

GarageBand For Game Devs

Synths and Sound Libraries

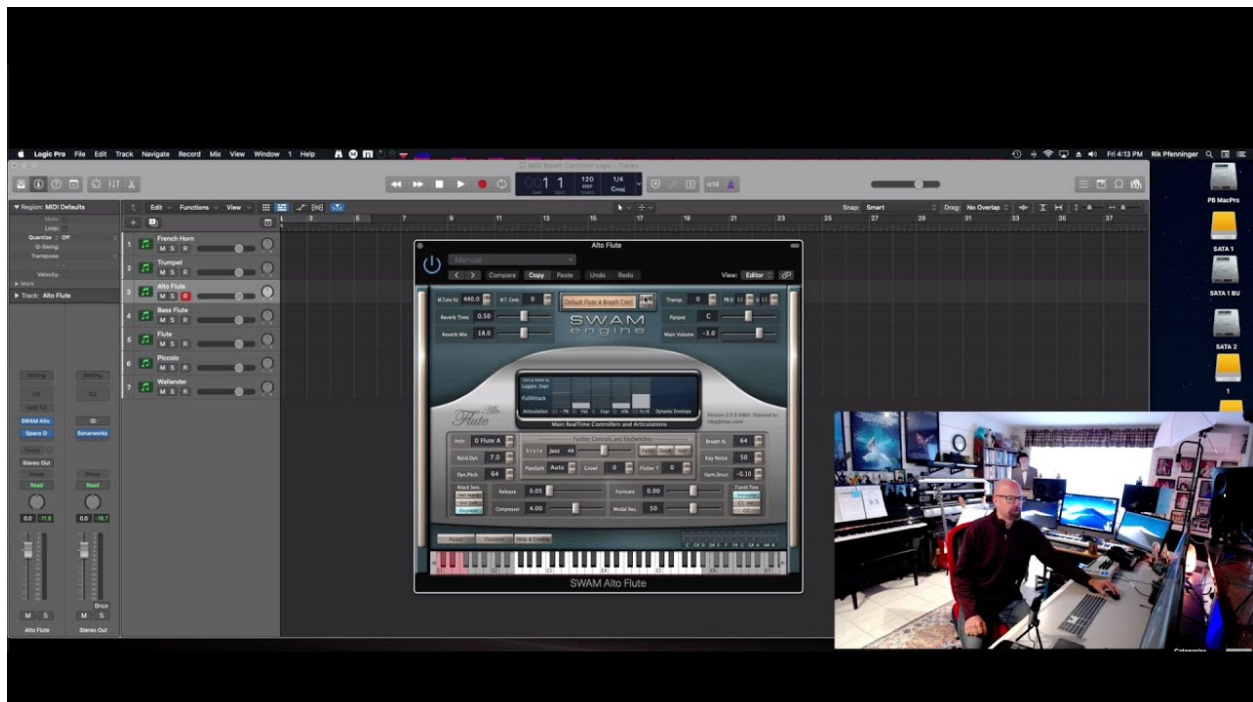
With sound libraries and synths we can come close to emulating “real” instruments and “live” performances by real musicians.

But, there is ***NOTHING*** like having a human perform on an instrument that they spent a lifetime mastering.

A ***DAW*** (Digital Audio Workstation) like GarageBand, is in essence, an instrument that you need to practice and master!

Anytime we are trying to emulate a “real” instrument, comparisons will be made by the listener.

Here is a link to a video that I made on Breath Controllers that help to emulate “real” instruments if you are interested in learning more:

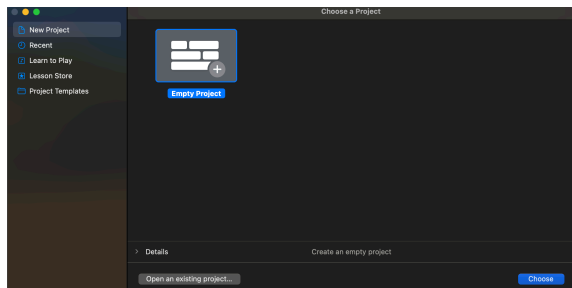


Here is a link to a video on a MIDI Wind Controller. Another tool for emulating “real” instruments.

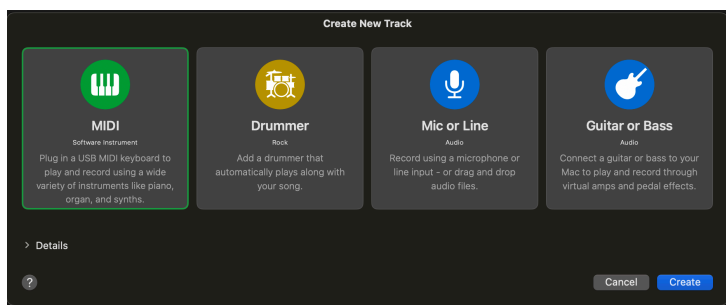


Learning GarageBand Let's Get Started!

Launch GarageBand

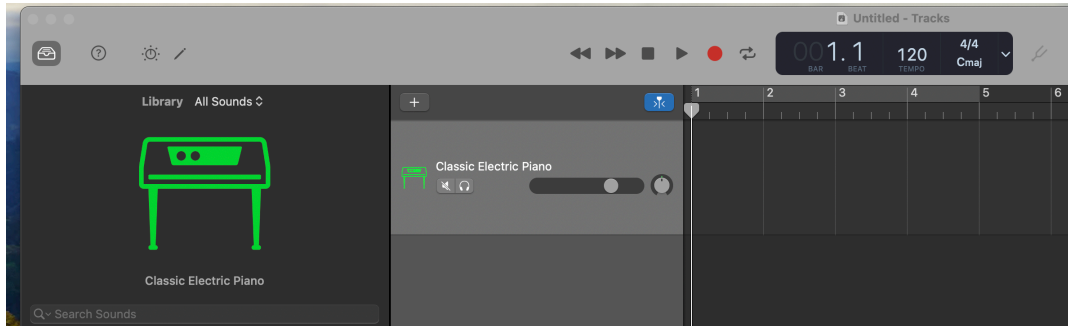


Select **Empty Project** and click on **Choose**



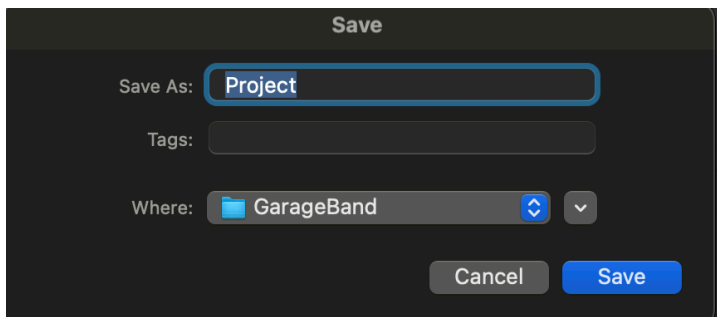
Select **MIDI** and click on **Create**

GarageBand will now load a default keyboard titled Classic Electric Piano



Before we get too far down the Rabbit Hole, let's save our project.

Command -S will bring up the **Save Dialog Box**

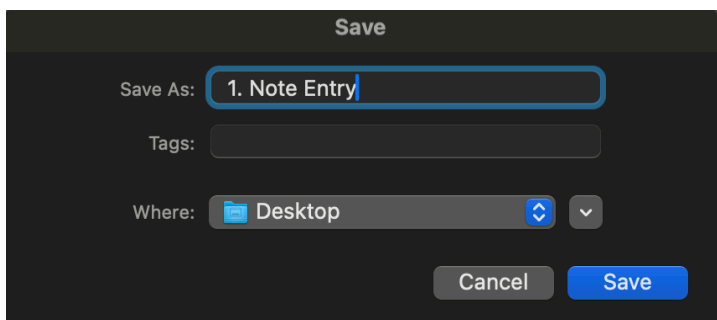


Don't

Hit **Save Yet!**

Title your project (anything that floats your boat).

Then...**Command-D** This will save your project to the desktop (easy to find)

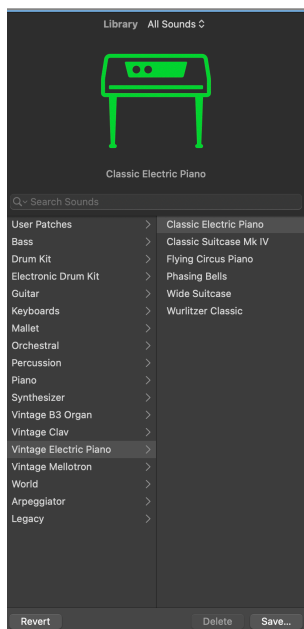


Make sure that **Desktop** is showing in the **Where:** pull down menu.
Hit **Save**

Auditioning Sounds

You don't need a MIDI keyboard to record or audition sounds in GarageBand, although having a MIDI keyboard and knowing a bit about playing the piano will greatly speed up your note entry (more on that later).

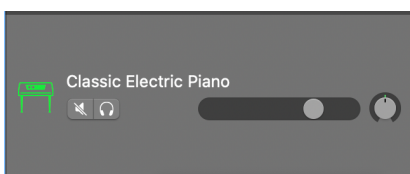
To view the **Sound Library** in GarageBand click on the **Library** icon located on the upper left-hand side of the workspace or hit **Y** on your keyboard. You will now see GarageBand's **Sound Library**

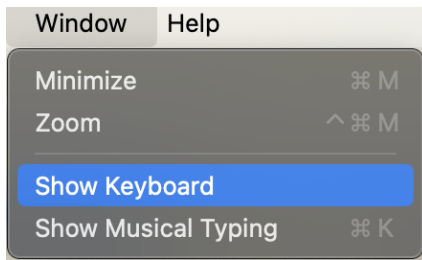


*****Note: if you hover your mouse over any icon in GarageBand you will get a description of that icon!

Let's Listen to the default **Classic Electric Piano** sound first.

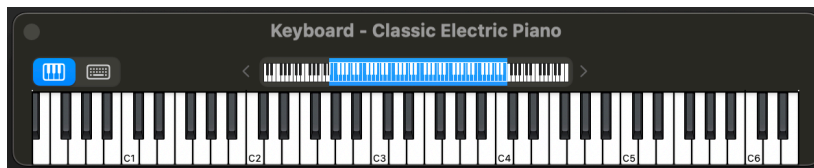
Click on the the **Classic Electric Piano** track to make sure it is selected.





