the kick drum.
- /audio/mixrescue/GuitarOriginal.mp3
The original guitar part.
- /audio/mixrescue/GuitarProcessed.mp3
The guitar part with some subtle processing from Noveltech's *Character* plug-in.
- /audio/mixrescue/SaxOriginal.mp3
The rather thin-sounding initial sax recording.
- /audio/mixrescue/SaxProcessed.mp3
The saxophone with processing from SSL Duende to give it extra weight and added reverb from Audio Ease *Altiverb*.
- /audio/mixrescue/OriginalMix.mp3
Yavuz's original mix, as sent in to Mix Rescue.
- /audio/mixrescue/Remix.mp3
My remix, complete with mastering-style buss processing.



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out some 1.5kHz, which is what was making the sax sound thin and a hint nasal. Again, the compressor in the channel strip was used very lightly on a 3:1 ratio to add some density to the sound, but I didn't do anything drastic.

Final Balancing

That left only the balancing, panning and final processing to deal with. For reverb, I wanted something less obvious and more intimate-sounding than whatever had been used on the original mix, so I called up Audio Ease *Altiverb* and chose a live jazz-club Impulse Response that I felt complemented the music well without getting in the way.

The guitar was panned just eight points to the right, with the sax eight points to the left, and I used the track level automation to balance the guitar against the sax so that it matched it nicely for the duet sections and stepped forward by a decibel or two for solo sections. Similarly, the drum overheads were panned to around nine o'clock and three o'clock, rather than hard left and right. On paper this makes the mix look quite narrow, but in reality it matches the way the band might sound in a club pretty well and stops the drum kit sounding as wide as the entire sound stage.

On the overall mix I used an SSL Duende *Stereo Bus Compressor* with a 2:1 ratio and a threshold setting that only produced two or three decibels of gain reduction on the loudest parts. As an alternative I also tried the UAD1 LA2A, and that sounded very similar. An SSL Duende *Channel Strip* was used to drop the 350Hz region by just one decibel to add some low mid-range clarity, and the trusty Waves L1 stood guard at the end of the line to watch for peaks. I was quite gentle in applying reverb to the various parts, with the only significant amounts being added to the snare drum, drum overheads, and sax parts, though I did add a little to the PodXT guitar too, just to help it blend with the miked sounds.

From my vantage point, cleaning up the tom spill and choosing a suitable convolution reverb made the greatest contributions to the mix. The rest was down to very fine tweaking, and if I hadn't EQ'd or compressed anything the mix would still have sounded nice. It was a joy to work with performances of such a calibre, and having everything cleanly recorded with no processing (other than the PodXT amp modelling on the guitar) really helped.

I sent a preliminary mix to Yavuz, who came back with a few artistic directions which I followed for the mix version we finally settled on. Yavuz felt the bass might have been a hint too bassy, but the only way to be sure that this is exactly right is to get the track professionally mastered. One of my pairs of monitors told be there wasn't quite enough bass, while the other pair swore there was a bit too much! SOS

Dynamics processing used on the main mix buss comprised SSL Duende's *Stereo Bus Compressor* and Waves *L1 Ultramaximizer*.

Remix Reactions

Yavuz Akyazici: "I just want to say that it sounds very good — I really like the remix and the guitar sounds great. To me the panning now sounds ideal. The bass sounded good, but a bit heavy on the bass frequencies in the original revised mix. However the version with a little less bass sounded right. Somehow, it sounds softer than anything I did before, and sounds a lot more like a record. I do not know how else to describe it. I could not describe all the nuances and the reason for the well-balanced sound, but I see now that there was a lot of stuff going on under the hood which is hard to describe. I do not like most of the commercially mixed jazz CDs, which is one of the reasons I went to all this trouble to learn mixing, building my own mic preamps, modifying mics, and so on, so I'm very critical about most mixes. I hope I can learn enough from this to improve my mixing skills. Congratulations on a great mix!"

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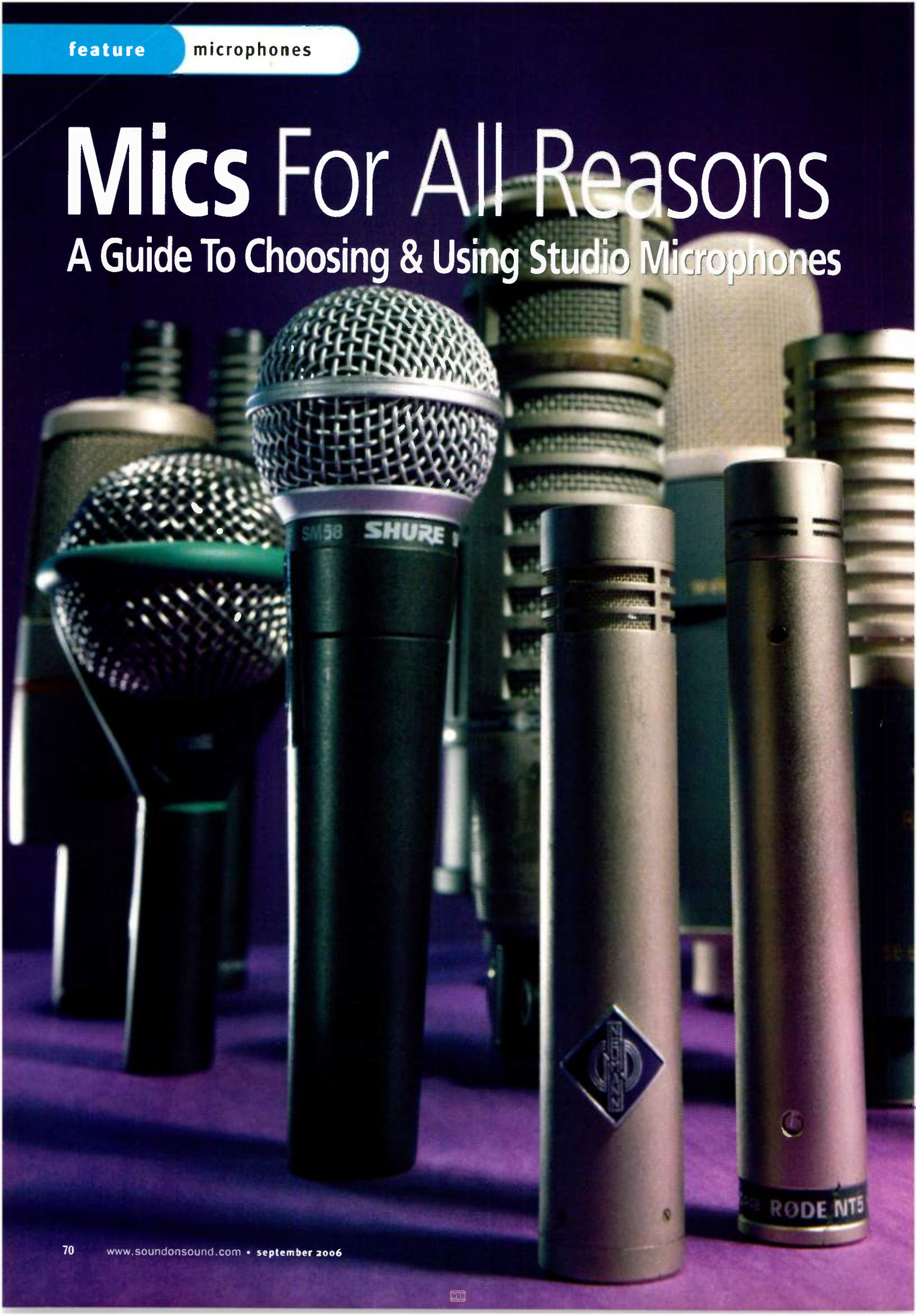
Mics For All Reasons

A Guide To Choosing & Using Studio Microphones



Knowing the right microphone for the job, from the huge variety of types and models available, is an essential skill for anyone who records regularly, and can make the difference between sub-standard and spectacular results. Follow our essential guidelines to ensure you always make the optimum choice.

Paul White

Here at *Sound On Sound*, we're constantly being asked which mic is the best in any given price range, but in reality it's very difficult to choose just one, especially when it comes to vocal recording, as different mics suit different singers. In addition, there are factors other than the mic being used, such as mic placement and room acoustics, that have a significant effect on the end result achieved — so we thought it was time for a good look at the whole subject of choosing and using the appropriate studio mics in the right way. But first, a little background...

The Human Ear & The Recording Environment

If microphone technology is so advanced, surely the perfect mic would pick up sounds in exactly the same way as the human ear and all properly designed microphones should sound pretty much the same? It's a fair question. However, in reality, the human hearing mechanism involves a lot of psychoacoustic filtering and processing: so, for example, when we hear a change in the frequency spectrum of a sound because of a change in its position relative to our ears, we only pick up on the change in position, not the change in tonality. Another consideration is that if you take a direct and a delayed version of a sound and mix it to mono, you'll hear comb filtering caused by the delay giving the sound a phasey or flangey quality. By contrast, the human hearing system uses the small delay between signals arriving at the two ears to determine direction. It also takes advantage of the aforementioned spectral changes due to angle and the masking effect of the head itself, which has a profound effect on how the left ear hears sound approaching from the right, and vice versa.

What this amounts to is that the human hearing system is able to ignore or block out (to a certain extent) factors like room acoustics or frequency-spectrum skewing and inter-ear delays due to direction, whereas a microphone simply turns everything it hears into an electrical signal. In this respect, the microphone behaves very differently to the human ear: the outer ear imposes some fairly radical angle-related spectral filtering to enable us to judge direction, whereas a microphone has a much more simplistic 'polar pattern' that comes about as a function of the physics of capsule design.

Omnidirectional mics hear pretty evenly in all directions, but with so-called cardioid (unidirectional) models the acceptable angle of accurate reproduction tends to be narrower for high frequencies than it is for low frequencies. This might seem irrelevant if what you're recording is always directly in front of the microphone (such as studio vocals), but in fact that's only true if you are recording in an environment with no reflective surfaces, otherwise sound bounces back into the microphone at every possible angle, and this reflected sound is coloured by the off-axis characteristics of the microphone. In practice, even well-damped studios reflect some sound. In any case, it would be undesirable to record in a totally 'anechoic' room (one without any reflected sound at all), as everything would sound unnaturally dead. The trick is to record in a room that's *adequately* damped.

From the above, it can be deduced that there are two possible basic approaches to miking a voice or instrument:

- Choose an acoustic space that complements the sound, then select a microphone with a fairly accurate off-axis response, to accurately capture the room's character.
- Or try to arrange things so that your microphone picks up as little reflected sound as possible.

Allowing the room to become part of the sound is generally more relevant to choral or orchestral recordings than to pop music production, although recording drums in a live room, in order to use its character, is still popular. Altering the mic-to-source distance allows you to balance the amount of direct and reflected sound you pick up.

The second approach is the most common in small studios and usually translates to using a cardioid (unidirectional) microphone fairly close to the subject, with acoustic screens or blankets around the recording area to minimise reflections. The combination of using a cardioid mic and working fairly close improves the ratio of direct-to-reflected sound ▶

CHOOSING AND USING STUDIO MICROPHONES

If you're lucky enough to have a great-sounding room at your disposal (this is the live room in New York's Power Station's Studio C), you can make the most of its character by capturing it, along with the source signal, via a mic that has an accurate off-axis response.

anyway, but in most project studios that have minimal acoustic treatment, hanging absorbing material behind and to either side of the player or singer often reduces room coloration significantly. Regular readers will have noticed that we often recommend duvets for this, as most homes have them. Where you need a bit of liveness, but not room coloration (such as when recording acoustic guitar), it can help to work on an uncarpeted floor or to place a reflective board over the carpet between the player and the microphone.

