ARK

USER MANUAL



b3FACO

TESSERACT

The user manual was last updated on 24 Sept 2026 12:00.

For ARK Core Firmware v1.01 Make sure to check repo for the right version:

https://github.com/Befaco/Ark/releases

THANK YOU FOR PURCHASING ARK.

Safety Instructions

Please read these instructions carefully before installing or using the module.

- **Disconnect power before installation.** Always switch off your Eurorack case and disconnect it from mains power before installing, removing, or repositioning the module.
- **Check the power connection.** Make sure the module's power cable is correctly oriented and securely connected. Incorrect polarity or connection may permanently damage the module and/or your Eurorack system.
- **Use a compatible Eurorack power supply.** Do not connect the module to power sources other than a suitable Eurorack power distribution system.
- **Observe the power requirements.** Verify that your case and power supply can provide at least 300mA on +12V and 60mA on -12V (5V is not used by ARK)
- **Do not operate with exposed circuitry.** Avoid touching the circuit board, electrical contacts, or other internal components while the module is powered.
- **Keep away from liquids and excessive moisture.** Do not use the module in damp environments or where it may come into contact with water or other liquids.
- **Provide adequate ventilation.** It is recommended to use ARK in a case with ventilation openings or install the module in a way that ensures adequate airflow.
- **Handle with care.** Excessive force, dropping, or improper handling may damage the module or its connectors.
- **If the module behaves abnormally**, immediately switch off the Eurorack system and disconnect power. Do not continue operation if you notice smoke, unusual heat, burning smells, damaged components, or other signs of malfunction.

Warning: Failure to follow these instructions may result in damage to the module, your Eurorack system, or connected equipment, and may cause electric shock or other hazards.

Installation

Install the module only in a suitable Eurorack case. Secure it using the appropriate mounting screws before powering on the system. Ensure that no components or cables are being forced against adjacent modules or the case.

Responsibility

The manufacturer is not responsible for damage resulting from incorrect installation, improper use, modification, or failure to follow these safety instructions.

Technical Support: If you have any doubts or questions regarding module power or installation, please contact technical support at support@befaco.org.

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1. Introduction

ARK is a comprehensive Eurorack solution, combining synthesis, sampling, and advanced CV generation with harmonic tools, all centered on a robust 16-track sequencer. This self-contained instrument acts as a versatile hub for both performance and studio production.

This versatile sequencer can manage internal mixing or direct physical outputs for both CV and audio. MIDI capabilities are equally powerful, allowing for per-track MIDI transmission, parameter modulation via incoming MIDI, or direct control of internal synth engines.

Designed for maximum adaptability, the ARK instrument consists of two separate modules: ARK-Core and ARK-Control. These components can be installed side-by-side, across different rows, or in entirely separate areas of your rack to perfectly accommodate your system's layout.

While the system is intended for integrated use—as the two parts are essentially a single detached module—it is possible to operate the Core module independently for limited applications, such as triggering pre-edited patterns or controlling the internal synth engines via MIDI.

For even greater flexibility, ARK-Control can be housed in an external enclosure and linked to ARK-Core with a single USB cable for both power and data. It can even be used outside of the rack by connecting to the USB host port on the Core module's front panel. To facilitate this, we provide a dedicated external housing, available for purchase separately or as a 3D-printable file for personal fabrication.

The development of ARK is the result of extensive collaboration and hard work by the Befaco and Tesseract Modular teams.
We hope that ARK brings you the same creative joy we felt while building it.

HAVE FUN!

Feedback channels
This module is the most ambitious project we have ever undertaken. Should you encounter any bugs or wish to offer feedback or request features, please report them as issues on our official repository:

https://github.com/Befaco/Ark

If you notice any mistakes or missing information in this guide, feel free to contact us at: support@befaco.org

We always value your feedback!

1.1 Core Vs Control

The ARK system is a single, unified module split into two distinct components: the **Core** and the **Controller**. While these parts are inherently linked, each serves a specific purpose.

The Core, (the one with the display) functions as the engine, managing and generating all signals, whereas the Controller is where you compose your music—much like writing on a musical staff. Although the Core can operate independently when necessary, they are designed to complement and rely on one another.

1.2 Installing ARK

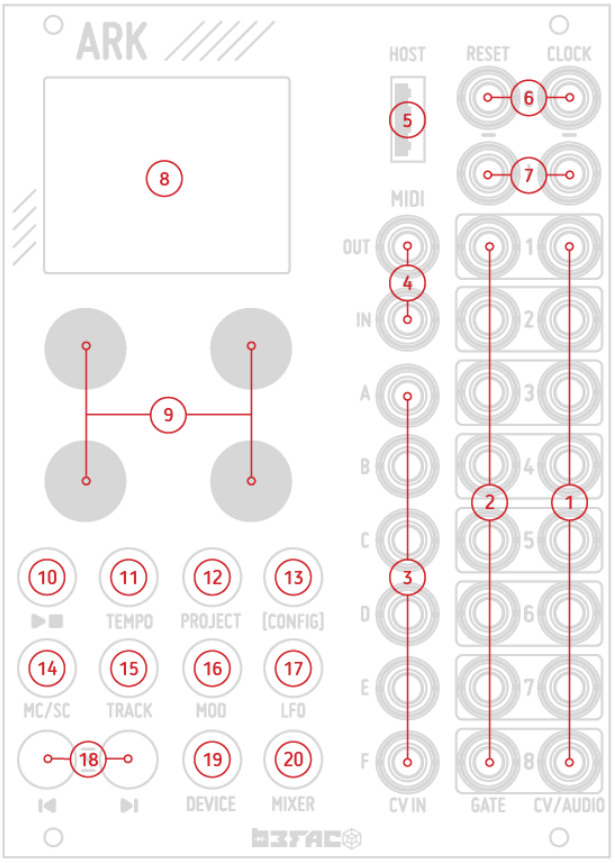
The ARK-Core and ARK-Control units feature independent power distribution. Only ARK-Core connects directly to your Eurorack power supply; it then powers the ARK-Control via a single dedicated cable that handles bidirectional data and power simultaneously.

Depending on your physical layout, you can link the two modules using one of two distinct connection methods and cable configurations:

- ARK-Core and ARK-Control **in the same case.** When mounted together in a single Eurorack enclosure, link the modules internally using the included 6-pin ribbon cable.

