

# **X-Treme SFX**

## **“Sound Effects Ideas for Project5”**

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## **X-Treme SFX 1 [Pitch Bend Automation Patterns]**

On this most traditional American holiday, when the L-Tryptophans have overtaken your brain chemistry, let's try something that might kick the energy level back up again. I'll illustrate a quite non-traditional method of introducing pitch bend effects into your next project.

Make sure that you have a synth loaded in a track that supports pitch bend, and that your keyboard controller is transmitting correctly. Remember that your actual pitch bend range is set in the soft-synth, and that some controllers can also limit the range of their transmitted PB messages. The following techniques can be just as easily applied to Track Automation; the principles are identical, but I'll show the procedure using P-Seq.

First, create a new pattern in P-Seq, and select MIDI-Wheel in the Automation Edit Menu. Again, we have a choice to make: You can record your preliminary pitch bend pattern directly into P-Seq by enabling the Record button there, and manipulating the physical pitch wheel on your controller in real-time. This method seems to circumvent the Snap to Grid setting, and come in at a higher resolution with finer curves. You can slow the tempo in P5 way down (as low as 8 BPM) to improve your 'drawing' accuracy, or increase the tempo to high extremes for recording, and return to the base tempo to preview the results.

Another option to bring the initial curve to life is drawing the curve within P-Seq itself, and this is what we'll be using to modify the curve further, anyway. Toggle the "T" key on your computer keyboard to cycle through the Automation Tools in P-Seq, arriving on the middle one [Draw Automation]. Link the Snap Resolution and Step Size for now, and leave the Snap to sixteenth notes.

The default centered pitchbend value of 0 appears to be slightly above the "E5" key's line on the green and black keyboard graphic in P-Seq. You can draw anything above it for a positive PB, and the reverse is also true. Click some randomly placed values around the pattern by left-clicking around the pattern. Play some notes, or hold a chord on your KB controller, click playback in P-Seq, and listen to the random pitches generated.

Values close to the minimum/maximum range will reflect the full range of PB set in your soft-synth. Values closer to the center value will hover around a few note range for an exotic scale-like effect, or be as small as to suggest unstable oscillator pitch fluctuations. You can even transpose other P5 note patterns with a recorded static pitch bend value, or further modify those patterns with the pattern Transpose function. These methods suggest classic sample & hold techniques.

Left-click & drag to generate continuous value curves. Upward or downward value 'sweeps' result in unusual glissando, with an atonal component. Remember than left-clicking, and holding the Shift key allows you to rubber-band a 'straight' line to a higher/lower value.

You can introduce some discrete 'stair-stepping' into the 'sweeps' by right-clicking on points in the curve. You'll invoke the Erase Tool in this manner, and carve out chunks of the 'sweep' at the point that you right-click, dependent on Snap to Grid resolution.

Speaking of which, feel free to change the STG setting to different degrees of coarseness/fineness during the course of experimentation. You'll get a variety of rhythmic qualities introduced by changing this often. Disabling the STG altogether leads to some fine curve shapes, although selecting the 1/128th note increment "ain't too shabby", either.

All the usual Select Tool options come into play here: Cut, Copy, and Paste for editing, and Retrograde & Quantize for some unusual data manipulation. Don't forget the ability of select a section, and then Ctrl-Drag a copy of it. Say there's a particularly nice 'scale' section that you like: Select it, and drag enough copies to make a complete 'riff' pattern. Or create some nice 'whammy-bar' effects using this and Retrograde.

Those of you with Wacom tablets might consider using that to draw your curves; I keep an old serial 4" X 6" around for just that purpose. And if you really want to freak out your soft-synth, play back one of these crazy automaton patterns while using your physical PB wheel simultaneously, and listen to the fight over who wins.

A combination of all the techniques above leads to the best automation patterns. With the select placement of modes that're different enough, you can approach random LFO control, but with a personal control over the depth of the generated effects. There's something about the combining of discrete off-scale notes and continuous pitch bend that really commands the full attention of the listener. You can base entire projects around the 'licks' that result from a creative roll of the dice.

The best part: all of the editing above can be done "live", in real-time, while previewing the results of your edits from your soft-synth, and having the pattern looping in P-Seq's Play mode. Try that with your average application!

## **X-Treme SFX 2 [Spectral Transformer Slots]**

Now here's an unusual automatable parameter to explore, and it's no surprise that it can be found in the unique processor: the Spectral Transformer. I could write a book on the wide range of effects possible with this included P5 effect; there's very fertile ground here for experimentation. It's one of the best documented plugs of Project5 within the Help file, and also the deepest.

Call up the ST after any synth in its Audio FX bay, and right-click on one of the parameters exposed in the third 'unnamed' bay. Select Slot 1 FX, and go to MIDI Remote Control (in the same menu) in order to assign one of your KB controller knobs to the parameter. You can use the pitch wheel, mod wheel, or preferably bind another programmable continuous controller knob/slider to it.

A slider may be easier to find the sweet spot that holds an effect in position. I limited the range of my rotary encoder from a low value of 16 to a high value of 127. The reason was to eliminate "No Effect" from the possible results, and select among the seven module choices with a flick of the wrist.

[Edit]: How's this for providencial? I originally tried using the Step mode of a programmable button on my controller, but the Step Size was fixed at 1. That required 16 button presses to reach the next module, and the method was quickly discarded. Later I discovered a new OS update that allowed for a programmable Step Size. Now I can set a Step Size of 16, a low limit of 16, a high limit of 127, and step through the modules sequentially with a press of a button.]

Now load a preset from the Spectral Transformer's menu, or create one yourself, and see what effect that MIDI Control has over the slot. The entire character of the particular effect can be changed by flying the various modules in & out of the equation. You could just as easily use an automation envelope in a pattern to sequentially increment the entrances & exits of the modules. Now think what's possible by automating the other three slots, as well.

Here's a really nice extension to this technique with real-time control. The results can be reminiscent of waveshaping, or nothing else that you've ever heard. Instead of a controller message, choose Velocity in the MIDI Remote Control dialogue. By varying the degree to which you strike your black & whites, you can bring in a completely different effect (& module) for each note that you play. Whip up some unique module settings, remote control the slots, and save the whole package as a track patch.

It really doesn't matter what synth precedes the ST in this example; it's all about the sound-mangling. I have a feeling that this won't be the last time that I'll be writing about the Spectral Transformer's features. It's a tad complicated, extremely tweak-able, needs to be massaged for latency, and is almost at the top of my all-time favorite FX plug list (just under Spectron).

## **X-Treme SFX 3 [Accurate Tempo Mapping]**

OK, admit it. You've never used the Edit Tempo Map function in Project5. Maybe you knew it was there, and clicked on the button once or twice; perhaps not. That might be because it's buried at the bottom left of P-Seq. Hopefully, that's all about to change ...

The Help file isn't much help at all. It basically tells you that you can draw an envelope, use the Shift to draw a straight line, or select a section. We need more than that. Click on the Edit Tempo Map button, and you'll see a faint blue straight line indicating the current tempo set in the Tracker under BPM. Use the "T" shortcut to toggle between the 2 available tools (no Note Tool here). Land on the Automation Tool.

At default, you're set to a Snap Resolution and Step Size of a sixteenth note. Draw an envelope way past the far right, and the display will follow, snapping back to show the entire envelope. Now this is cool enough for special effects, but the resolution of the drawing tool is such that all of the tempo increments have a fractional component. Look at the readout in the top left of P-Seq. You can't hit an evenly incremented tempo. [I always miss the readout, anyway. I'm too busy looking where I'm drawing. Tooltip readout, Cake?] What if you're using Project5 as a MIDI Sync master? Your old hardware's gonna' freak! Not exactly what you'd want for accurate tempo changes, but good enough for tempo sweeps.

Note the behavior of the Erase Tool (right-click & hold). Depending on where you click, whether you drag left or right, you can actually increase the tempo setting by erasing! You need to combine drawing, erasing, and Snap to Grid settings to try to come even close to an exact tempo in a given section of the envelope.

While we're here, toggle the "T" key to the Select Tool. You can select a section based on the Snap setting, and ... that's about it. None of the right-click commands are available. It would be most useful if you could Cut, Copy & Paste here, and (a vertical) Quantize might've been a solution to those fractional tempos. And Retrograde would allow you to select your envelope, and mirror it to create a symmetrical tempo envelope. Very useful in a musical sense. [Tip: A selected section can be removed by pressing the computer keyboard's Delete key, but none of the other shortcuts work.]

To be fair, you can select a section of the envelope, and left-click & drag it in place. Or Ctrl-click to drag a copy of the selection to a new spot. The lack of an editing marker in this view's timeline prevents any useful placement with the clipboard commands, anyway. The horizontal accuracy is provided by the Snap to Grid, but what do we do about vertical tempo accuracy?

Here's the answer: For this example, link the Snap Resolution and Step Size, and set the Snap to Grid to Measure. Now using the Automation Tool, draw anything out over, say, 16 bars. [This trick won't work on an "empty" (default one-tempo) envelope.] Now go to the Tracker. Verify that the Snap to Grid here is also set to Measure.

The BPM indicator will show the fractional tempo set in the envelope. If you try adjusting it with the arrows, the fractional component remains, although the adjustment will update the envelope in P-Seq. Double click on the BPM and enter an exact tempo. Try 100 BPM, and Enter or Tab your way out. Now either click on the timeline to get to measure 5, or use the Jog Backward and Forward keys [shortcuts , . ] to navigate there.

Repeat the procedure above, and enter 200 BPM at measure 5, and 50 at measure 9. Bring it all back with 100 BPM at measure 13. Now you have a medium-tempo intro, four bars at double-time, four at half-time, and a four bar return to tempo. Any patterns that you have stretched over the tempo changes will react in kind. The changes are reflected in P-Seq, and now you can select, copy, & drag accurate tempos both horizontally and vertically.

We used measures for this example, but of course the technique can be extended to any Snap to Grid settings. The STG doesn't have to be the same in both the Tracker and P-Seq, but it makes for the most repeatable results. Try differing settings for some interesting results.

Note that you can update a specific section of the P-Seq envelope by selecting it, then entering the tempo manually in the Tracker. Remember also that the Edit Tempo Map view is simply an overlay atop the pattern underneath. For example, if you have a Wheel automation pattern, and select any part of it, it is still "active" underneath the Edit Tempo Map view. It's quite possible to inadvertently use the clipboard functions, or even Reassign the Wheel to another MIDI message, by right-clicking in the Tempo View. I discovered that fact by trying to circumvent the system by drawing automation patterns, and trying to drop them in the Tempo View. Can't be done, unless ... Reassign Wheel to Tempo? Please, Cake?

As usual, I'll prescribe using all of the tricks in combinations. How about a gliding 128th note tempo change over exactly two bars from 250 BPM to your song tempo of 130? No motor inertia to worry about here. Or building excitement by shifting the song's chorus up a few BPM, and back down for the verse. Live bands do this all the time, consciously or not.

In conjunction with a drop in pitch, and lengthening of reverb or delay time, a song ending with a tempo slowdown sounds like you pulled the plug. Or try programming a break with drum rolls that increment by eighth notes and tempo changes simultaneously. And don't forget the double-time/half-time techniques that use the same pattern(s) to great effect. Your next song will sound humanized, or robotic, or like nothing else, depending on the extremes. But don't blame me if it's impossible to dance to.

## **X-Treme SFX 4 [Tempo Delay Comb Filtering]**

Just in time for the Dark Music Project, here's some ideas for using the Project5 Tempo Delay in some ways that you might not have considered. We've going to use very short delay times coupled with high feedback to create some unusual timbres with most any input. As with any extreme processing like this, keep your monitor levels low during the experimentation phase, and don't be surprised when P5's audio engine craps out occasionally from the strain.

First, a little background: Comb filtering is simply using a recirculating delay of your input signal, and introducing some of the delayed output back to the input via a gain control [Feedback]. The term comes from the appearance of the resulting frequency plot. The cancellations of frequency that are introduced resemble those of the teeth of a comb. There's a predictable 'natural frequency' [apparent pitch] in comb filtering that can be found by dividing your sample rate (set in your Project5 driver) by the delay time (set in the Tempo Delay). The process is similar, but not identical to 'phase shifting', and uses different delay times that distinguish it from flanging, chorus/doubling, & 'slapback' delay.

Whew! You still with me? I hope that I didn't scare you off with that; you'd be missing out on some cool effects. Load any synth with any patch into P5, and insert a Tempo Delay into the Audio FX bin. In the initial "No Preset" preset, leave the Stereo Delay Mode, and set the Tempo Sync to Off. The Time Left & Right controls are wht we'll be adjusting, but set the EQ Mode to Off for now to hear the following effects untouched. The Feedback setting is essential, with some leeway. You will get runaway feedback at 100%, which really accentuates the comb filtering, but you need to keep your delay time adjustments down to a reasonable range. Anywhere around 90% will allow the effect to die out, but I prefer close or at maximum [long sustaining times, but it'll eventually die out]. The Mix knob should be at 100% Wet.

One great thing about P5's delay is the separate adjustments for the left & right delay times. Try playing a few notes on you KB while adjusting those knobs. You certainly want to stay at the low end of the range, no more than .10 to stay out of long echo range. You'll get that distinctive metallic sound that comb filters deliver.

Of course, although I said use any synth or patch, the choice of input directly affects the resulting output. But what we're really "playing" is the delay lines. With the right pad-type sound, you can get individual "notes" in some otherworldly "scales" jumping out while adjusting the delay times. In the Stereo Mode that we set, the delays sound like dual-mono: one hard-panned to each side. Changing the mode to Ping, Cross(feedback) or LRC mixed your delay times from both sides through the center of your stereo image. Shifting the delay time (in some cases) actually shifts the stereo image with it. Sounds amazing!



Leaving one delay knob static while adjusting the other with your mouse ends up with a unique 'counterpoint' sound, but the real fun comes in with MIDI Remote Control and/or automation. Right-click on the Time Left and Time Right controls in the section next to the Audio FX bin. Select MIDI Remote Control, and "learn" in a couple of knobs from your controller. It can be the Pitch and Mod wheels, respectively, but if you have others that are adjacent for easy accessibility, use those. I use 2 sliders or an X/Y pad mapped to the delay times. If you can, limit the range of your knob/sliders to 25% (0-31) or below, to keep you under 130 milliseconds. Now you can dynamically adjust both delays with leaving a hand free to play, and, unlike the mouse, change both delay times simultaneously.

Knob-challenged users: don't fret. You can draw some automation curve in P-Seq. Create a new pattern, go to the FX section of the Automation Edit Menu, and select the Time Left control. Draw anything, but keep the curve low in the window [unless you're going for an extreme industrial effect]. Do the same for the Time Right parameter, or Duplicate the Time Left curve and Retrograde for the Time Right automation pattern. Send (these) to Track and that leaves both hands free to play the KB. You'll get some "smearing" as the delay lines try to catch up to the automation, but that's an extreme effect in its own right.

This isn't a subtle effect, but you can get an impressive array of sounds using very fine adjustments, many of which are very close to a delay time of 0 ms.; that is, within a very small range nearly fully counter-clockwise. I hope this opens up some doors to deeper experimentation for you.

**Note:** It would be prudent to place a compressor or a hard limiter after the Tempo Delay for this application. Saves on adjusting the volume & track/main controls so low, as well as speaker cones, headphone elements and ear drums. Notice that if you follow the delay with the Project5 Modfilter or Multivoice Chorus/Flanger, that has a way of mellowing the extreme resonances created. You can get a less intense version of the comb filter with the Chorus/Flanger alone, using the manual controls with a minimal sweep.

You can also shift the 'apparent pitch' of the Tempo Delay comb filters by placing another instance of the Tempo Delay in front of the first. You can then set that instance up in a similar fashion, but with a static delay of one or two milliseconds [different values for Left & Right] to offset the audio signal in time before it even reaches your main comb filter.

