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Earhoof is a sample-based musical instrument and sound design tool for the iPad.

The sounds in Earhoof are created by layering multiple audio samples. Each layer has a set of DSP effects whose parameters can be spatially modulated along the length of the device. This sonic gradient can then be rhythmically played with Earhoof's innovative internal sequencer.

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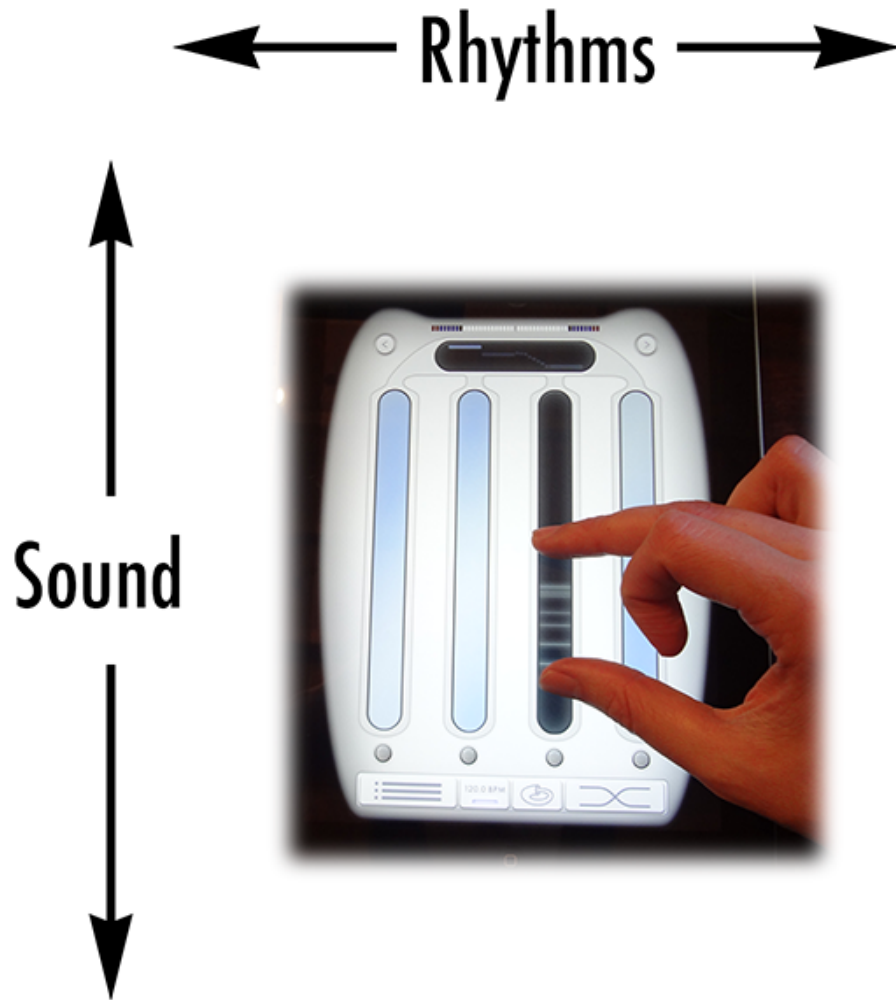
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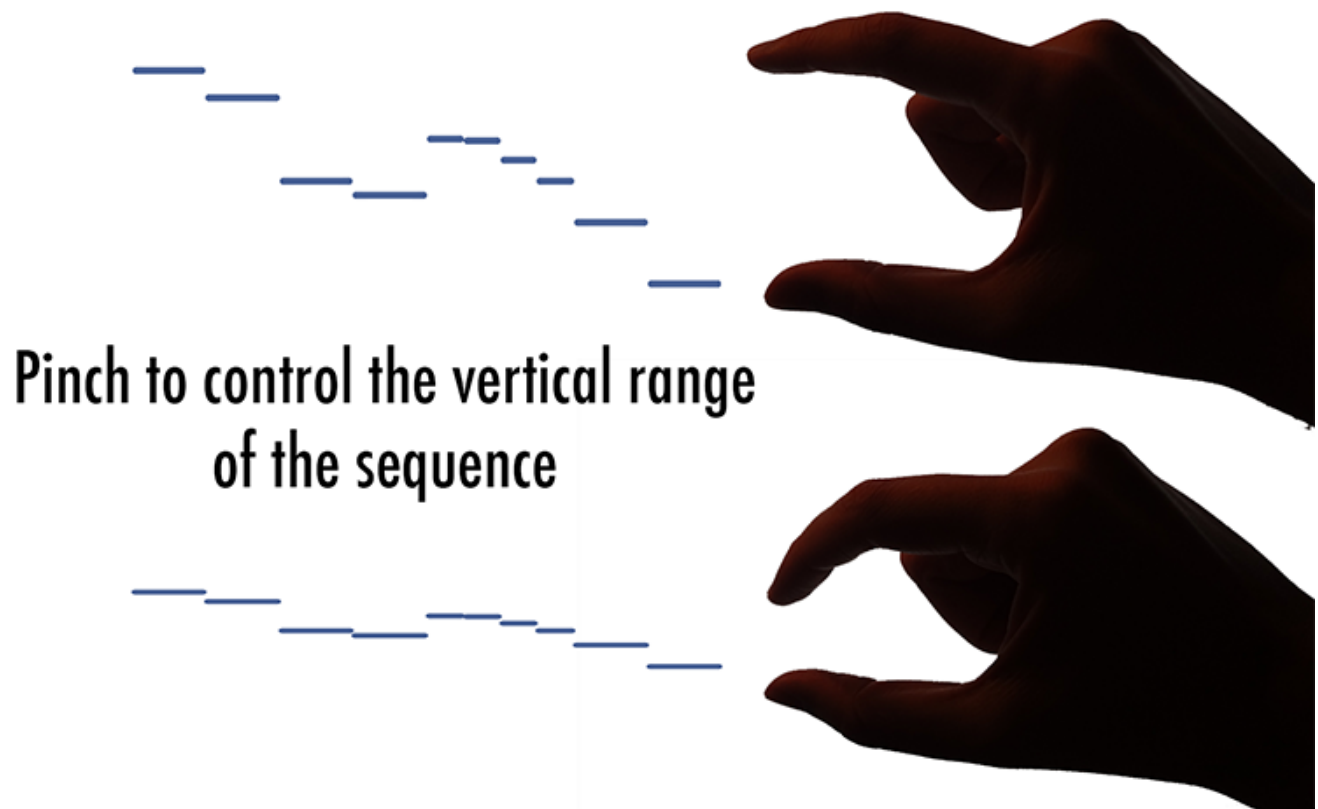
**Quick Start**



- Earhoof allows you to turn your iPad into a "sonic gradient". This gradient varies from top to bottom. As you touch different places vertically, different sounds will be generated.
- The internal sequencer begins playback when the sonic gradient is touched, and continues as long as you hold your fingers down. While the sequencer is running, it will automatically "strike"

the gradient at a position between your two fingers. Sounds are generated from this point based on how the samples are layered and their parameter values at this specific location.