- ARK-Core and ARK-Control **in separate cases.** When positioned in separate enclosures, connect the ARK-Core front-panel USB-A port to the ARK-Control using a standard USB-A to USB-C cable. This arrangement allows you to install the units across different Eurorack systems or house the controller in an unpowered standalone enclosure.
  For standalone mounting, a 3D-printable enclosure file is available for personal fabrication.

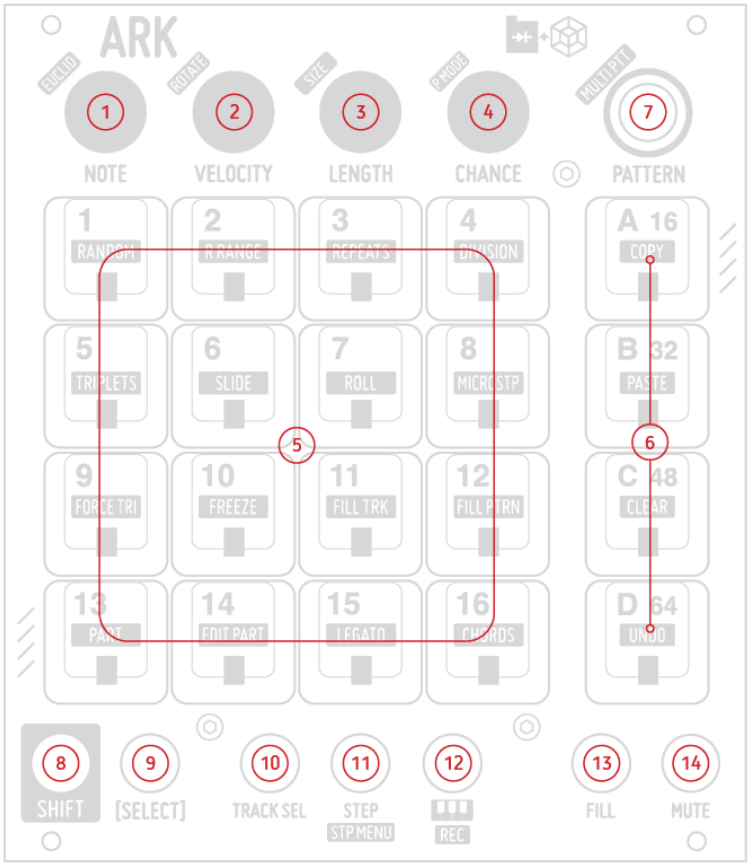
1.3 ARK Core Front panel overview



1. **CV / Audio Outputs.** Analog jacks for the transmission of control and audio signals. By default, outputs 7 and 8 are routed through the internal master mix. (Range ±10V)
2. **Gate Outputs.** Designed to trigger external Eurorack hardware such as envelope generators or sequencers. These are assigned by default to internal tracks 1 through 8. (Range 0 to 10V)
3. **CV Inputs.** Analog ports for external modulation. Use these to control ARK parameters from Eurorack voltage sources like joysticks or LFOs.(range -5V to +10V)
4. **MIDI TRS In & Out.** Enables integration with MIDI controllers and other instruments. The input port is compatible with both Type A and B standards, while the output is Type A.
5. **USB Host.** Dedicated port for connecting flash drives and MIDI peripherals (delivering up to 350mA of current).
6. **Clock & Reset Inputs.** Provides a method to synchronize the ARK sequencer with external master timing signals. These ports respond to any rising edge signal exceeding +1V.
7. **Clock & Reset Outputs.** Provides a master timing signal to synchronize external hardware with ARK. (10V)
8. **Display.**
9. **Multifunction Encoders**. Their operation adapts based on the active page. Rotate while pressing down for rapid value adjustments.
10. **PLAY** Button. Provides manual Start and Stop control for the sequencer.
11. **TEMPO** Button. Opens the Tempo interface for managing project BPM, including options to Nudge, divide tempo, or adjust project-wide Shuffle.
12. **PROJECT** Button. Accesses project-level management and settings.
13. **CONFIG** Button. Accesses the module's configuration interface. Holding this button while pressing MOD, TRACK, TEMPO, DEVICE, PROJECT or MIXER provides immediate navigation to the corresponding configuration pages.
14. **MACRO/SCENE** Button. Toggles between Macro controls and Scene management.
15. **TRACK Button.** Accesses specific parameters and settings for the active track. When the Master Track is selected, TRACK opens the Chords Track editor.

16. **MOD** Button. Accesses the internal Modulation Matrix. Pressing a second time reveals the Mod List, which provides a comprehensive overview of all active Modulation routings.
17. **LFO** Button. Opens the LFO / ARP interface. Repeated presses cycle through the three available parameter pages.
18. **|< >| Buttons.** Use these to cycle through the 16 tracks; pressing both simultaneously returns you to the master track. While in the sample browser or Sample Pool, they navigate between sample banks. In the Tempo menu, they function as manual nudge controls. While on the step page, holding one or more step pads, |< and >| nudge those steps' micro-timing earlier or later by one micro-step (1/6 step).
19. **DEVICE** Button. Successive presses cycle through the device's parameter pages (one or two, depending on the device), followed by the Device FX page when an FX is loaded.
20. **MIXER** Button. Accesses the internal mixing environment. Repeated presses cycle through the Mixer and the control pages for Delay and Reverb effects.

1.3 ARK Control Front panel overview



1. **Note Encoder.** Sets the note pitch for selected steps. In RANDOM and RANGE layers, it governs pitch variability. When combined with SHIFT, it activates and controls the Euclidean rhythm generator by adjusting the number of distributed beats.
2. **Velocity Encoder.** Adjusts the velocity values for active step selections. Within RANDOM and RANGE layers, this control governs velocity variability. When combined with SHIFT, it facilitates the rotation of pattern data left or right across the active (or selected) tracks.
3. **Length Encoder.** Determines gate duration in micro-steps (1/6 of a step). In RANDOM and RANGE layers, it defines duration variability. Combined with SHIFT, it adjusts the sequence size for the selected track.
4. **Chance Encoder.** Governs step probability and conditional triggers. Turning counter-clockwise adjusts likelihood, while clockwise rotation selects logic-based triggers. On the SLIDE page, it defines glide probability, same for ROLL. Use it with SHIFT to choose the track play direction.
5. **4x4 GRID.** The primary workspace for ARK-Control. Its behavior adapts to the active mode: step editing, pattern queuing, track selection, or muting. When combined with SHIFT, it unlocks a secondary layer of control, identified by inverted graphics.
6. **ABCD Bank Selection.** Cycles through step pages or pattern banks. Secondary operations including COPY, PASTE, CLEAR, and UNDO are accessed via the SHIFT modifier.
7. **PATTERN Key.** Opens the pattern grid for selection or queuing. Used with SHIFT, it enables multi-pattern mode for independent per-track pattern assignment.

