

TRANSONIQ HACKER

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LFO's: Useable, or What?

by Clark Salisbury and Erick Hailstone

The following is a somewhat modified (to run on both the ESQ'1 and the SQ-80) excerpt from the book "Programming the Ensoniq SQ-80", due out from Alexander Publishing, (14536 Roscoe Blvd, Suites 105/110, Panorama City, CA 91402) this spring.

LFO's. Every synthesizer has 'em. So what are they good for? And what does LFO stand for? And how do I use them? And where does electricity go once it leaves the toaster?

Well, first things first. LFO stands for Low Frequency Oscillator, and yes, it is an oscillator not unlike the audio oscillators found in the ESQ/SQ80, but there are a couple of significant differences. First, the LFO's have a much more limited selection of waveforms available, specifically, a triangle wave (a close relative of the sine wave), a square wave, a sawtooth (or ramp) wave, and a noise wave. Second, an LFO oscillates (cycles) at a much lower frequency than the audio oscillators. Its frequency range is below the normal audio range; in other words, LFO's will complete one cycle in a long enough period of time that we wouldn't be able to hear their output as a pitched sound. This isn't a problem, though, as LFO's are used as controllers, just as envelopes are used as controllers. But where envelopes are one-shot controllers, LFO's are cyclic controllers, swinging from positive to negative and back again, repetitively.

LFO's have four primary uses: to control pitch (creating vibrato and trill effects), to control amplitude (creating tremolo and cross-fade effects), to control timbre (for repetitive wah-wah, or "growl" effects, as well as quasi-phase shifting effects) and to produce automated stereo panning effects.

Let's set up one of the most common uses of an LFO, a vibrato effect. To follow along with this example, you'll first need to enter the "VIOLIN" patch included in this article into your ESQ/SQ80's memory. For the waves, we're using the "STRING" wave and the "BOWING" wave for the SQ-80; for the ESQ'1, use the "SAW" wave for all three oscillators - all techniques described in this article will still apply. Next, since we just want to work with OSC 1, let's turn the other two off by selecting DCA 2 and DCA 3, and setting "OUTPUT=" to "OFF" for each of them.

Now we should be hearing the output of OSC 1 all by itself. Select OSC 1, and set MOD 1 to LFO 1, and MOD amount to "+32". This will connect LFO 1 to OSC 1. Now all we need to do is make it do something - hopefully something interesting. So head over to the LFO 1 page. In the upper-left hand corner you will find "FREQ". This controls LFO rate - set it to "18". Next to "FREQ" is the "RESET" switch. When this is set to "ON" the LFO will return to the beginning of its cycle whenever a new key is played; when it's "OFF", the LFO continues through its cycle from whatever point it is currently at regardless of whether or not any keys have been played - for now, leave this set to "ON". Next is the "HUMAN" function. When off, the LFO will cycle with mechanical precision. When set to "ON", slight variations are introduced to the LFO's speed, giving it a less mechanical, more "human" sound. Leave this set to "OFF" for now. And in the upper-right hand corner is the "WAV=" function. This allows you to select which of the four waves you want the LFO to produce. For now, let's use the "TRI" (triangle) wave.

Along the bottom of the display are four more parameters. Reading from left to right, the first is "L1", the next is "DELAY", and then "L2". What we have here, in actuality, is a basic envelope. If you substitute the label "T1" for the label "DELAY", you'll see that

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