ZAZOU

firmware 1.0

Eurorack module for generative music

KAONA

Ingenious Instruments for Creative Minds

Introduction

Zazou is a generative music module based on numerous configurable algorithms. It can serve as an accompanist, improviser, or melody creation instrument.

Its function is to produce notes; no sound comes directly from Zazou. It is designed to be connected to one or more synthesizers (via multitimbral or polyphonic MIDI output) or other Eurorack modules. Zazou requires gate signals to trigger each note. It follows the rhythm imposed by a sequencer or any gate output generator (making it a good companion to **Skippy**, Kaona's rhythm generator).

Zazou produces music based on the chromatic scale and uses the same note divisions as keyboard instruments. Thus, in Zazou, as on a piano, a C# corresponds to a Db.

Zazou produces notes on 4 independent channels that can be tuned to each other.

Contents

Quick Start

Play/Stop: Stops or restarts all tracks (CV gate or button).

Reset: Resets playback to the beginning of the sequence (CV gate or button).

Change: Advances the sequence by one step (CV gate or button).

Gate inputs for the four tracks, each marked by a color: Red, yellow, green, blue. Zazou can match (or not) the length of each note to the length of each gate.

A selection button for each track (see next page).

The screen always indicates the relevant track by color.

Encoders (see next page).

Gate outputs for the four tracks (active for the duration of the notes). A LED indicates the state of each gate.

CV outputs for the four tracks, taking the values of the velocity.

MIDI output TRS A or B.

Note 1V/oct output for the four tracks, taking the values of each note.

Zazou's settings are divided into 6 different screens: **Base, Algorithms, Sequences, Live, Files, Configuration**. Each section can be accessed using the encoders.

Encoders

ACTION	ENCODER 1	ENCODER 2	ENCODER 3
BASE			
Short Click	Enters the menu	→ Algorithms	→ Live
Long Click	→ Configuration	→ Sequences	→ Files
Rotation	Scrolls through the menu	changes parameters	
Algorithms			
Short Click	→ Base	Enters the menu/ exits the menu	→ Live
Long Click	→ Configuration	→ Sequences	→ Files
Rotation		Displays algorithms/ Scrolls through the menu	nothing/ changes parameters
Sequences			
Short Click	→ Base	Enters the menu/ exits the menu	→ Live
Long Click	→ Configuration	→ Base	→ Files
Rotation		Displays sequences/ Scrolls through the menu	nothing/ changes parameters
Live			
Short Click	→ Base	→ Algorithms	
Long Click	→ Configuration	→ Sequences	→ Files
Rotation			
Configuration			
Short Click	→ Base	Enters the menu	→ Live
Long Click	→ Base	→ Sequences	→ Files
Rotation	Scrolls the menu	changes parameters	
Files			
Short Click	→ Base	Enters the menu/ confirm	→ Live
Long Click	→ Configuration	→ Sequences	→ Base
Rotation		Scrolls through the menu	changes parameters

Buttons

The buttons have three possible effects depending on the screens:
Base: Activates or deactivates each track to choose parameters
Algorithms and Sequences: Plays the note of each track (manual gate)
Live: Mute function for each track

BASE

→ Short click on encoder 1

The **BASE** screen allows you to set the basic parameters of your composition.

The same parameters are applied to all tracks when all the buttons are lit. You can turn off one or more buttons to choose specific parameters track by track. When a button is off, the track on the screen becomes dark and changes are not applied.

Parameters

Root Note

The root note determines the starting note for algorithms and scales. For example, you can use the same note for multitimbral melodic play with different algorithms or use different notes for polyphonic play with the same algorithm for all tracks. Any combination is possible within the chromatic scale (12 tones: no distinction is made between a D# and an Eb, for example).

Scale

Available scales are: Major, Minor, Natural minor, Harmonic minor, Pentatonic Major, Pentatonic Minor, Blues Major, Blues Minor, Bluesy, Bebop Major, Bebop Minor, Blues Nine, Ionian, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, Locrian, Chromatic (12 tones).

