



# User Guide

Manual Version v1.0

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## Introduction

AIR Drums, by AIR Music Technology, is a virtual drum module and pad controller that comes loaded with a world-class library of drum and percussion samples. Produce professional drum performances that suit any drumming or music style with convincing realism. Add nuanced details to your drum tracks with splicing, intensity, timing, and dynamics controls.

## System Requirements and Product Support

For complete system requirements, compatibility information, and product registration, visit the AIR website: **[airmusictech.com](http://airmusictech.com)**.

For additional support, visit **[airmusictech.com/support](http://airmusictech.com/support)**.

## Getting Started

This chapter contains instructions on how to set up AIR Drums with Trigger Finger Pro in one of two ways:

1. AIR Drums within Arsenal as a plugin in your DAW (recommended)
2. AIR Drums within Arsenal in Standalone Mode

### To set up AIR Drums within Arsenal as a plugin in your DAW (recommended):

1. Connect Trigger Finger Pro to your computer using a standard USB cable. (If you are connecting Trigger Finger Pro to a USB hub, make sure it is a powered hub.)
2. Power-on Trigger Finger Pro.
3. Open your DAW.
4. Open your DAW's **Preferences** (or **Options**, **Device Setup**, etc.), and select **Trigger Finger Pro** as your controller. Make sure that MIDI Port 1 is enabled for standard MIDI, MIDI Port 2 is enabled for Mackie Control or HUI communication, and MIDI Port 3 is disabled or not shown (Trigger Finger Pro uses this port to communicate with Arsenal).
5. Turn Trigger Finger Pro's **Value Dial** to browse through its available presets, and then push it to select one that corresponds to your DAW *and* whose name includes **Arsenal**. (These are Trigger Finger Pro presets and are not related to the patches in Arsenal.)  
Your Trigger Finger Pro can now communicate with your DAW and Arsenal.
6. Create a MIDI track in your DAW, and load Arsenal onto that track as you would with a typical plugin.

**Important:** You may need to open your DAW's **Preferences** (or **Options**, **Device Setup**, etc.) and select the directory where Arsenal was installed before it appears in your DAW's list of available plugins.

7. Open Arsenal's interface on that MIDI track.
8. In the **Plugin Tag Browser**, click **AIR Drums** to select it.
9. In the **Patch Browser** on the right side of the window, double-click the name of a patch to open the graphical user interface for AIR Drums.

### To set up AIR Drums within Arsenal in Standalone Mode:

1. Connect Trigger Finger Pro to your computer using a standard USB cable. (If you are connecting Trigger Finger Pro to a USB hub, make sure it is a powered hub.)
2. Power-on Trigger Finger Pro.
3. Turn Trigger Finger Pro's **Value Dial** to browse through its available presets, and then push it to select one whose name includes **Arsenal**. (These are Trigger Finger Pro presets and are not related to the patches in Arsenal.)

Your Trigger Finger Pro can now communicate with Arsenal.

4. Open Arsenal. If you created a desktop shortcut, double-click it. Otherwise, double-click the application where you installed it. These are the default locations:

Windows: **Program Files\VstPlugins\**

Mac OS X: **Applications/M-Audio/Arsenal**

5. In Arsenal, click the **Setting** icon (the gear) to open the Settings window.
6. Click the **I/O Settings** button to open the **Audio/MIDI Settings** window.
7. Under **Active MIDI Inputs**, make sure the option labeled **Trigger Finger Pro MIDI** is checked. Click the circle next to the option to check or uncheck it.
8. Close the **Audio/MIDI Settings** window and **Settings** window.
9. In the **Plugin Tag Browser**, click **AIR Drums** to select it.
10. In the **Patch Browser** on the right side of the window, double-click the name of a patch to open the graphical user interface for AIR Drums.

# Overview

## Global Controls



## Global Controls

## Pads

## Pad Controls

Arsenal's interface is divided into three different parts.