Now go to the **Window Pull Down** menu and select **Show Keyboard**.

You will now see the following:



You can resize the keyboard by dragging the right hand side of the keyboard.

To change the range of notes that you are playing, move the blue portion of the keyboard to the right or left.



Click the mouse on the piano keys to hear the sound of the electric piano. Note, that you ***can't record using the keyboard***.

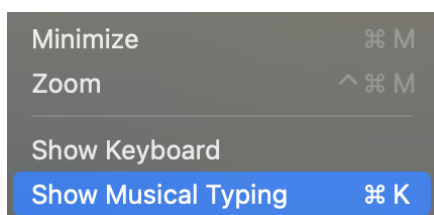
To change sounds, click on the sound name in the second column of the **Sound Library**. Notice that the track name will now change to the new sound.

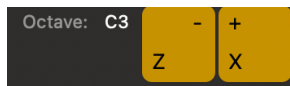
To audition sounds, click on the Instrument category and then select an instrument. There are some great sounds, so feel free to go through and audition each sound.

Recording With Musical Typing

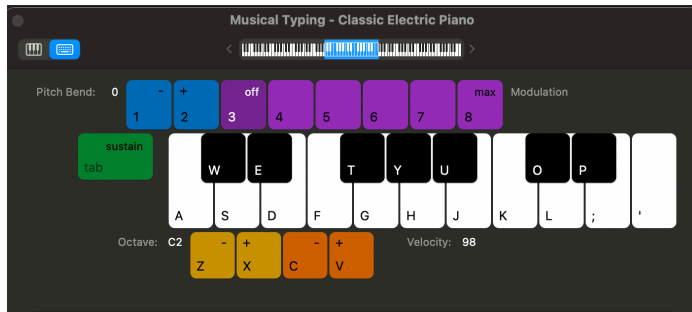
As I mentioned earlier, you don't need a MIDI keyboard to record sounds in GarageBand.

From the **Window** pull-down menu select **Show Musical Typing**





Command-K on your keyboard. You will now see the following:



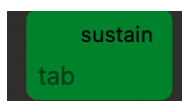
To change the Octave, use the Z to lower and the X to raise the octave that you are playing.



C and V control the Velocity (loudness) of each note.

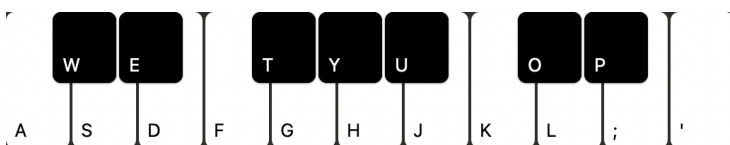
Velocity.

MIDI measures velocity from 0-127, with 0 being very soft, and 127 being very loud. This also depends on the sounds. Some sounds, like a snare drum hit, will not react to velocity as well as a violin sound. I will cover more on Velocity later.



The tab key acts as a piano pedal to sustain notes.

If you play the white and black keys as outlined in the **Musical Typing** keyboard in GarageBand



Let's so a simple recording using the **Musical Typing Keyboard**.



7

If you don't have a number keypad, the click on the **Rewind** icon located at the top of the GarageBand window to rewind back to the start of your recording.



Hit the **Spacebar** to start and stop your recording. You should now hear an Electric piano playing your wonderful melody.

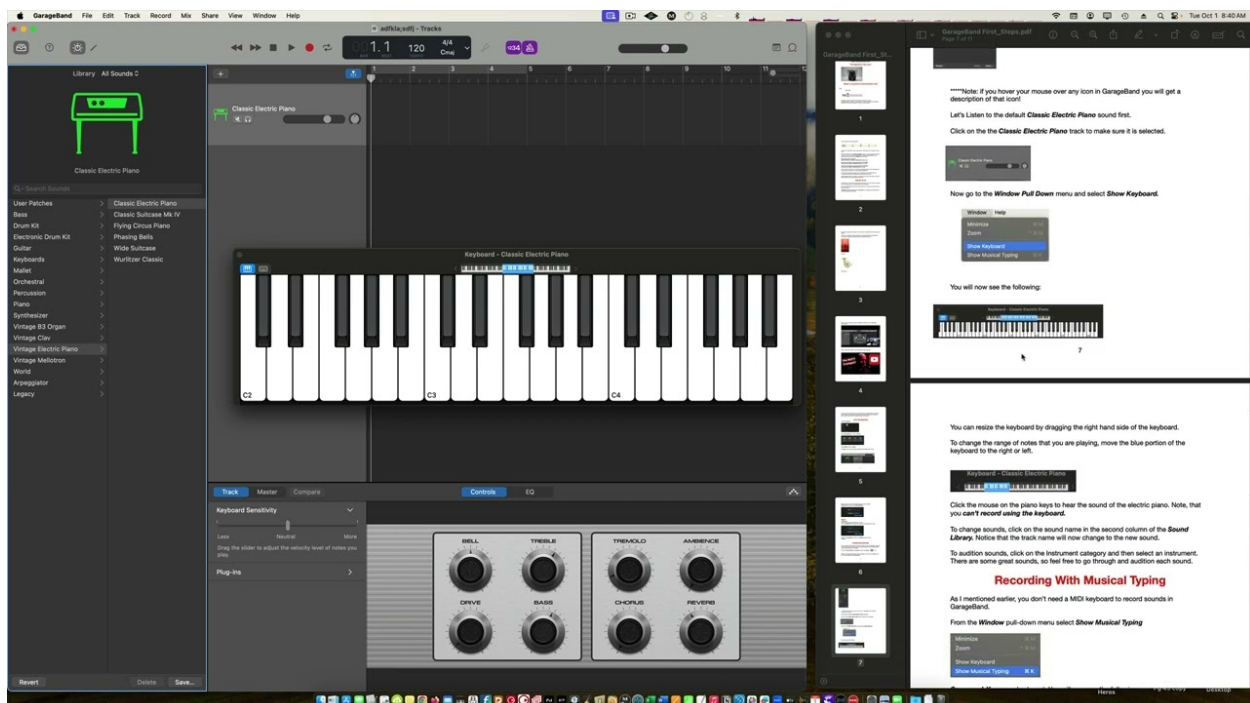
Recording With A MIDI Keyboard

If you have a MIDI keyboard attached via a USB cable, GarageBand will automatically connect it. Start playing, and if you hear an electric piano sound, you are connected!

Just repeat the recording process from above and use your **MIDI Keyboard** to enter the notes.

Video Recap #1

Here is a video recap of the above concepts that were just presented.
Feel free to watch it, if you want a visual tutorial!



Editing MIDI Tracks

***** ***My Favorite Key Command in GarageBand Command Z UNDO!!***

One of the most powerful features of working with MIDI and Software Instruments is that you can create the perfect performance using GarageBand's ***Piano Roll***.

You can access the ***Piano Roll*** by clicking on the track you want to edit and

Clicking on the ***Editors*** icon

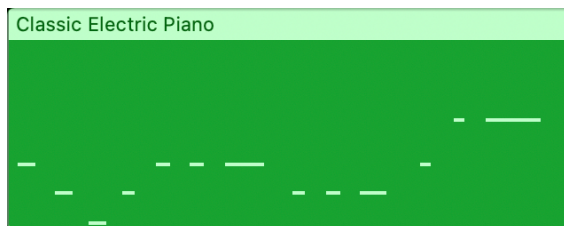


or

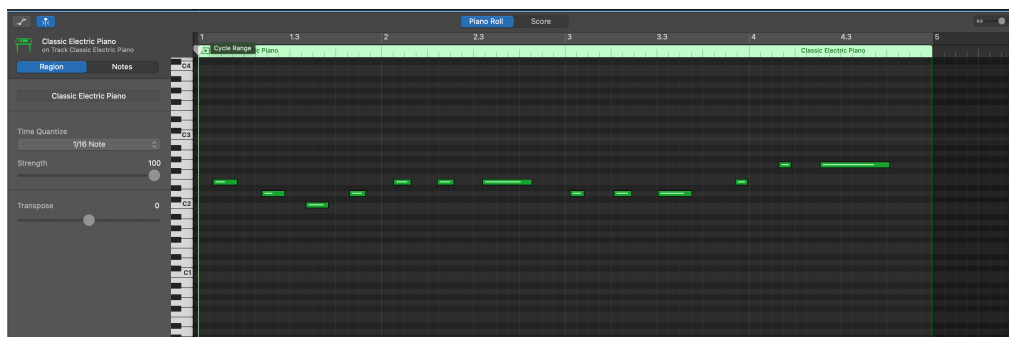
Typing the letter ***E*** on your computer keyboard

or

Double clicking on the MIDI track info



Any of the above methods will now take you to the ***Piano Roll*** window



You can expand the window vertically by grabbing the blue bar at the top of the ***Piano Roll*** and moving it upward

You can expand the **Piano Roll** window horizontally with the **Horizontal Zoom** icon located in the upper right hand corner of the **Piano Roll** window



Fixing A “Bad” Performance

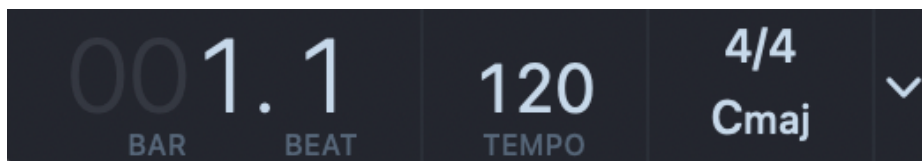
For this example I played **Mary Had a Little Lamb** pretty badly. In music **TIME** is everything! Feel free to record anything you want for this section of the tutorial.

Remember that **Metronome** that we turned off earlier? I recorded this without the metronome and it sounds pretty bad, note wise and time wise (trust me) you can hear it in the Video recap at the end of this section.

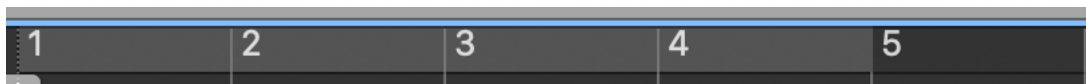
But first some music and math:

Tempo: how fast a song is perceived. You know-a love balled is slow and a corny polka is usually pretty fast!

