You can hear a piano, which is the default instrument when you import a MIDI file. However, this sequence should be played by a synth.

5 Select the Steinway Grand Piano track, and in the Library, choose Synthesizer > Lead > Citrus Fuzz. Listen to the song.

The synth plays a lot of fast notes, and then plays a very simple melody. You will breathe new life into the synth performance later in this lesson by inserting your own controller events.

Notice that the synth is panned to the left and a little too low in volume.

6 In the Citrus Fuzz track header, drag the Volume slider up, and drag the Pan knob to the center position.

7 Start playback.

As the playhead jumps to bar 1 (the beginning of the cycle area) and playback starts, the Volume slider and the Pan knob revert to their original positions. MIDI files can contain controller volume and pan events, and when Logic plays those events, it uses them to set the volume and pan of the track. You'll later delete them in the Event List.

8 Stop playback, and press Return to go to the beginning of the song.

Tip

To export a MIDI region(s) as a standard MIDI file, select the region(s) in the workspace and choose File > Export > Selection as MIDI File.

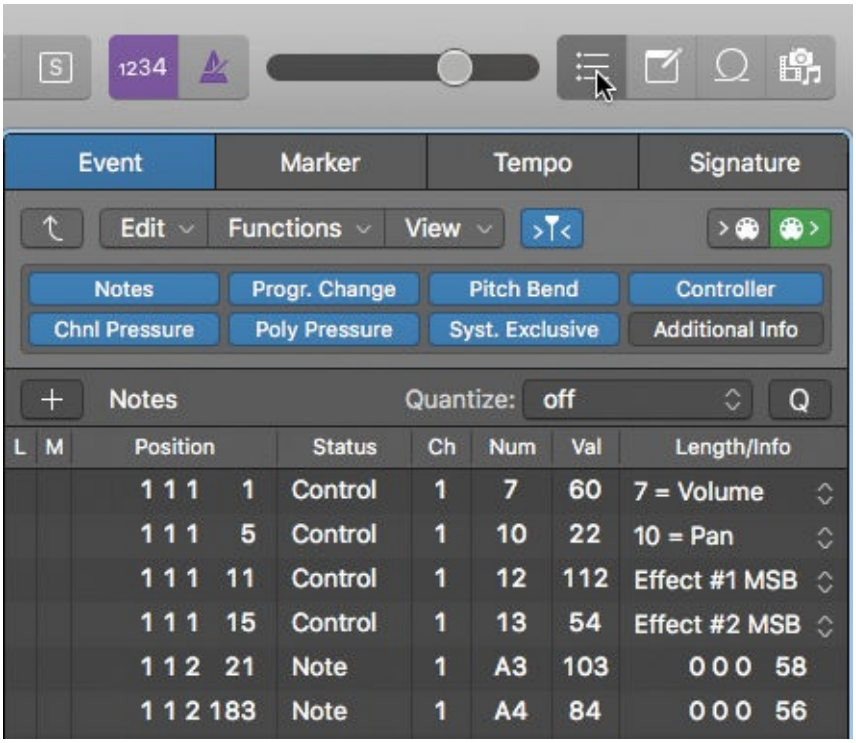
Editing MIDI Data in the Event List

The Event List shows MIDI events as text and numbers. Unlike other MIDI editors—such as the Piano Roll Editor or the Score Editor—that can be more convenient for creative tasks, the Event List displays all the MIDI events in a region, along with the exact numerical values of their attributes (such as MIDI channel, key number, velocity, and so on). Although you probably won't use the Event List to compose, it can be a very powerful troubleshooting tool.

You will now open a MIDI file (that you imported in the previous exercise) in the Event List to locate and delete those MIDI events that are displayed as gray

the Event List to locate and delete those MIDI events that are displayed as gray vertical bars on the MIDI region in the Tracks area.

1 In the control bar, click the Lists button to open the Event List.



The Event List displays all the MIDI events inside the selected *Lead Synth* region. You can see Control, Note, and C-Press (channel pressure, or aftertouch) events. A thin white horizontal playhead scrolls the events during playback. At the top of the Event List, the first two MIDI events are a volume event and a pan event. They are responsible for setting a specific volume and pan to the channel strip when playing that region. Let’s delete all MIDI events that are not notes.

You can use the event type buttons to filter the events displayed.

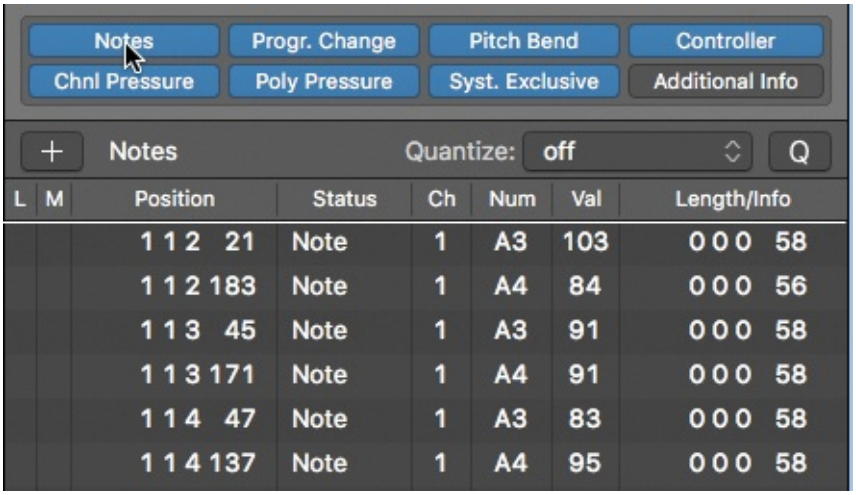
2 Click the Notes event type button to disable it.

Note events are hidden. You will now delete all the Control and C-Press events.

3 In the Event List, choose Edit > Select > All (or press Command-A).

4 Choose Edit > Delete (or press Delete) to delete all the Control and C-Press events.

5 Click the Notes event type button to enable it.



Notice that only Note events remain in the *Lead Synth* region.

6 Raise the volume and center the pan of the Citrus Fuzz track, and listen to the song.

This time the Volume slider and Pan knob in the track header stay put, and you can hear your synth loud and centered.

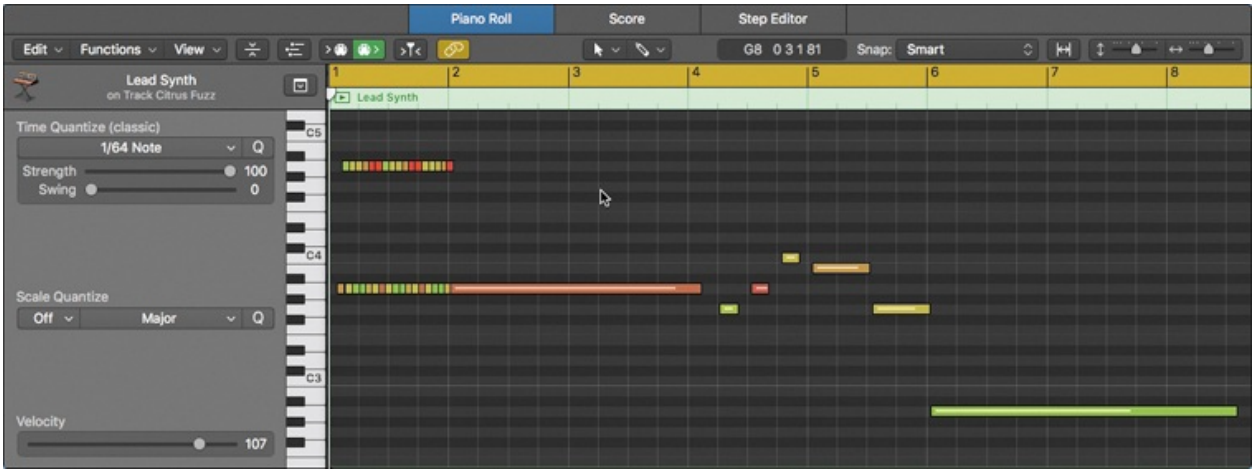
You won’t turn to the Event List for everyday music creation, but it can be a powerful tool to display all the MIDI events inside a region in a single list—when locating and deleting unnecessary MIDI events, for example.

