

The Lost Art Of Sampling: Part 7

By Steve Howell



We bring our series on rediscovering the art of sampling to a close with a look into the future.

We've covered a lot of ground during this series, from a basic explanation of sampling, to multisampling, sample editing and program creation, not to mention delving into certain areas of synthesis. In addition, I hope that I have shown that sampling your own sounds is not the onerous task that many believe it to be, and that you've felt inspired to regard your sampler as a tool for sound creation, not just the playback of stock library sounds with a few minimal tweaks.

Having covered much of the history of sampling in these articles, I thought it might be interesting to look to its future in this, the final part of the series. One area that I think will be an increasing problem over the coming years is sample-format compatibility — or rather the lack of it! This has been a problem since the early days of sampling, but I think the difficulties could well increase in future. It's worth looking generally at this issue, as it will affect almost every sampler user at some point.

The Joy Of Formats

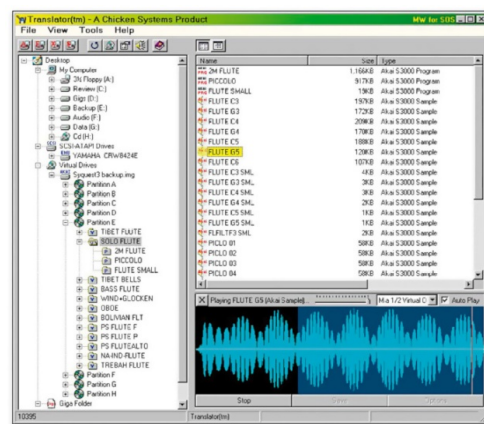
There was once a wag who commented that standards were a great thing, which was why we had so many of them — and although he wasn't talking about sampling, he might as well have been. Today, if you have a particular brand of hardware or software sampler and you want to use a library created for another sampler in it, you may well not be able to, or only be able to with some restrictions. Sometimes you'll be able to access the raw audio data in the samples, but you'll have to do all the programming to map them out and make them 'playable' yourself.

Even this awkward situation is, however, an improvement on how things were in the early days of sampling, when each sampler manufacturer had their own proprietary sample format. In those days, compatibility was not seen as a necessary requirement, and indeed, most companies refused to make their samples compatible with those of other manufacturers for fear of acknowledging the existence of their competitors in the marketplace.

But as time went on, Emu users began to wish that they could read Akai libraries, and *vice versa*. Roland users wanted to use both, and as Roland developed more and more quality libraries for their S700-series

samplers, so Akai and Emu users wanted to use those. Eventually, Emu were (I believe) the first to meet their customers' demands by allowing the import and loading of Akai S1000-format samples. Akai held out for a while, but from the mid-'90s and the arrival of their S2000- and S3000-series samplers onwards, you could import Emu and Roland sound libraries.

These days, most software samplers claim to read most sample formats, but as hinted a moment ago, this compatibility only extends up to a point. When you import samples in a 'foreign' format, you'll often only succeed in importing the basic samples and their keygroup mappings — other parameters, such as filter cutoff, envelope, or modulation settings, are often either ignored or incorrectly converted. Also, some software samplers don't support features such as velocity and positional crossfading, so attempting to import samples with these features may result in them sounding wrong. Loop points, too, are not always read or interpreted correctly, resulting in clicks or pops not present when the sounds are used on their original sampling platform. These problems are nothing that can't be fixed by editing the loop start or end point of the samples once you've imported them onto the platform of your choice, but this is a nuisance nonetheless.



Chicken Systems' Translator

Often, these problems occur because you're attempting to import samples made for a sampler with one set of functions onto a sampler with different functions. Korg's Triton, for example, can't handle positional crossfading of samples, so any attempt to import multisampled sounds with overlapping keygroups into the Triton won't come out correctly (the keygroups will simply be arranged next to one another with no overlaps). Likewise, if one sampler has a sound based around a resonant high-pass filter, how is that sound going to translate into a different sampler that only has a non-resonant low-pass filter? Different samplers also handle modulation in different ways, and these functions often have to be approximated or ignored when the sounds are imported onto another platform.

Although the built-in format-conversion functions on modern software samplers will at least get most samples in other formats into your sampler in *some* form that you can make usable, sometimes you have to reach for a third-party conversion utility, particularly if you're looking to import samples in formats specific to older hardware samplers, like those made by Emu or Ensoniq. **Chicken Systems' Translator** allows the conversion of the vast majority of sampler formats into others, and it's constantly being updated to incorporate ever more conversion permutations. If their 'full' version is overkill for you (or too expensive), there are 'lite' versions that can deal with specific source/destination combinations, and there's even a free version that might help dig you out of a conversion hole. Another similarly comprehensive third-party utility is **CDXtract**. Both of these allow you to 'mount' Akai and other proprietarily formatted floppies and/or CD-ROMs on your Mac/PC, something that Mac OS and Windows do not ordinarily allow (such media will normally be regarded as unreadable).