But if its "disturbing" that you're looking for, follow the TD comb filter with the Spectral Transformer. For once, the inherent latency won't matter, as you're using this setup as an unsync'ed ambient wash. And we all know how deep you can go with tweaking the Spectral Transformer, but all the original presets work great as is in this application.

I just threw together a simple setup: PSYN with the Bread Pad preset [A006], the Tempo Delay as a comb filter [only a couple of milliseconds for each side at 100% feedback], and the Spectral Transformer. Here's what comes up:

Basslift: Something out of War of the Worlds: sweeping sirens, metallic scraping, comb machine noises, and the occasional faint S.O.S.

ColorHarmoniz: Otherwordly orchestral sounds; dissonant, but strangely cohesive to the 'apparent pitch' center, which depends on the delay time settings.

FractalWah: Definitely spacey. Magical sweeps, subtle chime sounds, and sputnik noises bursting in intermittently.

Gyro Falling: You're going to like this one. Kind of a bell-like guitar/bass/drum line which builds to feedback. It approaches going 'over the top', but never quite makes it.

MadTrills: R2D2 tries crystal meth, and likes it ... This patch has a place; I just haven't figured out where yet.

MentalVox: Random ghost-like howlings; a little tweaking would make this an ideal intro.

MetalRain: Another one with great potential. As is, I hear a loop of some crazed harpist who went wild with his tuning and decided to ring-modulate the whole thing.

None: Even "none" changes this patch, due to some residual internal effects within the Spectral Transformer from selecting the earlier patches. The Help file explains this phenomenon in depth, and also how to resolve (clear) it.

Octave Up: Of course, this shifts the 'apparent pitch' upward, along with all its reinforced frequencies & cancellations. Hear a completely different effect by dragging the Transformer in front of the Tempo Delay.

Schizo: Rush Limbaugh tries to lend a helping hand to R2D2 from the MadTrills preset.

SeaSaw: Although completely dissonant and out-of-tune, this one's somehow all at once fragile, plaintive, and spacey.

SweepTrace: Bird-like chirps and wah-wah, if you can imagine that combination.

TubeWarp: Modern horror film score in a patch. Violin string scrapes, Balinese gamelan sounds, microphone feedback, you name it.

And this is all with a fairly bland patch [Bread Pad], and with static delay times in the Tempo Delay. Once you start moving around those delay times, and switching PSYN patches, you'll have to call into work tomorrow ...

## **X-Treme SFX 5 [Pattern Transpose]**

So what's so extreme about transposing a pattern in Project5? The range of transposition will freak out any soft-synth; some more than others. The beauty of this technique is that it's easily implemented, very versatile, and can be used with any pattern or soft-synth with a variety of results.

The MIDI spec allows for 128 Note On values; about 10 and 2/3 octaves. Many soft-synths' oscillators will cover this range, but some support a lot less. But the pattern transpose function in P-Seq [TRNS] will let you transpose 127 values over 0 (no transpose) in either a positive or negative direction. That's more like a range of over 21 octaves! Obviously, something has to give ...

Create a pattern in P-Seq around middle-C, but even that isn't written in stone; it just gives you a maximum range to work with. Send to Track; otherwise, you won't be able to transpose the pattern in P-Seq. Load any soft-synth into a track, and be prepared to Replace Synth often to test out the limits of your soft-synth collection. Hit the Play button in P-Seq, and let 'er loop ad infinitum.

Now start transposing the pattern "live" as it loops. You'll find some unusual sounds at the synth's extreme ranges; somewhere around +/- four octaves [48 semitones]. This is a great technique in itself. You have one patch on one synth driven by one pattern that can provide sync'ed lead, rhythmic, bass, and percussion lines, depending on the patch chosen and its transposition. You don't even have to duplicate the pattern; just Send to Track on each new track with its own unique transposition setting.

When you get around 60 semitones [5 octaves], strange artifacts are produced, as you reach the limits of the oscillator's capabilities. At one point in a negative direction, you'll overlap the range of the OSC and include points beyond it, and get a combination of low, grainy and almost sub-audio sounds with some high-frequency screeches, blips & bleeps. You can 'hear' the coding scrambling to interpret what's going on, and it spits out all manner of sounds. Go beyond the five octaves or so, and the synth settles into a predictable, yet no less odd, group of notes that signal it's surrender to your extreme programming.

Of course, there's a similar scenario achieved by transposing to extremes in a positive direction, but with different results. Now the barely audible high frequency notes mix with the primal screams of the oscillators straining at the seams. Here's the best part: All synths seem to exhibit this behavior, but every one has a distinctly different reaction to the technique. You can sit back and Replace Synths and/or patches all day until you find something useful; it's almost like algorithmic composition, but with control over the patterns and (somewhat) the final sound.

That's all there is to it: It took much longer to type (and for you to read) than it will to set it up & give 'er a spin. I'm not sure what Cakewalk had in mind with including this great of a range with pattern transposition, but I'll be glad to exploit it for the possibilities.

## **X-Treme SFX 6 [Echo Delay...with MFX?]**

6Yes, that's right, sports fans. This one has to go to the top of B-Rock's Believe It or Not! category. I could kick myself for not finding this extreme effect sooner, and it's so easy to get an amazing variety of sounds with the setup that follows. This effect and its variations will keep you going for weeks.

Have you ever used the Echo Delay MIDI FX much? Neither have I. MIDI delays developed a bad rep way back with hardware devices, because they ate up all of your polyphony by creating an "echo" using another MIDI note at a lower velocity. The more repeats that you have; the greater the number of available "voices" that you burn up. We'll use that to our advantage later ...

OK, so what can you do with it? As it stands, you can change the number of repeats, have the echos increase or decrease in loudness, sync to tempo or milliseconds or MIDI ticks, and also add "swing" to vary a strict tempo. You can also use it as a BPM/Time calculator. You already know what your project tempo is, so you can select, for example, 1/4 Note in the Delay section (with the Delay Units set to Note), switch the Units to Milliseconds, and the equivalent pops up: 600 ms., given a project tempo of 100 BPM. Comes in handy for a quick calculation of an audio delay time, or to sync an EG to tempo in a synthesizer. The method won't work in the reverse direction, but you can convert to MIDI ticks from either of the other two.

The Echo Delay will also transpose your notes with each iteration, so you can get some cool ascending/descending "bell tree" effects, but you'll quickly tire of that effect. We're going to exploit that feature now by loading three Echo Delay instances at once. Here's the quickest way that I've found: Load the first instance in the MIDI FX bin with any synth in a track. Make your rough settings in that. Double-click on the "green box" in the MIDI FX bin to open the GUI. It'll pop up in the default location to the left of screen. Drag it to the right, and set the Echoes to 4, the Delay to 16th Note Triplets, and the Transpose to 12. Copy and paste another instance with a right-click in the MFX bin, and double-click, dragging that instance to mid-screen. Repeat this once more, but leave the GUI in its default left position. The GUIs now reflect the positioning in the MIDI FX bin, to keep you straight.

Change the second instance to 1/8th Note with a Transpose of 7, and the first instance to 1/8th Note Triplet with a Transpose of -5. Play one note, and the craziest arpeggiator-like patterns fly out. Now change around the Transpose settings on all three, and increase the number of Echoes. If all three transpose settings are negative, the sounds will bury themselves in mud. All positive: through the stratosphere. Any mixture of the two will get you simultaneous ascending & descending lines.

Transpose settings clustered a few semitones apart create some churning, atonal licks. A switch to Milliseconds allows you to space your echoes up to 5 seconds apart, for some slowly developing counterpoint. A few millisecond spread or using MIDI ticks provides you with a "slurring" of MIDI notes that sound completely different from a short audio delay. A combination of Delay Unit settings turns out the most unique polyrhythmic combinations that I've ever heard; semi-automatically. This is very close to algorithmic composition, but you have more control over the parameters. By using MIDI Ticks (or even milliseconds), you can come very close to simulating random note generation.

If you increase the Decay to 100, and the Echoes to 16, while slowing it down to 1/2 Notes, and 1/2 & 1/4 Note Triplets, you'll get more of a sustained phrase. Up until now, I've been assuming that you're using a polyphonic synth. You can clear up the dissonance by using a Mono setting, and some perfect intervals in the transpose settings (like an octave, fourths, or fifths). Try it with any patch in PSYN. The lead patches turn out funky, the slower attack patches overlap notes like a tone poem, and if you slow the Note settings even further with a string patch, you can get the wildest riffs imaginable, hinting at 12-tone composition.

But the beauty of this is it can be used with anything. A spoken word sample soon becomes an angry crowd, a bass note becomes an unplayable hook, one synth note becomes an arpeggio. Speaking of which, what happens when you add the Arpeggiator MFX to this mix? You won't believe your ears. It'll open up at the head of the pack, but the Arp will completely change your note order by dragging & dropping it second, third, or last in the chain. The flurry of notes really gets out of hand now.

What's happening here is that the first instance is echoing your note, and transposing each repeat in one or the other direction. The second instance is transposing all of the first instance's notes and echoes, while echoing itself. The third instance transposes/echoes everything that's earlier in the chain. If you add the Arpeggiator to this, it'll attempt to "strum" the notes within its set algorithm, and that is why the positioning of the arp changes the note patterns so radically.

In some synths, you'll run out of polyphony quickly with extreme settings, resulting in a fade-out that might temporarily "lock up" your synth. That is, it won't play any more notes until you switch a setting, like from Mono to 02 polyphony in PSYN. But in special cases, you'll freak out the envelope generator, resulting in stuck note, or endless arpeggios from a single note trigger. This is not a bad thing; you get some great sounds in this manner. The same thing happens when you transpose to the extreme limits of a synth; at times it'll go crazy! If you need to spoil the fun, most of these "breakdowns" can be cured by resetting the Audio Engine in the toolbar. But there's times when that won't work, and the sustained note(s) will survive patch changes. Just think of it as a built-in preview setting, and enjoy the ride.

I really haven't scratched the surface of the technique here; I'll leave that up to you in your experimentation. Don't be put off by the length of this tutorial, because this is really a very simple way for complex sounds. It boils down to this:

- 1). Load any patch/sample in any synth/sampler.
- 2). Open three instances of the Echo Delay MIDI FX plug.
- 3). Take each plugin, and "tweak it 'til it hurts". [Thanks for the line, Marcella.]
- 4). Play one note, and create an astounding line.
- 5). Repeat.

You've really got to try this one, if only for the amazing variety. Have fun.

**Note:** One quirk to the setup that I've neglected to mention was the apparent 'velocity-sensitivity' of the plugin, at least in a chain of this sort. A very small range of the softest velocities fail to trigger the Echo Delay at all. But the highest velocities [I'd estimate that to be well over 100] will totally freak out the plugin [or P5], producing digital distortion, the infinitely sustained notes, and/or the runaway effect. This is highly dependent on the patch and synth chosen, but easily reproducible within a small selection of patches. The vast majority of the velocity range will produce the "normal" effect.

It's as if a 'bandpass filter' were applied to the velocity range, and anything outside of the 'fall-off' produces [evn more] unpredictable results. I'm sure that you'll find a way to exploit this anomaly to its fullest. <g>

## X-Treme SFX 7 [Microtonal DS864 & MIDI Echo]

OK, it's no Scala, but the DS864 sampler is capable of some basic microtonal exploration. It all has to do with the Keytrk knob in the Sample Edit Controls section. I've uploaded a set of companion files for this tutorial in the Project5 Content section called Microtonal DS864. It's not necessary to download it to follow this tutorial, but I'll use examples from those files throughout.

In the Microtonal.dp8 file, I've loaded a single guitar sample stretched along the entire KB range, and rooted at C5. It's not even a very good sounding sample, but it's perfect for this discussion. The sample is set to a 50 cents/key keytracking value. So what's that mean? Now for every semitone step that you press on your KB controller, the sample's pitch only changes by half of that. IOW, to audibly jump the pitch from C5 to D5, you have to actually press E5 on the keyboard. You now have 24 discrete steps from one octave to the next instead of twelve.

Well, what good is that? You can play exotic scales, approach some world music tunings, industrial strangeness, movie scores, or even "blue notes" in some jazz/blues music. You can still play your regular scales as well; you just have to remember that the "intervals" are twice as large, and adjust accordingly. Were you to use this technique with a multi-sampled instrument, you'd have to adjust the keytracking to the same value for each individual sample.

[Note: There's something amiss with these saved files. No matter what the setting, the Gain knob in the Sample Edit Controls appears to be at +6.0 dB, but is sounding at 0.0dB. If you click on it, it'll jump to an overdriven +6.0 dB. If that happens to you, double-click on the Gain control to reset it, and resave the file, while I try to figure out what's happening here. I hesitate to use the "B-word" until I'm sure, but ...] Edit: Also make sure that the master Volume control is dropped about -12dB, as the patch is rather hot. I've saved the settings correctly, but there some strange resets going on here ...

OK, you're thinking that this is all fine (theoretically), but ... Load the Microtonal.ptn file and see what you think. It has some unison bass/rhythm lines, some chord chops, a melodic flourish, and some high shuffling percussive parts; all from the same lowly sample, churning out a funk-ified pattern. The tuning strikes you in parts as not quite right, but that adds to the funky "outa-tune" feel to it. You can work some exotica into your everyday music, and separate yourself from the rest of the pack by using some similar techniques. Edit Again: This pattern works fairly well at any tempo in the range of 65-130 BPM; maybe even more (or less).

Yet Another Edit: You can tighten up the pattern by dropping the Amp EG Release slider to 1.0 ms., or slur it all together by raising that control to 10 seconds. The pitch-related controls in the sampler really don't know what to make of this. I have a very subtle negative pitch modulation going in these patches; you can get crazy by increasing the -1.6% Amt setting there. Pitch Bend takes on a whole new persona; now the fact that the Upper & Lower knobs don't land on a semitone value actually enhances this patch. Try some very low limits along with some judicious Pitch Wheel work for some amazing variations.

Of course, you're not limited to 50 cents/key; I've used that example for the easy math. What's normally an octave is now a tritone, and an octave requires a 2-octave KB jump. Try playing the pattern, & shifting the Keytrk control to 25 cents/key for a quarter-tone sound. Notice that the pattern was programmed with a half/semitone in mind, so the relationships between notes have changed dramatically. You can get away with +/- 5 cents or so from the original 50 cent/key setting, and the apparent base pitch seems to rise/lower. Anything beyond that, and we're into some craziness. Even the default 100/cents per key setting of the knob (fully clock-wise) sounds exotic, because the pattern wasn't geared towards it.

You can take a "normal" pattern, and reduce the cents/key ratio for some exotic effects as well. Or you can set the sampler for 25 cents/key, and go in the opposite direction. When you hit 0 cents per key, any KB key will produce the same pitched tone. But if you raise it to just a few cents, you're rewarded with some great pseudo-percussion sounds with just about any source. The slight variations in pitch with this setting emulate the pitch changes from striking a stretched drumskin with greater/lesser force.

Of course, I don't have to tell you what automating this Keytrk control would do for you, but AFAIK, it's unavailable (or I can't find it among all the repetition in the DS864's DX Automation). If you could, you'd have a variety of patterns at your fingertips, perhaps sweeping some exotic scales before dropping back to the "correct" pitches, or breaking back to that 3 cents/key setting for a drum fill before returning to pitch. Hope that this gets hooked up in the next version, but I've got bigger fish to fry here. Read this year-old thread and it's contained link for the promise of some fixes in the future versions of the DS864. [The future is now; or, at least this April ...]

I also included a track patch version of the Microtonal.dp8. It has a Tempo Delay added for a subtle shuffle, and that's followed by a disabled ModFilter plugin, which adds some sample and hold effects to this mix when enabled. Both versions also have LFO2 disabled by default. That adds a delayed vibrato when enabled which sounds great in a pattern with a mix of staccato & legato phrases. I left it out because it sounds too "Korn-ish" when playing live from the KB. Feel free to shift these around.



