ReFleX LiveLoop

AUDIO & PATCH IDEAS!

A Foreword on Audio Levels….

As the Reflex LiveLoop audio I/O circuitry is designed to work with modular levels, you may need a pre-amp to bring a home stereo / mobile device line level outputs up to modular 10Vp-p levels. This will greatly reduce S/N ratio and take full advantage of the Reflex ADC range. Some headphone outputs can drive close to this level, but is no replacement for a good preamp.

Similarly, if the Reflex output is fed into a standard line level stereo component (i.e. consumer amp, computer sound system, i-pod dock) the level will need to be brought down with a passive attenuator patch/box for 10Vp-p to 1.2Vp-p. A direct connection from the Reflex to a consumer product will not only sound noisy and distorted (mismatched levels and impedances) but it could damage the consumer component permanently!

More on Levels:

As the Reflex LiveLoop uses true audio/digital/audio circuitry, there is no DSP or other modifications to the signal path other than a low pass filter to reduce digital artifacts present in any ADA system. There will always be a 1/65536 "dither" on the AC outputs with no input signal. At modular levels, this equates to about .152 mV, which over a scale of 10 volts is a very tiny amount of "noise" on the line. At component levels this figure would be almost 10 times higher, and if fed into a microphone input or guitar amp, would be over 100 times louder! This is why an attenuator is so important.

Most modular systems already have an attenuator in place somewhere in the system, or use a Mixer capable of attenuation from modular levels.

The Reflex can attenuate via the Blend control, but as it's a cross-fader, the AC input signal at that point of adjustment would be fully on, so isn't really suitable for this application.

EQ Levels:

It is important to note that the Reflex EQ section is capable of +/-15dB of boost/cut on the output and feedback paths. This can add some effects when echoing or layering sound, but as the EQ steps in 1dB increments, it can quickly get away on you if the feedback is too high.

A good method of bringing up a band during an echo/delay is to reduce the feedback, bring up the EQ band some, then increase the feedback to desired level. That being said, the EQ will more be used to reduce the level of each band for useful purposes i.e. Bass tends to "pile up" in a delay (if present in the input) so reducing the Low band by 1 or 2 dB will greatly reduce this undesirable effect.

The pile up effect can be used positively, as with a Karplus Strong resonance during very fast delays demonstrates. If there is a signal of 1Vp-p, and after 1 delay cycle it doubles to 2Vp-p, the next would be 4Vp-p and so on. Even in a slow delay, the AC levels, along with DAC noise floor, and power supply noise, can increase very rapidly!

Being aware of all of the above will make your sampling experience much more pleasurable, and let you instead focus your efforts towards making some great sound!

…now for the fun stuff!

By now you probably already know your way around the Reflex, but haven't got into the "crazier" aspects of what it can do. These patch ideas will perhaps help with understanding the full potential of controlling a sampler with CV and triggers.
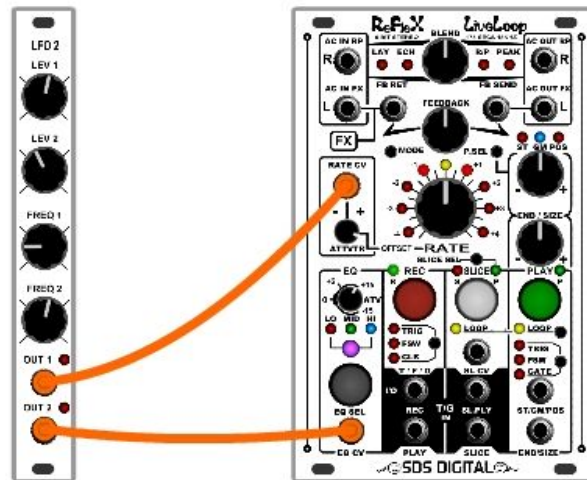
This patch manual will "grow" from time to time, so be sure to check http://www.freshnelly.com/reflex.htm from time to time for an updated version. There is also some ideas/experiences in the "Methods" portion of the site (in Support tab)

Enjoy!