Sequence

Sequences allow Zazou to chain chords according to defined rules (see page 16). They represent a succession of chords from the chosen major or minor scale. When expressed in Roman numerals, these symbolize the degrees of the chosen scale. For example, the sequence II-V-I corresponds to a D-G-C progression in the C major scale. Sequences are played in loops: in the previous example, the II (D) degree will be used after the I (C).

Available sequences (notes given as examples based on the C major scale):

ROOT: Repeats the root note of the track (equivalent to not using sequences)
RANDOM: Plays a random note (evolves according to sequence parameters)
II-V-I: D-G-C (one of the most used sequences in Jazz, classical, pop, blues, country, R&B, etc.)
CIRCLE OF 5: Circle of fifths (basis of tonal music, from classical to rock...). For all scales: C-G-D-A-E-B-F#, except for the minor scale: Eb-Bb-F-C-G-D-A.
CIRCLE OF 4: Circle of fourths (subtracting a fifth), C-F-Bb-Eb-Ab-Db-F# for all scales except the minor scale: Eb-Ab-Db-F#-B-E-A.
ANATOLE: Also called turnaround, it's a chord progression widely used in Jazz, pop, and songs. Progression I-VI-II-V: C-A-D-G.
CLASSICAL 4: A variation of the circle of fourths widely used in classical music. Progression IV-VII-III-VI-II-V-I: F-B-E-A-D-G-C.
I-II-III-II: The first three notes of the scale: C-D-E-D.
I-IV-V: Common progression (blues, rock, songs, etc.): C-F-G.
I-V: Moves from the tonic to the fifth: C-G.
BLUES 12 I: Basic blues on 12 bars: I-I-I-I-IV-IV-I-I-V-IV-I-I.
BLUES 12 II: Variant of the basic blues: I-I-I-I-IV-IV-I-I-V-V-I-I.
I-II-IV-IV#-V-V: The so-called "gospel" progression: C-D-F-F#-G-G.
II-V-VI-IV: Common progression (pop, punk, songs, etc.): D-G-A-F.
I-IV-V-IV: Common progression: C-F-G-F.
TIERCE UP: Progression upwards by thirds: C-E-G-B.
TIERCE DOWN: Progression downwards by thirds: C-A-F-D.
SCALE UP: Progression upwards by note of the scale.
SCALE DOWN: Progression downwards by note of the scale.

Algorithms

Choosing an algorithm determines the notes and their possible progression, shaping the melody. Different algorithms can be chosen for each track to build a complex piece using all multitimbral capabilities (external or modular synthesizers) or the same algorithm to construct chord sequences. All combinations are possible. The available algorithms are detailed on the next page.

RANDOM: Plays notes randomly.
ARPEGGIO: Notes follow different arpeggio rules.
WALKINGBASS: Regular progression commonly used in jazz.
SERIAL: Strictly applies the rules of serial music.
CANTOR: Simple fractal progression.
FIBONACCI: Notes progress along the eponymous sequence.
INTERVAL: Notes progress according to a fixed interval.
SIERPINSKI: Interpretation of the Sierpinski triangle progression.
MANDELBROT: Interpretation of Mandelbrot's formulas applied to music.
JULIA: Interpretation of Julia fractal sets.

Algorithms

→ Short click on encoder 2

The screen displays the four algorithms chosen for each track and allows you to set the parameters.

In the example below, four different algorithms have been chosen for the four tracks.

Navigation

Turning encoder 2 scrolls through the four tracks. A new click on the encoder scrolls through the options. Alternating between clicks and encoder rotation allows you to select and adjust parameters.

Turning encoder 3 changes the parameter values if an option is selected. The chosen parameter is applied immediately without needing an additional click. To exit this screen, simply click on encoders 1 or 3.