- Sliding your fingers up and down a column will change the vertical positions at which the sequencer will trigger sounds. By pinching your fingers together and apart, you will change the sonic range of the generated events.



- Slide your fingers to different columns to switch rhythms. Each column generates the same sounds, but with a different rhythm. Note that by sliding to new columns, the sequencer never stops playing

and so the rhythm seamlessly transitions.

- Use the left and right arrows to cycle through the different instruments.
- *Pro Tip: If you pinch a column and then touch in between the pinch with a third finger, this action will "latch" the rhythm, causing it to keep playing even if you take your fingers off the iPad. To stop playback, just touch this column again.*

## Performance Panel



- Sequence Display Shows the sequence data

of the current rhythm. The vertical position of the events represents where they will play back between your two fingers.

- **Level Meter** Displays current volume levels. The level meter will turn red when clipping occurs, in which case you should lower the global gain or the individual gains of the layers.
- **Preset Buttons** The "<" and ">" buttons allow you to cycle through presets.
- **Rhythm Touchstrips** Each column represents a different rhythm. Playback begins when one of these touchstrips is touched, and stops when it is released. Sliding up and down the touchstrip changes the sounds which the sequencer generates. Sliding from one column to another allows you to seamlessly switch between rhythms.
- **Preset List Button** Shows the [Preset Panel](#), which provides functionality for loading and saving presets.
- **Tempo Button** Allows you to set the tempo by tapping quarter notes. You can also drag left and right to change the tempo. If you hold this button



down for a couple of seconds a window will appear, allowing you to enter an exact tempo.

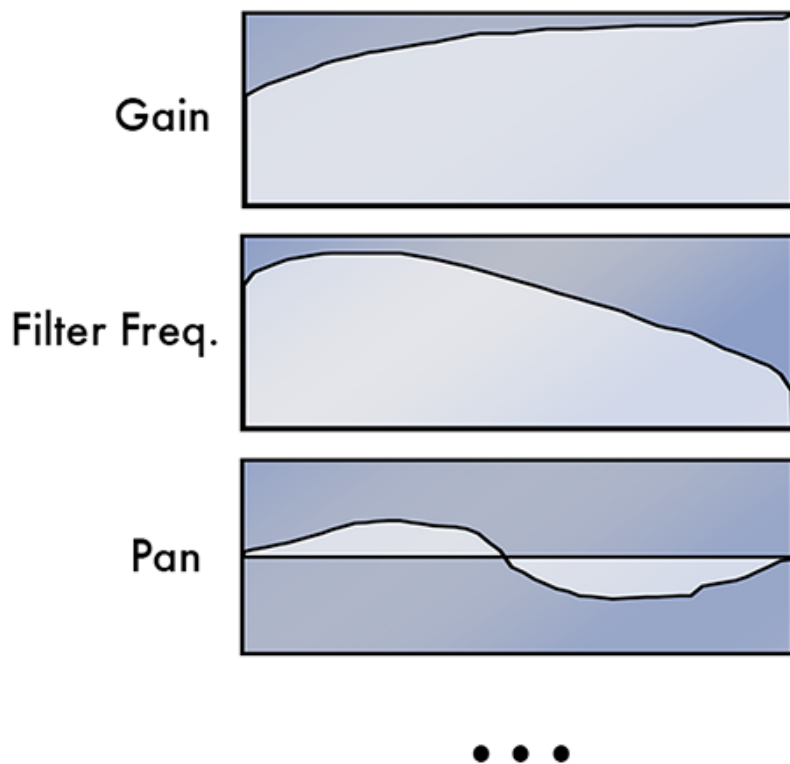
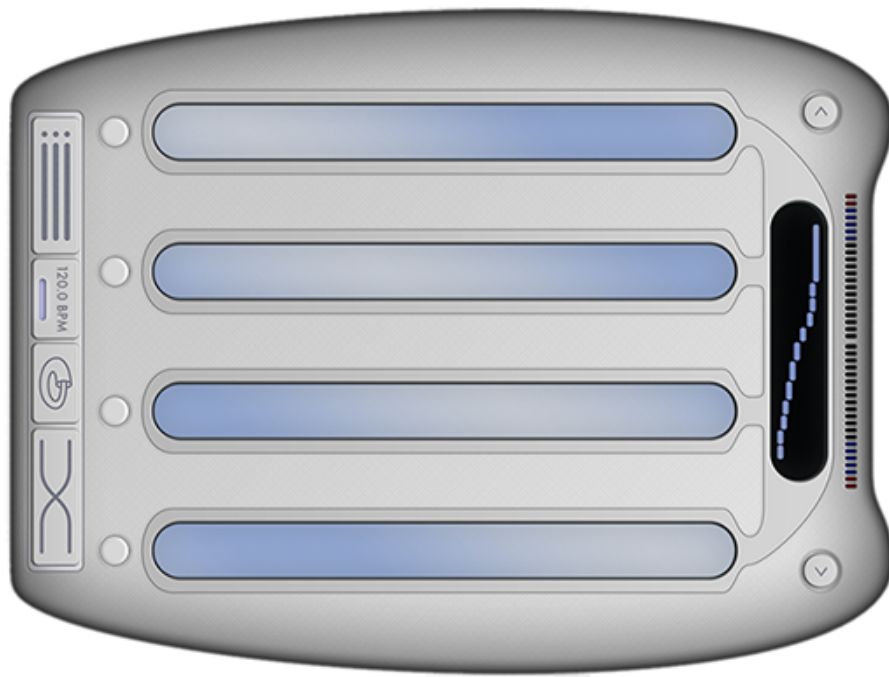
- **Tools Button** Shows a menu with miscellaneous functions allowing you access to features such as audio recording and options.
- **Layer Editor Button** Shows the [Layers Panel](#), where you can edit the sounds and DSP parameter mappings which make up the sonic gradient in Earhoof.
- **Rhythm Edit Button** Clicking this button shows a popup menu with commands for editing that rhythm.