I know of a number of cases where musicians have spent a lot of money on a big-name capacitor mic and a high-end preamp, but still end up with boxy-sounding results. Often they call us to ask which even more expensive mic would fix their problem, but invariably the room acoustics are the real issue. Hang up enough duvets and you can make a decent vocal recording almost anywhere, with virtually any cardioid capacitor studio microphone. A boxy sound is pretty much always down to a boxy-sounding room. Home-made vocal booths are the worst culprit in this respect, as they usually have inadequate absorption at mid and low frequencies. Studio walls covered in carpet are particularly bad news, as only the high end is absorbed, making the sound boxier than before treatment.

In the rather more likely event that the room sound is nothing special (or even has a character you'd rather conceal), the usual approach is to close-mic with a cardioid-pattern model, to pick up as much of the wanted signal and as little of the room reflections as possible, and to treat the space with sound-absorbing materials (in this case, duvets and soft hangings) to further minimise unwanted reflections.

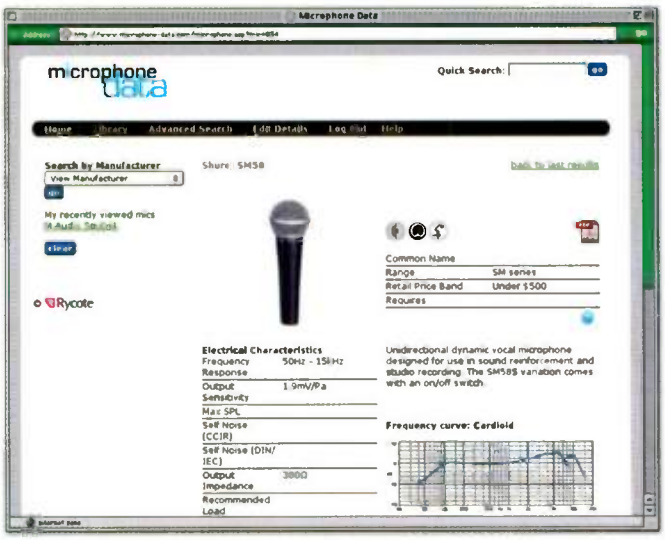
Microphone Sound Character

As a rule, studio recording is undertaken using capacitor mics, because their moving parts are much lighter (and so lower in inertia) than those of dynamic mics, enabling them to handle high frequencies with greater accuracy. Even so, the strong mid-range of dynamic mics (normally used mainly for close drum miking and guitar amp miking) sometimes suits a particular singer better than a more accurate capacitor mic. In this case, what works is what's right, emphasising that choosing the right mic is once again more an art than a science.

In my experience, there are very few bad studio mics on the market and even the sub-£100 'me too' Chinese capacitor mics can produce perfectly good recordings if used carefully. The problem is that most vocal mics sound different to each other due to a number of factors, not least being the way in which the high-end response is modified to give the mic more or less 'presence'. If the boosted frequencies are in the upper-mid range, this can help some singers sound clearer, but those with harsh or aggressive voices may find the same presence peak makes them sound too strident. A higher-frequency presence peak will help add 'airiness' to a voice without making it sound harsh but may not offer enough help to the singer who needs more clarity of diction, and it can enhance sibilance. Then there are the so-called 'warm-sounding' mics, which tend to pump up the low end slightly, often

These days, just because a mic doesn't cost much doesn't mean that it can't be used to produce decent recordings. Studio capacitors like this Red 5 model are even available at around the £100 mark.

Knowing the frequency response of your vocal mics can help you to decide which singers they may suit: the frequency plot on the Microphone Data web site (www.microphone-data.com) for the classic Shure SM58 dynamic shows an upper-mid boost that can improve clarity for some singers. The other side of the coin is that it could make someone with an already harsh voice sound strident.



combining this boost with a smoothed-off high end. These mics can sound superb if the singer has a harsh voice, or a thin voice that needs a fatter, less brittle sound, but stick one in front of somebody who already has a soft voice and it might sound as though they're singing through one of the duvets I keep going on about!

Choosing The Right Pattern

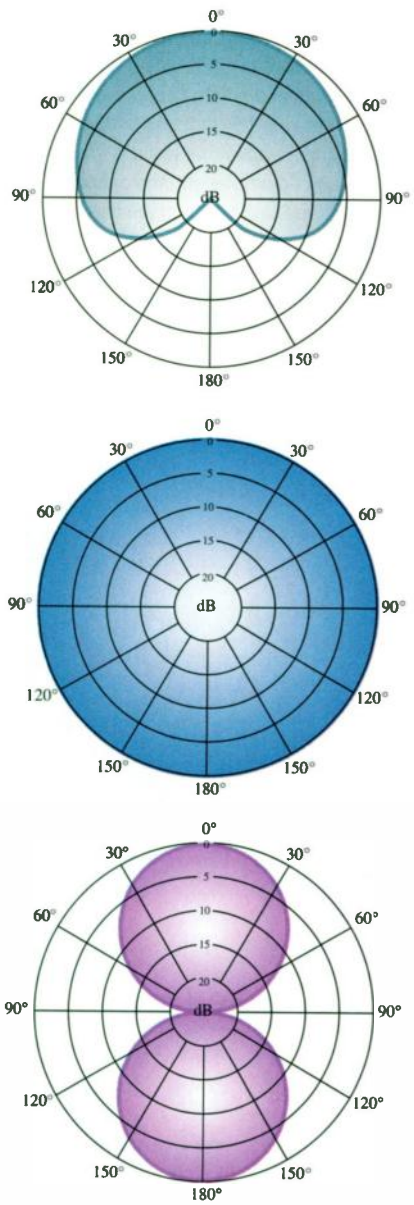
Mics pick up sound in different ways, dictated by what we call their 'polar' pickup pattern, as mentioned above, and it's important to know the pattern of the mics you have at your disposal or are considering buying.

Mics with a cardioid pattern have the advantage of rejecting a high percentage of the sound arriving from behind them, which means that they provide good isolation for the person or instrument being miked up, but they can sound slightly nasal compared to omnidirectional (omni) models, which pick up sound equally from all directions. The imperfect 'off-axis' response of cardioids also tends to colour whatever room reflections they do pick up. On the one hand, omni mics might seem to have a disadvantage, in that they pick up sound from all the way around, but they are much more accurate off-axis than a cardioid mic and they also sound more open and natural. If you use an omni mic and hang a couple of blankets or duvets behind the mic, as well as behind the singer, you can reduce the room coloration to around the same level as it would be if you were using a cardioid mic, and you may also capture a more natural sound. Other than that, the main difference you'll notice is that you don't get the 'proximity effect' when working up-close with an omni that you do with a cardioid model. The proximity effect is a low-frequency boost that occurs when cardioid and figure-of-eight microphones (more on these in a moment) are used very close to the sound source. Both these microphone types work by sensing the pressure differential between the front and the rear of the diaphragm, and the proximity ▶

CHOOSING AND USING STUDIO MICROPHONES

▶ effect is built into the physics of how such microphones behave at close quarters. Omnidirectional mics, which sense only pressure (rather like an audio-frequency barometer) don't exhibit this effect at all.

The degree of proximity effect varies with how the capsule is built and also tends to be greater for narrower cardioid patterns than for wider cardioid patterns. Dedicated vocal mics often have a built-in low-frequency cut, rolling off gently below 200Hz or so to compensate for the proximity effect. This can limit their usefulness when you're attempting to record bass instruments. Where switchable low-cut filters are fitted, these usually operate at a lower frequency to minimise stand-borne



These diagrams show how cardioid (top), omnidirectional (middle) and figure-of-eight patterns pick up sound: the cardioid picks up best from directly in front, rejecting sound directly from the rear; the omni picks up sound equally all around; and the figure-of-eight picks up from in front and behind but is insensitive to sound arriving at either side.

A mic with switchable patterns, such as this Rode NT2000, adds a lot to your miking options and need not break the bank.

vibration, although they still help counter the proximity effect to a useful degree.

Obviously, there are advantages to both omni and cardioid patterns and both are worth having. Fortunately, multi-pattern mics which allow you to switch between patterns are now fairly cost-effective. The figure-of-eight mic pattern is probably the least used one, other than for specialist stereo-miking applications, but it has the unique advantage of being totally deaf to sounds arriving from the sides (90 degrees off-axis), as any sound hitting the mic's diaphragm edge-on creates an equal pressure on both sides, resulting in no movement of the diaphragm. In situations where you need to separate sounds that are in close physical proximity, the figure-of-eight mic can be a useful ally, as you simply point its dead angle towards the sound you wish to exclude. A prime example of this is to help separate the acoustic guitar and vocal where both are recorded together. The exclusion of unwanted sound is never total, because of room reflections, but a figure-of-eight in this situation should be a significant improvement over using a cardioid. Of course, the figure-of-eight mic is just as sensitive at the rear as it is at the front, so it helps to put up some acoustic absorbers behind the mic if room reflections prove to be a problem.

Better By Tube?

Tube microphones use a valve as the preamplifier gain device rather than solid-state (usually FET) circuitry, and the vast majority also employ an output transformer. All early capacitor mics used tubes because transistors and FETs were invented rather later, and it turns out that tube microphones have a pleasing tonal characteristic that is a little different to that of most solid-state microphones — which are available both with and without transformers. Conventional wisdom has it that tubes introduce a very subtle distortion that flatters the sound, and they also overload more gracefully than solid-state circuits, although nobody has quite pinned down exactly why tubes sound as good as they do.

Modern tube mics can sound excellent, but there are some models that have had excessive amounts of distortion 'designed in', and (to my ears) these don't sound as good as the traditional tube approach, which is to make the microphone sound as clean as possible. There's also a tonal difference between tubes driven at their full operational voltage (often a couple of hundred volts or so) and so-called 'starved tube' circuits, where high-voltage tubes are run at much lower voltages, often in conjunction with some solid-state support circuitry. However, there are specialist miniature tubes designed to operate from low voltages that can sound good, and there's even one mic on the market that uses a tiny tube that can run from regular phantom power. All the other tube microphones come with a separate power supply, which means that they don't need phantom power — speaking of which...

Phantom Power

Capacitor microphones require power, both to operate their preamplifier and (in the case of conventional capacitor mics, as opposed to electrets) to polarise the capsule. While this could be provided from a separate power supply, the standard system of powering is known as phantom powering, where the power is supplied by the mixing console or preamplifier to which the mic is connected. Phantom power involves sending 48 Volts along a standard mic cable from the console/preamp mic-input socket, and it can only be used with balanced microphones connected via balanced cables. As a rule, if the mic body is fitted with a three-pin XLR socket, it is balanced, but always check the data sheet that came with the mic to be sure. Of course, all capacitor mics that need phantom power to operate will be balanced. Some portable equipment provides a lower phantom-powering voltage but many mics require the full 48 Volts to work properly, so check your mic spec sheets in such cases, to see what range of voltage is acceptable. Use of unbalanced cables with phantom power may cause damage to dynamic mics, as could ▶

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plugging or unplugging them with the phantom power turned on.

It's good practice to switch off the phantom power when plugging or unplugging mics, to avoid pops and bangs over your monitors and also to avoid stressing the electrical components in the mixer preamp and the microphone. It's very rare for any damage to be caused by 'hot plugging', but better safe than sorry.

