

# SONIFICATION TOOLS

MANUAL + USER GUIDE

# Sonification Tools

## Obligatory Legal Stuff

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# Sonification Tools

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## Important Info

These devices require Live 12 or Live 12 Suite with Max for Live installed; we strongly recommend Live 12.2 or higher with Max 9.0.5 or higher.

Please note Data MIDI and Data Mod are MIDI effects, which means they must be placed prior to instruments on MIDI tracks.

Dataforge, Photomat, and Typewriter are MIDI Tool Generators, and can only be accessed via the MIDI Tool Generator selector; they cannot be dropped onto MIDI tracks directly.

**If you are using a Windows operating system, you will need to install the free VIDDLL library in order to take advantage of the Image and Video device modes.**

It should only take a couple minutes, and there is no account required to do so. Please simply follow the instructions linked here:

**<https://manifest.audio/install-viddll>**

# Sonification Tools

## Installation Instructions

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To install Sonification Tools, first double-click to decompress the ZIP archive it arrived in. Presumably you've already done this, because you're reading the manual, also included in said ZIP — good job!

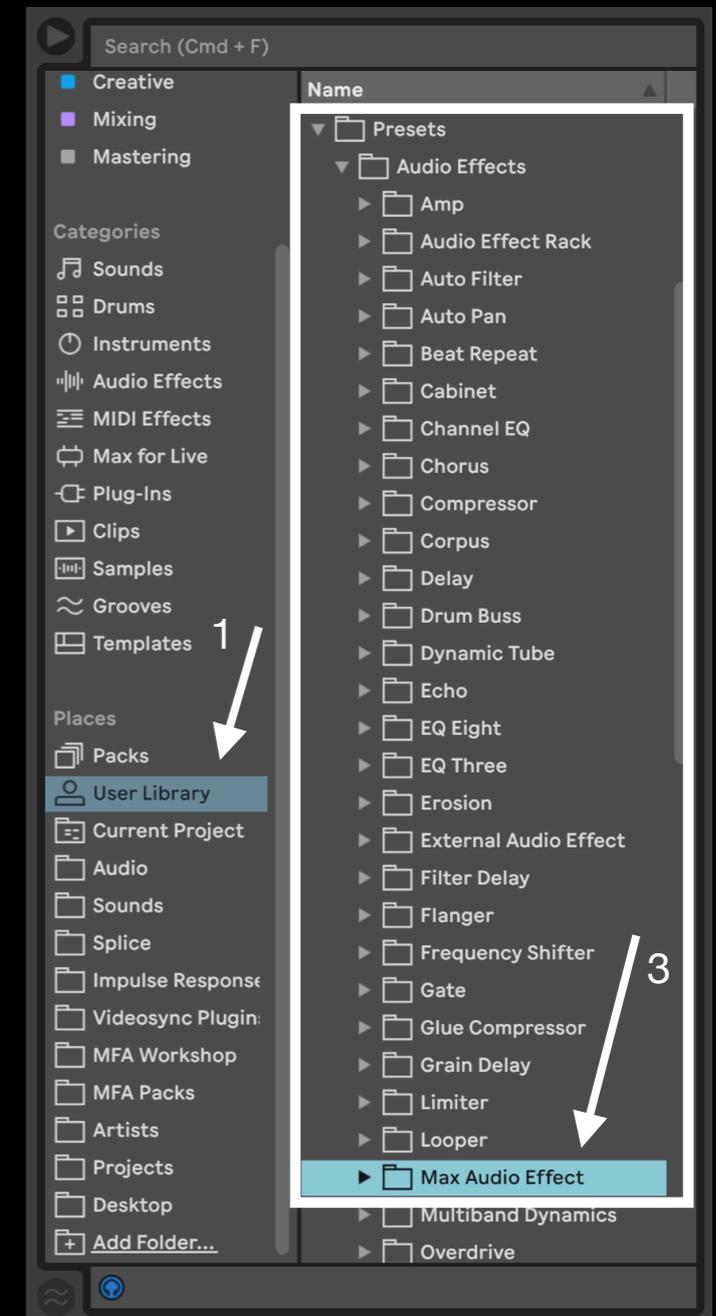
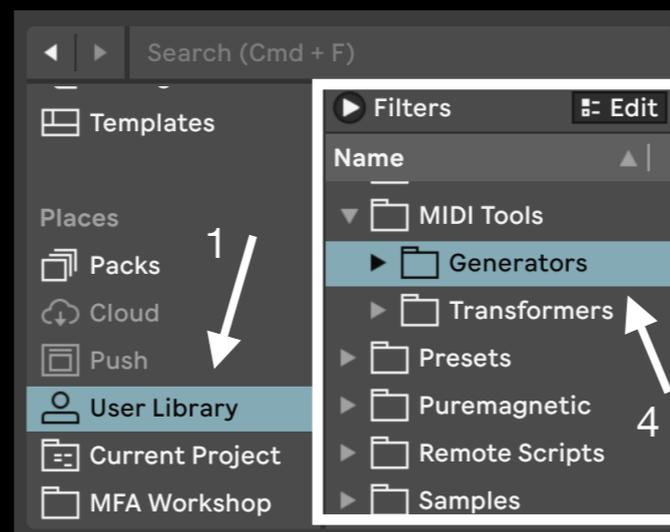
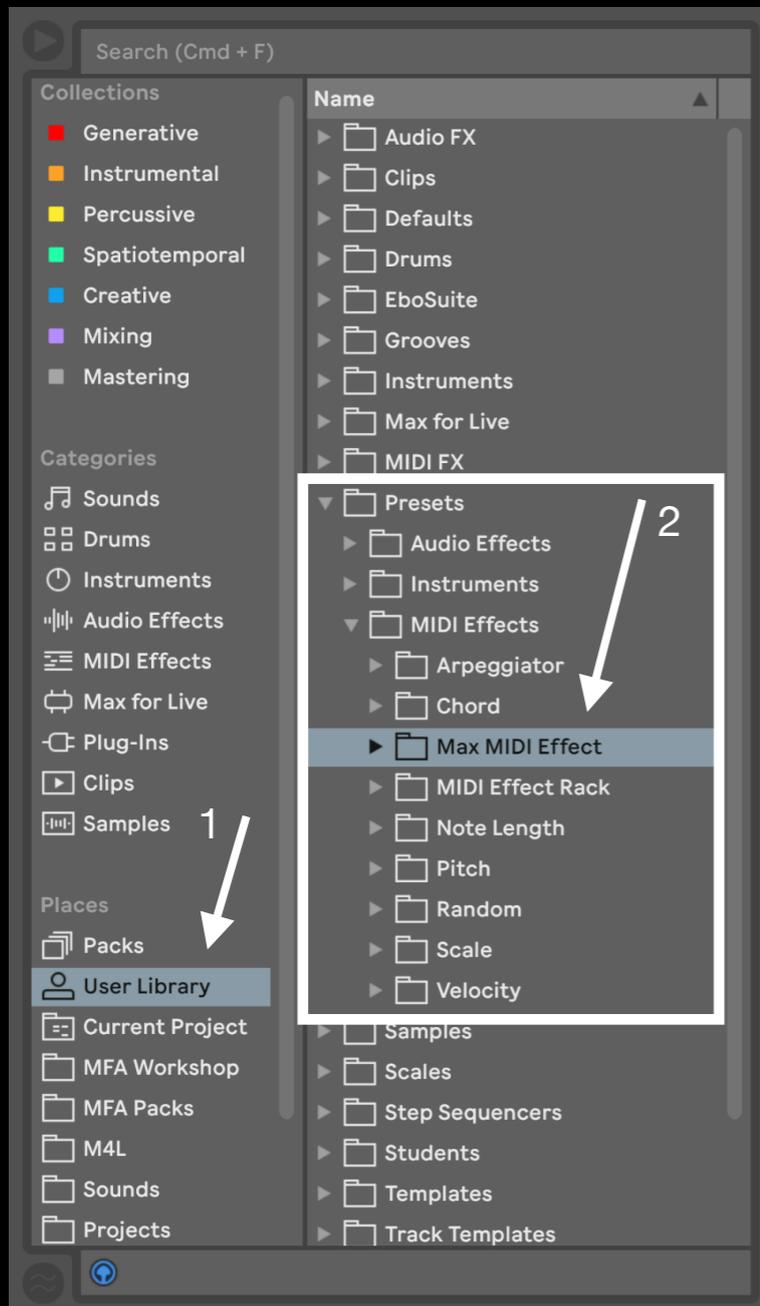
From Finder (macOS) or Explorer (Windows), drag the Data MIDI and Data Mod from the Sonification Tools MIDI Effects folder to the User Library in the Places section of Live's Browser (Arrow 1 pictured left). This will copy the required files to your User Library.