Playing Notes

In this mode, you can play the notes of the algorithm by pressing the illuminated buttons for each track. This allows immediate testing of parameter values or dynamic live play.
Pressing the Reset button returns to the first note of the sequence.

Principe

Algorithms instruct Zazou on how to produce notes. While the rules of chromatic music theory are respected, it is possible to push Zazou towards dissonance or inharmonious sounds. No artificial intelligence is used; choices are made based on your creative musical sensitivity. Thus, Zazou is not dedicated to a specific musical genre but depends on its user.

Common Characteristics

Certain parameters are found in some algorithms and function with the same logic.

They can still be individually adjusted by track and algorithm.

CHORD

Available chords (depending on the chosen root and sequence) include: **SCALE**, **M**, **m**, **6**, **m6**, **7**, **M7**, **m7**, **m,M7**, **7sus2**, **7sus4**, **°**, **°7**, **m7-5**, **+**, **7+5**, **M7+5**, **add9**, **madd9**, **add11**, **madd11**, **add13**, **madd13**.

Major chords are denoted with an uppercase **M** and minor chords with a lowercase **m**.

The **SCALE** chord is unique, allowing all notes of the chosen scale to be played (e.g., the five notes of a pentatonic scale).
Zazou permits the use of major chords with minor scales and vice versa.

DURATION

By default, Zazou is set to a quarter note duration of 120 BPM. This parameter can be changed in the base settings (see page 5).

For musical coherence, the base quarter note value is common to all algorithms and tracks. The note duration can then be set as a multiple of this quarter note: **x4** (whole note), **x2** (half note), **1** (quarter note), **1/2** (eighth note), **1/3** (quarter note triplet), **1/4** (sixteenth note), **1/6** (eighth note triplet), **1/8** (thirty-second note), **1/16** (sixty-fourth note), **1/32** (one hundred twenty-eighth note), **1/64** (two hundred fifty-sixth note).

The **GATE** duration (first default choice in the list) does not depend on the quarter note but will have the exact length of the gate signal triggering the note (via CV gate in or by pressing the track button). When a duration is set (other than the gate option), the note will play for the entire duration.

A new gate signal will not interrupt the ongoing note and will be ignored. This allows for very dynamic play when using a gate generator that lets you adjust the gate lengths live (e.g., Skippy + Skippy Live).

ORNAMENT POS and ORNAMENT

Zazou can add additional notes (beyond the gate signal) as ornamentation. Depending on the choice, speed, and note duration, the result may not be harmonious or even audible (e.g., a trill on a sixty-fourth note may not be heard).

The best results are achieved by choosing a slow enough duration to express the ornamentation notes. Ornaments are played on the beat (appoggiatura) rather than before the beat like a grace note.

Two fields are available with the following parameters:

ORNAMENT POS (context)
NO (no effect), **ODD** (effect only on odd beats), **EVEN** (effect only on even beats), **ALL** (effect on every gate), **ODD RND** (effect on odd beats randomly), **EVEN RND** (effect on even beats randomly), **ALL RND** (effect on any gate randomly).

ORNAMENT (type of ornamentation)
NO (no ornament), **APPO. +** (half-step higher appoggiatura), **APPO.** (half-step lower appoggiatura), **TRIPLET** (triplet), **TRILL** (trill), **REPEAT** (same note repeated multiple times), **REST** (no note played), **BREVE** (long note), **RND** (random ornament for each note).

VELOCITY

Velocity is a value ranging from 0 (no volume) to 127 (full volume). This value is sent via the MIDI channel (different synthesizers interpret this intensity differently) and also sent to **CV1** to **CV4** outputs.

Depending on the configuration choice (see page 20), the value progresses in steps of 39 millivolts (5V) or 62.5 millivolts (8V).

Algorithm Descriptions

RANDOM

Plays notes randomly within the chosen scale.