Quantizing Pitches and Timings of MIDI Notes

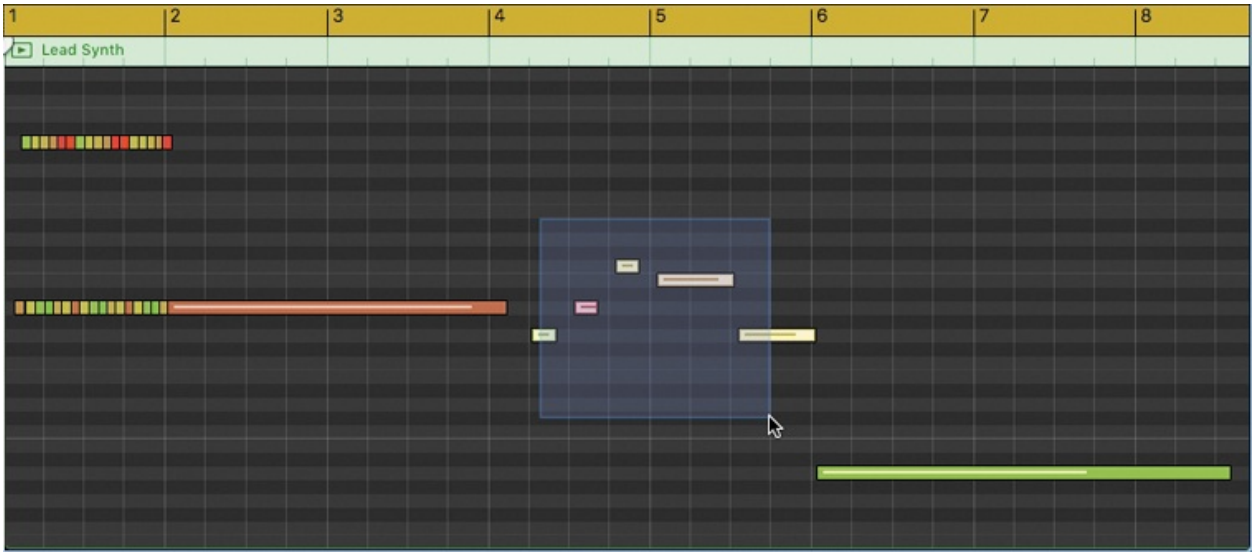
In this exercise you will quantize note pitches to certain keys and scales, forcing them to snap to the nearest note in that key. You will also quantize their timings to a grid, and adjust the strength of the quantizations to retain some of the human feel from the original performance.

1 In the workspace, click the *Lead Synth* region to display it in the Piano Roll Editor.

2 Press Z to see all the notes in the region.

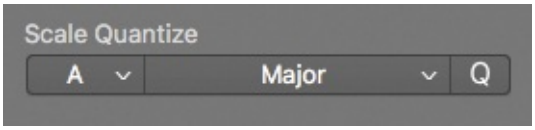


3 Select all five notes in bars 4 and 5.



Let’s try to play the selected notes in another key.

4 In the Piano Roll inspector, from the left Scale Quantize pop-up menu, choose A. Listen to the song.

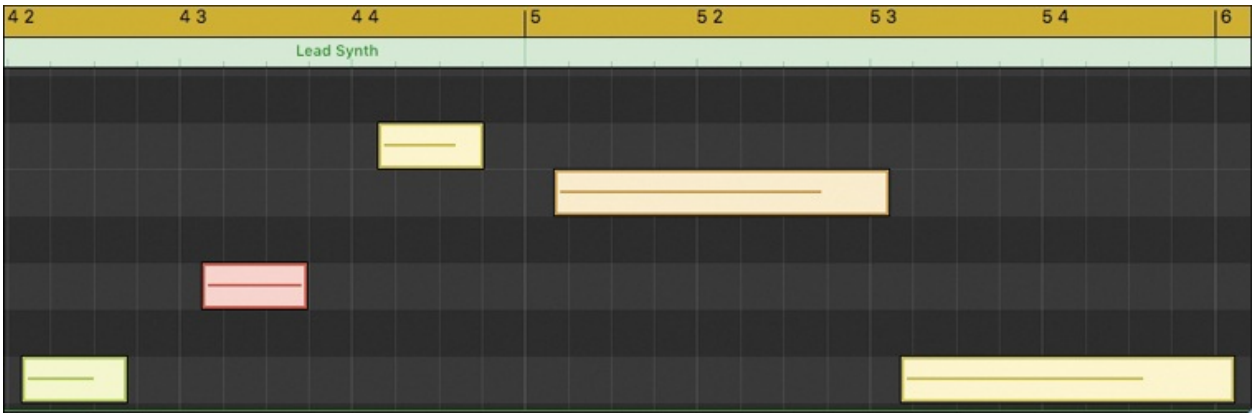


The notes jump to pitches in the key of A Major. You can use the Scale Quantize feature to experiment with playing a melody or chord progression in different keys. In this case, though, the original notes worked best.

5 From the Scale Quantize pop-up menu, choose Off to return the notes to their original pitches. Listen to the song again.

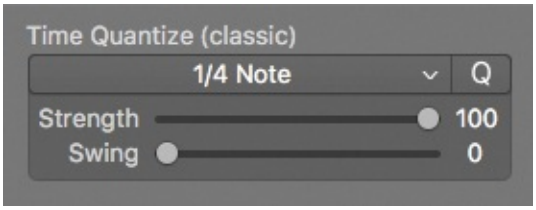
This time pay attention to the timing of the selected notes. It sounds as if the notes are really behind the beat.

6 Press Z to zoom in on the selected notes.

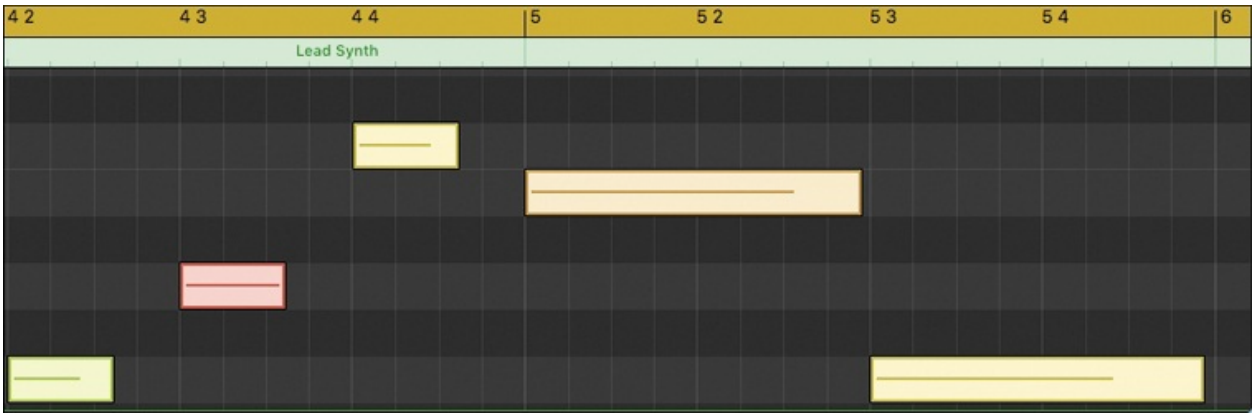


On the grid, you can see that the notes start late.

7 In the Piano Roll inspector, from the Time Quantize pop-up menu, choose 1/4 Note.



The notes snap to the nearest beat.

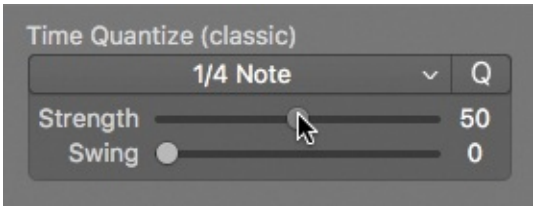


Listen to the song. The notes you've quantized are perfectly in time. But rather than snapping the notes to a rigid grid, you want to retain some of the original feel using the Time Quantize Strength slider.

As the song plays, the Piano Roll constantly updates its display to show the position of the playhead. After you've stopped playback, the notes you wanted to see are still selected, so you can press Z to bring them back into view.

8 Press Z. The selected notes fill the Piano Roll.

9 In the Piano Roll inspector, drag the Strength slider down to 50.



The notes are now positioned halfway between their original positions and the nearest quarter note on the grid.

10 In the Piano Roll, click the background to deselect all notes, and press Z to display all the notes. Listen to the song.