We recommend dragging them into the Max MIDI Effect subfolder of the User Library MIDI Effects folder (Arrow 2 pictured left). You should drag Data FX from the Sonification Tools Audio Effects folder to the Max Audio Effect subfolder of the User Library Audio Effects folder (Arrow 3 pictured right).

Data Synth should ideally be placed in the Max Instruments subfolder of the Instruments folder located in Presets as well.

The Dataforge and Typewriter MIDI Tools should go in the Generators subfolder of the MIDI Tools folder, located at the top level of the User Library, pictured below (Arrow 4); if these folders don't appear, simply create them yourself.

Once installed, we might humbly suggest adding it to an appropriate Browser Collection, if applicable.



# Sonification Tools

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## Overview

A collection of powerful creative devices, Sonification Tools allow you to access new musical ideas via data, text, images, video, and even real-time data feeds via OSC.

Just manually type or simply copy and paste any string of numbers in Data mode, use natural language in Text mode, or drag and drop JPG, PNG, or TIFF images in Image mode on all four devices to generate corresponding MIDI patterns with Data MIDI, modulation sequences with Data Mod, spectral filtration, wavefolding distortion, impulse convolution or even exported audio waveforms with Data FX — or unique synthesis oscillators with Data Synth.

With Data MIDI or Data Mod, you can select and loop your input data, with the lowest data value automatically corresponding to your lowest allowed output, and the highest data automatically corresponding to your specified upper output limit. Data MIDI and Data Mod also allow you to trigger data at any multiplied metrical base rate, with optional cycle reset as well as Euclidean sequencing for a wide variety of rhythmic patterns, with offset delay and swing further enhancing note timing. You can also trigger data at a millisecond rate — or via arbitrary MIDI pattern input. Data MIDI and Data Mod can also harness video files, real-time camera or desktop feeds, a visual noise generator, and raw OSC data.

A variety of trigger modes allow you to engage with Data MIDI's output in a variety of ways, all of which can be constrained via 69 scales in any key, set locally, via Live 12, or via the included Global Hub utility. Better yet, you can expand or contract the range of note pitch, velocity, or length output in real time to dynamically express your selected data source in highly musical ways.

Adding one last twist, data can also be randomized to easily generate a wide variety of patterns and tones from scratch. Data MIDI and Data Mod can also be Gated to only produce MIDI above or below a certain threshold for more rhythmically complex output. And with Live 12, you can use our MIDI Tool Generators Dataforge to sonify data, Photomat to sonify images, or Typewriter to sonify text directly in your MIDI clips, with the bulk of Data MIDI's controls on offer.

Whether you type or copy personally meaningful data or images, or research and source data sets available online or elsewhere, Sonification Tools allow you to embed real-world phenomena in your creative process — and express those phenomena as uniquely as you wish, giving them a voice through your music and inspiring new approaches along the way.

# Sonification Tools

## Gathering & Preparing Data

If you plan to engage in traditional sonification — that is, exposing data to our senses via sound — the first step will be to find high quality data. There are a wide range of sites available to explore a variety of data sets for free, from **sports** to **finance** to more **incisive academic data of all kinds**.

Websites such as **Our World In Data** allow you to use their data freely under a creative commons license — so long as you attribute the website and authors in your credits. However, different data sets will have different licenses, some of which may be more strict — so be sure to check that you have permission to use a data set (or image, or video) before committing to it.

Once you have your data set downloaded, **data preparation** is the next step to ensure a smooth sonification experience. Once you have a good data set downloaded as XLSX or CSV, you'll want to open it in a **spreadsheet editor** so you can copy and paste it into our device in Live. Certain data sets may contain nonsensical values that should be purged before sonification usage.

Data can be copied from any text, CSV, or Excel file to embody a data string of numbers as change over time. Integer or floating point number values need only be separated by a single space for the device to ingest them. Make sure only the actual data you wish to use has been pasted in. Be sure also not to include, for example, an index column that simply counts up from 1 alongside the desired data, as this will skew the results rather drastically. Please ensure only numeric characters are pasted into the Data field in data mode.