- **Global Controls:** These sections' controls affect all of AIR Drums. The controls in these sections let you select the current preset and pad bank. The knobs affect their respective parameters regardless of what pad is playing. Learn more about this in the **Global Controls** chapter.
- **Pads:** This section mirrors the layout of Trigger Finger Pro's pads across all four banks (A–D). These pads will light up when you play the pads on the Trigger Finger Pro. Learn more about this in the **Pads** chapter.
- **Pad Controls:** This section contains the controls for editing samples and pads, including Filter and Amp envelopes, panning, levels, etc. Learn more about this in the **Pad Controls** chapter.

## Global Controls

The Global Controls affect all sounds in AIR Drums's current Preset. If you save a Preset, these settings will be included.



**Global Pitch:** Click and drag this knob up or down to raise or lower the pitch of the Preset.

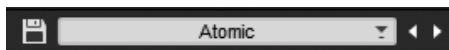
**Global Cutoff:** Click and drag this knob up or down to raise or lower the cutoff frequency of the Preset's low-pass filter.

When turned fully clockwise, the filter is completely open.

**Global Decay:** Click and drag this knob up or down to increase or decrease (respectively) the decay time of the Preset's Amp Envelope.

**Global Swing:** Click and drag this knob up or down to increase or decrease (respectively) the amount of swing (a "shuffle" or triplet-based feel) applied to REX loops played using AIR Drums.

When turned fully clockwise (**75%**), the maximum amount of swing will be applied. When turned fully counterclockwise (**50%**), no swing will be applied.



### Preset Management:

- Click the **Save Preset** (disk icon) to save the Preset. In the window that appears, select the location and enter a name for the file (.tfx), and then click the **Save** button.
- Click the **Preset Selector** (▼) to select another Preset from the drop-down menu that appears.
- Click the **Previous/Next Preset** buttons (◀ / ▶) to quickly select the previous or next Preset (an alternative to using the Preset Selector).

## Master FX



The **Master FX** panel contains controls for effects that are applied to the entire Preset. Click the **Master FX** button to view the controls (described below).

**Bypass All:** Click this button to activate/deactivate Bypass. When this button is lit (active Bypass), no master effects will be applied to the Preset, regardless of the state of their individual selector buttons (just below).

**Hype:** Click this button to activate/deactivate Hype Equalization effects on the Preset.

- **Low:** Click and drag this knob up or down to increase or decrease the amount of boost applied to lower-frequency sounds with an optimal range and curve determined by AIR Drums's Hype algorithm.
- **High:** Click and drag this knob up or down to increase or decrease the amount of boost applied to higher-frequency sounds with an optimal range and curve determined by AIR Drums's Hype algorithm.



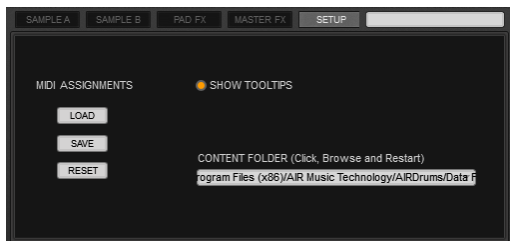
**Reverb:** Click this button to activate/deactivate reverb effects on the Preset.

- **Time:** Click and drag this knob up or down to raise or lower the rate at which the reverberation decays after the original direct signal stops. At its maximum value, infinite reverberation is produced.
- **Highcut:** Click and drag this knob up or down to raise or lower the frequency for the high-cut filter (**1.00–20.0 kHz**). Use this to change the decay characteristics of the reverb's high-frequency components. To cut the high end of the processed signal, lower the frequency.
- **Mix:** Click and drag this knob up or down to raise or lower the blend between the "wet" (effected) and "dry" (unaffected) signal. **0%** is all dry, and **100%** is all wet, while **50%** is an equal mix of both.
- **Mode:** Click this drop-down menu to select the type of room that the reverb will simulate: **Hall, Stadium, Room, or Abstract**.