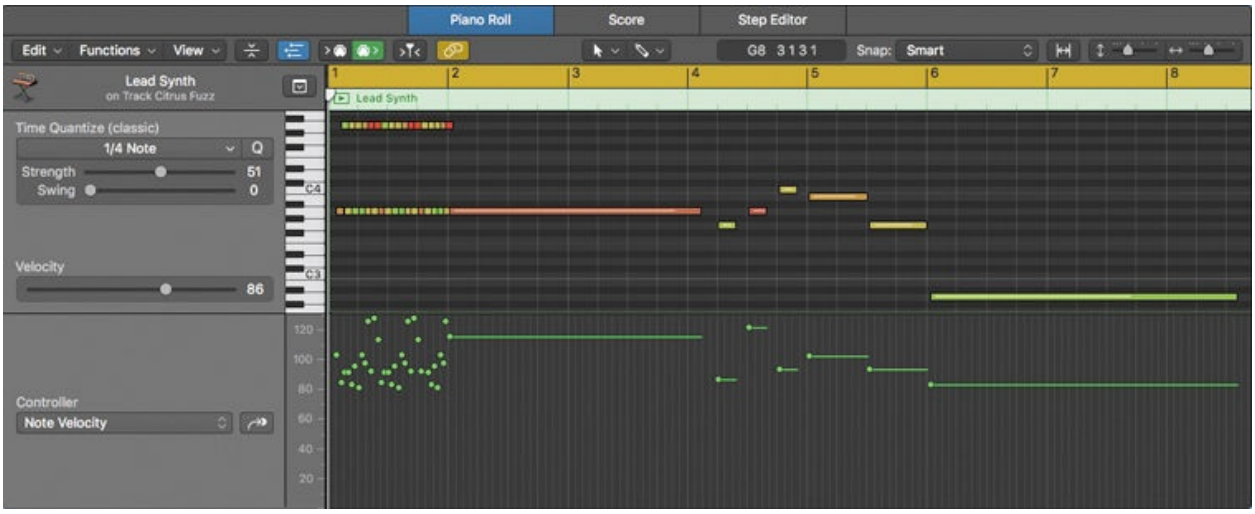
The synth's timing sounds better, but it still retains a bit of its original laid-back feel.

Creating a Crescendo Using Note Velocity

In the following exercise, you will employ a new technique to edit the velocity of the very fast notes at the beginning of the synth region, and make them play a crescendo (scaling note velocities from lower to higher values).

1 At the top of the Piano Roll, click the MIDI Draw button.

The MIDI Draw area opens at the bottom of the Piano Roll.

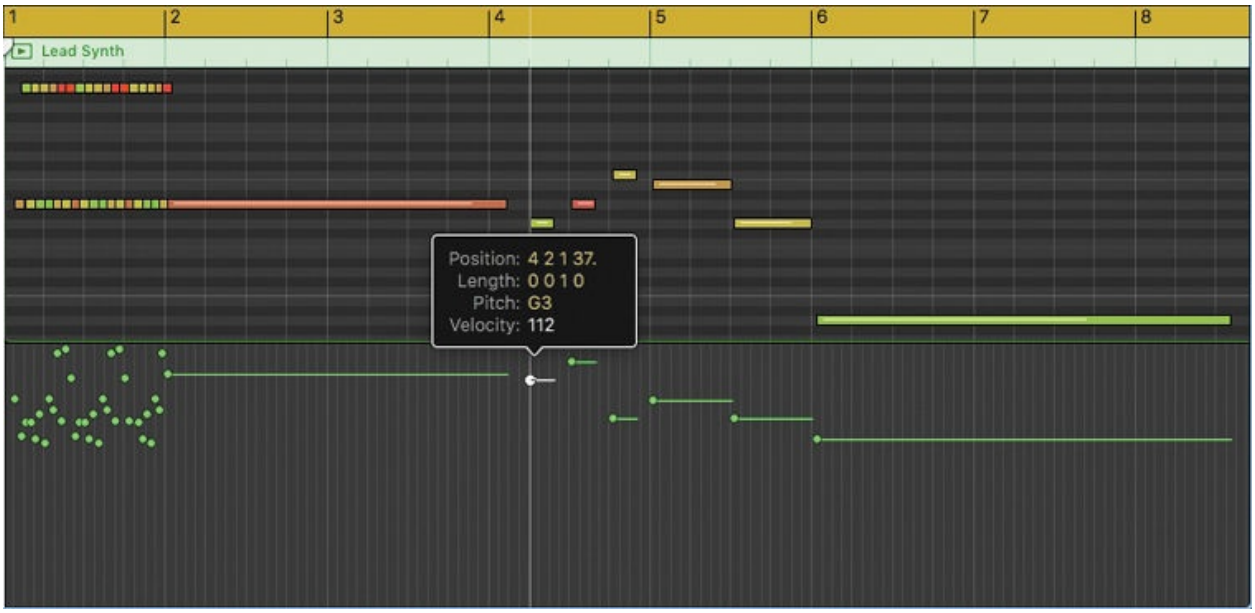


Tip

If you need more display space to work in, choose Window > Open Piano Roll (or press Command-4) to open a full-screen Piano Roll window.

The MIDI Draw area displays the velocity of each MIDI note as a point, along with a line representing the length of the note. The height of each point represents the velocity of the note above it on the grid. You adjust the velocity of a note by vertically dragging the point (not the line).

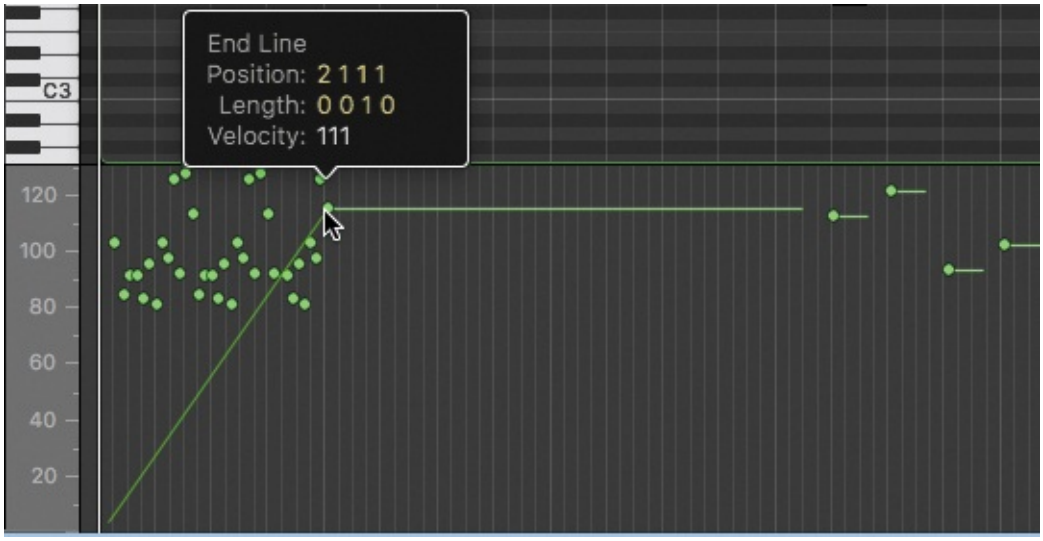
2 Drag up the point of the first note in bar 4 to raise its velocity.



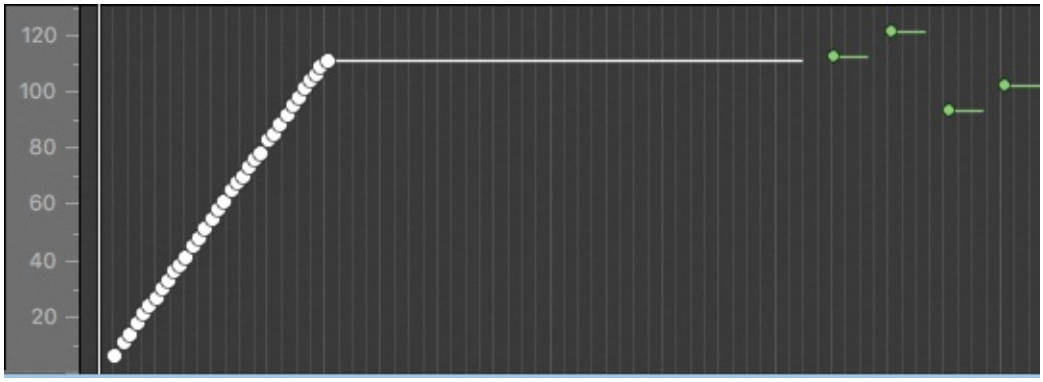
As you drag the point, a help tag shows you the position, length, pitch, and velocity of the note. When you release the mouse button, the color of the note beam in the Piano Roll updates to reflect the new velocity.

3 Listen to the fast notes at the beginning. They all sound fairly loud. You will now draw a line in the MIDI Draw area to create a crescendo in bar 1.

4 In the MIDI Draw area, drag with the pointer to draw a line up from the lower left to the beginning of the long, sustained note at bar 2.