Back-electret Mics

Some people perceive electret microphones as the poor relations of true capacitor mics, but with well-designed back-electret models this really isn't the case. After all, some of the best measurement test mics around are back-electrets. The highly respected B&K DPA4006 and 4011 mics are back-electret designs, as are the AKG C3000 and C4000 and the Audio-Technica 4033. The key point about back-electret mics is that the diaphragm (the all-important moving part) can be made in the same way as for a conventional capacitor mic, so the performance is similar. The special electret material that holds a permanent electrostatic charge is fixed to the non-moving back-plate (hence back-electret), the advantage being that there's no need for a high polarising voltage as there is with conventional capacitor mics. Some power is still needed for the on-board preamp and impedance converter, though.

The back-electret mics to avoid are the ones that use only batteries (the ones that can work on either batteries of phantom power are usually OK), as most of these are less sensitive and have a lower maximum sound pressure level (SPL) handling capability than models that use 48V phantom power. These battery models are great for location work where 48V powering is unavailable, but there's no real point in buying one for studio use. Also avoid consumer electret mics, as these are generally not back-electrets and their performance tends to be poor, in terms of sensitivity and maximum SPL handling.

Does Size Matter?

Have you ever wondered what the difference between small-diaphragm and large-diaphragm mics is? Well, large-diaphragm models are a little quieter and are often engineered to flatter the sound being recorded, while small-diaphragm capsules have a better off-axis response and tend to be more faithful to the original sound. Large-diaphragm models are also mainly side-address, which means that you sing into the side, not the end, and that works well in a vocal-recording situation. Not surprisingly, then, large-diaphragm models are the most popular choice for studio vocals, whereas small diaphragm, end-fire mics are firm favourites for instrument recording, especially where an accurate sound is what's needed. Nevertheless, both types can be used in both situations with a high degree of success, and if you only have one mic that happens to be a large-diaphragm model, the chances are that it will also sound fine for recording your acoustic guitar, for example. Similarly,

Back-electrets that can run from batteries as an alternative to phantom power are useful on location as well as in the studio.

a small-diaphragm model can sound great on vocals, although it probably won't sound as 'hyped' or flattering as a large-diaphragm model. You may also find that the large-diaphragm model has a built-in low-frequency roll-off to counter the proximity effect when close-miking vocals, whereas small-diaphragm instrument mics often feature a more extended bass response. If you're going to close-mic vocals with one of these, you may need the low-cut switch on your desk or preamp, as well as a pop shield.

Drum Mics

A common setup for miking a drum kit comprises a pair of small-diaphragm stereo capacitor mics for the overheads (usually cardioid pattern, unless the room is large and flattering), with dynamic microphones for close-miking the individual drums. A further capacitor mic may also be used on the hi-hat. The use of capacitor mics for the overheads and hi-hat is to ensure adequate HF response for capturing the fine detail of the cymbals, while dynamic microphones are traditionally used for the close mics because they are

A Microphone Hall Of Fame

The recording of sound dates back well over 100 years now, and in that time a number of microphones have survived the test of time to become true classics, as well as becoming instantly recognisable, in many cases. The body styling and general design of some of these microphones has also been plagiarised in many modern 'clones,' although looking similar isn't the same as sounding similar!

One of the earliest 'classics' — seen in many pictures taken during Hitler's wartime speeches — is the Neumann CMV3 'Bottle' mic, which dates back to 1928. Other instantly recognisable microphone shapes produced by the same company are those of the switchable-pattern U47 (introduced in 1949 and marketed in America under the Telefunken moniker) and the M50 omnidirectional mic. However, the very best known Neumann 'classic' microphone is undoubtedly the U87 — the one mic that everyone associates with professional recording studios, and which appeared in 1967 (seven years after its predecessor, the U67). It's not just large mics that are instantly recognisable, though. The highly regarded KM84, introduced in 1966, was one of the first microphones to employ a solid-state impedance converter. This, along with its bespoke small-diaphragm capsule, made it a very compact microphone which was probably the most versatile of its day.

The Austrian microphone manufacturer AKG has a fair few classics of its own. The C12, launched in 1953, was a hugely capable and popular microphone in professional circles. The same basic model was also produced under the guise of the Telefunken ELA M251, and its simpler 250 version, which was intended to compete directly with the Neumann U47.

Everyone knows the unique profile of the C414, which was designed as a solid-state replacement for the C12. The first version of this mic was launched in 1971, with the improved C414 EB version appearing in 1977, followed by the B-ULS version in 1986 and the TL-II in 1993. A total ground-up redesign of the C414 occurred in 2004 with the introduction of the very sophisticated B-XLS and XLII versions.

Another classic AKG capacitor microphone, which competed against the Neumann KM84, was the modular CMS range, best known for the C451 model launched in 1968. This was an enormously flexible miking system, with facilities to separate a range of different capsules from the associated mic body via knuckle-joints and tubes of various kinds. The system was not without its problems, however, and it was eventually superseded by the C460 series in 1983.

Amongst the classic dynamic microphones, AKG's D202 (introduced in 1966) has to be one of the most distinctive, along with its later and smaller sibling the D222 (1968). Another instantly recognisable mic is the D12 (dating back to 1952), which was the first large-diaphragm dynamic microphone to provide a true cardioid polar pattern and introduced innovations such as the mass-loaded tube and a deep-drawn diaphragm. This became widely used as a kick drum microphone until the D112

AKG's classic C12 valve mic.

This Electrovoice RE20 has done quite a few miles but is still going strong.

Aside from the fact that large-diaphragm mics have a diaphragm that's, er, larger, there are differences between them and their small-diaphragm cousins.

technically adequate, robust, produce a punchy sound and are affordable. For toms and snares, a general-purpose instrument mic such as the SM57 is a popular choice, but now that capacitor and back electret mics are becoming more affordable, these are starting to turn up as alternatives to dynamic models for close miking.

While the audio characteristics of a typical drum mic don't need to be out of the ordinary (other than the kick-drum mic, which I'll come to in a moment), it helps from a practical point of view if they are small and light, as this makes them easier to position out of the drummer's way, and may make it possible to mount them using rim clips rather than boom stands. A number of drum-mic kits have been designed with small-body microphones to meet these needs. If miniature back-electret capsules are used, the mics can be made very small indeed.

The kick-drum mic has to be able to tolerate very high SPLs and it must also have a good low-end frequency response, as most of the energy produced by a kick drum is below 150Hz, with a significant amount at around 60-90Hz. Furthermore, as miking a kick drum closely doesn't produce a very natural sound, mic designers tend to tailor the frequency response of kick mics so that they accentuate the low-frequency thump of the drum and also the beater impact in the 3-6kHz region. As the low-mid range can sound boxy if you use a 'flat' mic inside a kick drum, frequencies in the 150Hz-500Hz region tend to be pulled back in the case of dedicated kick models, and the result ▶

— another uniquely shaped microphone — took over that role.

While we're on the subject of dynamic microphones, the German manufacturer Sennheiser has had its own share of classics. The MD421 was introduced in 1960 and is still going strong, while the equally distinctive MD441 was launched in 1971. Sennheiser took a completely different approach to other manufacturers when it came to solid-state impedance converters for capacitor microphones. Eschewing the high-impedance FET as a valve replacement, Sennheiser instead developed the 'radio frequency condenser mic' system which allowed them to use bipolar transistors, with several significant operational and technical advantages. The MKH range of mics is unique in its use of the RF system, and the flattened sides of the slim microphone bodies are instantly recognisable.

Moving across the Atlantic, there are just as many instantly recognisable classic American microphones. Everyone will surely be able to identify the Shure SM58 dynamic and its sibling, the slightly smaller SM57. Similarly, the Electrovoice RE20 (left) is about as distinctive as dynamic mics come, with its huge body and wide side-slots.

Pretty much every mic manufacturer with more than a decade or two's history behind it can probably lay claim to producing a 'classic' mic in one form or another — for example, Audio Technica's 4033a, the Beyerdynamic M201 and MC740, DPA's 4006 and 4011, Microtech Gefell's UM900, Sony's C800, all of the Soundfield mics, and the Schoeps CCM series, just to pick a few more at random. *Hugh Robjohns*

CHOOSING AND USING STUDIO MICROPHONES

▶ is a mic with two distinct peaks in its frequency response. Used on any instruments other than possibly bass guitar, this would sound odd, but on a kick drum it helps produce a sound with both depth and definition.

Drums are loud! Because of that fact, drum mics don't need to be particularly sensitive or have spectacular noise figures, as they're never going to be short of level and you won't need to turn up the gain much on your preamps. This fact has enabled manufacturers to build complete kits of drum mics at very attractive prices, and though the mics they contain may seem a bit 'coloured-sounding' or noisy when used on other instruments or voices, they tend to work pretty well around a well-tuned drum kit.

Mic Positioning

The closer a microphone is to the subject, the better the ratio of direct sound to reflected sound, so in the studio, where spill and reflections are the enemy, the best option is usually to get the mic as close to the performer as possible without compromising the sound. With vocals this can be very close indeed, although it's not a good idea to get much closer than three inches from a cardioid mic, as the proximity boost will kick in and make the sound bass-heavy. You also need to leave a couple of inches for the pop shield.

You may also have seen pictures of vocal mics used upside down. Most side-entry mics work just as well upside down as they do the 'right' way up, and it can be more convenient to mount them upside down to keep the stand further away from the singer's arms or feet, and also to allow sight of a music stand. There is an argument that using tube mics the right way up is beneficial, because the heat from the tube rises to warm the capsule, which helps avoid condensation problems.

Drum miking is made easier by the existence of kits of mics specifically intended for the job: this dynamic mic, part of a CAD set, is meant for snare and tom miking and has special heavy-duty mounting hardware and a small body.

Virtually all capacitor microphones suffer a temporary deterioration in performance in the presence of condensation (more noise, less sensitivity) and in such cases they need to be put somewhere warm until they are thoroughly dried out.

In the case of instruments, the task is a little more complicated because most instruments produce sound from most of their surface, not from a single point. That means that if you get too close the mic favours the part of the sound that's closest to it. In addition, if the instrument moves at all the level change will be more noticeable the closer the mic is. My own rule of thumb is to make the initial mic distance about the same as the length of the part of the instrument that emits the majority of the sound. The exception is the pop/rock drum kit, where the close-miked quality has become part of the accepted sound, although the rule still applies for positioning drum overheads.

In the case of the acoustic guitar, the mic distance should be around the same as the length of the guitar body, while with a flute you'd use the entire length of the instrument as a guide distance. By applying this very rough-and-ready rule, you can see that to mic a concert grand piano accurately you need to have the mic (more often two mics for stereo) several feet away, although for pop music you can work closer, to the point where the mics are often set up above the strings, inside the piano lid. The sound is less accurate but it's musically appealing, which may be more important. In all cases, you can fine-tune the mic position while monitoring the result over headphones, as every combination of instrument, room and mic will sound different. If you can afford more room sound and spill isn't a problem, you can increase the mic distance, which usually gives a more homogenous sound.