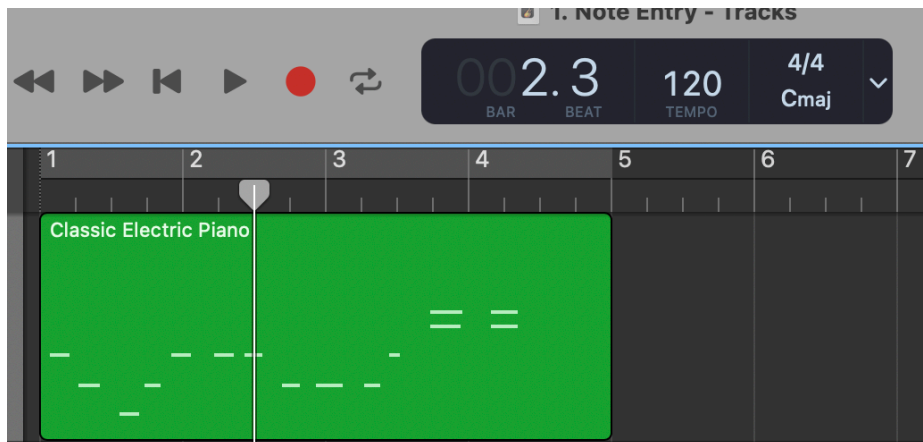
Let's have a closer look at the **Counter Window** in GarageBand



Bar: music can be divided into bars, which contain a certain number of **beats**. In GarageBand the bars are located at the top of the window:



Beats: in simplistic terms are the number of clicks in each bar. In the example below the GarageBand **Playhead** is located in Bar 2 Beat 3 as indicated by the **Counter Window**



You can grab the **playhead** with your mouse and move it around and the **Counter Window**

will follow along.

Changing the Tempo: We can change the **Tempo** by hovering the mouse over the **Tempo** number and dragging up and down to make the tempos slower or faster.

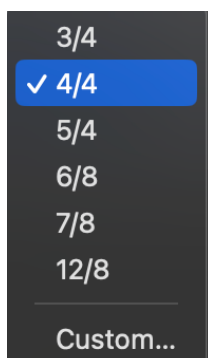


FYI: THIS IS MY SUPERPOWER when I have to play in a DIFFICULT piano part. I slow the **tempo** down to a crawl, play the part in very slowly and then speed the **tempo** back up to the original pace!

4/4 this is called a **Time Signature** how many beats in each measure. The top number refers to how many beats in each measure and the bottom number refers to which note value is getting the beat.

We are not going to worry about the bottom number (too much music theory) YUCK!

To change the **Time Signature** click on the 4/4 and you will see a set of commonly used time signatures. You may also enter a unique time signature by clicking on the **Custom** pull down.



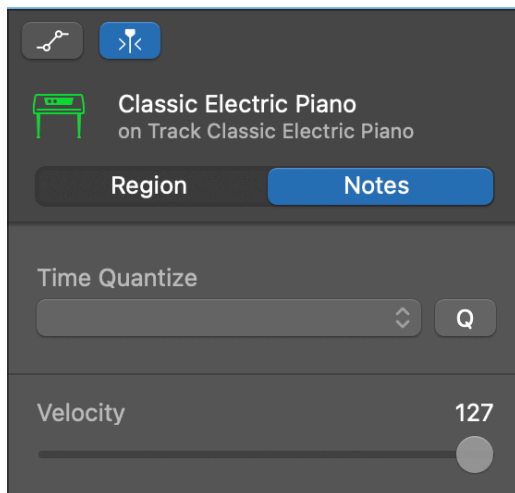
We are not going to worry about about **Cmaj**, which is a **Key Signature** (again, too much music theory).

Editing Notes In The Piano Roll

Ok, let's edit my “wonderful” performance of Mary Had A Little Lamb

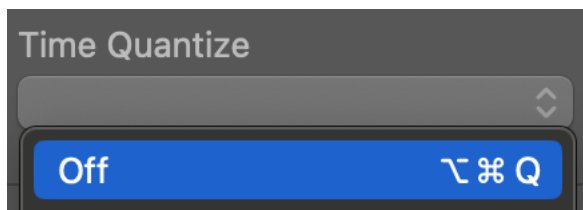
Open the Piano Roll (I'm just going to **double click** on the **MIDI Track**).

Since we are going to be editing the MIDI notes, make sure that **Notes** is selected. Your window should look like this:



Notice that the **Piano Roll** window has a grid. We can move the MIDI notes vertically (which changes pitch) and Horizontally (which changes timing).

To turn the grid off, which allows you to move anything without snapping to the grid, select off in the **Time Quantize** pulldown menu.



You can now move the MIDI notes around without snapping to the grid. Try it!

Remember when I mentioned **Velocity**, which is measured from 0-127? We can edit note velocity in this window as well. When all the Velocities are the same value it sounds “Robotic” not human at all.

Think about how a human would play piano, there is volume differences between each note that makes the performance sound more expressive.

To Edit **Note Velocity**:

Select a MIDI note by clicking on it.

You will now see the velocity of that note in the left hand column.

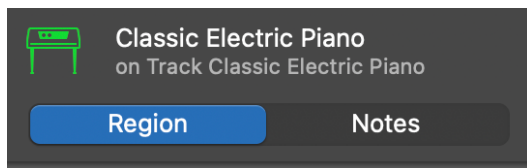


My first note has a velocity of 127 (full volume)

To change a notes Velocity, grab the slider and select a velocity between 0-127.

Editing Regions In The Piano Roll

Keeping the **Piano Roll** open, lets switch to the **Region** menu

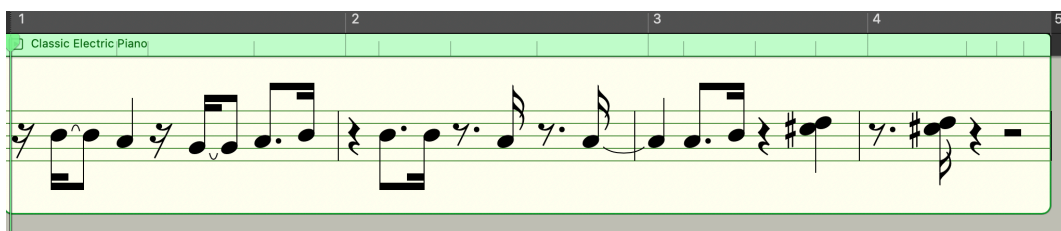


Fixing The Timing

If you click on the **Score** icon located at the top of the **Piano Roll** window



You will now see the musical notation for my poor **Mary Had a Little Lamb** performance. For those of you who can read musical notation. This looks pretty complicated.



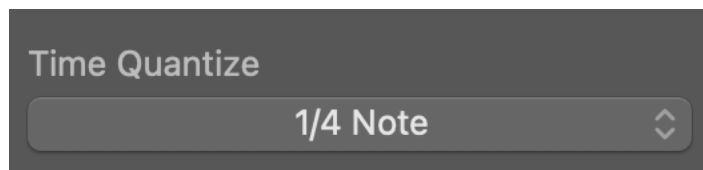
Let's fix the timing and clean up the musical notation. Switch back to the **Piano Roll** view.



Applying Time Quantize

For those of you who know how to read music, the next section will make sense. If you don't know how to read music, just use your ears. Does it sound like it is in time?

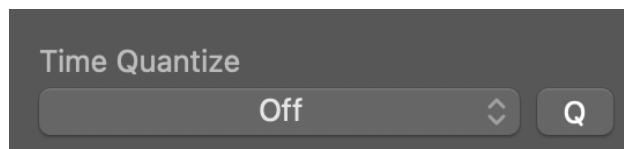
Since the smallest note value in **Mary Had a Little Lamb** is a quarter note. I'm going to select the following in **Time Quantize**



If you don't read music you are going to have to experiment with the **Time Quantize** Value.

*******Make Sure That You Don't have a Note or Notes Selected*******

Notice that the MIDI notes have now shifted and are locked into the grid. The **Time Quantize** menu now reads **Off**.

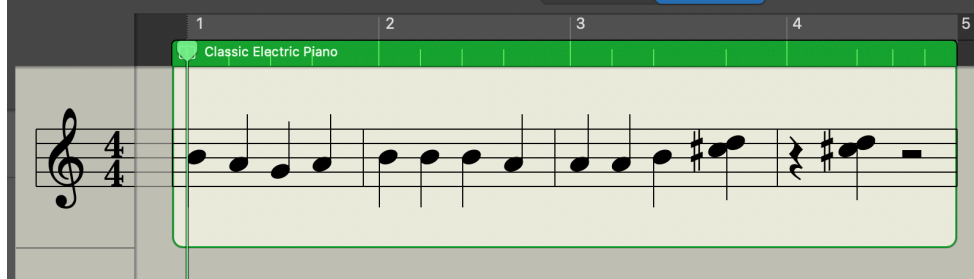


Let's Give This a Listen

Turn the **Metronome** back on by clicking on the icon located at the top of the **GarageBand** window.



Hit the **spacebar** on your computer keyboard to play back the sequence. Notice that it is now in time with the **Metronome** click.

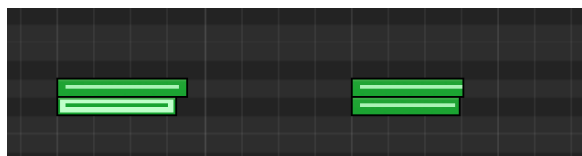


And...look at the notation in the **Score** view:

MUCH easier to read, right?

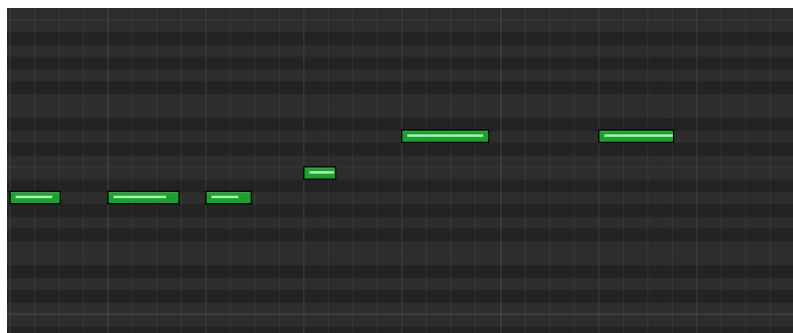
But I still need to fix some timing issues and get rid of my “clams” at the end.

I’m going to click on the bottom note of the last two groups of notes since that was a mistake. Notice that the **Piano Roll** will now switch back to the **Notes** view window automatically.