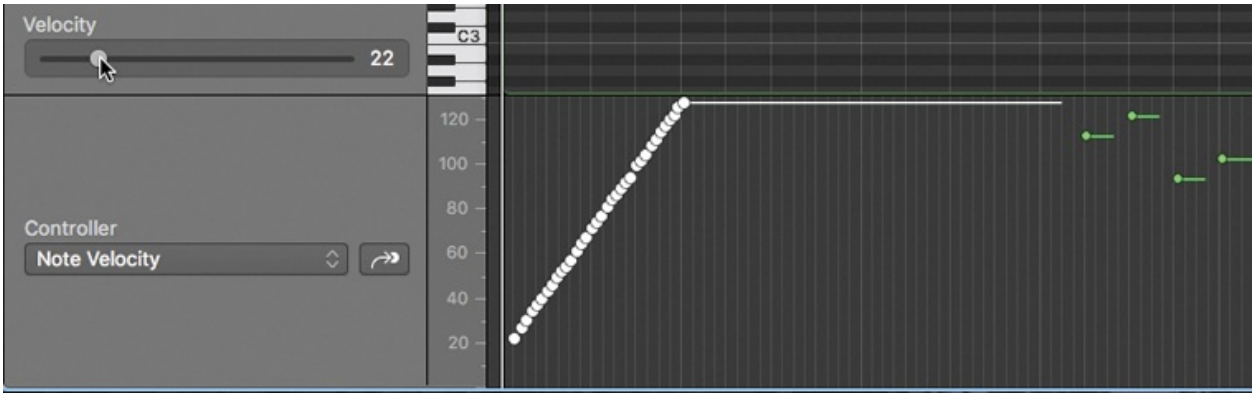
The note velocities are aligned to the green line you drew. In the Piano Roll, the notes with changed velocities are selected.



5 Listen to the synth. You can hear the notes crescendo; however, the first few notes are very soft and you can barely hear them.

Let’s raise the velocity of all the notes while keeping the crescendo you just drew.

6 In the Piano Roll inspector, drag the Velocity slider as far up as it can go, and listen to the synth.



The velocities of all the selected notes are raised by the same amount, and the crescendo is now louder. In fact, the crescendo could use a gentler slope so that the sustained note in bar 2 doesn't have such a high velocity.

7 With the notes still selected, in the MIDI Draw area, drag down the point of the sustained note at bar 2.

This time the note velocities are adjusted proportionately. For example, if you dragged one selected note velocity to half of its value, then the velocities of all the other selected notes are also halved. This gives your crescendo a gentler slope.

8 Listen to the synth. It is now easier to hear the first few notes, but the last note is no longer too loud.

Tip

You can also use MIDI Draw in the Tracks area by selecting one or more regions and choosing View > MIDI Draw, and then from the submenu, choosing the desired type of data.

Creating and Editing MIDI Continuous Controllers

When playing a MIDI keyboard, you can add expression to your performance by using the physical knobs, sliders, wheels (such as the pitch bend and modulation wheels), and volume pedal. Manipulating those controllers sends a stream of control events that represent the movement of the controller knob and trigger an action on the instrument.

When programming MIDI, you can draw a stream of control events to alter an instrument's volume, pitch, and other parameters. In the following exercises, you will use the Logic MIDI editors to automate pitch bend and modulation in the synth MIDI region.

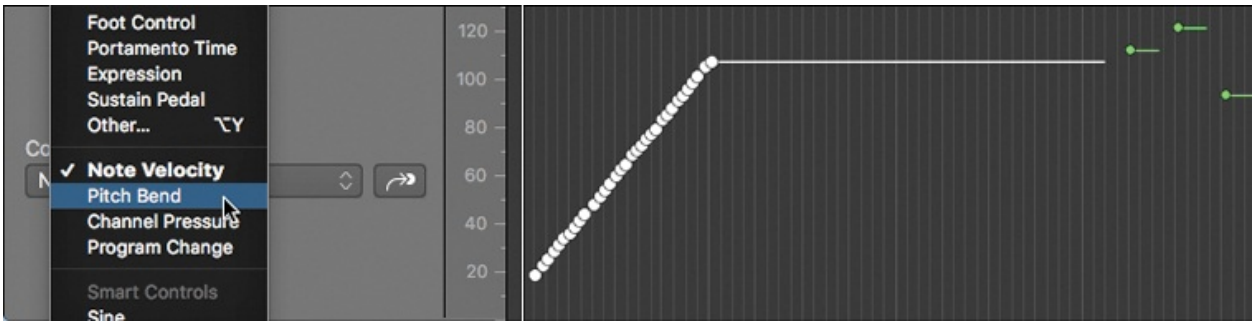
More Info

Control data is sometimes referred to as region-based automation, as opposed to track-based automation, which you'll explore in Lesson 10.

Automating Pitch Bend Data in MIDI Draw

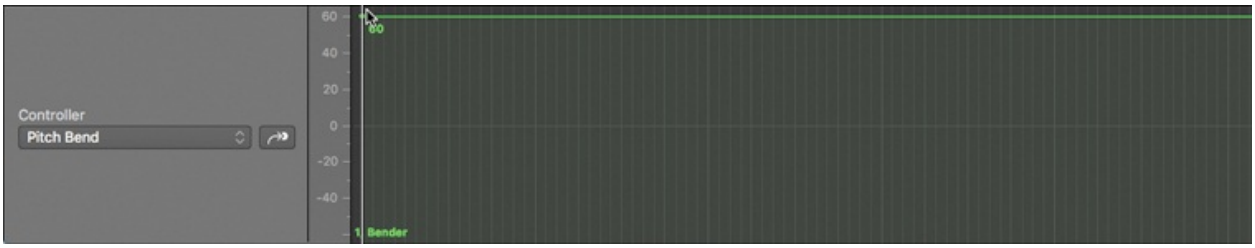
Adding pitch glides at the beginnings or ends of notes can make a MIDI sequence sound musical. Let's enliven your synth performance by bending the pitch in various places and adding a vibrato at the end of a sustained note.

1 In the MIDI Draw inspector, from the Controller pop-up menu, choose Pitch Bend.



The MIDI Draw inspector shows an empty canvas, ready for you to draw pitch bend automation. First, you will draw a pitch drop from the beginning to the end of the fast notes in bar 1.

2 At the upper left of the MIDI Draw area, click to create a control point.



Predicting the exact position and value of a control point you create can be a bit tricky in the MIDI Draw area. To adjust a control point, drag it using the Pointer tool.

Tip

After creating the first control point, click the automation line, or double-click away from the automation line, to create a new control point. You can also create control points by clicking or dragging with the Pencil tool.

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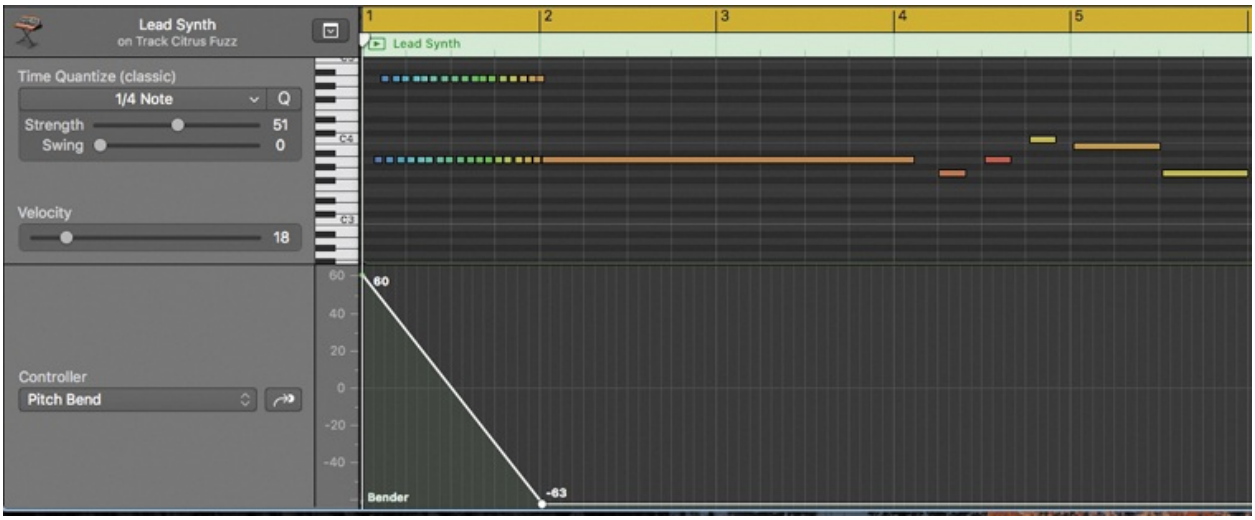
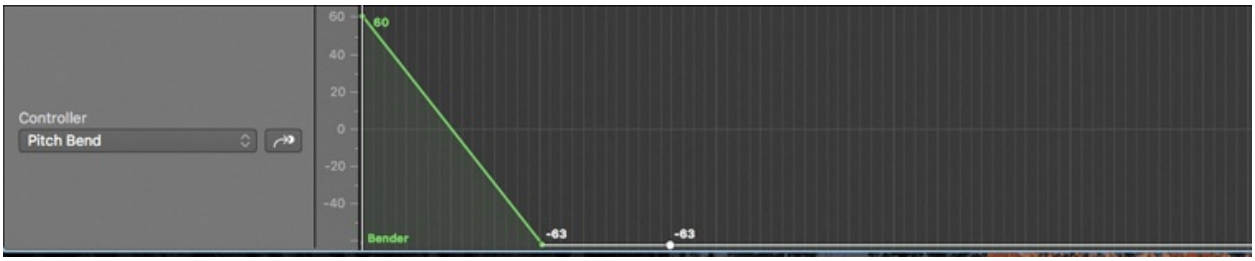
3 In the lower part of the MIDI Draw area, double-click at bar 2 to get the lowest value possible. Listen to the first bar of the synth.