## Layer Editor Panel

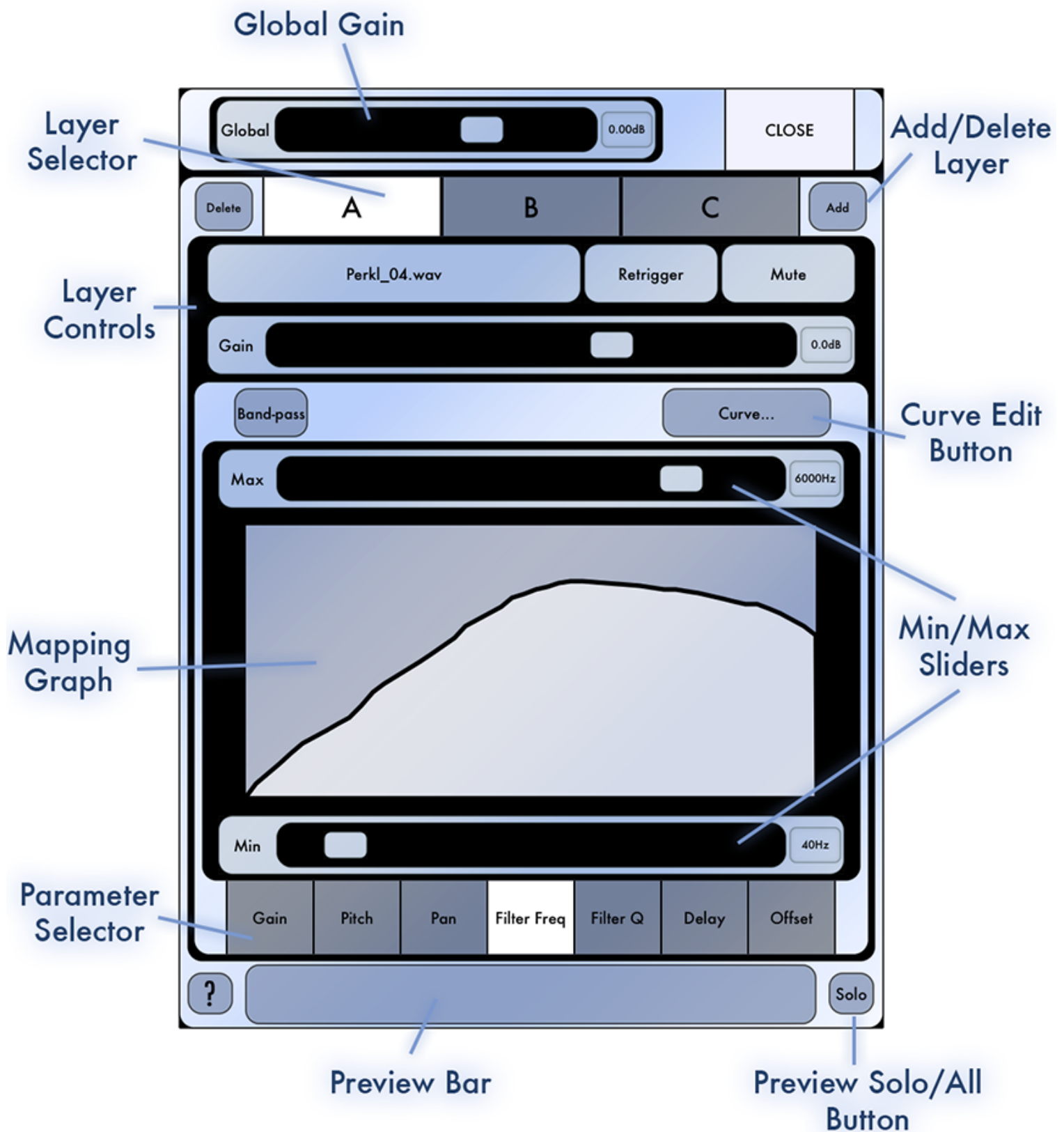
The "sonic gradient" in Earhoof is created by layering multiple audio files, then applying a variety of DSP (Digital Signal Processing) effects along the length of the device.

Each sample and its associated DSP parameters is

called a "Layer". Each preset in Earhoof can contain multiple layers, and each layer has seven different DSP parameters which you can continuously alter at each point along the playable surface. You create this spatial mapping by drawing curves, as illustrated in the image below. Note that the left side of the curve corresponds to the bottom of the device, and the right side corresponds to the top of the device.



The Layer Editor Panel allows you to set up the multiple layers and draw these parameter graphs.



- Global Gain Controls the amount of gain

applied to the whole instrument. Keep in mind that this slider controls the internal gain of Earhoof, not the actual volume of the device. If things seem quiet but the level meter is showing a healthy level, try turning up the volume on your device.

- **Layer Selector** Each letter represents one of the layers which make up the current preset. Clicking one of these letters will show the settings for that layer. You can drag the layers to rearrange them, or touch the current layer's button to show a popup menu containing assorted editing options.
- **Add / Delete Layer Buttons** The "Add" button adds a new layer, and the "Delete" button deletes the currently selected layer.
- **Layer Controls** Control the sound and behavior of the currently selected layer:
  - **Sample Button** - Displays the name of the audio file which is loaded into the layer. Clicking this button shows the [Sample Browser](#), which allows you to change the audio file

which the layer uses.

- **Retrigger Button** - Sets whether the layer should "Retrigger" or "Play Once". If "Retrigger" is selected, the layer will generate a sound every time the internal sequencer triggers an event. If "Play Once" is selected, the layer will only trigger a sound the first time the playing surface is touched.
- **Mute Button** - Mutes the layer.
- **Layer Gain** - Controls the amount of gain applied to this layer.
- **Mapping Graph** Draw a curve in this area to control how the current DSP parameter changes along the length of the sonic gradient (where the right side of the graph represents the top of the sonic gradient).
- **Min and Max Sliders** These sliders set the range of the graph by specifying the value at the top of the graph and the value at the bottom of the graph.
- **Curve Edit Buttons** Shows a popup menu containing a variety of commands for editing the

curve, such as Copy and Paste.

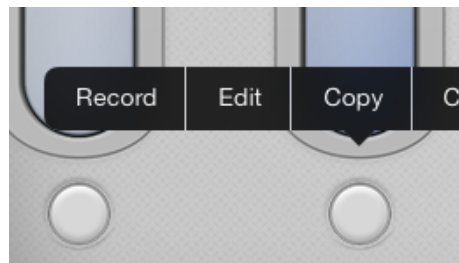
- **Parameter Selector** Controls which DSP parameter of the layer is currently being edited. Each parameter controls a different aspect of the sound.
  - **Gain** Controls the volume.
  - **Pitch** Controls the pitch. You can either map it with semitones, or have the pitch correspond to notes.
  - **Pan** Controls the balance between the left and right channels of the sample.
  - **Filter Freq** Controls the cutoff frequency of an optional High-pass, Low-pass, or Band-pass filter.
  - **Filter Q** Controls the resonance of the optional filter.
  - **Delay** Controls the amount of the signal to send to a delay bus. Earhoof has two available delays, each with independent settings.
  - **Offset** Controls the starting position the sample will play back from, in percentage of the total length of the sample.
- **Preview Bar** Tap this area to to preview the

sound at the point which you touch at.