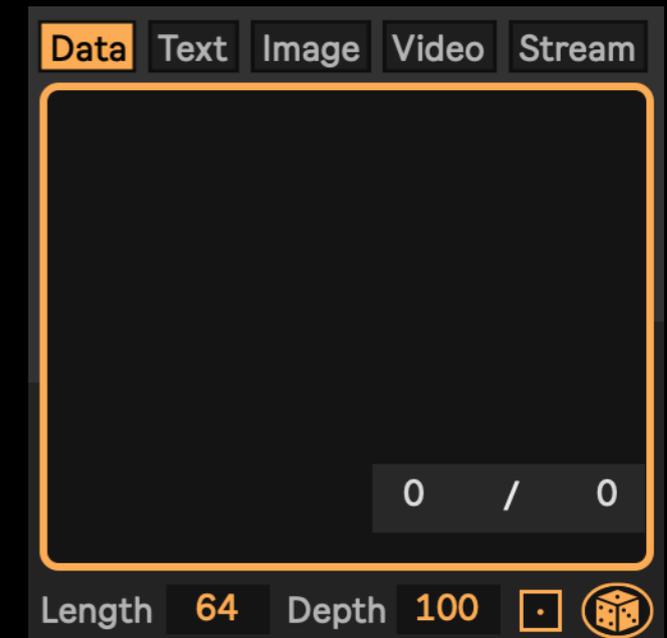
Numbers should be separated by a space and/or line break (enter); commas or semicolons may cause problems and should be avoided — but don't worry: data copied from a CSV or other spreadsheet will be entered correctly as space-separated here. Finally, you must ensure float values are denoted correctly with a period (".") symbol — not a comma (","), as is sometimes the case in European spreadsheets.

# Data Modes

## Data Mode

Data FX · Data MIDI · Data Mod · Data Synth · Dataforge

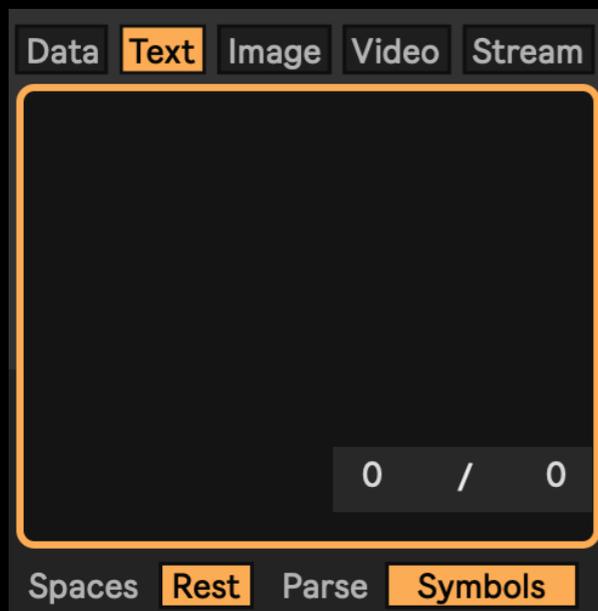
In Data mode, you can click to place the cursor and manually type or paste copied numerical data; be sure to hit the Enter key for the data to be ingested. At bottom we have our randomization settings. You can set the length of the randomized string, the depth of randomized values, and whether randomized values will be expressed as integers, or floating point values with up to two decimal places. Data MIDI, Data Mod, and Dataforge accept and generate up to 2048 discrete data points; Data FX 512, and Data Synth 256.



## Text Mode

Data FX · Data MIDI · Data Mod · Data Synth · Typewriter

In Text mode, natural language can be copied and pasted or manually typed in. The resulting phrases are converted to ASCII values which are then interpreted, scaled, and remapped numerically like any other form of data. You can choose whether space symbols are used as rests, or ignored by toggling to skip mode. You can also change whether individual characters are each assigned an output value in the default symbols mode, or whether words are summed and parsed as discrete units of data instead.



# Data Modes

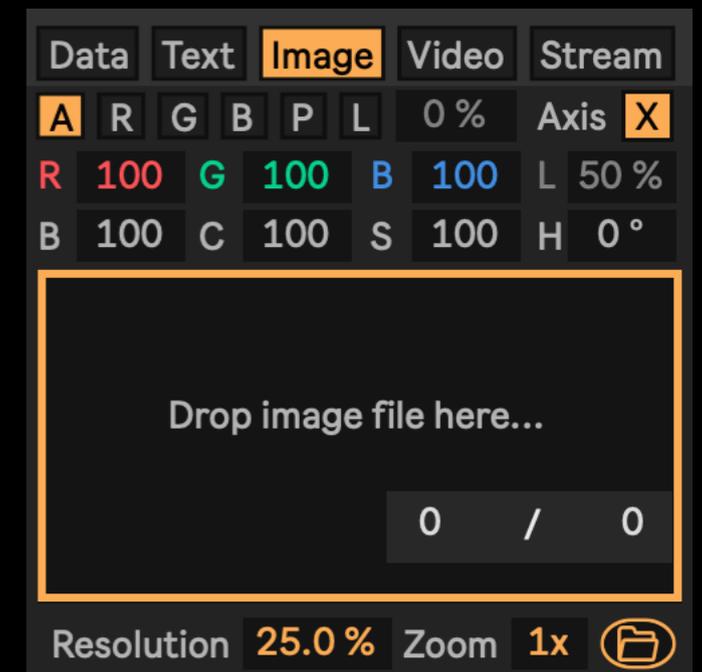
## Image Mode

Data FX · Data MIDI · Data Mod · Data Synth · Photomat

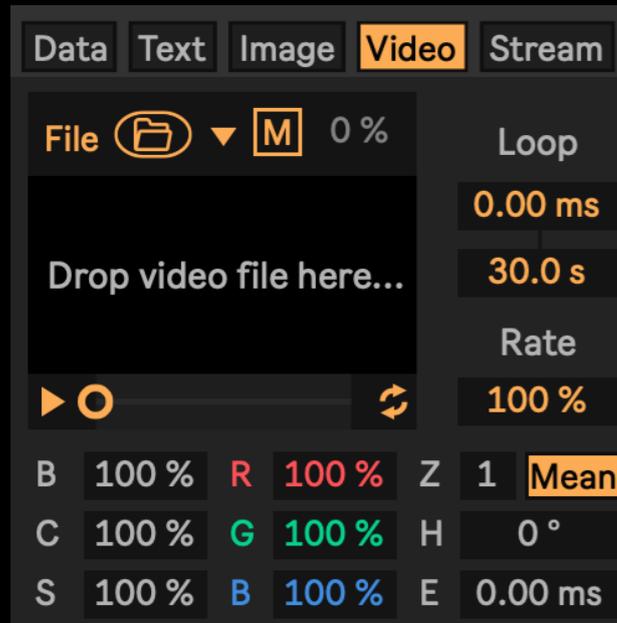
Image mode averages pixel data from rows or columns to generate usable data. The view differs slightly from one device to the next, but offer many of the same features. Drag and drop a JPG, PNG, or TIFF file — or select one via the file chooser icon. Then on Data MIDI or Data Mod, adjust the resolution: lower resolutions can yield more interesting musical patterns as they tend toward higher variance between one pixel column or row and the next.