You can hear the fast notes drop in pitch throughout bar 1. However, the rest of the notes play at the wrong pitch. To play the remaining notes at their correct pitches, you must return the pitch to the horizontal gray middle line, which represents the position of the 0 value (the center position on a MIDI keyboard's Pitch Bend wheel).

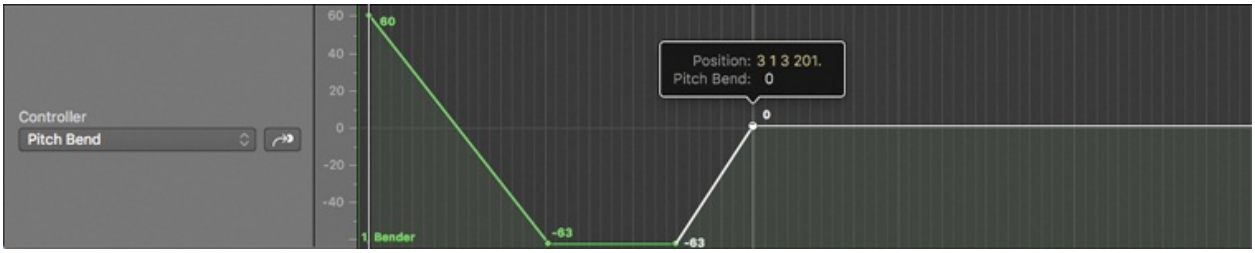
4 A little before bar 3, click to create a control point on the horizontal green line that has the same value as the previous control point you created.



Tip

To delete a control point, double-click it with the Pointer tool. To delete multiple control points, drag around them to select them, and then press Delete on your keyboard.

5 A little after bar 3, create a control point, and drag it to a value of 0. Listen to the synth.



The pitches of the fast notes in bar 1 drop over a range of four semitones; then the sustained note is bent at bar 3, going back up two semitones. You will make the pitch variations more pronounced by increasing the pitch bend range.

The MIDI pitch bend events do not include any pitch bend range information, so it’s up to the instrument receiving the events to determine which pitch bend range to use. As with the instrument used here, most instruments default to a range of two semitones above or below the original pitch. And most instruments allow you to adjust the pitch bend range. You will now open the ES2 instrument plug-in on the Citrus Fuzz channel strip in the inspector to adjust its pitch bend range.

6 On the Citrus Fuzz channel strip, click the middle of the Instrument slot.

The ES2 plug-in opens.

7 In the ES2, drag the upward Bend range field to 12 semitones (one octave).

The downward Bend range field is set to *link*, which means that the downward Bend range value is set the same as the upward Bend range

value. You can now bend notes up to one octave above or one octave below the original pitch.

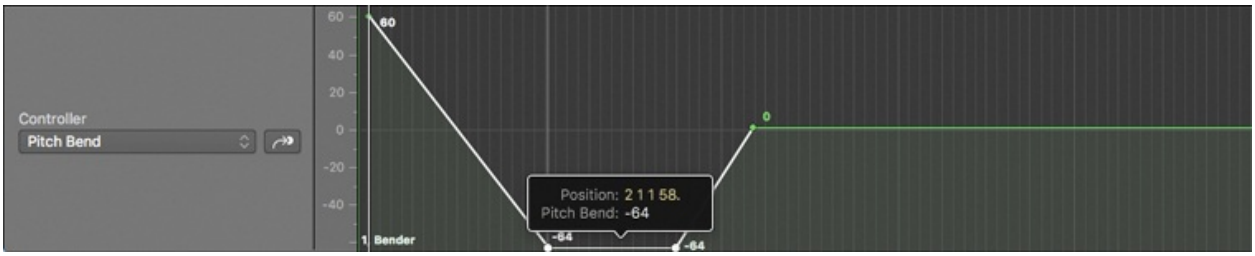
8 Listen to the synth. The fast notes at the beginning drop two octaves; then the sustained note comes back up one octave to the original pitch.

However, unless you got very lucky, the beginning of the sustained note sounds out of tune. You most likely need to adjust the pitch bend value in that section to make sure that it is all the way down (so that part of the note is exactly one octave lower than the original pitch of the note).

9 Close the ES2 plug-in window (or press Command-W).

10 In the MIDI Draw area, drag down the horizontal line between the two control points in bar 2 all the way to a value of –64. Listen to the synth again.

This time the beginning of that sustained note sounds in key, exactly one octave below the original pitch.



Holding down Control-Shift turns the pointer into an Automation Curve tool that you can use to curve the lines joining two control points of different values. (You can’t curve a horizontal line.) 11 Control-Shift-drag the line between the –64 and 0 values (around bar 3).

Drag up or down to create a convex or concave curve, respectively. Drag left or right to create a horizontal or vertical S curve, respectively.

Tip

To create more complex shapes, drag the Pencil tool to draw the desired automation.

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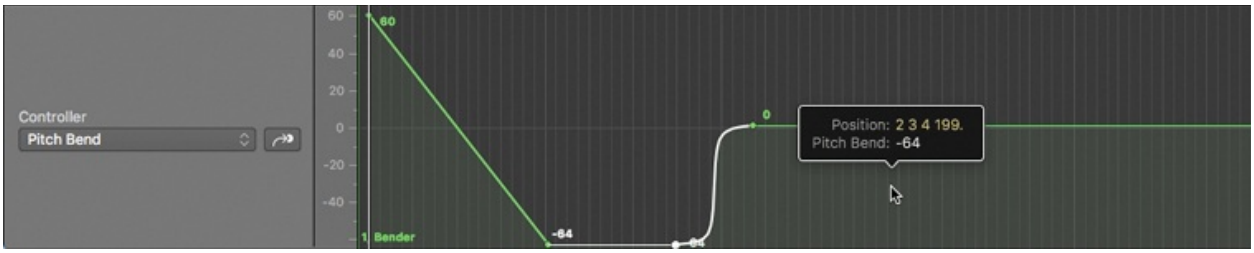
12 Control-Shift-drag that same line to the right to create an S curve.



The pitch glide in the middle of the sustained note is now a little faster.

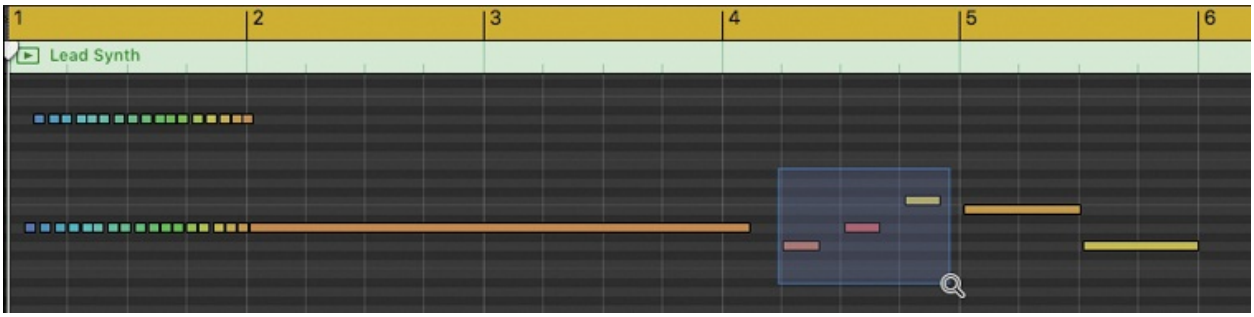
Tip

In MIDI Draw, Control-Shift-click a curved line to revert to a straight line.

