REVIEWS 2000

THE MIX : FUTURE MUSIC : KEYBOARD : SOUND ON SOUND

⊛ YAMAHA

A4000 : A5000

PROFESSIONAL SAMPLER

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Yamaha A5000 & A4000

Hands-on control samplers

Price A5000 £1,499 • A4000 £999 • Output Expansion Board £149
For Good cross-platform compatibility • Great sound
• Packed with creative and useful features
Against Data entry can be a little clumsy • Only 4Mb RAM as standard
• Esoteric operating system
Verdict Both feature-packed samplers sound great, but the A4000
wins by a nose thanks to its value for money

There's never been a better time to get into sampling – just look at the choices available. The two big players in the sampler market, Akai and E-mu, are selling their products at knockdown prices, and Yamaha, who returned to the sampler market two-and-a-half years ago with the A3000, are about to release a couple of feature-packed samplers, the A5000 and A4000. Similarly, software developers are beginning to take their slice of the pie.

The problem is that the options are getting a bit bewildering – although a bit of healthy competition keeps prices low. Many computer owners must be wondering whether they really need a hardware sampler at all. Existing sampler owners will no doubt be considering which way they should upgrade, and which platform will be the best. For new samplists, all of the above questions may well apply. So it is against this background and some pretty strong competition that Yamaha release these new MIDI stereo samplers.

Overview

In a move not unlike Akai's release of the S5000 and S6000 samplers just over a year ago, Yamaha are releasing two brand-new products at the same time. Physically very similar to each other, the two units differ in some fundamental ways, such that the A4000 (the junior of the two), cannot be upgraded to achieve the same specification as the A5000. The differences are polyphony (64 or 126), multitimbrality (16-part or 32-part), and effects (three or six).

Aside from these points, the samplers are very similar, offering a wealth of improvements over the A3000. Of course, the physical similarities between the A3000 and the new models are self-evident, but gone is the blue fascia, replaced with a more professional grey brushed steel.

words **Jon Musgrave** images **Gavin Roberts**

One improvement that will come as no surprise to existing A3000 users is the large LCD screen. Although the operating system is similar in concept to Version 2 on the A3000, it's implemented in a far more visual way, making full use of the new graphic facilities.

However, it would be foolish to dwell too long on the differences between these two units. What is stunning is the wealth of facilities common to both. There are 96 different FX types, 16 filter types, sample-specific EQ and MIDI-syncable LFO.

Samples can be modified using the loop divide and remix functions, re-sampled from the outputs, sampled via the effects boards or sampled straight to disk. Compatibility with other file formats is probably the most extensive yet, and includes Akai S1000/S3000 (programs and samples), E-mu EIIIx (presets and samples), Roland S760 (most patches and samples), WAV, AIFF, Yamaha's own EX5/7 and TX16W. Samples can also be exported to disk in both WAV and AIFF format, which is rather impressive.

There's a basic sequence recorder/player, a 4-band EQ at the stereo outputs, and the front panel knobs send out MIDI data and can be used as real-time controllers. Storage options include external SCSI for hard drives and CD-ROMs, internal SCSI and IDE for internal hard drives and Zip drives (should you not require the supplied floppy drive), and a couple of backup options to SCSI CD-R or CD-RW.

Although both units only come supplied with 4Mb of onboard RAM, this can be expanded to 128Mb with standard 72-pin SIMMs in the four slots provided. To cap things off, both units come with the Yamaha Professional Library of eight CD-ROMs, as well as editing software for both PC and Mac. Considering that the more inexpensive of these two samplers retails for just under a grand, that is one pretty serious

specification, and one that should have the other sampler manufacturers dropping their prices – and their jaws – even further.

Interface

Anyone familiar with the A3000 will find the front panels of the 4000 and 5000 pretty familiar. Inputs, record level, output volume, headphone socket and screen contrast are found at the left-hand end of the front panel. The mode keys and function keys make up a matrix at the right-hand end of the front panel, and three buttons (command, assignable and audition) sit below these to the left of the floppy drive.

The large LCD screen is accompanied by five dual-function knobs that can be both rotated and pressed, and correspond to elements on the screen. The back

of the A4000 is pretty basic with two stereo outputs, MIDI in, out and thru, one 50-pin half-pitch SCSI connector, a cooling fan, a standard IEC mains socket and an expansion slot for extra outputs and digital connections. The A5000 is exactly the same, but has an additional MIDI in and thru (though for some reason no extra MIDI out).

With a large LCD screen Yamaha have finally caught up with the competition in terms of the user interface – although Akai's S5000 and S6000 are still out there on their own. A detailed explanation of the screen layouts can be found in the Screen Saver box opposite. However, one thing that the A4000 and A5000 do share with their predecessor is an operating system which is at best novel, and at worst very frustrating.

For anyone who is unfamiliar with it, here's a quick round-up. Akai's approach to sampling, although sometimes a little baffling, is based on a system where a raw sample is modified in a number of ways (LFO, filter, key span, layering, outputs and so on), by the parameters of a program. These programs can then be placed in a multi, allowing you to use your sampler like a multitimbral synth.

Yamaha's approach is a little more esoteric, with the parameters you might normally expect to find in a program actually part of the sample. What's more, in order to group samples together and apply the same treatment to them, they can be put in banks too. Although these samples and sample banks are then put into programs for the purposes of playback, the program merely acts as a host for them and a means to save them together.

The system has a maximum of 128 program 'locations' into which programs can be loaded. In a concession to the way people like to work (and let's not forget, Akai only introduced a multitimbral mode with the S3000), the A4000 and A5000 now support a multi-mode, with 16 parts on the 4000 and 32 parts on the 5000.

So, you can now breathe a sigh of relief that all these wonderful facilities are available in a familiar manner. Well, almost. This system still takes quite a bit of getting used to. For example, once you've recorded a sample, although you can audition it from the front panel with the audition key, it has to be put into a program to play it via MIDI – which is basically quite annoying.

Thankfully, although the manual goes into great detail in some sections, it does have a quick start chapter at the beginning, which will quickly familiarise you with the Yamaha way of doing things. Of course Yamaha's approach does have some advantages, especially if as an Akai user you've ever lost the vital program information that goes with a raw sample and turns it into something brilliant. Inevitably, for anyone unfamiliar with other sampler operating systems, learning any new unit is going to be a steep learning curve, however, Yamaha have certainly followed their own path, so be prepared.

In use

On power-up both samplers display their respective names and default to the Play Sample page. This is a good starting point, as this is where you assign which MIDI channel the sample will use. Thankfully, the Yamahas come with seven standard waveforms on board (Akai take note!). These include sine, saw up, square, triangle and three pulse waves. No doubt you will soon tire of these and want to start some proper sampling; however, it may be worth loading up one of the four demo disks to see what the samplers can do. Some excerpts from the first demo disk can be found on this month's cover CD. In fact it took a couple of attempts to get the demo to work, but once the factory settings were restored and the appropriate

features

- 96 fully-editable effect types, including chorus, flanger, wah, rotary, distortion, autopan, delay, reverb, gate
- 16 filter types: low-pass 1, 2 and 3 all with resonance, high-pass 1 and 2 with resonance, band-pass, band eliminate, peak 1 and 2, dual peak, dual eliminate, dual low pass, low pass + peak, dual high pass, high pass + peak, low pass + high pass
- Back up to CD-R and CD-RW
- Amplitude, pitch and filter envelope
- MIDI-clockable LFO with choice of four waveforms: saw, triangle, square and sample and hold
- Loop remix and loop divide
- Audition of samples direct from disk
- Two separate MIDI continuous controller set-ups
- Sample recording via effects board
- Analogue inputs can be blended with outputs
- 'Easy edit' option to quickly change mix and output levels, filter, pitch, amplitude envelope, velocity sensitivity and crossfade in one page
- Export samples to WAV and AIFF format
- Time-stretch with real-time audition
- Sample normalize and auto normalize
- Fade and crossfade with choice of curve types
- Sequence recorder and player
- Panel play with real-time generation of MIDI info from knobs
- 'Total EQ' 4-band EQ across stereo outputs

The A5000's back panel, with the extra MIDI in and thru that you won't find on the A4000

MIDI — THRU-B | IN-B | THRU-A | OUT | IN-A | ASSIGNABLE OUT R L | STEREO OUT R L/MONO
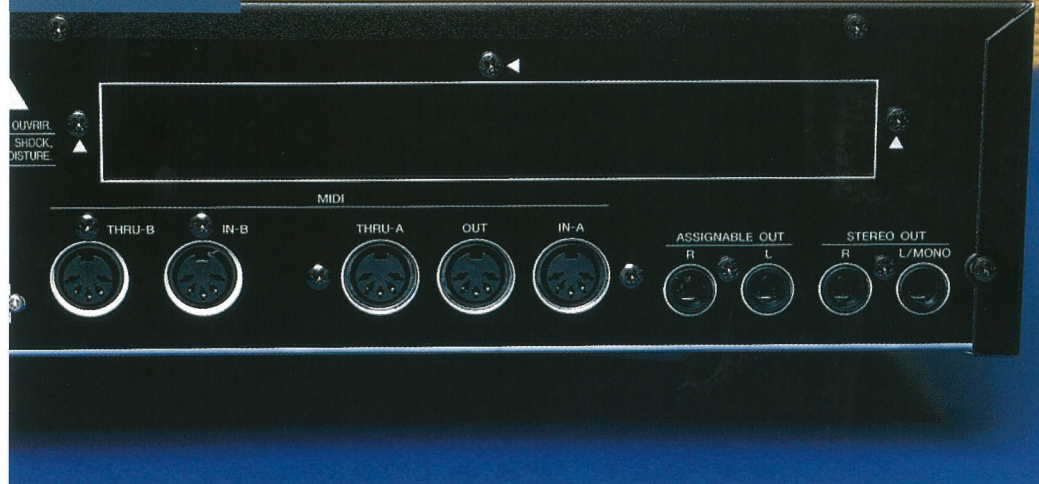
'sequence' loaded, rather than volume, program or sample, we were up and running. One minor niggle was the load time from the floppy disk (three minutes for one floppy!). Still, the demo gave a pretty good impression of the quality of both the filters and effects available on the A4000 and A5000.