Summary

What I've tried to do here is provide a practical crash-course in the essentials of choosing and using microphones, without burdening you with more technical information than you need. I hope I've also conveyed that with anything from a good budget microphone upwards you can make exceptionally good-sounding recordings, providing you choose a suitable microphone position and pay due attention to the room acoustics. Yes, a better mic will sound better, as will a high-performance preamp, but unless you get the room acoustics and mic position sorted out first, the difference between a cheap mic and an expensive one will be much less than you'd imagine. Too often we think better kit will produce better results when what we already own is actually making a pretty accurate recording of a dismal-sounding room. In this respect, microphones are not unlike photography: what's in front of the camera and how well it

Pops & Bangs

We've written on the subject of pop shields so often that little more needs to be said, other than that using one when recording vocals is mandatory for most singers. The metal-mesh models are arguably more transparent to high frequencies than the nylon-mesh models, but both do the job. Less tends to be written about shockmounts, and it's easy to assume that you don't need one unless you're setting up on a wooden stage, but the reality is that singers have been known to tap their feet or even kick the mic stand, and the amount of thump this produces is considerably more without a shockmount than with one. Now that shockmounts come with so many studio mics as standard (or are available separately for as little as £15), it just makes sense to use one as a matter of course.

It's also important to route the cable in such a way that it can't transmit vibration to the mic, or it could cancel out some of the benefits of using a shockmount. Wrapping the cable around the stand a couple of times helps, as does leaving a small loop of loose cable behind or beneath the mic. Fastening the cable to the stand with a plastic clip (often supplied with stands) will help prevent your cable slipping.

A shockmount is another essential accessory if you're using a studio capacitor.

The most common general-purpose mic stand has three legs and a boom arm. Always position one of the legs under the boom arm for maximum stability, and where you need height — such as for drum overheads — use a stand with a metal rather than a plastic base, as the extra weight adds to stability. To screw or unscrew a shockmount, it is easiest to loosen the boom-arm adjustment screw, then rotate the boom arm rather than the shockmount itself. While budget stands are usually fine with smaller microphones, it's worth spending a little more on a heavy-duty stand destined to hold a heavy vocal mic, as the boom-arm friction mechanism often slips on cheaper stands, causing the mic to droop.

The Right Mics For Popular Applications

- **Vocals:** Large-diaphragm capacitor mics are the most common choice if a cardioid pattern is used to exclude unwanted room coloration. However, there's no reason not to try a small-diaphragm model if you have one, as a small diaphragm doesn't equate to a small sound. Similarly, try an omni model if you have a very dead or acoustically flattering recording environment. In all cases use a pop shield. As an alternative, dynamic microphones are often used by male rock singers because their 'voicing' emphasises presence and helps the vocal cut through a loud backing track. Where cardioid mics are used close-up, a low-cut filter in the mic or the preamp is an advantage.

- **Acoustic Guitars:** Small-diaphragm capacitor mics are the usual first choice in this application, and cardioid models are useful in reducing unwanted room coloration. However, where the room permits, an omni-pattern microphone will usually give a more natural sound and will be less critical of positioning. Large-diaphragm capacitor mics can also give excellent results, and for some musical styles, where a natural high end isn't necessary, dynamic or ribbon microphones may be used as an alternative, providing they are used with a quiet preamplifer that will give the necessary gain without adding significant noise.

- **Drum Overheads:** Small-diaphragm capacitor mics are popular as drum overheads, although some engineers prefer ribbon mics because of their smoother high end, which makes the cymbals sound less abrasive. Because of the loud volumes around a drum kit, high sensitivity is not required.

- **Close-miked Drums:** Dynamic, cardioid-pattern models are the usual choice for close-miking individual drums, although back-electret and capacitor models are also used. Most mics can handle the required SPL. The physical shape and size of the mics is important for positioning them so as not to obstruct the player.

- **Kick-drum Mics:** Kick-drum mics are often dynamic models or dynamics used in conjunction with a second capacitor mic. The SPL inside a kick drum is considerable, so a microphone with high SPL handling capability is essential, and the mic must also have a good low-end response, which rules out most vocal mics, as these tend to have a built-in roll-off at the low end. The best bet is a dedicated kick mic, which will have a specially designed frequency response to emphasise the desirable aspects of the sound.

- **Electric Guitar & Bass:** Both electric guitar and bass can be recorded with just about any type of mic that sounds good, the main proviso for bass being that the mic has good low-frequency extension. All but the most sensitive mics can tolerate the high SPL in front of a guitar cabinet, and dynamic models are a popular choice for European rock music. Other styles, including US rock, tend to make more use of capacitor models for their brighter high end. Ribbon mics used on their own or in conjunction with other mics can also sound particularly good. Often, positioning the mic is more important than the actual choice of microphone.

- **Brass:** If you like the sound of a brass instrument miked very close to the bell, you'll need a mic with a healthy SPL-handling capacity (135dB or better), as these instruments generate enormous sound pressures close up. If you mic a little further away, for a more natural sound, most mics will tolerate the level. Both large-diaphragm capacitor mics and good-quality dynamic mics are popular in this application. While cardioid-pattern mics are most commonly used, you can also try an omni, as there's so much level that you're unlikely to suffer much from spill!

- **Percussion:** I'd always try small-diaphragm capacitor mics first in this application, athough large-diaphragm vocal models can also give very good results. Dynamic mics may be suited to hand drums, but where there's any significant high-end content, capacitor mics will generally give the best results.

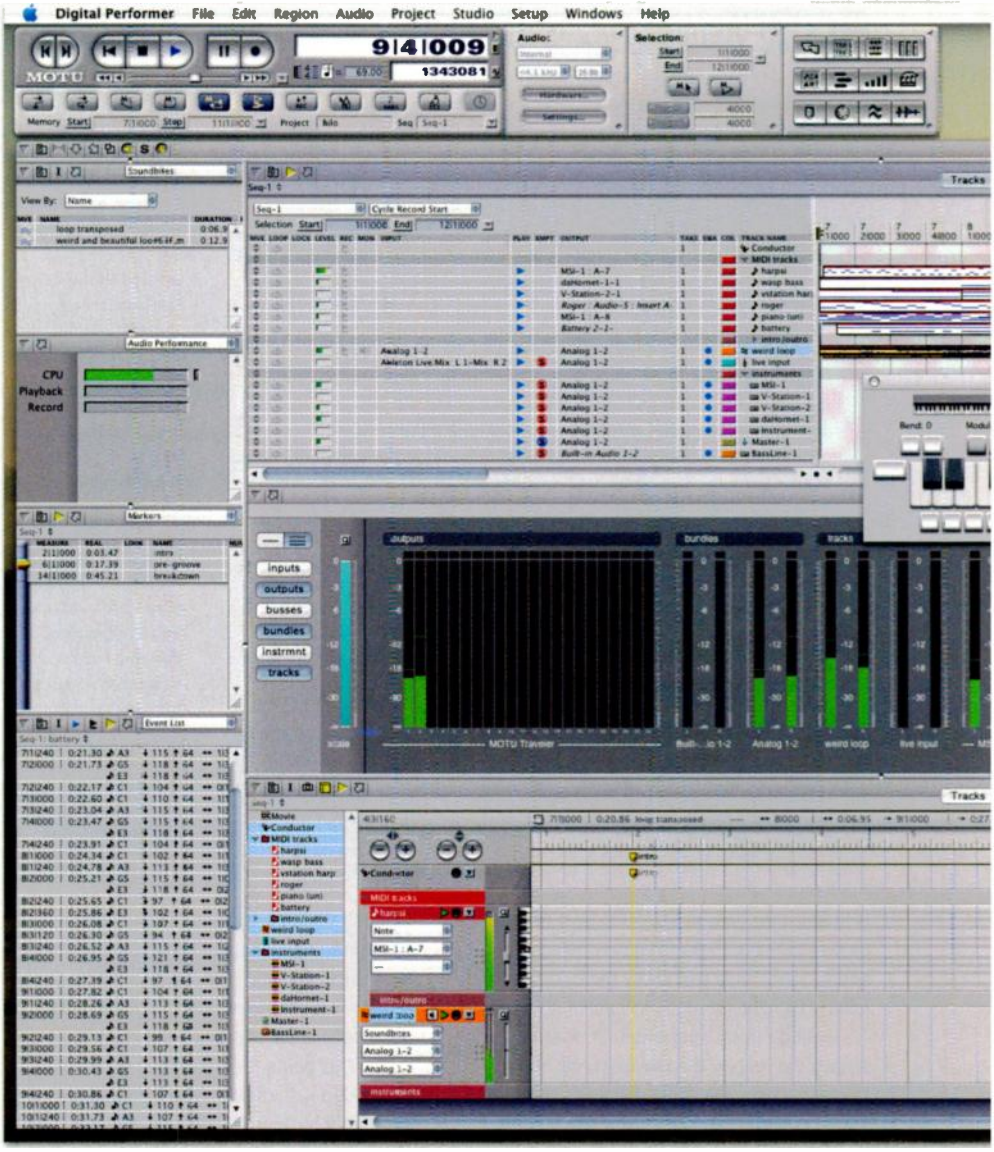
is lit has a far greater effect on how the picture looks than the quality of the camera, and it's only once you know the basics that having top-quality hardware makes sense.

Having put that argument, it doesn't always pay to buy the cheapest mic either, because when you do learn how to use it you'll probably want to upgrade to a better model if you've spent your money on something really basic. Unlike software or other bits of studio gear, mics don't go out of fashion or become obsolete — they'll give good service for decades if you look after them. This being the case, the cost of ownership is fairly low when worked out on a monthly basis, so if you can afford something a little above the entry-level, it will stand you in good stead in the future. SOS

Thanks to FX Rentals (+44 (0)20 8746 2121) for the loan of selected microphones. FX hire rates range from around £10 per day for basic models to £50 per day for valve classics such as the AKG C12.

Mark Of The Unicorn's flagship recording package combines individual design with a heavyweight feature set. Could *Digital Performer* be the sequencer for you?

Robin Bigwood



MOTU Digital Performer 5

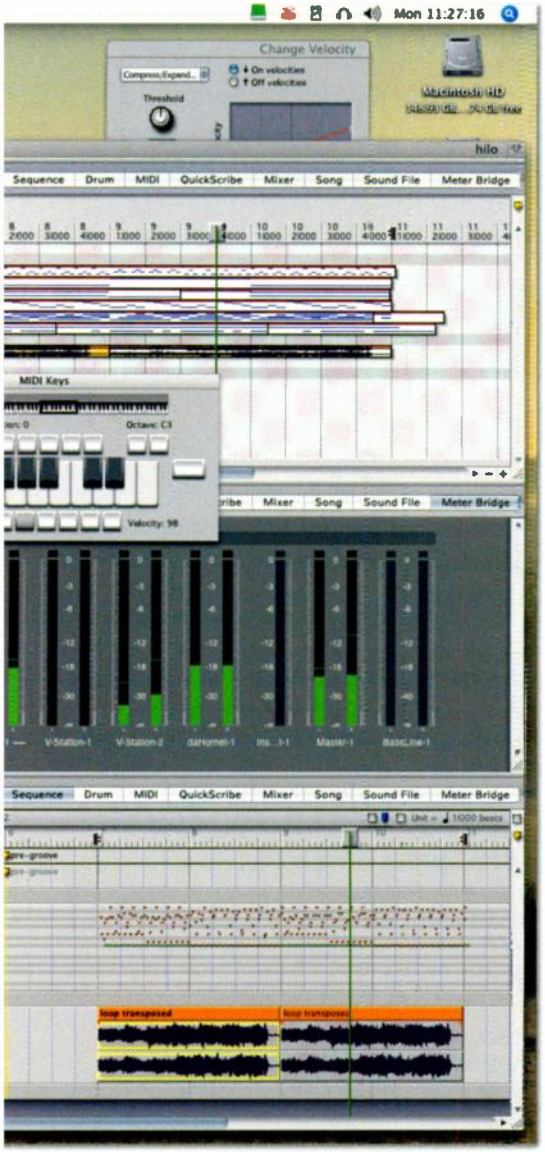
MIDI + Audio Sequencer For Mac OS X

Digital Performer 5 is the latest incarnation of one of the most long-lived Mac-based sequencers, having its roots in *Performer*, which was first released way back in 1985. *Performer* went 'Digital' in 1990, and since then its version number has crept up, with *DP4* being the first OS X-compatible version, seen in 2003.