8. **SHIFT Modifier.** Provides access to hidden parameter layers and auxiliary hardware features. While held, it enables the secondary operations identified by the inverted-style visual labels.
9. **[SELECT] Key.** Enables the creation of intricate steps or multiple track groups for simultaneous editing. It remains blinking when a selection is active. Combine **SHIFT** with **[SELECT]** to clear all active selections instantly.
10. **TRACK SEL Key.** Reconfigures the interface for track management, enabling rapid navigation between the 16 channels and batch editing of step data. While in real-time modes, the 4x4 layout transforms into a bank of dedicated performance pads for immediate track firing.
11. **STEP Button.** Enters the main edit mode for manual programming and per-step parameter locks. Combined with SHIFT, it opens the STEP menu, which lists all parameters of the selected step(s) (note, velocity, length, their random/range values, chance, slide, roll, micro-steps and triplets).
12. **PERFORM/REC Key.** Toggles between real-time playback and capture, transforming the grid into a performance surface or live recorder.
13. **FILL Button.** Momentarily triggers fills or rhythmic rolls on specific tracks for dynamic performance variations.
14. **MUTE Key.** Manages track silencing. Combine with **SHIFT** to enter the SOLO mode.

2 Make Something in 5 Minutes

Prerequisites.

- ARK-Core and ARK-Control modules mounted in a powered Eurorack case
- Included 8-pin ribbon cable
- Included 16-pin power cable
- A pair of patch cables for outputs 7 & 8
- Speakers or a headphone amplifier connected to the outputs

Your first Beat.

1. Ensure ARK is powered and both parts connected between them (as explained on chapter 1.2)

2. Connect your audio output gear to ports 7 & 8, which serve by default as ARK's stereo outputs.

3. Press DEVICE and click an encoder beneath the screen. Browse to the DRUMS section to select and add a **Kick** engine.

4. Hit PLAY on the ARK core and STEP on the ARK Controller, and use the 4×4 grid to program your rhythm. You can modify the sound using the four Core encoders; press DEVICE again to access a second page of sound parameters.

Success! The first ARK Pattern has been successfully programmed.

What to try next.

- **Adjust Tempo:** Press TEMPO and use the left encoder to change the BPM.
- **Layer Drums:** Use the |< / >| buttons to pick a new track. Go to DEVICE to add another DRUM engine. Return to STEP mode to program the grid manually or use the Euclidean generator (as on the next step).
- **Euclidean Patterns:** Hold SHIFT and rotate the leftmost encoder on the ARK Controller to automatically generate rhythms across the Controller's Grid.
- **Mix Your Sound:** Enter the MIXER to adjust volume, panning, reverb, or delay levels. Navigate between tracks using the arrow keys or TRACK SEL.
- **Incorporate Melody:** In the DEVICE menu, select a SYNTH VOICE engine (such as RUBBER SYNTH). Toggle STEP mode to draw a pattern. While holding a grid button, turn the controller’s top encoders to adjust pitch, velocity, length, and chance for that specific step.
- **Control External Gear:** Choose a fresh track and load a V/OCT engine from the CV category in the DEVICE menu. Select an available physical output when prompted, then patch it directly to your external oscillator's pitch input.

- **Switch Patterns:** Enter PATTERN mode to view the 4x4 layout. Tap a pad to select a new pattern, then return to STEP mode to begin composing. Repeat to navigate back to your original work.

- **To save,** click PROJECT → SAVE → choose a slot. Confirm, then name the project and click the green check.

Note.

At power-up, ARK reloads the last saved project from the SD card. Unsaved changes are lost, so save before powering off.

3 Basic Concepts

ARK structures musical data using a clear hierarchical architecture. Familiarizing yourself with these core elements is essential for mastering the sequencer's capabilities.

The system supports up to 255 Projects, with each individual project containing:

- **64 Patterns**: Musical loops (up to 64 notes in length) comprising 16 standard tracks plus a dedicated Master track.
- **16 Parts:** automated pattern chains (up to 64 patterns each) used to structure full arrangements.
- **16 Scenes**: Global sound snapshots that store device configurations and mixer setups.

Within a pattern, every track maintains its own set of step parameters—including Pitch, Velocity, Duration, and Probability—alongside 12 parameter lock lanes. These lanes dynamically assign settings to device and track parameters in sequence as parameter locks.

3.1 Project

A project functions as the master container for your entire session. It stores all 64 patterns, 16 parts, 16 scenes, 16 tracks, scale configurations, tempo settings, and global sequencer preferences as a single preset that can be saved and recalled at any time.

3.2 Patterns

ARK provides 64 patterns per project, acting as the primary musical loops or bars. Each pattern captures step data for all 16 tracks simultaneously, allowing independent step counts, clock divisions, and sequence content per track.

3.3 Tracks

ARK has 16 independent tracks. A track can be configured to generate sound via a synth engine, play a sample, or generate CV to control other modules — as well as output all information via MIDI. The term “track” in ARK refers to two distinct but related concepts:

- **Track as Configuration:** The permanent channel settings that remain consistent across all patterns — Audio and CV and MIDI Routing, Assigned device (synth, sampler, CV), MIDI channel, input source, quantize settings, slide time, etc.

- **Track as Pattern Content:** Each pattern consists of the musical data and playback settings specific to each of the 16 tracks — steps (notes, velocities, lengths), track size (number of steps), clock divider, play mode, Euclidean settings, and the Repeats and LFO-ARP settings.. The same track can have entirely different content in different patterns.

When we say “editing a track,” context determines whether you're adjusting Track Configuration or Track Pattern Content.
The active track selected for editing is indicated in the upper-left area of the screen header as T1, T2, etc. When navigating the Master track, this label changes to MST.

3.4 Output Routing: Internal Tracks vs Physical Connections

ARK manages 16 internal tracks that can be assigned freely to the following physical outputs:

- 8 Gate Outputs
- 8 CV or Audio Outputs
- 1 USB Host MIDI Port (front panel)
- 1 USB-C MIDI Port for Device MIDI And Firmware updates
- 1x TRS MIDI Port
- 1x Expander serial Port (compatible with Befaco **MIDI Thingy** Or future Expansions.