Sampling via the audio inputs proved pretty straightforward and highlighted some of the innovative features. For example, although the Yamahas do not have direct-to-disk recording and playback, it's possible to use the 'save' option to sample straight to disk. Also, within the record set-up it's possible to replace an existing sample or add-on to the end of one as well as starting afresh.

Other parameters are also selected here, such as sampling frequency, pre-trigger, auto-normalise, automatic key-mapping, trigger method and so on. Strangely, there appeared to be no way of triggering from a MIDI note, which is a little frustrating.

Anyway, many of the features found here really embarrass the competition. Once sampled and assigned to a key and program (all of which can be done automatically as noted above), you may want to normalise the sample. This can be done in two different pages. The first is the trim/loop edit page (edit + F1), and the second is the command menu. The command menu is a bit of a strange one – it's accessed by pressing the 'command/exit' key, and gets you into two different menus, depending on which mode you're in.

If you're in 'disk mode' it accesses various functions such as save, format and the CD-R backup features. From the other modes it accesses a selection of functions, most of which do not fit in the other pages. These include process, under which you'll find normalise, loop divide, re-sample, copy, delete and so on. Returning to the trim/loop edit page throws up some more useful features. These include start and end catch, which allow you to capture your start and end points and loop points on the fly while the sample is playing.

Also within these pages is one of the most innovative functions on the Yamahas. The Loop Remix option essentially rearranges sections of your sample into a different order, incorporating selectable options such as retuned bits, reverse bits and so on. This is a great function for adding life to what would otherwise be a boring loop.

The other great loop modifying feature on the A4000 and A5000 is the loop divide option. Found in the command menu, this splits the sample up into specified sections such as eighth notes and maps the samples out across the keyboard as a sample bank. It's a bit like a basic version of Recycle.

The other sample editing features also prove quite interesting. Within the filter pages, as well as some very good filters, there is a real-time 1-band EQ for each sample. The filters themselves proved to be very flexible, with five random velocity-to-cut-off settings – a must for those of you trying to create analogue-style synth sounds.

As mentioned above, both samplers have a complement of 96 (yes – 96!) effect types. These are arranged in one buss of three on the A4000, and two busses of three on the A5000. Overall, these effects are of high quality. As you may have come to expect, send levels to these effects are part of the sample parameters, and thankfully, the routing is shown graphically in the edit sample page (edit + F2).

The effect set-up itself is filed under play effect (play + F4). This is where each of the effects is selected, modified and routing decided. Each effect can either be sent straight to the outputs or chained to the next one. This allows for a pretty serious set-up, and on the A5000 effects from the two busses can be routed to each other for even more flexibility.

While using the Yamaha samplers, various other cool features crop up. Firstly, the five mode buttons flash when receiving MIDI data, but each one responds to different types of data. Also rather nice are the panel play options, which turn the front panel

Screen Saver

When Yamaha launched the A3000 sampler, one of the major gripes was the screen (a miserly two-row LCD affair). Thankfully, they have now addressed this problem, and their new models come suitably equipped with a green backlit LCD, not unlike that found on E-mu's new E5000 model.

Although the operating system is not substantially different in concept to its predecessor, the large screen has allowed much more information to be displayed at any one time. Existing Yamaha sampler users may therefore find themselves with some rather welcome features. For example, full graphical editing of samples, visual representations of filter types, EQ, effects routing, output routing, key span – that's mapping in Yamaha speak – and so on. In fact, so keen have they been to make full use of the new screen, you may initially find it a little confusing. However, worry not because here is a quick crash course.

The key to understanding the A5000/A4000 screen lies in the top left-hand corner. This box tells you which of the five main pages you're in as selected by the vertical buttons just to the right (play, edit, record, disk, utility). Each of these main pages has six main sub-pages selected with the six function keys. Just when you thought that was it, each of these sub-pages can be paged through in two ways to access all the parameters. In the top left corner of the screen is the number '1' with a little arrow icon, indicating that rotating knob number one will page through the rows of parameters. Alternatively, simply press the corresponding function key repeatedly. Either way, a small marker in the top left-hand corner shows you which row you are on, which is quite useful for those pages that have lots of parameters.

Now, this may all seem a little unnecessary given that a quick look at the key matrix will tell you which page you're in, but in practice it actually proves quite useful. In part this is because of the way the unit remembers which page you were last on. For example, if you were in play program (play + F1), moved to edit sample (edit + F2), and then wanted to go to, say, play sample (play + F2), pressing play will initially jump you back to play program because that was the last 'play' page you were in. Now it may sound petty, but when you're trying to access pages quickly, having the page info as part of the display is very useful. So, thumbs up to Yamaha for that.

As previously mentioned, Yamaha's new samplers offer a full complement of graphical features. Worthy of special mention are three pages. Firstly, the sample trim/loop page, which makes good use of the screen to show both sample start and end points as well as loop points, with full zoom capabilities. Also within this page is a graphical representation of the loop remix function, making it very easy to see exactly what it has done to your favourite loop. With the filter/EQ pages Yamaha have again come up trumps, with graphical displays of exactly what the various parameters are doing as you change them. Finally, the effects pages are well-implemented, showing the interconnection of the three blocks within each effects buss. This is definitely useful for the A5000, which allows its two effects engines to be interconnected.
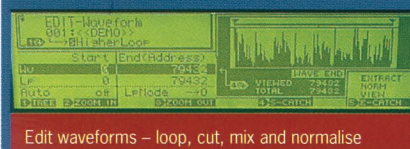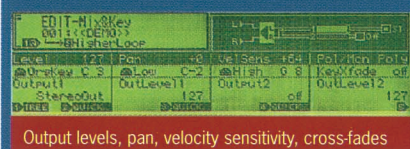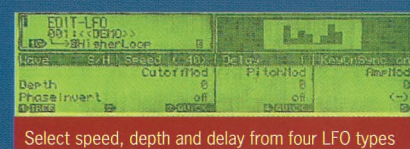
EDIT-Waveform

Edit waveforms – loop, cut, mix and normalise

EDIT-Filter
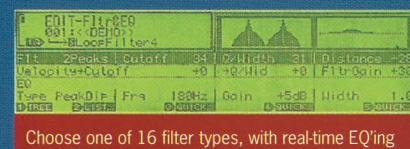
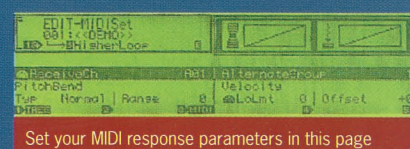Choose one of 16 filter types, with real-time EQ'ing

EDIT-Amp
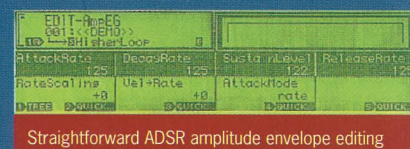
Straightforward ADSR amplitude envelope editing

EDIT-Mix&Key

Output levels, pan, velocity sensitivity, cross-fades

EDIT-LFO

Select speed, depth and delay from four LFO types

EDIT-MIDISet

Set your MIDI response parameters in this page

specifications

Conversion
A-D: 20-bit 64x oversampling
D-A: 24-bit 8x oversampling

Digital I/O (optional)
S/PDIF coax and optical

Digital sampling frequency
48, 44.1, 32 kHz @ input (ext sync), 44.1 kHz @ output

Analogue sampling frequency
44.1, 22.05, 11.025, 5.5125 kHz (mono & stereo)

Standard RAM
4Mb

Max RAM
128Mb (72-pin SIMMS)

Max sample length
32Mb mono, 64Mb stereo

Max sampling time
6min 20sec mono or stereo @ 44.1 kHz

Polyphony
64 (A4000), 126 (A5000)

Programs
128

Effects
3 blocks (A4000), 6 blocks (A5000)

Outputs
2 stereo expandable to 5 stereo

Internal expansion
IDE and SCSI

External expansion
50-pin SCSI (micro D/half-pitch)

Weight
8kg

Dimensions
480 x 461 x 90mm
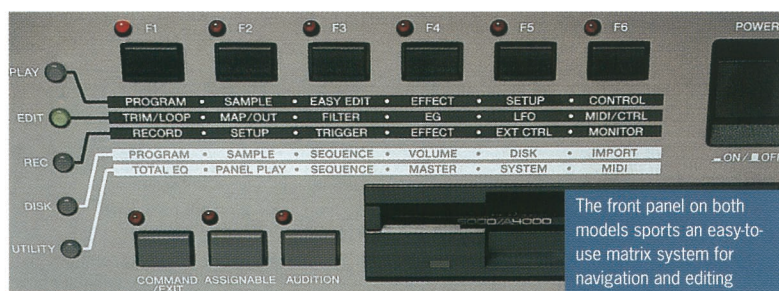
A4000 or A5000?

Spot the difference - this is the A4000
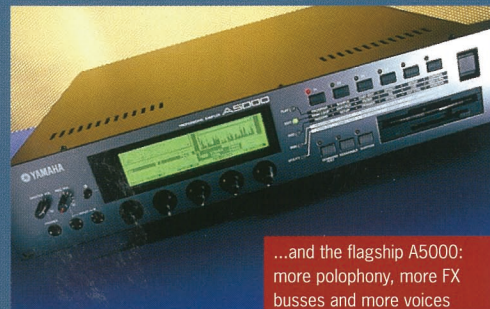
...and the flagship A5000: more polophony, more FX busses and more voices

Visually, the A5000 and A4000 are very similar. The only physical difference (apart from the badge) is the casing trim – the A4000 is blue with grey knobs (and definitely more sexy) and the A5000 is black with black knobs. So the question has to be 'what do you get for your extra 500 quid?'.

Well, although both samplers offer a wealth of upgrade options, there are a few features that limit the upgrade path from A4000 to A5000. Firstly, the A5000 has 126-note polyphony versus the 64 of the A4000. Secondly, the A5000 is 32-part and the A4000 16-part. Finally, the A5000 has two FX busses with up to three FX in each, where the A4000 has one FX buss of three FX.

So it's worth thinking carefully about whether any of these extra specifications will be important to you when deciding on which unit

to go for. On a positive note, both samplers do offer a wealth of other upgrade options. In a similar fashion to the A3000, an additional six outputs plus S/PDIF and optical connectors are supplied on one upgrade board.