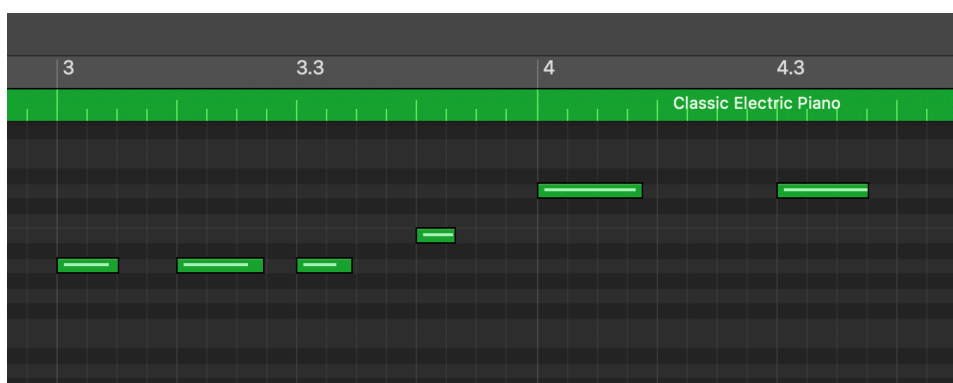
With the MIDI note selected hit the **delete** key on your keyboard and remove both of the lower notes.

In the second half of the song there needs to be a pause before that phrase begins

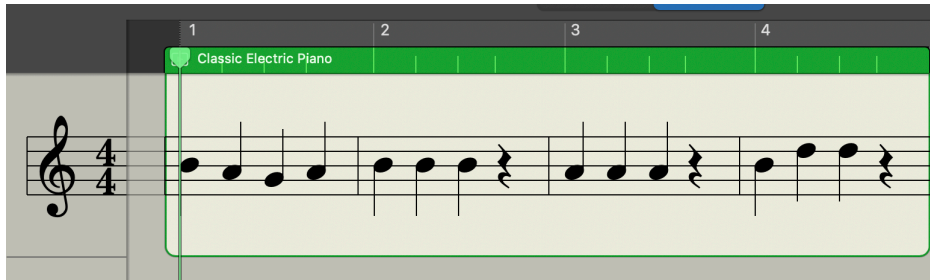


I’m selecting the entire second phrase and dragging it to the beginning of Bar 3.

It’s getting better, but I still ned to fix the timing at the end.



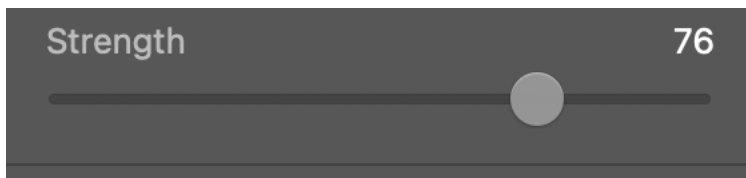
Two more edits and we now have a perfect **Mary Had a Little Lamb** rendition. (Sort of). I would spend more time editing the **Velocities** and **Note Lengths** to make it sound more like a “human” performance.



Humanizing a Performance?

In the **Regions** menu there is a **Strength** slider. Moving this to zero will mess with the timing and make you sound like a beginner.

Moving the slider to 100 will lock your performance into the grid. Experiment and find a setting that sound best to your ears.



Transpose

This slider works in semi-tones (half-steps) on your piano keyboard. I won't go into Music Theory here.

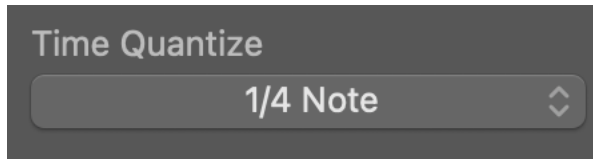
Grabbing the slider and sliding to the right **-12** will make the MIDI notes sound down an octave (more music theory).



I don't really like this method of transposing because the MIDI notes stay in the same position on the grid (it can get confusing)

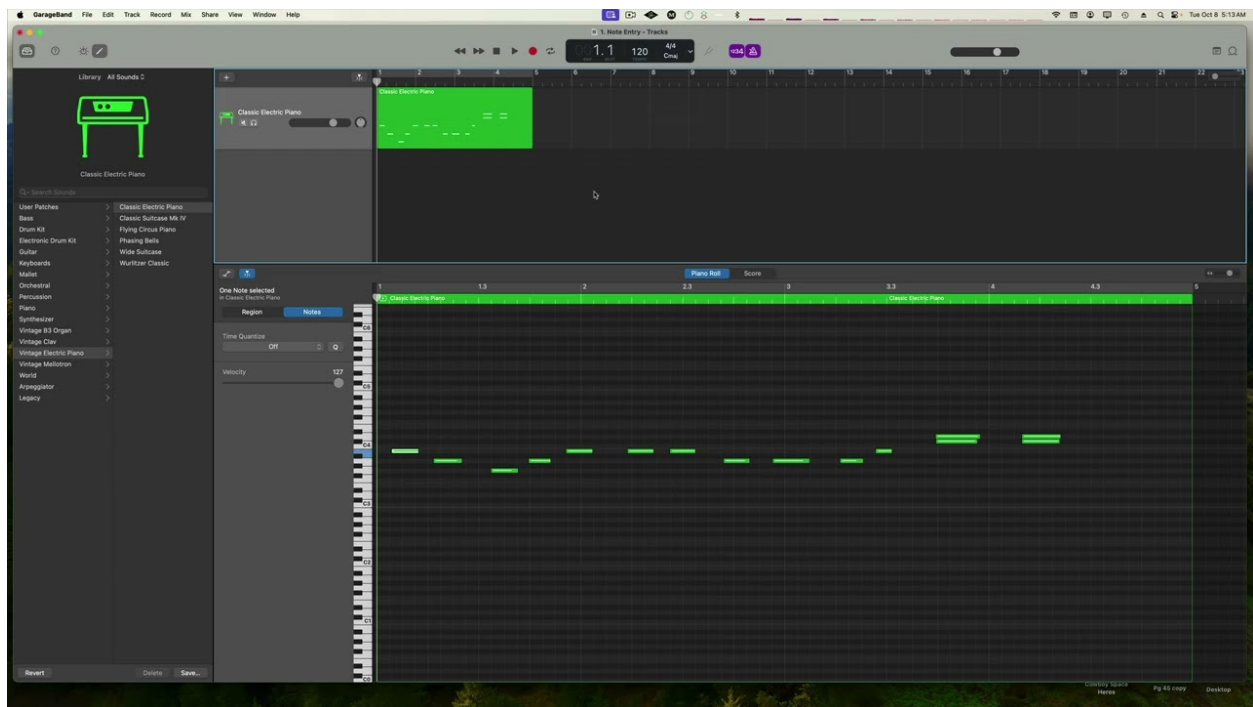
A better method would be to go to the **Notes** menu and select all the notes (**Command A**) and drag them up or down to the desired pitch.

***** To keep the timing intact, make sure that the **Time Quantize** is selected to whatever note value you want.



Video Recap #2

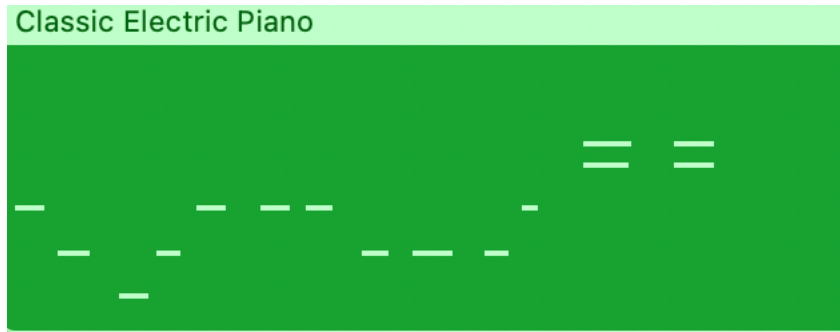
Here is a video recap of the above concepts that were just presented.
Feel free to watch it, if you want a visual tutorial.



Working With GarageBand Loops

One of the most powerful features in GarageBand is the looping feature.

You can delete your “Mary Had a Little Lamb performance by selecting the MIDI data and hitting **delete** on your keyboard.



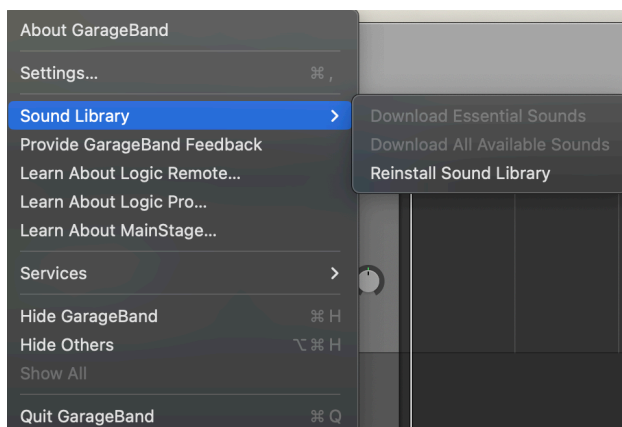
We will keep the **Classic Electric Piano** track available for possible future use.

Click on the **Library** icon to deselect it, or hit the **Y** key on your keyboard. This will give us more space in our main GarageBand Window.

To make sure that you have the **Sound Library** up-to-date and installed, click on the **About GarageBand** pull down menu located in the upper right-hand corner.

If the **Download Essential Sounds** is grayed out. You are good to go,

You can also download **All Available Sounds** as well.

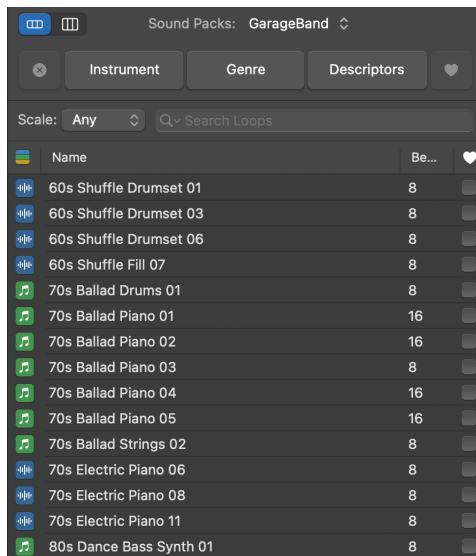


Viewing the GarageBand Loops Browser

To View the **Loop Browser**, click on the icon in the upper right-hand corner.