Parameters

CHORD: Notes are limited to this chord (**SCALE** allows playing all notes of the chosen scale).
OCTAVE BASE: No note will be produced below this octave.
OCTAVE RANGE: Number of octaves over which notes are produced.
OCTAVE RND: An octave is chosen randomly.
DURATION: Duration of notes.
DURATION RND: A random duration is chosen (the event occurs more or less often, from 0 no change, to 10 change at each note).
VELOCITY: Volume of the note.
VELOCITY RND: Velocity is chosen randomly (the event occurs more or less often, from 0 no change, to 10 change at each note).
REPEAT: **YES** allows the same note to be repeated consecutively, **NO** prevents the same note from being played twice in a row.

ARPEGGIO

The arpeggiator has many variations that allow creating simple to complex and evolving patterns. The number of notes set in the **Sequences** section can greatly influence the arpeggiator.

Parameters

CHORD: Notes are limited to this chord (**SCALE** allows playing all notes of the chosen scale).
DIRECTION: **UP** (notes are played progressively from lowest to highest), **DOWN** (notes are played progressively from highest to lowest), **UP&DOWN** (alternates progression direction), **RND** (randomly changes progression direction).
TYPE: Arpeggio style. **CHORD** (plays chord notes), **CHORD+8** (plays chord notes plus the tonic of the upper octave), **ROOT x2** (plays chord notes doubling the tonic and adding the upper tonic), **DOUBLE** (doubles each note), **DOUBLE+8** (doubles each note including the tonic of the upper octave), **ALTERN 5** (alternates notes, with the fifth played in second position), **ALTERN 5+** (alternates notes, with the fifth played in second position and the upper tonic added), **ALTERN 123** (progresses in group of three notes, including the upper tonic), **ROOT&CO** (adds the lower tonic between all notes), **ROOT&CO+** (adds the lower tonic between all notes and adds the upper tonic), **STRUM** (strums the chord like a string instrument; the note order remains that of the keyboard, not the strings), **RANDOM** (randomly chooses an arpeggio type).
OCTAVE BASE: No note will be produced below this octave.
OCTAVE RANGE: Number of octaves over which notes are produced.
DURATION: Duration of notes.

ORNAMENT POS: Context of ornamentation.
ORNAMENT: Type of ornamentation.
VELOCITY: Volume of the note.

WALKINGBASS

A walking bass line typically plays a quarter note on each beat, creating a melody like a musical walk.
Although the walking bass originated in jazz (hence the jazzy names for the bass types), Zazou allows many deviations from the rule, making this algorithm suitable for transforming the walking bass into... something else!

Parameters

TYPE: **ROOT** (plays only the root note, useful for setting a melodic tempo). The basses **USUAL 1, USUAL 2, LATIN, BOOGIE 1, BOOGIE 2, R'N'ROLL, BLUES 1, BLUES 2, BLUES 3, ALTERN1, ALTERN2** are inspired by various common styles found in many genres. **SCALE** allows traversing the entire chosen scale.
SYNCHRO: **YES** synchronizes with the sequence: even if the walking bass musical phrase is not finished, it will restart at the change of the sequence's dominant. **NO** plays the entire walking bass musical phrase in a loop, but the keys follow the sequence's keys.
OCTAVE BASE: Octave where the musical phrase starts.
DURATION: Duration of notes (normally a quarter note... but do as you wish!).
VELOCITY ODD: Volume of odd beats.
VELOCITY EVEN: Volume of even beats.
ORNAMENT POS: Context of ornamentation.
ORNAMENT: Type of ornamentation.
VOICING: **NO** (no effect), **YES** (the closest note in the chord inversion is chosen when the sequence changes). This has no effect with some bass types when the closest note is already part of the musical phrase.

Serial

Serial music is a composition technique using series of musical values in a predetermined order. Invented by Arnold Schoenberg, it extends the dodecaphonic principle by organizing all sound parameters serially, creating a rigorous and systematic structure. All notes of the chromatic scale are used once in a series. The series can either repeat or recreate itself once the twelve notes have been used. This algorithm only works with the chromatic scale; thus, the scale choice has no effect in this case.