However, it's the internal hard drive options that may worry the competition. Both A4000 and A5000 have an internal IDE buss for connection of up to two IDE drives, as well as internal and external SCSI connections. The only limitation internally is the space, with only one internal slot and the floppy drive bay. Still, this is a good range of storage facilities for units at this price. Incidentally, Yamaha are keen for owners to perform the upgrades themselves, and include fool-proof instructions at the back of the manual for all the upgrade options.

knobs and function keys into assignable MIDI-generating controllers. The latching audition button option is also a nice touch.

The supplied CD-ROM library proved pretty extensive, but also rather memory-hungry, so you'll probably want to budget for some extra RAM as well as £120 for a SCSI CD-ROM drive. Also included is a variety of Yamaha software for PC and Mac, including XG Works Lite (a sequencing package), a wave editor and exchange software for transferring data to and from your PC or Mac.

Compatibility with other sample formats was quite encouraging, although the system is still limited to eight characters for WAV file format. The export function also worked without a hitch. Although it was not possible to try it, the A4000 and A5000 allow you to back up to CD-R and CD-RW, and this facility takes two forms. One allows you to copy data from up to eight different disk sources onto a CD-R or CD-RW as a write-at-once procedure. The second allows you to burn up to 99 separate audio tracks of samples (as long as they are 44.1kHz) to create an audio CD.

Both are fantastic options; however, there are also some annoyances. Although the headphone socket is on the front panel, there's no separate headphone level control. The knobs themselves can be a little fiddly, and

unlike Akai and E-mu samplers, there's no keypad for entering numbers. In fact, the whole method of entering data and moving around pages takes a lot of getting used to, mainly because there isn't one dedicated data wheel. This means that one minute you're adjusting data with knob two and the next with knob four. Something else which is slightly annoying are the program options, as even if you delete all the associated samples and banks, a program retains its name and cannot be blanked, which seems pretty pointless.

Verdict

Once upon a time, not so long ago, there was an industry-standard sampler, and it was an Akai. Although it remains incredibly popular, the Akai isn't really an industry-standard anymore. This means that other manufacturers have a real opportunity to step in and take that crown.

The problem remains, however, that although cross-platform compatibility has improved, most people like to stick to one platform. Once you start to build up a sample library, the last thing you want to do is convert it all to another format. One thing Yamaha have got right is sample format compatibility. They've also crammed their samplers with so many features it would be impossible to discuss them all here. However, they still employ an operating system which is slightly out of the ordinary, and may therefore find it difficult to attract Akai and E-mu users. For the first-time buyer this may be of little consequence, and for the bargain-hunter the A4000 definitely gets our vote. As ever, the choice is yours.

The front panel on both models sports an easy-to-use matrix system for navigation and editing

The Yamaha A4000 is attempted to be the sampler of the millennium, despite the fact it's a couple of thousand years too early

Sampled delights

£999

Maff Evans called the Yamaha A3000 "a fantastically expressive sampler", but what will he think of its successor? Time to find out what 18 months' work can achieve. Enter stage left the **Yamaha A4000** super sampler…

TECHNICAL SPECIFICATIONS

Polyphony	64 voices
Multitimbrality	16 parts
Sample format	AWM2
Sample rates	44.1, 22.05, 11.025, 5.5125kHz
Memory	4Mb (expandable to 128Mb via SIMMs)
Sample time	47 seconds (44.1kHz), 94 seconds (22.05kHz), 189 seconds (11.025kHz), 380 seconds (5.5125kHz)
Effects	96 types, three processors
Max programs	128
Filters	13 types
Connections	Input L/R, Output L/R, individual out x2, headphones, SCSI
MIDI	In, Out, Thru
Display	320x80 dot LCD
Storage	2HD/DD built in floppy drive optional external SCSI and an optional internal SCSI/IDE

I LOVE THIS machine. There, I had to come straight out and say it. This sampler is just fantastic. When I first played with the A3000 I was well aware that it was something out of the ordinary, and it blew the dust from my preconceived ideas on what a sampler should be.

Admittedly there were a few points that kept me from letting go of my trusty Akai (a grip that wasn't even loosened by the E-mu range), but Yamaha's R&D department has been beavering away for over a year to come up with a sampler which is as usable and affordable as it is refreshingly unique.

Taste the strange

Unless you're already familiar with the A3000, the sampling structure used in Yamaha's latest samplers will seem a little strange. Just about every other sampler uses samples as the raw wave for a sound with tuning, keyspans, filters, outputs and envelopes all being handled at a higher level by programs. The A4000 does things differently.

Samples still hold waveforms and loop information but envelope, filter, tuning, key and output information is all attached directly to a sample. The program level is

purely for adding external modulation and assigning MIDI playback control. It takes a little getting used to, but once you've worked it out, the system soon becomes pretty intuitive and flexible.

For a start, each filter can have its own LFO and modulation parameters set independently of the program, as well as separate filter, envelope and effects routing. If you want to group samples together as you would in a traditional program structure, you can create a sample bank. Sample banks can contain multiple samples arranged across the keyboard in any way. This is because of the freedom that holding play-back info with the actual sample gives you. Since you determine how a sample can be played, for example which key triggers it, they can be layered, velocity switched or key-split within a sample bank.

At the top level is the aforementioned Program Level. To actually play back sounds from the A4000 you need to assign them to a program, since this is where MIDI control is determined. The system has 128 programs available at any one time and you can play them individually or via Multi mode which is for multi-timbral operation.

If the playback settings within a sample itself aren't quite what you need for a particular program then you

can override them using Easy Edit.

This offers access to many of the parameters of a sample that can be edited as usual, the only difference being that the settings only apply when the program is selected; the local settings within the sample are left alone. This means that you can build up a library of edited samples and not worry about whether they'll fit in a program or not.

Very special effects

A different internal structure isn't a good point per se, and if you've found it tricky to follow that runthrough of how the A4000's sample system works you may not be reaching for the chequebook just yet. What does make it worth attention though is how the unique nature of this sampler inspires new ideas.

One of the excellent features of the A3000 V2 has been retained and improved in the form of Loop Remix and Loop Divide. In fact E-mu thought it was such a good idea that it produced its own version called Beat Munging in the e5000 Ultra.

What these functions do is analyse a sample to break it up into chunks according to volume and frequency, effectively separating individual elements of a drum pattern. Loop Divide then maps these samples out across the keyboard as a sample bank, enabling you to treat them as separate instruments. Loop Remix goes further, actually using the parts to build a

new rhythm. Each section can be gated, tuned or reversed which can produce some dramatic drum 'n' bass patterns from even the simplest loop. With just a couple of button presses a straight four-on-the-floor techno beat can end up sounding like the lost rhythm part of an Orbital track.

Processing process

Once you've edited the samples it's time to output them through one of the A4000's three distinct effects processors. These each offer 96 effects types and can be linked in just about any way, enabling complex routing in parallel or series alongside the straight stereo and individual outs.

Some of the effects are nothing short of outstanding, as anyone who's used a Yamaha 01 or 03D digital mixer will attest. The effects are similar to those award-winning desks. In fact, much of the technology from the EQ and filter editing to the mix outputs bears a resemblance to the digital mixer versions, another point which makes the A4000's asking price of under £1,000 even more surprising.

The quality and variety of the effects coupled with the diverse and unusual edit capabilities make the A4000 more than just a sampler; it's a serious composition tool as well. Not only does it play back sounds with superb quality but it also actually inspires new ideas. You could be trimming a bog-standard 303 loop one minute, and then the next minute an industrial-

STEP-BY-STEP: RECORDING & EDITING A SAMPLE

Step 1
Enter the Record Set-up page by pressing Rec then F2 (pictured). Set record type to New using knob 2, then turn knob 1 to highlight the Input line. Turn knob 2 to select the input source then knob 3 to set the sample as mono or stereo and then turn knob 4 to set the sample frequency.

Step 2
Press F1 (pictured) to enter the recording page, then press knob 5 (Go) to go to record standby. Start your source playing and press knob 4 to start recording and knob 5 to stop, if the triggers aren't already set to automatic.

Step 3
Press Edit (pictured) then F1 to jump to the Trim/Loop page, then press knob 1 to see a list of samples contained in the memory. Turn knob 2 (pictured) to select the new sample and then press knob 1 to access its parameters.

STEP-BY-STEP: RECORDING & EDITING (cont.)

Step 4
Turn knob 2 (pictured) and 3 to set the start and end addresses of the sound, checking progress using the Audition key. Press F2 to access the Map/Out page, then use the knobs to set parameters for level, pan, key range, original note and to which output the sound should be sent.

Step 5
Press Play and F1 to reach the Program page and use knob 2 to select a program. Press F2, then use knob 2 to select the sample to play in the program. Turn knob 4 (pictured) to turn the receive channel from 'off' to the required MIDI channel, then play your MIDI controller to hear the sample.

Jargonbuster

Data filter
A device featuring a disk drive and MIDI interface for playing sequences without a dedicated sequencer or computer.

IDE
Integrated Drive Electronics. A more cost-effective hard drive standard than SCSI.

SCSI
Small Computer Systems Interface. A fast, but expensive connection standard used for connecting drives and peripherals to computer systems.

Zip drive
A small, removable hard disk which has taken over from floppy disks in many applications. Uses 3.5-inch removable cartridges to store either 100Mb or 250Mb of data.

Yamaha A4000
Professional sampler
£999 • Yamaha: 01908 366700
• Web site: www.yamaha.co.uk

Features

Ease of use / Setting up

Quality of results

Value for money

A system that not only works well as a sampler but also inspires musical creativity

FUTURE MUSIC
RATING **93%**

time record and playback device, but you can load sequences from disk if you want, making it a useful data-filer as well as a sampler.

The rack is back

Sampling using dedicated rack machines has gone out of fashion to a certain extent, with many people preferring to carry out their digital recording via computer hard-disk solutions. I must confess I hadn't used my Akai to this extent before, with the vocals and loops more likely to be triggered using a PC running Logic Audio while the sampler was playing some drums and basic instruments.

The A4000 regains some of the sampling limelight for the rack though because it does so many things that a hard-disk system simply can't do. Believe me, I tried to find limitations in the system so I could quiz the technical guys at Yamaha. The problem is, I couldn't find anything. Every time I thought I'd discovered one I managed to find the solution. This alone makes it such a formidable machine for such a reasonable price.