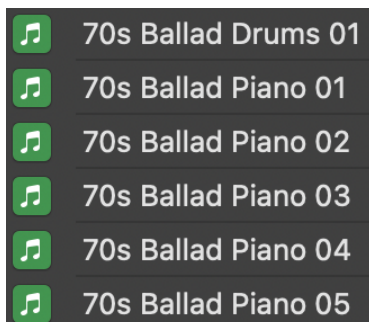
or, type the letter **o** on your keyboard. You will now see the following window:



MIDI and Audio Loops

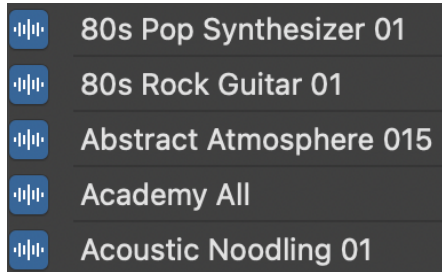
There are two types of loops in GarageBand:

MIDI Loops, which are green



MIDI Loops have unlimited editing possibilities (more on that later).

Audio Loops are blue, and have limited editing possibilities.

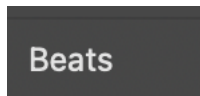


Auditioning GarageBand Loops

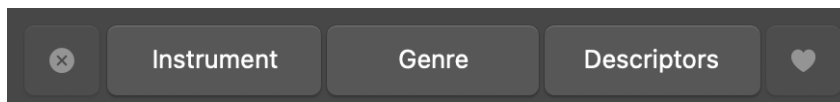
You have two view options. If you click on the **Name** icon, the loops will be listed alphabetically.



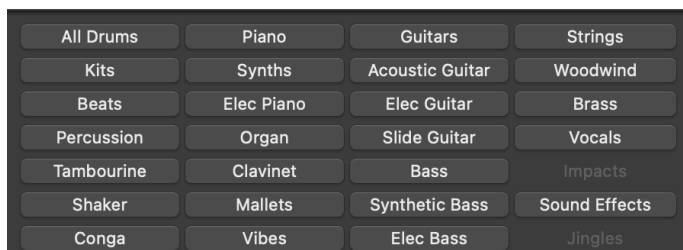
Clicking on the **Beats** icon will list the loops by the number of beats



At the top of the **Loop Browser** window are three categories.



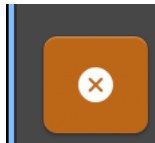
Instrument: allows you to view the loops from an instrument menu.



Selecting any of the above categories, will display all loops that are associated with that category.

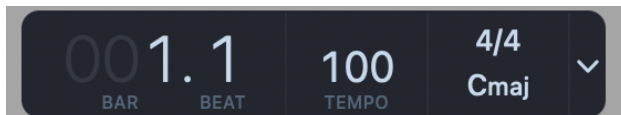
The same applies to **Genre** and **Descriptors**.

Once a **Category** is selected, you can clear that **Category** by clicking on the orange **X** icon.

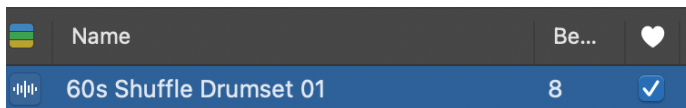


To audition a loop, simply click once on that loop. It will start playing. Click on the loop again to stop playing the loop.

******* NOTE! The Tempo in the GarageBand Project will dictate the tempo of the loops!**



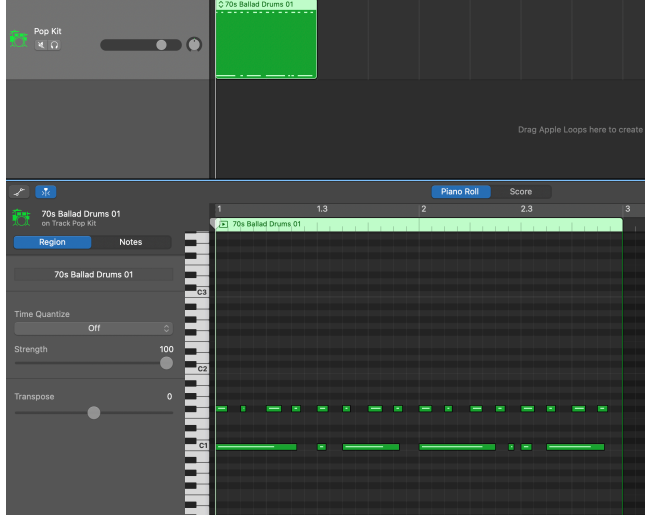
If you love a loop, give it a **check** in the heart column for future reference!



Drag A Loop Into A GarageBand Project

Simply drag a loop into your GarageBand project window. GarageBand. In the case below, I dragged a MIDI loop into my project.

GarageBand now created a MIDI Instrument that you can also play with your **MIDI keyboard** or **Musical Typing**.

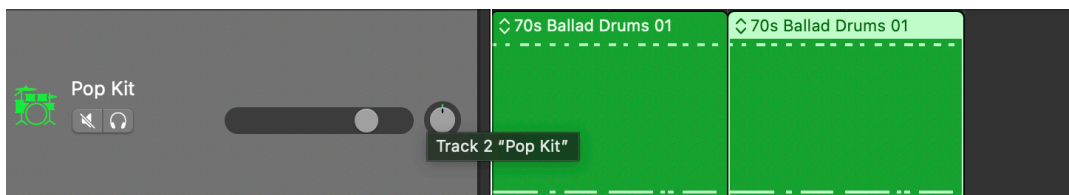


As discussed in above, you can also edit a MIDI loop in the **Editors** Window, or create a new loop by playing in your own original material.

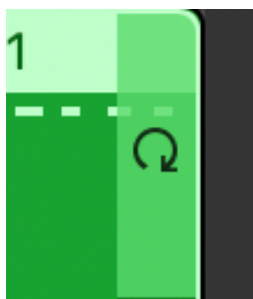
Expanding Your Loops

There are several ways to expand your MIDI and Audio Loops.

Option-Click and Drag will make a copy of the audio Loop

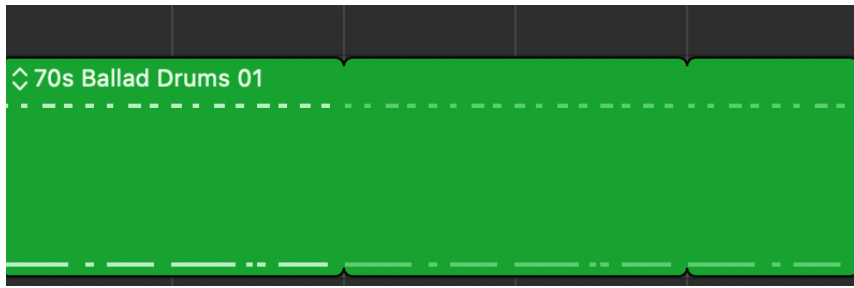


Hovering your mouse over the upper right-hand side of the loop will allow you to click and drag a loop to your desired length.



****** Notice that the newly created loop section is grayed out.** You can't edit a loop section if you use this method to expand it.

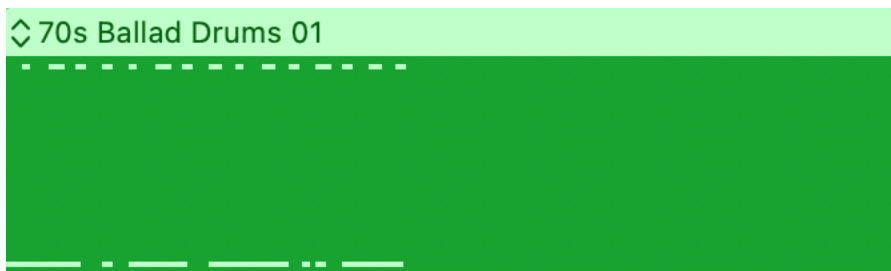
This works great if you don't need to do perform any future edits to a loop.



Hovering your mouse over the lower right-hand side of a loop will allow you to expand the loop area if you want to add your own MIDI notes.



The expanded area does not contain any MIDI notes.



*******This function will not work for Audio Loops.**

Editing Audio Loops

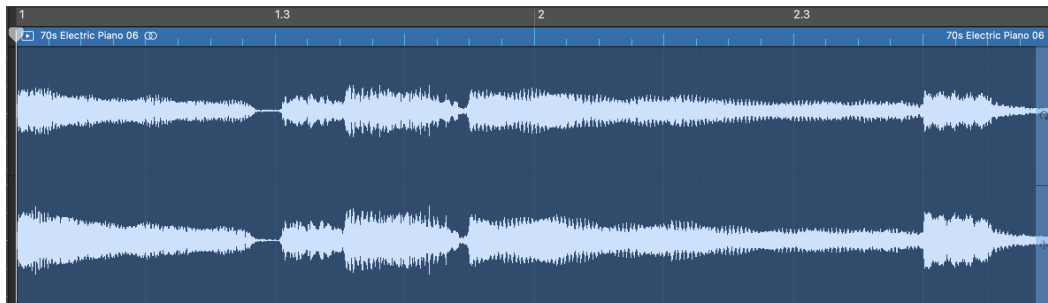
We are a bit more limited with what we can edit in **Audio Loops**.

We can **Transpose** an audio loop just like we transposed a MIDI loop.

Make sure the **Edit** window is open and select the **Region** icon.



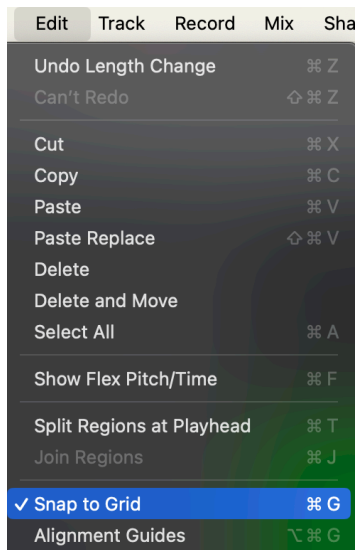
For this particular loop, there is a little hit at the end, which I don't want.



In this case, I don't want my audio edit to **Snap To The Grid**.