Then, choose your channel: A for an average of all three colors, R, G, or B, and L for black and white luminance mode, in which you can adjust a threshold. Otherwise, explore color amount sliders along with brightness, contrast, saturation, and hue rotation to modify the image and resulting output. With zoom higher than 1, click and drag on the viewer to select the focus area.

On Data MIDI or Data Mod, select the default X axis to scan horizontally between vertical pixel columns, or switch to the Y axis to scan vertically between horizontal pixel rows; in either case you can use the play direction control to determine the scroll direction: forward, reverse, elliptical or random. Data MIDI also features a polyphonic mode to output three separate notes for each color value, with optional spread.



# Data Modes



## Video Mode

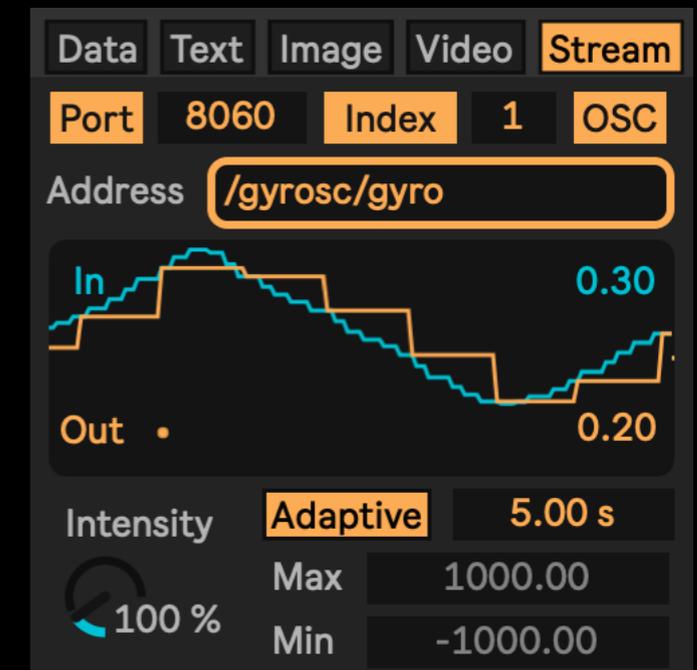
Data MIDI · Data Mod

Use video File mode to drag and drop or navigate to MP4 or MOV files which can be parsed in terms of current mean value or tracking mode. The video can be looped in various modes with optional easing, zoom, and rate control. With zoom higher than one, click and drag on the viewer to change the focus area. Explore color amount sliders along with brightness, contrast, saturation, and hue rotation to modify the image and resulting output. Click the File menu and switch to Camera mode to use real-time camera input, Desktop to take your real-time computer desktop as the input feed, or try Noise for a rudimentary visual noise generator. Data MIDI also features a polyphonic mode to output three separate notes for each color value, with optional spread.

## Stream Mode

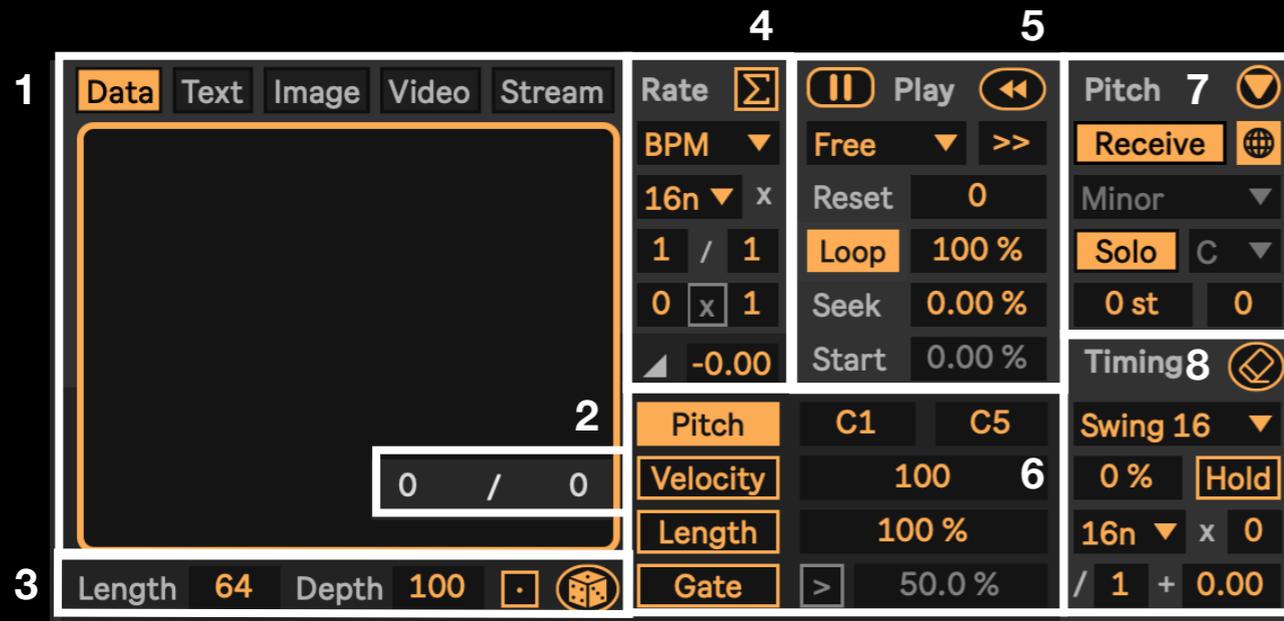
Data MIDI · Data Mod

Use stream mode to harness real-time data from any OSC or UDP port, with adaptive or fixed data range modes, a customizable shut-off time, and adjustable intensity to exaggerate or reduce the output values. Select your OSC Port number, then enter the exact OSC address in the text box from which you wish to receive data; the number of available indices on that address will be detected automatically, and can then be selected from. In UDP mode, a single stream of numeric values can be harnessed without the need for any address header. To configure your OSC, you may have to find your computer's IP address via your OS network settings and enter that in the sending application; we do not provide support for this configuration process.