Yamaha is pitching the A4000 as the entry-level version of the A5000, which retails at £1,499. Your extra £500 will get you another 63 voices of polyphony, 16 more MIDI channels and six effects processors rather than three. Maybe I'm easily pleased, but doing without those to get a sampler of the A4000's obvious quality for under a grand seems like something I could live with… so I did. That A400 you can see in the photographs? It's now mine.

sounding metallic synth sequence will emerge miraculously from the Loop Remix and effects sections of the Yamaha A4000.

The old A3000 had this quality but the somewhat esoteric edit system and limited display made things rather heavy going to begin with. Not a problem any more though, since the A4000 has a large, clear 320 x 80-dot LCD and a much friendlier page structure. The package also contains four demonstration disks to get you started and a library of CD-ROMs full of A3000-format sounds, so even if you just plug in a SCSI drive and learn the disk system you've got a load of presets to play with.

Learning the system is a very small hurdle that is definitely worth overcoming, since the rewards that lurk behind the stylish, brushed-metal fascia are legion. All the tools you need to professionally edit and play samples are there, along with the extra inspirational features that we've only just scratched the surface of in this review.

For a start there's a notepad sequencer that we haven't mentioned yet. Sure, it's only a simple real-
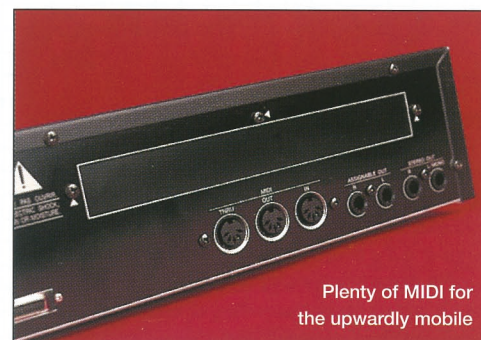
Plenty of MIDI for the upwardly mobile

ROOM TO EXPAND

One of the impressive features of the A4000 is the ability to expand the machine's capabilities at a relatively low cost. First is the Yamaha I/O card, which adds six more assignable analogue outs along with optical and coaxial digital I/O for the surprisingly low price of £149. Even better is Yamaha's support for low-cost memory and storage options. For

And if that's not enough ins and outs for you, the A4000 can be easily upgraded with SIMMS

a start memory expansion uses standard 72-pin SIMMs up to a maximum of 128Mb (using four 32Mb SIMMs). An internal hard drive can be added via an IDE interface rather than the more expensive SCSI if you prefer, while the floppy drive can be swapped for an internal ATAPI Zip drive. This leaves the SCSI port on the rear free for adding a CD-ROM drive to read the library of CDs that come free with the sampler.
For a fully expanded machine, you're looking at around £70 for an

internal 100Mb Zip drive, around £100 for an internal IDE hard drive, £110 for an external SCSI CD-ROM (which aren't that common these days) and – at the time of writing at least– about £50 per 32Mb SIMM. All in all a total of approximately £1,630 will secure you a 128Mb sampler with eight sub-outs and digital I/O, a 10Gb hard disk, internal Zip and even an external CD-ROM drive. This kind of package would have cost the same as a car a few years back.
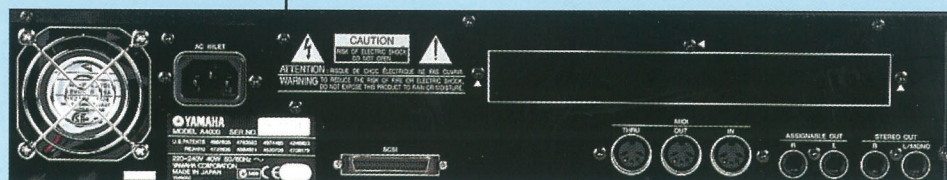
Yamaha A5000
SAMPLER WITH BUILT-IN EFFECTS

by John Krogh

Stereo sampler with 126-voice polyphony, 96 built-in effects, 9-CD-ROM sample library, and CD-R/RW recording capability.

Pros: Great-sounding filters. Cool, highly programmable effects. Nine sound CD-ROMs. CD-burning capabilities. Front panel knobs can be used as realtime MIDI controllers.
Cons: No rear panel inputs. Can't be fitted with an internal CD-ROM drive. SCSI communication problems between included Mac software editor and sampler via PCI ultra2 wide SCSI cards.

Yamaha, 714-522-9011, www.yamaha.com

$2,295 (A5000); $1,595 (A4000)

When Yamaha introduced their A3000 sampler four years ago, its features and sound attracted immediate attention, but no one was sure what to make of it. Many were intrigued, but not everyone was convinced that it would be around long enough for Yamaha to create a viable sampler format that could compete with Akai and E-mu, the "big two" sampler manufacturers at the time. This skepticism was inevitable, given the shortage of Yamaha-formatted sample libraries from major sound manufacturers. Fast-forward to 2000: While they're still not as well supported as the big guys, Yamaha has clearly taken the next step toward establishing themselves in the sampling arena. Their A4000 and A5000 samplers are the latest members of the A-series family, and offer some pretty amazing features that make them serious contenders. Also, just before press time we got word from Yamaha about a new sound developer support program that should radically increase the number of A-format CD-ROMs in the market.

We reviewed the A3000 back in Oct. '97. In '98, Yamaha released the V2 operating system upgrade, which addressed some of the A3000's initial shortcomings while adding remix-friendly features such as a syncable LFO, loop remixing, loop divide, ten new filter types, and the ability to route the outputs of any one of its three effects blocks into another effects block.

The A4/5000 models pick up where the A3000's features left off: 40 new effects

algorithms (for a whopping total of 96), increased polyphony, a generous display, nine sound CD-ROMs to get you started, and the ability to burn audio and A-series format CDs. There are, of course, other changes and enhancements, which I'll get to shortly. Rather than spend too much time covering the basic navigation, I'll highlight the cool remix features and other new stuff, and encourage you to dig out your Oct. '97 Keyboard or go to the Archive section of www.keyboardonline.com for more on "getting around."

I reviewed the A5000, so I'll refer to this model throughout. However, most of my comments apply to both models, since their feature sets are nearly identical. For a list of differences between the A4000 and A5000, refer to the "Differences" sidebar on page 90.

Overview
With its sexy silver face, the A5000 certainly has a pro look. Its 320 x 80 dot display (see Figure 1 on page 87) is a big improvement over the A3000's two-line LCD display, and makes fine-tuning the start and end points of loops a lot easier. But on the outside, the A3000 and A5000 are more alike than different. You still have five multipurpose knobs that can be used for data entry and parameter selection or as realtime MIDI controllers. To the right you'll find a front-panel matrix with five operating modes and six function buttons, which are used to scroll through the various pages of each mode. The only apparent difference here is that the A3000's Meter function has been renamed Trigger, which makes sense, since it's here that you

set up how sample recording will be triggered. Recording can start and stop automatically when audio levels reach specific thresholds, or it can be done the old-fashioned way — by manually pressing start and stop buttons. Oddly, there's no way to trigger sampling from MIDI.

One other major improvement: The A5000 is equipped with a 32-bit processor, which makes certain operations noticeably faster. (Loading big samples into an A3000 was an exercise in patience.)

Organization
The way in which samples and multisamples are organized for playback in the A5000 is a bit of a departure from the norm. Many samplers let you arrange samples into a multisample, with one or more multisamples assigned to a patch or program. At the program level you can apply filters, assign LFOs, arrange key maps, etc. These programs can also be grouped into a multitimbral setup.

In the A5000, however, synthesis parameters commonly available at the patch level are provided at the sample level. One LFO, one filter, and three envelopes (amplitude, filter, and pitch) are available per sample. Up to 960 samples can be loaded, each with its own synthesis settings, key assignment, and effects routing. Samples can be grouped together in a multisample, which is called a sample bank in the A5000.

There are two ways to organize samples and sample banks for multitimbral playback. The first is by assigning them to an empty program, where each sample/sample bank can have its own MIDI channel assignment. This is known as Single mode. In Multi mode, each sample and sample bank you want to use for a single part is assigned to a program, which is then assigned to a multi part with its own MIDI channel. This mode is more like the way other samplers handle multitimbral setups.

Why are there two ways to do the same thing? Because the A3000 only offered the first mode, which didn't handle program changes as elegantly as the new Multi mode. In Multi mode, you can send a program

change to select any of the 128 programs without changing the effects configuration.

Recording & Editing

Before you can start sampling, you must first choose which inputs to record from. You have the choice of the A/D inputs on the front panel or the stereo outputs. If the optional expansion board is installed, you can also choose the optical or coaxial S/PDIF digital inputs. You can record dry, or through up to three effects blocks.

The A5000 offers a number of thoughtful features that make the job of recording samples less of a chore and more of a creative process. There are several record types, one of which (New+) will automatically map consecutively recorded samples across the keyboard if recording is set up to start and stop when the audio signal's level reaches a specified threshold. This makes the process of splitting a construction kit track from an audio CD into individual component samples nearly hassle-free.

What's more, External Control mode allows you to control the playback of a SCSI CD-ROM drive capable of playing audio CDs, for sampling tracks off a compact disc via the analog inputs. Note that this isn't the same thing as extracting audio from a disc.

There's even a click that you can play along to when recording yourself live. What's so special about that? The resulting samples retain the tempo settings they were recorded at, which is useful when editing sample and loop end points by beat.

Once a loop has been recorded, you can determine its tempo using the tempo calculator. This works well for sampled loops in 4/4, but isn't that useful for figuring out the tempo of fills or odd metered music.

Finding sample or loop start and end points is easy with the S- and E-catch buttons. Here's how they work: Hit the Audition button to play the sample. When you hear where you'd like the end to be (or the start), press E-catch (or S-catch). It's that simple, and it works well. If you need to fine-tune things, there are three auto-addressing modes that can help: Length Lock (locks the distance between the start and end point), Zeroing (any address change you make will be forced to the nearest zero-point), and Snap (the loop end address always jumps to the nearest point having the same level as the loop start address).