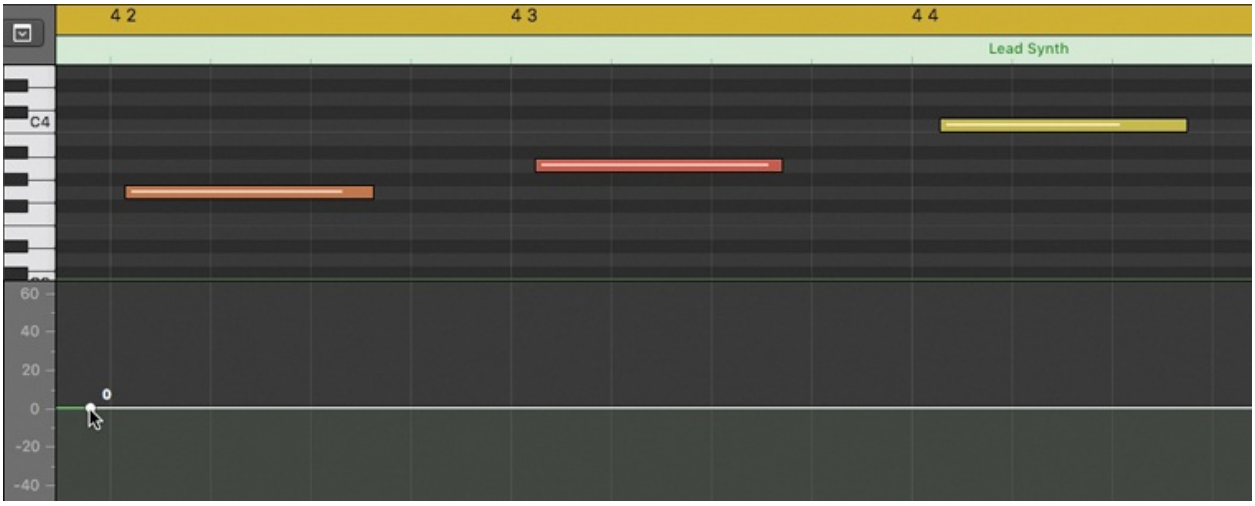
Copying MIDI Control Data in MIDI Draw

Let’s continue automating the pitch bend data in the *Lead Synth* region. You will raise the next three notes in bar 4 from lower pitches to their correct pitches at the beginning of each note. You will create the desired pitch bend automation for one note, and copy it to the two other notes.

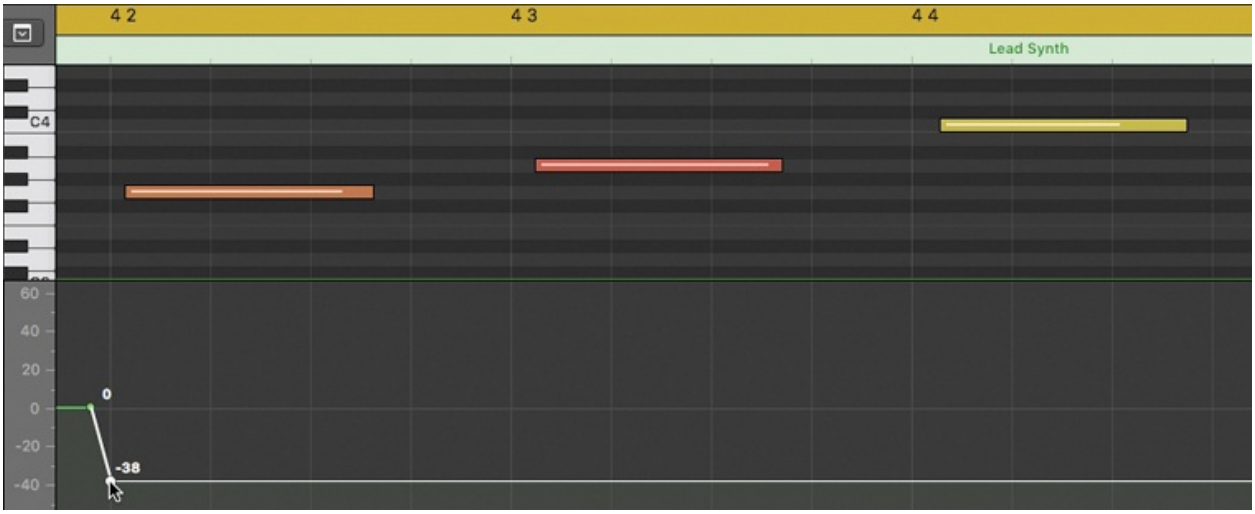
1 In the Piano Roll, zoom in on the three quarter notes in bar 4.



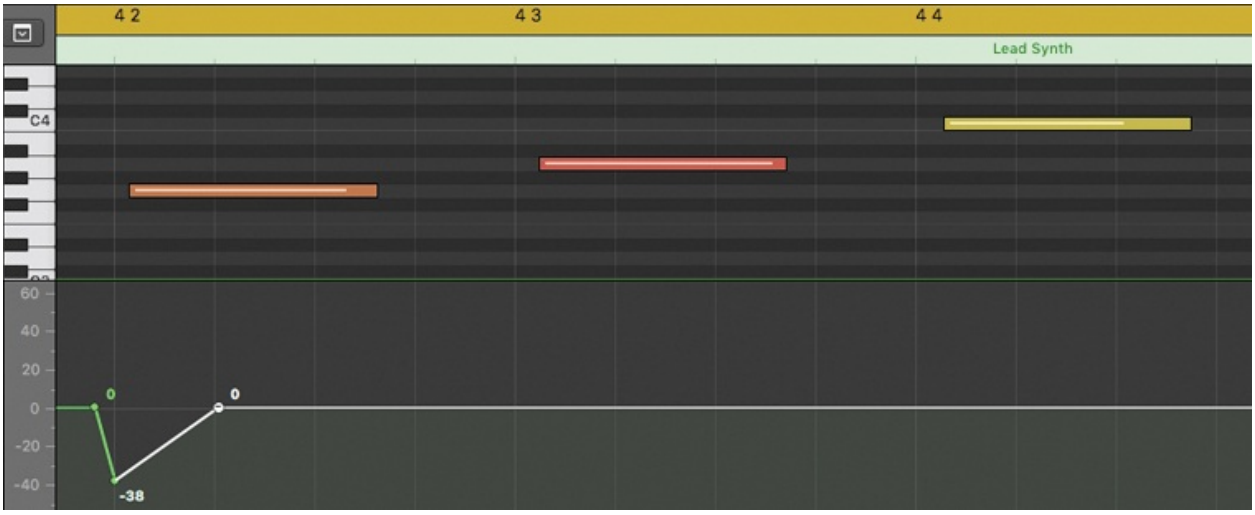
2 Click the green line to create a control point to the left of the first note, and make sure it has a value of 0.



3 Create a control point about halfway down, and drag it horizontally between the previous control point and the beginning of the note.



4 Create a control point a little before the middle of the note with a value of 0. Listen to your synth.

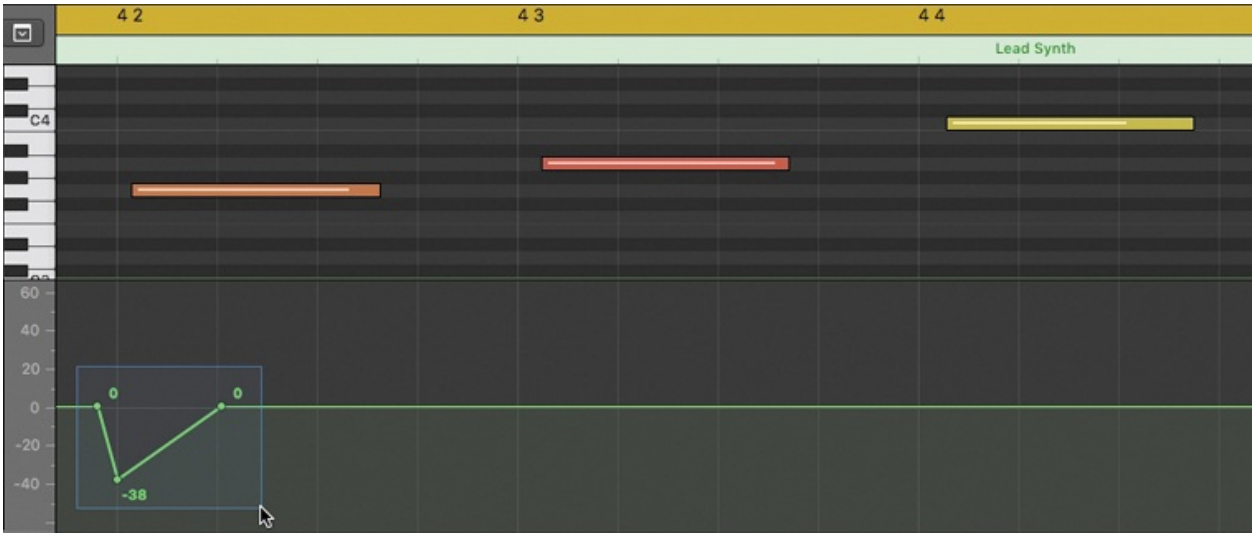


The note now starts on a low pitch and raises to the correct pitch (similar to the way Frank Sinatra often glided up into the correct pitch).