Parameters

AGGREGATE: **SINGLE** (the same series is always used), **CHANGE** (a different series replaces the previous one at the end), **MOVE** (the series is transposed according to the sequence: in this case, the strict rule of serial music is no longer followed).

INVERSION: Each interval is inverted in the series.
RETROGRADE: Notes are played in reverse order in the series.
RETRO. INV.: Notes are played in reverse, and each interval is inverted in the series.
OCTAVE: Octave where the series is located.
DURATION: Duration of notes.
SERIAL VELOCITY: **YES** decomposes the velocity into twelve values between **VELOCITY -** and **VELOCITY +** and applies them to the notes of the series.

CANTOR

Cantor's algorithm is a method for assigning a unique number to each pair of integers. Imagine an infinite list where each pair of numbers has its own place in this list. Cantor found a systematic way to create this list to show that even infinite pairs of numbers can be counted, proving that infinity can be organized and compared. This algorithm is freely interpreted here to generate melodic lines.

Parameters

SCALE FIT: **YES** uses only the notes of the chosen scale. **NO** uses the entire chromatic scale (recommended with a recursion of 3).
RECURSION: From 0 to 3. The smaller the number, the greater the variations; the larger the number, the more the pattern repeats.
OCTAVE BASE: No note will be produced below this octave.
OCTAVE RANGE: Number of octaves over which notes are produced. The higher the number, the greater the variations.
DURATION: Duration of notes.
ORNAMENT POS: Context of ornamentation.
ORNAMENT: Type of ornamentation.
VELOCITY: Volume of the note.
VELOCITY RND: Random velocity.

FIBONACCI

The Fibonacci sequence is a series of numbers where each number is the sum of the two preceding ones. This sequence begins with 0, 1, 1, 2, 3, 5, 8, 13, etc. It appears often in nature, such as in shell spirals or leaf arrangements on a stem, and is used in various fields to model growth and natural phenomena. This sequence is used here to grow a melodic line.

Parameters

ROOT NOTE: The tonic note from which the sequence propagates.
OCTAVE BASE: No note will be produced below this octave.

OCTAVE RANGE: Number of octaves over which notes are produced. The higher the number, the greater the variations.
DURATION: Duration of notes.
DURATION RND: Random note duration.
ORNAMENT POS: Context of ornamentation.
ORNAMENT: Type of ornamentation.
VELOCITY: Volume of the note.
VEL. RND: Random velocity.

INTERVAL

Notes are played sequentially following a fixed interval. The musical phrase is determined by the number of notes. The larger the interval, the fewer notes are possible. Conversely, a very small interval allows using many notes on the keyboard. Zazou does not control whether the resulting note belongs to the chosen scale.

Parameters

ROOT NOTE: Starting note of the interval sequence.
DIRECTION: **UP** (notes are played progressively from lowest to highest), **DOWN** (notes are played progressively from highest to lowest), **UP&DOWN** (alternates progression direction), **RND** (randomly changes progression direction).
INTERVAL: Interval between each note: **minor 2, MAJOR 2, minor 3, MAJOR 3, PERFECT 4, TRITONE, PERFECT 5, minor 6, MAJOR 6, minor 7, MAJOR 7, OCTAVE**.
OCTAVE BASE: No note will be produced below this octave.
NUMBER OF NOTES: Number of notes to be played with the chosen interval, within the limit of the possible number of octaves.
DURATION: Duration of notes.
ORNAMENT POS: Context of ornamentation.
ORNAMENT: Type of ornamentation.
VELOCITY: Volume of the note.

SIERPINSKI

The Sierpinski triangle is a fractal pattern that begins with a large triangle. By dividing this triangle into four smaller equilateral triangles and removing the central triangle, three triangles are obtained. This process is repeated indefinitely for each small triangle. The result is a complex, self-similar pattern that repeats at different scales, illustrating the infinity of fractals. This principle is applied here to generate a musical pattern.