## Patch Ideas

Patch #1: Rate & EQ

Because both the Rate CV input and the EQ CV input are bipolar, they can both be connected to a +/-5V LFO. The same LFO output can be used for the two, or an inverted output, or second LFO output. Using the two CV inputs together can make a warble in the sample, but with band highlights. This works best when the EQ is on MID or HI or ALL.

In simple terms, imagine the LFO running at .5Hz, the Rate CV attenuvertor is set to the positive side, as is the EQ attenuvertor. As the sample plays at a higher rate, the MID band becomes more responsive to those frequencies. Now this all depends on where the Rate knob is set to be an offset, which will change the "root" sample rate.

The EQ CV can be toggled to unipolar which means 0 volts = -15dB, and 5 volts=+15dB. If a bipolar input is present, then it will invert when negative, i.e. -5 volts would give +15dB.

The Rate CV will affect any sample playing in RP (sample) or PlayFX or Slice, so this can be used across the board. Be careful if echoing though, the levels on the second pass will add to the first and pile up very quickly!

Patch # 2: Slicing Rates
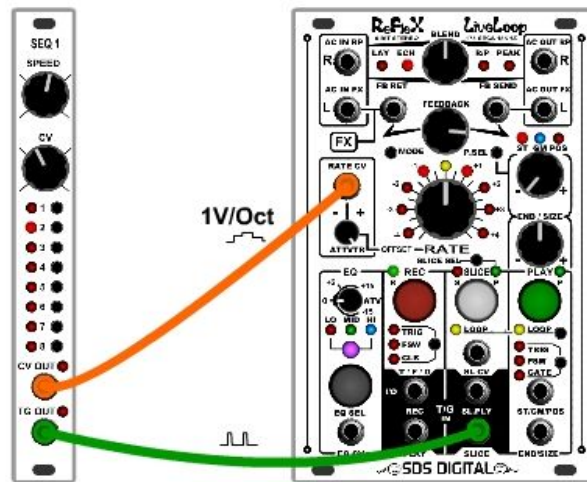
   You've probably already created Slices manually or by Peak slicing, but did you know the Rate can be changed during Slicing and retained in the Slice?
This simple patch uses the Slice trigger input to create Slices with the Rate being controlled by a sequencer. As each slice is created, it will sound the way the sample does at the time of slicing.
   For clarity, there is no re-triggering of the sample (PlayFX), so for a test, sample in a single note or tone using echo, then switch to infinite echo (3rd tap on REC button).
Slices will be created by a pulse on the SLICE trigger input

Plug in a sequencer (or it could be an LFO etc) to the Rate input and run it to set the range and "notes" (Turn attenuvertor to + max for 1V/oct)

Clear all Slices by holding the white button until the LED circle flashes, and you're ready to go.

Plug in the sequencer's Gate or trigger or clock output into SLICE input, and start sequencer.

It'd probably be good to start to have the sequencer running fairly slowly as the first 16 slices will pass quickly! Beyond 16 Slices can of course be accessed via the Slice CV input.

Once some Slices have been made from the sample playing, stop the sequencer and/or unplug all jacks from it.

Tap SLICE SEL to enter slice selection mode and dial the Rate knob to check out the slices just made.   (Don't forget to unplug the Rate CV or it'll add to the base Slice rate!)

This demonstrates the Slice Rate "capture". If you were to patch the sequencer clock source over to SL.PLY and the sequencer's CV out to SL.CV, the sequencer would be playing slices, but not the same way as before.

*Note:
Slices created in Echo Mode will always be the length of the echo before looping:
        Turning Slice Loop off (hold Loop button) will play through the entire echo build +
Slices created during Initial Record (REC LED is Red) will be sequential and are ended by the next slice.
        If Slice Loop is on, these Slices will loop in this space.
        If Slice Loop is off, then the Slice will play right through as no end is specified.

