SAMPLING Made Simple

Samplers make it possible to update and add to your sounds without having to buy a new drum brain, drum machine, or drumset. Flexibility – sampling is thy name. *Text by Chan G. Ling.*

"STEP RIGHT UP, folks. Get your brand new drum machine right here for less than two dollars!" No, I'm not talking about some guy in a parking lot offering a 'less than cold' selection of drum machines from the trunk of his car. You can get a new drum machine any time you want by sampling a different set of drum and/or percussion sounds and saving them to disk. (The disk is the two dollar part – I'm assuming you already own a drum machine and a sampler.)

What's In a Machine?

A DRUM MACHINE is really a sample playback device, with a simple built-in sequencer that you can program to trigger the onboard sampled sounds. (*Note that*

though drum machines do have sequencers, they are too limited in scope to be used to program all the music tracks for a song– with some exceptions, like Akai's MPC60 and the now defunct Linn 9000 and Sequential Studio 440, which have dedicated multitrack sequencers. However, you can use any multi-track sequencer –hardware or software types – to sequence drum tracks. – Ed.)

If you already own a drum machine, you really don't need another drum sequencer; you need more drum sounds. Or maybe you don't own a drum machine but you do own one of the keyboard synths, drum brains, samplers, or even pad to MIDI converters that has a built-in sequencer. There, again, you don't need another sequencer, you just need more sounds. And don't forget about computers. If you own any brand of personal computer, you

can get some very sophisticated software sequencers for under a hundred bucks. All you really need are the sounds.

Mix and Map

NOW THAT YOU'VE sampled the sounds, what are you going to do with them? How about replacing the sounds on your own drum machine with the new ones? Great idea. Once the new sounds are in your sampler, it's a simple matter to 'map' them – that is, assign certain drum sounds to particular notes. Since you're going to be playing these sounds with MIDI messages, it's very important to match the sounds you want to hear to the proper MIDI note numbers. Usually, this can be accomplished in a pretty intuitive way – trial and error! First, make the proper

MIDI connections (ie, drum machine's MIDI Out to the sampler's MIDI In). Then, while striking the pads on the drum machine, play with the maps on the sampler until you hear the correct sample sounds. Simple, huh? Of course, if you'd rather think of all this as note numbers (*there's always* one *in every bunch! – Ed*), then if your drum machine sends note number 36 for the bass drum voice, place the new bass drum sample under that same note number on the sampler.

Continue to map the newly sampled sounds to MIDI note numbers, until you can control all the sounds with your drum machine. When complete, you're going to hear the sounds from both devices at the same time (one set of sounds from the sampler and one from the drum machine).

Since you may not want doubled drums all the time, here are a few options. If you only want to hear the drum sounds that are fired by the sampler, turn the master volume of the drum machine down. But wait, there's even more flexibility at your disposal. Remember your drum machine's function that controls the audio output (mix) of each individual voice? By adjusting the individual volumes of the voices in the drum machine, you have the option of hearing only the sampled sounds, the sampler and the drum machine at the same time, or only the drum machine (by not assigning any sound to a note number on the sampler).

If you like the idea of mixing sounds from both machines, keep in mind that mapped sounds don't have to be identical. You can map the drum machine's hi-hat button so that it fires a shaker from the sampler, or even make the drum machine's crash cymbal fire a rim shot. The combinations of sounds are wide open. Mixing a kick sound with a snare makes the snare sound deeper, a rim shot makes the snare harder, and low toms mixed with a kick make it boomy. Experiment.

Using a sampler as the sound source for your drum machine may increase the flexibility of the unit. In fact, your sampled version may actually be better than the factory original.

The drum machine that I'm using has eight individual audio outputs and a mono mixed output. There are no stereo outs. Since I can't afford to dedicate eight channels on my audio mixer just for the drum machine, I'm forced to use the mono output. When in mono, there is no way that I can send the hi-hats to the left channel and the crash cymbal to the right side. (Boo, hiss.) But when I fire sounds from the sampler with my drum machine, I can use the sampler's stereo outputs. It's an easy task to tell the sampler to send each individual sample to any position in the stereo field. I've even sampled my own drum machine so that I can take advantage of this very feature. My drum machine

doesn't have dynamic voice allocation, but my sampler does. Think about it – cymbal crashes don't have to cut each other off. In addition, all of the sampler's other features (LFO, detuning, chorus, looping, filters, etc.) can be applied to my old drum machine sounds. Neato!

Bring In The Sounds

WHERE ELSE CAN you get new drum sounds? Everywhere. Stop and think about all the sounds that you hear everyday. Some are what I like to call 'natural' drum sounds. Tin cans, table tops, structural walls, the bottom of a plastic cup, or even two frisbies struck together fall under this classification. Others are 'latent' drum sounds. You know, sounds that really want to be drums, but right now they're going through an identity crisis and think they're something else.