Parameters

ROOT NOTE: The tonic note from which the sequence propagates. The chromatic scale produces the most variations.
RECURSION: A probability coefficient where a pattern can repeat.
SUBDIVISION: Detail of the pattern.
RECURRENCE: Pattern repetition.
OCTAVE BASE: No note will be produced below this octave.
OCTAVE RANGE: Number of octaves over which notes are produced. The higher the number, the greater the variations.
DURATION: Duration of notes.
ORNAMENT POS: Context of ornamentation.
ORNAMENT: Type of ornamentation.
VELOCITY: Volume of the note.
VEL. RND: Random velocity.

MANDELBROT

The Mandelbrot set is a fractal pattern that creates a complex image. It is generated by points on a plane, where each point is colored according to the speed at which it diverges when applying a certain repeated mathematical rule. The edge of the set becomes very detailed and complex to infinity, showing patterns that repeat at different scales. This algorithm is freely interpreted here to generate melodic lines that gradually tend toward a simple pattern or even just one or two notes.

Parameters

ROOT NOTE: The tonic note from which the sequence propagates. The chromatic scale produces the most variations.
STARTING POINT: Starting point from -30 to +30. The closer to 0, the less complex the pattern.
DIVAGATION: Propagation formula from -30 to +30. This parameter can significantly vary the pattern.
STEPS: Number of divergence steps. The fewer steps, the more distinct the pattern; the more steps, the more abrupt the variations in the pattern, but they also tend toward a single-note pattern.
OCTAVE BASE: No note will be produced below this octave.
OCTAVE RANGE: Number of octaves over which notes are produced. The higher the number, the greater the variations.
DURATION: Duration of notes.
VELOCITY: Volume of the note.
VEL. RND: Random velocity.

JULIA

The Julia set is a type of fractal similar to the Mandelbrot set. Each Julia set is created by taking a fixed point and applying a mathematical rule to all points in the complex plane. Depending on the chosen starting point, Julia sets can have very different shapes, ranging from smooth and continuous patterns to highly fragmented and detailed structures. Like fractals, these sets are self-similar and show patterns that repeat at different scales, offering complex visualizations. This algorithm is freely interpreted here to generate melodic lines that quickly diverge into patterns where the same note is often repeated.

Parameters

ROOT NOTE: The tonic note from which the sequence propagates. The chromatic scale produces the most variations.
TARGET: From 0 to 50. This parameter represents the complex point to reach. No obvious control here, just try it!
DRIFT: Drift speed to reach a very repetitive pattern. The higher it is, the fewer single notes are played.
STEPS: Number of calculation steps: the fewer steps, the more the pattern repeats; the more steps, the more the pattern tends toward a single note with irregular jumps.
OCTAVE BASE: No note will be produced below this octave.
OCTAVE RANGE: Number of octaves over which notes are produced. Note that Julia sometimes exceeds this maximum value due to its enthusiasm for divergence. However, Zazou prevents exceeding the maximum number of octaves defined in the preferences.
DURATION: Duration of notes.
VELOCITY: Volume of the note.
VEL. RND: Random velocity.

Sequences

→ Long click on encoder 2

The screen allows you to set the four sequences for each track.

It is common to use the same sequence for all four tracks, but many musical (and sometimes less musical...) variations are possible by varying the sequence parameters for each track. This offers infinite experimentation, allowing for very unique musical compositions when combined with the algorithms. Some sequences are complementary (e.g., **TIERCE UP** and **TIERCE DOWN**) and can also be limited by a judicious choice of scale (e.g., a sequence associated with a pentatonic scale fits well with other sequences). If the notion of sequence is not used in a composition, the simplest choice is to select the **ROOT** sequence for each track. The tracks will remain tuned according to the chosen root note, without transposition.