# Data MIDI

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1 · This is the **Mode** selection and **Entry** field; currently shown in Data mode, you can click to place the cursor and manually type or paste copied numerical data; be sure to hit the Enter key for the data to be ingested.

2 · The **Data Counter**, shows the total data points in the string at right, and the currently expressed data point on the left.

3 · Here we have the **Randomization** controls: adjust the Length to determine how many data points will be generated up to a maximum of 2048; use the Depth to determine the resolution range of data, up to 1000; the minimum of 2 will generate a binary string of ones and zeroes which can be highly useful to generate rhythmic patterns; simply click the dice to randomize a new string; click the decimal box to allow float values of up to two decimal places to be generated.

4 · This is the **Trigger** section that defines whether data points are advanced at a BPM-synchronized rate with multiplier, divider, and optional bar reset, unsynchronized millisecond rate, or arbitrary MIDI note on or note off messages; click the pencil to access the raw text data file or click the eraser to clear all stored data. Below is our exponential **Skew** slider to bias the curvature of a data set; up top is the **Euclidean** mode access button that allows you to define steps, fills, offset rotation, and pattern direction.

5 · Here we have the **Play** controls: play or pause the data output or manually reset the data string to the start point with the buttons up top; select the play Mode from Free playback, Gate mode to only play when incoming MIDI notes are held, Side to only play between incoming MIDI notes, Gate Pause to actually pause the data cycle between notes, Side Pause to similarly pause the data string during note, or Arp to manually gate and reset the data string with each new note on. Play direction allows you to advance through the data string Forward, Reverse, Cycle forward then reverse and back again, or trigger Random data points within the string; then, the entire data string can be Reset in bar intervals, the entire Loop length of the string can be shortened, and finally you can Seek for a new start point within the optionally looped string length. You can also turn looping off to only trigger the current sequence once via incoming MIDI note on message or by clicking the manual reset button.

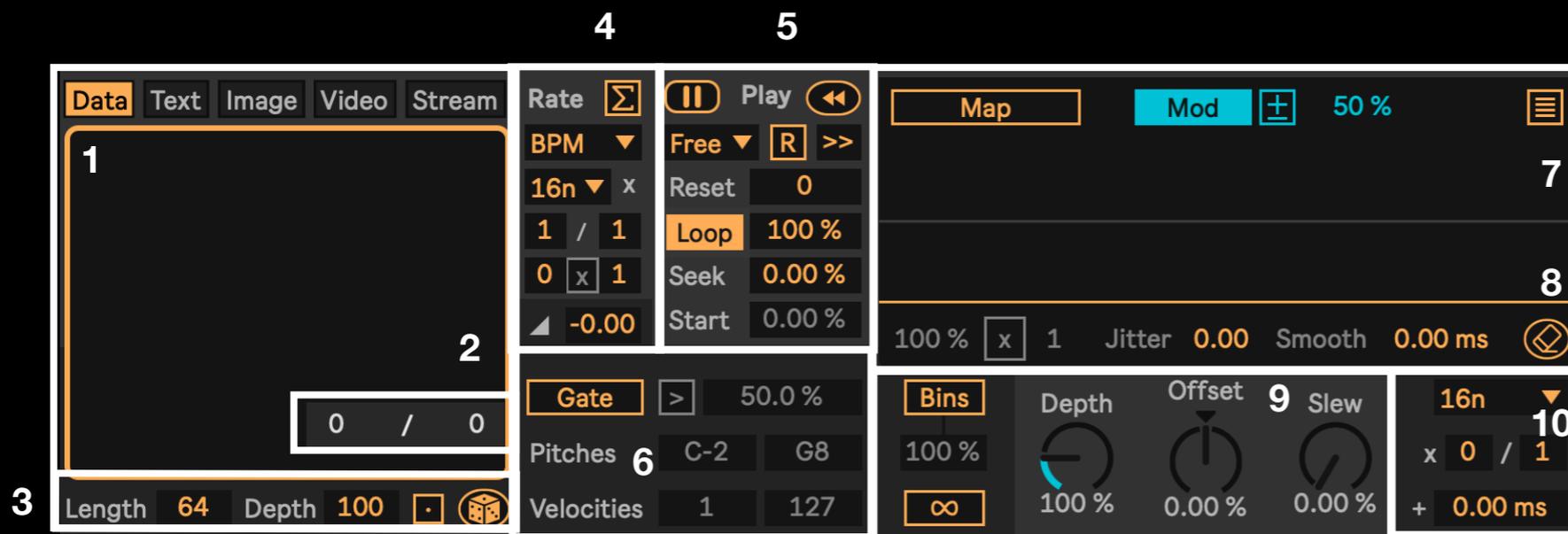
6 · Here we have our data **Expression** settings: with Pitch enabled, we can specify the minimum and maximum pitch values that will be output which can be inverted and altered in real-time; if disabled, a single specified pitch value will be triggered by the data; Velocity and Length, off by default, will then output a single value but when activated can also specify ranges that correspond to the minimum and maximum of output data, invertible and automate-able; when enabled, Gate specifies the point above or below which data will actually trigger note output.

7 · The **Pitch** settings determine the scale and key that will be output and whether those are set by Live 12 or Global Hub, or controlled locally, whether received note input will transpose the output, and whether output will play solo or be merged with incoming notes; you can also transpose the output manually in semitones and octaves. Click the reveal toggle to expose the data viewer for real-time insights.

8 · Finally, the **Timing** section defines the type and amount of swing, whether notes are held for sustain, and whether output is delayed by a metrical value multiplied by a rate with optional milliseconds in addition; with a multiplier of zero and a milliseconds at zero there will be no output delay.

# Data Mod

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1 • This is the **Data Entry** field where you can click the place the cursor and manually type or paste copied numerical data; be sure to hit the Enter key for the data to be ingested.

2 • The **Data Counter**, shows the total data points in the string at right, and the currently expressed data point on the left.

3 • Here we have the **Randomization** controls: adjust the Length to determine how many data points will be generated up to a maximum of 2048; use the Depth to determine the resolution range of data, up to 1000; the minimum of 2 will generate a binary string of ones and zeroes which can be highly useful to generate rhythmic patterns; simply click the dice to randomize a new string, with decimals optional.