By default, the internal tracks are routed as follows:

- Tracks containing complete audio voices (samplers and synth-drum voices) are routed through the internal mixer, which outputs as a stereo pair via CV/AUDIO 7 and 8.
- Internal tracks 1 to 8 are linked to physical gate outputs 1 to 8.
- All musical track data (including notes, velocity, and other parameters) is simultaneously transmitted via the TRS MIDI port on corresponding channels (e.g., MIDI Ch 1>Track 1, MIDI Ch 2>Track 2, etc).

When non-audio devices (such as LFOs or envelopes) or Oscillators are loaded, you will be prompted to choose a specific output. These signals bypass the internal mixer.

Directing a sound channel to an individual physical port bypasses the master bus, though volume levels, stereo panning, and effect send parameters continue to operate normally.

Several internal synth engines produce stereo audio. While these voices route through the main mixer by default, assigning them directly to physical jacks lets you choose between stereo and mono operation.

For a comprehensive guide on establishing custom routing configurations, please consult Chapters 8.3 to 8.6.

3.5 Input Routing and Monitor

Control signals from external CV sources or MIDI can interact with ARK via two distinct operational paths:

1. Parameter Modulation: Managed within the MOD matrix page, allowing incoming control voltages and MIDI messages to modulate active device settings or track parameters. (see Chapter 13 for comprehensive details).
2. Direct Sequencer Control: Utilizes the Monitor feature to inject external or internal pitch signals directly into a track, replacing or transposing the sequence note data in real time. This path is what is covered in this chapter.

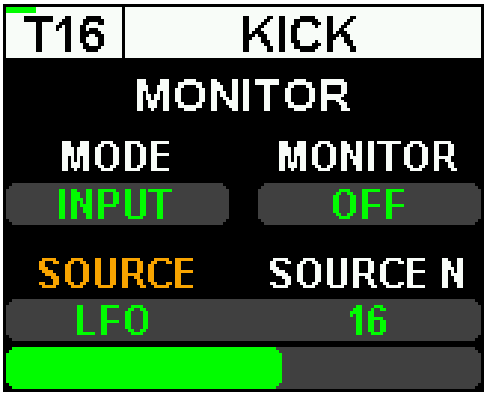
3.5.1 Monitor function Key Capabilities

- Smoothly alternate between internal sequence playback and external performance controllers (such as master keyboards).
- Dynamically transpose channel sequences using controllers, analog CV, internal LFOs, or other tracks.
- Utilize physical CV inputs as clocked harmonic quantizers constrained to your project's active scale.
- Record live performance data—from external controllers, analog voltage, or LFOs—directly into step sequences.
- Cross-route note information between channels, using musical events from one channel to drive others.

Utilizing the Monitor interface allows musicians to dynamically alternate between external signal routing and internal pattern sequence data. This provides a fluid method for toggling pitch sources. Enabling or disabling the MONITOR feature across specific channels offers a powerful performance technique for introducing spontaneous movement into repetitive sequence loops.

Incoming control signals can be captured in live mode or permanently written into static step data using the FREEZE function.

3.5.2 Monitor/IN Operation



All channel routing configurations are consolidated within the MONITOR page. To access this page, hold SHIFT and press TRACK SEL on ARK-Control (or navigate to CONFIG → TRACK CONFIG → MONITOR). Upon entry, the controller grid illuminates pink, with each pad displaying the active ON/OFF monitoring status for the corresponding 16 channels. The display simultaneously opens the Monitor menu, presenting the following parameter options:

Input

Beyond real-time play and capture via the controller grid, ARK supports multiple alternative input sources—including live performance from external MIDI keyboards.

Input routing options like **Track** or **MIDI** transfer comprehensive event parameters (Note, Gate, and Velocity) into the target channel. Conversely, note-only modulation sources capture purely pitch information while preserving existing sequence rhythms, functioning similarly to a sample-and-hold process triggered on active steps.Complete data sources:

Inputs	Description	Range
Track (1 -16)	The output of a track will be recorded in another one. The input track has to be a previous one if we want an identical replication, so track number 2 can only have track number 1 as input.(that's because tracks are processed sequentially),	Bipolar
MIDI (1–16)	External MIDI source on channels 1 to 16	Unipolar

Note only sources:

Inputs	Description	Range
LFO (1–16)	LFO signals from tracks 1 through 16.	Bipolar
Note (1–16)	Note (1–16): the current note of internal track 1–16 (pitch only; the receiving track keeps its own rhythm). Bipolar in Transpose mode, with C4 as the center.	Bipolar, C4=Center
Velocity (1–16)	The current step velocity of internal track 1–16, used as a pitch value.	Unipolar (0-127)
CV In (A–F)	Signals from the six physical CV input ports.	Bipolar
Track Output (1–16)	Control signal from any track containing an active CV device.	Same as Device
Macro (1–4)	Manual control via the four internal Macros (refer to Chapter 14).	Unipolar
MIDI CC (0–127)	MIDI CC (0–127): incoming MIDI Control Change number 0–127, received on any MIDI channel (omni) from TRS, USB Host or USB Device.	Unipolar

Monitor Mode:

Select one of three available operational modes to define how incoming control signals interact with stored note content. These modes only apply when the Monitor is ON.

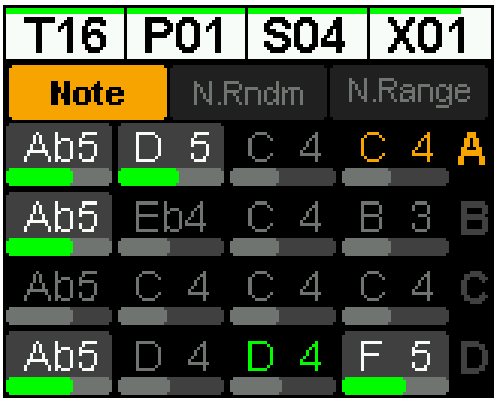
- **Input:** Incoming external signals completely override and replace existing track note information.
- **IN and Track:** Incoming melodic events take priority over stored pattern notes. Please note that when Input is assigned to a continuous modulation source lacking discrete triggers (such as CV inputs or LFOs), the channel acts like **Input** behavior, as an active gate may be obtained from somewhere and these sources can not provide it.
- **Transpose:** Combines incoming voltage or MIDI data with internal pattern values, dynamically shifting sequence pitch higher or lower.
  Transposition via an external keyboard is bipolar, with C4 acting as the center.

Monitor

Displays the monitor status (ON/OFF) for the selected channel. Toggling this parameter provides the exact same functionality as activating monitoring directly via the controller grid pads.