For example, try using only the first few milliseconds of the sound from a jet engine as a really *dyn-o-mite* bass drum (or a few seconds as a crash cymbal). Sample a can of spray paint, drop it down about an octave, reverse it, and truncate its length to about a half second. The result? A very mean gated snare!

I'll have to agree with you that it may not be easy to drag your sampler to the nearest military installation to get a good jet sample. But there is an easier way. Several manufactures are currently producing compact disks that are full of sounds that can be sampled. These sampling CD's contain everything from orchestral instruments and electronic synthesizers to sound effects (including a wide variety of jets and cans of spray paint). With your sampler and a CD player, you can sample jet planes, spray cans, whale songs, or a thunderstorm in the comfort of your own home.

If your musical tastes run in more traditional circles, sample your own percussion instrument inventory. Once sampled, a single snare drum can be pitch shifted to create four to ten different instruments. You may want to sample the same snare when it is tuned differently. Sample it with the heads cranked way up or down pretty loose, then add a little muffling or a tone ring to the batter head. Just think of all the different sounds that a single instrument can produce. In addition to your own inventory of instruments, ask your friends to lend you theirs. Ask a high school or college teacher if you can sample the school's instrument inventory. If you've got a friend who works at a music store, you're in even better shape.

You may even find friends with samplers who will trade sounds with you. With the advent of the MIDI Sample Dump Standard, you can grab sounds from any sampler, even if it is made by a different manufacturer. A word of caution about this: if you try to pass digital data from two

different machines (Ensoniq to E-mu, for example), you'll need a computer and a sample editing program to act as the interpreter. If you can't get your hands on a computer, just take the audio output from one sampler to the sample input of the other sampler. While this technique might add a little noise to the sample, it's better than nothing.

Samplers Live

SO FAR I'VE been talking about using samplers as a replacement sound source for a drum machine or some other sequencer. Let's take a creative look into how samplers can be integrated into a live performance situation.

It really doesn't matter if you're playing an electronic set or acoustic drums, you'll still be firing the sounds from your sampler with MIDI messages. Generally, samplers don't have any facility for reading voltage spikes from pads or trigger sensors. This means that you will need a trigger-to-MIDI interface between what you strike and the sampler. (There is an exception to every rule: Akai makes an add-on board for their S900 sampler which enables it to accept trigger inputs directly.)

Suppose you're using an acoustic set with piezo-type transducers as triggers (see *'The Trials and Tribulations of Triggering'* elsewhere in this issue for more info on triggering from acoustic drums. – Ed). The signals from the piezos are fed into a trigger-to-MIDI converter and the converter's MIDI Out port is connected to the sampler's MIDI In port. Now that everything is set up properly, it's time for the fun.

Even the least expensive, bare-bones converter will let you program which MIDI channel the message will travel over, and the MIDI note number that will be sent when the trigger is activated. If you want your bass drum (or pad) to fire the sound of a thunderclap, simply assign the sampled thunder sound to the same MIDI note number the converter has been programmed to send. In other words, if your bass drum is programmed to send note number 40, then assign the thunder sample to note 40.

Even though your converter may be basic, your sampler doesn't have to be. Let's assume that your sampler has the ability to perform a velocity switch – that is, a lower velocity (dynamic) will trigger one sound while a higher velocity will trigger a different sound. A velocity switch could be programmed so that MIDI note number 40, for example, would fire a closed hi-hat at a velocity of 64 or below, and another sound (perhaps an open hi-hat) at any velocity above 64. With your sampler programmed for a velocity switch, your bass drum stroke can fire two different sounds. Some samplers allow you to place as many as eight different sounds ▶

► under a single MIDI note number, each selectable by different amounts of velocity! You can also perform this trick with any drum machine that has velocity sensitive instrument buttons or accent buttons.

Besides volume, there are other parameters that can be controlled by the MIDI velocity. Think about the control that is available when a note's velocity determines its stereo placement. If you program the sampler so that velocity controls the attack envelope of the sound, a softer stroke could cause that sound to swell instead of having a sharp percussive attack. When applied to cymbal samples, this can create a more realistic effect than is possible on any drum machine. When velocity is used to control pitch, harder strikes can cause the pitch to rise or fall. This is a perfect way to have one pad or piezo-equipped drum sound as if it were five or six different toms.

Playing Technique

IF ALL THIS sound control seems wonderful – it is. But it takes incredible technique to control all these different parameters with velocity. Selecting which sample will fire, its stereo placement, pitch, attack envelope, and maybe even the filter cut-off frequency from velocity alone, is not that easy to do. But then again, a clean nine-stroke roll was also difficult . . . until you practiced. Total control of your electronic percussion system is going to take some practice – maybe even a lot of practice. But that doesn't mean it's not possible.