Is that it? Well, I added another pattern to illustrate a "bonus" technique. It's the same Microtonal pattern, with three more copies added 1/32nd note apart, and it's called the Microtonal Velocity Echo.ptn. I used an old MIDI trick to add an echo to the original pattern. [If you're previewing with the track patch version, disable the Tempo Delay in the Audio FX bin.] So why not just add a VST? Because with this technique, you have complete control over the volumes of the "original" and each individual "echo". You can bloom an echo to get louder with each echo, or randomize the volumes for some unheard-of combinations.

Here's how I built it: Load the original Microtonal.ptn into PSeq, and Ctrl+A to select all. Adjust the velocity of the selection now by (carefully) left-clicking on any selected note with the Automation Tool (near the top of the note) to get the "wavy-lines" icon. Copy the entire pattern & velocity. Set the Snap to Grid to 1/32nd, and double-click in the timeline to bring the yellow drop marker ahead one 32nd note. Paste your clipboard contents there, and again adjust the velocity while the pasted copy is still selected. Repeat this process for as many MIDI echoes as you wish, and adjust the velocity each time for the whole copy, while moving the marker ahead one note increment. You'll end up with a "delay line" with customized echo volumes.

You have to be careful with this, as it's easy to de-select a copy, or mix up tools in the process. You can just as easily duplicate a pattern, save it a few times under different names with altered velocities, and then drag & drop the saved "echoes" onto the master pattern. I wanted to present both approaches to the technique, with the first way being faster, once you get used to it.

I hope that this microtonal exploration (and its nested MIDI Echo tutorial) gives you some food for thought for your next project. As always, have fun with it ... [Title edited to better reflect the contents.]

## X-Treme SFX 8 [MFX Real-Time Harmonizer]

This should rightly be called X-Treme SFX 6 [Echo Delay ... with MFX Part II], as it picks up where that tutorial left off. It's funny; I always start to write about another subject, then get side-tracked and end up elsewhere. This is one of those cases:

I was looking for a way to easily produce octave-doubling in Project5, and landed again at the Echo Delay MIDI FX plugin. Yeah, I know that it's a delay unit, but the key here is to set the delay to the smallest increment that you can, and choose only a single Echo. And that would be using the MIDI Ticks setting in the Delay Units. MIDI Ticks used to represent a clock tick sent every 10 milliseconds [strictly time-based], but common usage has it equivalent to PPQN [Pulses Per Quarter Note]. In Project5, there are 960 MIDI Ticks for each quarter note beat. That's a pretty fine MIDI resolution, and can be verified by the last number in the Measures:Beats:Ticks readings in the BPM display. You can also verify this using your Echo Delay BPM/Time/Ticks "calculator". Note that this 'calculation' is independent of tempo settings. Set your Delay Units to Notes, and the Delay to 1/4 note. Now flip the Delay Units to MIDI Ticks, and a value of 960 appears.

So what's this got to do with real-time harmony? If you have a tempo of 130, one MIDI Tick is equal to 1/960 of a quarter note. In this case, that would take 462 milliseconds to complete. So, 462/960 is equal to less than one-half of a millisecond; virtually instantaneous. This is much faster than your brain can register, and better than any soundcard latency figure. Even at a medium-slow tempo of 100 BPM, the figure only rises to .625 milliseconds; well within acceptable levels. So, if we set the Delay in the Echo Delay MFX to 1 MIDI Tick, we can manipulate the Transpose settings in real-time. For now, set the Transpose toggle to Chromatic; it's much more predictable for this application. You can set up multiple instances of the plugin to add thirds, fifths, octaves, or any interval [within the limits of +/- one octave, and all the notes are played quickly enough to appear to be simultaneous. One fingered note can be octave-doubled, for example, and by adding just two or three repeats in the Echoes setting, will span the entire range of your keyboard. Of course, you can also set up one-finger chord shapes, and a variety of other stranger effects to boot.

Remember, though, that these settings are additive, as we've placed several instances of the MFX in series in the MIDI FX bin. I had thought that there was a better way when using a multi-output synthesizer, but that won't happen. The MIDI FX work on the input end of a synth, and persist through different output selections. IOW, you only have one MIDI FX bin in the DS864, although there are 8 Audio FX bins; one for each output. That does limit things to a certain extent. If you have two instances of the Echo Delay loaded, and they're set to 3 and 7 [a minor third and a perfect fifth], the first instance will add the third to the original note, but the second instance will add a fifth to the original note and the minor third, resulting in a minor seventh chord. When you get into anything exotic beyond octaves, fourths, and fifths, you'll have to do some careful planning of the results. Switch around the order of your transposed instances in the MIDI FX bin, and adjust your settings by small shifts for the most pleasing results. There's also positive and negative directions to consider. A +12 and a -12 setting in two instances will play

nice with one Echo, but when you start adding multiple echoes [even at this short of an increment], the plugs will add the octave shifts in both directions until MIDI runs out of note range.

But you can use that to your advantage. Increase the MIDI Tick setting for each instance by a few ticks, and you can create some [delay] doubling effects, and achieve some separation between octave 'instruments'. By slowly increasing the number of MIDI Ticks and the number of Echoes, you can actually change the timbre of the instrument that you're playing through the MFX. With very small MIDI Tick values [use the + and - on the MFX for fine incremental changes], but extreme Echo settings [up to 50], you'll swear that you hear Mario Bros. effects. Octave settings with short MIDI Tick values will sharpen the attack portion of your instrument. There's a huge number of different FX here, and the best part is that they can be applied to any instrument.

Of course, you're not limited to consonant intervals. A +1 and -1 setting in series gives you ambiguous note-clusters; a few MIDI Ticks along with an instance with several hundred ticks will give you some red-alert sweeps; positive combined with negative settings, along with large Echo and Delay values will smear you all over the map. Changing the Transpose toggle to Diatonic will get some incredible (if dissonant) results very quickly. Just remember to load at least a couple of Echo Delay MFX, start with small MIDI Tick and Echoes values, pick some Transpose settings, and work your way up from there. There's a lot of discovery to be had in this very simple setup. Have fun with this ...

Edit: The (inevitable) edits begin ... Note that you can use the MIDI Ticks setting to produce much finer Note increments than are available with 'normal' means. The lowest increment of 1/32 note is equal to 120 MIDI Ticks, but with an entry of 60 ticks, you get sync'ed 1/64th notes, or 128th or 256th notes with values of 30 or 15 ticks, respectively. Anyone for some BT-style granular editing for stutters & glitching?

## **X-Treme SFX 9 [Effects Source Morphing]**

I didn't scare you off with that subject line, did I? Good. This trick has been around since the analog tape days, but now it's much more versatile in the digital domain, and is especially well-suited to Project5. Originally, an enterprising engineer might record an instrument track through an FX unit at 100% wet. All that would be printed was the resulting FX sound, which would then be mixed with a matching note-for-note line from a completely different instrument. The result? The new instrument would cut through clearly in the mix, followed by only the trailing ambience of the original instrument. Time-based effects [delay/reverb/flanging] were most often employed, as they allow the ear to perceive the separation between the original signal and the out-of-place effect.

This is still a viable technique in a DAW; in fact, it's much easier. Record a .wav at 100% wet from one instrument/effect chain, and mix it to a unique dry signal. But the flaw is that if you decide to significantly change even one note of either track, you have to start the process over. Project5 circumvents that problem by virtue of its pattern-based recording, but this method can also be employed with live controller input, and by using multiple output synths.

In that scenario, you would load an instrument [say, the default Rhodes patch in the DS864] in a track. Load a second layer [for example, the Violins sound] and point it to Output 2. Insert the StudioVerb 2 with, say, the Taj Mahal preset in the second output, and crank the Mix knob to 100% wet [1.00]. The electric piano sounds, and it's 'echoed' by ambient violins. If you also crank the Predelay setting in the 'Verb, you'll gain a lot of separation, with the bonus of having the ability to echo or not with staccato/legato playing. Experiment with this one: flute with choir ambience, or just about anything followed by piano echoes; the sky's the limit.

You can also use different synths in adjacent tracks, and Ctrl-Click them both on the MIDI Override buttons. Now anything that you play on your keyboard will be played with one timbre on one track, and echoed on the other track with a completely differing sound. Arm both tracks, and record away into some 'live' Tracker patterns. It'll all get captured, and later on can be edited, if necessary. The use of MIDI channels will also come into play, as you can separate the two synths to different channels, and either control them from your KB, or from patterns loaded to the tracks with unique MIDI channels. More on this one later.

As I said earlier, the time-based effects work best, but don't limit yourself to that. Insert a Tempo Delay set at a short delay and 100% wet ahead of any other effect on the second instance. You can pull off things like a chopped vocal line in Cyclone doubled and delayed with a phase-drenched pad from PSYN. And here's another possibility (especially good in multi-out synths): setup one synth/delay at 1/4 note delay; the next at 1/2 note; the next at a full measure., etc. Your original notes can be followed by a PSYN/Spectral Transformer echo; which is followed by a Velocity/Modfilter echo, and so on. They'll all be different, and in time with your tempo setting. Just remember: always 100% wet. That's the key.

But the pattern characteristics in P-Seq really open this technique up. Load up two tracks of synths, as was described above. They can be the same one of different synths, with one of them having a time-based effect at 100% wet. Program a pattern in P-Seq, and Send to Track the same pattern to each one. Now you can edit that one pattern to your heart's desire [the changes are reflected throughout], and always have the source-morphed effect at your disposal for playback. Old-school engineers would've given anything to have this ability.

Now I'm going to take this technique one step further to territory that'd be much more difficult, if not impossible, to reproduce on an application other than Project5. [I hate this! I'm giving away some of my best 'secrets'. <g>] OK, here goes: Insert one instance of the Velocity drum [?] sampler, and load the Acoustic set in it for simplicity's sake. Clone Velocity to a second track, and load the StudioVerb2 in the Audio FX bin. Pick a shorter ambient preset like the Plate, Bright and set the Mix to 1.00. You may want to tweak the Decay time a bit.

Now select/click on every pad in the second instance of Velocity, and enable the Reverse button for each one in the Sample Edit Controls. You may need to tweak the length of the now-reversed pad sounds using the Start and End knobs for each pad [still in the SEC]. The reason is that with the samples reversed, some of the longer decays [cymbals, etc.] will take too long to build up to an audible level. [One trick that helps while auditioning the reverses is to click and hold on each pad until the drum sound comes through.] You can get some great variations of effect with these knobs, as well. What you now have is a reversed echo for each drum sound to follow the original hit. It sounds awesome with the short 'verb buildup, but you can even do away with that effect if you like. The resulting sound of a drum hit/reverse will stand on its own merit.

But wait, there's more: We're going to do the 'impossible' using pattern copies. What if you want that classic 'reverse echo' sound that precedes the drum hit? No need now to flop around some reel-to-reel tapes. Instead, create an appropriate pattern in P-Seq for a Velocity phrase. Send that to the first dry instance. Now Duplicate the pattern, and rename it to something like Pre-Echo. Send that one to the second Velocity: the one with the reversed samples.

Because we are attempting 'time travel into the past', you'll need to do something with the first few notes of the copied pattern. Select and Delete them, or, better still, move them the same spot that's exactly one measure ahead of your current copied pattern. That'll make space to move the pattern 'back in time'. Select all of the notes in the pattern, taking care to include the recently moved notes. Set a fairly fine interval in P-Seq's Snap To Grid settings, and begin playing back the patterns in the Tracker. Using the Left and Right arrow keys [Qwerty], gently nudge the copied pattern back & forth in time until you hear the 'sweet spot'. You'll hear it right away: the reversed drum sound will build to a crescendo, and signal the 'crack' of the forward drum sample that follows it a split-second later.

Now for the adventurous: While all of the notes are still selected, start using the Qwerty Up & Down keys as well. The reversed echoes will get 're-mapped' to new drum sounds in a pseudo-random fashion. You'll get echoes from different drum pads that reverse and swirl around the original pattern, but in a manner that's consistent with the original timing and tempo; only offset in varying degrees. You can easily end up with dozens of different drum patterns using this one technique alone, and it's simple to implement. The longer the pattern; the more variations available (and often, the better results).

I promise you that's the last time that I'll refer to Velocity as a drum sampler, because it's much more than that. But it provided for a prime illustration of the possibilities of using source-morphed effects. In closing, I'd like to add that you should use audio time-based FX for this, and avoid the MFX types. Because those are based on MIDI math, (as a rule) those effects won't allow for dropping the original note off. Without 100% wet (or the equivalent) the effect loses too much. Of course, there are avenues to explore using this technique in the Aux busses, but we'll save that for some further explorations. As always, have fun with this ...

## X-Treme SFX 10 [Modular Multi-Tap Delay]

This tutorial borrows from mainly the same principles as the last one [Effects Source Morphing]: audio time-based effects, and 100% wet is the key. But we're going to use multiple delay instances and the routing features in project5 to create a customizable multi-tap delay unit with a massive sound and some unique options. There are a lot of ways to create echo effects in Project5, and we've touched upon a few of those in previous installments using MIDI FX ([Echo Delay ... with MFX?]) and pattern shifting [Microtonal DS864 & MIDI Echo], but this time let's concentrate on using strictly audio delay effects as a performance device.

Experimental performers have been doing this for years in just about any genre that you can think of; from rock to classical treatments. They've used everything from echoed melodic lines with similar instruments to tape loops, real physical space, tape delays, and DDLs. In effect, you're creating a round: a composition for two or more voices in which each voice enters at a different time with the same melody. An alternate description would be a perpetual canon that returns to its beginning in which all the voices enter at the unison or the octave. I suppose that we are also using ostinati, which are melodies, chord progressions, or a bass figures that are repeated over and over as an accompaniment.

In Project5, though, we can use a modular approach. The signal path in P5 goes like this: A track has it's own Audio FX Bin in series with it's output(s). These output(s) go directly into the Master Bus, which has it's own FX Bin in series. But the track/synth output(s) are also split off in parallel to the four Auxiliary Busses. So what happens if we load a delay line in each component of the path? Magical effects! First off; let's make one rule: Parallel modules should be at 100% wet; that is with the Mix knob fully clockwise. The Series components should have at least some of the original notes allowed through, so the the Mix knob should be some percentage less than 100%. Use 50/50 as a starting point, as to not block out your original 'dry' notes. OK? Let's dig in.

The easiest way to start is to load a delay plugin into the track, adjust your settings, and then Copy it to the Audio FX Bin's clipboard. Then go to each one of the other components, paste the delay 'template', and make whatever unique adjustments you need to there, on a case-by-case basis. It's helpful to maximize each GUI afterward, and stack them all up in order, for ease of programming. It's very easy to get confused when you have 6 or 12 delay lines going. Consider this your programming session, save the presets, and then close out all the clutter when you're ready to play.

Start with something simple, like the Slapback 1 Measure preset in the Tempo Delay, and maybe a non-sustaining patch for now, like the default Rhodes in the DS864 sampler. Click on all four "LEDs" in the Mix section to enable A1 through A4 for the DS track. Leave the track delay at 50% dry/wet, and the Feedback knob at 0. Things can get out of hand very quickly with this setup, so start with minimal Feedback settings, and work your way up slowly from that. Copy that plugin in the FX Bin, and press "M" to switch to the Mains.

Now click on each of the Aux fader sections to highlight the "focus", and paste a Tempo Delay into each one. In the four Auxes, we're now using parallel modules, so set the Mix knob in all four to 100% wet. In turn, change the Tempo Sync control to 1, 2, 4, and 8 beats in a progression from Aux to Aux. Paste one final instance into the FX Bin of the Master Bus, leaving the Mix at 50/50, but changing the Tempo Sync to 16 [four measures]. I'm going to make an exception, and have you turn up the Feedback in the Master to 20; just for demonstration purposes. Now play around with a few of your favorites patterns or keyboard licks.

As you can see, with a little proper timing, you can play along with previous delayed lines, and create some rather large "ensembles". Speaking of which, switch the Rhodes preset to the Choir.dp8, and listen to some choral music that's composed on-the-fly. Or load up the Violins.dp8, and create some massive tone poems. The more rapidly you enter your notes, the more complex and 'busy' the accompaniment becomes, so be sure to mix it up with some variations in legato and staccato phrasing.]

