3D Physics Synthesizer

USER GUIDE

BETA VERSION

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1. Overview of Anukari

Thank you for purchasing Anukari–a new type of virtual musical instrument and sound design platform. Our development staff has worked hard to provide you with a unique and exciting approach to generating sounds, and we hope this new tool will inspire you to explore, create, and expand a whole new landscape of audio possibilities.

We truly appreciate your support and invite you to share your sonic creations with us and the rest of the Anukari community.

So what is Anukari and what makes it so unique?

Anukari uses physics modeling within a 3D simulated world to generate audio. It's based on Newtonian classical mechanics which determine how objects in the real world react when energy is introduced into a system.

What does that mean?

Think of how a video game works. The game, its characters and all the objects around them exist inside a virtual world (in this case, a 3D world.) These characters and objects can interact with each other, and react when certain things happen. The hero character hits an enemy with his or her sword, and the enemy will react in some way. Enemy: "AARRGH!!" [falls over, dies]

Anukari works similarly in that it uses a virtual 3D world where objects can be placed and connected into an arrangement called a "system" and set to react sonically when energy (like a percussive strike, plucked pick, oscillating vibration, etc) is introduced into that system.

How does this create sound?

Let's think of a traditional instrument like a piano. A piano uses a system of strings which are struck by hammer mallets. Striking these strings causes them to vibrate and that vibration is what makes the piano's sound. When the mallet strikes a string, it is introducing energy into that system of strings. Pianos also incorporate padded bars that dampen the vibration by absorbing energy which stops or reduces the string vibration and therefore stops or reduces the sound.

Anukari works the same way. Its virtual 3D world can hold systems of objects which react to energy and cause those objects to vibrate in a manner that mimics real world physics. This reaction is what makes Anukari generate sound and given the near-limitless possible combinations of objects and connections which can affect volume, pitch, timbre and other audio attributes, there is little to limit the sonic frontier that is now available to Anukari users.

2. Installation & Licensing

To install Anukari, you may download the installation file from the following address.

https://anukari.com/download

Select your operating system (Windows or macOS) and then click the button labeled Download. From here your web browser will download and save the installation file to its download folder. For Windows, this will be a .exe file. For Mac, it will be a .pkg file.

When the download has completed, you may open the download folder and run the installation file. Follow the onscreen instructions and, once the installation has finished, you may startup Anukari.

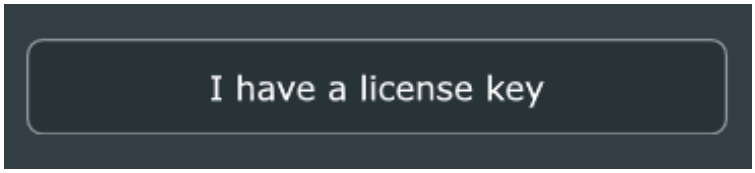
The first time you launch Anukari, it will walk you through the initial setup. You will be prompted to choose between entering a license key to use the full paid version of the software, or to continue without a license key to use the free demo.

The free demo has all of the features of Anukari, but it will periodically play a whoosh of white noise to render the output unusable for recording. If you try the free demo and would like to support us by purchasing a license for the full version, visit:

https://anukari.com/buy-now

And click the BUY NOW button to initiate the purchase. Once you have completed payment for the full license, you will receive an email with your license key which will have a format like `123ABC-123ABC-123ABC-123ABC`. Keep this key secret, and store it in a safe place.

Once you have the product key, if you are launching Anukari for the first time, click the “I have a license key” button at the first prompt:



If you have already launched Anukari in free demo mode, click the “Enter License Key” button in the upper-right portion of the main Anukari window:

In each case, follow the prompts to input your license key and the full software will be activated. Have fun!

Multiple Installations

An Anukari license key entitles you to install Anukari on three (3) personal devices at one time. For example, you could have Anukari installed on your Windows desktop, your Windows laptop, and your MacOS laptop.

If you have reached the limit of installing Anukari on three personal devices, when you enter your license key on a fourth device, it will not activate the full version of the software.

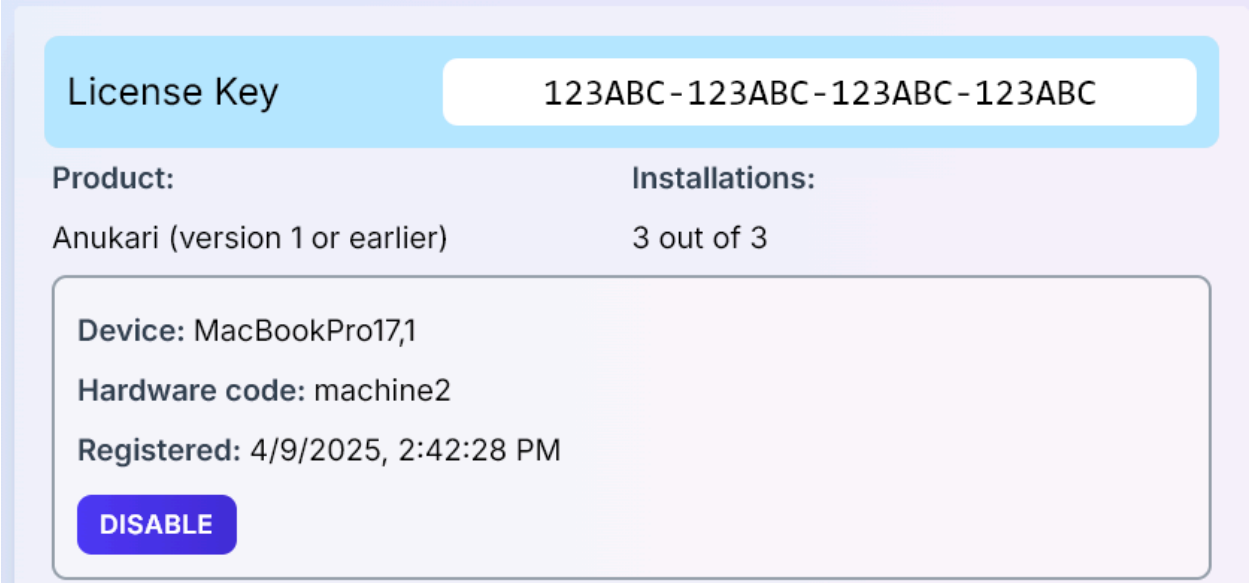
To install Anukari on the fourth device, it will be necessary to deactivate it on one of the existing devices.

Deactivating Anukari on an Existing Device

To activate Anukari on this fourth device, you can deactivate it from one of your original three devices by visiting:

https://anukari.com/account

Here you will see a panel showing your license key, the number of devices it is installed on, and some information about each of those devices. Find the device that you want to deactivate Anukari on, and click the DISABLE button.



Once you have disabled an existing device, Anukari will revert to the free demo mode on that device, and you can enter your license key on the fourth device to activate the paid version there.

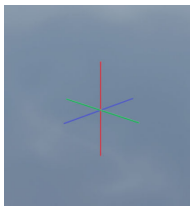
Note that this operation is reversible: you can always go back by deactivating your Anukari license on the fourth device, and enter the license key on the device that you had previously deactivated. There is no limit to the number of times you can shuffle around which three devices Anukari is activated on.

⚠ **IMPORTANT NOTE:** While to use the Anukari full version it is technically *not* required to enter your product key on the website, it is STRONGLY RECOMMENDED that you do so, because this permanently links the product key to your email address and ensures that you have full control over which devices it is activated on.

3. Main Window & Navigation

This is the main application window for Anukari. It displays all the objects and parameters from a preset as well as tools for editing and navigation. The main window is where most preset design work is done.

1. **3D Space** - This is the main area where objects are placed and connected.

   3D Space also contains this marker which denotes the center of the camera view. To center the camera's view on any object, simply double-click it.

2. **Object Mode Toggle** - This button controls whether clicking and dragging an object will move the object to a different space, or will rotate the object's orientation.

3. **Grid Mode Toggle** - This button will activate snap-to-grid mode for object placement. Snap-to-grid has three levels of detail which affect the grid display.

Click the button to cycle through the grid levels and/or deactivate snap-to-grid mode.

4. **Camera Mode Toggle** - This button will toggle through different views of 3D space. These include an isometric view, front view, top-down, and side-view.

5. **Camera Zoom** - Click and hold this button then drag the mouse to zoom in and out inside 3D space. You may also use the mouse wheel for this same function.

6. **Camera Pan** - Click and hold this button then drag the mouse to pan the camera view inside 3D space. You may also hold SHIFT and click-and-drag the right mouse button for this same function.

7. **Camera Rotate** - Click and hold this button then drag the mouse to rotate the camera view around inside 3D space. You may also click-and-drag with the right mouse button for this same function.

8. **Simulation Pause/Play Toggle** - Click this button to pause/play the simulation engine which controls the physics for object interaction inside 3D space. When the simulation is paused, no physics modeling occurs and therefore objects do not react to energy. When the simulation is unpaused, it will begin modeling the conditions for objects to react to energy and generate sound.

9. **Rest Reset** - The rest reset button returns all the objects of the current preset to their default resting state where no energy is present in the system of objects.

10. **Rest Replace** - The rest replace button takes a “snapshot” of the current state of the system and sets this as the new default rest state. From here on, whenever the Rest Reset button is pressed, it will return the system of objects to this new default state.

11. **Object Palette** - This contains all of the objects which can be used in an Anukari preset. Clicking an object and dragging it into the 3D space area will add that object to the current preset.

12. **Tuner** - This is the tuner for Anukari. It registers pitch for any audio that plays from the app. It is used for tuning preset objects and/or systems to specific notes.

13. **Object Properties** - This area displays parameters and options for objects when they are selected in 3D space. For more info on object parameters, see the section on Objects & Properties.

14. **Preset Properties** - This area displays parameters that apply to the entire preset.

15. **GPU Meter** - This meter displays the current workload that Anukari is placing on your computer's graphics processor. High GPU levels may cause issues like static noise or unresponsive presets.

16. **Audio Output Meter** - This meter displays the audio levels which are currently outputting from Anukari. In simple terms, it is a volume meter.

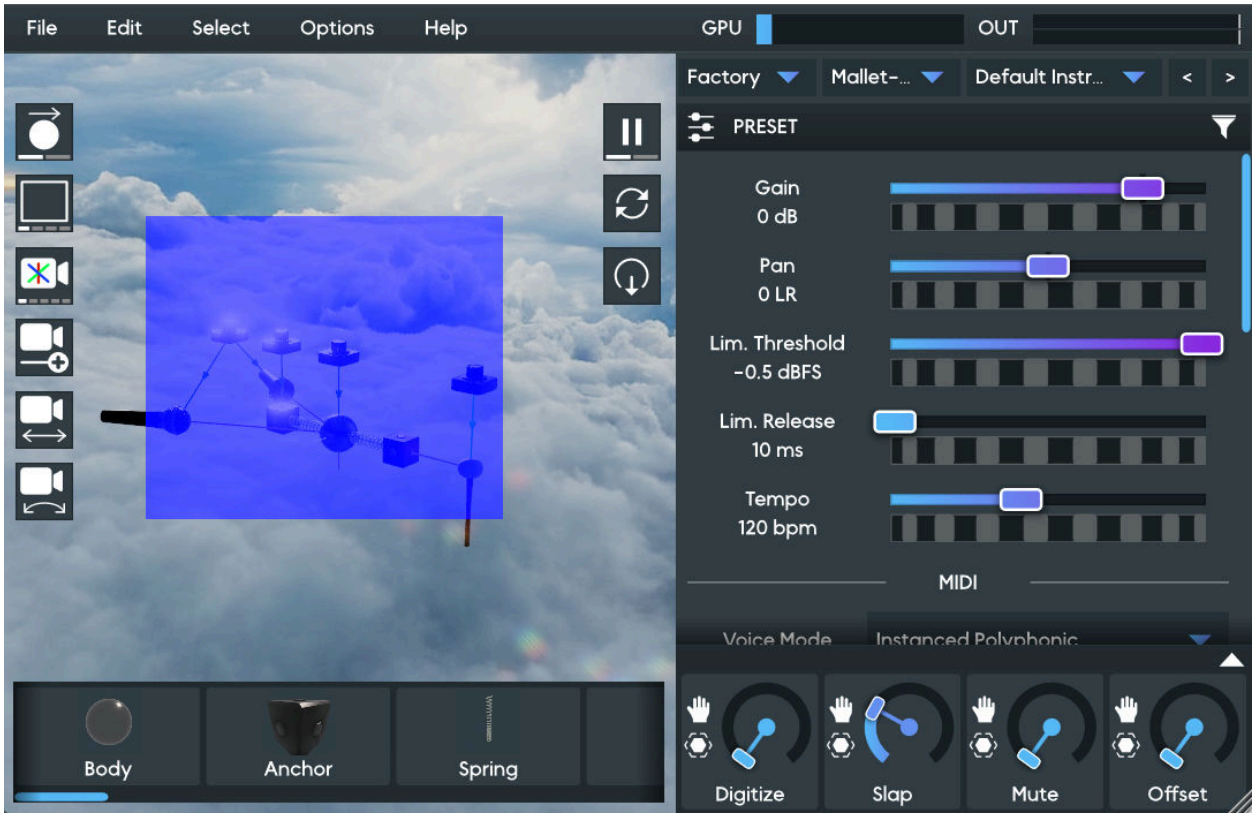
17. **Preset Selector** - This is the control by which presets can quickly be loaded and switched. There are drop-down menus to choose different collections (factory, user, etc), categories, and preset files to load. The "<" and ">" buttons (previous and next) will instantly cycle through the preset files within the selected category.

18. **Macro Panel** - This panel shows knobs to control up to eight macros**.** By default it only shows four macros, but it can be expanded/collapsed to show the other four macros by clicking the small white triangle in its upper right corner.

4. User Interface Tips & Tricks

Selecting Objects in the 3D View

Most preset editing in Anukari begins with selecting the physics objects that you wish to edit in the 3D view. This can be done by clicking on an individual object, or using the left mouse button to drag a box to select multiple objects:



☑ ***TIP:*** *Note that the various kinds of connectors between objects (Springs, Modulator Links, etc.) are objects themselves and can be selected. Many, but not all, connectors have editable parameters.*

The panel on the right side of Anukari's display will automatically show the parameters that can be edited for the objects that are currently selected. Parameters are grouped by each type of entity that is selected. For example, in the screenshot below, the selection consists of two Anchor objects and one Body object, so the parameters for each type of object are shown in panels (1) and (2).

The object editor panels can be resized by dragging their headers up and down with the mouse. Double-clicking a header will maximize its size. Finally, clicking the Filter button labeled (3) in the diagram will filter the selection to only the given type of object.

☑ ***TIP:*** *It's often useful to use the Select All hotkey (ctrl + A on Windows, ⌘ + A on Mac), and then to click the filter button next to the entity type you wish to work on.*

☑ ***TIP:*** *Double-clicking an object in the 3D view will center the camera on that object.*

Adding To and Removing From the Selection

Often it is desirable to add or remove some objects from the current selection. This can be done by holding down a key while clicking an object or dragging a box:

1. **Hold Shift and click object =** Add a single object to the selection.

2. **Hold Shift and drag a box =** Add multiple objects to the selection.

3. **Hold Ctrl (Windows) or Control (Mac) and click object =** Remove a single object from the selection.

4. **Hold Ctrl (Windows) or Control (Mac) and drag a box =** Remove multiple objects from the selection.

> ☑ ***TIP:*** *Each of these operations can be repeated as many times as you like. So for example you can add several objects to the selection by holding Shift and clicking a few objects one after the other. Then you can change your mind, and hold Ctrl (Windows) or Control (Mac) and click on two of the objects you just added to remove them.*

Connecting Objects Together

In Anukari, two objects can only interact if they are connected with a link of some type. There are several kinds of links, including:

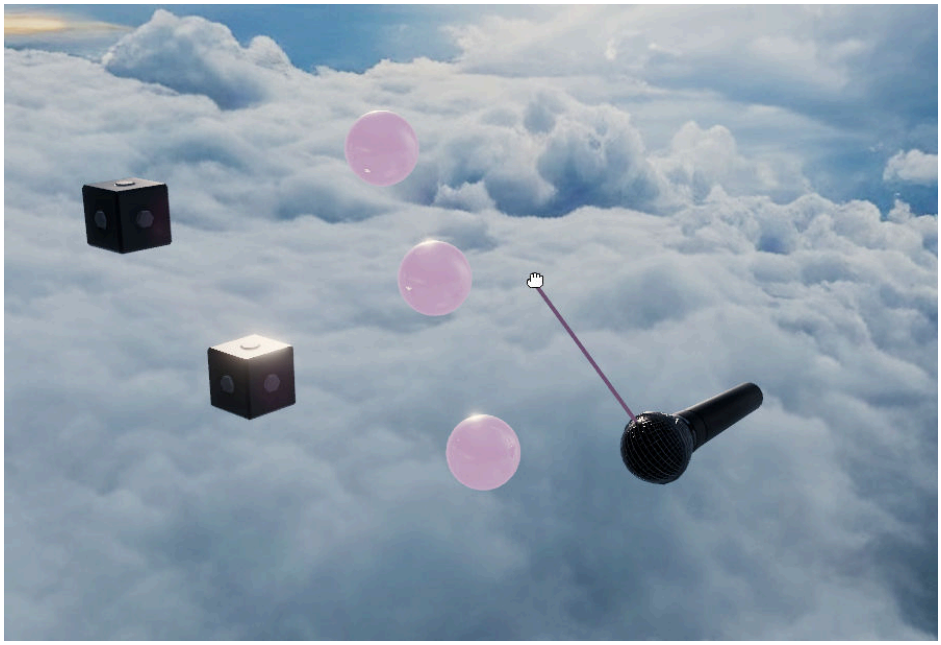
- Springs
- Exciter links
- Mic links
- Delay lines
- Modulator links

⚠ This point is important enough that it is worth repeating: objects can only interact if they are connected with a link.