- **Preview Solo/All Button** Controls whether (when playing the preview bar) all layers should play back, or just the current layer.

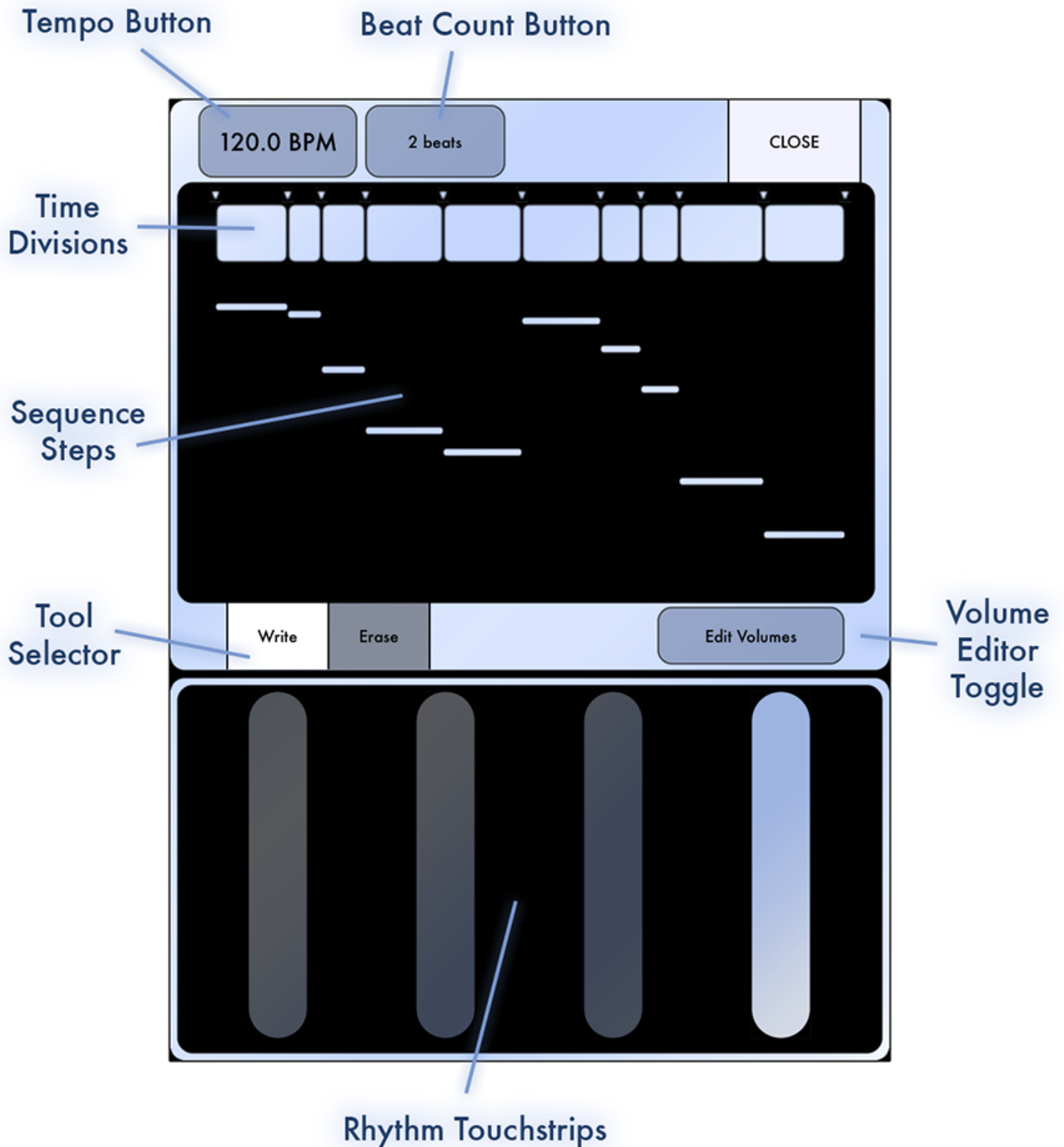
## Rhythm Panel

The Rhythm Panel allows you to edit the rhythms in the sequencer. To show the Rhythm Panel, choose "Edit" from the menu which appears when you click the button at the bottom of a rhythm's touchstrip. You can also access this panel by simply tapping the sequence view at the top of the Perform Panel.



To record a new rhythm, see the section [Recording Rhythms](#).





- Tempo Button Allows you to enter a tempo, in

Beats Per Minute.