"OK" (you're saying)," but why not just use a multi-delay line like the Deelay and P-Deelay freebies, and do it all with one plugin?" Valid point, but I'll counter with this: Each component module of this multi-tap delay configuration has the ability to chain even more delay lines within its own section. So you can add 2 more instances of the Tempo Delay in A1, for example, and have those loop with even shorter delay intervals within its own group. I hesitate to use the term "nested" for these groups, as they don't truly recirculate the signal back to the head of the chain. But remember that anything earlier in a delay chain here is echoed by every instance further downstream. So you can receive the initial track and echo signal at an Aux, cluster a chain of echoes there, and have something completely different going on in the other 3 Auxes.

There's another reason to do it this way: inserting an unlike effect somewhere in the series-parallel-series structure. You can insert an instance of the Spectral Transformer later in the MMD "timeline", load a Transpose module, and shift only the latter echoes by an octave. Add some LFO from L1 to 'bend' just some of the echoes in pitch. Or add some StudioVerb2 instances to blend together the discrete echoes into a similar ambient 'physical' space. Besides, if you really want to go crazy, take a full-featured multi-tap delay plugin, and substitute that for the Tempo Delay instances.



You still have delay volumes, panning, left/right delays, ping pong, and selective EQ in each segment of the MMD chain. I like to add MIDI Remote Control to the mix, and use some programmable buttons on my controller to mute the Aux echoes and plugin enable [Power] switching to fly the delay components in & out. Or use the KB sliders to bind to the Send knobs in the Mix section, or the Return Sliders in the Mains for some complete control. You can also easily control the entrances and exits of the modules while you're playing. If, for example, you're playing in Am, use the accidental [black keys] on your KB to control the volumes while you perform. Go to MIDI Remote, Learn those five notes into the four Aux & Master Bus volumes or Mutes, and use Velocity as a trigger to mix, or Note On as a momentary toggle switch, or Note On/Off as a latching control. And if you attempt to use Remote Control to alter the Tempo Sync settings in real-time ... I'm warnng ya': you'll quit your day job after hearing the results. I don't even want to go into the possibilities of using a multiple-output synth. Suffice it to say that you can now add grouped echo modules to each output, selectively send those [or not] to one or more Aux Busses, and on out from there. That's a staggering amounts of options.

And speaking of Tempo Sync, you don't really have to be synchorized. In fact, some of the more interesting variations can be found by slightly shifting some of the MMD modules away from strict alignment to the project tempo. But the advantages of Tempo Sync are what sets this apart from other slightly more 'crude' but equally musical methods. If you use a synth that features arpeggios in its patches, you already have those arp'ed notes sync'ed, and you follow that with a flurry of sync'ed echoes from your Modular Multi-tap Delay.

Another advantage of this setup is in having no limits on the Delay Time. At a tempo of 100 BPM, a setting of 16 [four measures] gives you a primary delay length of 9.6 seconds. Add enough instances at 100% wet and a 16 Tempo Sync dialed in, and you'll hear the echo sometime next week. You're only limited by your processing power, and the hit isn't that bad for what you get. On my aging middle-of-the-road DAW, an instance of Z3ta+ with 6-8 active delay lines and a Spectral Transformer instance hovered at about 14%, and never cracked 20%. YMMV, but I deliberately picked some "fuller-figured" plugs to test the delay scheme in real-world conditions.

Hey, what're you worried about, anyway? We've got track freeze, built-in arpeggios, and the Groove Matrix coming right around the corner, but I think that you'll still find this little exercise useful in the future. It's harder to explain than it is to setup, and you can get a massive number of things going on at the same time. There's something very satisfying about accompanying yourself in a musical setting, and it also sharpens your improvisational and metric skills. Great for ambient backgrounds, or algorithmic composition as well. Have fun ...

## **X-Treme SFX 11 [Performance Arp]**

This one marks the end of the 1.5 era, and the beginning of V2. A great deal of the information in earlier installments still applies in V2, and some future tutorials will be backward-compatible, but this one is all V2. Cakewalk's Brandon Ryan has already mentioned automating several parameters in the new Arpeggiator as a way of adding musical variations to the Arp settings. I'm proposing to take that one step further into the area of performance techniques and actual composition using MIDI Remote Control stored in the Device Chain.

Which parameters should you bind to MIDI? Every one of the available ones, if possible. Some are must-haves; other can be sacrificed to conserve physical controls. Remember that you can bind more than one destination to a single MIDI message, so it's often useful to bind two or more parameters to the same 'Learned' input.

I'll first present some scenarios where each automatable control might be used, and then add some situations where combinations of the controls work together for the desired effect. So, bind as many of the Arpeggiator controls that you can to MIDI Remote Control now, and store them in a saved Device Chain. You can also substitute for those settings with automation patterns, or twist the GUI controls while recording.

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**Enabled [On/Off]:** Big deal, right? You won't think that this one is so boring, after you experiment with changing the rest of the parameters "behind the scenes". Toggle it off, quickly change the Octaves and Rate values, and punch in the new sequence. Then punch out, change them again, and punch back in. It's like having several arpeggiators in one, and when you get comfortable with this, the fast changes imply one long melodic line.

**Rate:** Change this remotely, and you can go from "Mario Bros." frequency modulation effects to a catchy riff in one fell swoop. Great for accelerating 'speed riffs' or decelerating mood changes, or simply mixing up the licks on the fly, while maintaining a strict relationship to tempo.

**Octaves:** At 1 octave, you'll hover around your original chord; at 8 octaves, you'll crush your oscillators. With Remote Control, you can flip to either extreme, or anywhere in between. In conjunction with other controllable parameters, you can sound like you're shredding the ivory off of your keys. Don't ignore the possibilities with holding to one octave. That gives you a strong foundation for some of the other settings to catapult from.

**Latch:** You want this one remote-controlled, for sure. It will allow you some sleight-of-hand tricks by continuing a phrase while you're covertly changing the other settings. You can also use it as a compositional device; easily 'pedaling' in & out of a phrase while doing chordal or lead line changes. It gives a natural cadence to the lines, and breaks up the 'arpeggiated' feel to it. As much as I hate to give up the Sustain pedal [CC#64] for this, it's perfect for it. You won't be sustaining many chords using some staccato arp'ed lines anyway, and its use with the Latch quickly becomes second-nature.

**Swing:** Another two-state device: it's on or off. But controlling it remotely will introduce a staggered accent feeling to your phrases, and that will depend upon the settings of the Swing amount set in the Main Control View. Use in conjunction with the Flam Amount to really mix up the timing.

**Velocity:** The Help file states that this control adds to whatever velocity value is in the arp pattern, like an offset control would. I believe that's incorrect. Down to a certain point, there is a velocity response to your arpeggio, dependent on KB velocity input. But at some point, it becomes a static velocity 'master volume' control. This control may add to the value over the default value of 99, but in Remote Control, I just use it as an Expression pedal.

**Gate:** This defaults at 100%, but you can make the arp'ed notes hold longer or shorter than your original input notes. It might be best to use a physical 'pan-type' knob with a center detent for this, or a spring-to-center control like the Pitch Wheel. [The same goes for the Pitch Offset control in the arp.] Very useful for changing the note's durations. An example would be for palm-muting an acoustic guitar patch, mixing choked note attacks with ringing string decays.

**Pitch Offset:** This one is incredible. If you change it remotely with some rapid playing and other 'fast' arp settings, the offset introduces passing tones or completely different scalar runs in the middle of your arpeggiated sequence. This is another must-have Remote control, simply because of its compositional uses. You'll be playing riffs that you've never imagined by controlling this one parameter alone.

**Flam Amount:** This will add a second attack to whatever notes are input. The time between attacks is variable over the throw of the control's values. In a static setting, it's useful, but remotely controlled, its usage extends to drum stick wrist techniques and guitar circle picking.

**Chord Mix:** Use this remotely to fade in your arpeggios gradually, or quickly change up between 'straight' KB chops and the arp'ed accompaniment. You can sometimes substitute a 1 Octave, Rhythms Only setup as a repeated version of adding the original chord. After all, that's what this is: a mix control that adds the 'dry' signal to a default '100% wet' mix.

Shapes: Must-have. I won't go into the details of which shape does what, but if you control this parameter, the order of the arp'ed pattern's notes will be ever-changing, They will, however, remain within the other settings' defined container. You can change the chordal inversions with this, or use it with single-note runs for incredibly convoluted pyrotechnics. Serve with the Pitch Offset, Octaves and Latch for a complete riff-making machine.

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OK, we're already running long, and I could detail a ton of practical applications for this. We'll just start with a couple from the V2 General Tip Jar that might bear repeating:

*Want to push your synth's oscillators to the breaking point? You can select just about any Note Value [try 16ths], but make sure that the Octave Range is maxed at 8, and the algorithm used is Random [playback order of fingered notes; not random pitch values].*

*Right-click on the Latch button, and assign control over to your Sustain pedal [other messages will also do nicely]. Play fairly low on your controller, and the Arp will take over, stretching the limits of your soft-synths until they 'crack' under the applied pressure. Lay in some very active licks, and bring the Latch in & out with your Sustain pedal.*

*Open up any synth and patch, but you can start with something simple like the default Rhodes.dp8 patch in the DS864. Enable the Arp, set the Range to 1 octave, and hit the Latch for continuous preview purposes. You can select any algorithm, but note that the Rhythms Only one is a bit 'brighter' than the others for this situation.*

*Now hit a note, and gradually dial in increased Rate settings. At lower settings, you'll get a repeated 'tremolo'-like single note, but as you pass the 32T setting, the timbre begins to change. At it's most extreme, the 128T setting really mangles the original sound, resembling ring-modulation. This is wild enough alone, but there's more.*

*Since the Rate control is tied to tempo, you can modulate the 'distortion' by using a Tempo Track curve. Leave the setting at 128T, create a one bar loop in the Arrangement Pane, and set the Snap to Grid at a 16th Note. Draw in some 'quantized' tempo curves, taking care to not go too slow [<50 BPM; +/-], and take advantage of the upper 1000 BPM limit. Now playback the one-bar loop, and hit one note [still Latched in the Arp]. Wild sequencer-like pitch and timbre changes that are anything but ordinary, and an infinite amount of sounds, depending on the synth and patch that's input. And you did it with just an arpeggiator and a tempo change.*

Load up Dimension [simply because it's cool] with the E175 Chorused (slide MW) program. Set your Rate=32D notes [at around 100 BPM]; Octaves to 1; Latch=On; and bind your Pitch Offset and Shapes parameters to the same MIDI controller. Hit one note, and listen. Notice that you can control the Velocity of the repeated notes by hitting the same note again at different speed/pressures. Bringing up your Mod Wheel [defined in the Dim patch] introduces a trill, but moving your MIDI Remote Control will send you all over the map with jazz-fusion speed licks.

Keep the same patch, and change the Octaves to 3, but the Rate to Measure. You can un-Latch the Arp for now, but if left alone, you'll get an slow walking bass line as an automatic accompaniment. Play in mid-guitar range, and notice the the long Rate setting takes on almost a 'delay-line' feel to it; but not quite. Bring up the original input notes with a Chord Mix of around 50%, and play some nice overlapping guitar finger-picking. Depending on what you're playing when the Arp "reads" for the next repetition, ghost notes are slid into your phrasing. This is a very subtle use of the Arpeggiator that doesn't sound arp'ed at all. [Wow! Aftertouch vibrato by default in this patch; nice one, Rene!]

OK, just one more: Same patch, but with: Rate=16th notes; 1 Octave; Shapes=As Played Circle; Latch remote-controlled. Hold a pedal tone [a single note] down low, and play some stacatto riffs on the KB, while Latching in & out. Bach for Dummies. [Sorry, Johann: It's just a joke.]

And we haven't even gotten into loading your own .ptn files as algorithms for the Shapes [or adding audio delay lines]. Now go and apply these techniques to your own projects, and don't limit yourself to these few examples shown here. I don't even have to say "Have fun with this ..." this time around; that's a given.

## X-Treme SFX 12 [Invisible (After)Touch]

Here are the facts: Project5 V2.0 records channel aftertouch MIDI messages to a pattern or the Arrangement Pane. You can't see them; you can't edit them in automation, but they're there nonetheless. And not just a few occasional snapshots. Aftertouch generates a continuous stream of MIDI events for as long as the pressure is applied. Whether you consider this a bug or an undocumented feature depends on your point of view. Let's see if I can't win you over to my side:

We're dealing with channel aftertouch here, not polyphonic aftertouch. For more information on the differences, check out these two links:

<http://www.record-producer.com/learn.cfm?a=2443>  
<http://www.borg.com/~jglatt/tutr/touch.htm>

P5 may well record poly AT as well; I don't know. I've only been fortunate enough to play a KB like that a few times before. If you get the chance to play a CS-80, a vintage Sequential Circuits Prophet, or a Roland A80 controller, jump on it. Indescribably beautiful response, and an extremely heavy load for the MIDI stream to carry. <http://www.proav.de/index.html?http&&www.proav.de/midi/miditable.html> will show you why: You've got to keep track of 128 values for each of the MIDI notes played.

If you don't have a controller that generates channel aftertouch from the KB, you won't be *directly* affected. But you still may be able to utilize some of this information anyway. For example, Oxygen8 owners can program the Data Slider to produce aftertouch messages with a great deal of fine control. If you do have aftertouch, along with Sonar, you can easily export the pattern to that app, and open the Event List or Piano Roll to modify, edit, or delete the aftertouch data there. With enough perseverance, you can change the MIDI messages into something that P5 can see, and import the pattern [.mid] back in. But the whole purpose of this tutorial is to show some techniques for detecting, modifying, and utilizing the aftertouch [AT] within V2 itself.

Much like the sciences, we're going to use behavioral analysis to establish proof and manipulate the properties of something that can't be seen directly. Use a program from Dimension: Most all of them utilize AT to modulate some parameter, and all program patches can be made to do so in Dimension's MIDI Matrix. Record a pattern in the Editor, taking care to exert enough pressure on the keys to generate AT. Now use a quick *glissando* on the Editor's GUI keyboard to select only the notes values in the pattern. Right-click on those, and Cut them from the pattern. Now use Ctrl+A to select all of the remaining events [the "unseen" AT].

Now right-click again. The fact that you can now Cut/Copy/Delete the selection shows that there's something in there. If you choose Delete, then go to the Edit/Undo menu, you'll even see exactly how many AT events were deleted from the pattern [usually hundreds]. You've now separated the AT messages from the notes in the pattern, and can Copy the events to Paste elsewhere, or duplicate the pattern. If you'd like the AT gone for good, just Cut the notes as above, Ctrl+A to select the AT, Delete the AT, and Paste the notes back into the pattern. Instant house-keeping!

With the AT events selected, you can Quantize the aftertouch, but not Retrograde it. [Don't know why; it just doesn't.] But incredibly, you can move it with the arrow keys! With careful Snap to Grid settings, and key-press counts, you can move the aftertouch events to anywhere in the pattern. The Up & Down arrows don't seem to change the values, though. [I have a reinforced respect now for the visually-impaired.]

So what good is this? As mentioned Dimension uses the aftertouch messages, and so does the DS864, along with many other third-party synths [Z3ta+, for one]. By separating the AT messages from the pattern (and from the companion notes), you now have an independent control source. Paste those events into another new pattern, and record some new notes over the top. The notes and AT no longer have to co-incide in the timeline, opening up a world of possibilities.

Create some patterns just for the AT control and timing, delete the 'proxy' notes, then use that as automation on some differently timed note/patterns. Or you can Cut the aftertouch from a pattern that produces vibrato in a Dimension patch [like the Guitars], then paste it for use as a per-note pitch bend controller in the DS864. Go to an LFO, leave the Depth down, max out the Aft, and select Pitch as a destination. Try it on the default Rhodes: The pitchbends don't necessarily have to align with your new KB input, so some really unusual timings results. You'd be hard-pressed to produce these results in any other way.