NOTE* Make sure that the upper area of your GarageBand window is active by clicking on it. Otherwise Snap To Grid will not be available in the Edit pull down menu.**

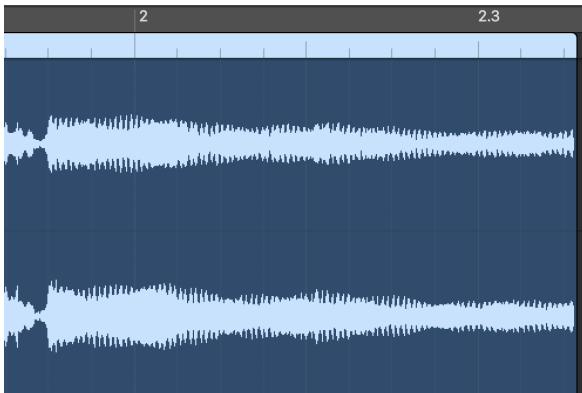
Go to the **Edit** pull down menu and deselect **Snap to Grid** or use **Command-G** on your keyboard to deselect it.



Grab the lower right-hand side of the loop and drag to the left to shorten the loop and get rid of the audio that you don't want.



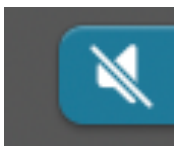
Experiment with right timing and use your ears. My new audio loop now looks something like this:



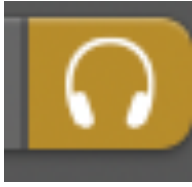
Track Controls

Each of your tracks has a set of controls, which include ***Mute***, ***Solo***, ***Input Monitoring***, ***Volume***, and ***Pan***

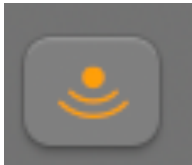
Mute, will mute the track, so that the track will not be heard in your mix.



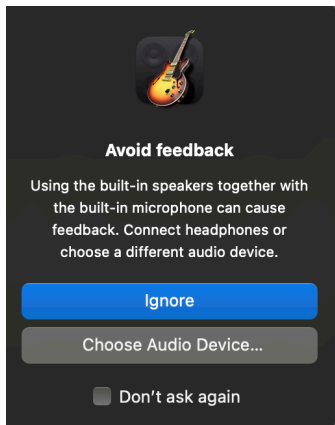
Solo, will solo a track so that only that track will be heard in your mix.



Input Monitoring, allows you to hear the live microphone input when you are recording from a microphone (more on that later).



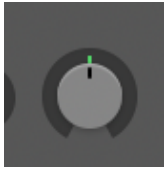
If you are using your computer's built in microphone and speakers, you will get the following pop-up message. Be aware that if the levels are set too high, you may get feedback.



Track Volume, this allows you to set the volume of your track in a mix, by moving the slider left and right.



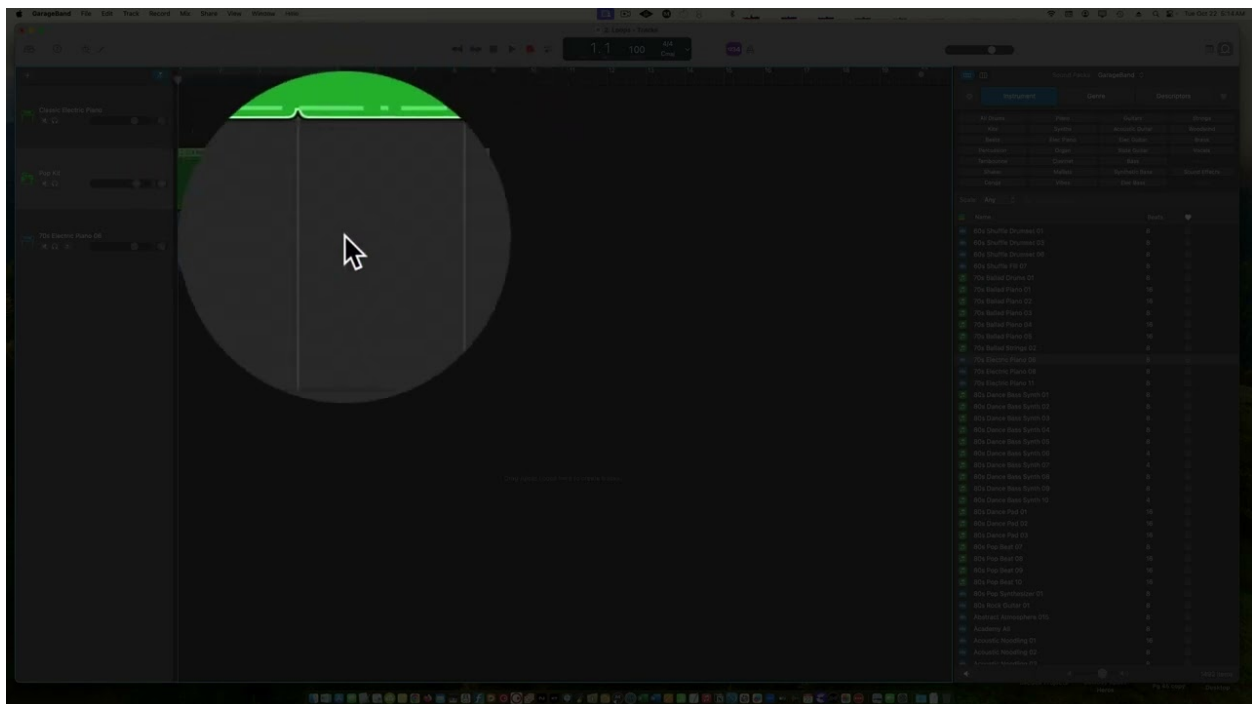
Pan, this allows you to move the sound left or right in the stereo field.



Video Recap #3

Here is a video recap of the above concepts that were just presented.

Feel free to watch it, if you want a visual tutorial.



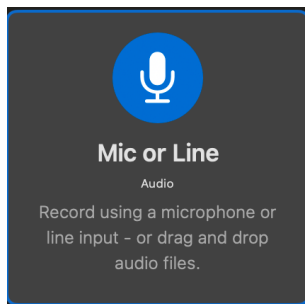
Recording Your Voice

Let's make a simple recording of your voice. We are going to use your computer's microphone to do this.

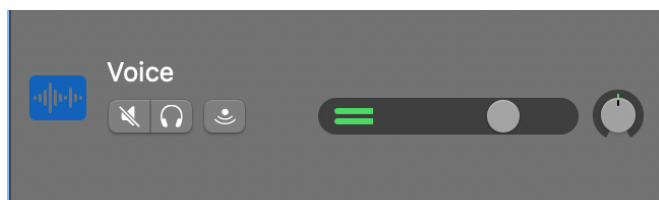
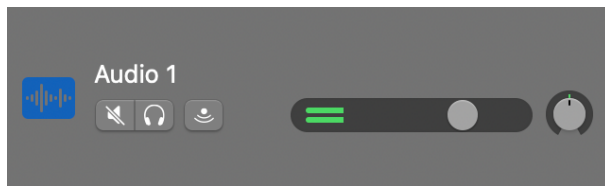
Let's add an **Audio Track** to our project by clicking on the + icon in the upper left hand side of the GarageBand workspace.



Select **Mic or Line** to add an Audio Track.

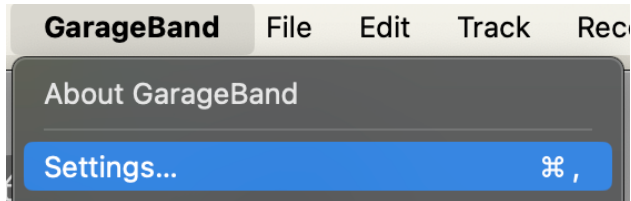


Let's title our track **Voice** by double clicking on the **Audio 1** track title.

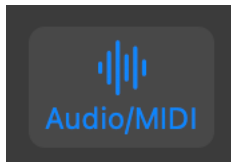


Selecting Your Mic Input

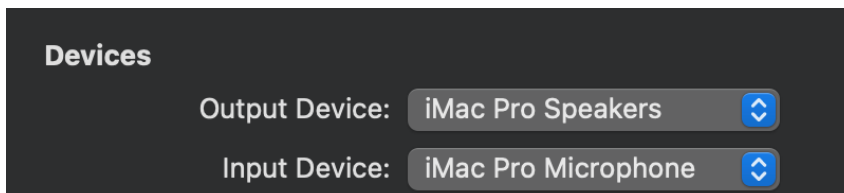
To select your microphone input and playback output click on the **GarageBand** pull down menu in the upper left hand corner and select **Settings...**



Select the **Audio/MIDI** icon

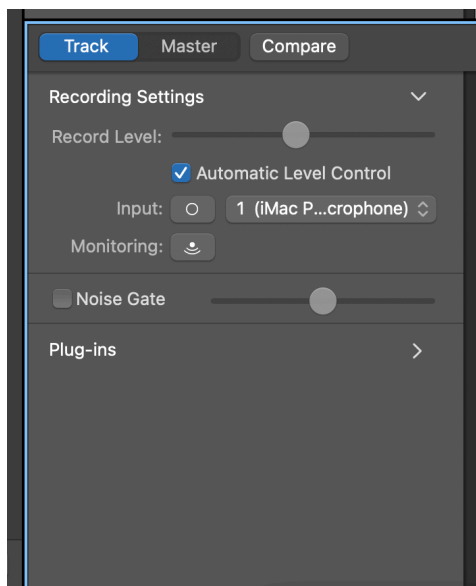


In the **Devices** section select your computer's **Output** and **Input** Device. In my case, I am using an iMac Pro:



Close the window by clicking on the red button in the upper left corner.

Double click on your voice track. You will now see the following window. Copy the settings below:

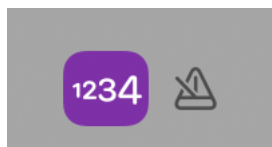


Automatic Level Control should be checked. This will help you to get the best possible recording level.

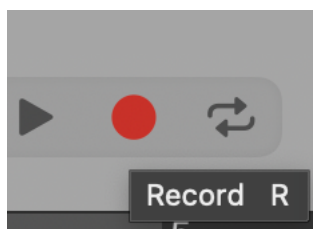
Input should be set to mono 0 as we are using the built in Mac Microphone, which is a mono mic

Leave everything else unchecked.