4 • This is the **Trigger** section that defines whether data points are advanced at a BPM-synchronized rate with multiplier, divider and optional bar reset, unsynchronized millisecond rate, or arbitrary MIDI note on or note off messages; click the pencil to access the raw text data file or click the eraser to clear all stored data; finally, when enabled, Gate specifies the point either above or below which data will actually trigger note output. Below is our exponential **Skew** slider to bias the curvature of a data set; up top is the **Euclidean** mode access button that allows you to define steps, fills, offset rotation, and pattern direction.

5 • Here we have the **Play** controls: manually reset the data string to the start point with the buttons up top; select the play Direction to advance through the data string Forward, Reverse, Cycle forward then reverse and so on, or trigger Random data points within the string; then, the entire data string can be Reset in bar intervals, the entire Loop length of the string can be shortened, and finally you can Seek for a new start point within the optionally looped string length; below these you can select the range of MIDI note pitches and velocities that will trigger new data values in MIDI trigger mode as detailed below. You can also turn looping off to only trigger the current sequence once via incoming MIDI note on message or by clicking the manual reset button.

6 • Here we have input and output settings to optionally exclude values above or below a certain value, or prevent certain pitches or velocities from triggering modulation output with the MIDI source selected in the rate section.

7 • Here we have our data modulation **Mapper and View Scope**: click Map then click the parameter you wish to control anywhere throughout your set, then constrain and even invert the mapping range with the percent sliders at right; click the hamburger menu to access seven additional mapping assignments.

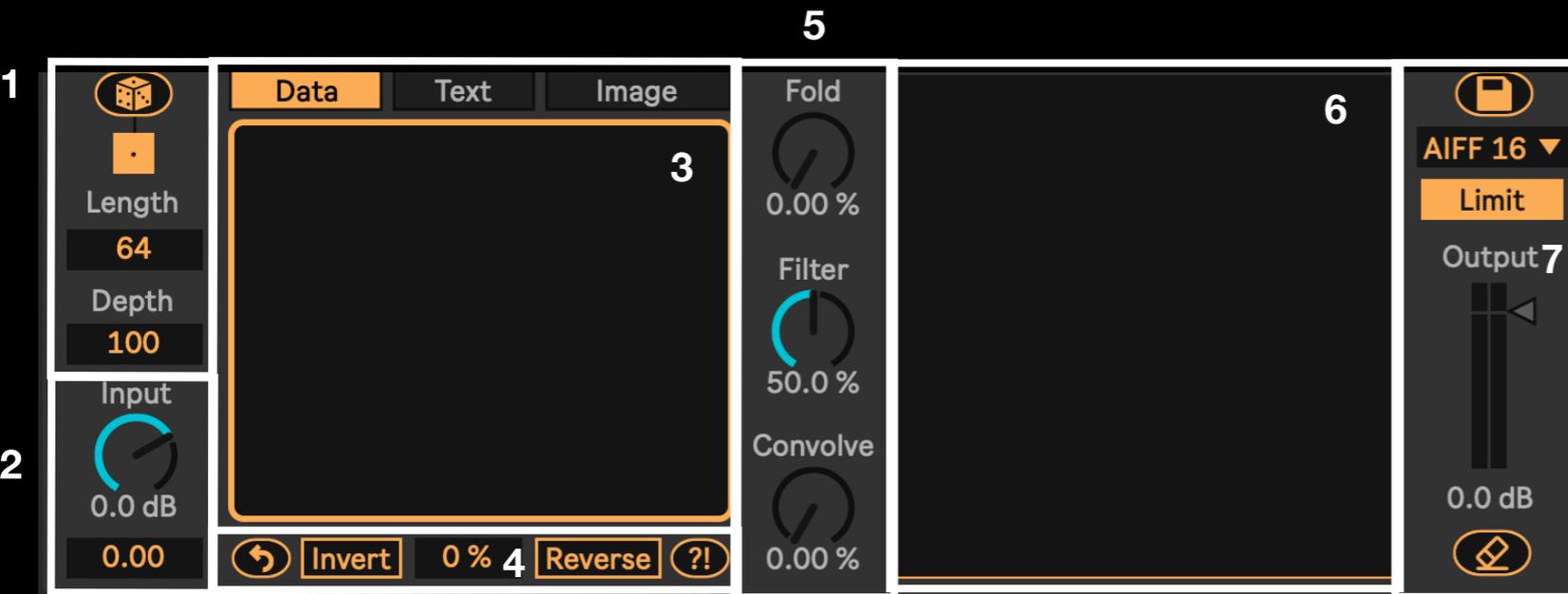
8 • The **Refinement** settings determine the chance modulation will be triggered, the data interval at which data will be triggered; at 81% x 2, 81% of data points will be output and counted, every second of which will trigger modulation — or the inverse with count mode switched to avoid; Jitter adds random motion to the modulation signal, while Smooth softens the modulation. Click erase at far right to clear the currently selected data.

9 • **Modulation** settings govern the Slew amount for smooth linear slopes between data values, the overall Depth of modulation, and whether the resulting modulation is Offset to higher or lower values; this is also where you can enable Bins mode, set the relative amount, and freeze modulation with the infinity toggle.

9 • Here we have the final **Delay** settings: modulation output can be delayed by a metrical value with multiplier and divisor, plus optional milliseconds in addition; with a multiplier of zero and a milliseconds at zero there will be no delay of the output modulation signal.

# Data FX

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1 • This is the **Edit Mode** field: in Data mode we have the randomization controls to generate fresh data points from scratch; click the decimal to randomize float values; this is also where text options and output channels will show in Text and Image modes, respectively.

2 • Here we have the **Input** gain control and exponential data bias slider.

3 • Here we have the **Data Entry** area where in Data mode you can click to place the cursor and manually type or paste copied numerical data up to 512 points in length — just be sure to hit the Enter key for the data to be ingested; in Random mode these values are greyed out and must be edited in the visual editing area. Alternatively, switch to Text or Image mode for their input settings.

4 • This is the **Data Processing** section that allows you to invert data values, reverse their order, bias positively or negatively, randomly scramble the current data values, or revert to unscrambled data values at left.

