

"Granular" Textures on EPSs/ASRs

Dennis Burke

As with many other composer/sound designers one of my ongoing interests has been in exploring new, unique timbres. This voyage has taken me through the full spectrum of synthesis techniques — subtractive, additive, FM, AM, and sampling. Through this exploration it has been my experience that the most effective and evocative sounds I have created rely on some sort of acoustic model for their realization. Without some connection to the acoustic world listeners tend to be less engaged, experiencing new sounds as simply "strange" or as a novelty.

It was with this thought in mind that I was drawn to and intrigued by the sounds of granular synthesis. The concept of granular synthesis was first suggested by Yannis Xenakis in 1971, although I first heard these sounds through the work of Barry Truax (Director of the Sonic Research Studio and Professor of acoustic communication and electro-acoustic composition at Simon Fraser University in Vancouver B.C.), most notably *Riverrun* (1986), *The Wings of Nike* (1987), and *Pacifica* (1990). (See note *.)

Briefly Barry describes this method: "...small units or grains of sound are produced, usually with very high densities (100 — 2000 grains per second) with each grain having a separately defined duration and position within the original sound sample." These small grains of sound he then combines and layers (in real time) to produce gestures and timbres with remarkable results. Because of the density and complexity of the information involved, a high-end computer is needed to produce these sounds.

I was so interested in these new timbres that I set out to see if I could replicate some of these ideas on my EPS. As it turned out I was pleasantly surprised how close I came to the granular sound and how flexible this method was when performed on the EPS.

The first step is to sample a sound "event," something longer than 4 seconds works best. This event should have changing activity within it, a phrase of dialogue, a series of acoustic sounds, or a musical gesture. As a way to "granularize" this sample the next step is to create a short loop within this sample. The length of this loop depends on your overall sample length and the nature of your material. For this example, it was around 8k bits or about 5% of the sample. I found that a bi-directional loop worked best in this instance.

If you play the sound now you simply get a short bit of the sample looping, not very interesting. Somehow we still want to access the entire sample. This is where we take advantage of the EPS's ability to modulate the loop position. First, go to WAVE MOD page — set it to LOOP and set the source to ENVELOPE 1 (other sources can also work but for now we will use a custom envelope that we will set up later). Now go to the next page,

MOD AMT — set to +99 and set the range to 512k.

What we have done at this point is we've created a situation where this short loop is moving through the sample at a rate determined by our envelope. For this to occur relatively slow set your Envelope 1 parameters to:

Hard Levels	0	24	0	66	62
Times	99	99	99	99	99
Mode	CYCLE				

The final touch to this "granular patch" is to set the pitch table (Edit Layer Page) to NO PITCH and adjust the root key so that it plays the root note on every key. Now with your foot on the hold pedal slowly run your finger up or down the keyboard. What you should hear is a thick, rich wash of sound made up of "grains" of your sample, slowly moving through the entire sample length. The sound "event" is slowed down with no change in pitch, while each loop (or grain) focuses closely on the sound as we pass through the overall event.

This is the general principle of emulating granular textures, and with a little bit of experimenting I found many variations that work. Controllable time expansion/contraction can be achieved by using the Mod Wheel or CV Pedal as a source for loop modulation. The MOD RANGE parameter determines how far into the sample you can move and the Wheel or CV Pedal movement determines the speed and direction. (Also try an LFO as a modulator, POS SINE works best.)

This is sometimes a very touchy procedure, the loop length, MOD AMT, and MOD SOURCE all have to be adjusted in relation to each other, a small tweaking in one may require a large change in another. After a while you start to get a feel for what works best for each situation. It takes some time and patience but it is worth it. Try it out and good luck. ■

*Note: These are available on 2 CDs from Cambridge Street Records: *Digital Soundscapes* (contains *Riverrun*) and *Pacifica Rim* (contains *The Wings of Nike* and *Pacifica*). They can each be purchased directly from Barry for \$24 Can. (\$20 US).
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Bio: Dennis Burke is a composer and sound designer with over 20 film scores to his credit. He is also an instructor in the Film/Video department at Emily Carr College of Art and Design in Vancouver, B.C. as well as an active jazz drummer.