Obviously in the real world, simply pointing a mic at an object will allow it to pick up the sound from that object. But in Anukari, Mic objects have to be linked to the objects that they will pick up. Similarly for Exciter objects, it is not enough to place e.g. a Mallet near a Body, it has to be connected to that Body to strike it.

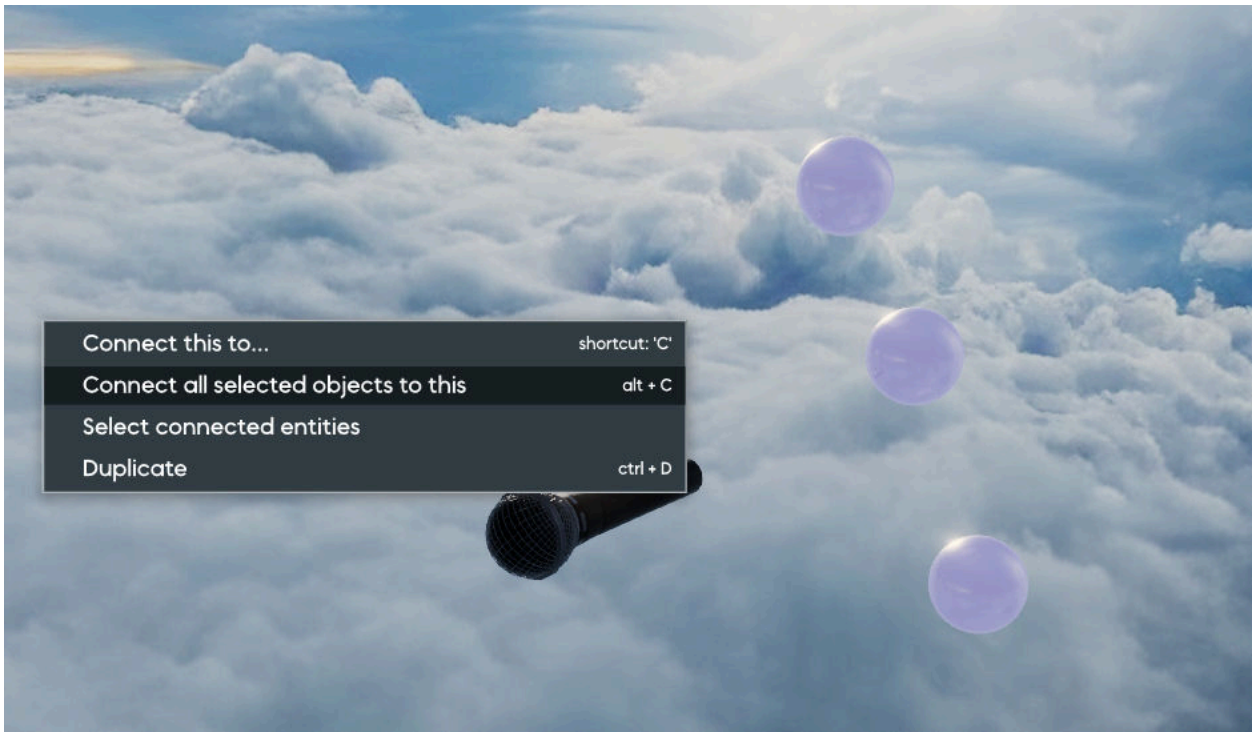
The easiest way to link two objects together is to hover the mouse over an object, and press the “C” hotkey (C stands for Connect). This will highlight all the objects that the first object can be connected to. Clicking the mouse on one of the highlighted objects will connect it.

In the diagram below, the “C” hotkey was pressed with the mouse over the Mic object. The three Body objects are highlighted, but the two Anchor objects are not, which tells you that the Mic can be connected to a Body but not an Anchor. Clicking on a Body will connect it to the Mic.



Often you will want to connect an object to many other objects. For example, since Mic objects only pick up sound from connected Body objects, you may wish to connect a Mic to several Body objects to pick up sound from all of them.

1. The first way to connect many objects is to select multiple objects that you wish to connect, and then with those objects selected, right click on the object you wish to connect all of them to. Then select the *“Connect all selected objects to this”* menu option as in the following diagram.



2. The second way to connect many objects is to select multiple objects, and then to drag an object from the Entity Bar at the bottom of the screen onto the editor panel header for the selected entities. For example, in the diagram below, the Body objects are selected, and a Mic object is being dragged from the Entity Bar. The header for the “BODY” panel on the right side is highlighted, indicating that dropping the Mic on the header will create a Mic object which is connected to all the selected Body objects.

☑ ***TIP:*** *For some kinds of objects, using the “C” hotkey to connect them will result in a different type of link depending on which direction you make the connection. For example, connecting from an Envelope Follower to a Mic will result in a Modulator Link.*

But connecting in the opposite direction from a Mic to an Envelope Follower will result in a Delay Line. In general, the type of link you get is related to the direction that a signal will follow. Audio signal goes from Mics to Envelope Followers, and Modulation signal goes the opposite way.

Copy, Paste, and Duplicate

Anukari supports the copy, paste, and duplicate operations that you may be familiar with from applications like word processors or image editing tools. These are available under the Edit menu, by right-clicking on one of the objects in the selection, or via the following hotkeys:

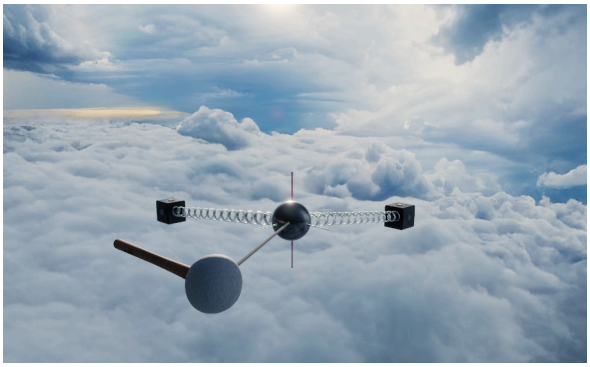
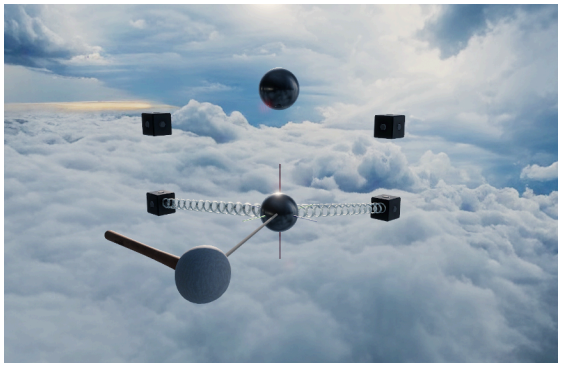
1. **Copy =** Ctrl + C (Windows), ⌘ + C (Mac)

2. **Paste =** Ctrl + V (Windows), ⌘ + V (Mac)

2. **Duplicate =** Ctrl + D (Windows), ⌘ + D (Mac)

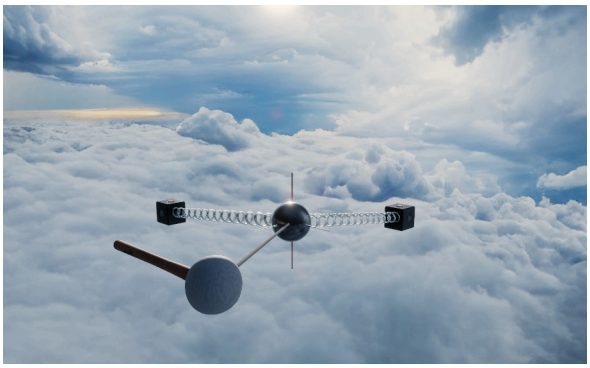
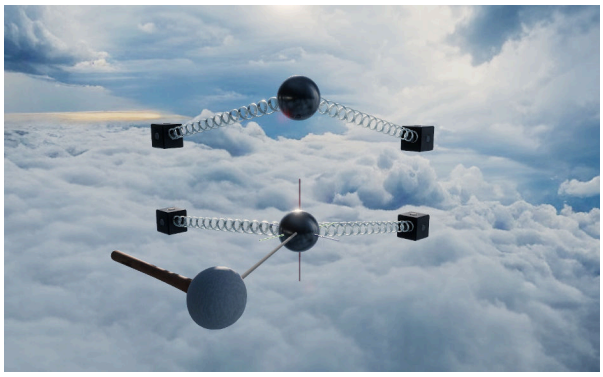
⚠ These mostly work as you expect, but there is one important detail that is specific to Anukari's copy and paste system: the way links between objects are copied. Let's walk through how that works.

Consider a simple preset, with a Body connected by Springs to a couple of Anchors, and a Mallet connected to the Body. If you select only the Body and the two Anchors and press the Duplicate hotkey, this will be the result:

Original Preset	*After Duplication*
	

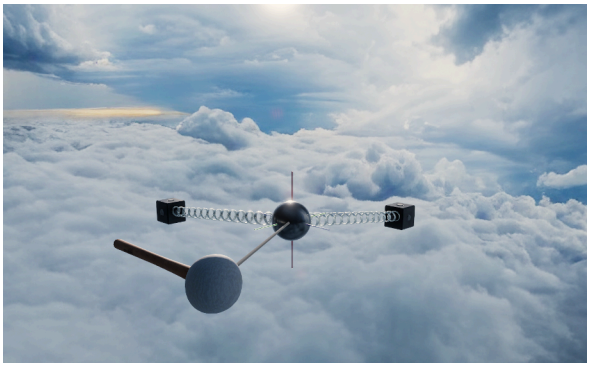
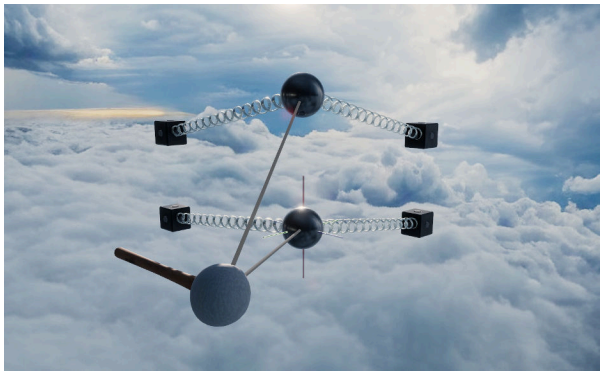
Notice that the Spring objects are not copied, because they were not part of the selection.

Now let's look at what happens if you select the Body, the Anchors, and the Springs, and press the Duplicate hotkey:

Original Preset	*After Duplication*
	

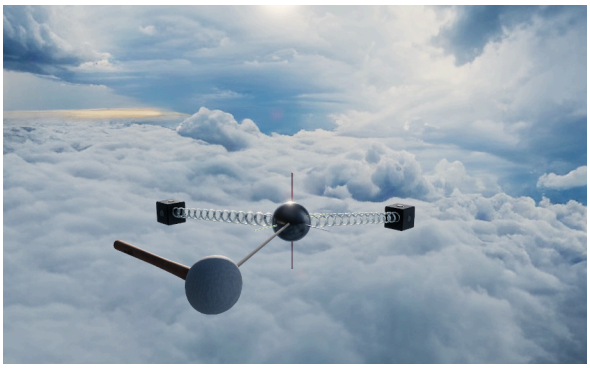
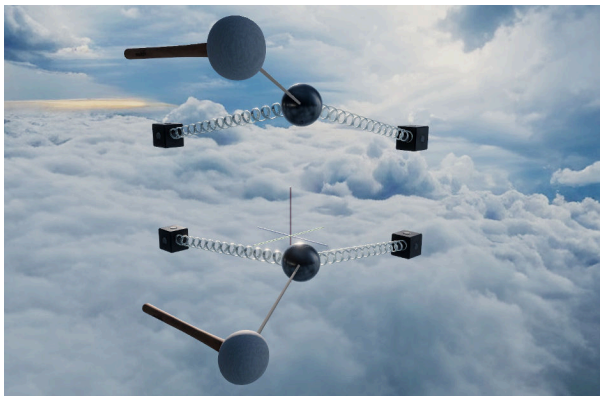
Notice that this time, because the Spring objects are selected, they are copied. So far, so good.

Now let's look at what happens if we select everything *except* the Mallet object. So the Body, Anchors, Springs, and even the Exciter link are selected, and Duplicated:

Original Preset	*After Duplication*
	

Notice now that **the duplicated system is connected to the original unduplicated Mallet object**. This is important because often you will wish to duplicate some objects but not others, while ensuring that the duplicate objects are still connected to the objects that were not duplicated.

Finally, if we wish to duplicate the entire system, we can select everything (including the Mallet) and Duplicate:

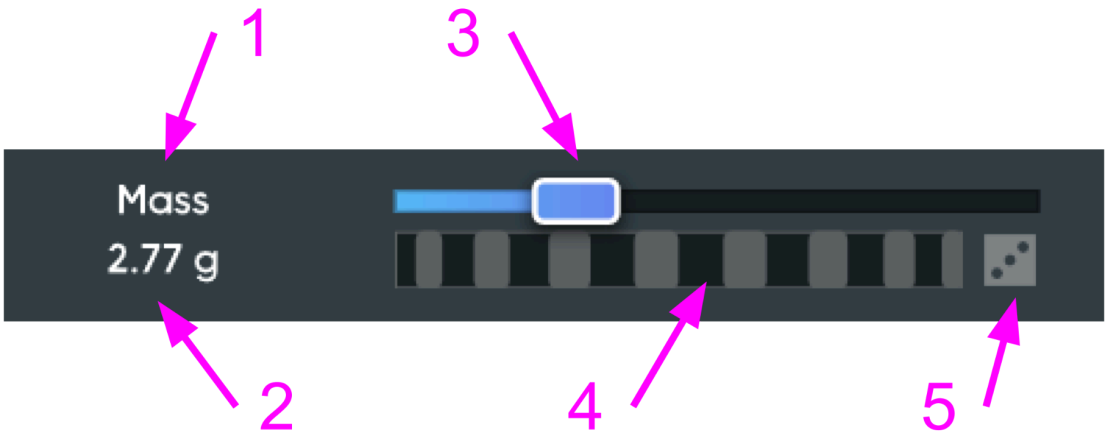
Original Preset	*After Duplication*
	

Notice how in this case we get a full duplicate copy of all objects.

So by making careful choices about which objects are in the selection when it is duplicated or copied and pasted, you can determine how the resulting pasted object is connected to existing objects.

Parameter Sliders

The main tool for editing numeric parameters in Anukari is the Parameter Slider. These sliders appear in the right-hand Object Parameter Editor panel, based on what kinds of objects are selected in the 3D view. When the slider is moved, it changes the parameter value for *all* of the objects selected in the 3D view.



1. Parameter name = The name of the parameter that this slider controls, in this case, mass. Hovering the mouse over the name will show a detailed tooltip explaining what this parameter does.

2. Parameter value and units = The value of the parameter and units, in this case 2.77 grams. Click on this to open a text editor where you can type in a precise value.

3. Coarse adjustment = Drag this slider or click along its track to make larger adjustments to the parameter value. You can also hover the mouse over this and use the mousewheel. Right click the slider handle to “split” a single value slider into a Range-Value Slider. For sliders that have a default value, double clicking this will reset the value to the default.

4. Fine adjustment = Drag this thumbwheel to make smaller adjustments to fine-tune the parameter value. This is especially useful when tuning the pitch of an instrument or making other changes where the sound is very sensitive to the precise value. You can also hover the mouse over this and use the mousewheel.

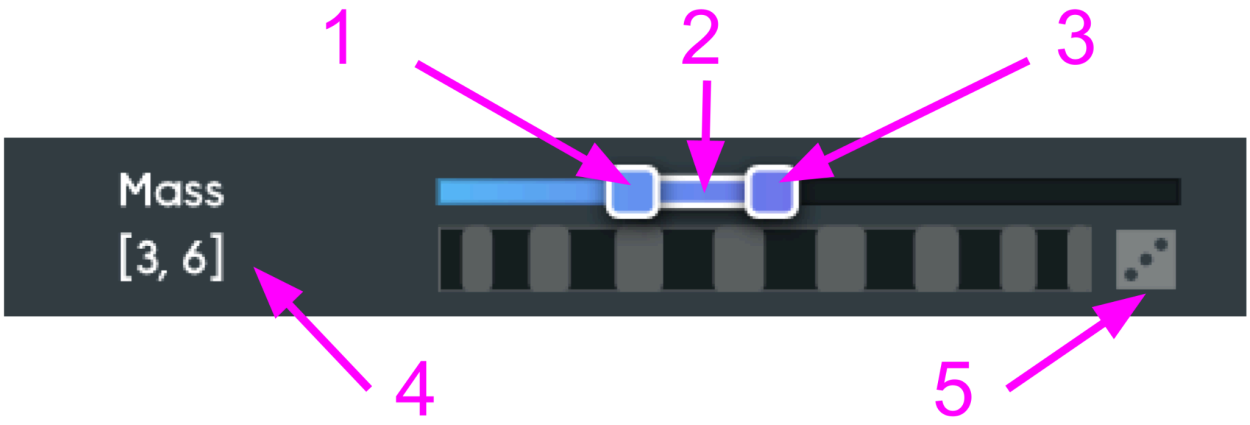
5. Randomize button = Click this button to assign a random value for the parameter.

Range-Value Sliders

Parameter Sliders control the value for *all* objects selected in the 3D view. But each object has its own unique parameters, which means that if multiple objects are selected, they may have varying parameter values.

In this situation, the Parameter Slider will appear as a Range-Value Slider, which allows the parameter values to be edited in bulk by stretching, compressing, or shifting the value range.

For example, if 5 Body objects are selected, and their masses are 1, 2, 3, 4, and 5, respectively, the Range-Value Slider will show a range of 1 to 5. If the top of the range is stretched to 10, then their masses would become 1, 4, 6, 8, and 10, respectively. Notice how their values are stretched proportionally over the range.