Yamaha also included a Mac/Windows software CD-ROM containing a simple

Vital Stats

|	
Polyphony	126 voices
# of multitimbral parts	32
# of programs	maximum 128
# of samples	maximum 960
Imported sample formats	Akai S1000/1100/S3000, E-mu EIIIx, Roland S-760, AIFF, and WAV
Sample memory	4MB RAM standard, expandable to 128MB RAM
Supported sample rates	analog inputs: 44.1, 22.05, 11.025, and 5.5125kHz; digital inputs (optional): 48, 44.1, and 32kHz
Resolution	16-bit
Sample editing	normalize, loop, reverse, fade, loop crossfade, trim, tempo calculator, loop remix, loop divide, stereo to mono, time-compress/expand
Loop types	6
Filters	16 resonant multimode types
LFOs	1 per sample, plus 1 per program, syncable to MIDI clock
LFO waveforms	*sample*: saw, triangle, square, sample-and-hold; *program*: sine, saw, triangle, square, sample-and-hold, programmable 16-step wave
Envelopes	three 4-stage envelopes (ADSR) per sample: amplitude, filter, and pitch
Effects	96 algorithms (parameters controllable via MIDI); 6 per program
Analog outputs	rear panel: 4 unbalanced 1/4" jacks; front panel: 1/4" headphone jack
Analog inputs	front panel: L/R unbalanced 1/4" jacks
Digital audio I/O	none
Word clock sync	none
SCSI connectors	1 micro 50-pin
MIDI connectors	dual in, out, thru
Sequencer	realtime recording and playback; SMF import
Included software	A4/5000 Editor, Tiny Wave Editor (both Windows and Mac)
CD recording	Red Book audio and Yamaha A-series format CDs
Dimensions/weight	18-7/8" W x 18-1/8" D x 3-9/16" H (2U); 17 lbs. 10oz.
Options	AEIB Input/Output expansion board adds coaxial and optical S/PDIF digital I/O and 6 assignable analog outputs ($249.95)
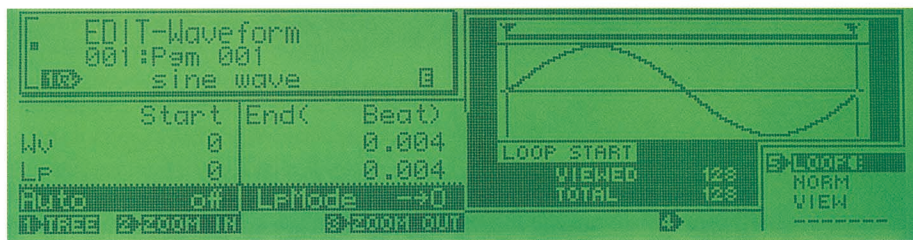
Fig. 1. The A5000's display is a welcome change from the tiny two-line LCD of the A3000. Here we see the Edit Waveform window, which is one of three that can be accessed by pressing the F1 function button. Notice the rotating arrow next to the sample's name (sine wave). This indicates that turning knob 1 will cycle you through the various samples. Alternately, knob 1 can cycle through the various pages and parameters available under F1. (Knob 1's function is assigned elsewhere.) You can audition just the looped portion of audio by selecting Loop (lower right corner) and pressing knob 5.

waveform editor, Tiny Wave Editor (TWE), and a dedicated sampler editor that gives you remote control of the sampler from your computer. TWE isn't exactly supported by Yamaha — the Read Me file states, "Yamaha makes no guarantees, implicit or explicit, regarding the quality or performance of this software." The A5000 Editor is a full-fledged desktop-based interface to the A5000, letting you edit all the program, sample bank, and sample parameters from your computer.

I tried using my computer to run both TWE and the A5000 Editor, but had no success. I can't point the finger solely at Yamaha. My Adaptec 2940U2W SCSI card doesn't work with BIAS Peak or Digital Performer — two other SMDI-capable programs. If Yamaha really wanted to make me happy (and others who have a B&W G3 with an ultra2 wide SCSI card), their software should include the ability to choose the SCSI bus that the sampler is connected to. To my knowledge, Propellerhead's ReCycle is the only program that allows this, and it works with my A3000. Reportedly, the A5000 Editor works
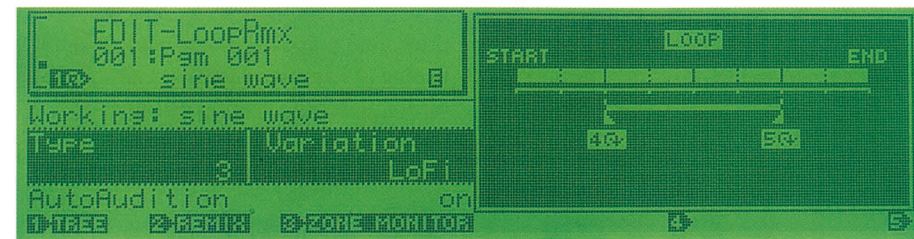

Fig. 2. In the Loop Remix window you can specify portions of a sample to be rearranged by dialing in the region boundaries with knobs 4 and 5. The sample in this screen shot will be remixed with the LoFi variation, type 3. When the A5000 is done scrambling the sample, a Create button will appear. If you like the new version, all you have to do is press Create. The new sample will be created and you can continue to remix.

great with Windows machines equipped with SCSI connectors and older Macs, but I wasn't able to test this prior to presstime.

Sounds

The sound library included with the A5000 is more than a token offering of heard-it-before loops and third-party sample manufacturer demos. Nine CD-ROM titles are included: Piano/Keyboards, Standards, DJ/Producer Tool Kit, Guitar/Bass, Real Drums, World/Latin Instruments, Brass/Wind Instruments, Strings/Choir, and Syntraxx/Loops. On the whole, all of these sound sets are very good. Grand piano, CP80, Wurly, and Rhodes patches are all on hand, as well as gritty and mellow analog synth textures and decent organ samples. The ensemble strings are nice, though I had to spend some time setting up the right keyboard velocity to make them respond properly to my playing. Both solo and ensemble programs are included. I especially liked the brass ensemble samples, which included several articulation variations as well as a couple of brass effects. I found the woodwind samples, especially the flutes, to be fairly convincing and very playable. The guitars and basses are passable, but they're not as outstanding as some of the other instrument sounds.

Of all the discs, the DJ/Producer Tool Kit, Syntraxx/Loops, and Real Drums CD-ROMs were my favorites. There's enough material on these to cover almost any rhythm programming job I'd want to tackle. The synth sounds from Syntraxx/Loops rival those found in some of the current analog modeling synths. This is partly due to some smart programming and use of the A5000's synthesis features. Of the Real Drums samples, I liked the ambient and funk kits best. I didn't care too much for the toms, though, since they had a very close-miked

L.A. sound. So I ran them through the Auto Synth effect to create a cool, trippy lounge sound effect that was the perfect complement to the trip-hop patterns I programmed with the ambient kit.

What about other sample CDs? Since the A5000's native format is WAV, you have a lot of third-party material available to you that can be brought directly into the sampler. The A5000 will also read Akai S1000/S3000, Roland S-760, and E-mu EIIIx formatted sounds via CD-ROM.

Synthesis

Now that you have all those sounds loaded into the A5000, what can you *do* to them? Plenty. It's as if the A5000 has a split personality — on one hand it's a feature-laden sampler, on the other it's a RAM-based synth module (sort of). As I mentioned earlier, each sample has its own LFO, for which you have your choice of waveforms (sawtooth, triangle, square, and sample-and-hold). There's also a Program LFO, which is syncable to MIDI clock and offers two more waveforms (sine and stepped) in addition to the ones available at the sample level. It would be nice to have a second LFO per sample, but this is just a wish, not a complaint. The stepped LFO wave is a simple 16-step repeating envelope, and allows you to generate some unusual modulation shapes.

The filter section features three types of lowpass, two types of highpass, one bandpass, one band-eliminate, and two peak filters, in addition to seven dual filter types that combine various filters (lowpass+peak, dual highpass, and so on). But how do the filters sound? Bad-ass, I'd say. And I couldn't hear any zippering at all when I used an LFO to sweep the cutoff frequency — very smooth. Along with the basic cutoff and resonance parameters (both of which can be modulated by velocity), the A5000's filter

section also offers single-band EQ with user-specified frequency, EQ type, and gain.

So can you run external audio though the filters? Yes and no. You can't route audio signals from the analog input through the filters, because the filters are *at the sample level* — gotta be a sample to get at those filters. However, new to the A5000 are two filter effect algorithms that *do* let you process external signals through the filters.

On the thoughtfulness tip: Sample parameters (such as filter and LFO settings), program parameters, and effects settings can be copied from one sample or program to another. This is a handy feature, and one sure to be appreciated by the dedicated tweaker.

For each sample, six modulation sources can be assigned to any of 36 destinations, which include (among other things) sample address, envelope attack, sustain, decay, and release settings for amplitude, filter, and pitch, filter cutoff (of course), and portamento rate/time.

Effects

The A5000 kicks serious butt in the effects department, with no less than 96 single and multieffect algorithms, each of which can be controlled via MIDI, and each offering up to 20 parameters. Up to six effects blocks (divided into two banks of three) can be used simultaneously, and every sample can have its own effects routings. Furthermore, the output of an effects block can be routed into another effects block for some staggering sonic possibilities. A good number of the new effects are versions of those found in the A3000, except that these new effects are already set up for syncing to MIDI clock, making it easy to get those delays (or whatever) in time with your sequenced tracks.

Effects range from standard — reverb, chorus, flange, delays — to the outrageous. Beat Change, for example, modifies the waveform length in real time for a "metronome on acid" effect. The Turntable algorithms are very useful, and made even more so with the ability to sync the simulated scratching to MIDI. The reverbs are a bit on the murky, grainy side.

Sound manglers will appreciate the abundance of overdrive/distortion, wah-wah, and lo-fi effects. Even the most insane samplists should have no problem finding what they need to properly "grunge up" their samples. I absolutely love the Auto Synth and TechMod algorithms for turning ho-hum samples into electronic-sounding ear candy. One thing I did miss, though, is some sort of

gating effect (*à la* Korg Electribe R). Even so, the A5000's effects alone are almost worth the price of admission, especially when you consider that samples can be resampled through the effects.

Remix Ready

Yamaha makes no attempt to hide the fact that some of the features in the A-series samplers are squarely aimed at dance/remix producers, and why should they? The A5000 offers some very cool features for working with loops.