Some of the free MFX plugins at TenCrazy ( <http://www.tencrazy.com/> ) are specifically geared for aftertouch [the plugins are here: <http://www.tencrazy.com/gadgets/mfx/> ]. Two of note are the MFX CCMaP and the MFX Control Cascade. The former allows you to convert AT to other continuous controllers. You can shape the 'envelope' of each note with aftertouch converted to CC#11 [Expression], for example. Sounds as a guitarist would, fading in with a volume pedal. The latter gives you a way to use aftertouch to modify another message's values, like the Mod Wheel. [That Markleford Friedman is one sharp cookie (and fast, too!).]

Aftertouch is perhaps the most natural and expressive method of control that you have at your disposal. Think about it: It's one of only two [the other being velocity] MIDI messages that allows you to produce emotional nuances in your synth without ever leaving the black & whites. It most often used to control depth of vibrato, but filter cutoff, pitch, amplitude, and FX depth/parameters are fertile ground to explore.

Now we look for Poly Aftertouch to come of age. It's data-intensive, and it's difficult and expensive to implement in hardware. But we want it! Firewire can handle it, and Rene's ready [implemented in rgc:audio's products, including z3ta+ and Dimension]. He's just waiting for the rest of the world to catch up ...

**The Inevitable Omission Edit:** The aftertouch messages are actually independent already from the MIDI Note values than timeline along with them. Unfortunately, you have to trigger a MIDI Note On first before the aftertouch values begin to ramp up. Prove this to yourself: In the Track Inspector, set the Note Filters from C0 to C0. Only one MIDI note passes through. Now play some riffs on the KB, and record the results. You can cut to the chase in this way, and record only the aftertouch without having to delete those pesky note values ...



## X-Treme SFX 13 [EZ Harmonized Melodies]

Let's try something different this time around: first, the good stuff, and leave the dry theory for another day:

Open up a synth/track [I'm using the Dual Head guitar program in Dimension], and Create an additional Layer. **Important:** Make sure that at all times the MIDI Override buttons are defeated. Select the second 1.1 layer, and in the Track Inspector, Transpose up to +12 semitones. That's all you really need to octave-double your melodic lines. In V2, you can now choose different Transpose settings for each layer, and that now affects both the patterns in the track and your 'live' KB controller input. This is great if you want your lines to be at parallel intervals, like octaves, fifths, fourths, and any other static interval. Or twelve-string guitars, bass & lead lines, etc. This is just another option, as you can do very much the same thing with the MFX plugins: Echo Delay and several modes of the Transpose plugin. You can also Transpose a pattern in the Editor independently.

But what if you want truly harmonized melodic lines, restricted to intervals within one scale, or even polychordal or polyharmonic lines [containing two or more distinct scales]? Here's another cool feature of the Track Layers: You can load a different chain of MIDI FX plugins in the main track or any of its layers. Reset Track 1.1's Transpose to zero. Click on Add MFX, and select the Transpose plugin. Choose Key/Scale as the Transposition Method.

Now it's decision-time. Choose your root note of the scale that you're playing in the **From** section. Choose the harmony interval that you desire in the **To** section. If you're playing in **C**, and you want a fifth above that, select **G** in the **To** section. Now for the scales themselves. Concentrate on the first seven choices in the dropdown ('natural' modes) and leave the others ('synthetic' modes & world music scales) alone for now. If you're playing **C major**, choose the **Ionian** mode in the **From**, and the **Mixolydian** mode in the **To** section. Now all of your lines [KB and patterns] will be harmonized perfectly (at or around a perfect fifth apart), constrained within the major scale. [Note: The complimentary minor scale would be **A(minor) Aeolian**.]

Would you rather try a major third? Set it up as above, but change the **To** section to **E** with the **Phrygian** mode as a scale. The best part about this procedure is that it's easy to harmonize existing patterns. Load the original pattern into the main Track 1, and Ctrl+click and drag a copy to the Track Layer 1.1. Instant harmonized melodies!

Now if you want that to sound more like a double-track of two distinct instruments, you'll need to gain some separation between the parts. Unfortunately, you can't just tack on an audio delay at 100% wet to one of the layers and fake it; not even with an Aux. The Track Layers are divisions of one actual track, which shares the same output and Audio FX chain. You can take some other paths, though.

One method is to disable the Snap To Grid and gently nudge one of the harmonized patterns off of timeline sync with the other with the left & right arrow keys. You can do this in the Arrangement Pane and see the results, but the Editor zooms in for a bit more accuracy. Either way: Don't nudge too much. You can preview the harmonies together and shift the timing of the selected pattern while you listen to it. You'll know when you've hit the "sweet spot". The results are even more realistic if you select small sections of each pattern, and nudge them *ever-so-slightly* in either direction. Then repeat the procedure with other small selected divisions.

Another method of separation can be done by adding more MFX. You can add an Echo Delay in either track and set it to 1-30 milliseconds at a single Echo. That'll fatten it up just a bit. Experiment with the Swing timing and the Decay percentage for more variation. The MIDI FX Velocity can add a degree of randomization to your notes, and the Tendency setting there can make your harmonized line generally louder or softer than the original tonic line.

You can gain a clue on harmonizing in any key at any interval by realizing that the first seven listed modes are in a cycle. Find your root key, and add up the desired interval by counting through the modes. If you go past 7, cycle back to Ionian, and continue counting. Here's a quick link ( <http://www.banjolin.supanet.com/modesandscales.htm> ) with some charts to help you get started.

For those of you considering polyharmonic lines ... well, I probably don't have to explain that procedure to you. You've already escaped what Bela Bartok called "the tyrannical rule of the major-minor keys", and need no further explanation. I'll just say that Project5 is **made** for generating multiple scalar melodic lines and polychords, and its applications extend beyond 20th-century "contemporary" music to modern genres, like hip-hop, industrial, and electronic [if not electronica] music. Now go in harmony ... <g>

**Omission Edit (surprised?):** Although the title of the tutorial is [EZ Harmonized Melodies], don't let this dissuade you from trying chordal input. You get some really complex chord shapes by inputting simple triads and inversions. Adding additional layers and harmonies to the original track and layer lead to larger chords and more complexity. If you're enterprising enough, you can invert the harmonies with a Custom Map setting in the MFX Transpose plugin, and be treated to simultaneous ascending & descending lines. Then save your work as a preset within the MFX for use later on. Have fun ...

**Edit: And yet, even stranger things have now come to the surface with this setup:** I wasn't confident in the presented music theory structure; something weird happening with the major/minor sevenths. It's been a *long* time since I formally studied any theory, so I was uncertain that the presentation was sound.

So I started toying around with the straight Transpose function in the Track Inspector, while maintaining the harmonized structure detailed above. My idea was to 'hard-transpose' up in the original track to match the harmony layer, and see what shakes out. The results are fascinating: Some of the notes come out in a beautifully imperfect unison; some are a full semitone off; others appear to drift a quarter-tone or so. It's either my theoretical mis-steps, enharmonic errors, or an algorithm straining at the seams. Personally, it doesn't matter which one it is ...

Who cares about the theory? This new discovery is deliciously consonant and slightly dissonant in an alternating manner; depending on the scales, track transposition, and note played. Equally good & nasty results can be had by 'straight-Transposing' the Track Layer 1.1 down to match the original root [tonic] note. Controlled chaos; you have to hear it to appreciate the extreme 'mood swings' between unison and "anarchy".

Here's the next amazing discovery: Evidently, the Arpeggiator scans each layer first before looping back to the start point in its selected algorithm. If you have two notes harmonized in layers (as above), and switch on the default Arp 'preset', a single note will produce **four** arp'ed note events. In the example above, a Track at the tonic **C** with a layer at **G** will produce **C**, **G**, then **C & G** one octave higher. If you add another layer at **E**, six notes will be produced [two triads; repeated an octave higher) for each note fingered.

You get a huge amount of arpeggiated notes out of some simple four-note chords, with the simplest of algorithms. And each one of those notes are constrained to the proper scales. Now for the really crazy stuff: Playback a pattern that's been duplicated in each layer, and stretched out over a few dozen bars in the Arrange pane. Enable the Arp, and arm for recording in each of the Track Layers. Proceed to record your live keyboard input played over those patterns, all of which are going through the Arpeggiator. Record that long pattern in the Arrange pane and ... Groove Matrix? What's a Groove Matrix ...? [j/k]

## **X-Treme SFX 14 [Reserved About the MIDI Matrix]**

**The MIDI Matrix parameters [Source, Destination, Depth and Smooth] in Dimension are all automatable, and by logical extension, controllable under MIDI Remote Control.**

**Got your attention? Read on ...**  
[Cheaters: Skip to the bottom.]

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Dimension's MIDI matrix is an extension of the functionality of this great sample-synth, for those who want a little more control over the front line parameters. Access the floating window by that third icon [MIDI DIN-socket] that's next to the current Program readout. It offers a variety of Sources that can be routed to control an even larger number of Destinations. The Sources are MIDI-related, but with the addition of some unusual twists. The Destinations list most all of controls in the GUI itself. It boils down to this: select a Source to be able to change any parameter [Destination] in Dimension from some MIDI message or behavior generated by your KB controller.

The Depth control regulates the maximum value that can be addressed by the Source, and varies, depending on the Destination chosen. It can have a positive or negative value, which changes the direction of the action taken. As an example, a Depth setting of +2400 with a Pitch Destination has a maximum range of 2 octaves [24 semitones, or 2400 "cents"] above the note value input. A -2400 Depth goes two octaves downward.

The Smooth parameter changes the shape of the "curve" that you're sending in variable amounts, rounding out any linear input. Experiment with this setting to fine-tune the way that a Destination goes from A to B. Think of it like Portamento Time on an oscillator: The higher the Smooth value; the longer it will take for a Source input to reach the maximum set in the Depth parameter.

These two parameters, along with the Destinations, are fairly self-explanatory. If need be, I'll go through these later. The only unusual (and undocumented) ones might be the Sample Offset and Sample Delay Destinations, and even those terms are descriptive of their usage. But I will spend a little time with the Sources, as that usually requires the most attention.

Set yourself up a simple testing platform: Open Dimension, click on the empty multi-sample slot, and load in something like the zeta-resampled.wav [Wavetable] sample. Float the MIDI Matrix, and choose Pitch 1 for the Destination. That makes it easy to hear what's going on. Bump up the Depth setting to something over a semitone [+/-100] or more, and don't forget to add some "lag" or "slew" with the Smooth parameter on occasion; just to hear the differences that ensue. Then run through the Sources column to check out the types. Remember: some of the Sources may not be available from your controller, but others only need a Note On input. Now here's the Sources:

**CC 1-127:** These are the usual MIDI continuous controllers. You can use any one that your controller will transmit, but be aware that there are some conventions that most manufacturers and users adhere to. Things like CC#1 as the Mod Wheel, and CC#10 as Master Volume. You should also stay away from using certain messages like the Channel Mode messages from 120-127, or those involved with xRPNs. For some insight into common usage, check out this chart ( <http://www.midi.org/about-midi/table3.shtml> ) at the MMA ( <http://www.midi.org/> ).

**Pitch Bend:** This parameter is important enough to music-making to get its own category. This is a high-resolution control with well over 16,000 increments, as opposed to the usual 128 values in a continuous controller. The main PB range is set in the Sample Edit controls in the GUI, but you can also use your PB wheel to control (and override) Pitch (and any other Destination) in the MIDI Matrix. This one goes both above & below a central "snap-back" value.

**Channel [and Polyphonic] Aftertouch:** This one was pretty much covered in X-Treme SFX 12 [Invisible (After)Touch]. Either your KB has it, or it doesn't. If it does, use it. These Sources are arguably the most naturally expressive controls that you have at your disposal.

**Velocity:** You know what this is. It's actually a MIDI trick: your brain thinks that you are hitting the keys "harder"; you're actually just hitting them "faster". The Destinations know the difference, and respond in varying degrees to the "speed" that you hit your black & whites.

**Release Velocity:** KB-specific. It will respond to how quickly that you *release* your KB keys, but don't drive yourself crazy trying to get some response out of this one. You've got the functionality, or you don't.

**Keyboard:** Now here's an interesting Source. This one will "map" the Depth setting over the entire span of 128 MIDI Note Ons across your keyboard. If you're sending to Pitch, you'll gradually add a small amount of Pitch shift to each ascending key. It starts at a minimum at C0, and reaches the maximum Depth at G10. You can also invert the response with a negative number. Great for just about everything, including opening up the filters across the KB to emulate increasing brightness and harmonic content in acoustic instruments. Good one for subtle uses as well.

**Keyboard Gate:** This keeps the Source open when *any* Note On is pressed on your KB, and drops off when *all* notes are released. There's some uses for this parameter, but it might not be your "go-to" Source.

**Random Unipolar and Random Bipolar:** My favorites: The first one generates a random value in a single direction only, as referenced to your Depth setting. The second one will base its result on a random seed on both sides of your Depth setting. What comes to mind is easy sample & hold [filter and/or pitch], but these have a thousand uses, including tiny random Pitch deviations that suggest unstable analog oscillators.

**Alternate:** Get to know this one. It will switch between a Depth setting of zero, and your maximum Depth setting with successive Note Ons. Set it to a Pitch value of 200, and a quickly repeated single Note On will produce trills or a hammer-on. This is another one with 1000 uses. Just try in with the Arpeggiator on, and you'll see what I mean.

Remember that you can control many Destinations using the same Source, or use a lot of Sources to modify a single Destination. The Dimension sample synth is *very* deep. The MIDI Matrix takes it even deeper. Now let's see if we can break through some boundaries, and dive *deeper still* into the Unknown ...

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Now here's the real news: Open up the MIDI Matrix, and highlight one of the parameters [Source; Destination; Depth; Smooth] in the floating window. Note that you can adjust these values in a variety of ways: using the mouse scroll wheel, R- & L-clicking, or the arrow keys. Now arm the Dimension Track for recording, and either hit Record in the Editor, or the Arrange pane. While it's recording, adjust the highlighted parameter in the MIDI matrix. It doesn't matter what you input; just get a curve going in there. Now stop recording, go to the Automation dropdown, and look under the In Use section.

You will have a curve labeled "Reserved". Each of the four parameter types in the MIDI Matrix generates a different "Reserved" curve, which you can edit later to produce any combination of Sources to Destinations, Depths and Smoothing. And you can change to any combination of these "on-the-fly" at any Snap To Grid setting, and edit the results as you would any other automation curve. This opens up a *staggering* amount of possible directions. You could, for example, switch from an Aftertouch vibrato to a velocity-sensitive pitch bend in an instant; all in one automation curve.

So where do these "Reserved" parameters live? They're *somewhere* in the DXi Automation dropdowns, living amongst almost 400 of its closest friends; all "Reserved" look-alikes. If I ever get really bored with life, I'll try tracking them down one-by-one to see if I happen to stumble on the right combination. I tried to do this half-heartedly, but became quickly discouraged. I'd be better off begging & pleading with Rene [bribing? Zima, anyone?] to front me a chart of what all the Reserved parameters correspond to, or *at least* the locations of these four.

I can understand that this might be proprietary information, and "reserved" for future implementations of the Dimension. But if one could locate exactly where a particular "Reserved" parameter hides, then there's no reason to think that you couldn't control any of the MIDI Matrix parameters themselves under MIDI Remote Control. Think of it: use a MIDI CC message to choose *any other* MIDI CC message as the Source. Or use velocity in the MRC to fly among the Destinations under fingertip control.

But that'll come later. In the meantime, once you've established a set of four "Reserved" curves in automation, you can tweak each curve to exactly control the MIDI Matrix parameter changes, and that's good enough. You just need to keep track of which of the four corresponds to what Matrix parameter, and you can gain clues by their differing curve shapes. Besides, playing back a curve automatically previews the results in the MIDI Matrix (which conveniently stays "always on top"), and quickly reveals what's what. You just can't get much deeper than this one ...