Protection & Copyright

If there are so many built-in and third-party tools available to handle sample-format conversion, why do I think the issue of format compatibility is going to get worse in future? In a nutshell, it's because of the threat of Internet piracy, which has resulted in many manufacturers deliberately imposing 'proprietary' limitations on their libraries. For example, sound libraries based around Native Instruments' *Kompakt Player* have the raw samples converted into what Native Instruments call a 'monolith': one huge file with all the samples embedded within it. This means, of course, that there is no way to edit the individual samples, but the

Kompakt Player doesn't offer that facility anyway, unlike NI's full-blown sampler, *Kontakt*. Similarly, Tascam's *Gigastudio* embeds the samples in its GIG patches, and the innovative Italian software house, Nusofting, develop their sound library in a proprietary format, arguing that if they released their samples in standard WAV or AIFF format, anyone could copy and use them in any modern sampler that supports those formats, thus potentially scuppering their own sales.

For developers like these, many of whom depend on the income from these libraries, there's nothing worse than having spent a lot of time and money to develop a decent-sounding commercial library (possibly employing talented freelance session musicians, engineers, studios and editors at significant cost), only to find that its contents are available to download for free on the Internet three days after its release. Consequently, my feeling is that we will see more of this kind of 'protectionism' as developers and manufacturers become more aware of the need to protect their intellectual copyright against piracy, and fight to protect their (often quite substantial) investment in their sound libraries.

The End Of Multisampling?

Back in *the second part of this series*, I explained in some detail why multisampling was necessary — it's simply not possible to take one sample of a real instrument, stretch it over the whole span of a MIDI keyboard, and expect it to remain realistic at all extremes. One of the reasons, you may recall, was to do with the shifting of 'formants' — fixed frequencies in the sound of certain instruments. This formant shifting, which sounds most unnatural, occurs when a sample is pitched up and down, but not when a real instrument plays notes up and down a scale.

However, so-called formant-corrected pitch-shifting has been around for a decade now, and in 2000 Roland released their first Variphrase product, the VP9000. Initially, it seemed as though this might herald the end of a need for multisampling. The VP9000 claimed to be capable of keeping formants and sample length constant in sounds, irrespective of the pitch at which you wanted to play them. Alternatively, it could (Roland claimed) play back samples at any length, or separately shift formants to any degree (enabling you, for example, to change the 'gender' of vocals from male to female), whilst keeping the pitch of a sample the same.



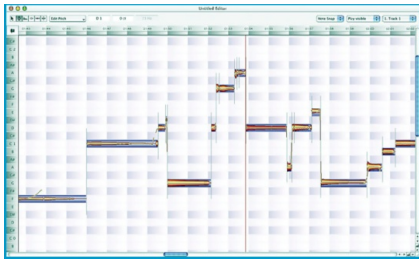
Roland's original Variphrase product,
the rackmount VP9000

Of course, such real-time processing came at a price, and it wasn't just financial (the VP9000 wasn't cheap at £2300 in the UK on release), but also in terms of its facilities. Offering only six-voice polyphony, and with some curious limitations on memory usage (the maximum single sample size you could record was 8MB, even though 136MB of RAM could be installed), the VP9000 was not the success Roland probably intended.

But Roland persevered with Variphrase technology, and the most recent manifestations have been in the form of the *V-Synth* and *V-Synth XT*, powerful sampler/synth hybrids that offer many exciting creative possibilities for the adventurous programmer.

One thing that has become clear with the release of all this Variphrase kit, however, is that you still can't take just one sample of a Steinway and have a perfect rendition of it across the keyboard range. The current real-time Variphrase processes have some audible artifacts of their own, although you can do more to stretch and mangle samples with Variphrase than you could with early '90s time-stretching.

The release of the VP9000 was, of course, followed by similar technology from Celemony (*Melodyne*, shown in the image), which also allows you to adjust the pitch, formant and length of samples independently of one another (although again, not without audible artifacts becoming apparent at extremes). Some software samplers (such as IK Multimedia's *Sampletank*) are also beginning to incorporate similar features.



Celemony's *Melodyne* offers similar facilities as Roland's *Variphase* in a piece of software.

Even if these products are not (yet) a true substitute for multisampling, they can be very creative tools for sound mangling and manipulation nonetheless, and Roland's V-Synth, with its real-time controls, is a lot of fun. But if we're not quite at the point where the technology allows us to dispense with multisampling yet, the likes of *Variphase* may be pointing the way.

The Future Of Sampling

Other than copy protection on sample libraries becoming more complex, what else lies in the future for sampling? This is, of course hard to predict, especially when the field has seen so much change over the past few years. When the original samplers were released, I don't suppose anyone imagined the kind of software sampling products we have today... or even 10 years ago. One thing is certain — the originators of sampling technology never predicted the uses it would be put to, the technology being originally intended simply for playing realistic representations of acoustic instruments. Who'd have thought that a few years later, musicians would be sampling entire rhythmic and musical phrases to construct songs with? Loop-based sampling and song construction has really taken off in the last decade and a half, and has grown still faster since affordable software tools became available to do the job. In the last few years, accessible software packages that integrate loop libraries and tempo-matching capabilities, like Sony's *Acid* and latterly Apple's *Garage Band*, have proved hugely successful, and it's not hard to see why, as applications like this have made it simple for people with little or no musical training or experience to construct decent-sounding tracks quickly and easily.