1. Low value handle = Indicates the lowest value of this parameter over all selected objects. Drag this to stretch or compress the range of parameter values for all selected objects.

2. All values handle = Drag this to shift the parameter values for all selected objects up and down without stretching or compressing the range.

3. High value handle = Indicates the highest value of this parameter over all selected objects. Drag this to stretch or compress the range of parameter values for all selected objects.

4. Parameter value range = The numeric range of parameter values. Click on this to open a text editor where you can type in a precise range in the format *[lowest, highest]*. The square brackets are important; if you type a single number without brackets, the parameter on all objects will be set to the same value.

5. Randomize button = Click this to randomize the parameter values for all selected objects *within the current range*. Clicking multiple times will continue to use the original range for randomization.

Using Macros

Anukari supports drag and drop Macros, which allow you to quickly set up on-screen knobs to control parameter values. There are a total of eight Macros available.

When running as a plugin in a DAW, these Macros will be visible in the DAW as parameters that can be automated, recorded, etc.

When running as a standalone app, these Macros are automatically mapped to MIDI Continuous Control numbers 1-8. On most MIDI controllers, these will correspond to the Mod wheel (#1) as well as the physical knobs and sliders on the controller. Note that some controllers may use different Control numbers than 1-8, and may need to be configured to use 1-8 for compatibility with Anukari.

1. **Drag and Drop Handle** = Click and drag from this handle onto the 3D view to create an unconnected Macro object, or drag it onto a modulatable parameter in the Object Editor panel on the right side to connect it to that parameter on the selected objects (see the Macro Drag and Drop section below for a detailed explanation).

2. **Select Button** = Click here to select all of the Macro objects in the 3D view that are controlled by this knob. Many Macro objects can be controlled by one knob.

3. **Macro Name** = Click here to edit the Macro name. When running Anukari as a plugin, this name will appear in your DAW so that you know which parameter is which. This name is saved as part of the current preset.

4. **Macro Knob** = Click and drag here to change the Macro value. When running Anukari as a plugin, adjustments made to this knob will be visible in your DAW and can be recorded.

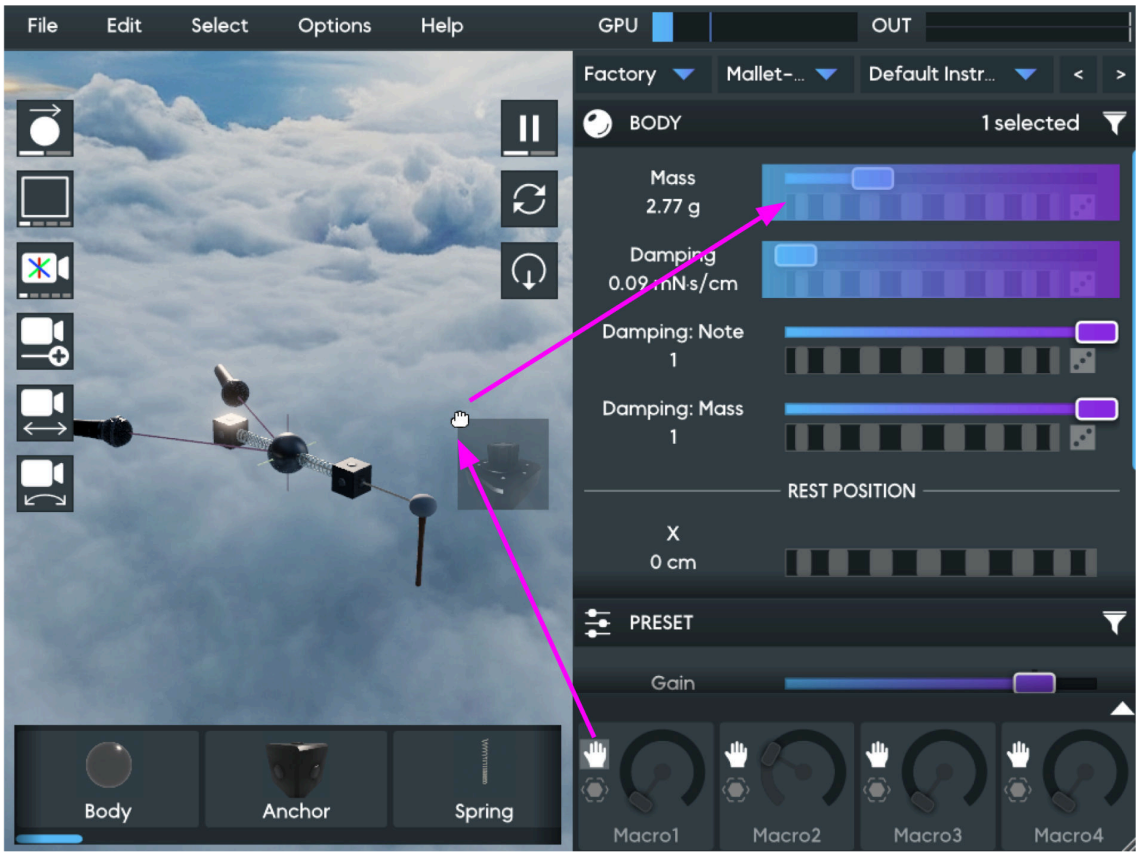
5. **Expand/Contract Panel Button** = Click here to expand the Macro panel to show all eight Macros, and click again to go back to showing just four Macros.

Macro Drag and Drop

Like all other objects in Anukari, Macro objects have to be connected to other objects in order to do anything. This can be done in the 3D view by creating a connection with the “C” hotkey (or other means), and then by selecting the Modulator Link and editing its Target parameter. However, there is a much faster way to create Macros, which is the drag and drop system.

To use the drag and drop system, first you need to select the objects that you wish to modulate in the 3D view. For example, if you wish to modulate the Mass on several Body objects, you would start by selecting the desired Body objects.

The next step is to drag the mouse from the desired macro’s handle (the little hand icon next to the knob). While dragging the mouse, the parameters that can be modulated on the selected objects will be highlighted in the Object Editor panel on the right hand side. Dragging the mouse to one of the highlighted parameters and dropping the Macro on it will automatically create a Macro object in the 3D view and connect it to the given parameter on the selected objects.



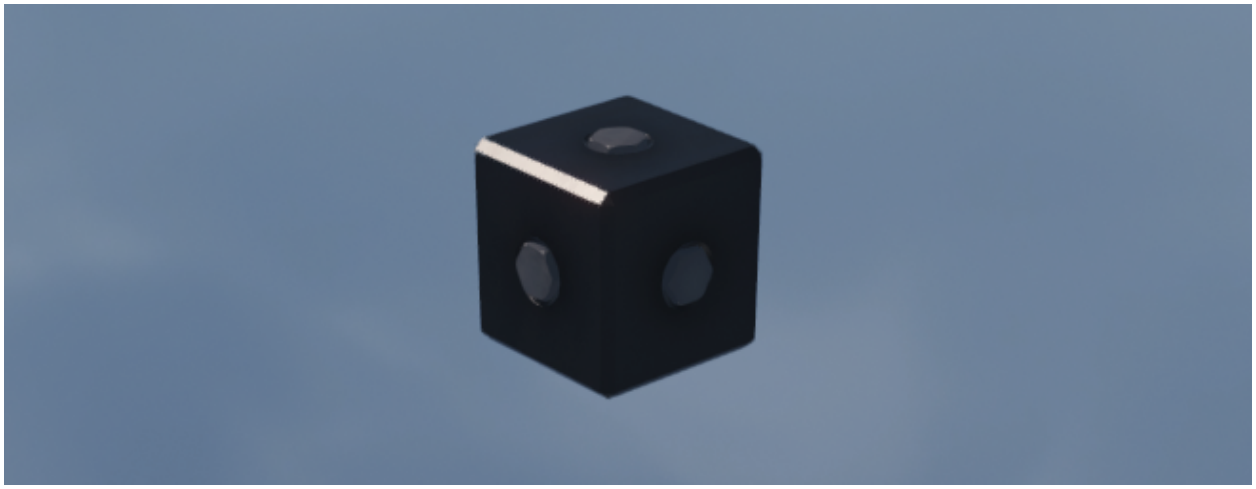
☑ ***TIP:*** *The drag and drop system also works when dragging other kinds of modulators from the Object Palette. For example, you can drag an LFO from the Object Palette onto the Mass parameter in the same way that you can drag a Macro from its grab handle.*

5. Objects & Properties

Objects are the basic building blocks of Anukari. Within its virtual 3D space, various objects can be placed and connected together to form what is called a system. Each system is capable of storing up to 512 total objects, and reacts to energy that is introduced into it via an exciter or other method. What is meant by introducing energy into a system? In the case of Anukari, it means movement, or more specifically vibration.

Here is a list of all of the objects available within Anukari, including a description of how they react to energy or other objects, and the various parameters that can be used to control them.

Anchor



The anchor is an immobile object that tethers body objects together in a system to restrict their movement. Without an anchor, the entire system of objects will become uncontrollable and fly away in 3D space.

An anchor can quickly be placed in 3D space by pressing the hotkey “A”.

Anchor Properties:

Position = These X, Y and Z coordinates determine where in 3D space the object is placed. Though the anchor is “immobile”, modulating these parameters will cause the anchor to move.

Body

The body object is a principal element for transferring energy throughout a system. It is a freely-moving mass that will vibrate when it comes in contact with energy which generates sound.

A body object can quickly be placed in 3D space by pressing the hotkey “B”.

Body Properties:

Mass = The physical mass of the body. Increasing the mass tends to lower the pitch, and vice versa. Body objects with higher mass will be harder to move, and body objects with lower mass will be flung around easily.

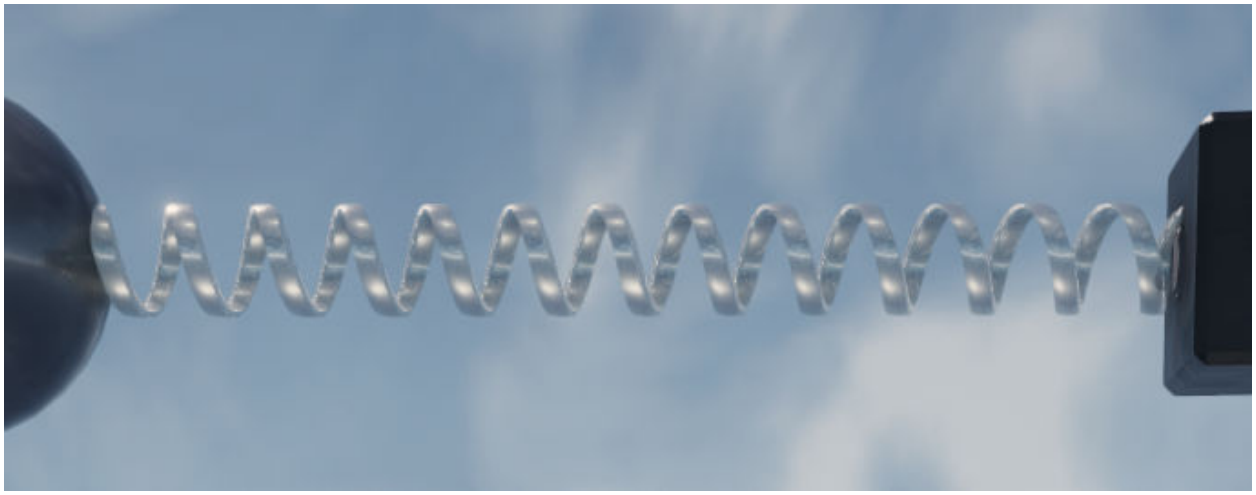
Damping = The physical damping of the body. This controls how fast the motion of the body naturally dies down due to loss of energy through e.g. air resistance. Higher damping will make the motion die down quickly. Set this low for long-ringing tones, or set it high for clicks.

Damping: Note = Controls how much the damping should be scaled based on what note is played. When set to 0, damping will not be scaled, and thus lower notes will ring out longer than higher notes. When set to 1, damping will be fully scaled, and low/high notes should ring out similarly.

Damping: Mass = Controls how much the damping should be scaled based on the mass of the Body. When set to 0, damping will not be scaled, and thus body objects with larger mass will ring out longer than those with smaller mass. When set to 1, damping will be fully scaled, and body objects with large/small mass should ring out similarly.

Rest Position = These X, Y and Z coordinates determine where in 3D space the object is placed and where it should reside while in a state of rest. Modulating these parameters will make the object move.

Spring



The spring physically connects body objects to one another and to anchors. Each spring has a configurable neutral length that it is always trying to return to. If it is stretched beyond its neutral length, it will pull the attached body objects together, and if it is compressed below its neutral length, it will push these objects apart.

Springs can be quickly used to connect body objects and anchors by clicking on the first object, pressing the hotkey “C”, and then clicking the next object to be connected.

Spring Properties:

Stiffness = This controls how resistant the spring is to compression or elongation, or in other words, how hard it will push/pull on connected body objects to return to its resting length. Higher stiffness tends towards higher pitch, and vice versa. When attached to a body with high mass, higher stiffness is required for the same pitch.

Length = The neutral resting length of the spring. This is the length that the spring is always trying to return to. When the two body objects connected by the spring are at this distance apart, the spring does not push/pull on them. As the body objects get closer together than the neutral length, the spring will push them apart, and as the body objects get further apart than the neutral length, the spring will pull them together.

Relax Spring Length = This button sets the neutral resting length of the spring to its current length. This can be used to relax a spring so that it is no longer under compression or elongation in its current configuration.

Mic & Mic Link

The mic object is used to pick up vibration from each of the body objects that it is connected to via a mic link line.

The mic link connects a mic to each of the body objects from which it will pick up vibration. One mic can be linked to many body objects, and will sum the vibration from all of them. The physical orientation of this link relative to the direction of vibration influences the sound.

The mic can quickly be placed in 3D space by pressing the hotkey “S”. Mic links can be added by clicking on the mic, pressing the hotkey “C”, and then clicking the body object to be connected.

Mic Properties:

Gain = The amount of gain that will be applied to the microphone signal.

Pan = Negative values will pan the microphone to the left speaker channel, and positive values will pan it towards the right channel. A value of zero is balanced between left and right.

Directionality = Controls how directional the microphone is. A value of 0 gives an omnidirectional microphone, and a value of 1 is highly directional. This can be particularly useful when modulating the microphone's rotation.

Isotropy = Adds distortion by progressively ignoring the particular axis of a Body's vibration, somewhat like a signal rectifier but in 3D. Set to 0 for a clean signal.

Ext. Output = Enable external audio output for this microphone. If this is turned off, the microphone will not be mixed into the master output, but will only send to internal delay lines. For more info, see the section on Delay Lines.

Compressor Threshold = The signal threshold above which the compressor will begin to apply gain reduction (subject to the attack and release durations).

Compressor Ratio = The amount of proportional gain reduction the compressor will apply to the signal when it is above the threshold.

Compressor Attack = The duration for which the signal must be above the threshold before the compressor will apply gain reduction.

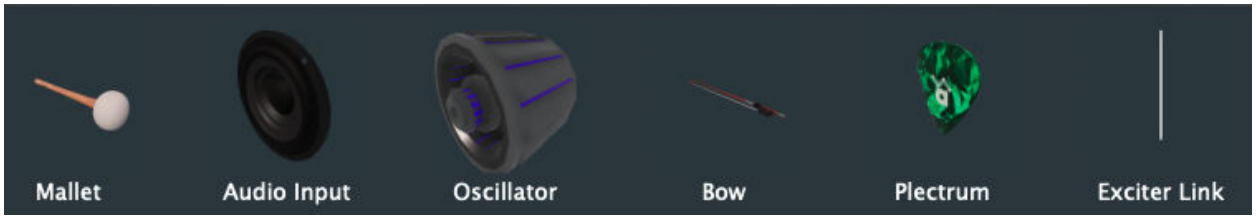
Compressor Release = The duration for which the signal must drop below the threshold before the compressor will stop applying gain reduction.

Compressor Makeup Gain = The amount of gain that will be applied to the signal post-compression.

Orientation = The rotational latitude, longitude, and spin of the entity in 3D space. Modulating these parameters will make the object rotate.

Position = These X, Y and Z coordinates determine where in 3D space the object is placed. Modulating these parameters will make the object move.

Exciters & Exciter Link



Exciters are the objects that introduce energy into a system. There are currently five types of exciters which add energy in different ways. Exciters can quickly be placed in 3D space by pressing the hotkey “E”. The mode parameter determines their type.

An exciter link connects an exciter to each of the body objects in which it will induce vibration when triggered. One exciter can be linked to many body objects, and will induce vibration in all of them. Exciter links can be quickly added by clicking on the exciter, pressing the hotkey “C”, and then clicking the other object to be connected.

All exciters share the following parameters, but specific exciters have their own parameters discussed later on.

MIDI Note = The MIDI channel/note used to trigger this exciter.

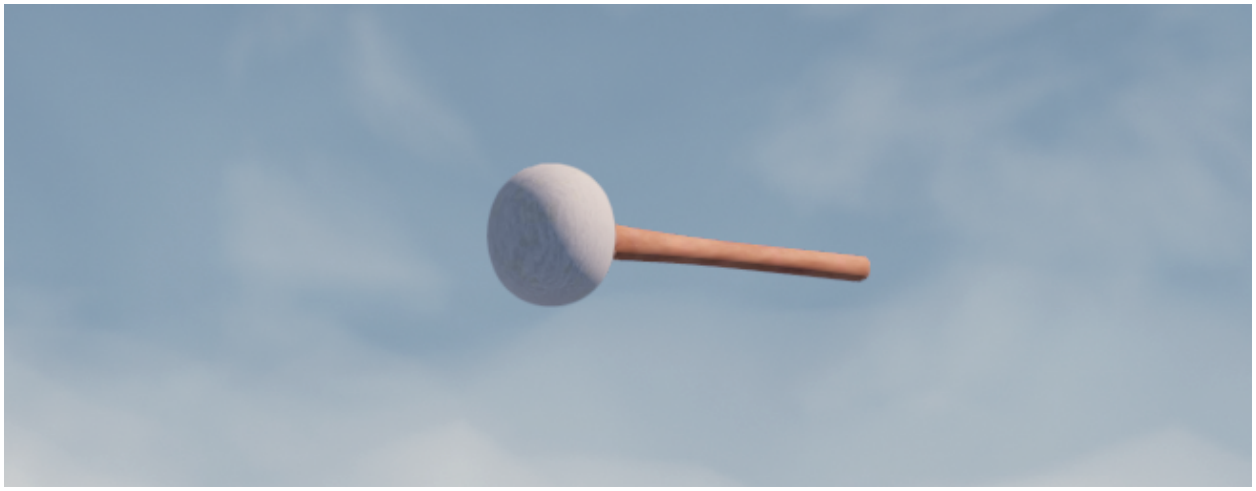
Mode = The physical model used for this exciter–mallet, audio input, oscillator, bow, or plectrum. Each model has its own behavior and parameters.