**Edit:** Not too much news to report on the "Reserved" front. I did get the Mode parameter in the Sample Edit controls to generate a Reserved automation curve. It's a switch: values greater than 63 change the setting to 32b loading mode; anything under switches to 16-bit. That's not too useful in an automation sense, but perhaps I'm just not thinking this through enough.

What I did find interesting is that moving the *nodes* in any of the EGs generated an 'invisible' Reserved curve. I couldn't find any values in it, and playing back the curves did not animate the nodes. But this gives you a glimpse into how far ahead Rene is thinking with this sample synth's implementation. Can you imagine what you can come up with in a synth whose envelope generator's nodal points can be automated in two planes [time and value] simultaneously? I'd have to 'reserve' a month's time just to scratch the surface of the potential. So *that's* what a lot of those parameters are "Reserved" for. Coming soon to a Dimension near you ...

I did neglect to mention the fantastic charts available in the Help file for Dimension's parameters. If you ever get stuck, just scan the Parameter Ranges, MIDI Matrix Sources, and MIDI Matrix Destinations charts. (Almost) everything's in there in a row/column format that makes comparisons easy. And you can check out your CPU percentages when planning a new program by referring to the Dimension Resources Usage chart. Keyword "The Sound Elements" into the Search function of the Help file for another very informative page.

But there's one Help file item that I have to take issue with. Here's a quote from the Up/Down Selectors page:

Parameters with numerical values, **not suitable for automation**, are controlled via Up/Down selectors. - *emphasis mine*

Well, I have to respectfully disagree. All of the Up/Down Selectors can generate a curve by manipulating the values while recording, and it's a lot easier than fishing around the DXi Automation menu. The Sample Edit controls, EG parameters, the LFO stuff [even the waveform display!], etc. can all be highlighted [as detailed in the first post], and manipulated during recording to produce automation. Sure, these aren't "hidden" under the "Reserved" cloak, and you can hunt them down in the Automation menus. But it's much simpler to target an exact value using the Selectors manually, then fine-tune the values in the Editor/Arrange Pane later. As with the MIDI matrix parameters, playing back a curve animates the GUI values in the display. You ought to see my Dimension instances: they look like the Colossus computer taking over the global network (from the movie Colossus: The Forbin Project ( <http://www.imdb.com/title/tt0064177/> )).

One more trick to mention: Keep that Ctrl+T shortcut handy, especially in the Arrange Pane, to open up those dedicated automation lanes. I personally keep them all open by default, and scroll through the scores of tracks in some projects with my mouse scroll wheel. I'm automating more than I'm not, and the extended output level indicators remain large enough to be useful. You can always Ctrl+T to shrink them back down for clarity.

OK, gotta go now: I've got some "reservations" made for later on at the Dimension Cafe. I hear that you can be treated to some really exotic dishes if you come in the side entrance, and sneak through the kitchen ...



## X-Treme SFX 15 [Bug Loop Soup]

OK, put away the magnifying glass; this is serious. We're going to have fun with a little bug I discovered in V2 that pops up when automating the Arp. It requires a keyboard controller that transmits true MIDI Note Off messages, and it only shows up with note messages played below G2 (using Project5's note convention). The other requirement is to use a velocity message to trigger the Arpeggiator's Latch function via MIDI Remote Control. The reason for doing so is to add a natural breathing technique to the arpeggiated patterns that can be controlled directly with playing technique.

So how do you find out which flavor of Note Off message your controller features? If you're lucky, you can decipher it from your KB documentation and MIDI Implementation Chart. If not, get some visible feedback from a MIDI monitor app, like Bome's postcardware: SendSX ( <http://www.bome.com/midi/sendsx/> ). Open it up, set the MIDI Input to the device under scrutiny, and play a note on the KB. You'll see a couple of sets of three hexadecimal numbers each. Here's an example of what you might expect to see for a medium-velocity note at middle C:

### Example 1

```
90 3C 57  
80 3C 1A
```

The 90 indicates a MIDI Note On message on MIDI Channel 1 (the zero part). It's been transmitted at the hex equivalent [3C] of middle C [C5, or MIDI Note# 60]. The third number in the set is the velocity value. In this case, it's a velocity of 87 out of 128 possible values. The second string of status bytes shows a Note Off message, indicated by the 8 (Note Off) and the 0 (MIDI Channel = this hex digit +1). It's also at a middle C note value (of course), and has a release velocity of 26. Now you know what that Dimension source is all about in the MIDI Matrix, and not all keyboards feature this. But you'll also see why the velocity messages can't be separated from the note that they ride in on. They're inextricably tied together, although velocity can be copied, and/or used as a source message by MIDI Remote Control (without being "intercepted").

The Note Off message cuts off the companion Note On message; otherwise, a note would drift on forever without any resolution. This has nothing to do with release times on envelope generators, or anything that's synth-specific. It happens the instant that you lift your finger from the KB, and measures the speed in which you do so. You might instead see some messages like the following examples:

### Example 2

```
90 3C 7C  
90 3C 00
```

### **Example 3**

90 3C 7F  
80 3C 40

### **Example 4**

90 3C 40  
90 3C 00

In the second and fourth examples, the manufacturer has chosen to use an alternate version of the MIDI spec. That is, instead of using a Note Off message to stop a note, they've implemented a second MIDI Note On message at a velocity value of zero, which effectively shuts off that companion note before it with one of a velocity that's inaudible. It works well in most cases, and many KBs use this technique. All M-Audio products come to mind.

The third example displays a message from a KB sending a static velocity, like you might use for a drum pattern or a "glue loop" that anchors your composition's background. You'll see that the velocity in Ex. 3 is set here to send a maximum value on each note, and the the shutoff message is set to a velocity of 64. Note that this cutoff velocity value is just over the halfway point in the value range, so anything that was MIDI-controlled by velocity could be "turned on", but not off again. Keyboards that are incapable of velocity-sensitivity are still required to send a Note On message with a static velocity value of 64, or you wouldn't hear anything on the receiving end [Example 4].

OK, so now you know what you're transmitting with your KB. If you have the Note On/Note Off variety, you can now load up any synth into a track and play along with our game here. Any synth will do, but keep in mind that many sample-driven engines won't have the raw material at these extreme KB ranges to work with, so I'd suggest a VA or similar synth with wide range oscillators. Normally, the MIDI-controlled Latch function would latch on with stronger velocities, and release the Latch with a softer note. But ...

### **Recipe for Bug Loop Soup**

- 1).** In your loaded synth track, enable the Arp at default settings, and right-click on Latch. Select Velocity as a source, and OK out.
- 2).** Open up the Editor for some visual feedback, and play any note from G2 downward on your KB. It's got to be live input, not a pattern or the preview keyboard.
- 3).** Listen to the stuck notes play back endlessly. You can keep adding to those in the given range for more complexity, and you'll even see them "stick" in the Editor's keyboard as "blue notes". Add other notes above that range to modulate the evolving "pattern". Triggering the same note keys from your KB or any other device will not stop the latched notes, but it may modify the timbre, depending on the synth patch chosen and it's polyphony settings.

Here's the cool part: All of the Arp parameters are still active, so you can change the Pitch Offset, Shape, Octaves, Rate, and everything else and "play" the stuck loop. It'll persist through patch changes, but not through a Replace Synth action. You're not going to destroy it; even an All Notes Off [Panic] over MIDI only dents the loop, muting it temporarily (as another compositional device). The only general way out is by double-clicking on the CPU meter, or by pressing Play then Stop [double Spacebar] in succession [in this case: effectively the same action]. Unfortunately, this can only be recorded with an outside application, but using something like Sound Forge's Remote mode will capture the moment for use later on as a wavfile.

Since this bug loop inserts itself into the Arp stream, you can play other notes over the top and have those slide in-between successive iterations of the bug loop. If you've got five notes bugging out, it'll carve out 5 slots from your fingered input. Now this is also *tres cool*. Mouse the Transpose slider in your track over it's extreme ranges, and the looping bug travels with it. Incredible sounds result from mashing this loop up against the extreme boundaries of your oscillators. Add some audio effects to the track; you've got a new sound source to play with.

My best guess as to why this happens is that the Note Offs are somehow lost in the Arp or Project5's engine, but why only in this range? I used the Transpose track function to try and work around this thing, but that seems to actually modify the incoming MIDI Note values and shift them to the problematic range. Hey, I'd rather just roll with it. I kept having this anomaly pop up in my compositions, and now I realize it's a direct result of my technique. I treat the octave switches on my two-octave KBs as I would any other note, used as frequently as anything else, and that caused me to dip into the "capture range" in the course of my playing.

Hey, it's not your bread-and-butter technique, but, after all, this is the X-Treme "Special" FX series. It's small point of contention here, but a *sound* effect label to me implies a Foley effect of some sort. I look at these techniques here as more of a *special* effect. As a parallel to the graphics CG departments in film, sometimes the best special effects are those not immediately obvious or invisible to the naked eye.

## X-Treme SFX 16 [P5 as S&H Generator (Part I)]

**Sample and Hold:** that's what the **S&H** designation stands for. So what is sample and hold, why do you need it, and how do you get there from here? Well, I've got a couple of things to say about the subject. First, a definition, from the [Wikipedia can be found here](#).

Not good enough? How about this: **A device that acquires a signal and then stores it for a specified period of time before processing.**

Just like "sampling" a CD, you're taking a level at a specific point in time, and "recording" that. The twist here is that you're doing this process at a lower sampling rate, and holding the results in a buffer until the next sample is taken. And you're doing it in a control source, rather than with audio. You can use that control source with just about any parameter in Project5, including track controls, or synths and FX.

The classic example of S&H is in using a random sequence [sampled & held noise] to control a filter cutoff and/or pitch. Something like Emerson, Lake and Palmer comes to mind, but that makes it sound so dated. There's lots of modern applications. It'll all become clear enough soon. Try this:

1). Load up Dimension, click on the Empty Multisample, and grab the fm 01.wav from the 00 - Wavetables folder for use in Element 1.

2). Open up the MIDI Matrix (third icon from the left), and enter the following settings in a slot:

```
Source: Random Bipolar
Destination: Pitch 1
Depth: 2400
Smooth: 0.0
```

Play in a few notes consecutively on your KB. You'll get a random pitch each time you press a key. In this instance, the sampling rate is determined by how often you press a key. What you're "sampling" is a random series of numbers generated internally by Dimension; the modern day equivalent of a noise source. The variable "hold" buffer length is how long you hold on to a key, and the rate trigger is provided by your MIDI Note On messages. Let's add some random filter action now:

3). Click on the filter choices, and grab the LP 6p filter. Bring both the Cutoff and Resonance knobs up halfway.

4). In another MIDI Matrix slot, enter the following settings:

```
Source: Random Bipolar
Destination: Cutoff 1
Depth: around 7000
Smooth: 0.0
```

Now you've got a random cutoff frequency start point to go along with each random note. Notice that some of the notes will drop out to inaudible. That's because the nature of the Random Bipolar source is to swing both above and below the Depth setting. So you're going to swing those cutoff frequencies way low on occasion. Substitute this for the filter settings:

5). In the "filter slot" in the MIDI Matrix, plug in:

```
Source: Random Unipolar
Destination: Cutoff 1
Depth: around 7000
Smooth: 0.0
```

Now your random filter frequency will just go up (Unipolar), making each note in the keyed "sequence" audible. Most sampling rates found in S&H have a regular fixed sampling rate. It maintains a steady "beat", and doesn't waver from that. If you're looking for a true random source along these traditional lines, I'd suggest checking out the [Petertools LiveSet demo](#). It contains a loadable module that is the equivalent of a MIDI LFO. The important thing to note is that, because it's under Rewire, Project5 treats these incoming MIDI messages as if they were generated by your KB controller. In other words, if you want to produce a cyclical Mod Wheel message, for example, you can automate this before it even gets to P5. It's like having a third hand for your wheels & sliders.

I'll just add the the MIDI LFO has waveshapes of sine, triangle, ramp up & down, square, "stepped" random, and "smoothed" random. The two random waveshapes represent something more like a quantized random output, and a one that gently curves from one value to the next (respectively). All you have to do is set it in motion, hands-off, and it becomes a curve generator for MIDI messages in Project5. Send it to a pattern (watch for sync issues here), or the Arrange Pane, and you can record away for auto-automation. We're going to use another common Cakewalk plugin in Part II to produce similar results.

For those not so inclined to Rewire, you'll have to settle for a *pseudo-random* source input, and that's going to be generated by you. Let's clear out that example patch in Dimension [right-click E1, and Reset Element. Confirm the warning.]. Now click on the Empty Program, go to Guitars, and select the Twelve String Guitar program. Then ...

1). Element 1 will be visible. Lower the Lo/Hi Velocity setting of 48 to 0. Click on E2, and raise the upper Lo/Hi Velocity setting from 81 to 127. We don't want any velocity settings messing with what we hear.

2). In Project5's Editor, create a new pattern. Click "T" on the Qwerty once, to bring up the Automation Tool. Change the visible MIDI: Velocity to MIDI: Modulation Wheel.

3). The default Snap To Grid size is a sixteenth note. Consult I Ching, and just start clicking in random levels in each of the 16th note "cells". Really try to mix it up; *you're* the random source.

4). Back in Dimension, open up the MIDI Matrix, and you'll see three default assignments. In the fourth slot, enter these settings:

<b>Source:</b> CC 1 (Mod Wheel)
<b>Destination:</b> Pitch All
<b>Depth:</b> 2400
<b>Smooth:</b> 0.0

5). Start the pattern preview (hit Play in the Editor) to get the automation rolling.

Play a few notes. Now the pitch of both Elements is "randomly" shifted by the values you entered in the pattern. The Mod Wheel (CC1) is modulating those pitches, but it's also adding to Pitch LFO Depth2 and Cutoff 1 in the first two MIDI Matrix slots. The sampling rate is determined by the project tempo divided by the Snap to Grid size (16th notes, in this case). The hold time is the Snap to Grid setting. If you want *just* the project tempo to become the sampling rate (quarter note gets one beat, and it's beats per minute [BPM]), do any of the following:

**Option A:** Change the Snap to Grid setting in the Editor to Quarter note, and randomly click in four distinct level values, or

**Option B:** Click "T" again on the Qwerty, bringing up the Select Tool. Ctrl+A {Select All}; right-click on the selected automation, and choose Quantize. Change the resolution to Quarter Note. All other settings at default. OK, and out.

**Option C:** Go to the Process menu, select Quantize, and follow the procedure in Option B.

Note that there's a Randomize function in the last two options. Using our scenario here, this setting actually randomizes the sampling rate, and doesn't provide for a random source to be sampled. It's an interesting option, but it will destroy any sync to tempo relationship that you've set up previously. Could be a good thing. Just don't get these two "random" ideas mixed up; it's easy to do.

We used the Mod Wheel as a source in this section, and there's a good reason for that. Most every KB controller has some way of inputting a modulation message, and we're going to try a little experiment. Get your automation pattern cranking, and play a few notes. Slow down your sampling rate (the project tempo) to make this easier to hear. Move your Mod Wheel at the same time that your pattern is playing. The level value will jump to wherever you have your Mod Wheel pushed to at the moment, until it is "overridden" by the next "sample" in this sample and hold sequence. In effect, Project5 is "sampling" your Mod Wheel input, while also playing back the S&H sequence that contains a parallel Mod Wheel automation message.

Remember, a sample & hold device will capture a sample from *whatever* input you choose. You can enter this automatically with external "oscillation", manually with pattern editing, or with a human touch by using you're KB controller's knobs, switches, sliders, and wheels. You set the sampling rate with the tempo, the sample rate divider value with the Snap To Grad size, and the Hold times with quantization. Because you can vary each of these parameters in such an extreme way in a project, that pretty much makes Project5 the most versatile sample and hold generator around.