Parameters

CHANGE GATE: **EXT** changes only if a gate signal is intercepted in the **CV CHANGE** or if the change button is pressed. Note that the change mode will always work even if **EXT** is not selected. However, if **EXT** is selected, it will be the only way to change the sequence. Each colored square then indicates which track triggers each sequence step. For example, if for the red track (track 1) you choose a blue square, the gates of the blue track (track 4) will trigger the red track's sequence (track 1).
STEPS CHANGE: Number of notes to be played before moving to the next step.
REPEAT CHORD: Number of note sequences to be played before moving to the next step. This value is not always relevant and thus has no effect depending on the chosen algorithms (works mainly with repetitive algorithms: walkingbass, arpeggio, interval...).
ALTERNATE M/m: Alternates major and minor chords.
RND ALTERNATE: Randomly alternates major and minor chords.
PASSING NOTE: Inserts a grace note at each sequence step. The note duration must be long enough to be audible or harmonious.
RND CHORD: Randomly chooses a chord. Only works with algorithms incorporating chords.

Live

→ Short click on encoder 3

The Live screen shows the sequence path along the circle of fifths.

It is very useful when using Zazou as an accompanist to know which chord or root note is currently being played on each track. If the chosen sequence is the same for all tracks, a circle composed of four colors indicates the current chord.

If the sequences are different for each track, the circle composed of four colors is divided into quarters, and each track progresses at its own pace.

In Live mode, pressing the colored buttons for each track stops note production (**MUTE** mode). The corresponding button turns off. Pressing the button again turns it on and restarts the track's sequence.

The **play/stop** button (or CV) stops all four tracks simultaneously.

Pressing **reset** (or CV) restarts the sequence from the beginning and visualizes it. Reset also sends an "All notes off" via MIDI if a connected synthesizer has a ghost note or MIDI information loss issue.

Files

→ Long click on encoder 3

Saves in Zazou are made on an internal SD card provided and installed. This card is for exclusive use with the module and is not intended for use outside the module. However, you can remove this card to copy and use it on another Zazou, for example. Zazou does not need this card to operate, but without it, only automatic saves are possible. If you need to change the card, it does not need to be large (a 4 GB card represents about 8 million saves...) but should be fast enough: a class 10 card is recommended.

All steps are automatically saved in Zazou, and its state is fully restored even if the module is accidentally turned off.

Usage

It is possible to save or load individual tracks or sequences or the entire composition.

Parameters

LOAD TRACK: The color of the corresponding square indicates on which track the track save will be loaded. Useful for keeping part of a composition and reusing it.
LOAD SEQUENCE: The color of the corresponding square indicates on which track the sequence will be loaded.
LOAD ALL: Loads a complete composition.
SAVE TRACK: The color of the corresponding square indicates which track will be saved. Useful for keeping part of a composition and reusing it.
Save sequence: The color of the corresponding square indicates which sequence will be saved.
SAVE ALL: Saves the entire composition.
NEW: The save in Zazou is automatic, and the musician finds Zazou in the same state as when it was turned off upon restart. However, it is sometimes necessary to start with a blank page. The NEW option allows this.

Saves

For saves, you can choose the name. Rotating encoder 2 scrolls through the positions, and rotating encoder 3 allows choosing a character. The save is effective when a short click is made on encoder 2. The message **OK** in green is displayed if the save was successful.

Loading

Scrolling encoder 2 shows the files recorded on the card that correspond to the type of load you want to perform. The names of recorded tracks do not appear, for example, when loading a sequence or composition. When loading is successful, the **BASE** screen automatically displays with the new parameters.

Configuration

→ Long click on encoder 1

It is possible to choose several parameters that will be permanently saved in Zazou until a new change is made.

The save is automatic. Since each Zazou track can be assigned a MIDI number, many configurations are possible: four different numbers for a multitimbral synthesizer or four different synthesizers, or the same number for polyphonic experimentation, etc.