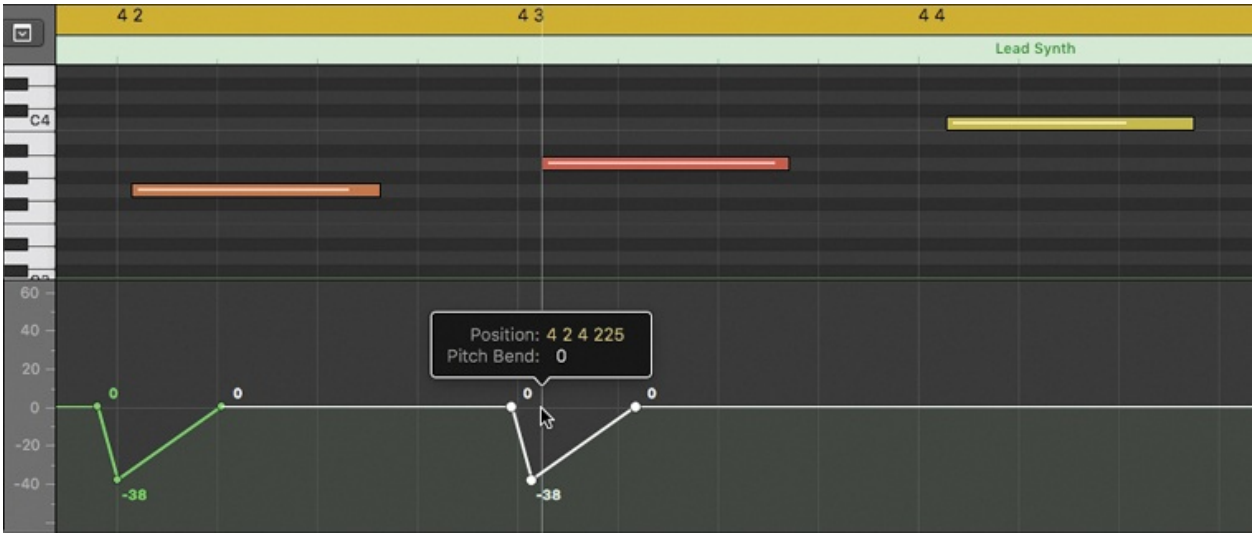
You will now apply the same pitch bend automation to the two following notes.

5 At the bottom of the Piano Roll, drag the horizontal scroll bar to scroll back to the three notes in bar 4.

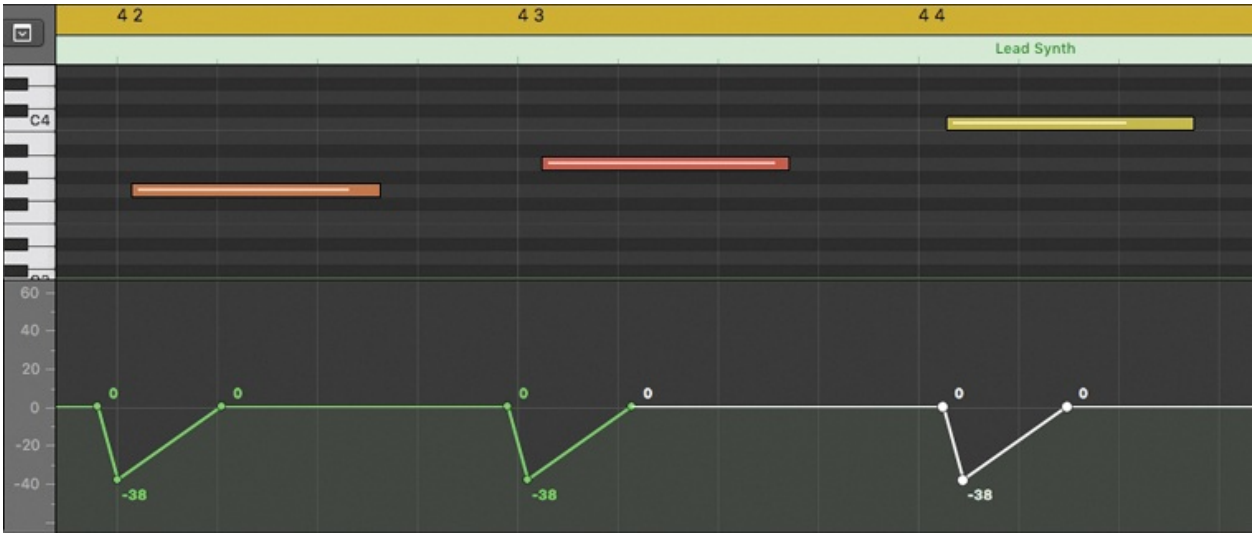
6 Drag a selection rectangle around the three control points at the beginning of the first note.



7 Option-drag the selected pitch bend data to the beginning of the second note.

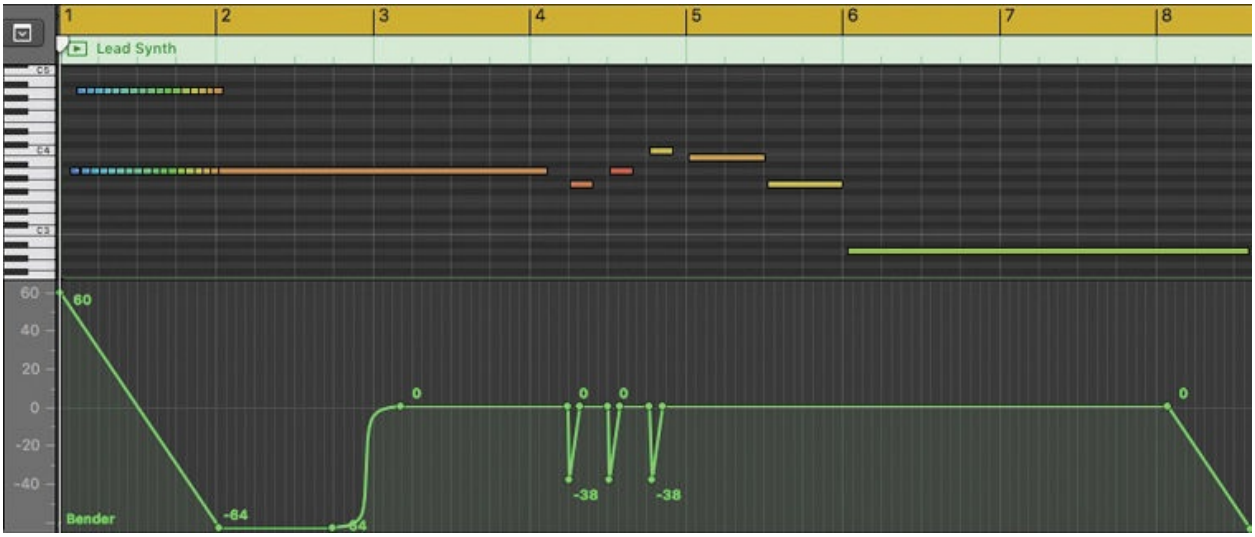


8 Option-drag the selected pitch bend data below the second note to the beginning of the third note. Listen to your synth.



All three notes are raised to their correct pitches at the beginning of each note, which makes them more expressive.

9 Using the techniques you've learned in this exercise, drop down the pitch of the last sustained note in the region an entire octave before the end of the note (around bar 8).



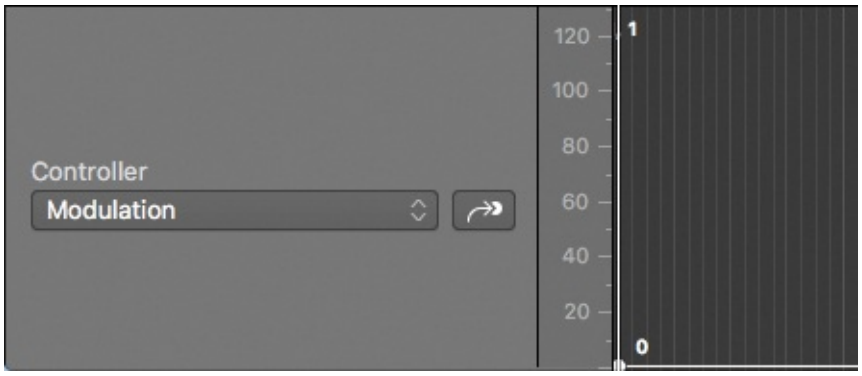
Automating Modulation Data in MIDI Draw

When listening to singers or string players, you may notice that they often use vibrato, and tend to use it more toward the end of sustained notes. On synthesizers, the modulation wheel (often located to the left of the keys) frequently controls the depth of the vibrato. You will now add some modulation automation to the synth to add vibrato to the end of the first sustained note.