Loop Remix, which first appeared in the A3000 V2, can chop a rhythm loop into sections, then randomly rearrange these sections to create a new loop. (See Figure 2 on page 88.) Consider it a non-destructive loop auto-generator of sorts. Here's how it works: Press the Remix button, then let the A5000 do its slicing and dicing. When it's finished, it'll play the new loop. If you like it, you can save it. If not, you can press Remix again to create a new loop.

There are eight remix types, including reverse (which chops up a loop and reverses the audio of some of the slices), lo-fi (which adds grunge and changes the pitch of some of the slices), and gate (which can create some interesting stutter effects). If you happen to like the way a loop was chopped up and remixed, you can save the remix "algorithm" as a user preset for use with other loops. Loop Remix is certainly a cool feature, but it doesn't work as well as Propellerhead's ReCycle for getting accurate slices. This is because Loop Remix doesn't define its slice points based on transient attacks. Rather, it divides a loop into sections based on tempo, so if you have a loop with swing rhythms (*i.e.*, it's not metronomically perfect), you might not get usable results. I had success working with "straighter" loops, though, and found Loop Remix to be a very inspiring, creative tool.

Loop Divide is another beat-based loop function, which cuts a loop up into subdivisions, creating a new sample for each slice and mapping it to a key. You can specify the resolution at which Loop Divide does its slicing (from a half-note duration all the way to a 32nd-note).

Under the Resample page you'll find four types of time-compression/expansion as well as Pitch Convert. Time-stretching can be done by tempo, length, time, and beat. Of course, stretching by beat and tempo are great for loop-based production, but I have to commend Yamaha for including time-based stretching, which allows you to "fit" a

sample into to new time, say, from 28.7 to 30 seconds. The time-stretching works very well for changes in tempo of up to ten to 12 bpm in either direction. But when I time-compressed a loop 32 bpm faster, I heard some serious (unwanted) chorusing effects on the reverb tails.

In Use

After running assorted tests on the A5000, I went into production mode to get a sense of how easily I could create a track from start to finish using nothing more than samples taken from my personal library and the included CD-ROMs, the A5000, and my sequencer (MOTU's Digital Performer) running on my blue and white G3. Loading sounds was an easy and quick process, even when I was working with Akai-formatted material. Most of the sounds from Yamaha's sound library require more than the standard 4MB of RAM that comes with the A5000, so you'll want to bump up your RAM to at least 64MB for serious work. Plus, Loop Remix requires free RAM for the original and remixed loop.

After loading the sounds and assigning various sample banks to specific MIDI channels, I started building tracks using some of the 140 bpm loops from Yamaha. The loops were tight with each other. However, I noticed a bad loop point in two of the acid synth loops. Not anything that threw them out of time, just a small click, which got buried as I added more drum tracks. The A5000 never hiccuped once due to any of the MIDI data being thrown at it — even when I was overdubbing continuous controller data being played from its front panel knobs.

As I went through various sample and synth parameter editing stages, I found myself wishing for Jump and Compare buttons so I could quickly move from one edit page to another and compare my tweaks to the original. Sampling was quick and yielded expected results when I used the New+ sampling type to create a sample bank of construction kit sounds. It would have been nice, though, if there was a way to copy and paste a portion of a sample into another sample or a new, empty sample. While I didn't have a problem sampling from the A/D inputs on the front panel, I had to wonder why the inputs aren't doubled on the back panel. I don't like having to run cables around my studio. Plus, it's cleaner to patch rear input jacks into a patchbay.

Burning a CD of my sample data took just over six hours to complete using a Yamaha 4260tx CD-RW drive. Why so long?

It turns out that the 4260tx isn't a supported drive, even though I got it to work. If you're hoping to take advantage of the CD burning capabilities of the A5000, check Yamaha's website (www.yamaha.com) to be sure your CD burner is on their approved list of drives.

One other interesting SCSI note: The connection between the A5000 and the internal hard drive that was supplied with the review unit came loose during shipping. I had to open the box and reconnect it. This was easy to do, but you might need to get inside there from time to time if you're taking the A5000 on the road.

Conclusions

At $2,295, the Yamaha A5000 is a great value. You get a well-rounded complement of sounds on CD-ROM, plus editing software, and some of the best filters I've heard in a sampler — or in an analog modeling synth, for that matter. Add to that the A5000's six effects blocks with 96 algorithms, which can be controlled via MIDI, and you've got yourself a serious sound design/ synthesis tool. Dance music producers will love this box for its remix-friendly features, namely Loop Remix and Loop Divide, but sound tweakers will also appreciate the synthesis possibilities. SCSI communication issues aside, the A5000 is a solid machine. First-time sampler buyers and serious samplists alike owe it to themselves to give the A5000 a good hard look. ∎

By day, technical editor John Krogh writes and edits copy. At night he sweats it out in the studio building tracks for TV commercials. You should see his studio tan — a fish's belly couldn't be any whiter.

the a team

YAMAHA A5000 SAMPLER

Yamaha's former sampling flagship, the A3000, represented a novel but very powerful approach to sampler design. The new A4000 and A5000, as **Derek Johnson & Debbie Poyser** report, maintain the distinctive design ethos, but should provide even stronger competition to the established names.

I f you'd been looking for a new studio rackmount sampler a few years ago, it wouldn't have taken long to list the options: UK industry-favourite Akai or respected US institution Emu. Like Coke and Pepsi, MacOS and Windows, HP and Daddies, these two giants slugged it out with little serious competition to distract them. Worthy machines in Roland's S700-series gave samplists pause for thought, but then Roland shifted their focus towards 'groove' samplers, leaving the big two alone in the ring once more.

Until mid-'97, when Yamaha threw down a glove with the launch of the A3000, their first studio sampler for almost 10 years. Labelled 'Professional Sampler', the A3000 combined plenty of features and power with an affordable price. It wasn't universally liked in all aspects — the *SOS* review (July 1997) found its operating system 'arcane', for example — but there was no denying that it provided unprecendented value for money. The A3000 and the 1998 v2 upgrade must have made their mark, because Yamaha are decidedly not moving away from professional sampling: two new A-series machines are on the loose, still looking good on the price and spec front, and still providing that bit more choice in the sampler market.

Inside & Out

The new A-Team consists of the A4000 (£999), and the flagship A5000 (£1499) under review here. (We've outlined how the 4000 differs in the 'A4000 Differences' box on p152.) Even a brief list of the 5000's features runs to a lot of words: mono/stereo 16-bit sampling, 126-voice polyphony, 32-part multitimbrality, 4Mb RAM as standard (expandable to 128Mb), four analogue outputs (expandable to 10 with the AIEB1 board that also features S/PDIF digital I/O), synthesis facilities, and comprehensive effects, looping, editing and DSP tools. There's space inside for a SCSI or IDE hard drive (plus SCSI connection for an external drive), a floppy drive which can be replaced with a Zip removable, a CD-burning facility, simple Standard MIDI File playback sequencer, real-time MIDI controller knobs, editing software, and a set of free sample CDs. It also reads Akai S1000/3000, Emu EIIIx, Roland S760, WAV and AIFF samples, plus some Yamaha synth voice/wave data, and can save in WAV or AIFF as well as native format. Nice...

The well-endowed A5000 offers some significant improvements over the 3000 — multitimbrality and

polyphony are doubled, as is the quotient of effects processors — while retaining the same basic look and operating system, with certain enhancements. Physically it's differentiated not only by its gun-metal livery (which contrasts with the 3000's blue) but also by its 13 x 3cm backlit graphic LCD which, though not quite as vast and eye-poppingly gorgeous as those on the latest Akai samplers, is giant compared to the 3000's.

The display probably makes the biggest impact on the usability of the A5000 over the 3000, providing space for menus, icons, and waveform displays. Like the 3000's LCD, the 5000's works in tandem with five knobs beneath it, which line up with parameters in the display, selecting them or changing their values. The knobs can also be pushed to confirm certain operations. Choosing function-specific windows is done with a familiar Yamaha front-panel matrix: five labelled operating modes (Record, Edit, Play, Disk, Utility) are arranged along one axis, each with accompanying status LED, while the other axis offers six switches to select each mode's six 'Functions', again with LEDs.

Also on the front panel are two analogue inputs, a headphone socket, Master and Record Volume knobs, an LCD contrast control, three buttons that access some miscellaneous functions not covered by the five Modes, a power switch, and the floppy drive. The *Big Book Of Reviewer Dos And Don'ts* (sadly, this doesn't exist) says we now have to talk

Photos: Mark Ewing.

The A5000's large display is far superior to that of its predecessor, the A3000, though it doesn't quite match that of Akai's S5000.

Going Deeper

Before we look more closely at what the A5000 can do, we should examine its internal sound hierarchy. Unfortunately, the manual deals with the issue of sample organisation very badly, so we'll try to fill that gap here.

Many samplers use a system similar to modern sample-based synths. You start with a sample, one or more samples are arranged into a multisample, and then one or more multisamples are assigned to a program or patch, where the multisample(s) are provided with synthesis facilities and perhaps layered or split according to key or velocity ranges.

You can pretty well disregard *that* idea when it comes to the A5000 (and the A3000 before it). All the required options for multisampling, synthesis, and key/velocity splitting are available, but they're applied to the centre of the A5000 universe, the individual sample, which is quite autonomous. Up to 960 samples can be on board, and each can have its own central pitch, key range, synthesis parameter settings and effects routing. For easier management, related samples, such as multisampled piano notes or drum kit voices, can be collected together in what's called a Sample Bank. So far, so straightforward.

Now things get a little more complicated, with two modes available for putting samples into a multitimbral form where they can be played over MIDI. In Single mode, all you do is assign samples and/or Sample Banks to an empty Program slot, of which there are 128. That's it. The Program basically *becomes* a multitimbral setup, as all the samples/Banks in it have their own MIDI channels and so on. The A5000 differs from the 3000 in also offering a dedicated Multitimbral mode, where the method is slightly different. Each sample and

Sample Bank that you want in the multitimbral setup is first assigned to a Program slot, and the resulting Programs are assigned to Multi parts, each with its own MIDI channel. The latter resembles the way most hi-tech musicians are used to operating.