Vel. Sensitivity = Adjusts the simple built-in MIDI velocity sensitivity for the Exciter. To fully customize how velocity affects this Exciter, you can set this to zero and connect a Modulator to the Exciter.

Orientation = The rotational latitude, longitude, and spin of the entity in 3D space. Modulating these parameters will make the object rotate.

Position = These X, Y and Z coordinates determine where in 3D space the object is placed. Modulating these parameters will make the object move.

Mallet



The mallet is used to simulate the physical striking of each of the body objects that it is connected to via an exciter link. The orientation of the mallet controls the direction in which each body is struck.

Mallet Properties:

Impulse = The total amount of force the mallet will apply to each body it is attached to over a brief time period. Higher impulse values tend to produce larger vibrations, and thus louder sounds.

Min. Hardness = Controls how hard the head of the mallet is at minimum MIDI velocity. Small values are more like felt heads, and larger values are more like wood or metal heads. The hardness increases between the min/max based on MIDI velocity.

Max. Hardness = Controls how hard the head of the mallet is at maximum MIDI velocity. Small values are more like felt heads, and larger values are more like wood or metal heads. The hardness increases between the min/max based on MIDI velocity.

Noise = The amount of white noise to mix into the mallet's impact with the connected body objects. This adds a bit of a click to the sound, and also can help reduce the impulse required to get the same amount of loudness.

Plectrum

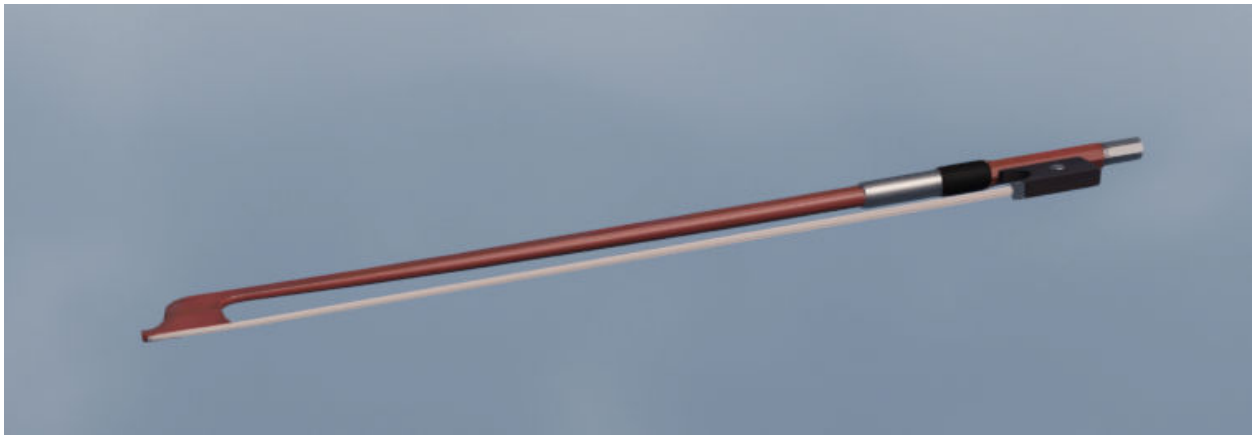
The plectrum is used to physically pull back and release each of the body objects that it is connected to via an exciter link. The orientation of the plectrum controls the direction in which each body is pulled back.

Plectrum Properties:

Distance = The distance by which the connected body objects will be pulled back (in the direction of the plectrum) before being released.

Duration = The duration over which the connected body objects will be pulled back (in the direction of the plectrum) before being released. Note that while the body objects are being pulled back, they cannot vibrate normally, so if e.g. a microphone is connected to one of these body objects it will go mute during this duration. To avoid this, you can apply a very brief duration, or connect the microphone to a nearby body instead.

Bow



The bow is used to simulate the physical bowing of each of the body objects that it is connected to via an exciter link. The orientation of the bow controls the direction in which each body is vibrated.

Bow Properties:

Draw Velocity = The velocity with which the bow is drawn across the connected body objects. Higher velocity tends towards larger vibrations and thus louder sounds.

Rosin Stiction = Controls how strongly the bow's rosin sticks to the string. Higher stiction tends to lead to more odd harmonics, or a harsher sound.

Rosin Dropoff = Controls how quickly the rosin's stickiness drops off when the bow's rate of movement is different from the connected body's movment. If the bow is not making sound, you may need to experiment with different values for this parameter.

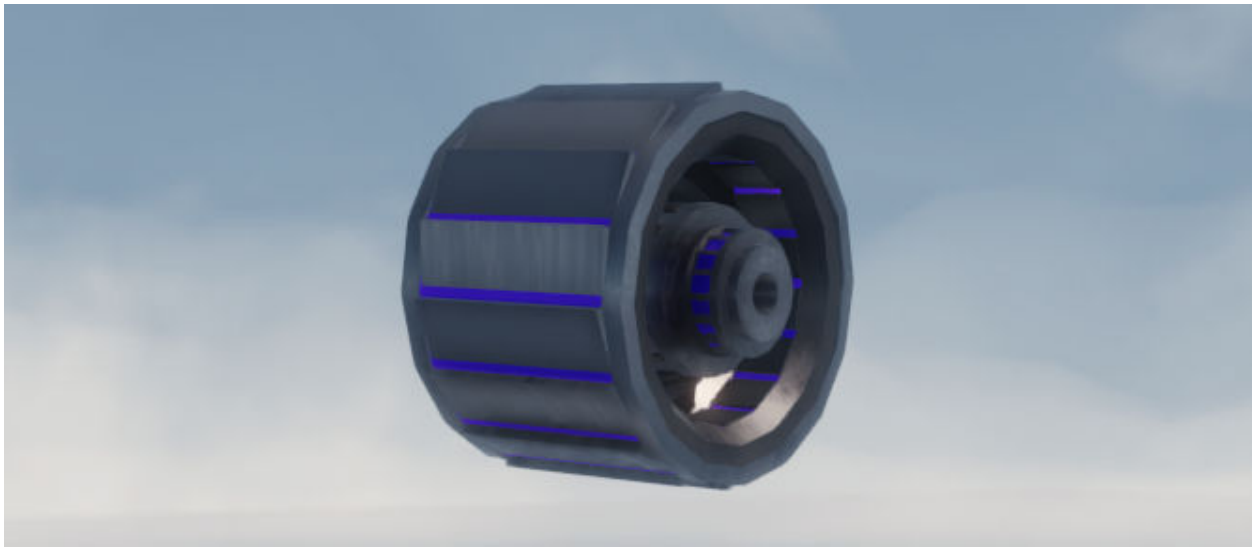
Envelope Attack = When the MIDI note is pressed, this is the duration it takes for the envelope to increase from minimum to maximum gain.

Envelope Decay = After the attack phase of the envelope is finished, this is the duration it takes for the envelope to drop from full gain to sustain gain.

Envelope Sustain = After the decay phase of the envelope is finished, this is the fraction of maximum gain that the envelope will sustain.

Envelope Release = When the MIDI note is released, this is the duration it takes for the envelope to decrease from sustain gain to minimum gain.

Oscillator



The oscillator is used to induce vibration based on a waveform in each of the body objects that it is connected to via an exciter link. The orientation of the oscillator controls the direction in which each body is vibrated.

Oscillator Properties:

Gain = The amount of gain that will be applied to the oscillator waveform before it is applied as a directional force to connected body objects.

Shape = The type of waveform that this oscillator will generate. Options are sine, sawtooth, rectangle, white noise, and sample & hold.

Octave = The number of octaves by which to raise or lower the pitch of the oscillator.

Semitone = The number of semitones (interval) by which to raise or lower the pitch of the oscillator.

Detune = The number of cents by which to raise or lower the pitch of the oscillator.

Pulse Width = When the waveform is set to Rectangle, this is the duty cycle of the wave, or the fraction of time that it is positive. If a modulator is attached to this oscillator, this can be modulated for PWM.

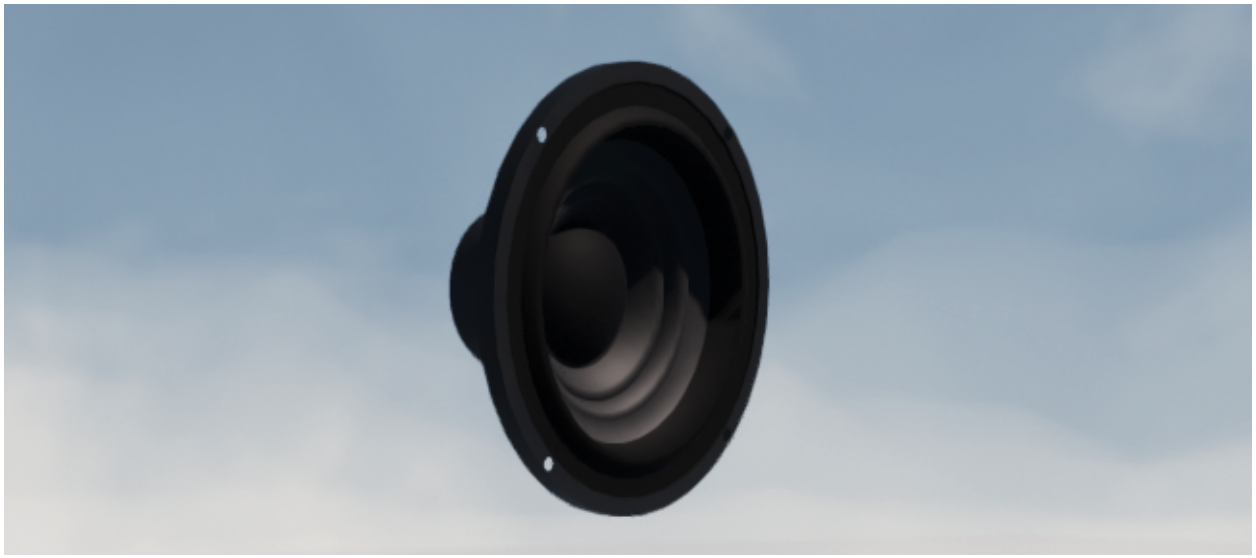
Envelope Attack = When the MIDI note is pressed, this is the duration it takes for the envelope to increase from minimum to maximum gain.

Envelope Decay = After the attack phase of the envelope is finished, this is the duration it takes for the envelope to drop from full gain to sustain gain.

Envelope Sustain = After the decay phase of the envelope is finished, this is the fraction of maximum gain that the envelope will sustain.

Envelope Release = When the MIDI note is released, this is the duration it takes for the envelope to decrease from sustain gain to minimum gain.

Audio Input



The audio input is used to induce vibration based on an audio signal in each of the body objects that it is connected to via an exciter link. The orientation of the audio input controls the direction in which each body is vibrated. The audio signal can come from an external input source (such as your computer's microphone) or from an internal source by connecting one or more mics via delay lines. For more info, see section on Delay Lines.

Audio Input Properties:

Ext. Enabled = Enable external audio input for this audio signal exciter. If this is turned off, the audio signal exciter will ignore external signals and will only receive signals from internal delay lines.

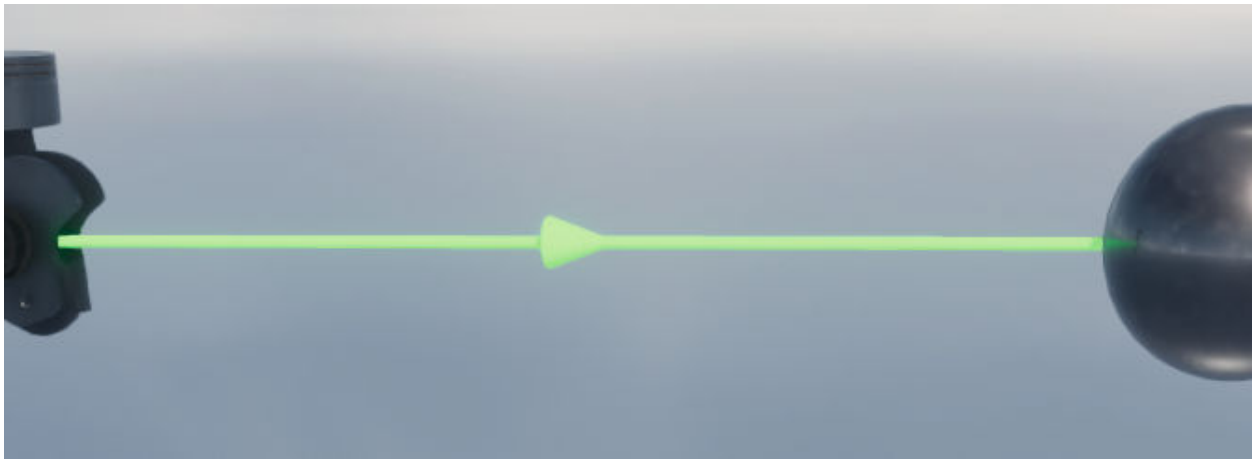
Ext. Channel = The external audio input channel to use for this audio signal exciter.

Gain = The amount of gain that will be applied to the audio signal before it is applied as a directional force to connected body objects.

Delay = The duration for which the audio signal will be delayed before being applied as a directional force to connected body objects. This is applied both to external audio signals, as well as delay line signals. Note that delay lines each have their own delay parameter, which is additive with this one.

MIDI Note Gate = If enabled, the audio signal will be muted except when the associated MIDI note is played, and an envelope will be applied.

Modulators & Modulator Link



Every modulator uses a modulator link to connect to other objects. This link appears as a green line with an arrow indicating the direction data is being sent.

It also has its own parameters which will appear in the object properties section when the modulator link is selected.

Modulator links can be quickly added by clicking on the modulator, pressing the hotkey “C”, and then clicking the other object to be connected.

Target = The target parameter on the connected object that the connected modulator will modulate. Most target parameters match a particular property of the connected object, but some objects like exciters can employ special targets like the MIDI Note Trigger. Here is a list of all of the target parameters available to modulate for each object:

Anchor	Position X, Position Y, Position Z
Body	Mass, Damping
Spring	Stiffness, Neutral Length
Mic	Position X, Position Y, Position Z, Gain, Pan, Rotation Y, Directionality, Isotropy
Mallet	Impulse, Hardness, Noise Amount, Rotation Y, MIDI Note Trigger
Audio Input	Gain, Rotation Y, Delay, MIDI Note Trigger
Oscillator	Frequency, Pulse Width, Gain, Rotation Y, MIDI Note Trigger

Plectrum	Displacement Distance, Displacement Duration, Rotation Y, MIDI Note Trigger
Bow	Draw Velocity, Rosin Stiction, Rosin Dropoff, Rotation Y, MIDI Note Trigger
LFO	Depth, Frequency, Pulse Width, Sync Frequency, MIDI Note Trigger
Envelope Generator	Depth, MIDI Note Trigger
Envelope Follower	Depth, Delay
MIDI Controller	Depth, Smoothing
MIDI Pitch Bend	Depth, Smoothing
MIDI Channel Pressure	Depth, Smoothing
MIDI Poly Aftertouch	Depth, Smoothing
MIDI Velocity	Depth, Smoothing
MIDI Note Follower	Depth, Smoothing
Macro	Depth, Smoothing

MIDI Note Trigger = This is a special target which appears for exciters and allows a modulator to use its values to trigger MIDI notes instead of parameter changes.

Depth = The peak amount by which the chosen parameter's value will be modulated. Can be set negative to negate the polarity of the waveform.

Invert Polarity = Inverts the polarity of the modulation signal (turns positive to negative and vice versa).

Exponential = Use an exponential curve for the modulator's application to the target parameter. This is especially useful when modulating parameters that vary over a large range, or affect pitch.

Multiply = By default, the modulation value is added to the target parameter. When multiply mode is enabled, the target parameter is multiplied by the modulation value instead. Note that not all target parameters can be multiplied. If a single parameter is the target of both additive and multiplicative modulators, the additive ones are applied first.

Macro

The macro uses specific information received from a DAW to modulate parameters for each of the entities that it is connected to via a modulator link.

> ☑ ***TIP:*** *For much more detailed information on how to use the Macro object, see the Using Macros section.*

Macro Properties:

Mode = The type of modulator being used. Each type has its own parameters and effects.

Smoothing = How long it takes for the modulator's output value to change when it is updated. Longer values will produce smoother changes with more input lag, and smaller values will produce more abrupt changes with less input lag.

Macro Slot = To control this modulator with one of the Macro knobs in the lower right hand corner of the Anukari screen, select one of the Macro knob slots here. Multiple Macro objects can be controlled by the same Macro knob.

LFO

The LFO generates a low-frequency oscillator waveform signal to modulate parameters for each of the entities that it is connected to via a modulator link.

LFOs can quickly be placed in 3D space by pressing the hotkey “D”

LFO Properties:

Mode = The type of modulator being used. Each type has its own parameters and effects.

Shape = The type of waveform that this LFO will generate.