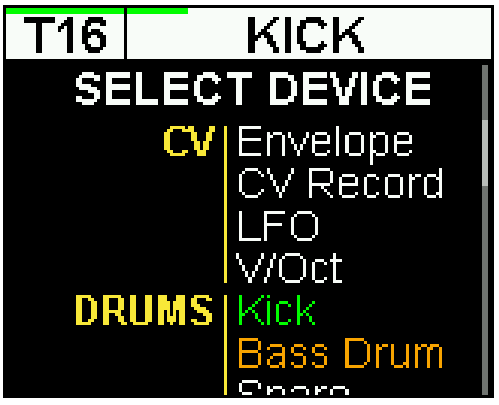
For further explanation on input routing and the MONITOR function, please check chapters 8.6 and 8.7

3.6 Steps



Steps are the individual events within a track — up to 64 per track — containing note pitch, velocity, length, and parameters like slide, roll, and probability. Steps are where you place notes and rhythms. To lock a parameter value to a specific step, hold down the target step pad while adjusting the corresponding parameter control.
A step can also be activated or deactivated by quickly tapping its button.

3.7 Devices and Device FX



A device is the sound source or CV/MIDI generator assigned to a track. It acts as the engine that determines the track's function. You can assign either an audio instrument—such as Drum voices, Samplers, or Synth voices—for sound generation, or a CV device—like V/Oct, Envelope, or LFO—to control external modules. Each of the 16 internal tracks holds one device at a time, and the device type determines whether the signal is routed by default to the internal mixer or requires a specific physical output assignment.

Device FX are per-track audio processors inserted after the device. Each audio track supports one effect for sound shaping within the sequencer. CV devices do not support effects.

Each track holds one device and one Device FX.

Note. System resources usage—including CPU and memory—is determined by the specific combination of Devices, Device FX, and the file size of loaded samples. Depending on the

complexity of your configuration, loading engines and effects on all 16 tracks simultaneously may not be possible if system resources are exceeded.

3.8 Scenes

Scenes allow you to quickly switch between different parts of a song or performance, while keeping the desired instruments and settings ready to play. They provide an efficient way to organize and recall different sounds during live performance or sequencing.

ARK includes 16 Scenes that operate as complete sound presets. Each Scene captures a snapshot of the sound setup across all 16 tracks, including device configurations, Device FX, and mixer settings.

Changing scenes alters the overall sound instantly without modifying your underlying pattern data.

Please check section 16 for further info on how to operate with scenes

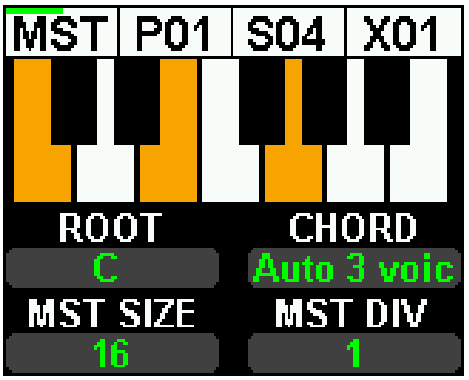
3.9 Parts

A Part is a sequence containing as many as 64 patterns that trigger in succession. Functioning as the ARK's "song mode," these 16 available parts enable you to organize patterns into full musical arrangements.

You can toggle between pattern playback and part playback at any time during a session.

Refer to Chapter 19 (Patterns and Parts) for more in-depth instructions on managing and composing with parts.

3.10 Master Track and Chords Track



In addition to the 16 standard tracks, ARK features a dedicated 17th channel known as the **Master Track**. While individual tracks can possess unique sequence lengths, the global duration of a pattern is governed by the Master Track's size and clock division. Linked directly to this master layer is the **Chords Track**, which enables the storage of specific chord or scale data on a per-step basis.

The Chords Track serves as an internal harmonic guide rather than a sound source; consequently, it does not support device assignments or MIDI transmission. Its operational parameters—including sequence size, clock division, and playback direction—are hard-wired to mirror the state of the Master Track.

4 Core & Control Overview

4.1 ARK-Core

ARK-Core handles all inputs and outputs — the hub for sounds and settings. It has four encoders and twelve push buttons; each lights up to indicate the current page, pressing again cycles to the next.

Core Encoders.

While in Left encoders navigate lists and confirm selections (click to enter); right encoders adjust the selected value. When four items are displayed in a 2×2 grid, each encoder controls its corresponding item. In this layout, pressing the active CORE button cycles through the available pages — e.g. pressing MIXER repeatedly steps through MIXER, DELAY and REVERB pages. Pressing and turning any encoder changes values in larger increments.

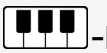
Core Buttons VS functions

Button	Function
PLAY / STOP	Start and stop the sequencer.
TEMPO	Open the Tempo Menu.
PROJECT	Open the Project Menu.
CONFIG	Open the Config Menu. Holding this button and pressing another gives direct access to that section's config (e.g. Config + Device → Device Config).
MC / SC	Open Macro mode. Press again to enter the Scene menu.
TRACK	Open the Track menu.
MOD	Open the Modulation matrix. A second click shows a list of the active modulations.
LFO	Open the LFO / ARP menu.
|< >|	Navigates left/right through the 16 tracks (press both together to jump to the Master Track). Switches sample banks in the sample browser, or temporarily nudges BPM up/down in the TEMPO page. While on the STEP page, holding one or more step pads, |< and >| move the notes in those steps one micro-step (1/6 step) earlier or later within their step, for micro-timing.
DEVICE	Open the Device menu to configure the sound source and FX assigned to the current track.
MIXER	Open the internal Mixer, where levels, panning and effect sends are accessed.

4.2 ARK-Control

ARK-Control is where you edit beats, select patterns, and perform in real time. Mode buttons control how the grid behaves — tap to toggle, hold for momentary (releasing returns to the previous mode). Grid LEDs reflect the current state.