The program was last reviewed in *Sound On Sound* in February 2005. That was version 4.5, perhaps the first really mature version for OS X, and one which added a plethora of new and improved features. Anyone interested in finding out more about *Digital Performer* would be well advised to revisit that review, as much of it still very relevant — it's available on-line at www.soundonsound.com/sos/feb05/articles/motudp45.htm. However, *DP5* has enough enhancements and new features to be seen as more than just another incremental update. Some of the new features described here were actually introduced in version 4.6, but for a run-down of the things that are really new, see the 'New Features Summary' box. In case you're entirely new to *Digital Performer*, I've tried to give an overview of the application that means you won't need to scrabble around digging out your old copies of SOS, or worry about versions of the application that you'll never end up using.

System Requirements

Digital Performer is, and always has been, a Mac-only product, but whereas previous versions have been compatible with very modest Macs (we're talking pre-G3 here) *DP5* has less basic system requirements. You'll need a 500MHz G4 with 512MB of RAM and OS 10.3.7 or later as an absolute minimum, but MOTU suggest a 1GHz dual-processor G4 with 1GB of RAM as a better starting point. Owners of G5s will of course be even better off, but actually I've had no trouble running *DP5* on my 1GHz G4 Powerbook during the review period. Fairly decent track counts (at 44.1kHz) have been perfectly possible, with only the usual suspects — reverbs and software



Digital Performer 5 retains the best features from most recent updates, such as the Consolidated Window and Pitch Automation, and adds bundled software instruments, an informative Meter Bridge, Track Folders, sophisticated new AV facilities, and improved all-round efficiency and refinement.

instruments — really tying up the old trooper.

At the time of writing, there's no Universal Binary version of *DP5* which will allow it to run natively on Intel Macs, although one is very much in the pipeline, and might well be available as you read this. Some users have reported success in running *DP5* on Intel Macs using Rosetta, Apple's technology for supporting Power PC code on the new processor, but with an inevitable impact on raw performance and restricted compatibility with third-party plug-ins and drivers. MOTU, incidentally, make no claim whatsoever for Rosetta compatibility, and users experiment with this very much at their own risk!

One thing that has always been in *Digital Performer*'s favour is its copy-protection scheme — or lack of it! Although MOTU make use of the iLok dongle for copy-protecting their range of software instruments, *DP* has never been saddled with this. A degree of copy-protection is provided as part of the installation process, when users have to enter a key code (printed in the manual) whilst the installation disc is still in the Mac's drive — presumably some sort of cross-checking occurs, but no Internet connection is required or challenge-and-response process entered into. It's an approach which *DP* users seem to appreciate and which is very easy to live with.

As you'd expect, *DP5* is designed to work with OS X's audio and MIDI features. It can utilise any Core Audio-compatible hardware, whether it's USB, Firewire or PCI-based. It cooperates with Core MIDI and the Audio MIDI Setup application too. Additionally, *DP5* can use multiple audio hardware drivers simultaneously without having to rely on OS X's sometimes troublesome Device Aggregation facilities. This can be worth its weight in gold if you like to use PCI and Firewire interfaces at the same time, for example.

Finally, in this round-up of *Digital Performer 5* practicalities, it's worth mentioning *DP*'s ability to use DAE, the Digidesign Audio Engine, which lets it talk to Pro Tools audio interfaces and HD or Accel DSP cards. *DP5* supports DAE 6.7 or later. Read more about this in the '*DP* And Pro Tools' box.

Features Overview

DP's capabilities are as extensive as you'd expect from a mature, heavyweight sequencing application, and difficult to summarise — but here goes. MIDI capabilities are formidable, offering an extensive range of approaches to recording and editing, with near sample-accurate playback of software instruments and sub-millisecond timing accuracy for conventional MIDI hardware when you use one of MOTU's own MIDI interfaces. Audio can be played back and recorded at sample rates and bit depths of up to 192kHz, 24-bit, though only at one sample rate and resolution can be used at any one time. Channel formats from mono and stereo, through 5.1 and up to 10.2, are supported, and non-linear and non-destructive graphical audio editing in all of them is possible, with audio being represented visually in the form of 'soundbites'. Destructive audio editing is provided for by a dedicated Waveform Editor, which in *DP5* can be locked to the main transport. *DP*'s mixing is based around a 32-bit floating-point audio engine, allowing for astronomical headroom in the digital domain, a range of surround panners is provided for different applications, and all mixing features are fully automatable. *DP5* natively supports its own MAS (MOTU Audio System) plug-in format along with Apple's Audio Units, and a number of third-party options allow the hosting of VST plug-ins too. Running as an alternative front end for Pro Tools, *DP* supports both HTDM and RTAS plug-ins, but not MAS and Audio Units at the same time. There are extensive AV facilities, with flexible time-code synchronisation, Quicktime movie support, find tempo solutions, and a range of programmable streamers, punches and flutters. Timing cues can be incorporated into printable music scores, too.

As well as these fundamental features, *DP* has some more unusual capabilities. For example, Beat Detection analyses all audio for rhythmic and transient content, which then facilitates audio editing, quantising, time-compression and expansion, and audio groove extraction. There's a dedicated 'performance-oriented looped audio recorder' that records audio into RAM and comes into its own for tracking overdubs, solos, backing vocals and percussion stacks. And pitch automation, introduced in version ▶

SOUND ON SOUND

MOTU *Digital Performer 5* **£395**

pros

- A super-powerful sequencing platform for all kinds of music, audio and video-related work.
- Improvements over previous versions put sophistication and usability ahead of gimmicks.
- Issues with audio performance and user-interface responsiveness have been addressed.
- Excellent plug-in support, and the supplied bundle now includes six useful instruments.
- Can address multiple hardware drivers without resorting to OS X Device Aggregation.

cons

- As of the start of July 2006, there's no sign of a Universal Binary Intel-compatible version.
- Some questions remain over processing efficiency, especially at low buffer sizes.
- Uses the increasingly antiquated split-channel *Sound Designer II* audio file format.
- Some old chestnuts are still with us: there's no ability to simultaneously display and edit multiple takes for a single track, no 'snap to absolute grid' for editing windows, and only one time-stretch algorithm that doesn't work for all material.

summary

DP5 continues the *Digital Performer* tradition: it's a powerful, flexible workhorse that excels in many areas. A raft of sensible, well thought-out enhancements to existing features will please established users, and the new bundled software instruments makes it an 'all-in-one' sequencing solution for the first time.

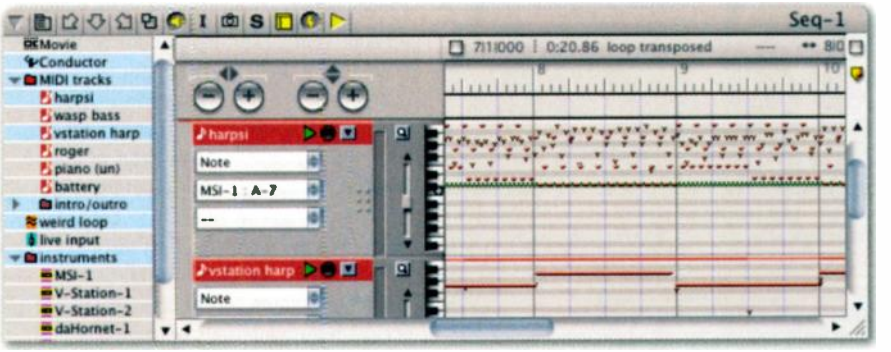
▶ 4.6, subjects monophonic audio to pitch analysis, allowing for non-destructive pitch manipulation much in the manner of *Auto-Tune*, but incorporated at track level.

In Use

If you haven't experienced *Digital Performer* before, the first thing you'll notice is the unique appearance of many of the editing windows, their title bars positively festooned with extra buttons and gadgets. There's certainly a concession towards OS X's bright, airy look, but there's still plenty which is highly idiosyncratic. For example, nowhere can be found OS X's red, yellow and green title-bar buttons for closing, minimising and maximising a window. Those functions are there, but under a different guise. Additionally, many windows have a title-bar mini-menu which provides specific features not available in the main menus.

Only in a few places do a few inconsistencies seem a bit daft. One is the differing appearance of play-enable indicators across differing windows. In the Tracks window they're blue, in the Sequencer Editor green, and in the Mixing Board non-existent! It's a similar story with input monitoring buttons. When you get used to these few quirks, *DP*'s non-standard user interface is straightforward and perfectly friendly, but doubtless for many it will cause a few moments of head-scratching at first.

There are some other interesting features of the user interface. *DP* doesn't make use of two-button mice, so there's no right-click contextual menu functionality. This is fine in practice, but I can't help thinking that it would bring an improvement in ease of use for some aspects of editing. There is, however, support for mouse scroll wheels, which can be used to change the position of on-screen knobs and sliders, or adjust the numbers in value boxes when you're pointing at them.



In keeping with *Digital Performer* tradition, *DP5* puts various buttons and mini-menus in the title bars of windows, replacing the standard OS X traffic lights.

These details aside, *DP*'s *pièce de résistance*, from the user-interface point of view, is undoubtedly the Consolidated Window. This is a 'mothership' of a window that can contain one or many of *DP*'s other windows, providing a flexible, organised approach to organising screen use and setting up your perfect workspace. Key editing windows, such as those using a 'timeline' approach, open up in a wide central area, whilst smaller windows are accommodated in 'side bars' on the left and right. The exact width and height of each 'pane' in the Consolidated Window is not preset, and can be adjusted by simply dragging horizontal and vertical dividers, so you can have exactly the setup you want whether you're using a Powerbook display or a 30-inch Cinema Display.

The Editing Environment

Here's a quick run down of *DP*'s main editing windows:

- Tracks Window: a timeline editor that displays track data in block-like 'phrases', providing an overview of the sequence and an easy way to make large-scale structural changes, but no means of making detailed edits whatsoever.
- Sequence Editor: the window which is most like other sequencers' Arrange pages, offering detailed editing of MIDI and audio tracks and their automation data. Individual tracks can have different levels of vertical zoom, and any selection of tracks can be shown or hidden at any one time.
- Graphic Editor: a MIDI-only 'piano roll' editor, which allows note data from multiple tracks to be viewed simultaneously, together with velocity and controller data for one track at a time.
- Drum Editor: a rhythmic grid-style

New Features Summary

• Revised audio engine
DP5 **gets a reworked version of the MOTU Audio System to help it run better on single-processor Macs, and improve user-interface responsiveness for everyone. Entire tracks can now be taken on or off-line at a single stroke, to assist with managing processing resources.**

• Multiple output instrument handling
DP **now easily handles virtual instrument plug-ins that have multiple outputs (such as multi-channel samplers and drum modules). When instantiated, audio streams from these plug-ins automatically appear amongst input choices for other tracks.**

• Input monitoring
As described in the main text, *DP5* has a hugely improved way of configuring and controlling input monitoring of audio tracks.