Patch #3: Slice Sequencing
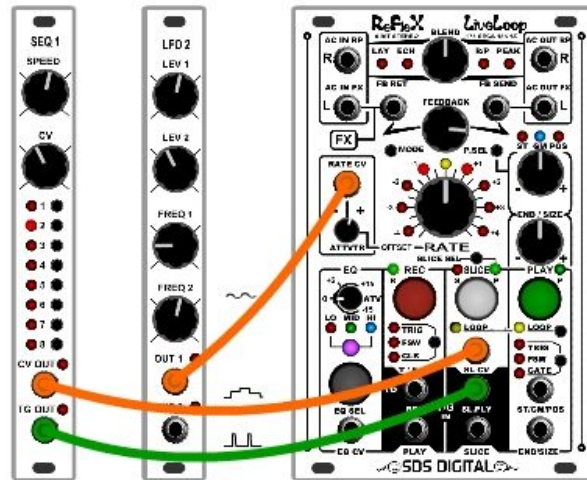
   One of the best features of the Reflex LiveLoop is the ability to "address" sample Slices via CV.
This method can be used to create a Slice Groove Sequence, where the Reflex plays a recorded
sequence on it's own, access sections of a sample in a predictable way to PlayFX them globally,
or save a section of a sample to be recalled to start a new Echo from.

   When Slices are created, the first 16 can be accessed from the panel without any external
inputs, beyond the first 16, Slice Select acts as a Slice # offset to the CV input, which can access
up to 400 Slices. The SL. CV input can be regarded as # of Slices / 5 per volt of input.
   So if there were 100 slices, then 100/5=20, so 20 slices /volt. The Slice Sel (Rate knob) can
offset this by 1 - 16 Slices. This comes in really handy for shifting a whole sequence, by #.

   This Patch assumes you have some Slices created (if not, just select Peak, then Tap REC) and
a Sequencer of some sort. The SL.CV input is patched to a Sequencer CV out, and the SL.PLY
trigger to the Gate/trig of the sequencer. This will select the Slices to be played.
Slice LOOP has been turned of so it'll play through, but it's your choice.

   The LFO in the diagram is patched to the Rate CV input to demonstrate how the global Slice
rate will change. This could be patched over to another CV out on the sequencer so it changed
with each step.

Slice Groove Sequencer:
   If you need the Sequencer to control something else, this sequence can be recorded into the
Reflex, and looped to continue playing!
While the Sequence is playing Slices, and SLICE P LED is on (Slice Sel Mode), Press the White
button and tap REC button. The SLICE R LED will light indicating "ready to record" sequence.
Once ready, tap the white button to begin recording the sequence.
At a good loop point, tap REC to end recording and switch to play the sequence.
Now unplug the SL.CV and SL.PLY inputs and the sequence continues!

Applying PlayFX:
At any time during the playing of this Sequence, any of the 3 PlayFX modes can be globally
applied to the playing slices. "Globally" means that PlayFX will use the same method on all.
The PlayFX Start/End, GM/Size, Position/Size CV inputs also work as normal, which can create a
seemingly intelligent and complex sequence!
See Patch#4: Slice Sequencing and PlayFX below

Patch#4: Slice Sequencing and PlayFX

...or same Seq
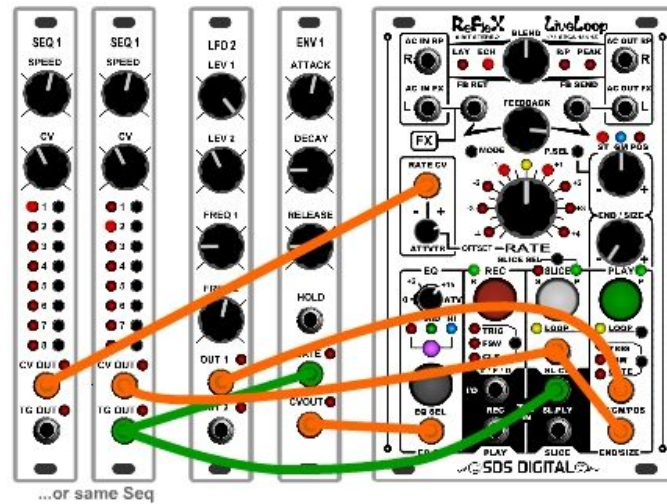
  This patch will apply PlayFX mode Start/End to Slices sequencing Globally according to CV inputs for the Start/End controls. Remember the Start/End knobs become + offsets.
Position the Start/End knobs as shown in the diagram for this patch. P.SEL ST mode.