So, in Part II (and perhaps a Part III), we'll look at various sources to be sampled, different ways to change the sampling rate and hold times, and ways to manipulate the sampled sequences once they've been recorded, including automation mixdown. If you have any questions, fire away, so that I can adapt the other parts of the tutorial to fit the readership. If you want, I can throw together some example files at the end of this "serial" tutorial, and that may help you to play along with our little game. But don't tackle Part II until you've absorbed this one, because I'm going to pick up right where we left off here.

Have fun ...

Oh. For extra credit, you might want to jump ahead to [this fine Sample & Hold tutorial link](#), (and [the second half of it here](#)), and see how things were done in the good ol' analog days. It's a great background read, and it'll prepare you conceptually for the Project5 specifics coming in the future.\nYou're on your honor with this one. <g>

# X-Treme SFX 17 [Recorded Arp Note Solution]

## The Router

Why didn't I think of this before? One solution for recording the notes generated by Project5's arpeggiator has been out there for a while. See [this Wiki article](#) for the details. It uses the [RGC MIDIOut plugin](#) and [MIDIYoke](#) to bring the output from a Project5 track back as the input of another track. But the virtual routing of MIDIYoke has the potential for confusion, and also can lead to undesirable MIDI looping if set up improperly. So, why not just skip the virtual MIDI, and go with hardware?

In MIDI convention, you have a MIDI In jack, a MIDI Out, and sometimes a MIDI Thru jack. Not all of these are needed on any given device [example: Trigger Finger], and the advent of bidirectional USB connections [in effect: combo MIDI In/Out] makes the implementation of all three jacks rare. It gets even more complicated: depending on the O/S of a MIDI device, the MIDI Out may be set up as a MIDI Thru, you may have a soft-Thru jack, or even a combination MIDI Out/Thru jack.

But the basic definitions are this: MIDI In provides a way to bring in external data to a device. MIDI Out sends the data generated internally by a device out to another device (or DAW). But here's what we're looking for: MIDI Thru takes an exact copy of what arrives at the MIDI In jack, and sends it on down the line. **Jackpot.**

## The Setup:

First, you need any old hardware device that features a MIDI Thru jack. I haven't had much success with USB-only devices, even with MIDI channelizing, but that may be user-error on my part. The worst thing that can happen is that you're going to create a MIDI loop. That may lock up Project5, but it also produces some very cool sounds. The key is to ride the edge just below self-oscillation; just like you would a resonant filter. Another day; another tutorial.

I can't see why one of those cheapo parallel port MIDI In/Out/Thru snakes wouldn't work. You can get them for pennies. I'll dig one out later, as this remains untested here. You can also use a device with just MIDI Out, provided that you can setup the device to mirror the data incoming to the MIDI In jack. For this application, *anything* will do [drum machine; hardware synth; external FX unit; full-featured controller; external sequencer; SoundBlaster]. You're not actually using it to generate sound (although you can, in a more complex application). You're just using it as a MIDI router.



On the software side, make sure that the MIDI Override Follows Current Track in the Options menu is **unchecked**. Sometimes you have to "goose" the MIDI Override on & off with a the track to get P5 to realize what's going on [important: remember this for later], but the whole Override thing defeats the purpose of MIDI routing when applied "permanently". Hook up two cables to your external device [**The Router**]: One to the MIDI In, and one to the MIDI Thru. They'll be on the same Port (as seen by Project5), and you might want to check Options/MIDI Devices to assure that they're recognized. The "Thru" will appear as an "Out".

### The Routing:

So far, it all sounds more complicated than it really is. The software end is very easy, but you need to follow the procedure exactly.

1). Load up any synth in a track in Project5. Set the MIDI Input Port in the Track Inspector to the the Port of **The Router**. You can dive down narrower, and select the actual MIDI transmit channel (usually Ch. 1) of **The Router**, but that's unnecessary in a simple setup. This represents the signal coming through the MIDI Thru jack. Just don't leave it at All Ports - Omni. Remember: disable any inadvertent MIDI Override clicks.

2). In a second track, load an instance of MIDI Out. Bring up the GUI, click on the text, and set the output of MIDIOut to whatever represents **The Router**. This will be where the MIDI exits Project5, and enters **The Router**; only to be looped back to your DXi/VSTi synth in Track 1. In the Track Inspector, set the MIDI Input to the Port of your main controller. I've gotten more consistent results by bumping MIDIOut's Latency (one of two available parameters in the Track Inspector) to around 20. YMMV.

Here, you *can* use All Ports -Omni, but with a caveat: It's possible to get some controlled feedback from **The Router** device. No matter whether you set Local Off there, or Receive Only, there's going to be some "extra" notes added to the arpeggiator. This is cool, but it might not be as manageable. Better to use a single KB controller in the beginning.

### KB controller (MIDIOut track 2) -> The Router -> VSTi Track 1.

3). Here's the real trick. The arpeggiator is set up in the MIDIOut track; *not* the VSTi track. You can, but those added arp notes in track 1 won't be recorded. The arpeggiator gets transmitted through the MIDIOut, and brought back in to the VSTi track [recordable Note Ons appear in the *synth* track]. And, lo & behold: you'll see the arpeggiated notes dancing around the preview KB in the Editor. You can now record them to patterns, or directly into a track in the Arrange Pane.

If you have any problems with this setup, try "goosing" the MIDI Override in the two tracks [on & off]; just to get P5's attention. Remember, once you have the default arpeggiator Shapes recorded into a pattern, you can save that pattern, load it into the Arp as a template Shape, and modify the process all over again. The Shape parameter processes any loaded pattern template in the Arp, and you can run it through the Router again, and arp the routed/arp'ed track, and add more synths, and ...

Believe me: you'll be up nights. This is big, and it presents you with a quantum leap of possible creative options.

Questions? I'm all ears.

### **Red Alert:**

We are dancing on landmines here, so you need a way out. Should you start messing around with Ports, and things start to get out of control, remember to click the CPU meter to reset the engines. If you can ... <g>

Sometimes, this won't be enough. You've already freaked out Project5. A more foolproof way to the surface is to right-click and Delete either the VSTi synth track, or the MIDIOut one. Either action will break the chain, and stop a runaway loop. But there's times when MIDIOut refuses to play the game anymore, and you have to Delete it, and replace it with another fresh instance. The setup isn't that difficult with that plugin, so it's a small price to pay for the results.

Just don't think that this rig is "set-it-and-forget-it". In order to play with the cutting edge, you have to keep it honed razor-sharp.

Just a couple of more things to add to the grab-bag, and a few related observations as well.

Now I can see & measure what goes on in the Arpeggiator. It's a bit of an eye-opener. For one thing, there were those reports of timing issues with the Arp. I'm seeing that extremely low-velocity Note Ons aren't recognized by the Arp, which will drop a "hole" in the resulting pattern shape.

I'm talking only a velocity of 01 or 02 [00 should be Note Off, anyway]. If you have a soft KB touch, or a similar velocity curve set up, this could be significant. You'd be surprised how often this can come up in the course of normal playing.

I'm sorry to report that the MFX are not reflected in the note "conversion" of the Arp. It would've been nice to actually convert the Transpose scales or Echo Delays to hard data. I guess that those items remain outside of the loop. But the Track Inspector's Transpose works, so you can shift by semitones, and get *that* recorded. I was also hoping to use the Looped Arp as a MIDI Remote Control device, but (sadly), the notes are "intercepted" by P5 before they get to the Loop. Bummer.

What you can do is assign one of your individual notes in a chord to MRC, and have the rest of the chord trigger Notes. Then you triggered Remote Control can be re-ordered in an arpeggiated sequence, by changing up the Shape control. Say it's a resonant sweep. You can shift that occurrence around within an arp'ed chord, and it'll always remain in sync. Automatically.

Hmmm ... multiple Arp tracks. And velocity? You can *finally* get distinct controller changes from each individual note in the arp sequence. The variations possible are staggering. This alone is worth the price of admission.

When you get ready to record, assign an unused Note in your planned recording to MIDI Remote Control [v.] the main Record button. Then, instead of a count-in, you can start recording your Arp sequence with KB. One finger for the trigger; the rest for the Arp pattern. Something funny happens in the Step Record mode of the Editor. The first recorded "note" is a cluster of the chord; followed by the arpeggiated notes. MIDI lag, or true Notes with Arp delayed?

Each chord change exhibits the same behavior. It's a small matter to delete that cluster, and arrow over to fill in the blank, but I find it odd. You can't beat the Step Mode, though. Set it up to record, and it's there; waiting for you. Punch in a chord, and all the arpeggiated notes start the thing *flying*. Instant massive arpeggiated pattern; ready for further editing, or nothing at all. *Blazing*.

I'd have uploaded a p5p file, but this is only two tracks, and it's completely system-dependent. My Ports aren't necessarily going to be your Ports. And, since you can use anything as a **Router** device, each of *those* will be different. But I've been able to consistently call this up from scratch; now that the "bugs" have been worked out. Set your Ports first, and everything else falls into place.

Next time, it'll be how to integrate an external pattern through the Looped Arp. That's another novel in its own right.

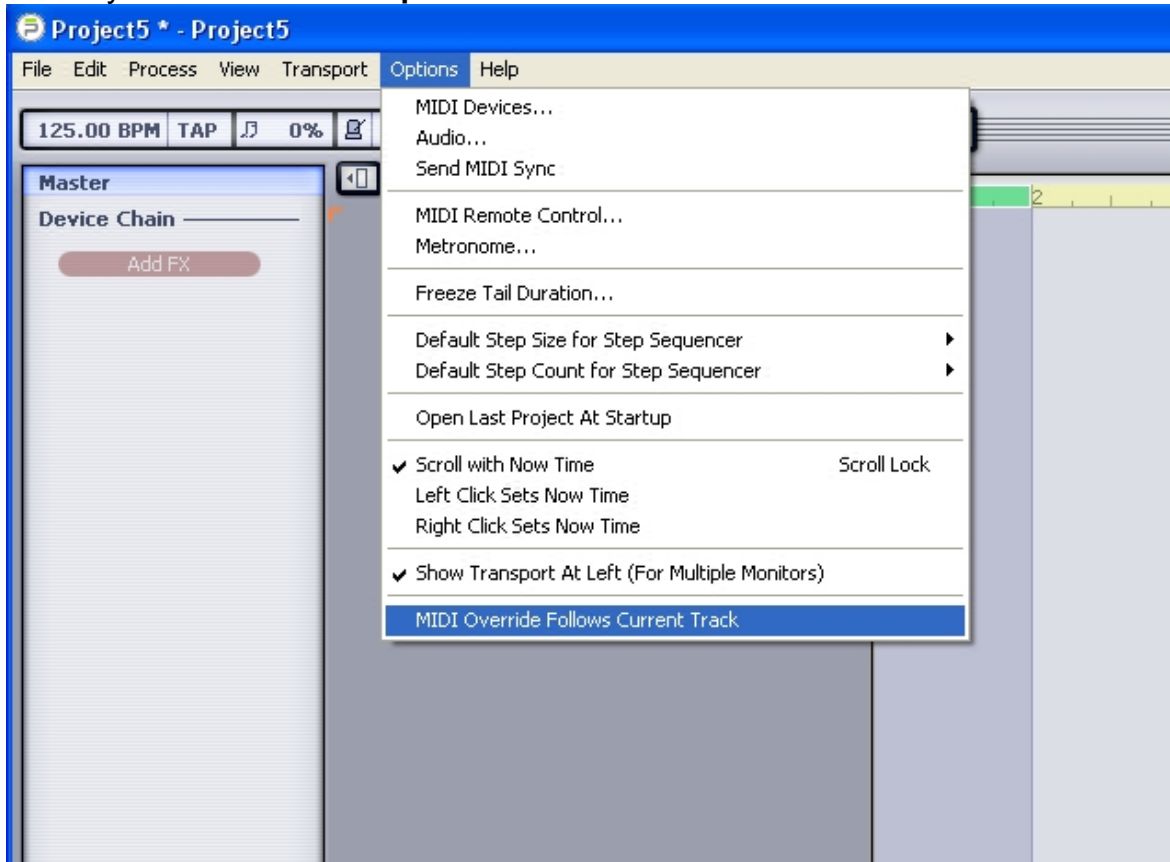
Man, I feel like I'm forgetting something ...

## X-Treme SFX 18 [Recordable MIDI FX]

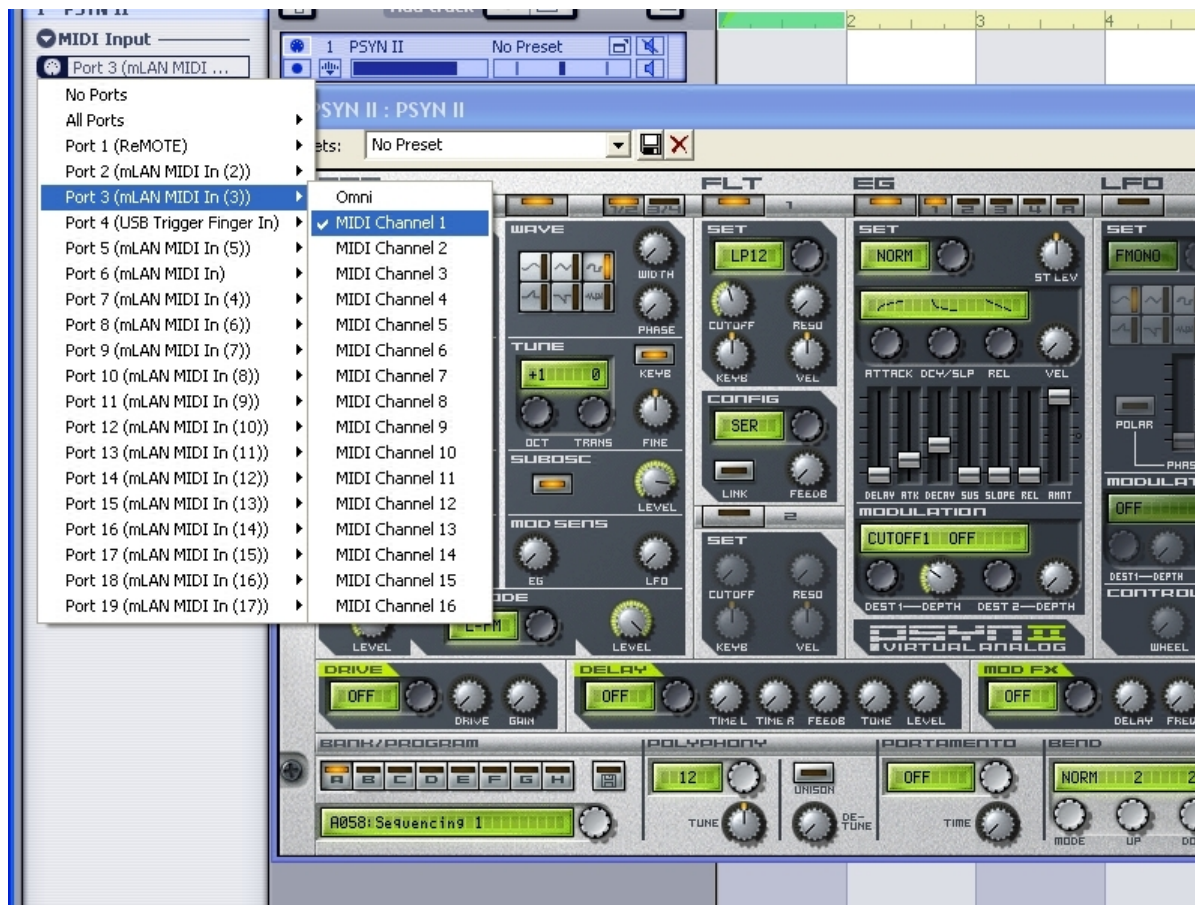
This one builds on the same principles as [X-Treme SFX 17 \[Recorded Arp Note Solution\]](#) . But this time, we have *pictures* to map the process out. These pics detail arpeggiator usage, but you need only substitute a MIDI FX plugin in its place. I'd like to thank a friend for graciously posting those screenshots on his personal web space, but that brings up another point. I wasn't asked to say this, but this procedure is a **hack**. It's not officially sanctioned or supported by Cakewalk, so if you have any problems with this, you have to come to me for the solutions. My hack; my headache; my own tech support.