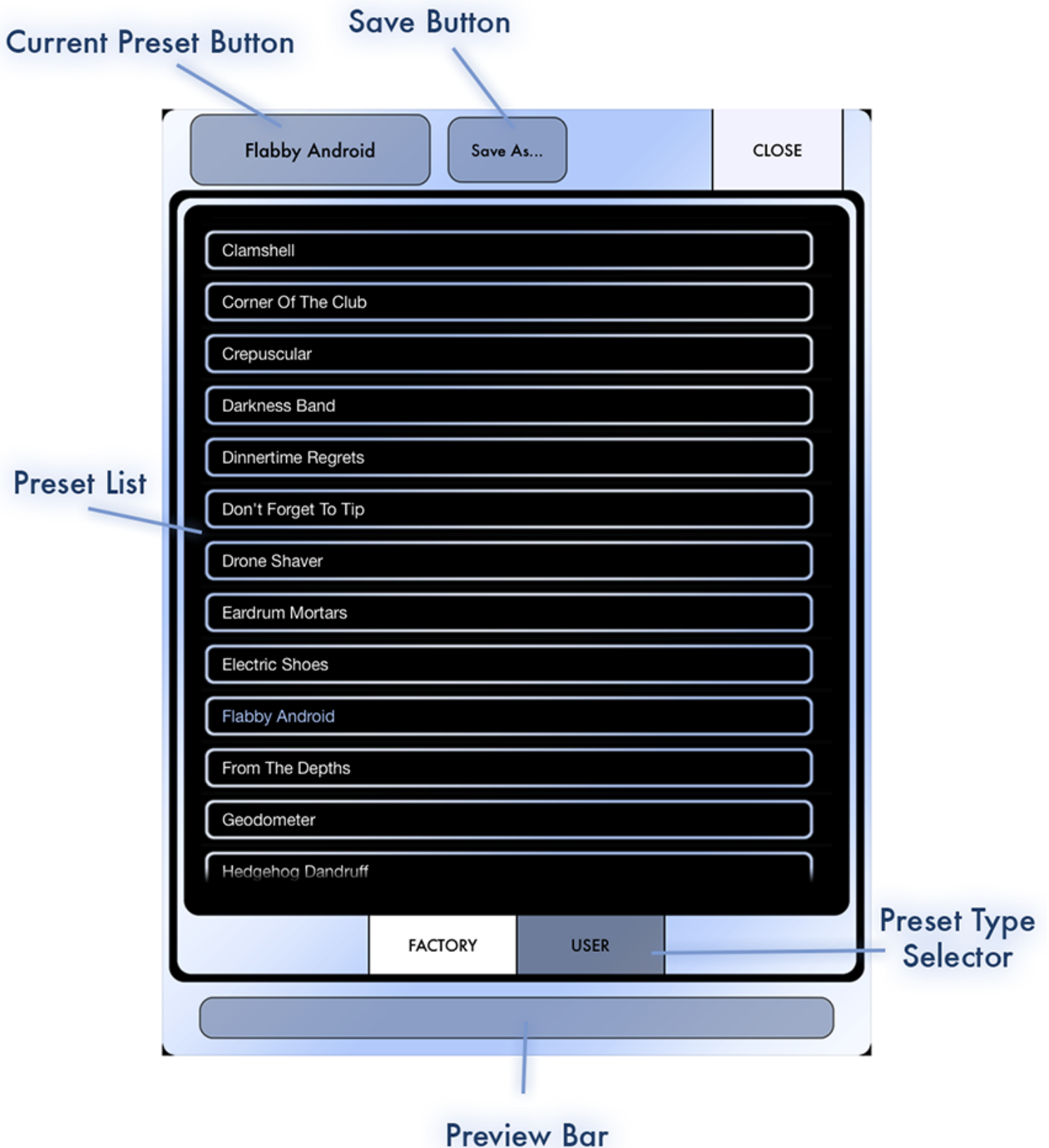
- **Beat Count Button** Sets the length of the rhythm, in quarter notes. The sequence is stretched to fit this musical length.
- **Time Divisions** Shows how time is divided to create the events of the rhythm. You can select multiple sections by clicking and dragging, at which point a menu will appear allowing you to change the number of divisions in that selection. You can also copy/paste/duplicate these sections from this menu.
- **Sequence Steps** The sequence data of the rhythm. The vertical location of the events represents the location between your pinched fingers where the events will trigger. Touching and dragging in this area allows you to add or delete events.
- **Tool Selector** Controls whether touching in the Sequence Steps should create new events or remove them.
- **Volume Editor Toggle** When this button is activated, the volumes of the steps show as

individual lines. Dragging in the Sequence Steps area will now alter the volumes of the events.

- **Rhythm Touchstrips** Provides a set of touchstrips so that you can easily preview your rhythms.

## Preset Panel

The Preset Panel shows you a list of available presets. Presets which come bundles with Earhoof are referred to as "Factory" presets, and can not be deleted or modified. If you want to save an altered Factory preset, you can save it as a "User" preset.



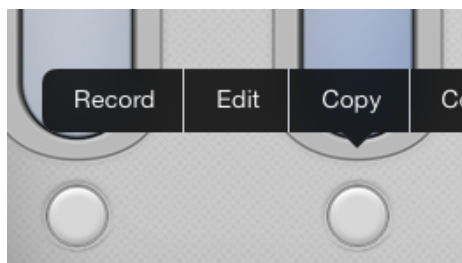
- Current Preset Button Displays the name of

the currently loaded preset. Clicking this button on a user preset will give you the option of deleting the preset. You can also delete user presets by swiping in the table.

- **Save Button** Allows you to save modifications to a preset, or save it as a new one. Since Factory presets can not be modified, the "Save" button will only appear for User presets.
- **Preset List** Shows the available presets in the selected category.
- **Preset Type Selector** Selects whether to show Factory or User presets in the list.
- **Preview Bar** Allows you to preview the sounds in the loaded preset. Note that while in the Perform Panel the sonic gradient varies from top to bottom, in the preview bar it varies from left to right.

## Recording a New Rhythm

You can create rhythms by manually editing them in the [Rhythm Panel](#), or you can record a performance. To show the rhythm recording controls, choose "Record" from the rhythm's popup menu.



Recording begins when you first tap the pad which appears, and stops when you click anywhere off the pad. You should try to end the recording in a rhythmic fashion, since the time at which you stop serves as the rhythm's loop point. For instance, if you were recording something a measure long, you would stop recording on the down beat at the start of the next measure. To facilitate this technique, clicking anywhere off of the pad will stop recording - you don't have to click exactly on the "Stop Recording" button.

The sample browser allows you to choose which audio file a layer uses. This sample can come from an existing preset (the "Factory" or "User" tabs). You can also access any samples which are placed in the app's Documents folder - these samples show when the "Imported" tab is selected. The "Imported" folder is useful because you can drop a collection of audio files into Earhoof and then use them as your sample pool from which to create presets. Currently Earhoof supports 16-bit WAV or AIFF files at 44.1kHz.