Controller function buttons (the round ones)

Button	Function
PATTERN	Access the 64 patterns. While the sequencer is running, clicking a pattern queues it next. Holding Pattern + click sets it instantly. Shift + Pattern activates multi-pattern mode, where each track can play a different pattern independently.
SHIFT	Modifier button. Holding it unlocks secondary functions on the grid buttons, bank buttons and encoders.
[SELECT]	Build a step or track selection facilitating editing them all simultaneously. Also enables multi-track selection. (see chapter 5)
TRACK SEL	The grid displays all 16 tracks and their activity. Clicking a pad selects that track. Holding a pad while turning an encoder applies the change to all steps in that track. Used in conjunction with SHIFT, it opens the MONITOR page (Pink) where the input of the track of choice can be activated and deactivated (See chapter 5)
STEP	Enter step-edit mode. Each pad represents one step — click to toggle. Hold a step and turn the encoders to edit its note, velocity, length, or chance. Used in conjunction with SHIFT, open the STEP Menu where all parameters relative to the steps of these tracks can be seen and edited in one place.
-REC Button	Tapping this key engages real-time play or recording performance modes. The 4×4 layout reconfigures into an isomorphic note grid assigned to the active channel, automatically monitoring incoming data from external MIDI controllers—such as a keyboard attached to the USB Host port—directly to the channel input. When operated in conjunction with the TRACK SEL button, the pads trigger / capture events across all 16 channels at once. Hold SHIFT while pressing PERFORM/REC to enable live recording of notes and parameters.

Button	Function
FILL	Holding each pad triggers a fill on its corresponding track — equivalent to enabling all steps momentarily. Holding a pad fires a fill on its track, as if every step were on for as long as you hold it. Bank D gives a plain fill with no roll. Banks C, B and A add rolls of increasing density, and A is the densest.
MUTE	Manages manual silencing of tracks. A rapid tap toggles ON and OFF, while a sustained hold provides momentary control. Silenced channels are highlighted in yellow. While typically asynchronous, muting can be synchronized to the project tempo within the GLOBAL CONFIG menu. Utilize the SHIFT + MUTE command to activate the SOLO function, which always remains asynchronous.

Grid Buttons (Mechanical keyboard)

The 4×4 GRID is the main workspace of ARK-Control. Its function adapts completely to the active mode. LEDs reflect the current state, showing which steps, patterns or tracks are active, selected or muted. These are hot swappable mechanical keyboard switches that can be replaced by the user if a different action feeling is desired.

In Step mode, the Bank Buttons (A, B, C, D) select which group of 16 steps is displayed: 1–16, 17–32, 33–48 or 49–64. In Pattern mode, they switch between the four banks of 16 patterns each. In Edit Part mode, they also switch between the four pattern banks of the selected part.

The Control Encoders control step parameters — note, velocity, length and chance. Holding Shift while turning them switches to track-level controls: Euclidean generator, Rotation, Size, and Play Mode. Pressing and turning any encoder changes values in larger increments.

5 Controls & Workflow

5.1 Control and Core Buttons Behavior

The operational logic of the **ARK-Control** interface is heavily influenced by the duration of button presses, distinguishing between momentary taps and sustained holds to maximize functional density.

4×4 GRID Interaction: A rapid tap on a grid pad toggles step states. In contrast, sustaining a pad allows for track selection management. Holding a pad while simultaneously adjusting encoders enables non-destructive step editing or facilitates total track modifications, depending on whether the STEP or TRACK SEL button is active.

Dual-Action Navigation: Several primary keys on ARK-Control feature dual-action behavior. A sustained hold provides temporary access to secondary operational pages, with the interface automatically reverting to its previous state upon release. This workflow is integrated into the following keys:

- **TRACK SEL:** Temporary track navigation and batch editing.
- **STEP:** Main edit mode and per-step parameter locking.
- **PERFORM/REC:** Toggles real-time performance and capture modes.
- **FILL:** Triggers momentary rhythmic fills or rolls.
- **MUTE:** Quick track silencing.
- **PATTERN:** Instant pattern queuing and selection.

Within the **ARK-Core** interface, specific buttons feature multiple parameter layers, which are cycled through successive presses.

The navigation flow is organized as follows:

Button	First Page	Second Page	Third Page
MC/SC	MACROS	SCENE	
MOD	MODULATION MATRIX	MODULATIONS LIST	
LFO	LFO CONTROLS 1	LFO CONTROLS 2	LFO CONTROLS 3
MIXER	MIXER CONTROLS	DELAY CONTROLS	REVERB CONTROLS
DEVICE	DEVICE CONTROLS 1	DEVICE CONTROLS 2	FX CONTROLS

DEVICE CONTROLS 2 only appears for devices with more than four parameters, and FX CONTROLS only appears when a Device FX is loaded on the track.

5.2 SHIFT Button: Accessing Secondary Functions

The SHIFT modifier is the gateway to the ARK's secondary control layer. When SHIFT is held, all encoders and grid buttons unlock additional parameters, visually identified by inverted "black on white" graphics on the hardware.

Four critical track-level parameters are accessible by holding SHIFT while adjusting the controller encoders:

- **EUCLIDEAN (Note Encoder):** Governs the Euclidean rhythm generator by adjusting the number of distributed beats.
- **ROTATE (Velocity Encoder):** Facilitates the left or right rotation of pattern data across the active track.
- **SIZE (Length Encoder):** Adjusts the sequence length (number of steps) for the selected track.
- **PLAY MODE (Chance Encoder):** Determines the playback direction of the track (e.g., Forward, Backward, Pendulum, or Random).

5.3 [SELECT] Button: Editing several things at the same time

The **[SELECT]** key provides a powerful method for managing groups of steps, tracks, or patterns to be edited together.

- **Step Selection.** Enables the modification of multiple steps simultaneously without needing to manually sustain each grid pad.
  While in STEP mode, hold **[SELECT]** and tap the desired steps to perform batch edits across the selection.
  Holding the SELECT Button without selecting any step will momentarily select all the steps in the Pattern allowing the edit of all at the same time.
  Combining **[SELECT]** with the ABCD bank buttons allows for the immediate selection or de-selection of all 16 steps within a bank.
  Use **SHIFT** + **[SELECT]** to instantly clear any active selections.

- **Track Selection.** Facilitates the simultaneous editing of parameters across multiple channels. While in TRACK SEL mode, hold **[SELECT]** and tap the grid pads to group tracks for batch processing. The following track parameters support batch editing:
  - Sequence Size
  - Euclidean Density
  - Pattern Rotation

  Holding the SELECT Button without selecting any track will momentarily select all the tracks in the Pattern allowing the edit of all at the same time.

To exit track selection, use the **SHIFT** + **[SELECT]** command or press the **|< or >|** navigation buttons on the Core.
Furthermore, when Multi-pattern mode is engaged (SHIFT+PATTERN), choosing a pattern will apply only to the tracks in the current selection;

- **Pattern Selection.** Used to organize patterns into a specific playback sequence to form a Part. While on the PATTERN page, hold **[SELECT]** while tapping patterns in your preferred order and frequency. The sequencer will automatically reproduce this sequence, effectively creating a Part (refer to the Parts chapter for advanced usage instructions).