• Track folders
This is a much-requested feature. Tracks of all kinds can now be visually grouped together in the Tracks window, Sequence Editor and Mixing Board, and hidden or shown *en masse*.

• Bundled instruments
Six MAS-format virtual instruments are now included, covering most sound-production bases.

• Meter bridge
A new, highly configurable, window which can display levels for almost any part of the mixing environment — hardware inputs and outputs, along with *DP* tracks, busses and auxes.

• Editing tools
Four new options in the Tools palette provide some sophisticated ways of working with soundbites.

• AV improvements
For those working with music and audio for film, *DP* can now overlay Streamers, Punches and Flutters on to Quicktime movies running in the Movie window, and can communicate them to compatible third-party video hardware too. Hand in hand with this go enhanced Conductor track facilities, including pattern, tacet and 'visual' clicks to complement the wide range of available click sounds and options.

• Soundbite volume and gain
Soundbites can now have gain non-destructively applied, and volume automation can be linked to the soundbite rather than the track, so that it 'travels' with the soundbite if it's ever moved or duplicated.

• MIDI keys
A window which lets you play generate MIDI messages from your Mac's keyboard, to play *DP*-hosted instruments and MIDI-compatible plug-ins.

• MIDI bundles
Not just another way of controlling OS X's Audio MIDI Setup application, MIDI bundles provide a way for devices to be quickly remapped if you open a project on a system that doesn't have access to the same MIDI hardware.

editing window optimised for drums, capable of displaying multiple tracks side by side, but showing only those pitches actually used in each track. Various display modes allow for velocity editing directly in the note lanes.

- Event List: a pretty straightforward text and number-based MIDI event editor.
- Quickscribe Editor: a notation editing window that displays single tracks or entire scores.
- Soundbites Window: a tabbed window that either lists and helps organise all audio soundbite usage in the sequence, displays detailed information about individual soundbites, or allows destructive waveform editing and retouching.

Working hand in hand with these windows is a Tools palette that can either attach itself automatically to the Consolidated Window or other frontmost editing window, or be free-floating. What tools are available at any one time depend on what you're doing, but the full complement includes data and time range-selection tools, along with pencil and reshape tools. These are used for writing and reshaping all kinds of data, but they have sophisticated shape and waveform drawing modes for working with MIDI controller data and automation. There's also a 'pattern tool' which speeds up writing complex rhythm patterns (especially in the Drum Editor), the obligatory Zoom, and also audio Scrub, Loop, Mute, Scissors, and four specialist tools for performing complex edits to soundbites (Trim, Roll, Slip and Slide). Tools can be selected with the mouse, or temporarily by holding down single-key shortcuts.

DP5's Tools palette contains everything needed for data selection, editing and manipulation, and now includes some new tools for working with audio soundbites.

Talking of keyboard shortcuts, *Digital Performer* uses an open-ended approach that allows virtually any aspect of the application to be controlled with up to two keyboard shortcuts or a MIDI message. This is configured in a dedicated Commands window which has a fully fledged text search facility, so zoning in on a specific feature and assigning a shortcut to it is quick and easy.

Test Spec

- *Digital Performer* version 5.01.
- Apple dual 2.0GHz G5 Power Mac with 2.5GB RAM and 1GHz G4 Powerbook with 768MB RAM, both running OS 10.4.6.
- Audio hardware: Mac built-in, MOTU 896HD, MOTU Traveler.

What's always been striking about *Digital Performer* — and version 5 is no exception — is the sheer flexibility of the environment, and the fact that many recording, editing and mixing tasks can be achieved in different ways. *DP* absolutely does not channel you into one way of working, but whilst this can be a breath of fresh air for experienced sequencer users who know what they want to achieve and how they want to achieve it, it's arguably less straightforward for absolute beginners, for whom the possibilities (and the 1000-page manual!) can be almost overwhelming. Help is at hand, though — a range of on-line and Quicktime-based training materials is already available from a number of companies.

Audio Recording & Playback

Digital Performer 5 records and plays back audio files in the split-channel *Sound Designer II* format — an uncompressed format that has many similarities with the more familiar AIFF and WAV, and which carries information such as time stamps, loops and so on. This provides a flexible approach to handling conventional mono and stereo audio right up to the multi-channel surround formats, as *DP* just applies suffixes such as '.L', '.R', '.Lfe' or '.C' to the separate audio files' names to denote their channel characteristics. However, *Sound Designer II* is increasingly seen as an anachronism, and very few other mainstream audio applications on OS X support it directly these days. There have been requests for a while for MOTU to allow *DP* to work natively with Broadcast WAV and other more modern 'interleaved' formats, but there are no signs of this happening any time soon.

A broad range of audio formats is, at least, supported when it comes to importing and exporting. *DP5* will import *SDII*, AIFF, WAV, Broadcast WAV and MP3, along with REX, *Acid* and Apple Loops, and audio from Quicktime and AVI movies as well as audio CD tracks. Export formats include *Sound Designer II* (interleaved or not), AIFC, WAV and AIFF,

and MP3 courtesy of the open-source LAME framework, which has to be installed separately. This all works swimmingly, except for one thing. When exporting in any format other than *SDII*, *DP* will often insert a very brief period of silence at the beginning of the resulting file. Sometimes this will go by unnoticed, but for audio files that eventually need to be adjacent on a CD, say, this causes an annoying problem. It's not difficult to think up any number of workarounds, but surely for something so simple you shouldn't have to?

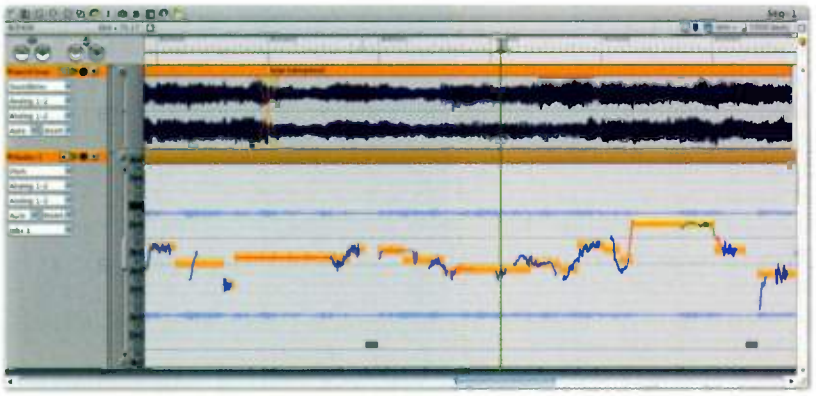
Routing of audio signals is flexible. For simple recording and playback you'd just configure a track with a valid hardware input and output and record-enable or play-enable it as necessary. However, there's also a system of internal busses (which can be anything from mono to multi-channel) to submix multiple audio sources and shunt them from place to place. Also very much part of this scheme are so-called Aux Tracks — audio tracks that appear in *DP*'s mixer but which can't actually be recorded on. Instead they act more like discrete mixer channels that are always 'open', allowing audio from hardware inputs or busses to be treated with plug-ins, tapped off to Aux Sends, or routed on elsewhere. It's a fine system in that it allows huge flexibility whilst remaining faithful to conventional hardware concepts.

One important enhancement in *DP5*, though, is a much more sophisticated input monitoring scheme. This was workable in previous versions, but was both limited and sometimes confusing, and had some adverse implications for those working extensively with hardware synths being mixed in *DP*'s environment, or heavy users of Rewire-enabled software synthesizers. Now, true audio tracks (ie. ones that can be recorded on) can have input monitoring enabled on an individual basis, and independently of their record-enable status. It's a vast improvement, but I did encounter an inconsistency within one of the four available input monitoring modes that determine how pre-existing track audio is combined with the live audio input during playback and punch-in. It's not a major problem, though, and is the sort of thing that would very likely get cleared up in a future maintenance release.

As I mentioned before, non-destructive editing of audio is achieved using what are known as 'soundbites'. Like Events in *Cubase* or Regions in *Pro Tools*, these are quite separate entities from the audio files they reference, so it's possible to have 100 slightly different soundbites all referencing one short audio file, for example. Soundbites can be dragged into new positions or on to different tracks, and can be selected, renamed, duplicated, trimmed,

DP And Pro Tools

***Digital Performer*'s compatibility with DAE — the Digidesign Audio Engine — allows it to be used as an alternative front-end to *Pro Tools* when your Mac is hooked up to Digidesign audio hardware. Used like this, you lose access to MAS and Audio Units plug-ins, but gain instead from being able to run plug-ins in the RTAS and HTDM formats. Most other features of *DP* stay the same, but become subject to any extra capabilities or restrictions imposed by DAE. You get a different Audio Performance window which monitors processing hit on your HD or Accel cards, surround mixing and routing are not available, Rewire is not supported, and RTAS instruments with multiple outputs can't make use of them. In all other respects, though, it seems as if *DP5* has ironed out some of the DAE difficulties that were apparent in version 4.5.**



Displaying audio waveforms, right down to single-sample detail if necessary, soundbites are *DP*'s approach to viewing and editing audio content in tracks. The soundbite on the lower track is shown with Pitch Automation data overlaid — by editing or redrawing the curves or pitch outline, the pitch of monophonic audio can be non-destructively modified during playback.

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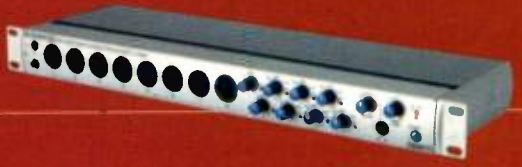

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Bundled Plug-ins

_DP5_'s bundle of plug-ins will get most users a long way, and includes some fine audio processors, many of which are available in channel configurations from mono to 5.1. The four 'Masterworks' plug-ins — a multi-band compressor, gate, EQ and limiter — are rather good, the _Sony Oxford_-inspired EQ in particular. The three reverbs range from trashy (_Reverb_) to tasty (_Plate_) via the usable but not outstanding _E-verb_. A range of delay-based plug-ins covers chorus, flanging, standard echo and stereo ping-pong types, whilst for tonal manipulation there's _Multimode Filter_, a ring modulator, the harsh-sounding _Preamp-1_ and the more complex _Sonic Modulator_, which includes a filter, crossover, pitch manipulation and delay. Dynamics control is offered by the combined compressor/limiter/expander/gate _Dynamics_, with _Pattern Gate_ and _Autopan_ fulfilling more specialised needs. Audio tools and utilities include _Trim_, which can apply gain, pan and phase changes, the surround-specific _Bass Manager_ and _Calibration_, and several other problem-solvers such as _Invert Phase_.

What seems to be missing from the line-up are a really ballsy, characterful single-band compressor, a flexible and realistic reverb, and a decent distortion and amp simulator plug-in. I'd also love to see something a bit more leftfield — maybe a pattern-based granular synthesis plug-in, for example.

Some of the better bundled MAS plug-ins — there are things here to cover most bases.

time-stretched and have fades or crossfades applied, all directly using mouse clicks and drags on various 'handles'. Plug-ins can be destructively applied to individual soundbites via an off-line process with full preview capabilities, and a new feature in *DP5* is that soundbites also have a 'Gain' setting, so that their playback volume can be adjusted independently of audio track volume or automation.