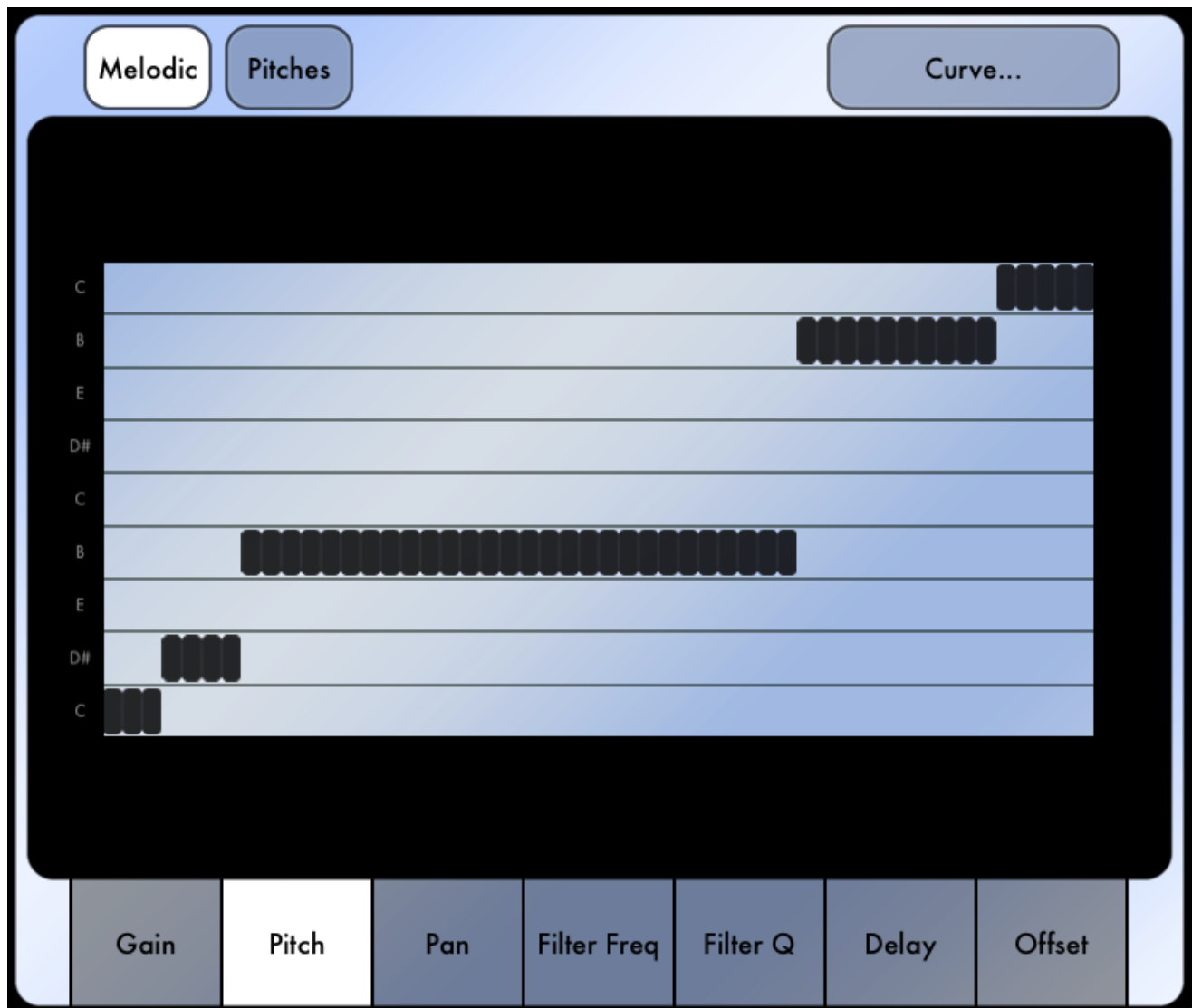
*Note: Earhoof presets contain all of the sample files which they use, as opposed to referencing a shared sample library as many drum machines and instruments do. When you load a sample from a different preset into a Layer, you are essentially copying a sample out of that preset for use in the*



current preset. Because Earhoof has the ability to draw samples from existing presets, the Factory presets themselves serve as your sample library. Earhoof comes installed with a wide assortment of samples in its Factory presets which will serve as a great start for creating your own instruments. As you import, collect, or purchase additional presets you are also growing your library of available samples.

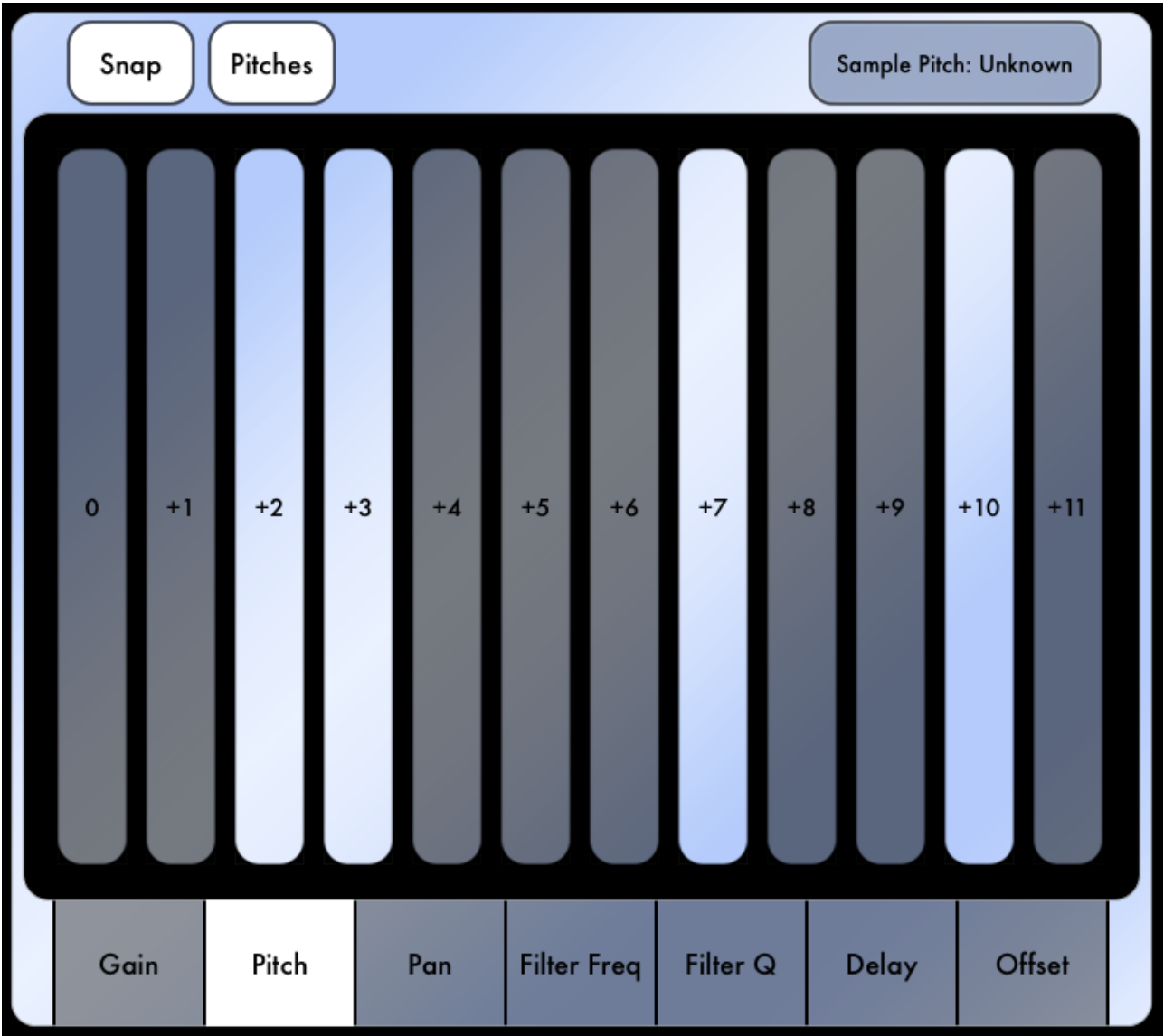
### Creating Melodic Presets

One of the DSP parameters which you can vary along Earhoof's surface is pitch. By default the pitch is a continuous curve of cents values, but you can have the pitch value snap to certain pitches when the "Melodic" button is enabled.