**Compressor:** Click this button to activate/deactivate the compressor on the Preset.

- **Thresh:** Click and drag this knob up or down to raise or lower the threshold—the level (**-40.0 to 0.0 dB**) that the incoming signal must exceed to trigger the compression. When triggered, the compression reduces its dynamic range.
- **Attack:** Click and drag this knob up or down to raise or lower how quickly (**10.5  $\mu$ s to 100 ms**) the compressor responds to the "front" of an audio signal once it crosses the selected threshold. Long settings let peaks through unaffected.
- **Makeup:** Click and drag this knob up or down to raise or lower the boost in output gain to compensate for heavily compressed signals. This control ranges from **0 to +30.0 dB**. At **0 dB**, the compressed signal is unaffected.

## Setup



The **Setup** panel contains general settings for configuring AIR Drums. Click the **Setup** button to view the controls (described below).

**MIDI Assignments:** AIR Drums makes it easy to assign its controls to a hardware MIDI controller. To learn how to assign or unassign controls, see the following **Assigning Controls** section.

- **Load:** Click this button to load a previously saved MIDI Assignments file. In the window that appears, locate and select the desired MIDI Assignments file (**.airMIDI**), and then click the **Open** button.
- **Save:** Click this button to save a MIDI Assignments file for later use. In the window that appears, select the location and enter a name for the file (**.airMIDI**), and then click the **Save** button. To learn more about creating assignments, see the following **Assigning Controls** section.
- **Reset:** Click this button to reset all MIDI Assignments.

**Show Tooltips:** Click this button to activate or deactivate Tooltips. When this button is lit (active), you can hover the mouse cursor over certain elements of the interface (buttons, pads, knobs, etc.) to see an explanation of that feature.

**Content Folder:** Click this field to select where your AIR Drums content files (**.big**) are stored. AIR Drums scans this location each time you open it. If you select a new location, close and then reopen AIR Drums.

## Assigning Controls

**Tip:** If you are using Arsenal, you can use Arsenal's MIDI Learn function to assign AIR Drums controls to Arsenal's controls rather than directly to your hardware controller (e.g., Trigger Finger Pro).

### To assign a MIDI controller to any AIR Drums control:

1. Right-click the control you want to assign. (For reference, the control's name is at the top of the menu that appears.)
2. Select **Learn CC**.
3. On your controller, move the knob, fader, button, or other controller (e.g., mod wheel, footswitch, or volume pedal).
4. **Optional:** After learning the assignment, you can further configure the assignment by right-clicking that control again and selecting any of the following:
  - **Set Min:** Select this to set the minimum value the assigned control will send.
  - **Set Max:** Select this to set the maximum value the assigned control will send.
  - **Invert Range:** Select this to reverse the polarity of the assigned control. The controller's maximum position will correspond to the assigned control's minimum value, and the controller's minimum position will correspond to the assigned control's maximum value.

### To unassign (forget) a MIDI assignment for any AIR Drums control:

1. Right-click the control you want to unassign.
2. Select **Forget CC**.

## Pads



Each of the 16 drum pads lets you load factory or custom samples for playback in a Sequence.

The bottom of each pad displays the sample's name (depending on whether **Sample A** or **Sample B** is selected in the Pad Controls section). The upper-right corner of each pad displays the pad number and the pad's MIDI note number.

Click a pad to select it. The selected pad will light up, and its samples and settings will appear in the **Pad Controls** section on the right. Clicking a pad also triggers the drum sample if one is loaded. (To edit a pad's sound, see the **Pad Controls** chapter.) The pads also light up when played in a Sequence or via MIDI.

Click a **Pad Bank** button in the upper-left (**A**, **B**, **C**, or **D**) to select the respective pad bank. The pads will change color to indicate which bank is selected, as well.

**To load a sample to a pad**, click the desired pad, and then click the **Pad Sample Selector** (▼) to load a Pad Preset or another sample by using the drop-down menu that appears.

**Tip:** To learn how to edit a sample on a pad, see the **Pad Controls** chapter. To learn how to save or load individual pads (as Pad Preset files) or entire pad banks (as Pad Bank files), see the following **Managing Pads** section.

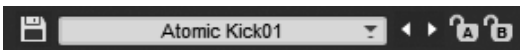
**To mute a pad**, click its **Mute (M)** button.

**To solo a pad** (muting all un-soloed pads), click its **Solo (S)** button.

## Managing Pads

AIR Drums lets you save and load entire pad banks or individual pads—independently of each other and of the entire Preset.