Getting Sliced!
  Go to Echo Mode and start a 10 or 20 second loop to fill with random sounds, or notes, percussion, then switch to Infinite Echo.
Use Peak Slicing to create a couple of dozen Slices (MODE Select PEAK)

  Patch up a Sequencer (or two) as shown. The Rate CV input should be a sequenced CV so it repeats, as well as the SL.CV input. If you only have one Sequencer CV output, they can be patched together. The PlayFX END CV input also from the sequencer CV.

  The LFO patch to the PlayFX start provides a state of "randomness" to the Sequence, so should be set to 3 or 4 seconds. This will set the PlayFX Start position at time of each Loop.

 Finally, using the EQ (All Bands on) to Envelope on each step adds the finishing touch to this patch. If your Envelope (ADSR) goes into negative territory, you're ready to go. If not, then hold the EQ button to toggle into unipolar CV mode. You know it's there as at "0" it's -15dB attenuated.
Set the EQ knob all the way up, for maximum envelope affect.

  If not already there, tap SLICE SEL to toggle into Slice Select mode with the Rate knob.
(SLICE SEL LED mostly on) This can be used to shift the Slices, which will completely change the "instruments" of the rhythm.

  Start the Sequencer(s) and Slices will start playing. Turn on PlayFX (Green button, Loop On) and enjoy the sequence! PlayFX will forward/cut/reverse and buzz occasionally, all in sequence.
 Try adjusting the Rate Attenuvertor, or PlayFX start/End. Notice the changes? Once you're tired of "this" sequence, turn the Rate knob (SLICE SEL) to select another set of sounds.

  This patch is great for establishing a recycling beat to work around, and can easily be changed with one knob, without changing the whole thing. It will also work with a Slice Groove Sequence as described in Patch#3.

Exit PlayFX (by holding Green button > 1 second) to hear original Slices

V1.03b update: This all works fine with 1-Shot Slices

Patch#5: Slice Sequencing and G-Move Fine
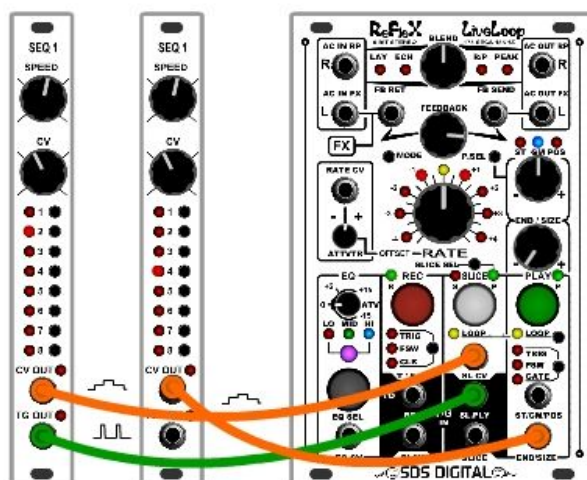
This patch is similar to Patch#4 in that a PlayFX is being used to Globally modify Slices being played, but with G-Move only the fist small section of a Slice is played, and the Grain size sets the "note" from a sequencer. Initially the setting for G-Move is GM centered so there is no "move" but adjusted slightly one way or another will allow G-Move to pan the Grain starting anew at every Slice played.

While G-M is centered, the waveform that is at the start of the Slice becomes the wave table of sorts, so when creating slices, perhaps use manual slicing at interesting points in the sample that are not "quiet" spots (no waveform, no sound!)

The synth-like sounds created are constantly changing, but repeating, so this patch can act in place of a percussion, still primarily controlled by the sequencer's clock.

In the diagram, the left Sequencer could be an LFO or any CV source, while the right sequencer is what will make the G-Move Fine "notes". This will not be 1V/oct! ..and it'll be inverted.
The trigger/gate input plays/changes to each Slice selected, so can stay in sync with the clock.