Tempo Sync = Enable tempo syncing for the LFO frequency, so that instead of setting an arbitrary frequency, a specific multiple of the tempo will be used.

Frequency = (When Tempo Sync is disabled) the rate at which the LFO will modulate parameters for connected objects according to the selected waveform.

Rate = (When Tempo Sync is enabled) the rate at which the LFO will modulate parameters for connected objects according to the selected waveform, relative to the current tempo.

Pulse Width = When the waveform is set to SQUARE, this is the duty cycle of the wave, or the fraction of time that it is positive.

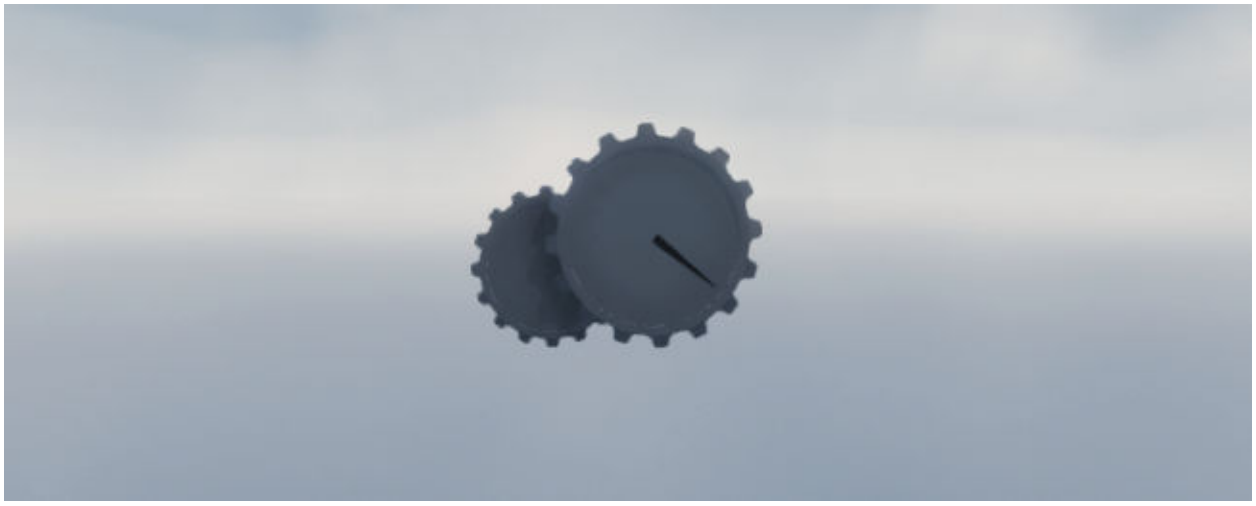
Retrigger = Enable MIDI note retriggering, which will restart this LFO at a specific phase when a selected MIDI note is pressed.

MIDI Note = (When Retrigger is enabled) the MIDI channel/note used to retrigger this LFO.

Retrigger Phase = (When Retrigger is enabled) the state of the phase that the LFO will be reset to.

Scale Frequency = Normally the LFO's frequency is kept constant regardless of what MIDI note is being played. If this option is enabled, the LFO's frequency will instead be scaled based on what note is being played, with higher notes having higher frequencies. One use for this feature is to scale the LFO frequency for FM synthesis.

Envelope Generator



The envelope generator creates an envelope based on a MIDI note trigger to modulate parameters for each of the entities that it is connected to via a modulator link.

Envelope Generator Properties:

Mode = The type of modulator being used. Each type has its own parameters and effects.

MIDI Note = The MIDI channel/note which will trigger this envelope.

Envelope Attack = When the MIDI note is pressed, this is the duration it takes for the envelope to increase from minimum to maximum gain.

Envelope Decay = After the attack phase of the envelope is finished, this is the duration it takes for the envelope to drop from full gain to sustain gain.

Envelope Sustain = After the decay phase of the envelope is finished, this is the fraction of maximum gain that the envelope will sustain.

Envelope Release = When the MIDI note is released, this is the duration it takes for the envelope to decrease from sustain gain to minimum gain.

Envelope Follower

The Envelope Follower uses an audio signal to modulate parameters for each of the entities that it is connected to via a Modulator Link. It receives its audio signal from one or more Mics via Delay Lines.

Envelope Follower Properties:

Attack = The approximate amount of time for the envelope follower's output to increase to match an input signal if the input signal stays the same for long enough.

Release = The approximate amount of time it takes the envelope follower's output to decrease to match an input signal if the input signal stays the same for long enough. Note that for most use cases, this should be longer than the attack time, or else the envelope follower will only produce extremely transient output signals. On the other hand, extremely short attack or release may be useful for frequency modulation-type techniques (or similar).

MIDI Controller

The MIDI controller input uses a MIDI continuous control signal (knob, fader, etc) to modulate parameters for each of the entities that it is connected to via a modulator link.

MIDI Controller Properties:

Mode = The type of modulator being used. Each type has its own parameters and effects.

MIDI Channel = The MIDI channel on which continuous controller (CC) messages will be received by this modulator.

MIDI CC Number = The MIDI continuous controller (CC) number for the knob/fader/etc that will control this modulator.

Sense = Click here to assign the MIDI channel and controller number by wiggling the input on the controller of your choice (knob, fader, pedal, etc).

Smoothing = How long it takes for the modulator's output value to change when it is updated. Longer values will produce smoother changes with more input lag, and smaller values will produce more abrupt changes with less input lag.

MIDI Pitch Bend

The MIDI pitch bend input uses a MIDI pitch bend signal to modulate parameters for each of the entities that it is connected to via a modulator link.

MIDI Pitch Bend Properties:

Mode = The type of modulator being used. Each type has its own parameters and effects.

MIDI Channel = The MIDI channel on which continuous controller (CC) messages will be received by this modulator.

Sense = Click here to assign the MIDI channel and controller number by wiggling the input on the controller of your choice (knob, fader, pedal, etc).

Smoothing = How long it takes for the modulator's output value to change when it is updated. Longer values will produce smoother changes with more input lag, and smaller values will produce more abrupt changes with less input lag.

MIDI Velocity

The MIDI velocity input uses a MIDI velocity (on or off) signal to modulate parameters for each of the entities that it is connected to via a modulator link.

MIDI Velocity Properties:

Mode = The type of modulator being used. Each type has its own parameters and effects.

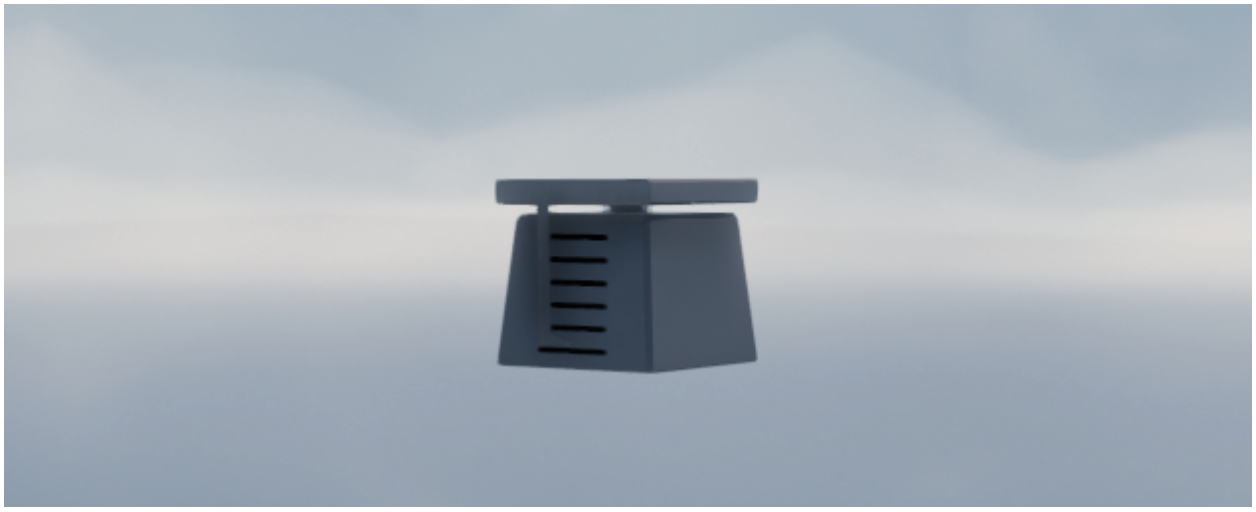
MIDI Channel = The MIDI channel on which continuous controller (CC) messages will be received by this modulator.

Velocity Phase = Controls whether this modulator will output the MIDI note ON velocity or note OFF velocity.

Sense = Click here to assign the MIDI channel and controller number by wiggling the input on the controller of your choice (knob, fader, pedal, etc).

Smoothing = How long it takes for the modulator's output value to change when it is updated. Longer values will produce smoother changes with more input lag, and smaller values will produce more abrupt changes with less input lag.

MIDI Poly Aftertouch



The Midi poly aftertouch input uses a MIDI aftertouch signal to modulate parameters for each of the entities that it is connected to via a modulator link.

MIDI Poly Aftertouch Properties:

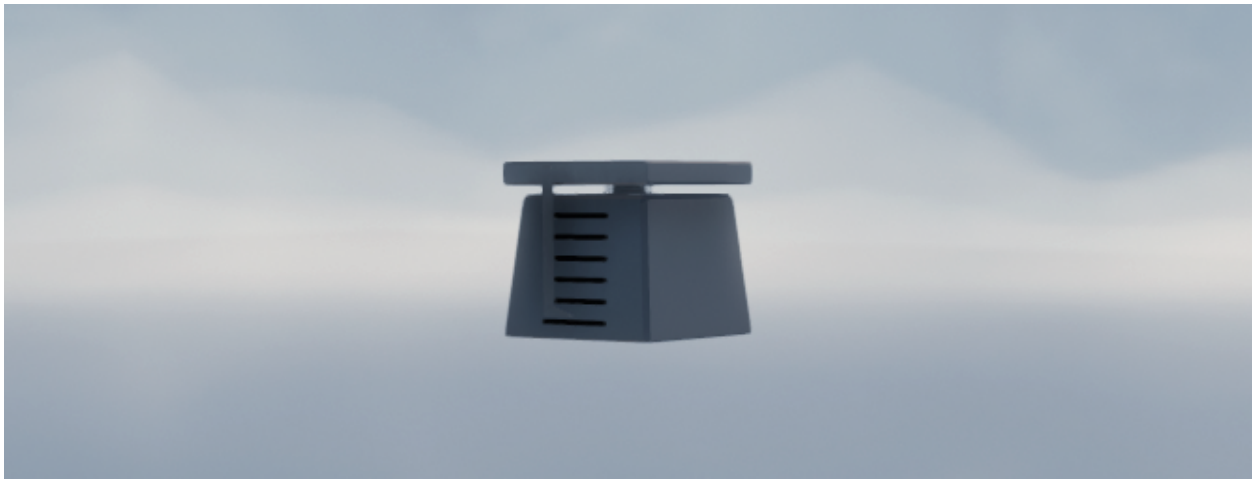
Mode = The type of modulator being used. Each type has its own parameters and effects.

MIDI Channel = The MIDI channel on which continuous controller (CC) messages will be received by this modulator.

Sense = Click here to assign the MIDI channel and controller number by wiggling the input on the controller of your choice (knob, fader, pedal, etc).

Smoothing = How long it takes for the modulator's output value to change when it is updated. Longer values will produce smoother changes with more input lag, and smaller values will produce more abrupt changes with less input lag.

MIDI Channel Pressure



The MIDI channel pressure input uses a MIDI channel pressure signal to modulate parameters for each of the entities that it is connected to via a modulator link.

MIDI Channel Pressure Properties:

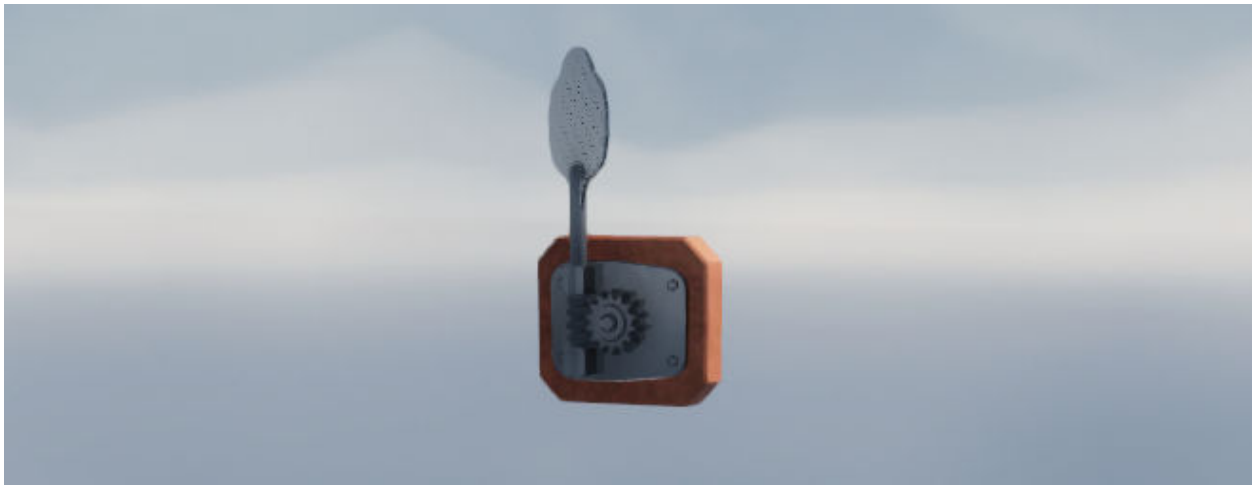
Mode = The type of modulator being used. Each type has its own parameters and effects.

MIDI Channel = The MIDI channel on which continuous controller (CC) messages will be received by this modulator.

Sense = Click here to assign the MIDI channel and controller number by wiggling the input on the controller of your choice (knob, fader, pedal, etc).

Smoothing = How long it takes for the modulator's output value to change when it is updated. Longer values will produce smoother changes with more input lag, and smaller values will produce more abrupt changes with less input lag.

MIDI Note Follower



The MIDI note follower converts the current MIDI note into a signal to modulate parameters for each of the entities that it is connected to via a modulator link. The signal it generates is unity for a configurable reference note, and doubles/halves for each octave up/down the note goes.

MIDI Note Follower Properties:

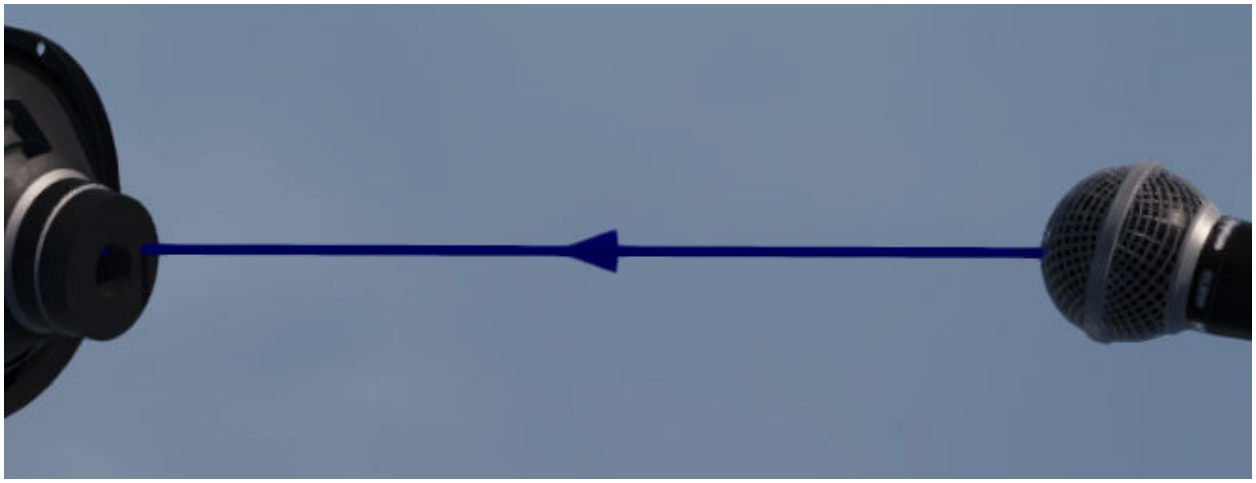
Mode = The type of modulator being used. Each type has its own parameters and effects.

Reference Note = The note follower will output zero when the reference note is pressed, negative values if the note is lower than the reference note, and positive values if the note is higher than the reference note. If you are using this note follower to control pitch, you may wish to set the reference note to the natural pitch that the system generates without modulation.

Sense = Click here to assign the MIDI channel and controller number by wiggling the input on the controller of your choice (knob, fader, pedal, etc).

Smoothing = How long it takes for the modulator's output value to change when it is updated. Longer values will produce smoother changes with more input lag, and smaller values will produce more abrupt changes with less input lag.

Delay Line



The delay line connects an audio input exciter or envelope follower to each of the mics from which it will receive an audio signal. They appear as blue lines with an arrow indicating the direction of audio signal flow. An audio input or envelope follower can be connected to many mics, and will sum the audio signal from all of them. The delay line link is used to configure the delay for each mic's audio signal.