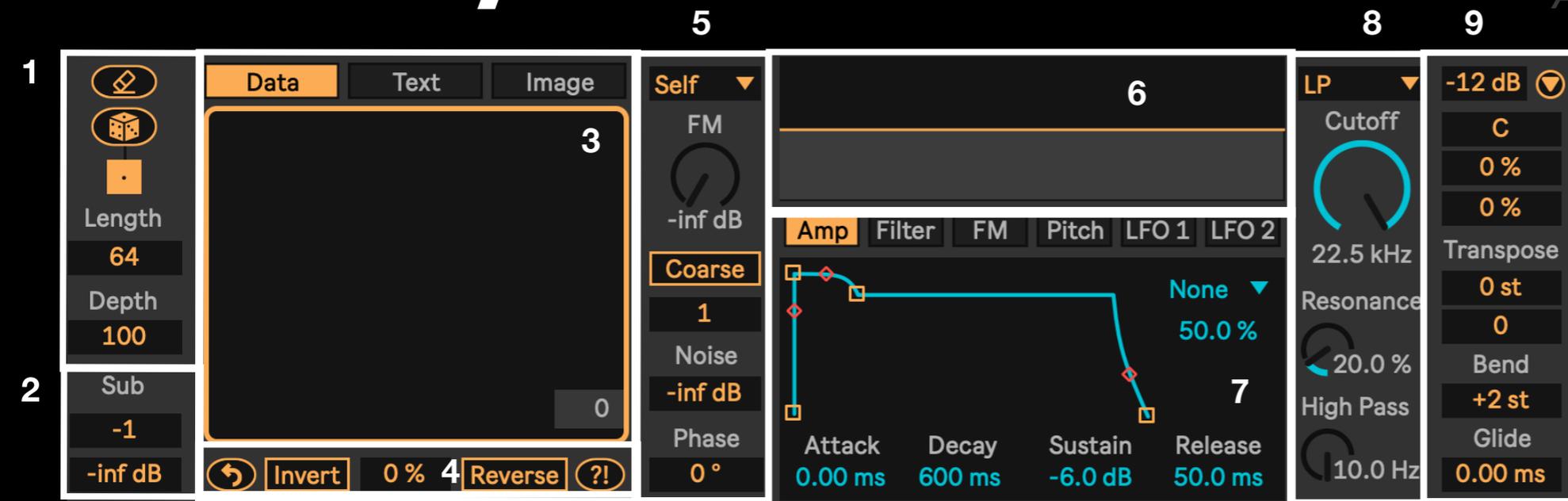
5 • Here we have our data **Effects** dials where you can use the current data table to apply corresponding wavefolding distortion, spectral filtration, and/or finite impulse response convolution via the three dials here.

6 • This is the graphical editing area where the current data points are displayed as a graph that can easily be altered by clicking and dragging your mouse to draw new shapes.

8 • **Output** settings allow you to toggle optional output limiting and adjust the output gain as needed. You can also find the **Waveform Export** settings here: select your preferred format (AIFF or WAV) and 16- or 24-bit depth, then click the disk button to save a waveform corresponding to the current data set that can then be used as a looping oscillator in any sampling instrument, or even as a wavetable. Click erase at the bottom to clear the current data.

# Data Synth

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**1** - This is the **Edit Mode** field: in Data mode you can enter your own data or toggle to Random mode to randomize fresh data points; click the decimal to randomize float values; this is also where text options and output channels will show in Text and Image modes, respectively.

**2** - Here we have the **Sub** oscillator gain and octave controls, useful to warm things up with a lower fundamental harmonic.

**3** - Here we have the **Data Entry** area where in Data mode you can click to place the cursor and manually type or paste copied numerical data up to 512 points in length — just be sure to hit the Enter key for the data to be ingested; in Random mode these values are greyed out and must be edited in the visual editing area. Alternatively, switch to Text or Image mode for their input settings.

**4** - This is the **Data Processing** section that allows you to invert data values, reverse their order, bias positively or negatively, randomly scramble the current data values, or revert to unscrambled data values at left.

**5** - Here we have our **Frequency Modulation** area: select from the default current data Self oscillator or other basic waveforms, adjust the FM amount, toggle between coarse or fine tuning and adjust the corresponding ratio, increase the dedicated noise modulator, and adjust the phase offset of all oscillators.

**6** - This is the **Waveform** display and editing area; draw here with the mouse to manually edit the current waveform.

**7** - This is the **Modulator** area where you can view the dedicated Amp, Filter, FM, and Pitch ADSR envelopes or the two LFOs.

**8** - Here we have our multimode **Filter** settings. Select from low pass, high pass, band pass, or notch, then adjust cutoff and resonance; a dedicated high pass is placed in series to help control low end.

**9** - Finally, this is our **Output** section with gain and panning, random panning and spread, transposition in semitones and octaves, pitch bend range, and portamento glide. Click the reveal toggle at upper right to expose the modulation matrix and advanced settings.

# Data Synth

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The screenshot shows the 'Data Synth' interface. On the left, there are various filter and modulation controls: LP (Low Pass) filter with a cutoff of 22.5 kHz and -12 dB gain, Resonance at 20.0%, High Pass filter at 10.0 Hz, Transpose at 0 st, Bend at 0, and Glide at 0.00 ms. The main area is a 'Modulation Matrix' table with columns for LFO 1, LFO 2, Random, and Velocity, and rows for various targets. Below the table are 'Advanced' controls: a 'Display' dropdown set to 'Waveform', a 'Normalize' toggle set to 'Off', and a 'Clear' button with an 'X' icon.

10 Source	LFO 1	LFO 2	Random	Velocity
Target				
Volume	0 %	0 %	-	-
Filter	0 %	0 %	0 %	0 %
FM	0 %	0 %	0 %	0 %
Pitch	0 %	0 %	-	-
FM Pitch	-	-	0 %	0 %
Noise	-	-	0 %	0 %

11 Display Waveform Normalize  Off Clear (X)

**10** - This is the **Modulation Matrix** exposed by the reveal toggle, where both LFOs, as well as velocity and a per-note random modulator can be assigned bilaterally to Volume, Filter, FM amount, Pitch, FM Pitch, and Noise modulator amount.

**11** - Below we have our **Advanced** controls. Select whether the real-time scope is in Waveform or Oscilloscope mode, or switched off for moderate processor savings. Toggle auto-normalize waveform mode when current data results in a quieter waveform. Finally, click the X button at bottom right to clear all current modulation assignments from the modulation matrix.

# Sonification Tools

## Dataforge

Dataforge offers the same essential controls as Data MIDI in Data mode — directly in your MIDI clip note editor. Shown below, a basic sequence of five MIDI notes expressed by the Dataforge MIDI Tool; it offers the same settings available as in Data MIDI, with the addition of Chance, which allows you to control the probability of notes depending on their original data value — while Gate mutes notes rather than removing them.