You can save the settings of individual pads, called Pad Presets, which contain the samples and settings for *the currently selected pad only*:

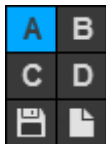


- Click the **Save Pad Preset** (disk icon below the pads) to save the Pad Preset. In the window that appears, select the location and enter a name for the file (**.pad**), and then click the **Save** button.
- Click the **Pad Sample Selector** (▼) to load a Pad Preset or another sample by using the drop-down menu that appears.

You can also select any of the following options:

- **Clear Pad:** Select this option to remove all samples and settings from the currently selected pad.
- **Clear Sample A** or **Clear Sample B:** Select either of these options to remove Sample A or Sample B from the currently selected pad.
- **Copy Pad:** Select this option to copy all samples and settings from the currently selected pad (to be pasted onto another pad).
- **Paste Pad:** Select this option to paste all samples and settings copied from one pad onto the currently selected pad.
- Click the **Previous/Next Preset** buttons (◀ / ▶) to quickly select the previous or next Pad Preset (an alternative to using the Pad Preset Selector).
- Click the **Lock Sample A** or **Lock Sample B** icon to prevent a different Pad Preset from being loaded to Sample A or Sample B (respectively). This applies to *all pads*.

**Note:** If you lock, for example, Sample A in this way and then load a different Pad Preset to it, the "A" sample for that Pad Preset will load to the pad's Sample B layer instead.



You can also save and load Pad Bank (**.bnk**) files, which contain all samples and settings for *all pads in the currently selected bank*.

- Click the **Save Pad Bank** (disk icon below the Pad Bank buttons) to save a Pad Bank file. In the window that appears, select the location and enter a name for the file (**.bnk**), and then click the **Save** button.
- Click the **Load Pad Bank** (page icon below the Pad Bank buttons) to load a Pad Bank file. In the window that appears, select the desired Pad Bank file (**.bnk**), and then click the **Open** button.

## Pad Controls



The **Pad Controls** section contains settings and parameters that affect the sound of the currently selected pad.

The nine knobs and drop-down menu at the bottom of the section apply to the entire pad (i.e., both Sample A and Sample B). The controls above them apply to whichever sample is currently selected (i.e., Sample A or Sample B).

The nine knobs control the parameters described below. Each knob's setting is displayed underneath it.

- **Pitch:** Click and drag this knob up or down to raise or lower the pitch of the selected pad's samples.
- **Cutoff:** Click and drag this knob up or down to raise or lower the cutoff frequency of the low-pass filter applied to the selected pad's samples. When turned fully clockwise, the filter is completely open.
- **Reso:** Click and drag this knob up or down to increase or decrease the amount of resonance for the cutoff frequency of the selected pad's samples.
- **Hold:** Click and drag this knob up or down to shorten or lengthen the Hold phase of the Filter Envelope for the selected pad's samples.
- **Release:** Click and drag this knob up or down to shorten or lengthen the Release phase of the Filter Envelope for the selected pad's samples.

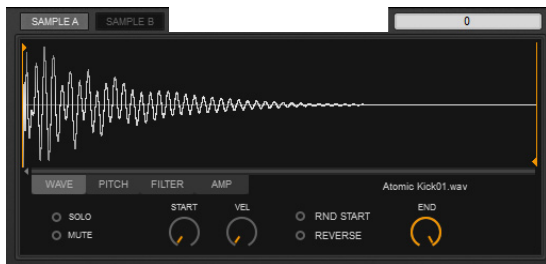
- **Vel:** Click and drag this knob up or down to increase or decrease how much a MIDI note's velocity will affect the Release time of the selected pad's samples.
- **Pan:** Click and drag this knob up or down to pan the audio output of the selected pad's samples left or right in the stereo field.
- **Level:** Click and drag this knob up or down to increase (boost) or decrease (attenuate) the amount of gain for the selected pad's samples.
- **Quantize:** Click this drop-down menu and select how the notes of a REX loop will be quantized (time-corrected) while the knob determines the "strength" of the quantization.