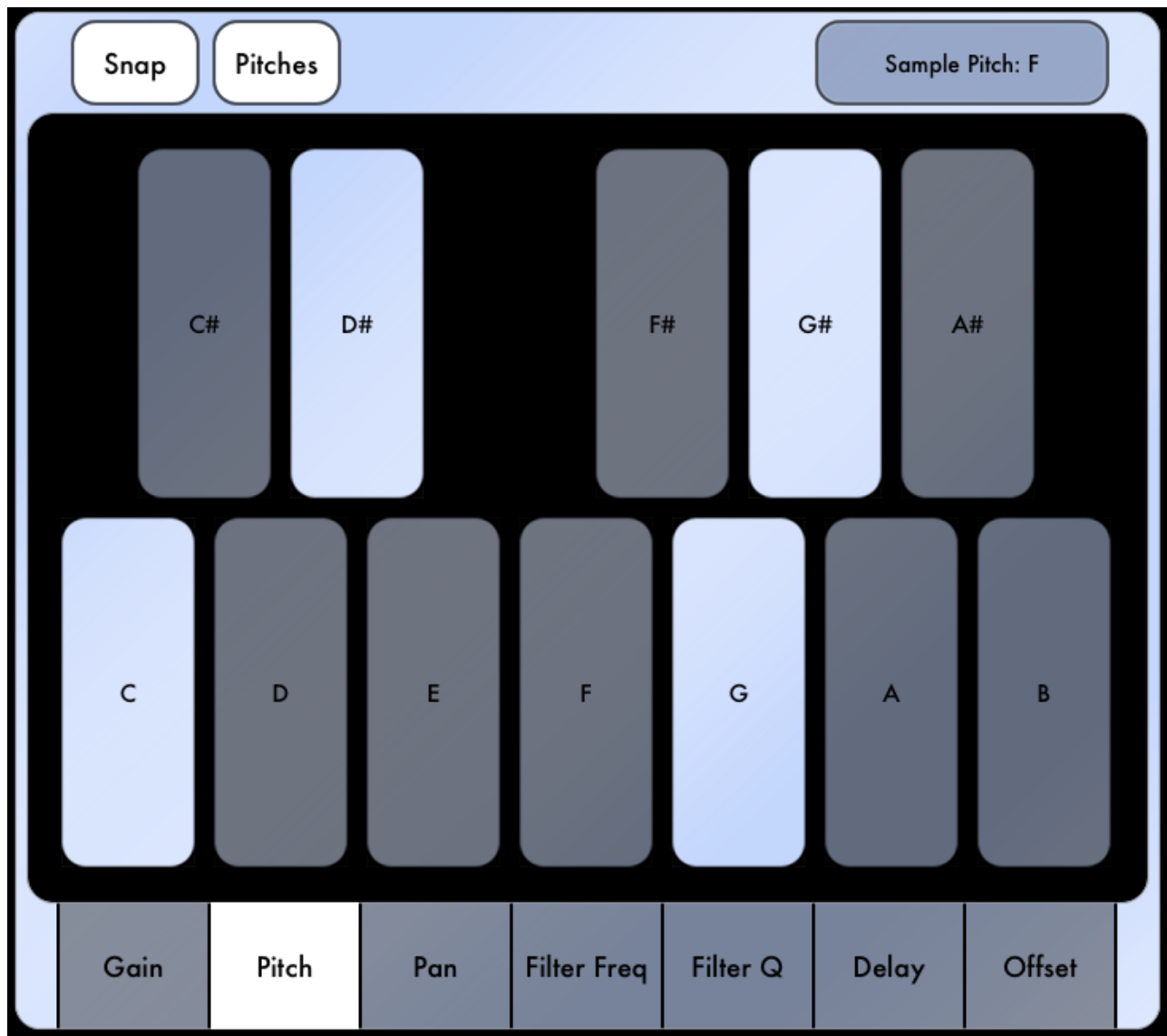


With melodic pitch snapping on, each row represents a different pitch. The set of available pitches can be changed by clicking the "Pitches" button, which will allow you to essentially define a custom scale. Any notes in the scale will appear as rows in the mapping graph - notes which aren't selected will not. The "Sample Pitch" button allows you to optionally define what the pitch of the sample is (if you know it, that is). If the pitch is not known, the buttons are labeled with semitone offsets. If the

pitch is known, a convenient keyboard layout with pitches is provided. Even though this panel shows a single octave, the available pitches will cover two octaves.