Once you have Slices to play, patch as shown and P.SEL mode GM (blue LED)
Start the sequencer. If you don't have a sequencer, you can sequence using Slice Groove.
Turn on PlayFX (Green button) to G-Move the Slices.
Adjust GM knob to center (Blue LED flickers) to pause G-Move. Size fully left as shown.
Turn on Fine mode (tap P.SEL to toggle Fine/Coarse) while PlayFX on.

There should now be a sequence of tones with varying waveforms playing.
Try adding an envelope to EQ CV input as in Patch#4, triggered by the sequencer of course.
Try shifting the Slice sequence (SLICE SEL LED mostly on) through the 16 offsets
Try changing the Rate up (SLICE SEL LED flickering quickly)
    *Notice how the Rate can't go down too much? This is because G-Move grain
    size is time based, and there's simply not enough waveform left at the lower
    sample rates, and the Reflex blanks the otherwise annoying sharp click that would
    result once at this point. Silence is golden.
Try patching an LFO into SL.CV. This will pan through the slices, not in sync.

Using an envelope on the EQ as in Patch#4 shapes this de-facto wave table synth.

#6   PlayFX Rate varied Percussive Triggers   (V.1.03b+)
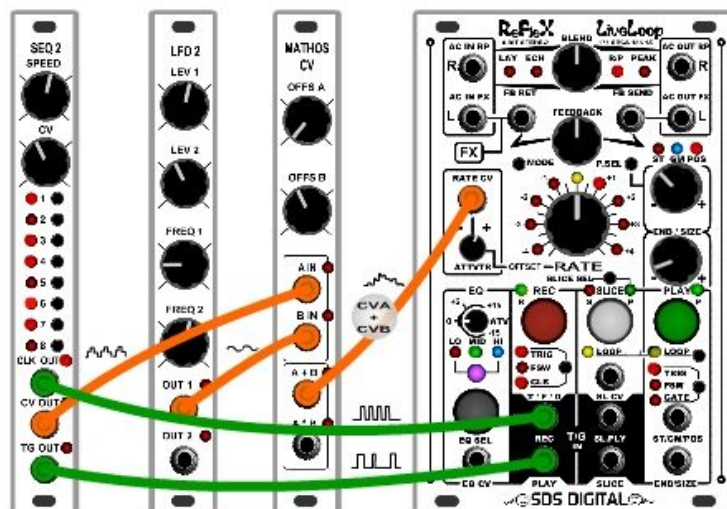
For lack of knowing what else to call it!
This patch will clock an existing loop in made R/P mode (would work in Echo too) and insert
PlayFX "stabs" that are changing in pitch from an LFO, or LFO + Sequencer if you can do CV
addition. It is easy to set-up and can be looped quite a while as the PlayFX sample rates are
constantly changing.
To start, don't patch anything yet (except audio of course!)

1) Firstly, set you ClockDiv to max /16 (Hold REC T/F/C, then dial to 16, then tap it to save)
    If you have the Rate locked, unlock it for this patch (Hold MODE button)

2) Switch to R/P Mode, Set PLAY T/F/G to TRIG, REC T/F/C to TRIG, PlayFX to POS/SIZE
    mode and turn PlayFX LOOP <u>off</u>.

3) Record in a nice loop and end it at a good point so plays. (REC→REC)

4) Switch REC T/F/C to CLK and patch in your (sequencer's) clock, or a master clock
    The sample rate will shift up/down so your loop matches the clock time/16

5) Patch in the Rate CV from sequencer or Maths consisting of Sequencer CV + slow LFO
    If you don't have a CV adder/mixer then just use the sequencer or a Complex LFO shape

6) Patch in a Trigger/gate that is under control of the master clock (like off of a sequencer) to
    the PLAY input to start/re-trigger PlayFX.

Now adjust the PlayFX POS knob to find a good start in your loop for the "PlayFX stab" and vary
the SIZE and Rate attenuvertor to taste.

Notice how the PlayFX rate is changing the pitch of your triggered stab, but not the main loop?
That's because it is clocked and the clock has control of the RP sample rate.

The PlayFX LOOP is off so it can exit after a trigger. This is to stop a new PlayFX "capture" on
each trigger which would change the start each time.

More?
-Try adding and LFO or sequencer CV to control the PlayFX SIZE parameter.
-Split off the signal into the PLAY input (the PlayFX trigger) into an envelope generator then
   use that to envelope the MID band on the EQ. (mind your levels!)