Keep in mind that when you are firing sounds from electronic percussion instruments, you're playing a new instrument. Some techniques that you learned while playing acoustic percussion do transfer to electronics, but additional techniques are still needed. Emerging electronic percussion instruments require new knowledge, skills, equipment, and an open mind. Okay, time to get off the philosophical soapbox and get on with the subject.

Many samplers have a multi-timbral mode that allows them to listen to several MIDI channels at once. Although this was designed with melodic instruments in mind (MIDI channel one might be a sampled piano while channel two plays a sampled electric bass), there's no reason why different MIDI channels can't be directed toward different 'maps' of percussion sounds. This can be another way to control your sound selections in a live performance. Let's say that one map is all Cuban, African, and Brazilian percussion sounds, and another map consists of traditional drumset sounds. Program the sampler so that messages on MIDI channel one play the ethnic sounds and those on channel two play the drumset voices.

When you call up a new program (or patch) on your converter, it can send new note numbers on new MIDI channels. The result – a new set of sounds under your hands.

Creative Sampling

HERE ARE A couple of games to play with your sampler, presented here as a type of creative springboard. If you've tried some of these little tricks before, see if you can expand upon them. If you haven't, then by all means, get going and see if they spark any new ideas.

Most often, people who do sampling tend to get into a rut of sampling single notes from single instruments. Why not sample an entire lick, pattern, or phrase? If your sampler has enough memory you can even sample an entire verse of a song (although you might not have much memory left over for anything else). How about sampling four one-bar fills off your acoustic drumset and assigning the sampled fills to four notes on your sampler, then programming your converter to send one of those four MIDI note numbers when you hit one of your tom pads or trigger the piezos from your acoustic drums? Now play a beat pattern and simply hit one of the drums when you want the fill to begin. If you need to have the fills play at a faster or slower tempo than the one you sampled, simply pitch shift the sample up or down (don't forget that the pitch of the sampled instruments will move up or down along with the tempo).

As a variation, you may want to turn the sampler's dynamic voice allocation feature off. Let me explain how this might be an advantage in some instances. Suppose that you've just sampled an entire measure of sixteenth notes. Whenever the sampler is instructed to play back that sample, you'll hear the whole thing just as you played it. But when dynamic allocation is turned off, sending a second note-on message will force the sample to begin again, even if the first statement of the sample isn't yet finished. Using this technique, you can play a series of quarter notes if you want to hear the first four sixteenths of your sample over and over. By playing more complicated rhythms on your pad or transducers, you can create some pretty interesting patterns.

Here are a few more ideas. Sample two strokes – one loud and one softer. You've just created your own custom-made echo unit. Sample two notes (spaced very close together in time) and create your own slap-back effects. Some samplers let you program a delay time from the instant the note-on message is received until the sampled sound begins playing. By adjusting the time, you can further refine your delays and slap-backs.

Try sampling composite sounds. Get a few friends together and sample several

different colors at the same time. How about a conga slap, guiro scrape, shaker, and cowbell as a single sample?

And one of my favorite ideas . . . The sampler that I'm working with contains an onboard arpeggiator. Arpeggiators were originally designed for keyboard players. The idea is that you can hold down a single key (a 'D' for example) and the arpeggiator would instruct the sound generating device to arpeggiate a major triad (D-F#-A), minor triad (D-F-A), or any combination of different melodic or chordal intervals. You can stick a bunch of really hip drum sounds under those particular MIDI note numbers and then program the arpeggiator for different types of structures.

One might be four toms and a bass drum (a five note figure), another could be open and closed hi-hats along with a snare stroke (a three note figure). Now whenever you send the sampler an instruction to fire a certain MIDI note number, you'll hear the instrument patterns that you've programmed into the arpeggiator. Pretty cool, huh? Are some additional ideas popping into your head?

To make things a little more comfortable, try syncing the sampler's arpeggiator to a drum machine's internal clock and then program a little drum machine pattern. When you play, follow the drum machine's tempo and the arpeggiator will do the same. Believe me, it's amazing what you can come up with when using something like this!

The Bottom Line – Again

SO NOW YOU'RE convinced. You're going to go out tomorrow and buy a sampler. Which brand and model should you buy? I'm sorry, but I can't make your life that easy. The number one factor you should consider is your bank balance. These instruments are not cheap.

Perhaps, the best advice I can give is: set yourself a budget, visit the stores, listen to the instruments, and then ask the salesperson to let you see the owner's manual. Take your time and read through several sections of the manual. If you read last month's article, you should have a good idea of what features you want your machine to support.

Take a look at the MIDI implementation chart and notice which messages the machine can receive and transmit. Receiving MIDI messages is the name of the game if you're planning to use the sampler as a sound source. The 'Mr. Spock' approach would be to take notes while you're at the store (how each instrument sounds and various features) so that you can go back home and compare the pros and cons of each sampler. Whichever sampler you choose, you'll be adding a new, creative reservoir of sounds to your current setup. ®