To learn about the sample layers, see the following **Sample A / Sample B** section.

To learn about applying effects to the pad, see the following **Pad FX** section.



## Sample A / Sample B



Each pad can consist of two sample layers: **Sample A** and **Sample B**. A pad may have a sample loaded to one, both, or neither of these layers. (See the **Pads** chapter to learn how to load samples to a pad.)

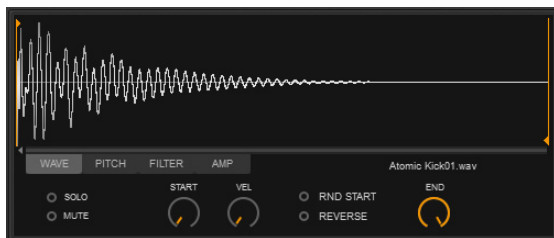
Click the **Sample A** or **Sample B** button at the top of the window to select it for editing.

The controls shown at the bottom of this section depend on which tab is selected. There are four tabs, each containing controls that affect the sample:

- **Wave:** Click this tab to show the sample's waveform and other settings that effect its playback. See the following **Sample Waveform** section to learn more.
- **Pitch:** Click this tab to show the sample's Pitch Envelope and its related settings. See the following **Pitch Envelope** section to learn more.
- **Filter:** Click this tab to show the sample's Filter Envelope and its related settings. See the following **Filter Envelope** section to learn more.
- **Amp:** Click this tab to show the sample's Amp Envelope and its related settings. See the following **Amp Envelope** section to learn more.

**Important:** Any changes you make to the sample in the Pad Controls affect the sample on that pad alone. The original sample file will remain unchanged.

## Sample Waveform



Click the **Wave** tab to display the sample's waveform above it.

Click the waveform and drag up or down to zoom out or in, respectively. Click and drag left or right to scroll in each direction.

The controls under the tabs function as described below:

- **Solo:** Click this button to solo or unsolo the entire sample. When the button is lit, it is soloed.
- **Mute:** Click this button to mute or unmute the entire sample. When the button is lit, it is muted.
- **Start:** Click and drag this knob up or down to shift the sample's start point left or right. The start point marker in the waveform (on the left) will move accordingly. Alternatively, you can click and drag the start point marker to adjust its position directly.
- **Vel:** Click and drag this knob up or down to increase or decrease how much the pad's velocity will affect the sample's start time. When **Random Start** is activated, the knob instead affects how much the pad's velocity will affect the randomization.
- **Rnd Start:** Click this button to activate or deactivate **Random Start**. When this button is lit, the sample's playback (when triggered) will start from a random point. Use the **Vel** knob to determine how much randomization is applied.
- **Reverse:** Click this button to reverse or un-reverse the entire sample. When the button is lit, the sample is reversed and will play from the end point to the start point.
- **End:** Click and drag this knob up or down to shift the sample's end point left or right. The end point marker in the waveform (on the right) will move accordingly. Alternatively, you can click and drag the end point marker to adjust its position directly.

## Pitch Envelope



Click the **Pitch** tab to display the sample's Pitch Envelope above it.

Click the waveform and drag up or down to zoom out or in, respectively. Click and drag left or right to scroll in each direction.

The controls under the tabs function as described below:

- **Solo:** Click this button to solo or unsolo the entire sample. When the button is lit, it is soloed.
- **Mute:** Click this button to mute or unmute the entire sample. When the button is lit, it is muted.
- **Pitch:** Click and drag this knob up or down to raise or lower the pitch of the entire sample.
- **Env Depth:** Click and drag this knob up or down to increase or decrease how much the Pitch Envelope affects the sample.
- **Vel:** Click and drag this knob up or down to increase or decrease Pitch Envelope's sensitivity to velocity.
- **Edit Tools:** Click any of these three buttons to select the corresponding Edit Tool:
  - **Grabber:** Lets you move an existing breakpoint in the Pitch Envelope.
  - **Pencil:** Lets you draw control breakpoints in the Pitch Envelope.
  - **Eraser:** Lets you delete control breakpoints in the Pitch Envelope.