Here's a five-step procedure for getting this all to work. You have to have a MIDI output of some kind looped back into a MIDI input already in place. That can be an unused MIDI port looped to itself with a MIDI cable, or an external MIDI device with a MIDI Thru connected back to it's Port. In the screenshots, I used mLAN MIDI Out (3) looped to mLAN MIDI In (3). Yours will differ. You can also use the [MIDIYoke](#) virtual routing setup. The configuration of that free application is beyond the scope of this article.

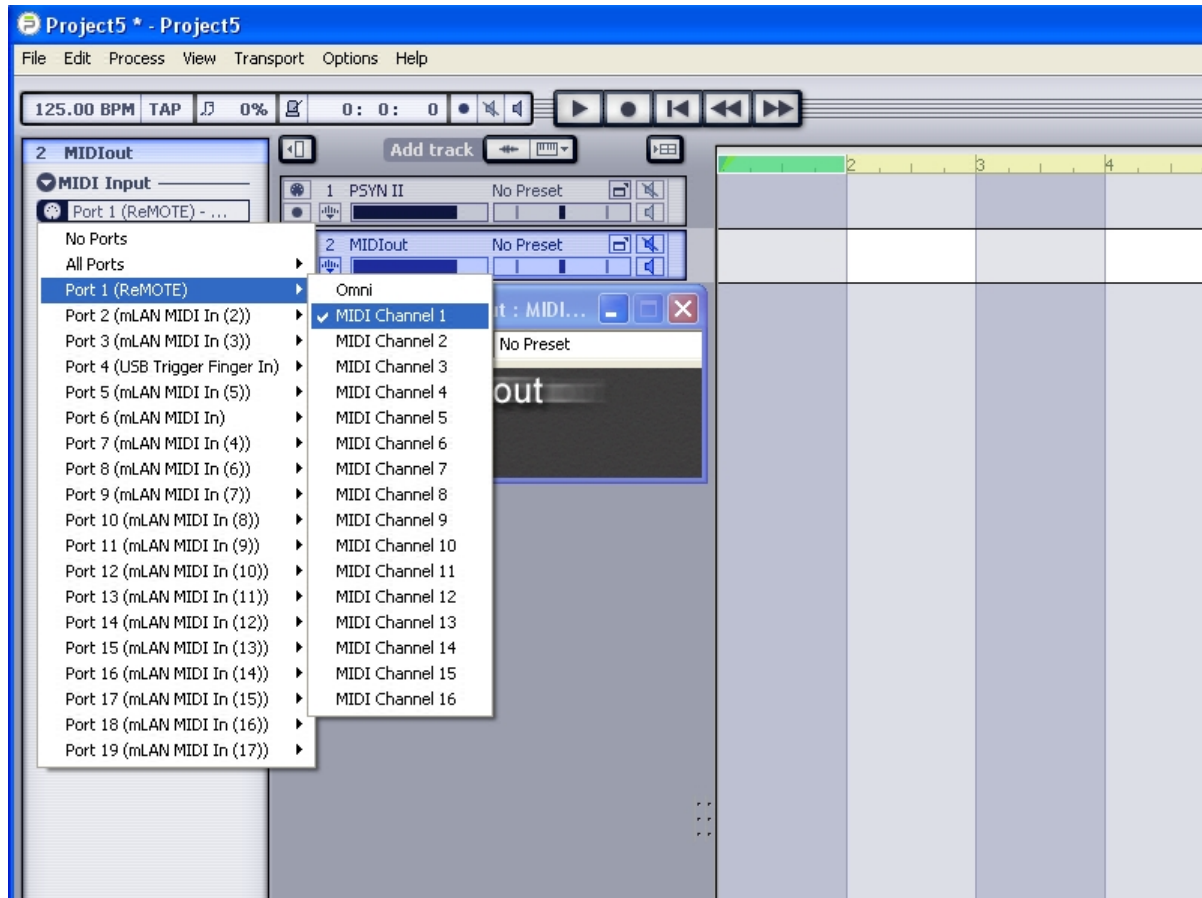
It's important to keep the MIDI Override button **disabled** at every step, because you'll get a nasty MIDI feedback loop by routing the output of a single track back to its input. Consider yourself warned. **Step 1** disables this feature's default automatic movement.



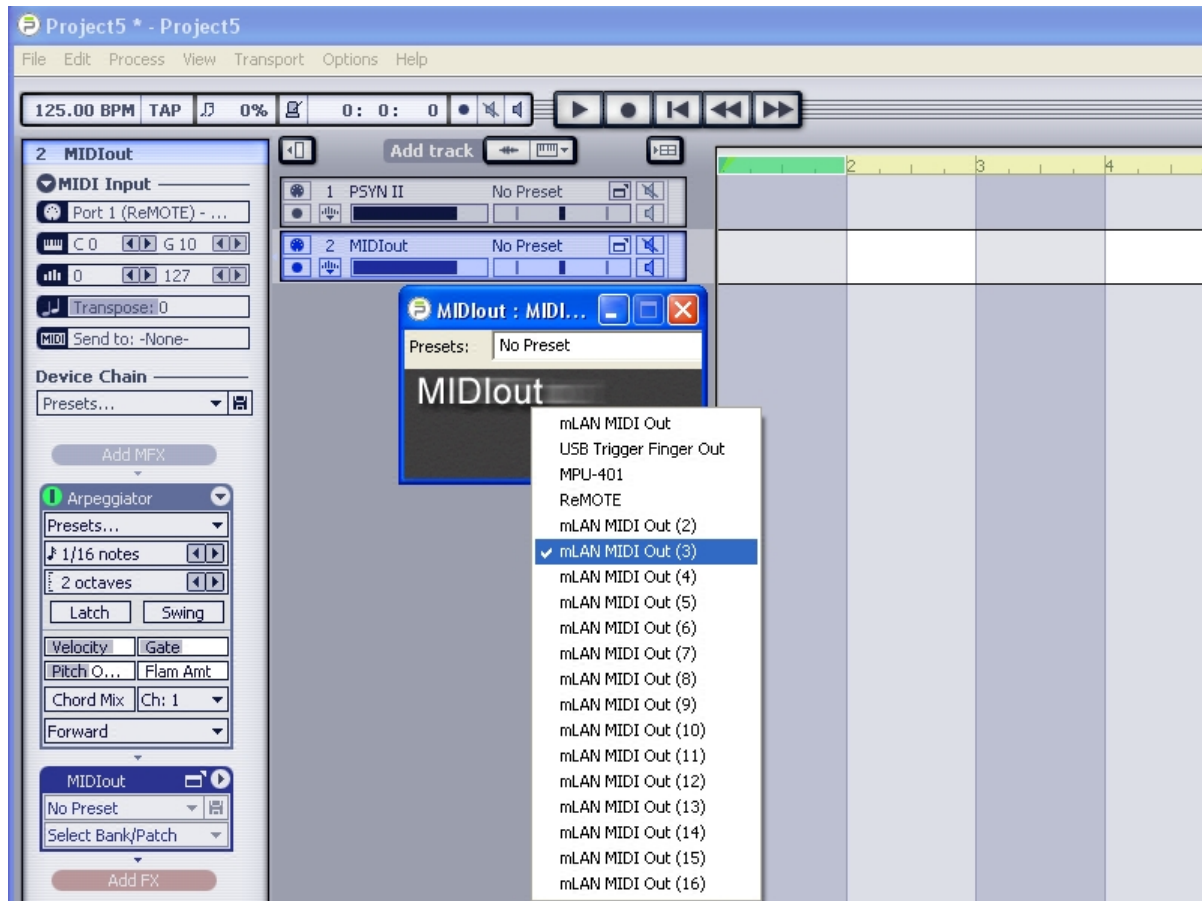
**Step 2** loads a synth in the first track. I used PSYN with a sequencer-style patch, but you can replace that with anything else. The input in the Track Inspector is set to the MIDI In Port where the signal returns back into your computer. This 'return' track is where you're going to have your arpeggiator or MIDI FX recorded in the results.



The next step (**Step 3**) loads up the MIDIOut plugin provided free by Rene Ceballos. Download that plugin [[here](#)]. The input in the Track Inspector will be your main keyboard controller (the Remote25 is shown in the pic). You can also fly in .p5p patterns to this track, have the results processed by MIDI FX, sent out the computer, and back into Track 1. This is the 'send' track.

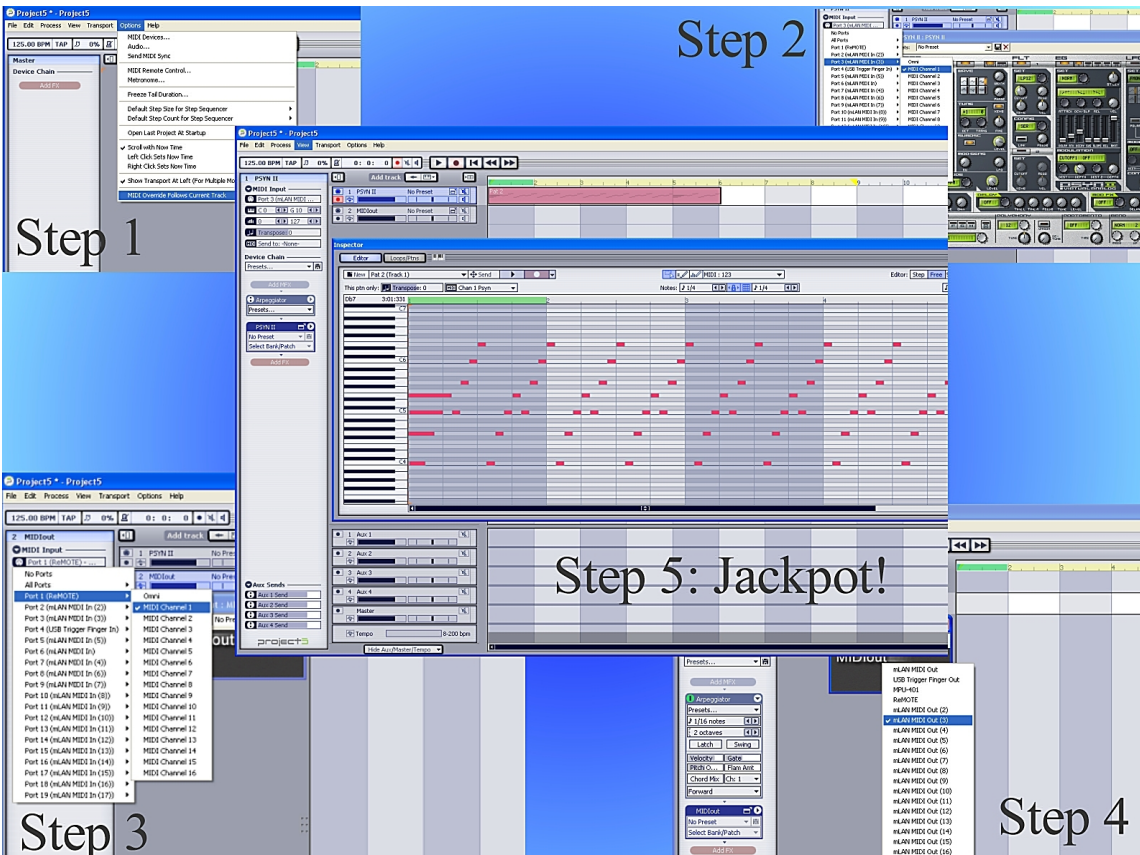
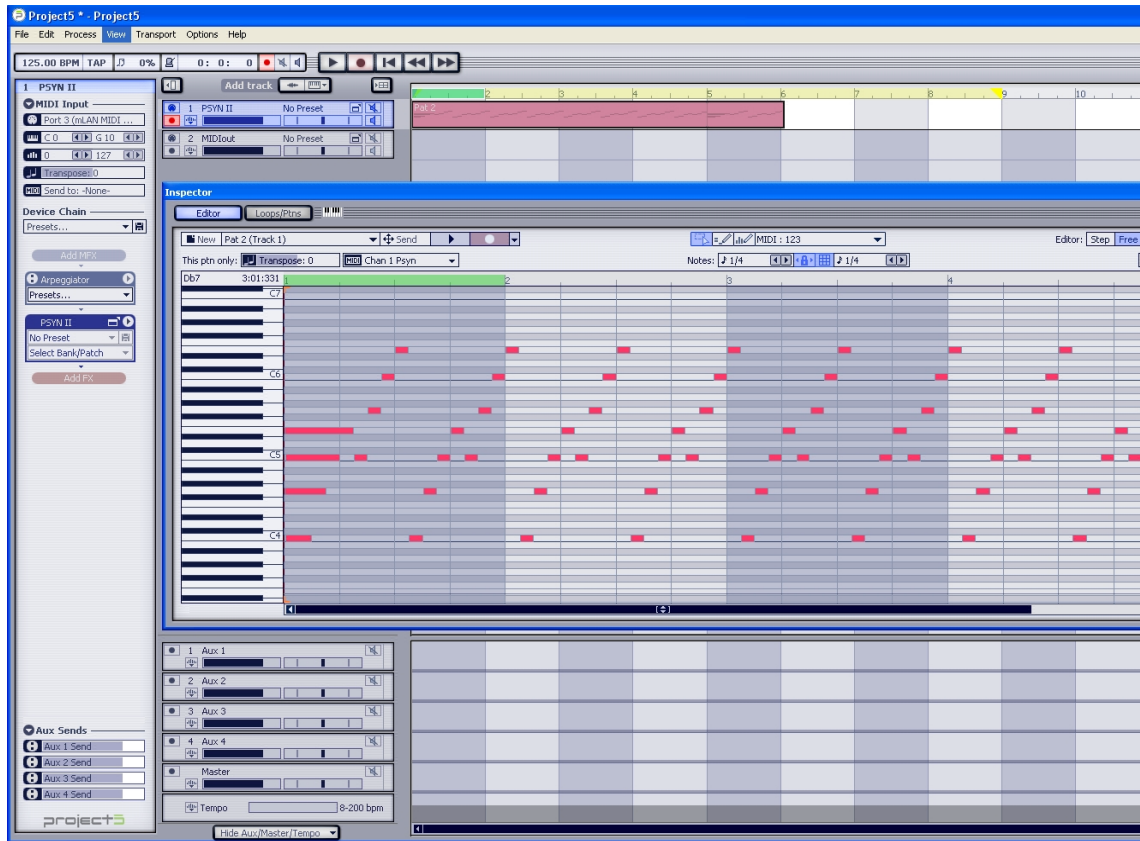


Now **Step 4** does two things: you first configure your arp/ MIDI FX plugins. Play around with the settings, replace them, and adjust some more. This is the testing ground, and all output is still blocked from the MIDI loop. When you click on the MIDIOut text in the plugin's GUI, and configure it to an output, that's when the final connection is made. It'll be set to the output Port where you've configured your MIDI "loopback".



Hey, there's no need to go any further. **Step 5** is just a screenshot of the arpeggiated notes that have been recorded to Track 1, and **Step 6** is a summary screenshot review of all the Steps combined. Just remember: Your plugins, arpeggiator and/or patterns get loaded in the MIDIOut track, and the results are recorded in your synth track.







That's it. Any MIDI FX that you load into Track 2 are recorded in Track 1, and that is available for further editing (as any pattern would be). You'd be crazy not to check out [TenCrazy's donationware](#), and the site has a lot of useful [MIDI FX plugins](#) that really make this hack shine. Of course, you have all of the Cakewalk plugins at your disposal as well. Be forewarned: Some plugins work well; others aren't made to take advantage of this hack.

No warranties: expressed or implied. That said, if you have any questions or problems related to this hack, you know where to find me.