1 In the MIDI Draw inspector, from the Controller pop-up menu, choose

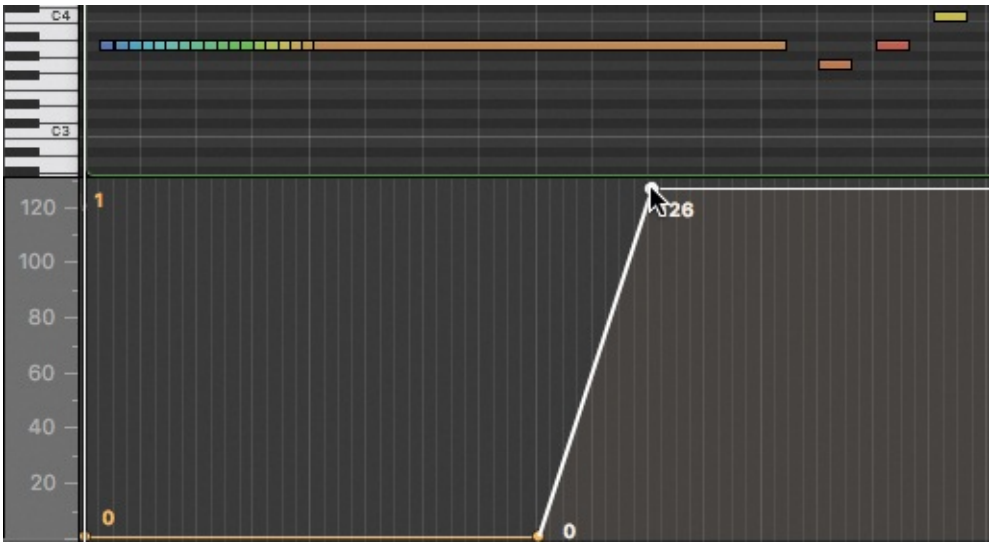
Modulation (in the top half part of the menu).

2 At the beginning of the region, click the very bottom of the MIDI Draw area to create a control point with a value of 0.



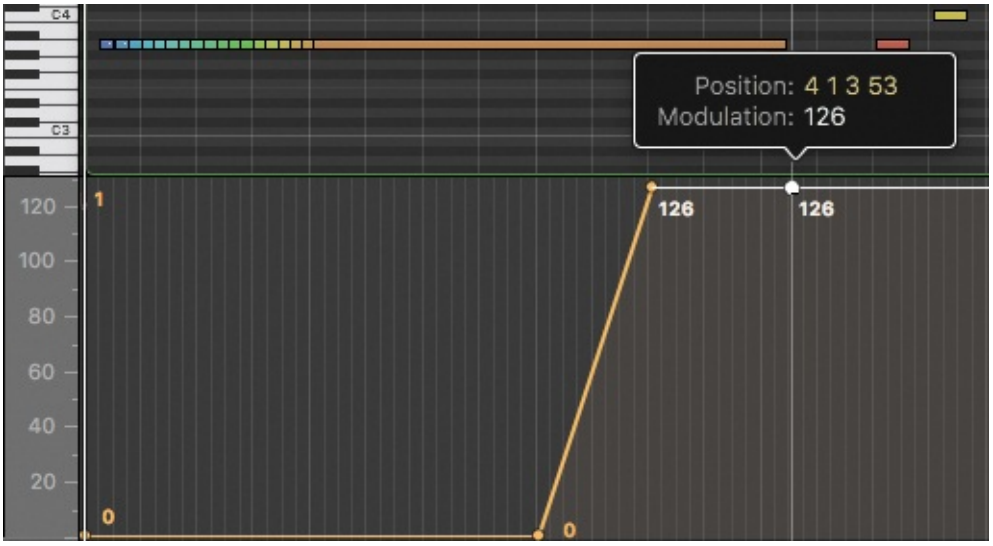
3 Click the line at bar 3 to create a control point with a value of 0.

4 In the middle of bar 3, at the very top of the MIDI Draw area, double-click to create a control point with a value of 126. Listen to your synth.

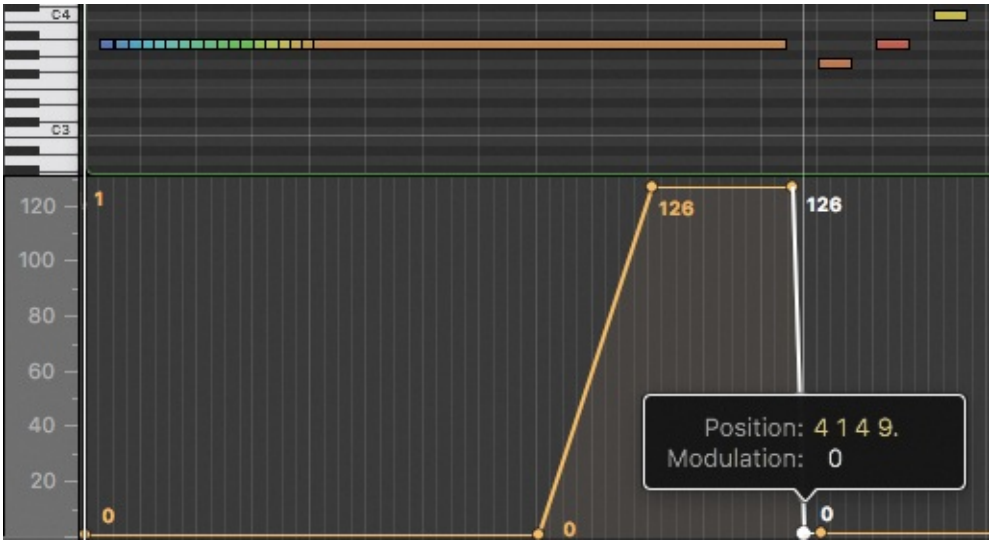


You can hear the vibrato effect come in after the sustained note's pitch goes up an octave at bar 3. However, the vibrato currently stays at its maximum value for the remainder of the region.

5 In the MIDI Draw area, create a control point with a value of 126 right after the end of the sustained note.



6 Create a control point with a value of 0 after the point you just created, but before the beginning of the next note. Listen to your synth.



Now the vibrato applies only to the first sustained note, and the next notes don’t have any. This synth is now much more expressive than it was when you originally imported its MIDI file into the project. You will now add some audio effects to give even more life to the sound.

7 In the control bar, click the Smart Controls button (or press B).

8 Drag the Delay knob to about three quarters of its range, and drag the Scream knob halfway up.

9 Listen to the song, and adjust other Smart Controls knobs as you listen to their effect on the synth sound.

10 Now that you're done editing the synth, you can turn its volume down (try about –10 dB). It may seem like the mix is weaker, so turn up your monitoring level on your audio interface (or by clicking the speaker icon in the Mac main menu bar) to compensate.

Bringing down the synth should enable you to more clearly hear the drums and bass.

In this lesson, you used two MIDI editors—the Piano Roll Editor and the Event List—to create and edit note and control data. But they can do so much more! The MIDI editors in Logic are powerful tools that include numerous options and features.

When trying to perform a specific task, don't hesitate to look through an editor's local menu, or to Control-click an event or an area of the editor to access the shortcut menus. Chances are, you will find the feature you are looking for and discover even more useful features you wouldn't have imagined.

Lesson Review

1. How do you create notes in the Piano Roll Editor?
2. How do you adjust note lengths in the Piano Roll Editor?
3. How do you adjust the velocity of notes in the Piano Roll Editor?
4. In the Piano Roll Editor, how do you view only those lanes occupied by MIDI notes?
5. How do you quickly paint multiple notes of the same length?
6. How do you create a crescendo using note velocities?
7. How do you create MIDI control data?

8. How do you curve lines in MIDI Draw?
9. How do you copy a section of automation in MIDI Draw?
10. How can you check the pitch and velocity of a note in the Piano Roll?
11. How can you check the position, length, and pitch of a note in the Piano Roll?

Answers

1. Click with the Pencil tool.
2. Drag the right edge of the note beam to resize the note.
3. Drag notes vertically with the Velocity tool.
4. Click the Collapse Mode button.
5. Drag the Brush tool.
6. In the MIDI Draw inspector, ensure that Velocity is chosen, and draw a line in the MIDI Draw area.
7. Choose a controller in the MIDI Draw inspector, and click to create the first point. After at least one point is created, click the automation line, or double-click away from the automation line, to create a new control point.
8. Hold down Control-Shift and drag a line between two control points of different values.
9. Drag a rectangle around control points to select them, and Option-drag the selection.
10. Place the pointer over the note. After a pause, a help tag appears with the information.
11. Click and hold the note.

Keyboard Shortcuts

Editing	
Command-A	Selects all
Piano Roll	
Left Arrow	Selects the note to the left of the selected note
Right Arrow	Selects the note to the right of the selected note
Option-Up Arrow	Transposes the selected note up one semitone
Option-Down Arrow	Transposes the selected note down one semitone
Shift-Option-Up Arrow	Transposes the selected note up one octave
Shift-Option-Down Arrow	Transposes the selected note down one octave
Windows and Panes	
E	Opens the Editors area
F	Opens the Browsers area
Command-4	Opens a Piano Roll window