**Tip:** Double-click on the envelope line to create a breakpoint at that location (an alternative to using the Pencil tool).

## Filter Envelope



Click the **Filter** tab to display the sample's Filter Envelope above it.

Click the waveform and drag up or down to zoom out or in, respectively. Click and drag left or right to scroll in each direction.

The controls under the tabs function as described below:

- **Solo:** Click this button to solo or unsolo the entire sample. When the button is lit, it is soloed.
- **Mute:** Click this button to mute or unmute the entire sample. When the button is lit, it is muted.
- **Filter:** Click this drop-down menu to select the type of filter that will be applied to the sample: **LP** (low-pass), **BP** (band-pass), **HP** (high-pass), or **EQ**.
- **Cutoff:** Click and drag this knob up or down to raise or lower the cutoff frequency of the sample's filter.
- **Env Depth:** Click and drag this knob up or down to increase or decrease how much the Filter Envelope affects the **Cutoff** frequency.
- **Vel:** Click and drag this knob up or down to increase or decrease Filter Envelope's sensitivity to velocity.
- **Edit Tools:** Click any of these three buttons to select the corresponding Edit Tool:
  - **Grabber:** Lets you move an existing breakpoint in the Filter Envelope.
  - **Pencil:** Lets you draw control breakpoints in the Filter Envelope.
  - **Eraser:** Lets you delete control breakpoints in the Filter Envelope.

**Tip:** Double-click on the envelope line to create a breakpoint at that location (an alternative to using the Pencil tool).

## Amp Envelope



Click the **Amp** tab to display the sample's Amp Envelope above it.

Click the waveform and drag up or down to zoom out or in, respectively. Click and drag left or right to scroll in each direction.

The controls under the tabs function as described below:

- **Solo:** Click this button to solo or unsolo the entire sample. When the button is lit, it is soloed.
- **Mute:** Click this button to mute or unmute the entire sample. When the button is lit, it is muted.
- **Level:** Click and drag this knob up or down to increase (boost) or decrease (attenuate) the overall amplitude of the sample.
- **Pan:** Click and drag this knob up or down to pan the audio output of the sample left or right in the stereo field.
- **Vel:** Click and drag this knob up or down to increase or decrease Amp Envelope's sensitivity to velocity.
- **Edit Tools:** Click any of these three buttons to select the corresponding Edit Tool:
  - **Grabber:** Lets you move an existing breakpoint in the Amp Envelope.
  - **Pencil:** Lets you draw control breakpoints in the Amp Envelope.
  - **Eraser:** Lets you delete control breakpoints in the Amp Envelope.

**Tip:** Double-click on the envelope line to create a breakpoint at that location (an alternative to using the Pencil tool).

## Pad FX



Each pad can have up to three effects applied to it.

Click the desired pad, and then click **Pad FX** to manage these effects and their parameters.

**To select an effect**, click a drop-down menu above an effect module and select an effect. See the **Appendix: Pad Effects** for a complete list and description of effects.

**To activate or deactivate an effect**, click the button for that effect module (next to the drop-down menu). When the button is lit, the effect is activated.

**To adjust an effect parameter**, click and drag its knob up or down. The value will be shown in the display next to the **Setup** button. Each effect has up to four adjustable parameters.

The four drop-down menus on the right side of the window affect the pad's audio and playback:

- **Output Bus:** Click this drop-down menu to select where you want to route the pad's audio. The **Main (1/2)** output will be routed through the Master FX. Any other output will bypass the Master FX. Setting different pads to different output buses lets you mix and process individual pads on separate host tracks.
- **Poly:** Click this drop-down menu to set the pad's polyphony from **1** to **8** voices. If a pad is likely to be frequently re-triggered before the end of the sample has been reached, use a higher setting to keep consecutive samples from being silenced. Higher settings are definitely better for sounds like ride cymbal samples that should overlap rather than cutting each other off.

- **Group:** Click this drop-down menu to assign the pad to one of four possible Groups (**A–D**). Select **Off** to leave the pad unassigned to a Group. Playing a pad will immediately silence the sound of other pads in the same group. For example, assign open and closed hi-hat samples to the same group so that they never sound simultaneously.
- **Play Modes:** Click this drop-down menu to select how the pad will play back:

- **One Shot:** Triggering a pad will cause its samples to play all audio from their start points to their end points.