It's fairly easy when you've got your head around what Yamaha have done, but one does wonder why there are two ways of doing basically the same thing — playing samples multitimbrally. Perhaps the first approach is simpler for novices. It's quick and does away with the whole (perhaps unnecessary) idea of having to make a multitimbral setup, because the Program *is* the multitimbral setup. The second approach has the advantage of familiarity for some people, and makes retrieving Programs for use in other songs more straightforward.

The fact that each sample can have independent filter, EG and LFO settings, plus a routing to one of the effects processors, is a very powerful aspect of the A5000. However, you'll often want to apply the same settings to a group of samples (a multisampled piano, for example). Fortunately, you can: almost all sample parameters are also available to a Sample Bank. Changes made to a Bank are applied as offsets to the settings of its constituent samples, the individual settings of which remain intact. If you edit one Sample Bank in which these samples are used, the same edits won't carry over to other Banks which use those samples, so the same samples can be used freely and repeatedly: very RAM efficient. If you *should* want edits made at Sample Bank level to stay with the individual samples, you use the Freeze command. In addition, at Program level there's an Easy Edit facility providing further offset editing of a smaller group of parameters. Easy Edit offsets can also be 'frozen' to samples.

Start Sampling

The business of sampling is undertaken in Record Mode, where six pages cover aspects of preparing to record, and recording a sample. First stop is the Setup page, where you decide which input(s) to

record from. Stereo sources can be automatically summed to mono, to save memory, and you can also choose to resample the A5000's mixed output, complete with effects. A sample rate is set here, too — 44.1, 22.05, 11.025 or 5.5125kHz via the analogue inputs, plus 'lo-fi' options for the lower three. The digital input, if fitted, accepts 32, 44.1 and 48kHz rates, but you can record digital audio at half, a quarter or an eighth of its actual frequency, also giving a 'lo-fi' effect. Stereo or mono sampling can be defined, and the sample can be given a destination key, key range, and pre-trigger amount. The A5000 constantly samples its input, and setting a pre-trigger amount makes it retain the fragment of audio before sampling is initiated, so you never miss the start of wanted audio.

If automatic triggering is your bag, you'll visit the Trigger page next, to set thresholds upon which automatic recording will commence and stop. The Effects page only needs a visit if you want to sample *through* the A5000's effects — a welcome facility which can save having to tie up effects later. Next up is the Monitor page, to set a click to play against if you're sampling your own playing. (A sample recorded like this has the click tempo stored with it, making life easier in the Trim/Loop page, later — how thoughtful.) Sampling is actually initiated in the Record page, where you can also Optimise (defragment) sample RAM.

The sixth Record mode page is 'External Control', which usefully allows the transport of a SCSI CD-ROM drive to be controlled from the A5000, for sampling from an audio CD. Unfortunately the audio doesn't come in digitally via SCSI, but via the CD-ROM drive's analogue outputs.

It might seem that Record mode sends you through lots of pages just to record a sample, but most people will only have to set up working preferences occasionally, because the A5000 remembers your settings. So if, say, you'll generally want to record mono samples at 44.1kHz, from the left analogue input, with manual triggering, not going through effects, you set these things up once and they're stored. Making a sample thereafter could simply entail going to the Record page, setting a level (there's an input meter on the page), and hitting 'Go'. If needs change, you tweak the settings. Especially useful during tweaking is the fact that the A5000 can be set to remember where you last were in each page and take you right there, instead of defaulting to the top of that page — though it can do that too.

So sampling with the A5000 is pretty straightforward, and Yamaha have tried to make it even more convenient with a couple of refinements. First, samples can be automatically normalised after recording, ensuring the best possible signal level without clipping. Sampling takes slightly longer with this feature enabled, but that's a small price to pay for a very audible improvement in level. (Samples can be recorded straight and normalised later, if preferred.)

Then there's a very useful consecutive sampling facility, which enables the capture of multiple samples on the fly without the need to start and stop recording each time. The process is even automated when you choose automatic triggering of sampling — brilliant for pain-free recording of multiple sounds off audio sample CD. Samples can also be automatically collected into a Sample Bank (or Program) and mapped to adjacent keys, whether recorded via consecutive sampling or not. If you don't want them so mapped, re-mapping afterwards is easy.

Once in memory, a sample can be auditioned with the Audition button, which can even cycle through every sample in a Sample Bank. However, if the sample hasn't been auto-mapped to a Program, it will have to be assigned to a Program, in Play mode, before it can be played via MIDI.

Editor's Choice

Edit mode is the place to be for anything from a simple trim and loop to a radical 'remix' of a sample.

All edits can be undone (to one level), but only if the sample in question has been saved to disk. Moral: save often!

Various mundane but important sample-specific parameters are set in Edit mode. These include a sample's desired key and velocity ranges (easily set using an attached MIDI keyboard), crossfades between key and velocity zones to smooth sample transitions, level and pan position, sample velocity response, and routing to the outputs or onboard effects. (Since many sample-level parameters can be overridden at Sample Bank or Program level it's quite acceptable to choose nominal values to start with.) You can even apply Expand parameters to a sound: these enhance the image of a stereo sample or 'stereo-ise' a mono sample. Extreme values create a 'chorusy' effect.

Trimming and looping operations are also available here. Only the top half of a sample's waveform is shown in the display, which initially seems odd but doesn't compromise your ability to work with the sample. First, you may want to trim unwanted material at the start and end of a sound.

The zoomable waveform display (which goes down to single-sample level) has cursors at the sample's start and end points, and these points are also shown numerically. Two knobs below the display move the cursors, in increments of one, 10, 100, 1000 or 10,000 samples. For speed, start and end points can be punched in on-the-fly as a sample plays. Once its length is adjusted to your satisfaction, the Extract function deletes unwanted audio.

Looping uses similar tools to trimming, including another pair of cursors for loop start and end. The A5000 offers just one loop per sample (though there's the choice of letting audio after the loop point play out once a key is released, or not, which can help to add interest during a sample's release). Looping is a tedious job with any sampler but the A5000 has ways of making it more bearable, and good loops can be easily achieved on both instrument-note samples and rhythmic material. For a start, you can hear loop changes in real time while holding down a note. The A5000 will also let you scroll through the sample from zero crossing to zero crossing, until you find the one that yields the smoothest loop — great for avoiding clicks.

Sometimes, however hard you try, there's just no good loop point in a sample. This is where crossfade looping, which helps disguise awkward joins, comes in handy. The A5000 offers a choice of three crossfade curves, and you can set a percentage of the loop to be crossfaded, plus whether the crossfade area will derive from the sustain or release portion of the sample.

There's still more about the Trim/Loop page that's worth mentioning, including a 'wave start address velocity sensitivity' parameter. Don't let the name put you off: this parameter simply causes a waveform to play back from a point inside itself rather than its official start point. The playback point (over which one has limited control) changes according to velocity, yielding some very neat effects. Last in this area is the Loop Tempo control, which lets you assign a tempo to a rhythmic loop or tell the A5000 to determine tempo for you. The latter option works nicely as long as the sample is some multiple of four beats long — ideal for matching breakbeats and loops. It's doubly useful since looping a sample can be done in terms of beats, and once the A5000 has worked out a sample's tempo, it also knows how many beats it has. The timestretching function, too, is easier to use if you work with a known tempo.

Bend It, Shape It

The A5000's synthesis facilities comprise filters, envelope generators and low-frequency oscillators. The multi-mode filter features three kinds of low-pass, two high-pass, one each of band-pass and band-eliminate, two peak filters, and a variety of dual filters — each filter type has adjustable cutoff frequency and resonance, plus a cutoff distance control for dual types. Both cutoff frequency and resonance can be modulated by velocity, and a scaling function alters filter response according to

where a sample is played on the keyboard. There's even a well-specified single-band EQ on the Filter page (in addition to a 4-band 'Total' EQ dedicated to a whole stereo mix and found elsewhere). In all, the filter is very comprehensive, and the possibilities are staggering given that every sample could have its own filter settings. Soundwise, it's capable of being absolutely evil, with a huge amount of bottom end, and the potential to be *very* cutting. Watch out for those speakers...

There are three EGs on board, one each for amplitude (following the attack-decay-sustain-release model of classic synths, with one or two small enhancements), filter and pitch. Each sample also has its own LFO, with choice of waveform (sawtooth, triangle, square, sample & hold), speed (though the S&H speed is, rather confusingly, altered at Program level), delay, and depth amounts for amplitude, filter cutoff and pitch modulation. At this point, one greedily wishes there were *three* LFOs per sample, to modulate the three destinations independently!

The synthesis section does everything you'd reasonably want — the 5000 even has seven basic synth waveforms so you can create sounds from scratch without sampling — and Yamaha have sensibly made it comprehensible rather than esoteric. Yet there's enormous power available just by virtue of the fact that every sample can have its own settings. Since the 5000 holds up to 960 samples, that's almost like having 960 little synths. Parameters can be easily copied from one sample to another, too, so although, for example, there

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isn't a library of preset envelope shapes, you can nick a suitable envelope from another sample. The one niggle in the synthesis area is that the A5000 has inherited the A3000's counter-intuitive value range of 127-0 for envelope stages — for example, the fastest attack is 127 and the slowest 0.

Jam Today

So much for bread-and-butter sample manipulation and synthesis. Now for some jam...

Loop Remix, featured on CS6x control synth and the A3000 v2, is a great process that divides a looped sample and randomly re-orders it, in terms of sound quality, pitch and playback direction. It's non-destructive and can be performed repeatedly until you like the result and save it. One A5000 innovation is that more user interaction with Loop Remix is possible, via four tweakable parameters, though the outcome remains fairly unpredictable! Probably the most useful results are achieved with rhythmic material, but it also has potential for textures, sound effects, and 'weirdening' speech samples. Remixing a melodic loop could even produce a new melody. Note that Remixing requires sufficient RAM for the original and the Remixed version to co-exist.

The other major sample-mangling tool is Loop Divide. This chops a sample into up to 32 equal chunks then puts them in a Sample Bank, mapped to consecutive keys. Ideal for dividing drum or other rhythmic samples into component parts, it's also effective for chopping other material into bits. For example, a two-bar sample of any musical material can be divided into 16 chunks roughly an eighth-note long, and said material reorganised just by triggering the new samples in a different order. An option to set custom Loop Divide points, using markers, would be nice — maybe in an upgrade?