Paramètres

MIDI TRACK 1: MIDI number for track 1 (red)
MIDI TRACK 2: MIDI number for track 2 (yellow)
MIDI TRACK 3: MIDI number for track 3 (green)
MIDI TRACK 4: MIDI number for track 4 (blue)
SOURCE BPM: Default is **FIXED**. Choosing **MEASURED** allows connecting a sequencer to the **CV play/stop** input, and Zazou will measure the value of a reference quarter note. Do not confuse this measurement option with a clock input. Zazou does not use a clock as it depends on gate inputs to produce notes.
QUARTER NOTE: Value of the quarter note. This value determines the multiples of note durations chosen in the duration options.
VOLTAGE MAX: Determines the amplitude of signals produced by CV1 to CV4 outputs. Since some digital modules are limited to 5V, it is preferable to choose the 5V option to benefit from the full amplitude of velocities.
OCTAVE MAX: Some synthesizers handle high note indications poorly. Limiting the number of octaves avoids this problem. It also limits the voltage produced by CV notes.
TUNING: No effect for MIDI output. Only applies to CV outputs. Allows tuning Zazou with other modules. Varying this value gradually shifts all voltages produced to generate notes in 1V/octave.
CALIBRATION: Allows slight variation of produced voltages (a precision voltmeter [or a very, very good ear] is essential to use this parameter).

Connections

Power Supply

Zazou connects to a standard Eurorack power supply with the provided ribbon cable. It only uses +12V and consumes about 200mA. A key prevents the ribbon cable from being connected incorrectly.

MIDI

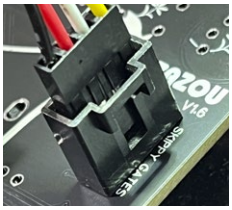
A switch allows switching from TRS-A to TRS-B mode. If your MIDI device does not seem to receive a signal, try changing this switch. It is best to do this with the module turned off.

Expander

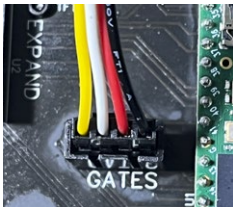
A connector is provided for a future expander. Do not attempt to connect anything else, as Zazou may refuse to work permanently...

Gate Connector

You can connect Zazou to Skippy using this connector and the provided cable. It is essential to perform this operation with all modules turned off to avoid damaging both.

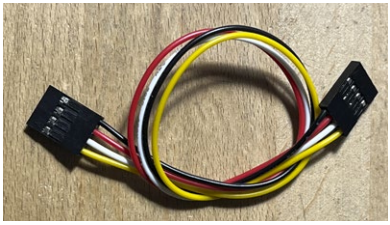


Zazou



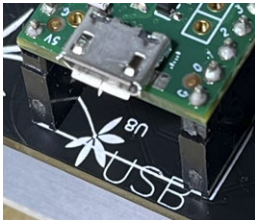
Skippy

The direction does not matter, but it is preferable not to cross the cable if you want Zazou's red track to correspond to Skippy's red track. If track 1 of one corresponds to track 4 of the other, simply invert (always with modules off) one of the connectors.



USB Port

The USB port is used for module updates. **NEVER CONNECT THIS PORT WITH THE MODULE CONNECTED TO THE POWER SUPPLY** (you would fry everything, and this version of Zazou does not have a toaster option). You will find any updates and instructions on Kaona's website (www.kaona.fr).



Bibliography

Some reading on musical theory and applied mathematics:

Coll., Music and Mathematics, *From Pythagoras to Fractals*, Oxford University Press, 2003
Abromont (Claude), de Montalembert (Eugène), *Guide de la théorie de la musique*, Fayard, 2001.
Arbonés (Javier) and Milrud (Pablo), *L'Harmonie est numérique*, RBA, 2013
Maor (Eli), *Music by the Numbers*, Princeton University Press, 2018
Siron (Jacques), *La Partition intérieure, Jazz, Musiques improvisées*, Outre Mesure, 1992, 11th edition 2020.
Toussaint (Godfried T.), *The Geometry of Musical Rhythm*, CRC Press, 2020

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Peace and Love,
Gilles de Kaona.