Automation, by the way, is a *DP* strong point. Automation data for the Mixing Board and plug-ins (in all formats) becomes part of the track it's related to — you don't get separate automation tracks. It can be written directly into the track using the pencil tool and its various draw modes, automatically using a 'Snapshot' of any desired parameters for any number of tracks, or can be generated by dragging faders and knobs during an automation record pass. If you choose to do it this last way there's the full complement of Overwrite, Latch, Touch and Trim modes to determine how new automation data is incorporated into the sequence. MIDI tracks also fall under the automation umbrella, with channel volume and pan messages being considered MIDI automation data.

Mix Matters

DP5's Mixing Board can show MIDI, Audio, Aux, Instrument and Master tracks side by side, and by default its left-to-right layout stays synchronised with the top-to-bottom ordering of tracks in the Tracks and Sequence Editor windows. However, single or multiple tracks can be hidden at a stroke, so it's easy to keep the Mixing Board customised and manageable no matter how many tracks are in your project.

Both MIDI and audio tracks have insert slots in the Mixing Board, for their respective types of plug-in. MIDI plug-ins include useful non-destructive tools like *Time Shift* and *Transpose*, along with a real-time *Quantise*, a *MIDI Echo* that mimics an audio delay by generating new MIDI data from what is already in the track, and a pretty good *Arpeggiator*. Audio plug-ins that come bundled with *DP5* are all in MAS format, and many come in multi-channel versions for surround use. See the 'Bundled Plug-ins' box for a round-up of what's on offer.

A major plus point for *DP5* is its automatic latency compensation, which works without limitation throughout the mixing environment, on audio tracks as well as Aux, Instrument and Master tracks. So long as a plug-in correctly reports its latency to *DP* — and this should be the case whether the plug-in is in MAS, Audio Units or 'wrapped' VST formats, even if it's running on a DSP engine such as a Powercore or UAD1 card — *DP5* will deliver track audio to it ahead of time to keep it in sync with the rest of the mix. This all happens without any user involvement whatsoever — I have never caught it out — and is an excellent and reliable feature that would be hard to live without.

Software Synths

One of *DP5*'s most heralded features is a bundled set of software instruments, in MAS format. MOTU give you the *Bassline* monophonic synth, three polyphonic synths (the Juno clone *Polysynth*, the FM-based *Proton*, and more flexible subtractive *Modulo*), the *Model 12* drum module and a simple sampler (*Nanosampler*). Though none rivals the very best third-party equivalents on the market, they're still very good, and for many jobs may be the 'first call' choice — the fundamental sound quality of each is excellent. *Model 12*, in particular, stands out, with on-board time-stretching and duration-independent tuning for individual drums or a whole kit, and decent modulation and routing options. Of course, the *DP5* instruments fulfil another role — as living advertisements for MOTU's separate *Mach Five*, *MX4* and *Symphonic Instrument*, which all run in native MAS format in *DP5*. For detailed information on these instruments see last month's *Performer* column in *SOS*.

Virtual instruments are hosted in *DP5* in Instrument Tracks, which handle audio routing, automation data and the application of plug-ins to the instrument's output. A separate MIDI track is then needed to actually 'drive' the instrument. *DP5* also works well with stand-alone synths, routing

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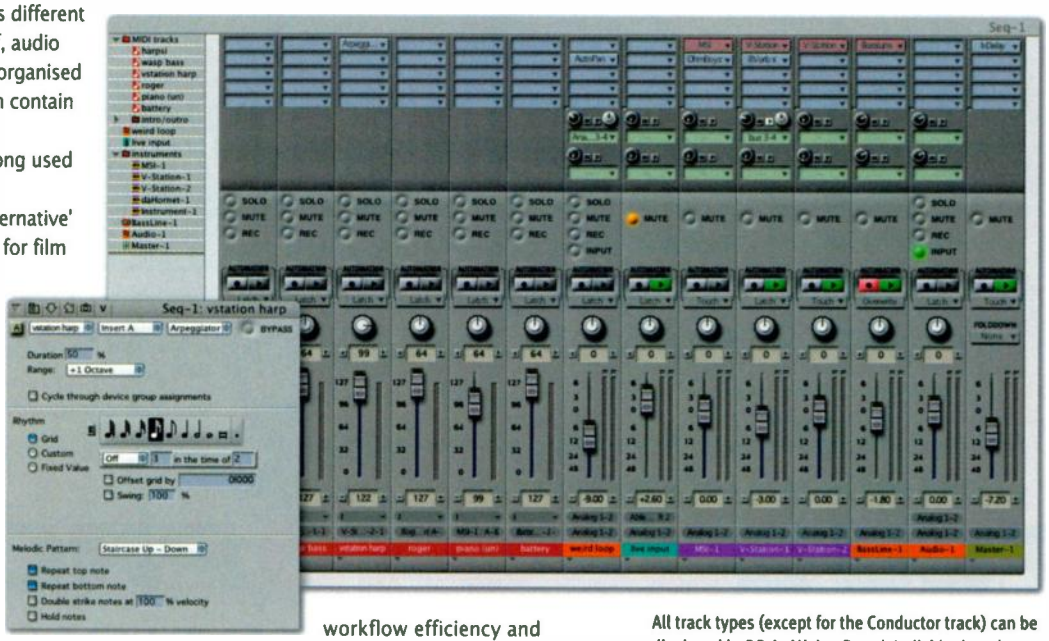
audio from them via a flexible and reliable Rewire implementation, or via third-party system audio routers like Cycling 74's *Soundflower* or the open-source *Jack*. Rewire operation with Propellerhead *Reason* and Ableton *Live* is flawless, with transport controls, sequence tempo and loop playback (termed 'Memory Cycle' in *DP5*) correctly shared and communicated.

Instruments In Complex Projects

All work in *DP5* is done within a Project, and each always gets its own folder on your Mac's hard drive, helping to keep all its different elements — the project file itself, audio files, analysis files and so on — organised in one place. A single Project can contain any number of entirely separate Sequences, and *DP* users have long used this feature to assist in project development, in maintaining 'alternative' versions of the same work, and, for film composers, developing the separate cues that together make up the music for one film or show.

In this last respect, however, previous versions of *DP* have been pretty clunky if you've tried to use virtual instruments as your sound sources. The problem was that you'd need to instantiate virtual instruments (often exactly the same ones) and any associated plug-ins in every single Sequence in your project. If you made much use of software samplers, switching from cue to cue would require the sampler plug-in to be reinstantiated and all its instruments to be reloaded, as the new Sequence was itself loaded. This not only caused delays in workflow, but could lead to memory usage problems too.

To help with this, *DP5* has a feature called V-Racks. These are specialised Sequences that have only 'real-time' track types — Instrument, Aux and Master tracks — and have no timeline, so you can't open any sort of editing window for them. They exist merely to host virtual instrument plug-ins, or handle the audio from Rewire or external hardware synths, whilst the synths themselves are 'played' from the MIDI tracks of a conventional Sequence. Using one, a film composer can now set up his or her preferred instruments in a V-Rack, and then work on each cue in separate Sequences that contain only MIDI tracks and any additional audio or instrument tracks that each needs. The V-Rack is not affected when switching from cue to cue so samples do not need to be reloaded, and there are gains in workflow efficiency and reliability too.



All track types (except for the Conductor track) can be displayed in *DP5*'s Mixing Board. Individual tracks get insert slots for plug-ins, aux sends (in the case of audio tracks), automation and playback/record controls, and routing pop-up menus, along with the inevitable fader and pan control.

The V-Rack concept is elegant, and seems like it might have a future role in some sort of distributed processing scheme — something which is not currently offered in *DP5*. It feels slightly unfinished, though, as Sequences using V-Racks can currently prove harder to handle during mixdown, and need extra work to include in a bounce-to-disk operation.

Good Performance

I hope it's becoming clear from this review that *Digital Performer 5* is a hugely powerful and flexible sequencing platform which can do an awful lot for a wide range of musicians, songwriters, composers, engineers and sound recordists. Flexibility really is *DP*'s strong point — it's configurable and doesn't channel you into one way of working. There's so much good about it that it would be editorial suicide to try and list it all — but here are the best bits.

The sheer number of real-time and off-line facilities for manipulating and editing MIDI is matched by the ease with with data can be worked with graphically. It's a similar story for audio: the soundbite-based approach allows for intuitive ease of use alongside great precision. Comping, two-track editing, voiceover work, Foley and sound design are all well served by *DP5*.

Also, *DP5* just sounds good! My own, admittedly subjective, impression — which seems to be backed up by others — is that there's little or no sense of the rather opaque, hard 'digital' mid-range and treble that characterises some digital mixers. The mix environment is also forgiving of big gain boosts or cuts, so you get away with it if you really overload a mix buss and make a large cut to counteract this later on in the signal flow. Then there's the bundled instruments, which sound excellent.

Plug-in support in *DP5* is unrivalled. The native MAS format only works with *Digital Performer* and the cut-down *Audiodesk* application which comes bundled with MOTU's audio interfaces, so it's absolutely rock solid. It's catered for by plug-in developers like Waves, Izotope, Wave Arts and Audio Ease. The looser Audio Units

AV Features

Digital Performer **has built a reputation as the AV sequencer of choice, especially in the US. Certainly it has a fine feature set for film work of all kinds, including a wide range of synchronisation options, Quicktime movie support, automatic video scrubbing when dragging MIDI and audio events in editing windows, a sophisticated marker and Find Tempo system, and the ability to bounce completed projects to the audio track of a Quicktime video file.**

In *DP5* new features include user-programmable Streamers, Punches, Flutters and 'visual clicks' — the visual cues that are superimposed on video during scoring sessions to assist conductors and musicians with timing and tempo of cues. These are all configured via *DP*'s Conductor track, and are applied to the Movie Window or, using two of MOTU's external synchronisers or some third-party hardware units, to external video sources.

format is also well supported, though, with all plug-ins being subject to an examination process that weeds out those that don't meet the Apple standards and could cause stability problems. You can also use VST plug-ins in *DP5* using Audio Ease's VST Wrapper, FXpansion's VST To Audio Unit Adapter or Native Instruments' Kore.

Finally, a feature that deserves to be singled out is Pitch Automation. This is a phenomenal feature that provides *Auto-Tune*-like pitch flexibility but with much less fuss and a greater degree of subtlety. What's more, it doesn't preclude the use of *Auto-Tune* if you prefer that automated, highly processed effect.

Better Performance?

When was anything all good, though? For me, *DP5* still comes up short in a few areas. The first is audio performance reliability. Undoubtedly the enhancements in this version help to eradicate the processor spiking issues that plagued some people (mostly single-processor G4 and G5 owners) running *DP4*. But on both my dual-2.0GHz G5 Power Mac and 1GHz G4 Powerbook I occasionally ran into processor usage warnings (which you can turn off) and momentary 100 percent spikes when going into playback from transport stop, even in the simplest projects. These are benign spikes, in that they're easy to live with and don't undermine the ability to get work done — but I wish they didn't happen.

Then there's efficiency at low audio buffer sizes. It's always difficult to compare like with like here, but there's enough evidence for me to be pretty sure that *DP5*'s processor use increases relatively more when buffer size is decreased than does *Logic*'s, for example. With a buffer size of 128 samples, say, it certainly seems as though *Logic* gives you better software-instrument performance than *DP*, and stories about *Logic* users doing entire complex projects at the lowest buffer sizes are hard for many *DP* users to relate to. Of course, if you're not a heavy user of software instruments, or you have reliable zero-latency monitoring in place for audio recording, this is a moot point. But even though *DP5* is the most efficient OS X version of *Digital Performer* ever, I still feel this is an area that could be improved.