**Important:** One Shot Mode works slightly differently with REX loops and depends on whether Trigger Finger Pro's Sequencer or your DAW's transport is running or stopped:

**During playback,** REX loops will trigger in **One Shot** Mode as described above, playing all audio from their start points to their end points. When you stop playback, any REX loops that are playing will stop immediately.

**While playback is stopped,** REX loops will trigger in **Note On** Mode, described below.

- **Note On:** Triggering a pad will cause its samples to play from their start points until a Note Off message is sent (i.e., the pad/note is no longer being held). If no Note Off message is sent before the samples reach their end point, the samples will end normally.

## Appendix

### Pad Effects

Below is a list of available pad effects and their parameters.

**To select an effect**, click a drop-down menu above an effect module and select an effect.

**To adjust an effect parameter**, click and drag its knob up or down. The value will be shown in the display next to the **Setup** button.

To learn more about pad effects, please see ***Pad Controls: Pad FX***.

### EQ

Use the EQ effect to raise (boost) or lower (attenuate) the low, mid, or high broadband frequency range in an audio signal:

- **Low**: Boosts or attenuates the gain for the low-range frequencies.
- **High**: Boosts or attenuates the gain for the high-range frequencies.
- **Mid**: Boosts or attenuates the gain for the mid-range frequencies, as set by the **M Freq** knob.
- **M Freq**: Sets the frequency affected by the **Mid** knob.

### Para EQ

The Para EQ effect is a parametric EQ that you can use to help sculpt the sound by raising (boosting) or lowering (attenuating) specific frequencies.

- **Gain**: Boosts or attenuates the gain for the frequency band.
- **Frequency**: Sets the frequency (**40.0 Hz–16.0 kHz**) affected by the equalizer.
- **Q**: Adjust the resonance of the equalizer.



## Filter

Use the Filter effect to apply a modulating, resonant filter to the audio signal. Have fun with filter sweeps or give your sounds that extra-resonant aura.

- **Freq:** Sets the cutoff frequency of the filter, from **20.0 Hz** to **20.0 kHz**.
- **Reso:** Sets the amount filter resonance (**0–100%**). At **100%**, the filter feeds back on itself.
- **Slope:** Sets the filter steepness ("slope") from **-12dB/Oct.** to **+12dB/Oct.**
- **Env:** Determines how much the envelope follower affects the cutoff frequency.
  - At **0%**, the envelope follower has no effect on the cutoff frequency.
  - At **+100%**, the Attack ramps up to the cutoff frequency setting, and the Release starts from the Cutoff frequency setting and ramps down.
  - At **-100%**, the Attack starts from the cutoff frequency setting and ramps down, and the Release ramps up to the cutoff frequency setting.

## Limiter

Use the Limiter effect to prevent your audio signal from exceeding a set level.

- **Drive:** Sets the input volume of the signal through the Limiter.
- **Level:** Sets the output volume of the Limiter.
- **Attack:** Sets how quickly (**10.0  $\mu$ s** to **100 ms**) the Limiter responds to the "front" of an audio signal once it crosses the selected threshold.
- **Release:** Sets how long it takes for the Limiter to ease off of its attenuation after the input signal drops below the threshold level. In general, if you are using heavy limiting, use proportionally longer release times in order to avoid the "pumping" effect that may occur when the Limiter is forced to jump back and forth between limited and unlimited signal levels.

## Comp

Use the Compressor effect to squash (compress) the audio signal.

- **Drive:** Sets the input volume of the signal through the Compressor.
- **Level:** Sets the output volume of the Compressor.
- **Attack:** Sets how quickly (**10.0  $\mu$ s** to **100 ms**) the Compressor responds to the "front" of an audio signal once it crosses the selected threshold. Long settings let peaks through unaffected.
- **Release:** Sets the amount of time (**10.0 ms** to **10.0 seconds**) that it takes for the compressor gain to reduce when the input signal level drops below the selected threshold. In general, if you are using heavy compression, use proportionally longer release times in order to avoid the "pumping" effect that may occur when the Compressor is forced to jump back and forth between compressed and uncompressed signal levels.