#7   Slice Groove Sequencer Clock Step mode
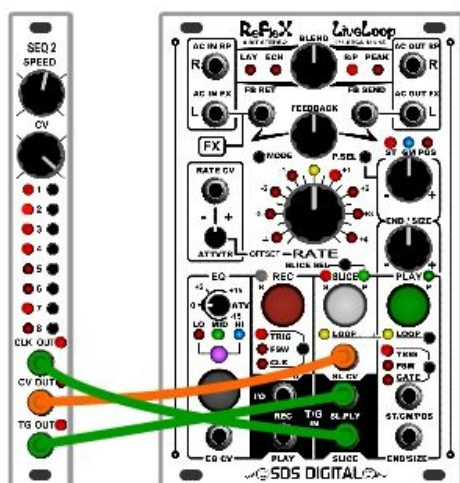
As of V1.03b, the SGS mode now has a quantized loop point Clock stepped sequence record and play.

This mode is set by simply applying a clock signal to the SLICE input while in active SGS mode, and remains set this way until the SLICE button is held for 1 second to exit SGS & Slice Play.

Basically all of your sequencer control is recorded at each clock, then after a time, sequence record is ended and sequence play begins, using the same clock.

At this point the SL.CV and SL.PLY plugs can be optionally removed and the clock alone will continue the sequence.

Clock Stop:
The clock can also be removed or stopped/paused, and the sequence will stop/pause.
If the stop/pause is longer than 5 seconds, the LED circle will flash and the SGS sequencer will reset to step 1. This is very handy for a "cold start" synchronization as the SGS is essentially "waiting" for that first clock.

Quantized actions:
The difficult part of the previous version of SGS was getting the sequence to loop at the proper moment. Too early and a clock is skipped and you end up with a 31 clock sequence, too late perhaps a 33 clock sequence.
Now there's quantization, so only sequences can end recording or begin recording at a count point defined by the setting of ClockDiv. So if ClockDiv is set to /8 then changes can only be made every 8 clocks. This makes it very easy to keep sequences lined up with everything else running from that clock! Only initial alignment, if important, takes some skill.Tap SLICE, & tap again just before Step1.

Slice Trigger Output:
During the Clock Stepped sequence, if the REC T/F/C is switched to CLK, the REC jack will output the sequence's Slice trigger, replicating the gate (trigger) that was used to create the sequence except that it will be a trigger pulse. This can be useful for Slices to drive a filter envelope or other such beast! … or can just be a clocked trigger sequence recorder even without the audio.

1) First check / set ClockDiv by holding the REC T/F/C button and dialing in with LED circle 1-16.
   I suggest /8 as that's a standard sequencer length. Tap REC T/F/C to save new ClockDiv setting.
2) Assuming you have some Slices made, get into SLICE SEL (Slice's P LED on). Hold the SLICE
   button and tap REC button to enter into SGS mode. SGS should be active (R & P LEDs on)
3) Now it's safe to patch in the clock (SLICE input), SL.CV, and gate/trigger into SL.PLY.
4) Tap SLICE button to start a sequence record for alignment.
5) When your sequence is about to roll to Step 1, tap SLICE button to re-start the sequence record.
6) Tap REC button to play the sequence. Notice it didn't switch right away?
7) Tap SLICE button to start a new sequence and use the Rate knob to select other Slice offsets.
8) After several sequencer cycles, tap REC button to "arm" to end Recording on next 8th clock.

Up to 192 clocks can be recorded (192 = 24 x 8 clocks) before the sequence recorder loops.
Clocks can step very fast or very slowly (max 5 seconds per clock!)
These clocks do not need to be even, as this is not a time-based mode at all.

You don't have to have a sequencer for this. The clock can be any "even" source, and the trig/gate to play Slices (SL.PLY) from any source, just remember this is sampled at the rising edge of the clock input, so if not synced to the clock, should be a longer gate-type of signal.

Patch #8: ??

That's it for Patches so far! Re-download this paper from time to time, it'll grow!
(Sept 13 2016)