Other gripes include the inability of *DP* to play back 16-bit and 24-bit audio simultaneously, and its insistence on converting even uncompressed imported audio files into *Sound Designer II* format. *DP*'s time-stretching algorithm is unspectacular, adding a lot of artifacts and not handling rhythmic audio very well. Some pop-up menus for configuring inputs and outputs aren't labelled, and can be confusing. The track take system doesn't help at all with 'comping' from multiple takes, as you can never view more than one take at a time. And finally, even after years of using *DP* myself, I find some aspects of data, track and time-range selection confusing.

Conclusion

Version 5 isn't a new dawn in the world of *Digital Performer*, but then it isn't MOTU's style to sweep away the old and replace it with the new. Instead, the new version builds upon and refines still further the already brim-full feature set of *DP* 4.6, becoming yet more powerful and flexible, and in the process improving on some less appealing features of previous versions, such as the input monitoring.

There's an irony in that *DP5*'s high-profile bundled instruments — which are very good, if rather simple, as I've mentioned — are in many ways the least 'pro' addition to the application. They'll mean a lot to anyone just starting out down the software sequencer road, but a lot less to anyone already earning their living with *DP* and running several orchestral sample libraries, Spectrasonics instruments, Native Instruments *Komplete* or any number of other 'heavyweight' software synth packages. For these people it's the less glitzy and immediately obvious things that will make a difference — the improved audio performance, excellent Meter Bridge, even better click options, and the handling of multiple-output instruments, for example.

Overall, though, there's no doubt that *DP5* is the best *Digital Performer* to date, and that MOTU have been listening to their customers. It can hold its own with any other sequencing package, and is a stable, mature platform for all sorts of projects. *DP5* is a great sequencer that deserves its fine reputation. SOS

information

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Alesis DM5 Electronic Drum Kit

Now that electronic drums have finally become respectable, there seems to be a trend towards producing more easily affordable MIDI kits. This offering from Alesis is based around the well-regarded DM5 module, yet is still surprisingly inexpensive.

Brett Taylor-Holmes

As an acoustic drummer who has also embraced electronic drums, I have owned and played various electronic kits over the years, ranging from the first Simmons kits with their bone-jarringly hard playing surfaces, via the newer softer rubber pads, to my present Roland V-Drum kit with its mesh heads, fabulous hardware, and equally imposing price tag. Even though the V-Drum family have been falling in price, there's still a place in the market for something simple, cheap, and practical, so I was particularly interested to see how Alesis had approached their new DM5 Electronic Drum Kit.

Hardware & Setup

I was pleasantly surprised at just how easily and simply the drums and rack were packed, and at how compact the kit is when disassembled. The kit comprises a black rack frame to support the pads; five drum trigger pads, one of which serves as the hi-hat playing surface and is used in conjunction with the supplied open/closed footswitch; two cymbal pads; and the sound module 'brain'. In this case the brain is the long-established Alesis DM5 drum module, which has 12 analogue trigger inputs, so cost has been saved by not having to design new electronics. The same was true of its predecessor, the smaller Ion Audio IED01 (reviewed in *SOS* October 2005), which used the long-running Alesis SR16 drum machine as a brain. Given the low cost of the kit, I was delighted to see the inclusion of both a set of reasonable drum sticks and a bass drum pedal, so all you need is a stool and a pair of headphones to get up and running. As with its predecessor, this kit is easy to set up and transport and, once unpacked, it took me less than 15 minutes to assemble it, a process that was only slightly hampered by the fact that I could find no assembly instructions included with the review kit!

The rack for the DM5 is the usual black-painted steel affair with multiple clamps that house the side extensions and pad arms. Included with this kit are the two side extension arms on which both the hi-hat and floor-tom pads are mounted. There is a 'T' bar leg support at either end, which vertically supports the entire frame, with a middle-section crossbar to add strength to the entire assembly.

Assembling the rack was indeed fairly quick, but less easy than it might have been. Most of the pad extension bars had come loose and needed to be assembled as I went along. The wing nuts provided with this kit are very small and fragile, which is quite unnecessary. Even slight over-tightening can cause these plastic parts to fracture, so Alesis would do well to sort this issue out as soon as possible, as it is the only real weak point of this kit and could be significantly improved if a little more thought was put into the design of the fittings, positioners and tightening screws.

First Impressions

Compared to my V-Drum kit (not entirely a fair comparison given that this kit costs less than the VAT on my V-Drums), the hardware is very lightweight, but it still adequately supports the five black plastic velocity-sensitive playing pads. These are identical, and covered in a rubberised substance to enhance the feel of the playing surface. Each pad is around eight inches diameter by two inches deep, and presents a slightly larger playing area than available on the earlier Ion Audio kit. On the underside of each pad is a quarter-inch jack socket for connection to the DM5, and all the necessary leads come with the kit. As with the earlier Ion Audio kit, the newer model's pads include sockets for dual triggering, but one of these is mysteriously blocked off, suggesting some room for future development. The current kits are, however, strictly one sound per pad, unless you count the hi-hat, which switches from open to closed and also generates a closing sound when the pedal is operated.

The two supplied 12 inch cymbal triggers are both functional and easy to position on the rack. They're certainly better than using more rigid rubber pads for cymbal triggering. The rack itself has changed little ▶

SOUND ON SOUND

Alesis DM5 Electronic Drum Kit
£370

pros
- Great-sounding drum and percussion voices.
- Very easy-to-use DM5 interface.
- Comparatively inexpensive.
- Compact.
- Bass-drum pedal and sticks included.

cons
- Playing surfaces a little noisy.
- Rack construction and connectivity could be improved.

summary
This electronic drum kit is simple to operate, sounds good, and is good value for money. A few simple frame and pad upgrades would make this kit a real winner, but it should still hold up to home and studio use without any problems.

from the previous version except for the addition of two side extension arms that mount both the hi-hat and floor tom triggers plus the snare pad. In terms of hardware compatibility, the rack is not suitable to mount other manufacturers' hardware, as the tube diameter is significantly smaller. Cleverly, the 19-inch DM5 module hangs suspended from the upper of the two support struts, which keeps it well out of the way of flying sticks, while still being within easy reach when adjustment is required. This keeps the kit nice and compact.

Playability

One of the most interesting aspects of electronic drums is their appeal to drummers and non- drummers alike. Casual players or studio owners who need a way to program drum parts will probably be perfectly happy with this kit, though more serious drummers may be put off by the lack of true drum-head 'bounce' — the tensioned mesh heads used by other electronic drum manufacturers are greatly superior in this respect, but the price of the pads is significantly higher. Being honest, the playing surface of the DM5 kit is a little harsh, and the tap, tap, tap of the sticks hitting the surface can be intrusive, but at least there's enough give in the pads not to make your wrists ache.

The hi-hat controller footswitch is both simple and effective, while the addition of a bass drum pad that is hit by means of a standard-style pedal is a great improvement over the kick switch provided with the Ion Audio kit — a switch lacks sensitivity to dynamics when compared with more elaborate kits, making it harder to play expressively. The two 12-inch cymbal triggers are quite a good size to hit, simple in design, and constructed from hard-wearing plastic with a thicker rubber 'outer shell' to shield the trigger from stick impact.

"I was more than pleasantly surprised by the range and quality of drum voices that this kit has on board, and the factory preset drum kits are well thought out."

One of the major benefits of these types of drum kit is that they produce very little mechanical noise compared with an acoustic kit, and can be used effectively with a set of good-quality closed-back headphones. The clicking of the pads may be enough to drive people mad if they're in the same room, but at least this kit won't be heard throughout the house.

The Brains

Even though it has been around for many years, the Alesis DM5 drum module still provides a great range of both conventional and electronic drum and percussion sounds, as well as some novel special effects. This outputs via 18-bit DACs running at a 48kHz sample rate and offers over 500 ROM-based drum and percussion sampled voices. You can store 21 drum kits, and each kit can have up to 61 sounds. Having become used to some of the more exotic features provided by the more advanced and certainly more expensive Roland, Yamaha, and Ddrum kits, I was more than pleasantly surprised by the range and quality of drum voices that this kit has on board. The factory preset drum kits are well thought out, with kits covering heavy metal, pop, rock, jazz, Latin, and general percussion. Those interested in the techno/rap/world-music end of the musical spectrum are also well catered for. All the preset kits are available for editing, so sounds can be substituted, retuned, panned, and mixed.

For drummers, simplicity of operation tends to be important, and the interface on the DM5 module is both simple and clearly laid out, with a central backlit LCD display for kit names and edit parameters. There is a variable-level phones output, essential for practice, and an overall volume control. Most parameter adjustments are made using a large value dial. A very clever Preview button helps ensure you haven't dialled up a John Bonham kit by mistake when you are just about to play a jazz number. When tuning your drums (via the Tune button) there's an automatic 'pad follow' system which can be used to get the edit window to track the pad you last hit. As the DM5 has four audio outputs, there are also group-assign and output-selection functions, so you could take your kick and snare out separately for processing in a recording situation.

Altogether there are 12 trigger inputs, which you connect to the pads to create your sound. As not all of them are used, you can add more pads as required. Power for

the DM5 module comes from an included mains adaptor which connects on the rear panel. Also round that back you'll find MIDI In and Out/Thru ports, as well as an input for a footswitch, which can be used either as a hi-hat pedal or to move incrementally through the drum-kit presets. Finally, there are the obligatory left and right main output jacks, as well as the two auxiliary output jacks which may be used to separate out some of the kit elements.

One of the most important aspects of the DM5 module is its versatility beyond being the brain of this kit. For example, you could use it as an expander to another electronic kit, or use it in your studio as a MIDI triggerable box of drum samples — which is how it was originally designed to be used. You can even trigger it using an audio track fed via a gate if you're careful, which makes replacing poor-quality drum sounds a possibility as long as there isn't too much crosstalk to allow the gate to work properly.

Verdict

Because I'm primarily an acoustic drummer used to playing on very responsive playing surfaces, any move away from that environment feels unnatural. The recent development of mesh heads on electronic drums has made a big difference, but, as I've already pointed out, that kind of innovation comes at a price. If you want to build an affordable electronic drum kit, there seems little alternative to sticking a rubber layer over a solid backboard with a pickup on it. The seasoned professional may well like the sounds within the DM5 module, but balk at the playing feel — but then this kit clearly isn't aimed at the professional.

The frame, pads, and bass-drum pedal, whilst adequate for studio and casual use, would be unlikely to stand up well to the sustained wear and tear of nightly gigging, but, when you weigh up the cost, the Ion DM5 still offers excellent value for money. In fact I seem to recall that the DM5 module when launched used to cost more on its own than this complete kit. The kit is probably best suited to those needing to practice drums at home without annoying the neighbours, but it will also work well for general-purpose studio tasks, and should also be OK for the occasional pub gig.

In the studio, having playable surfaces is a big step up from programming drum beats or manipulating loops with a mouse or MIDI keyboard. I feel that Alesis could make a much bigger splash into the electronic drum-kit market if they spent a little more money on the playability and durability aspects of this kit. That said, if they drove the price up to the point where they were in competition with some of the entry-level V-Drums and similar units, then they'd probably find the market too tough, so it is a fine line! As it is, they have the 'cheap and cheerful' end of the market pretty much sewn up. What they lose in feel and durability, they gain in simplicity, sound quality, and affordability — even the manual is disarmingly simple. Overall this is a good-value, entry-level kit for practice or studio use, with the added bonus that the DM5 module is a versatile source of MIDI drum sounds. SOS

information

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