## Gate

Use the Gate effect to chop up the audio signal into staccato rhythmic patterns with variable amplitude.

- **Threshold:** Sets the level (**-60.0** to **0.0 dB**) that the signal must exceed to sound. Signals with levels lower than the threshold will not sound.
- **Range:** Sets the amount of attenuation when the gate is closed.
- **Attack:** Sets the duration of the Attack phase of the envelope.
- **Release:** Sets the duration of the Release phase of the envelope.

## Autopan

Use the Autopan effect to create "choppy," tremolo sounds in a stereo field at a set rate.

- **Rate:** Sets the speed of the panning.
- **Depth:** Determines how "far" to the left or right the signal is panned.
- **Trem:** Sets the intensity of the tremolo effect, which causes the signal's volume to fluctuate at a regular rate.
- **Width:** Sets the width of the stereo field for the panned output signal. At **0%**, the signal is essentially mono.

## Phaser

Use the Phaser effect to apply a phaser to the audio signal for that wonderful "wooshy," "squishy" sound.

- **Rate:** Sets the rate of the Phaser (**0.01–20.0 Hz**).
- **Depth:** Sets the depth of modulation (**0–100%**), which in turn affects the amount of phasing applied to the audio signal.
- **Center:** Sets the frequency center (**0–50%**) for the poles of the phaser.
- **Color:** Determines the intensity of the phaser. At **0%**, there is essentially no phasing.

## Clip

Use the Clip effect to digitally distort the incoming audio signal.

- **Drive:** Sets the input volume of the signal through the Clip effect.
- **Tone:** Softens the clipping of the signal, resulting in less high-frequency sounds.
- **Level:** Sets an amount by which the output level of the clipped signal is lowered from **0%** to **100%**. At **0%**, no clipped signal passes through the output. At **100%**, the clipped signal passes through the output at full volume.
- **Thru:** Sets how much of the "dry" (unaffected) signal bypasses the Clip effect.

## Tube

Use the Tube effect to add overdriven, tube-saturated distortion to the audio signal.

- **Drive:** Sets the input volume of the signal through the Tube effect.
- **Tone:** Increases or decreases a broad gain boost or attenuation of frequencies in the processed signal. This essentially makes the distortion "bite" at different frequencies. Higher settings provide a boost in the high end of the distorted signal (more treble distortion), while lower settings suppress the high end, with some mid-range boost, for a darker, less distorted tone.
- **Level:** Sets an amount by which the output level of the distorted signal is lowered from **0%** to **100%**. At **0%**, no distorted signal passes through the output. At **100%**, the distorted signal passes through the output at full volume.
- **X-Over:** Sets the crossover frequency for the **Tone** knob. Frequencies above this setting will be affected. At lower settings, the **Tone** knob affects a wider range of frequencies.

## Crush

Use the Crush effect to apply a digital-sounding distortion by reducing the sample rate.

- **Rate:** Sets the sample rate used for resampling.
- **Random:** Sets the amount of randomization of the sample rate. This helps prevent the same pitches from repeating constantly in the output signal.
- **Bits:** Sets the amount of bit reduction (**1.00–16.00**).
- **Mix:** Determines the balance between the amount of "dry" signal (unaffected) with the amount of wet (effected) signal. At **50%**, there are equal amounts of dry and wet signal. At **0%**, the output is all dry and at **100%** it is all wet.

## Ring Mod

Use the Ring Mod effect to produce a classic ring modulator sound.

- **Freq:** Sets the frequency of the additional signal affected by the modulation.
- **F Mod:** Sets the amount of modulation.
- **Noise:** Determines how much noise is added to the additional signal affected by the modulation.
- **Mix:** Determines the balance between the amount of "dry" signal (unaffected) with the amount of wet (effected) signal. At **50%**, there are equal amounts of dry and wet signal. At **0%**, the output is all dry and at **100%** it is all wet.

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