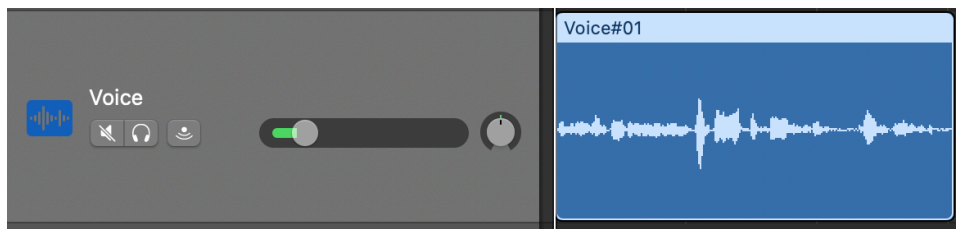
Make sure that **count-in** is selected and the **metronome** is off. This is located at the top of your GarageBand main window



Press **R** on your computer keyboard or click on the record icon to begin recording. You will hear four metronome clicks and then you can record your voice.



Do a short recording and hit the **Space-bar** on your computer keyboard to stop recording. You should now see your audio recording in your **Voice** track:



This can now be edited as an Audio File using the concepts that we have already covered.

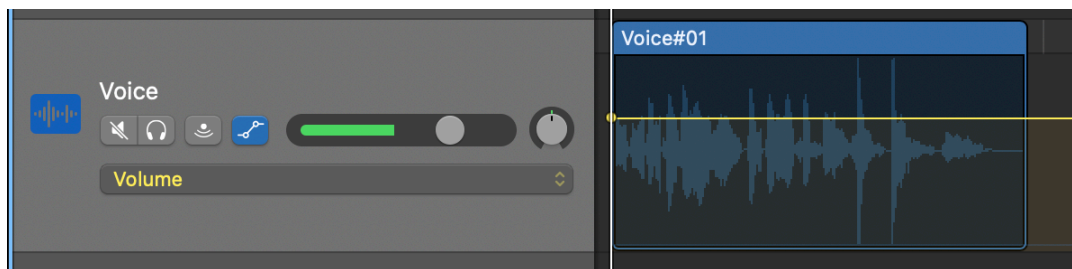
Adding Automation To Your Audio Track

Let's add some **Automation** to our Audio Track.

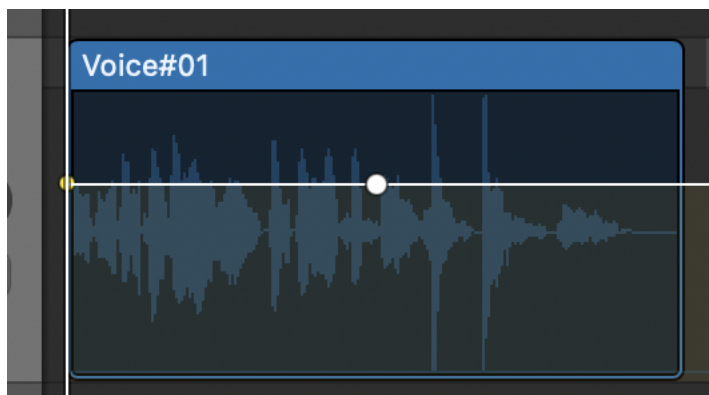
Let's start by Automating some **Reverb**

Hit the **A** key on your computer keyboard.

You will now see the following:



Click anywhere on the yellow line to create a node. We are going to do a fade in. So create the following:



Grab the first node and move it down to 0dB. Your audio file will look like this:

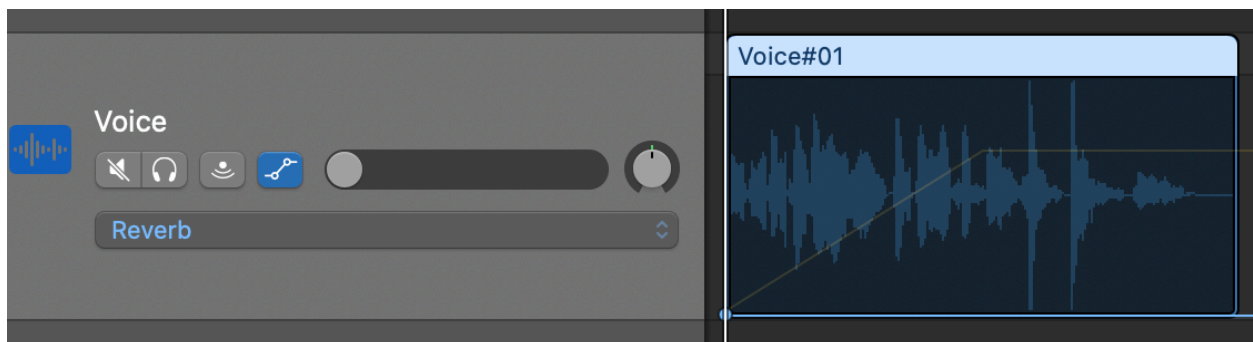


Play your track back, by hitting the spacebar. Notice that the track will now fade in.

Let's now add some **Reverb** to the track.

Use the up-down arrows in the Volume pulldown to select **reverb**.

You will now see the following:



Reverb is now selected and a blue line appears at the bottom of the audio track.

Repeat the node process that you did for volume and create the following:



This will give us a TON of reverb on our voice.

Feel free to experiment with the different parameters that you can automate. You can also automate different parameters for MIDI and instrument tracks as well.

Video Recap #4

Here is a video recap of the above concepts that were just presented.

Feel free to watch it, if you want a visual tutorial.

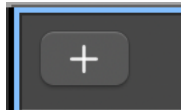


Working With GarageBand's Drummers

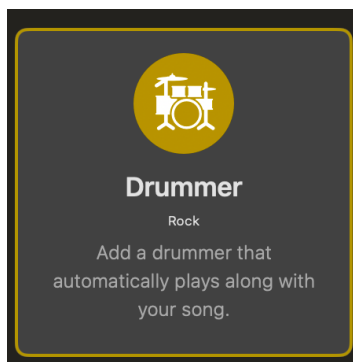
I have a rather unique way of working with the **Drummer** track in GarageBand.

Open our original GarageBand project with the Electric Piano track.

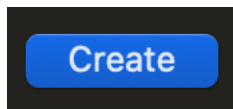
Click on the + icon to add a new track



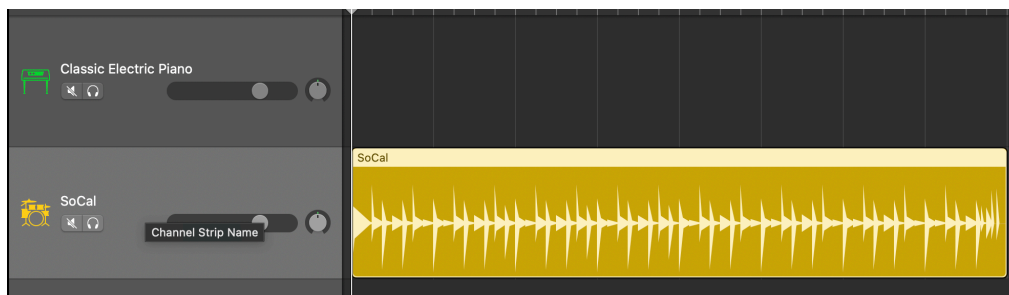
Select **Drummer**



Click Create



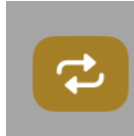
You will now see the following:



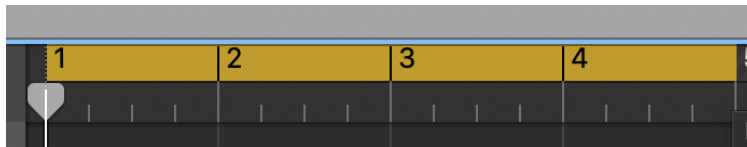
The Cycle Region

Let's first turn on the **Cycle Mode**-This allows you to loop your playback and also begin your playback anywhere in your project.

Turn on **Cycle Mode** by clicking on the icon located at the top of the GarageBand Window



You will now see the **Cycle Region** appear on your timeline/



You can change the position of the **Cycle Region** by clicking on it in the center and dragging it left or right.

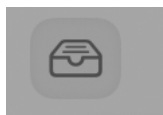
By default the **Cycle Region** is set to four-bars. You can expand or contract the **Cycle Region** by hovering your mouse on the right-hand or left-hand side of the **Cycle Region**. Your mouse cursor will change to left-right arrows. Simple grab and drag the **Cycle Region** to make it longer or shorter.

For now, let's keep our **Cycle Region** at four measures.

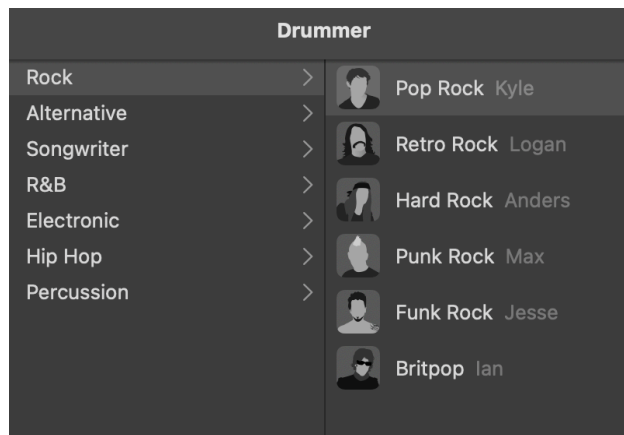
Hit your spacebar to start and stop playback. The **Cycle Region** will now loop.

Drummer Auditions

Let's first try out some of our available drummers. Make sure you have your **Drummer** track selected by clicking on it and type **Y** on your keyboard or click on the **Library** icon to open up your drummer library.



You will now see the following window:



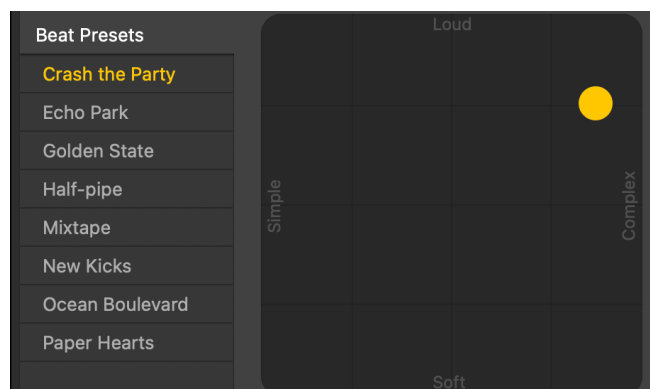
The left-hand column presents musical styles and the right-hand column gives us several drummers within a specific style.

The **Sounds** menu in the lower portion of the **Library** window allows you to select different drum kits.

If you open up the **editor** window by typing **E** on your keyboard, or by clicking on the **Editor** icon



You will be presented with even more drum grooves to try out within each style.