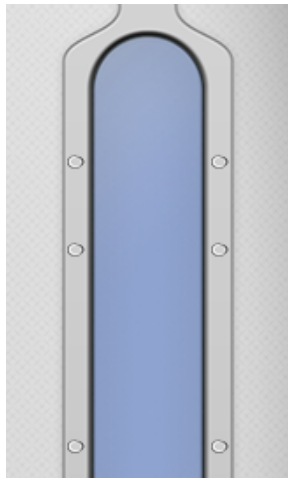


Note selector with unknown sample pitch



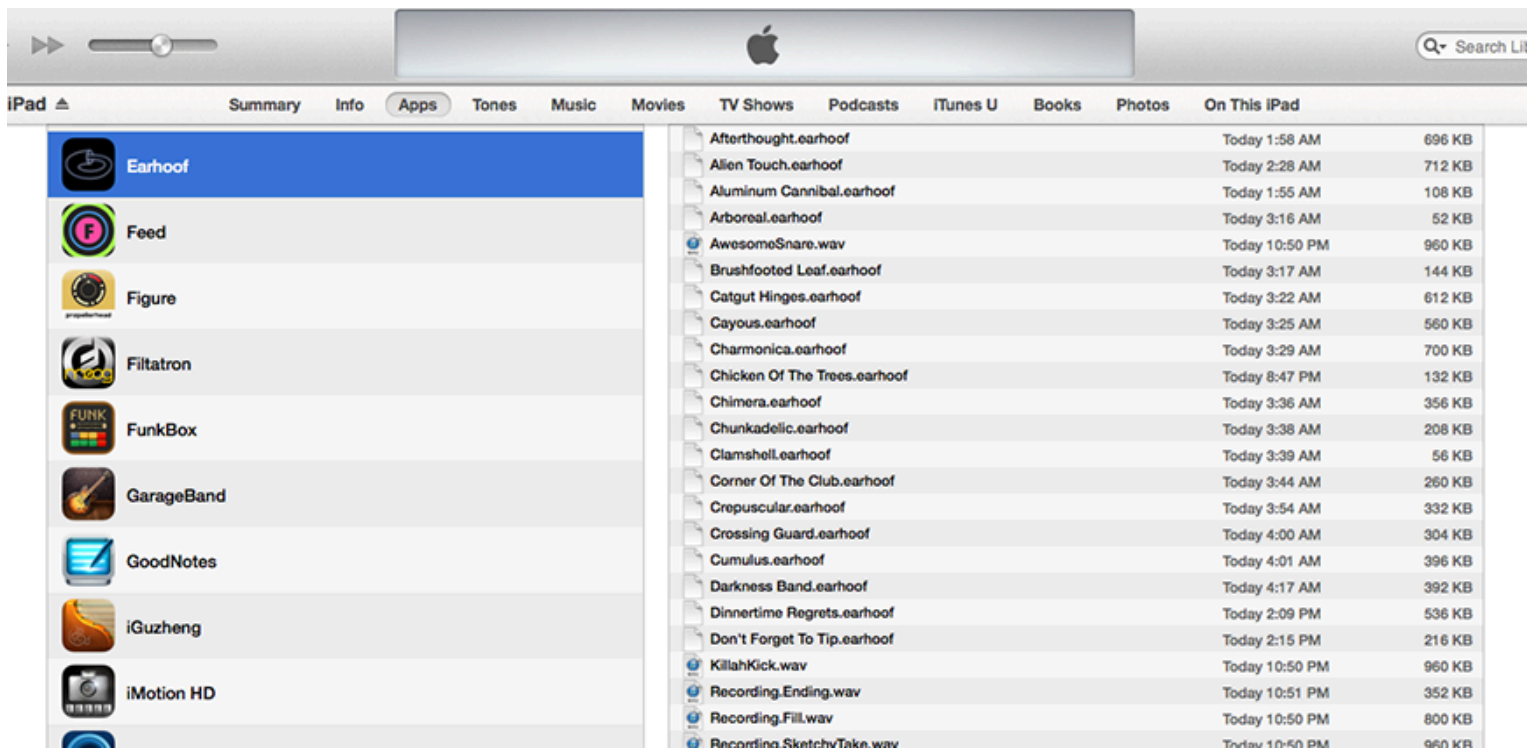
Note selector with known sample pitch

When a preset has layers which use pitch snapping, the points at which the pitches change are labeled on the touchstrips with little dots. These markers make it easy to be able to transition between notes while you are playing the touchstrips.



# Importing and Exporting Sounds and Presets

Earhoof uses Apple's native iOS File Sharing to transfer files between your computer and your iPad.

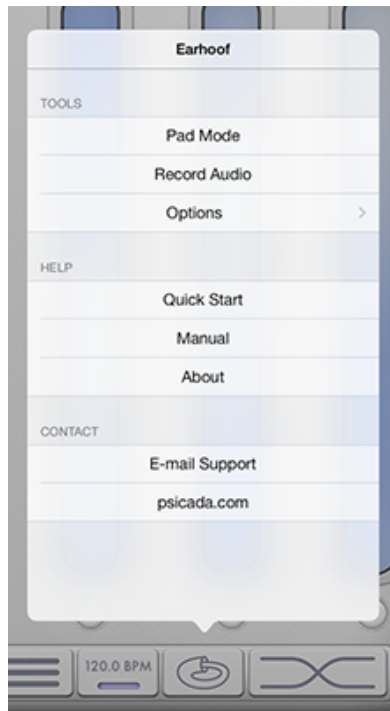


- Presets (which have a .earhoof extension) placed in this folder will appear as User presets in the Preset Browser.
- Audio files placed in this folder will appear in the Imported section of the Sample Browser. Earhoof currently supports mono and stereo 16-bit AIFF and WAV files at 44.1kHz.
- Any recorded audio files (see the Recording Audio section) will appear in this folder.

**Note:** After adding files, you must restart Earhoof to have the new files available.

# Recording Audio

Earhoof has the ability to record a performance, in realtime, to an audio file. To access this functionality, select the "Record" item from the Tools Button menu.

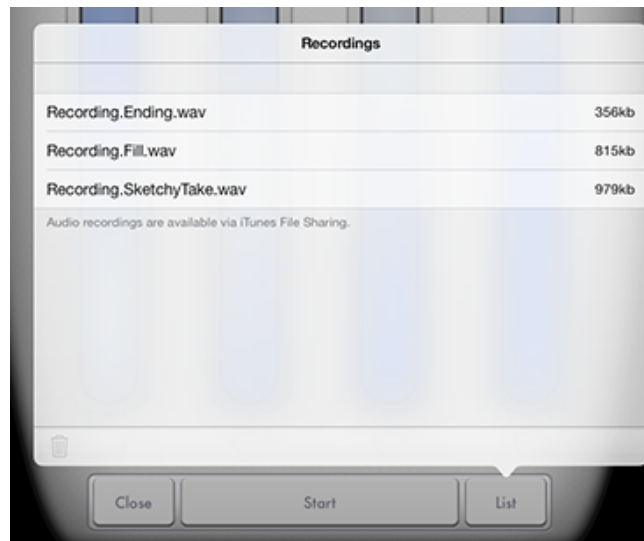


A set of controls will appear - tapping the "Start" button will begin recording.



When you are done performing, tap the "Stop" button to stop recording. You will be prompted to

name the recording or discard it. All recordings are able to be accessed via iTunes File Sharing, and are prefixed with the word "Recording". The "List" button will show a list of all recordings and their size. The file sizes are also listed as a reminder that these recordings exist in your Documents folder and as such will be synced with any backups (such as to iCloud), resulting in potentially longer backup times and storage issues.



# Inter-App Audio & Audiobus



Earhoof is equipped to serve as a sound generating output for both Apple's Inter-App Audio and Audiobus. This capability allows you to route Earhoof's sonic output to other apps on your device.

## Miscellaneous Tips & Tricks

### Latching Rhythms

Try touching the middle of a range. Doing so will "latch" the current rhythm - you can now take your fingers off the iPad and the sequencer will keep playing.

### Setting an exact tempo in the Perform Panel

Holding down the tempo button for a few seconds will show a popup from which you can enter an exact tempo.

### Drawing straight lines in the mapping graph

When drawing the graph for a layer's parameter, using two fingers will draw a straight line between those two points.

## Stretching segments in the Rhythm Panel

To do corrections in timing, or to add swing or groove, you can "Stretch" the time segments which events are attached to. In the Stretch popup, enter a value to multiply the time by. For instance, multiplying by 1.05 will make the time 5% longer.

## Custom Delay Note Values

It is possible to set the delay time to be fractions of a quarter. To do so, select "Custom" as the note value and input a numeric "beat factor", which is the length of time represented as a fraction of a quarter note. For instance, a quarter note will be 1.0, an eighth note would be 0.5, and a sixteenth note would be 0.25.

## Preset File Format

Earhoof presets are actually compressed .zip files, renamed with a ".earhoof" extension. If you are feeling adventurous, you can rename them to have .zip extension, unzip them, edit any audio files within, and rezip and rename them.