The **[SELECT]** key offers great flexibility but demands attention to prevent accidental modifications. While steps are selected, manipulating encoders creates immediate parameter locks or data changes. Be sure to check the **[SELECT]** key; if it is flashing red, it means something is selected. To reset your selection and ensure no unintended adjustments occur, simply use the **SHIFT** + **[SELECT]** shortcut.

To rectify any unintended changes, utilize the **UNDO** command to revert previous step data.

In the event that a parameter lock is established erroneously, hold **SHIFT** while clicking the P-Locked encoder to immediately clear the lock from the selection.

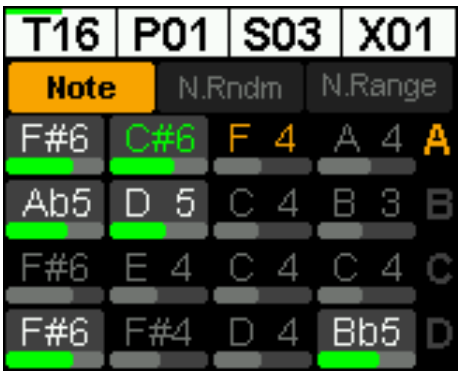
5.4 TRACK SEL Button: Selecting Tracks

Accesses the track-selection interface, providing a comprehensive overview of all 16 channels via the 4x4 layout. Tapping a pad instantly designates that track as active; the grid LEDs provide real-time visual feedback by blinking in sync with channel activity. By sustaining a pad, all steps within that track are highlighted, enabling batch-editing across the entire track when manipulating the controller encoders.

Utilize the **[SELECT]** modifier while interacting with the grid to group multiple tracks for simultaneous control.

5.5 STEP Button: Triggering Notes

Click STEP to enter step edit mode. Tap fast on the grid to toggle a step on/off. Hold any grid key to select without changing the step state and turn the encoders to set parameters (note, velocity, probability…). Hold [SELECT] and click to add steps to the selection — turning an encoder will then affect all selected steps.



If the sequencer is not playing, clicking a pad plays the step but may also change its state if held briefly. Holding STEP while clicking plays the step without changing its state.

Press STEP again while in step mode to show the step parameters (note, velocity, length and chance, with their random and range layers) on the Core display. SHIFT + STEP opens the full STEP menu list.

Activating any step beyond the current sequence size automatically expands the track length to the end of that bank.

5.6 -REC Button – Live Play & Live Record

Tapping this key activates Live Play. Use in conjunction with SHIFT to enable Live Record. The system supports various real-time capture techniques, with three specific methods determined by the active controller mode:

- **During Track Select Mode:** The grid layout provides direct access to all 16 channels. Interacting with the pads allows for the simultaneous real-time capture of pattern data across the entire track set. Access this mode by tapping TRACK SEL Button.
- **During Step Mode:** Facilitates the playback and capture of musical information exclusively for the active channel. The 4×4 layout reconfigures into an isomorphic note grid. The specific arrangement of the pads is determined by track quantization: snapping to the project's primary scale when active, or offering a full chromatic layout when disabled. Bank buttons A and D provide immediate access to higher and lower octaves, respectively. In addition to the grid, this mode accepts incoming data from external MIDI instruments or internal track routing (see Section 3.5). When using velocity-sensitive MIDI hardware, all dynamics are captured and stored.

  Tapping STEP while the note keyboard is shown returns to the step grid and ends Live Play/Record. Pressing PATTERN or FILL also cancels Live Play.
- **During Fill Mode:** Tapping a pad initiates a fill on the matching channel, facilitating the live play and capture of rhythmic fills. Use bank D for a plain fill, or banks C, B and A for rolls of increasing density (A is the densest).

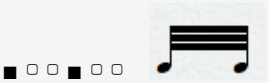
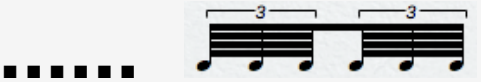
  Enter this interface by tapping the FILL Button. (see next chapter)

Note. Manipulating device or mixer parameters while the live record is active and the sequencer is running generates parameter locks, so tweaking the cutoff of a synth device in this situation will capture that motion into the pattern.

5.7 FILL: Manual Rolls

A fill is a short musical phrase or rhythmic pattern used to add variation or smoothly transition between sections of a song.

While in Fill Mode, interacting with the grid initiates a fill on the matching channel. Additionally, bank buttons A, B, C, and D can be utilized to choose between different rolls with escalating levels of density:

Bank	Pattern
Bank D 16th-note FILL (no roll)	
Bank C	
Bank B	
Bank A	

TIP. If Live Record is active, fills are recorded too, creating a fast way of making patterns. A plain fill (bank D) adds the first microstep of each step it plays, keeping existing microsteps. Rolls (banks C, B, A) write their roll pattern into the step's microsteps, replacing microsteps 2-6; the roll setting itself is not stored. Steps with a programmed Roll are also written into microsteps while Live Record is on (see 6.1).

5.8 MUTE

Mutes temporarily silence a specific track. They allow musicians to isolate specific instruments in real-time for mixing purposes without deleting the underlying musical data.

Mute behavior can be latched (click on the grid) or momentary (hold the grid button). Latched mute toggles on/off. Momentary mute unmutes (or vice-versa) on release. Muted tracks turn yellow on the grid and in the mixer.

While typically asynchronous, muting can be synchronized to the project tempo within the **GLOBAL CONFIG** menu. Navigate to CONFIG → GLOBAL CONFIG → Synched Mutes and enable the feature.

With Synched Mutes on, mute changes are queued (the pad blinks) and applied at the end of the current pattern (Master Track cycle). To mute or unmute at once, keep the MUTE button held while tapping the pads.

5.9 PATTERN: Selection and Multi-Pattern Logic

A **pattern** serves as a cyclical musical loop that stores the comprehensive state of all 16 tracks. Within the ARK environment, a **multi-pattern** offers per-track control, facilitating the assignment of independent pattern data to specific channels rather than a global change.

Each project contains 64 patterns (divided into 4 banks of 16 each) and they are accessed using the 16 grid buttons plus the 4 right side bank buttons.

5.9.1 Pattern operation

While navigating the pattern page (marked by a green **PATTERN** key), tapping the 4x4 grid during operation queues the chosen slot for the following cycle, according to the master track duration. To force an instantaneous transition, maintain a hold on **PATTERN** during your selection.