The screenshot displays the MFA Dataforge MIDI tool interface. On the left, a control panel for 'MFA Dataforge' shows a data input field containing '23 42 55 -11 42' and a '5' value. Below this are controls for Pitch (C1, C5, Gate), Velocity (1, 127), Rate (16n, 4, 1, 50.0), Length (150%, 50.0%), and Chance (100%). A 'Generate' button is at the bottom of the panel. The main area is a piano roll with a vertical axis labeled A1 to A4 and a horizontal axis with time markers (1, 1.1.3, 1.2, 1.2.3, 1.3, 1.3.3, 1.4, 1.4.3). A blue piano roll shows five notes: one on A2, one on A3, one on A4, one on A3, and one on A2. A velocity graph at the bottom shows five data points corresponding to the notes, with values ranging from 1 to 127. The bottom control bar includes 'Velocity Randomize 100', 'Ramp 66', '102', and 'Deviation 0'. The top of the interface shows tabs for 'Fold', 'Scale', 'Highlight Scale', 'Notes', 'Envelopes', and 'MPE', along with a '1/16' zoom level indicator.

# Sonification Tools

## Photomat

Photomat provides the same affordances as Data MIDI in Image mode — directly in your MIDI clip note editor. Zoom, pan, and scroll, adjust image and color settings, and tweak ranges to discover, explore, and reconfigure a wealth of patterns hidden in any image.

The screenshot displays the MFA Photomat software interface. On the left, a control panel for 'MFA Photomat' includes an image preview, a 'Generate' button, and various settings: 'Image' (12%), 'Axis' (X), 'Colors' (Brightness 124), 'R 100' (Contrast 96%), 'G 100' (Saturation 173), and 'B 100' (Threshold 50%). The main area is a piano roll with a grid of notes. A blue bar at the top indicates a selected range from 1 to 3. The piano roll shows notes on staves C1 through C5. At the bottom, a velocity control bar is visible with settings: 'Velocity' (100), 'Randomize' (73), 'Ramp' (81), and 'Deviation' (0).

# Sonification Tools

## Typewriter

Typewriter offers the same essential controls as Data MIDI in Text mode — directly in your MIDI clip note editor. Count the notes and see how they correspond to the letters in the text field, with spaces as rests. It's a fun and novel way to arrive at musical patterns.

The screenshot displays the MFA Typewriter interface within a MIDI editor. On the left, a control panel for 'MFA Typewriter' includes a text field containing 'we can explore rhythms and melodies in such a way' with a character count of 49. Below the text are controls for Pitch (C1, C5), Velocity (65, 127), Length (100%, 50.0), Rate (16n, 1, 0.00), and Chance (100%). A 'Generate' button is also present. The main workspace shows a piano roll with a grid of notes. The notes are organized into a 4-measure structure, with measures labeled 1, 1.2, 1.3, 1.4, 2, 2.2, 2.3, 2.4, 3, 3.2, 3.3, 3.4, and 4. The notes are plotted on a vertical axis of pitches from C1 to C5. A blue bar at the top indicates the selected region. The interface also features a search bar, 'Fold' and 'Scale' buttons, and a 'Highlight Scale' checkbox.

# Sonification Tools

## FAQ

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### **The data I entered doesn't play — why?**

After data points are entered into a device by manually typing or pasting in, you must then press the Enter key for the data to be ingested and processed for output.

### **Why do I get a VIDDLL message using Image or Video mode?**

The free VIDDLL package should be installed via the Max package manager for optimal use of Image or Video modes across all operating systems. [This video](#) shows how to install the free VIDDLL package on macOS or Windows; if it's not already installed as shown in the video, an **Install** button will appear. It's completely free, and you should only have to do this once.

### **How can I sonify multiple a full table of data strings?**

Simply use as many instances of our Sonification Tools as necessary to give voice to all the concurrent strings of data required for your project; a good way to think about each instance is that it can handle one row or column of data — therefore, simply add another Sonification Tool for each column or row of data in a table you wish to give voice to.

### **What is the maximum length of data I can enter into a Sonification Tool?**

Due to limitations with Max list processing, the maximum data string length for Data MIDI, Dataforge, and Data Mod is currently 2048. It's debatable whether longer strings would produce musical results anyway. Meanwhile, due to MSP buffer size limitations, the maximum data string length for Data FX is 512, while the buffer size of Data Synth is limited to 256.

### **My data isn't playing back as expected, what should I do?**

Make sure only the actual data you wish to use has been pasted in. Be sure not to include, for example, an index column that simply counts up from 1 alongside the desired data, as this will skew the results rather drastically. Please ensure only numeric characters are pasted into the data field. Numbers should be separated by a space and/or line break (enter); commas or semicolons may cause problems and should be avoided — but don't worry: data copied from a CSV will be entered correctly as space-separated here. Finally, you must ensure float values are denoted correctly with a period (".") symbol — not a comma (","), and finally, certain data sets may contain nonsensical values that should be purged before sonification usage.

### **Why isn't Data MIDI or Data Mod receiving my OSC messages?**

First, you need to make sure your OSC application is sending to your computer's IP address, which should be visible in your computer's wi-fi or network settings panel. Then you must ensure Data MIDI or Data Mod are set to receive on the corresponding OSC port. Finally, the exact correct address, including any backslash symbols, must be entered in the Address text field, without any spaces - then be sure to hit the Enter key after typing it in to ensure the desired OSC address is ingested by the device.

### **Sonification Tools's scale and key are not stored with my Live Set or saved presets — why?**

By default, Sonification Tools is in Global scale and key mode, so it will inherit the scale and key from Live 12 or any instance of the included Global Hub, which will be stored with your Live Set. To ignore Global Hub settings or to ensure scale and key are saved independently with your pre-Live 12 Sets or any presets, simply toggle from Global scale mode to pin these settings locally.

### **I don't want Sonification Tools to conform to Live 12 or Global Hub's scale and key — is this possible?**

Any device that can be impacted by Global Hub has a Global toggle; click this to pin the scale and key to Local Sonification Tools settings. Toggling from Local back to Global mode will automatically and instantly force the device to inherit Live 12 or Global Hub settings.

### **Sonification Tools looks small — how do I make it bigger?**

In the Display tab of Live's Preferences pane, increase the Display Zoom percentage slider to 125% or 150%.

**Thank you for supporting us by purchasing these devices — we hope they inspire your creativity!**

For more information, video tutorials, and other devices, please visit us online at: **manifest.audio**