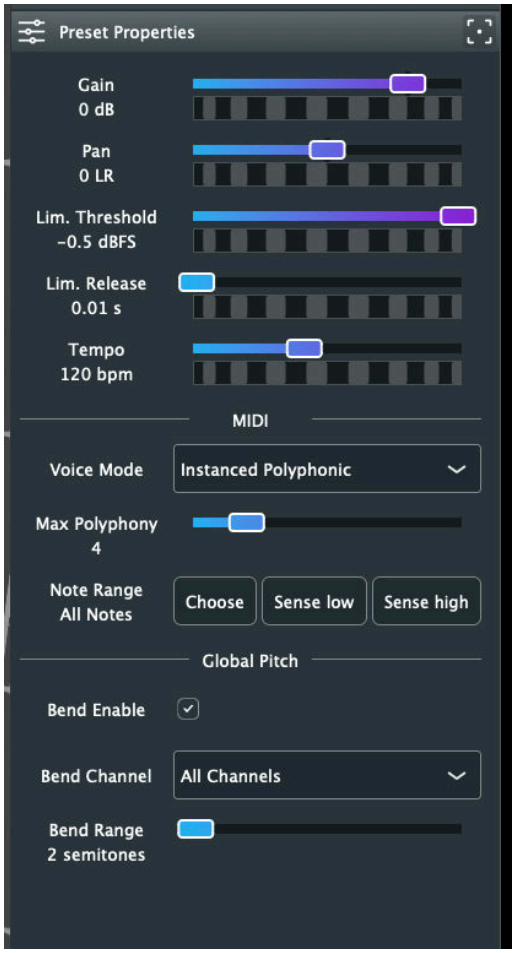
Delay lines can be quickly added by clicking on the audio input exciter, pressing the hotkey “C”, and then clicking the mic object to be connected.

Delay Line Properties:

Delay = The duration for which the audio signal picked up by the connected microphone will be delayed before being sent into the connected audio signal exciter. Note that the audio signal exciter itself has its own delay parameter, which is additive with this one.

6. Preset Properties

Every preset has a set of parameters that apply to the overall sound and function of the preset. These controls affect the overall volume, MIDI, and other master settings found in the Preset Properties section.



Gain = The amount of gain that will be applied to the master output signal

Pan = Negative values will pan the microphone to the left speaker while positive values with pan it towards the right channel. A value of zero will be balanced between left and right.

Dry/Wet = This controls the output mix between the completely dry input signal (value of 0) and the fully-processed wet signal (value of 1.) Note: It is only available with the AnukariEffect plugin.

Lim. Threshold = The signal threshold above which the master brickwall limiter will reduce gain.

Lim. Release = The duration over which the master brickwall limiter will drop gain reduction once the signal has dropped below the threshold.

Tempo = The tempo (in beats per minute) of the main beat clock, which is used for things like synced LFOs. If running in plugin mode, the tempo is set by the plugin host (DAW) instead.

MIDI Section

Voice Mode = The global MIDI control mode affects how Anukari responds to MIDI inputs.

In Singleton mode, you explicitly choose which MIDI note is mapped to each Exciter/Modulator, so if you want to play a scale, you need to design an instrument with an Exciter for each note. This mode requires the most work to create an instrument, but gives you total control.

In Instanced (Polyphonic) mode, the instrument you make is automatically instanced and mapped to all MIDI notes. The number of voice instances controls the maximum polyphony.

In MIDI Polyphonic Expression (MPE) mode, the instrument is set up for compatibility with MPE devices such as the Roli Seaboard or Linnstrument.

Max Polyphony = The number of distinct notes that can be played at one time before the least-recently-played note will be replaced by a new note. Larger values use more system resources and are more taxing on the GPU.

Note Range = This sets the lowest and highest MIDI notes that this instrument will respond to. This can be useful, for example, to prevent the instrument from responding to high notes that you have determined are likely to cause physics explosions.

Click the “Choose...” button to manually assign the note range for this preset using an on-screen piano keyboard. Click “Sense Low...” to assign the lowest note for this preset by pressing any note on your MIDI input device. Click “Sense High...” to assign the highest note for this preset by pressing any note on your MIDI input device.

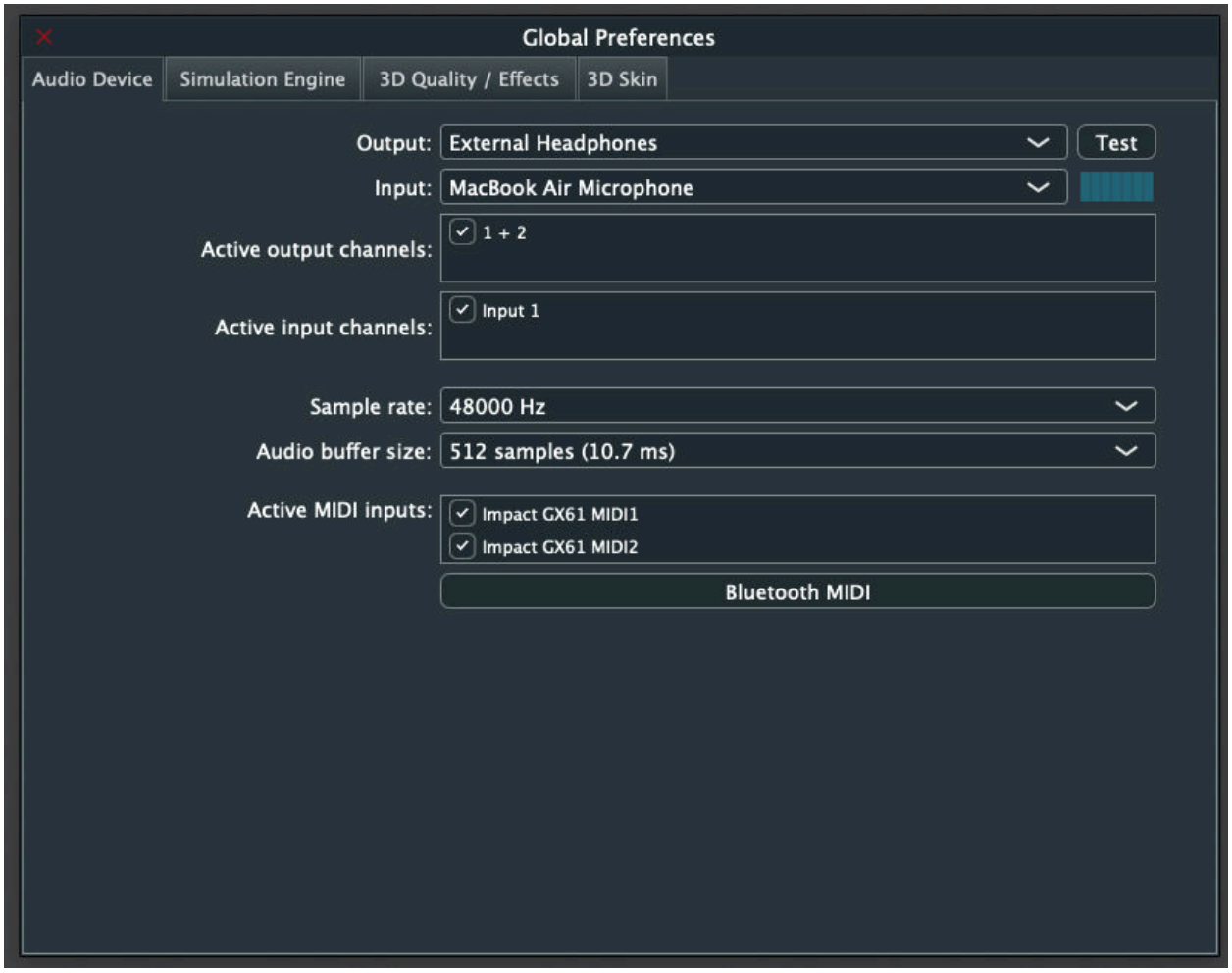
Global Pitch Section

Bend Enabled = Whether MIDI pitch bend messages should automatically be applied globally to the instrument. You may wish to disable this if you are using pitch bend as a modulation source and want full control.

Bend Channel = The MIDI channel on which to receive pitch bend messages.

Bend Range = The number of semitones (up and down) of pitch bend range for global MIDI pitch bend messages.

7. Global Preferences



The Global Preferences window contains various application settings that determine how Anukari works on your computer. It can be accessed by clicking on Options in the menu bar and selecting Preferences.

The settings are categorized into four tabs. First is the Audio Device tab with the following options. Note: this tab only appears for the standalone version of Anukari. The plugin version uses the audio device settings from its host DAW.

Output = This is the device that Anukari will use to output its sound.

Input = This is the device that Anukari will use for bringing input signal (like a microphone or guitar signal) into the app.

Active Output Channels = Some devices have multiple channels for outputting sound. Here a user can select the one(s) they wish to use with Anukari.

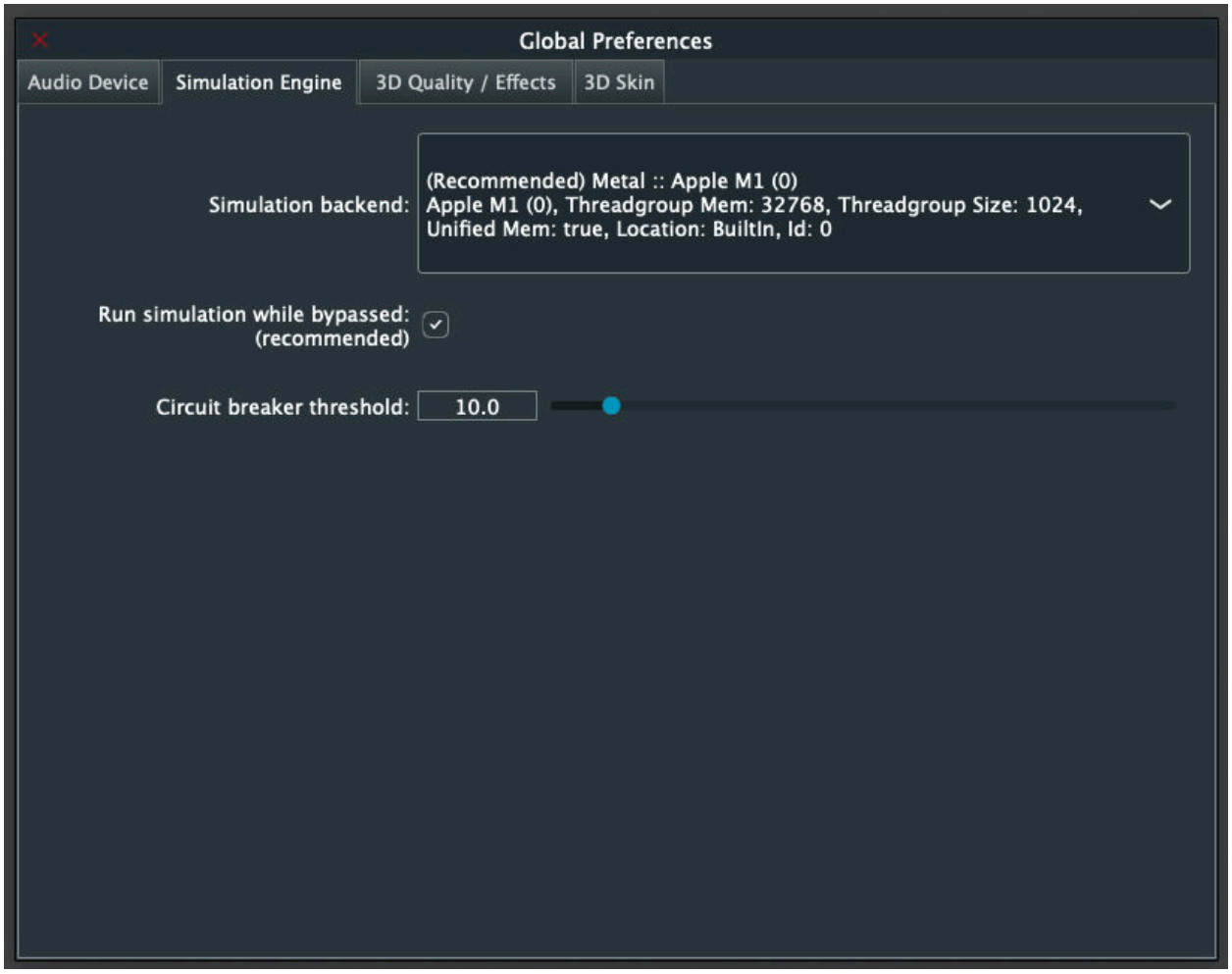
Active Input Channels = Some devices have multiple channels for inputting sound. Here a user can select the one(s) they wish to use with Anukari.

Sample Rate = This selects the digital sample rate that Anukari will use to generate sound.

Audio Buffer Size = To reduce input/output latency, the buffer size should be reduced to as low as possible. However, lower buffer settings will increase your computer's workload. It is best to find a balance between the two which will vary from computer to computer. For more info, see the section on "Plugin Performance."

Active MIDI Inputs = These are the MIDI devices that can be used with Anukari. Checking the device will enable it for use within Anukari.

Bluetooth MIDI = This will allow Anukari to scan for any MIDI devices that are bluetooth enabled.

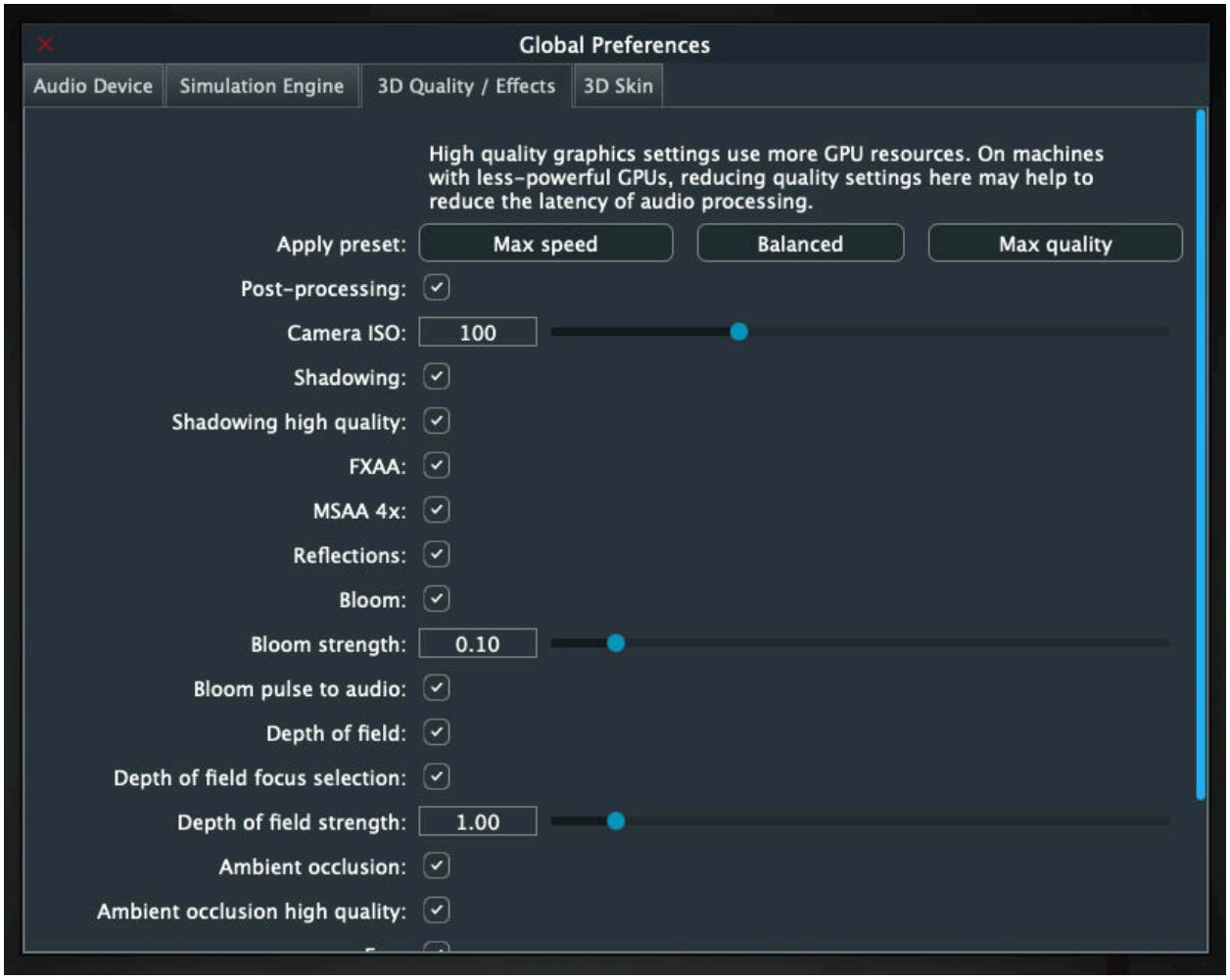


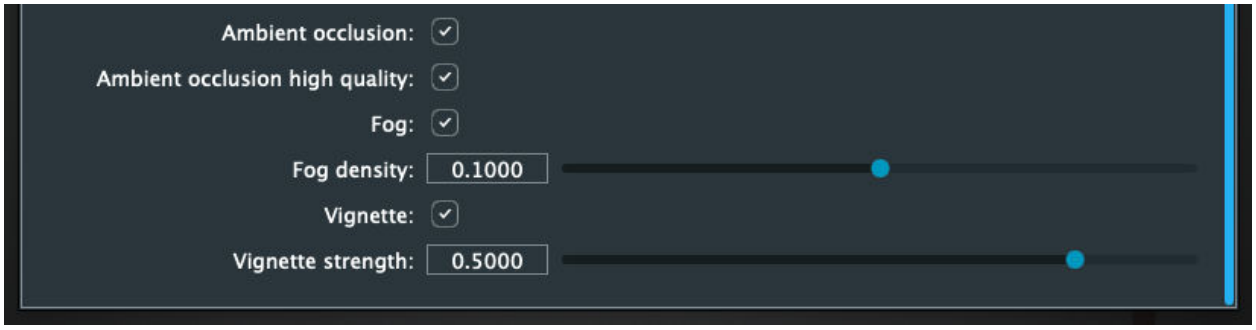
The next tab is labeled Simulation Engine and it offers options related to how Anukari renders its 3D environment, the objects within it, and how they interact according to Anukari's physics modeling.

Simulation Backend = Selects the GPU backend to use for processing the physics simulation. The recommended backend should be automatically selected. This should only need to be changed for advanced use cases, such as on machines with multiple GPUs. Other than that it's best to use the recommended backend.