Whilst it's not really appropriate to discuss these applications in great detail in this series because they do not 'sample' in the traditional sense of the word, and most of the techniques we've discussed do not apply (there's no multisampling, keygroup mapping, looping or velocity switching to be done), I suspect that there will be a lot more products like these incorporating samples and sampling technology in the future. And if *Garage Band* (or one of its successors) encourages people into the world of music technology, then that's got to be a good thing.

Like loop-based music-making, the full-blown software sampler isn't going to go away either — if anything, these will become more and more powerful, with bigger libraries that are able to take advantage of ever-increasing computer power. Whether we'll ever see a resurgence in the popularity of the 'traditional' hardware sampler is harder to say. There are still people like me, who (as I've made fairly obvious throughout this series) prefer hardware samplers and haven't yet been persuaded otherwise. However, I've also talked to software-sampler owners who have bought a hardware sampler for live use, and have subsequently been so impressed that they've stuck with it for studio work. There are also software sampler users who are growing tired of the business of keeping their sampler running smoothly with respect to changes in their host computer's OS or DAW/sequencing software — an on-going task which, frankly, can be a right pain. I'm not suggesting there might be the same kind of resurgence in hardware samplers that there was from the late '80s onwards with analogue synths, but already some samplists are seeking out eight- and 12-bit samplers for their 'lo-fi' sound...

Even if rackmount hardware samplers never return to their former prominence, sampling will continue to be available in hardware products such as Akai's ever-popular MPC-series and also in 'hybrid' sample-based synths and workstations that feature a vast array of onboard ROM samples together with an integrated sampling section. Roland, Korg and Yamaha all have workstation products of this type on the market, although in some of these, the sampling functions feel like something of an afterthought. Korg's new OASYS is perhaps more of a pointer to where sampling in a hardware product will go next, as is the new Alesis Fusion. Both of these neatly integrate sample and synthesis, virtual analogue and other types of synthesis with hard disk recording and traditional sampling features. The software brigade like to point out that all of this can be done on a laptop, and so it can, but the fact remains that many people do like the idea of truly integrated and reliable technologies from one manufacturer in one box — it avoids the conflicts that can arise from mixing and matching different technologies from different manufacturers.



Recent all-in-one workstation products like the Alesis Fusion and Korg's OASYS may be the future of sampling in hardware — where sampling is just one set of features amongst the many recording and audio-manipulation facilities on offer.

There's also no doubt that more can still be done to make sampling easier, and technological developments yet to come may well, for example, do away with the need for multisampling as processing power increases (see the box on the previous page). The ideal to shoot for here would be something that many of us, including *SOS*'s august Editor In Chief, have been requesting for years — an 'intelligent' sampler that will allow you to provide just the lowest and highest (or the softest and loudest) notes of an instrument, and leave the notes and articulations in between to be realistically extrapolated for you by the sampler. Given the rate at which software is developing, this might be closer than you think.

In the more immediate short term, I think we might see tighter integration of hardware sampling with software. DSP accelerators that help overstressed computers to run processor-heavy plug-ins, such as TC's Powercore or Waves' APA32, are now common — why shouldn't we offload sampling duties to a similarly dedicated piece of hardware? To those who claim in response that computers are always getting faster, I would point out that so far, sample libraries and virtual instruments have matched this progress, becoming ever larger and/or more processor-intensive to use at the same time (24-bit, 96kHz samples, anyone?). By integrating dedicated, optimised hardware tightly with editing software, computers and DAWs, we might find ourselves in a position when our computers can cope properly with the demands we place on them. Akai did this quite successfully with their *Aksys* editor and their S5/6000 and later Z-series, and it's a fine combination (though underdeveloped). Imagine a powerful, self-contained hardware workstation with a tactile control surface that fully integrates various synthesis techniques, sampling and hard disk recording, which can be taken out to gigs but which can also be seamlessly integrated with your Mac or PC via plug-in-compatible front-end control software similar to that used in Access's Virus TI... Well, I'd buy one, anyway!

Whether any of these predictions will come true or not, only time will tell. However, sampling has already had as much, if not more impact on music-making than the invention of the electric guitar, and it's here to stay, in whatever form it takes next.

Final Thoughts

With Part 7 this series about The Lost Art Of Sampling comes to a close, I hope I have dispelled some of the myths surrounding sampling — it really isn't (or needn't be) that complicated. It's not necessarily easy either, but then neither is learning to play an instrument to any degree of proficiency. Certainly judging from feedback I've received to this series, many of you have taken the plunge and started sampling in earnest with encouraging results. I hope that you're one of those who now regard your sampler in a different light!