Further tools include DSP processes such as time-stretching, pitch change, sample reverse and fade in/out. All work as expected, with time-stretch being particularly good. Quite extreme stretches produce usable results, and you can specify a weighting towards better sound quality or more rhythmic integrity. Oddly, there doesn't seem to be a way of reducing a sample's rate by 'downsampling'.

Yet another flavour of jam is offered by the Program LFO (which is separate from the sample-specific LFOs). This MIDI-sync'able device can modulate a wide variety of destinations, at Program or sample level, and can create some extraordinary effects with its programmable waveform option. Routing the Program LFO to filter cutoff, for example, produces automated super-
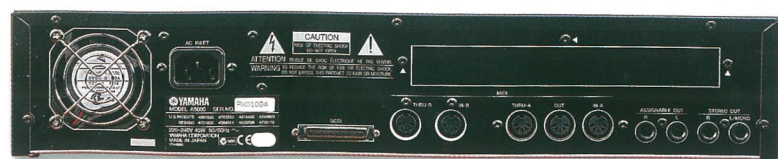
TB303 madness, while sending it to a sample's pitch results in instant pseudo-algorithmic delirium that's anything but well-tempered.

Most Effective

Another A5000 high point is effects. A generous total of six processors is provided, each of which can be assigned one of 96 effects covering pretty much every treatment you could reasonably ask for — plus various unreasonable ones! The processors are organised into two banks of three, but it's easy to create effect chains using all six.

Various flavours of delay, reverb, chorus and flange are augmented by distortion, overdrive and amp simulation, a turntable effect, digital scratch, and the eccentric jump and beat-change effects, which chop up or modify the input signal in real time. Radio simulation, rotary speaker effects, compressors, enhancers and noise gates are all offered, and a significant number of effects comprise dual or triple chains — compressor/distortion/delay, for example. Nine treatments, including some delays and flanges, can be sync'ed to MIDI clock. All effects are fully editable, with a maximum 20 parameters each, though a 'favourite' option lets you choose four preferred parameters to pop up on screen.

The effects would certainly be one of the creative samplist's reasons for buying this machine; as well as being diverse, they're generally of good quality. Distortion and overdrive effects are occasionally harsh, but modulation treatments are warm and pleasing. Reverbs are slightly grainy and would be too unsophisticated for some applications, but they have a character that's desirable for others. The delays, too, can tend to coarseness, but this only really becomes noticeable when you're using long delays and high feedback values. One bonus for the impoverished samplist is that external audio can be routed through the A5000's effects, so you could use the A5000 as an extra effects unit. ▶
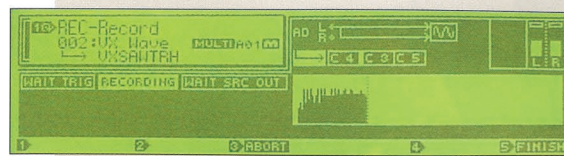
This is the Record page just after sampling has been initiated, with a sample waveform arriving in the display. The graphic at the top right shows the sample's routing (mono in, coming from the left input), original key, and key range. There's an input-level meter on the far right.
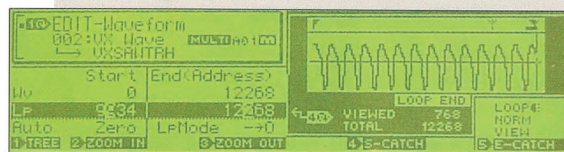
The Trim/Loop page. The waveform display has markers at top to show start and end points. The greyed marker is a loop start point. The loop end point can't be seen because it's at the same position as the sample end point. As you can see from the bottom right of the display, pressing knob 4 sets a start point on the fly (S-Catch), while pressing knob 5 sets an end point (E-Catch).
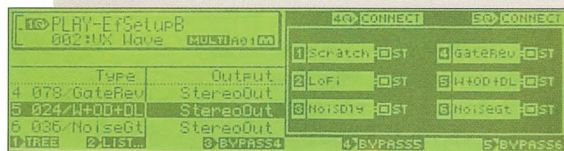
The Effect page. The area to the top left tells you where you are at any given time: in this instance, Play mode, effects setup B (effects 4-6). The diagram on the right shows how the effects are routed between themselves and the output. Over on the left is a text list of effects 4-6, which is where they can actually be selected and their outputs defined. Individual processors can be easily bypassed via knobs 3-5.

The large blanking panel on the A5000 can be used to host either the AIEB1 I/O expansion board or a forthcoming mLAN interface.
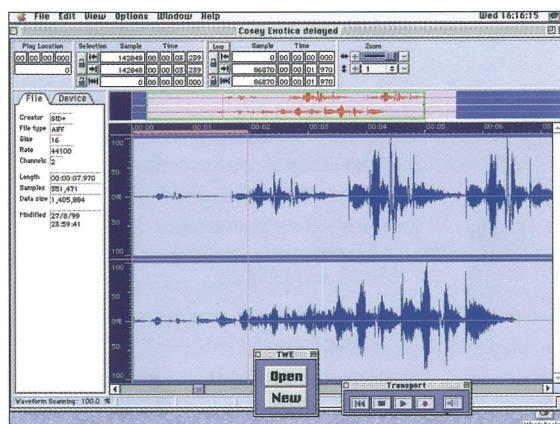
YAMAHA A5000

It's all good stuff so far. Actually accessing the effects, however, requires you to (as the slogan says) Think Different. There are no 'global' effects processors, nor send-return loops — the A5000 doesn't employ the 'mixing desk' effects metaphor used by most modern instruments. At sample level, the sample's audio output is routed to the desired effect, and a secondary output allows it to be routed to a second effect in parallel. It's possible to override this routing at Sample Bank level (to send all the samples in a bank to the same effect, say) and with the Program level Easy Edit facility`z.

You *could* emulate a send/return loop, by using main and secondary outputs creatively: for example, use one routing option to send a sample's audio to the main stereo output, and the other to send the same audio to one of the effects. Set the effect's wet/dry balance to completely wet, and route that to the main output. More than one sample, or Bank, can be routed to one effect so, with a little bit of juggling of effect and dry sample output level, the finished result should approximate genuine global effects.

One last effects-based niggle relates to editing effects in a multitimbral setup. The main Program window in Play mode lists Programs that have been assigned to parts in the multitimbral setup, and pressing the front-panel Effect button takes you to a window where you can edit their effects. However, for some reason you can only do so if the setup's so-called 'Master' part has been selected in the Program window. (The part designated Master shares its MIDI channel with the A5000's basic receive channel and is shown by a small 'M' next to its name.) If you try to edit effects with any other part selected, you can tweak parameters but a warning flashes up to say you're not editing from the Master Part and the changes will have no effect. Another niggle is that in neither of these windows — Program or Effect in Play mode — is there an indication of which effect is in force for which Program. You just get the list of the six effects to edit and have to remember which is assigned to each Program. If you don't remember — and you could be editing an old setup — you have to visit another page to refresh your memory. (A similar situation arises with samples and Sample Banks. There's no indication in the Effect window of what samples have been routed to which effects.)

Testing Times

The new display puts the A5000 miles ahead of the 3000 in terms of usability, but we still found the 5000 challenging initially. Not because the Yamaha method is bad or illogical — it's not — but mainly because Yamaha don't explain its fundamentals properly in the machine's documentation. If you've read the 'Going Deeper' section earlier, you will have more idea about where they're coming from than we did when we first got the A5000. A decent quick-start guide

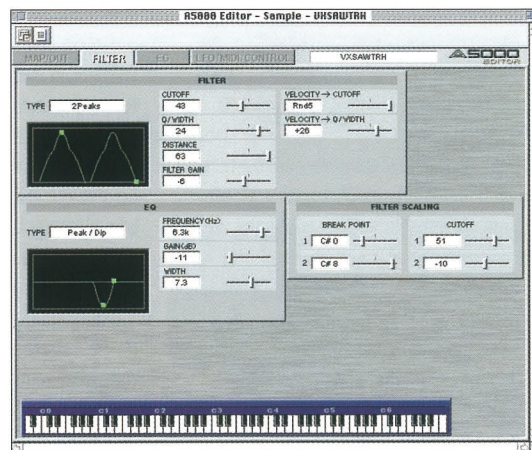would have speeded things up enormously. Apparently, one is on its way.

With or without such a guide, once you're familiar with how the A5000 works it's not only very powerful but also very fast. Sampling, trimming, looping and DSP operations are quick to perform, both with and without the use of the free software (see 'Freebies' box) and they take effect rapidly. Happily there's none of the display and control sluggishness which was identified in the *SOS* A3000 review.

Speaking of the display, as we've already said it's extremely useful, but Yamaha have sometimes tried to provide *too much* information, resulting in a busy feel. Conversely, sometimes we noticed a lack of graphic displays which would have helped us — a graphic approach to layering and splitting samples would have been a welcome use of the large screen, for example.

Verdict

There are some criticisms to level at the A5000's OS, one or two probably caused by the bolting on of a multitimbral mode that wasn't present in the A3000. Power samplists may also wish the A5000 had the 256Mb RAM capacity of the Akai S5000/6000. Still, the A5000 has to be a serious recommendation: there's just no arguing with its power and features at this price. We were also struck by the many thoughtful featurettes that make the whole business of sampling less of a technical chore and more of a creative activity.

Most importantly, the results achievable with the A5000 are breathtaking. Top sound quality combines with excellent synthesis facilities, meaty filters, wonderful effects and spontaneous, innovative sample-manipulation tricks, to produce a sound-designer's dream machine. Even if loading samples off CDs is the closest you come to sampling, there's no excuse for producing tired-sounding timbres with the A5000.

Tiny Wave Editor has just one screen, and this is it. Here an entire sample is shown in the top display, plus a zoomed portion in the large working area. All the sample's 'personal' details are listed on the virtual file card to the left. You can do any editing here that you'd be able to do in the A4000/5000, plus more.

The Filter page in *A5000 Editor*'s Sample window. Here it's possible to edit the chosen sample's filter and EQ parameters; other pages in the Sample window let you edit its keygroup and output routing, envelope generators, LFO and MIDI controller assignment. A similar editor for the A4000 is included on the free CD-ROM.