Run simulation while bypassed (recommended): = Some DAWs will bypass plugins automatically to save CPU, such as when the track for an effect plugin is not being played, or when an instrument has not received a MIDI event in a while. When this option is enabled, Anukari will continue the physics simulation even when bypassed. It is strongly recommended that this option is left ON. When this option is off, Anukari's physics will not function correctly while bypassed, and there may be clicks/pops when the DAW removes the automatic bypass.

Circuit Breaker Threshold = The circuit breaker pauses playback when RMS loudness exceeds this level. Lower values make it more sensitive. Recommended level is 10.0. For more info, see the section on circuit breaker.





The settings in this tab will determine the quality of the virtual 3D space and objects within it.

Apply Preset = Click one of these preset buttons to automatically choose settings for speed vs. performance. This will overwrite any settings you've chosen manually below.

Post-Processing = Post-processing enables color correction and is also required for some of the other effects configured below.

Camera ISO = The light-sensitivity level for the camera. Higher numbers will make the scene brighter. An ISO of 100 is a good default.

Shadowing = Shadows add realism at moderate rendering cost.

Shadowing High Quality = High-quality shadows look better but have high rendering cost.

FXAA = Fast approximate anti-aliasing: reduces jagged pixel edges with small rendering cost and some blurring.

MSAA 4x = Multisample anti-aliasing: accurately reduces jagged pixel edges with high rendering cost.

Reflections = Reflection allows shiny objects to reflect nearby objects instead of just the skybox, at high rendering cost.

Bloom = Bloom adds blurry spots and lens flare when a bright spot is visible, at moderate rendering cost.

Bloom Strength = Adjust how strong the bloom effect is.

Bloom Pulse to Audio = Pulse the bloom strength based on the master audio output level.

Depth of Field = Depth of field makes objects that the camera is not focused on blurry, at high rendering cost.

Depth of Field Focus Selection = Focus the camera's depth of field effect on the currently selected objects. Disable this to choose a static focus distance.

Depth of Field Distance = The distance from the camera at which the focus is set. Objects at this distance will be sharp, and objects nearer/further will be progressively more blurry.

Depth of Field Strength = Adjusts the strength of the depth of field blur effect.

Ambient Occlusion = Ambient occlusion shades objects more realistically at a small rendering cost.

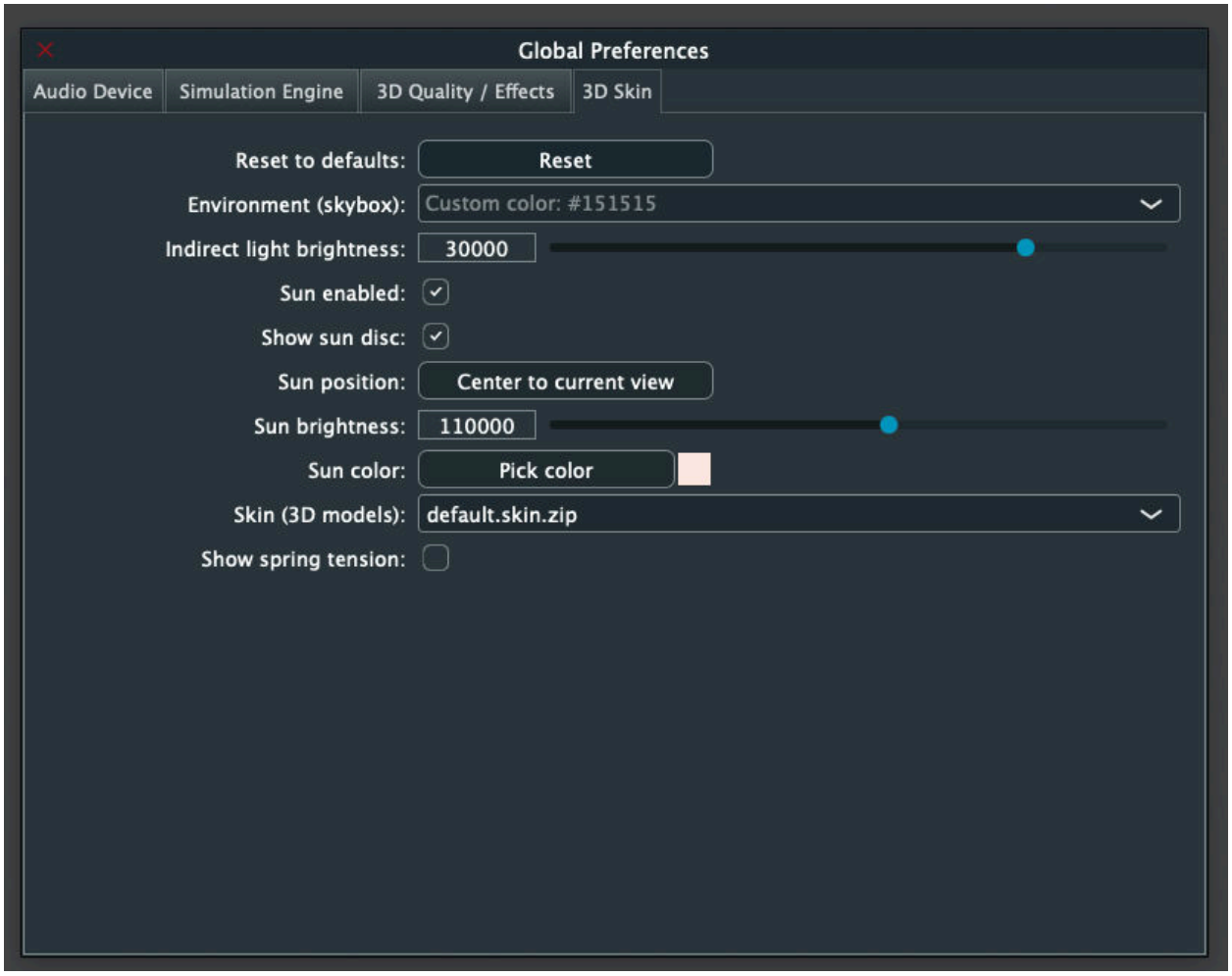
Ambient Occlusion High Quality = High-quality ambient occlusion looks better at high rendering cost.

Fog = Enables a simple but fairly unrealistic fog model with small rendering cost.

Fog Density = Adjusts how dense the fog is.

Vignette = Enables a darkening of the corners of the screen for a vignette effect.

Vignette Strength = Adjusts how much of the screen the vignette effect covers.



With these settings, a user can customize the look of Anukari's graphical interface.

Reset To Defaults = Resets the settings below to their factory default values.

Environment (Skybox) = Changes the appearance of the environment, including the skybox and ambient lighting.

Indirect Light Brightness = Adjusts the intensity of the environment's indirect lighting (in lux). A value of 30,000 would be typical for a daytime outdoor scene.

Sun Enabled = Whether sunlight is enabled. If this is off, the instrument will only be lit via indirect environmental lighting.

Show Sun Disc = Whether a representation of the sun's disc should be visually rendered in the sky. Light from the sun is emitted regardless of this setting.

Sun Position = Change the position of the sun's visible disc (and its light directon) to the center of the current 3D camera view.

Sun Brightness = Adjusts the intensity of the sun (in lux). A value of 110,000 would be typical for a daytime outdoor scene.

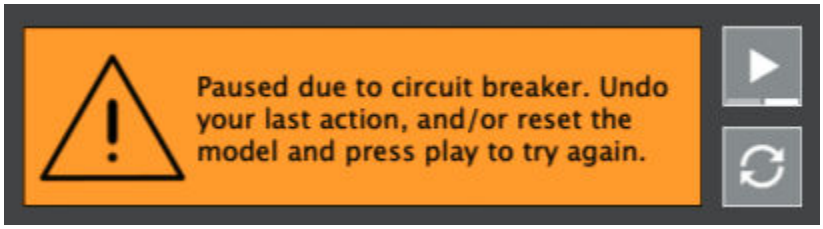
Sun Color = Choose the color of the light emitted by the sun as well as its visible disc.

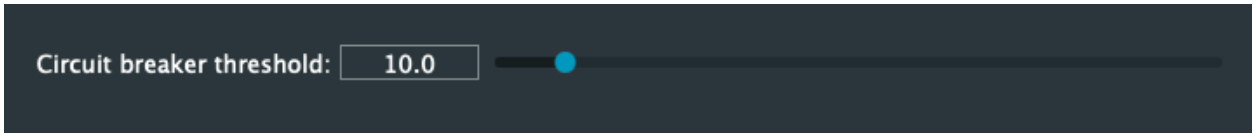
Skin (3D models) = Changes the appearance of the physics objects, such as the 3D models for the bodies, springs, mallets, etc.

Show Spring Tension = Whether springs should be colored red when under tension (stretched) and green when under compression (squished).

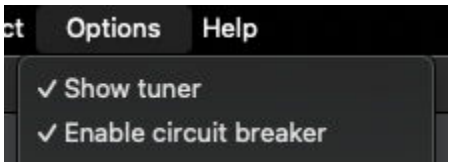
8. Other Features

Circuit Breaker





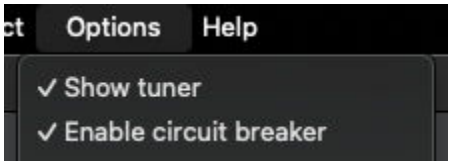
The circuit breaker is a type of failsafe mechanism that is built into Anukari to prevent a “flood” of volume from escaping the app (and into the user’s speakers and/or ears.) It will automatically pause playback of Anukari’s simulation engine whenever RMS loudness exceeds the level set by the Circuit Breaker Threshold setting in Global Preferences. Lower values make it more sensitive and therefore will trigger the failsafe more often. The recommended level is 10.0.



The circuit breaker can be enabled and disabled via the “Enable Circuit Breaker” setting located within the Options section of the menu bar.

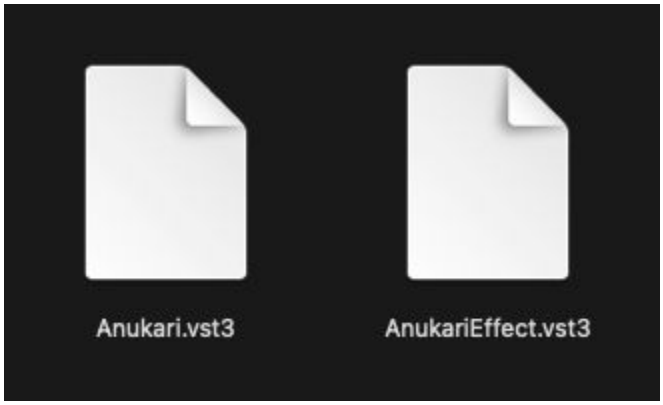
Tuner

This is the tuner for Anukari. It registers pitch for any audio that plays from the app. It is used for tuning preset objects and/or systems to specific notes.



To show the tuner on the main window, enable the “Show Tuner” setting located within the Options section of the menu bar.

Anukari vs. AnukariEffect



Anukari is not only capable of generating audio as an instrument, it is also able to process external audio signals through its systems of objects. In this way, Anukari can be used as an effects plugin. It is important to note that each use of Anukari has its own plugin version.

The plugin labeled “Anukari” is used as an instrument plugin.

The plugin labeled “AnukariEffect” is used as an effects plugin.

Plugin Performance

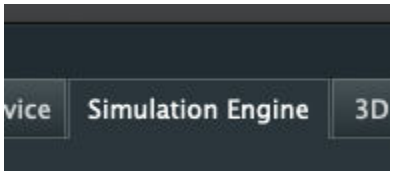
Due to its use of GPU and other resources, Anukari's performance can vary from computer to computer. To better configure the application for a particular system, a user can adjust certain settings found in the Global Preferences window.

Audio Buffer Size

This setting is located under the Audio Device tab. It controls the size of the audio buffer used to process digital audio. Think of the audio buffer as a bucket that needs to be filled before any sound can be heard. If the bucket is small, then sounds can be heard more immediately as it occurs because the latency time it takes to process the digital audio is shorter. The downside is that it will increase the workload on your computer. A smaller bucket fills faster, but it requires more trips to the well which means more work.

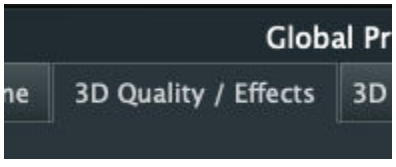
With higher buffer sizes, the bucket will be bigger and it will take less trips to the well. However, this also means that it will take longer to fill the bucket so some latency issues can occur. Finding a balance is key. The buffer size should be as low as possible, but not so much that it overworks the computer and causes unwanted noise.

Simulation Engine



This tab contains settings related to how Anukari runs its physics modeling features. How the simulation engine runs greatly affects performance. For more info on each option, see the section on "Global Preferences."

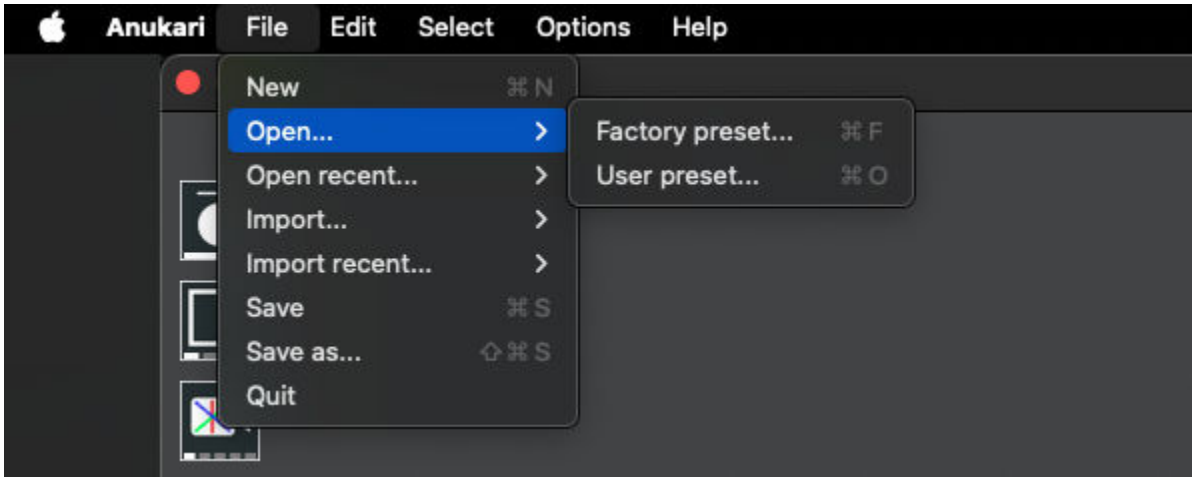
3D Quality / Effects



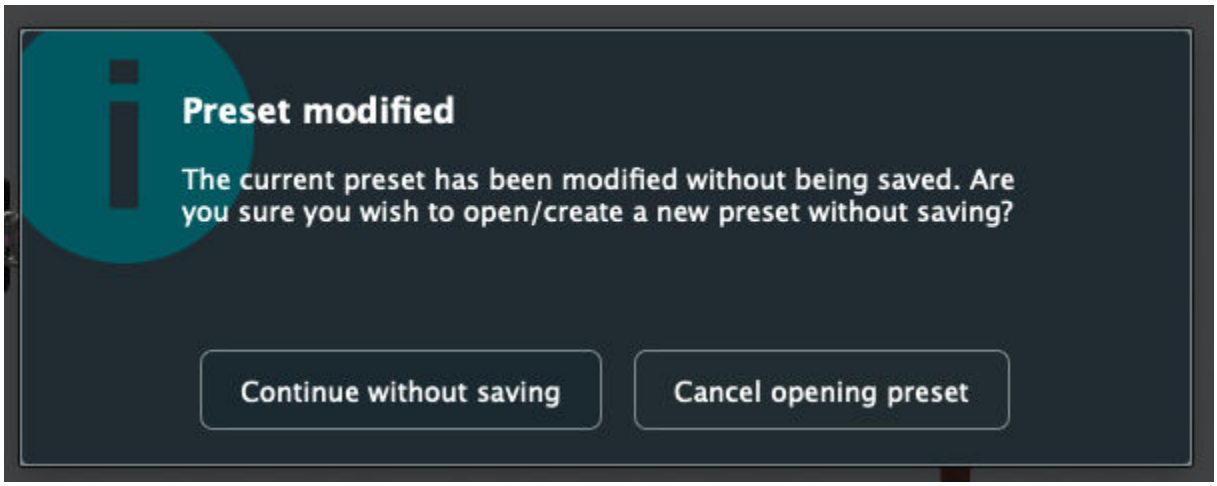
The settings in this tab control how Anukari displays the graphical content of its 3D space. This includes objects, textures, lighting and other elements that configure its GPU usage. Enabling these options will increase the computer's workload. For more info on each option, see the section on "Global Preferences."