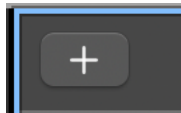


Experiment with different drummers, drum styles and musical styles to find one that may work for your project. In the next session, I am going to show you how to edit the drum grooves so you can create your own unique drum track.

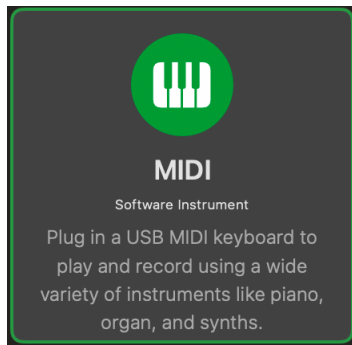
Creating Unique Drum Tracks

Now we are going to create a Software Instrument drum set directly under the Drummer track.

Click on the + icon to add a new track



Select ***MIDI***



The default will be the ***Classic Electric Piano***. Select the track by Clicking on it.

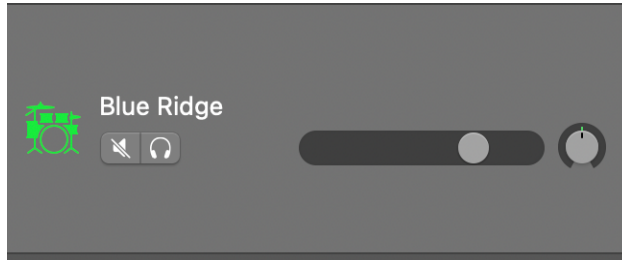
If the ***Library*** window is not open, enter ***y*** on your computer keyboard or click on the ***Library*** icon in the upper left-hand corner of your GarageBand window.



From the Left-Hand column you can select ***Drum Kit*** or ***Electronic Drum Kit***. We are going to select ***Drum Kit*** from the Left-Hand column and ***Blue Bird*** from the Right-Hand column.

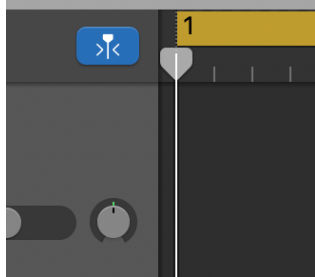
User Patches	>	Blue Ridge
Bass	>	Bluebird
Drum Kit	>	Brooklyn
Electronic Drum Kit	>	Detroit Garage
Guitar	>	East Bay

Notice that our newly created MIDI/Software Instrument track is now titled **Blue Ridge**.



We are now going to copy the **Drummer Track** into the **Blue Ridge** MIDI/Software Instrument track.

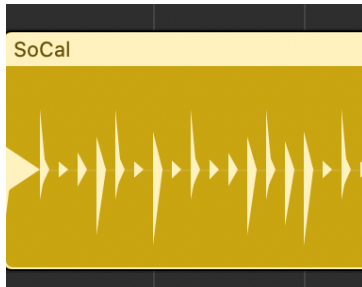
*******MAKE SURE YOUR PLAYHEAD IS AT THE BEGINNING OF THE SEQUENCE.**



IF IT IS NOT, CLICK ON THE SET TRANSPORT TO THE LEFT ICON LOCATED IN THE PLAYBACK CONTROLS

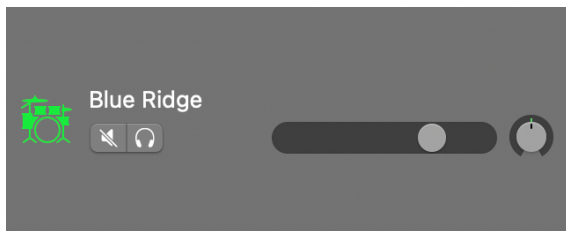


Select the **Drummer** Audio track by clicking on it.

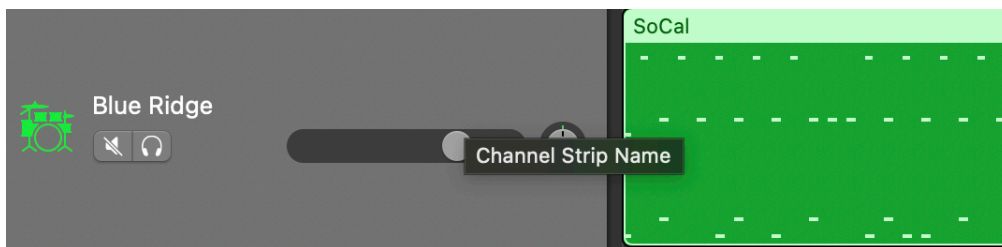


Type **Command-C** on your computer keyboard to copy the audio track

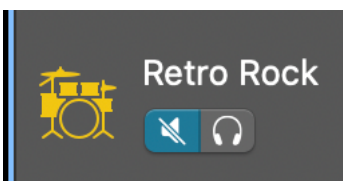
Select the **Blue Ridge** Software Instrument track by clicking on it.



Type **Command-V** on your computer keyboard to paste the audio data into the **Blue Ridge Track**. You should now see the following:



Mute the Drummer track by clicking on the **Mute** icon.

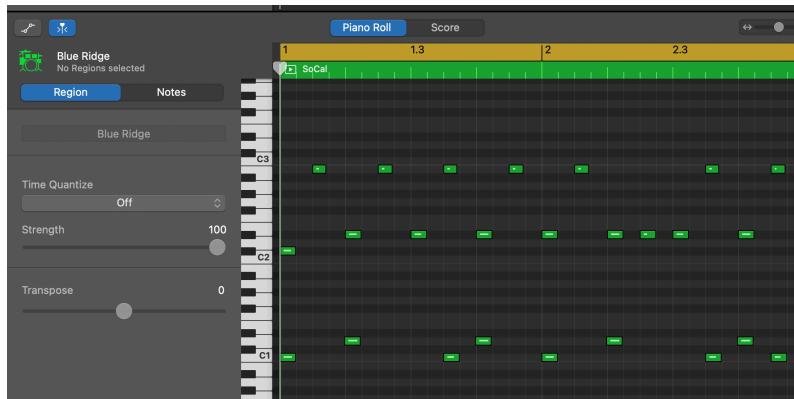


Hit the spacebar on your computer keyboard to listen to the **Blue Ridge** software instrument track. They should sound similar.

Editing Our Software Drum Track

Since our **Blue Ridge** Software Instrument track contains MIDI data we can easily change rhythms, drum sounds, velocity, etc. By doing this we can create our own unique drum sounds.

Double click on the green MIDI data of the **Blue Ridge** drum track to open the **Editor** window and make sure **Piano Roll** is selected. You will now see the following:



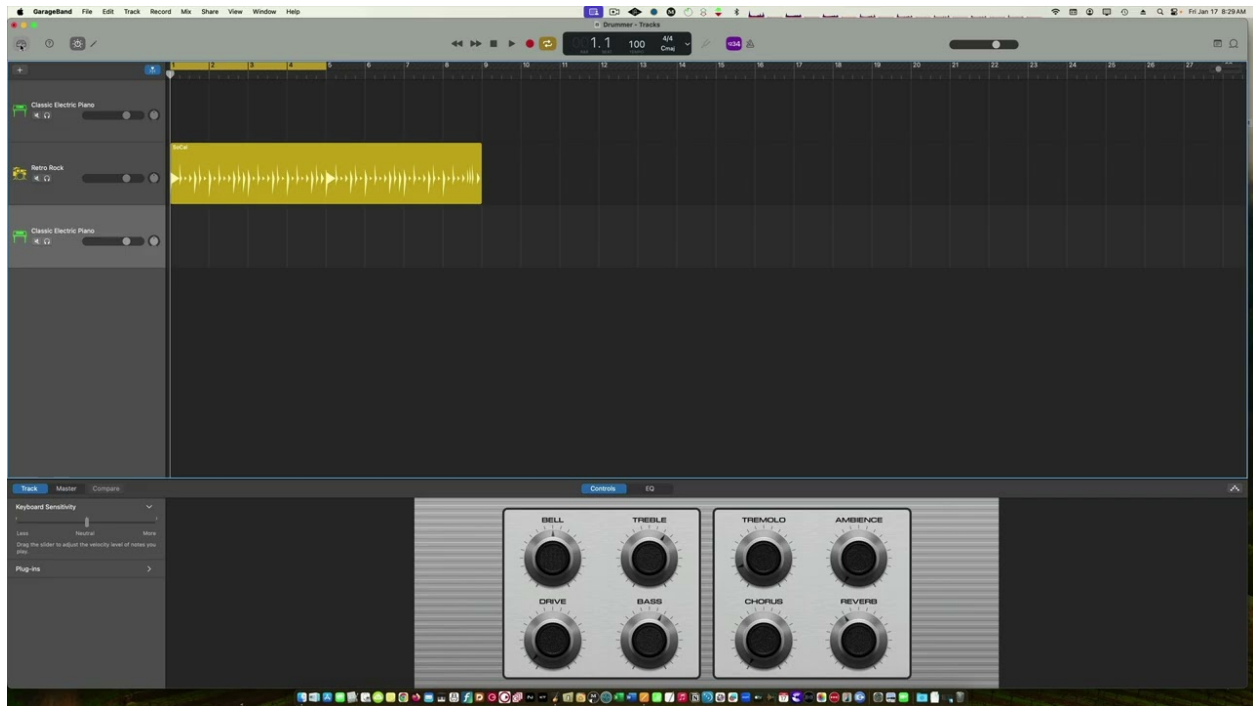
Rememberer the lecture on **Editing MIDI Data** that we covered earlier? You can now add notes, change drum sounds, delete notes, and make this your own unique drum groove.

Feel free to experiment and come up with your own unique drum groove!

Video Recap #5

Here is a video recap of the above concepts that were just presented.

Feel free to watch it, if you want a visual tutorial.



Conclusion

This concludes my brief introduction to GarageBand. Please, please go online and search for YouTube videos and tutorials. It is a VERY DEEP program with a ton of options for creating sound FX and Music.

Also know that I work with a lot of students on Video Game projects so please feel free to reach out if you need Sound FX or Music. I taught at a university for 34 years and it is my way of giving back. If my schedule allows, I would be more than happy to help you out!

Here is my contact info:

Rik Pfenninger
<http://coolcitymusic.com/>
rikp@mac.com

I would love to hear from you, and I hope this tutorial piqued your interest for learning GarageBand or another DAW!

Cheers,

Rik