9. Basic Operations

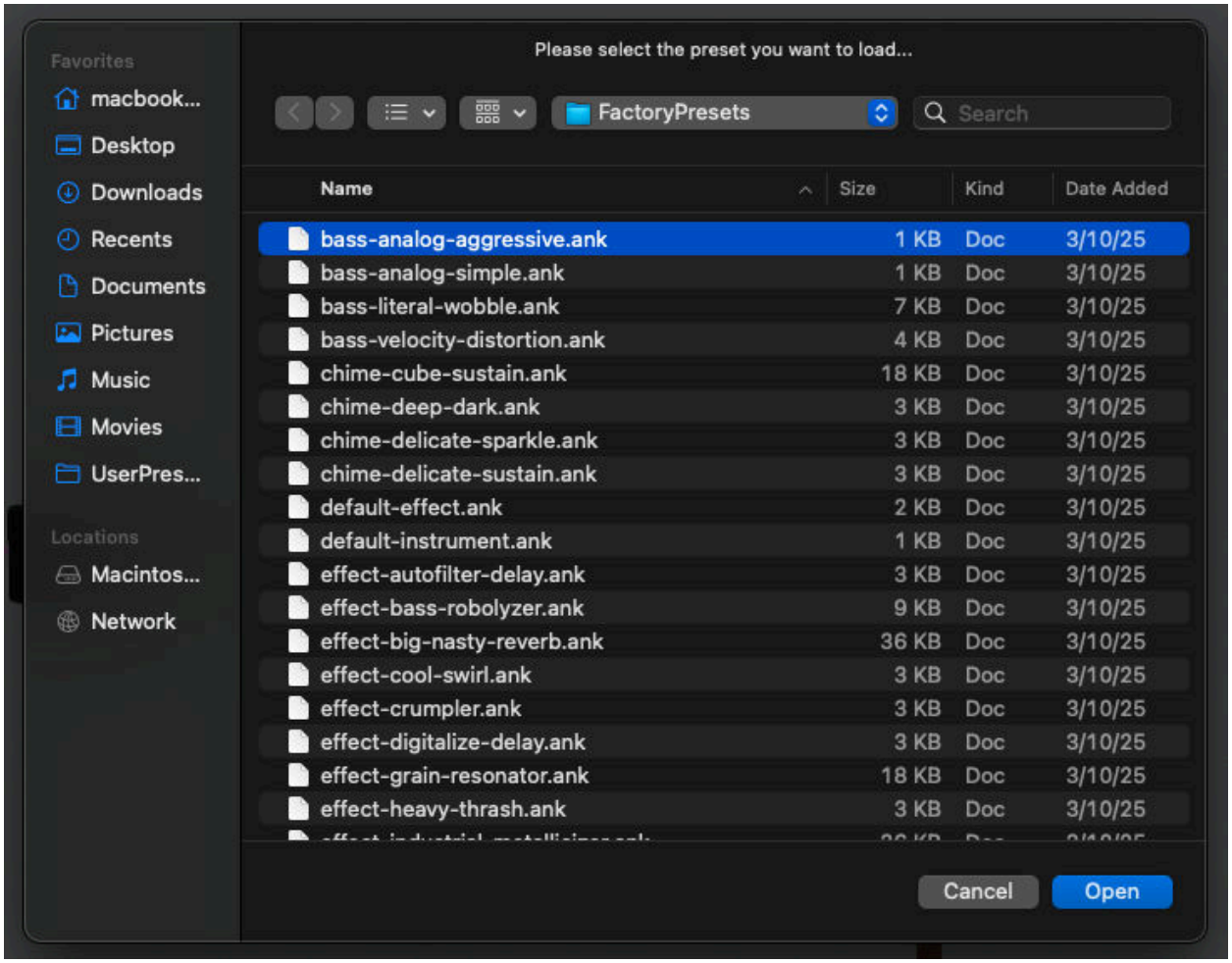
Opening a preset



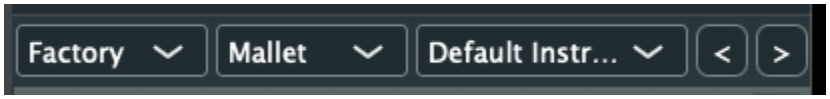
To open a preset in Anukari, click on “File” in the menu bar, select “Open...” and choose either “Factory Preset...” or “User Preset...” Factory presets are ones that are included with Anukari while user presets are ones created or added by the user.



If there is an unsaved preset currently open, Anukari will ask if you wish to continue without saving or cancel opening the preset. Choosing to continue without saving will load a new preset, but discard any changes made to the previous preset. Choosing to cancel opening a new preset will return the user to the current unsaved preset.

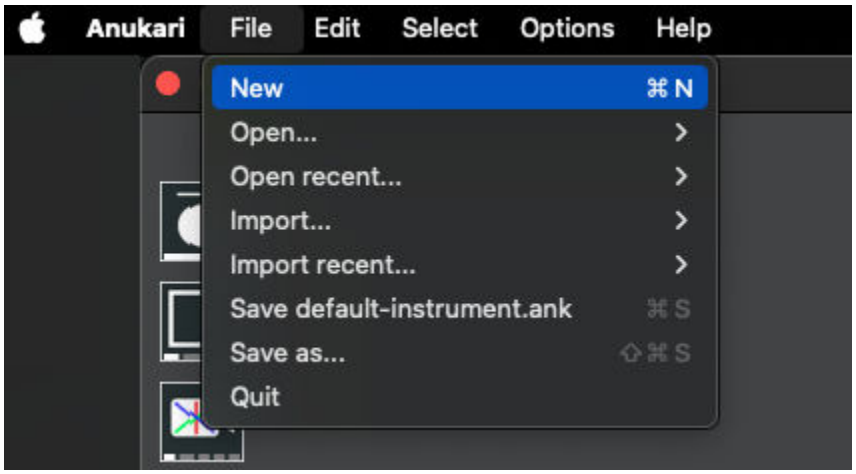


If the user chooses to continue without saving, a file selection window will open where a new preset can be selected for loading.



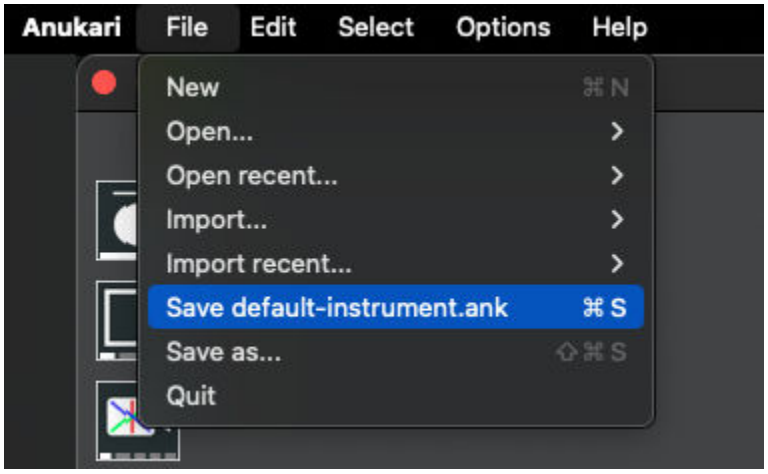
Presets can also be quickly loaded and switched via the Preset Selector. There are drop-down menus to choose different collections (factory, user, etc), categories, and preset files to load. The “<” and “>” buttons (previous and next) will instantly cycle through the preset files within the selected category.

Creating a new preset

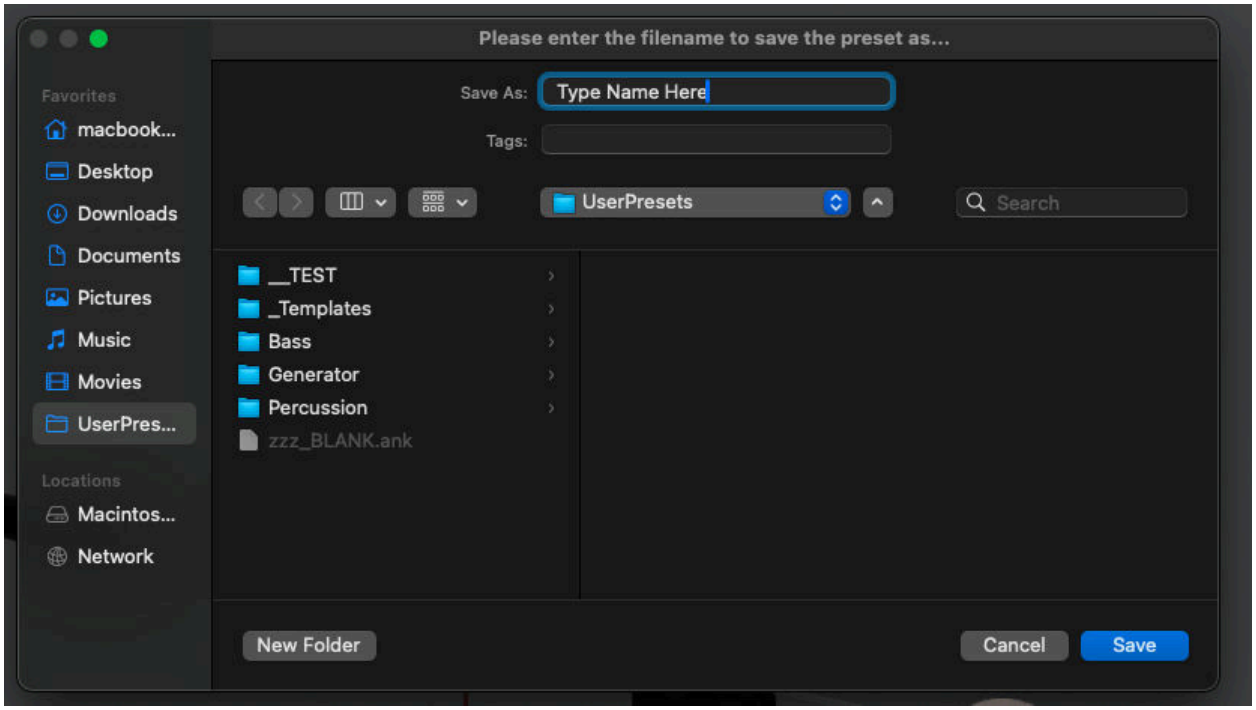


To create a new preset, start by clicking “File” on the menu bar and selecting “New”. This will load a preset called “default-instrument.ank”. From here, a user may edit the objects and their settings, add new objects, or make any other changes they wish.

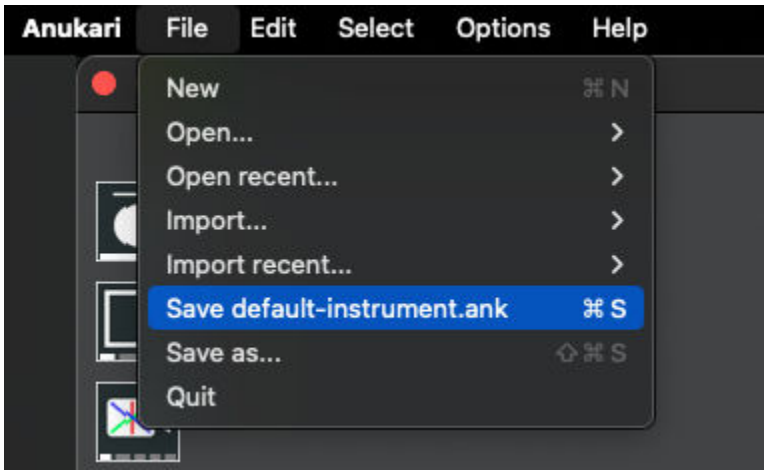
Saving a preset



To save a preset, click “File” on the menu bar and select “Save as...”



This will open a file saving window where a filename can be added.

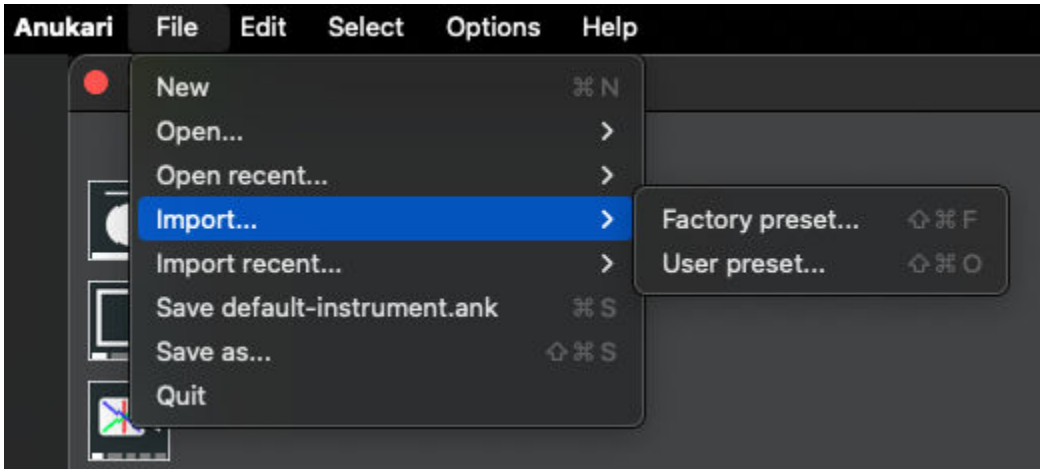


If the preset already exists and a user is saving changes to the preset, an option will appear that is labeled “Save [name of preset file].ank”. Clicking this option will save the current changes to that same preset file.

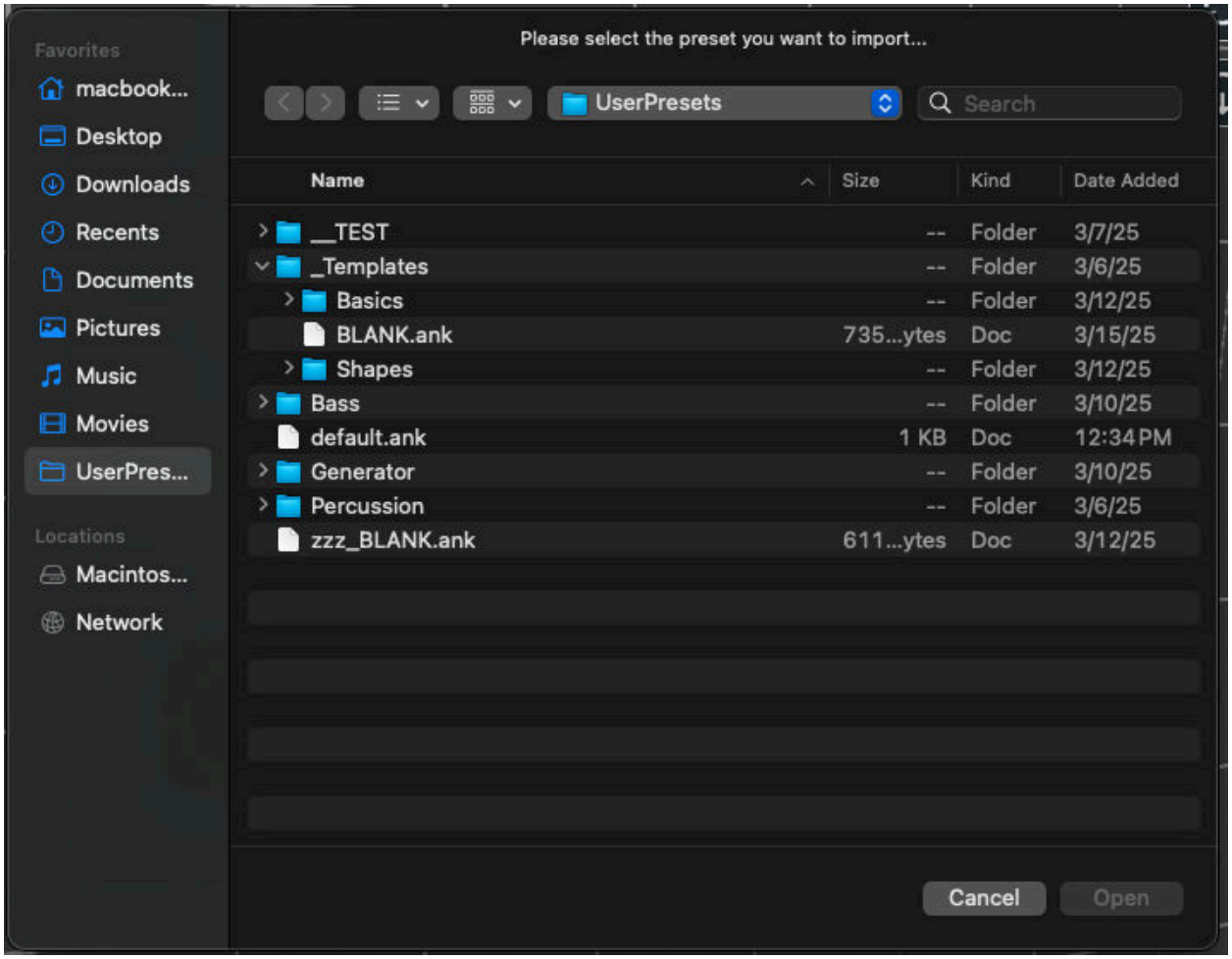
Note: The file “default-instrument.ank” is a system preset which cannot be saved so selecting either “Save default-instrument.ank” or “Save as...” will both open a file saving window where a new filename can be typed.

If the user attempts to quit Anukar without saving the current preset, a prompt will appear asking if the user wants to continue. Clicking “Exit Without Saving” will close Anukari and any unsaved preset changes will be lost. Clicking “Don’t Exit” will return the user to the main Anukari window.

Importing an existing preset



Anukari allows a user to add the objects and settings from one preset into another by importing preset files. To do this, first click “File” on the menu bar, select “Import...” and then choose either “Factory Presets...” or “User Presets...” Factory presets are ones that are included with Anukari while user presets are ones created or added by the user.



Once one of these menu options is clicked, a file selection window will open and allow the user to choose which preset file they wish to import.

The new objects from the imported preset file will be added to the current preset and the user may adjust or reconfigure them as needed.

Saving a preset file from here will include all objects and settings that are present in the current preset.

10. Help & Resources

Jumping into a new tool such as this one can be overwhelming so many helpful resources have been provided to aid the user. Anukari includes informational video clips for all of its major features that can be accessed directly from the app (click Help from the menu bar and select View Tutorials.) Seeing these features in action will help the user in implementing them within their own presets. Other resources are available through the official Anukari Youtube channel as well as our website Anukari.com. New updates and additional information are added regularly. Check the links in the Online Resources section to sign-up for future notifications.

Online Resources

Company website = https://anukari.com

YouTube Channel = https://www.youtube.com/@anukarimusic

Discord = https://discord.gg/9c6GmgKp

X.com = https://x.com/anukarimusic

Thank You

We want to again thank you for adding Anukari to your audio toolset. Crafting this app was truly a labor of love and we look forward to hearing all the amazing new sounds that our user community will create with it. May Anukari help make all of your artistic visions come to life.