TIP. Organizing pattern chains for automated playback is simple: hold the **[SELECT]** key while tapping the grid slots in your desired sequence. Pressing the same pad repeatedly inserts multiple iterations into the chain (consult Section 19.2.1 for complete part composition details).

5.9.2 Multipattern operation

Multi-pattern mode allows patterns to be loaded on an individual track basis. To activate this feature, press **SHIFT** and **PATTERN** simultaneously. While multi-pattern mode is on, the PATTERN button lights red (instead of green on the pattern page) enabling independent sequence management for each track. Re-entering the same shortcut and selecting a pattern restores standard synchronized playback across all tracks.
While in Multi-pattern mode, assigning a new pattern applies instantly to all channels in the current selection group. You can create these channel groups within the **TRACK SEL** interface by maintaining a hold on **[SELECT]** while tapping your target tracks on the grid.

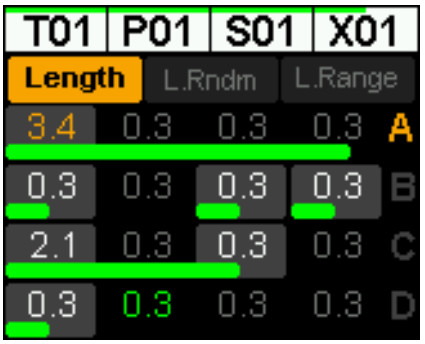
Note. When ARK is in multi-pattern mode, parts have no effect at all.

5.10 Controller Encoders

The four encoders on the ARK controller set note, velocity, length, and chance for a step (or a [SELECT] selection). Press the step to activate it, or use [SELECT] to edit multiple steps simultaneously.

In track-selection mode, holding the corresponding grid button while turning an encoder applies the change to the whole track (current pattern only).

5.10.1 NOTE, VELOCITY and LENGTH encoders.

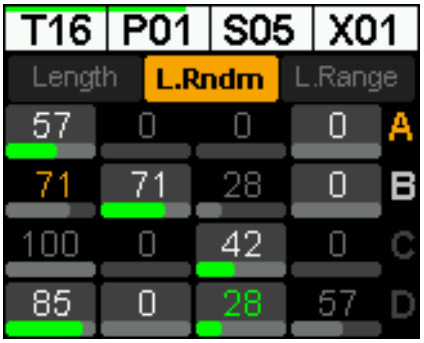


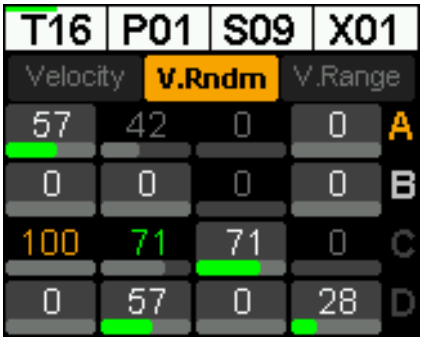
Modifies step values (or active [SELECT] groups) for Note, Velocity, and Duration. Depending on the selected parameter layer, these controls also dictate the probability depth or bipolar spread limits for these settings.

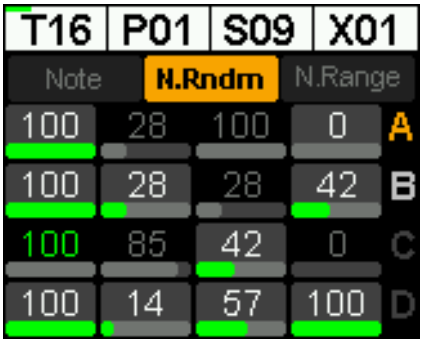
To access the RANDOM and RANDOM RANGE sub-layers, hold SHIFT and press grid pad 1 or 2, respectively. The RANGE parameter operates in a bipolar fashion, setting variance limits from (base − range) to (base + range). For instance, an active step assigned to pitch C4 with 100% note probability and a note range of 12 randomly generates values spanning C3 through C5 during sequence execution.

The active parameter layer dictates how the NOTE, VELOCITY, and LENGTH controls operate:

Layer	Note encoder	Velocity encoder	Length encoder
Default	note	velocity	length
Random	note random	velocity random	length random
Range	note range	velocity range	length range







When scale quantization is enabled on the active track, all generated variations automatically snap to the designated harmonic framework. Setting probability or range values to 0% completely deactivates random generation.

Beyond their primary roles, maintaining a hold on the SHIFT modifier while adjusting these three control encoders unlocks an auxiliary layer of track-level parameters:

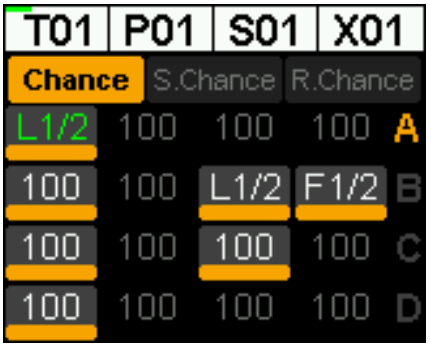
Secondary function:

SHIFT + NOTE: **EUCLIDEAN.** Engages the Euclidean rhythm generator and modifies the active beat distribution (consult Chapter 7.1 for detailed instructions).

SHIFT + VELOCITY: **ROTATE.** Shifts sequence step data left or right across the active channel.

SHIFT + LENGTH: **SIZE.** Adjusts total sequence length for the track (refer to Chapter 7.4).

5.10.2 CHANCE encoder



The **4th ARK Controller encoder adds** controlled variation to binary parameters such as **STEP, SLIDE, and ROLL**.

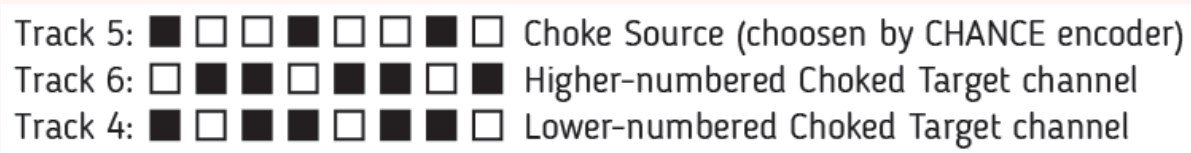
While range-based parameters such as **NOTE, VELOCITY, and LENGTH** randomize their values, **CHANCE** determines whether a binary event is triggered or not. This can be determined by **probability** or by deterministic **conditions**

Turn the **CHANCE encoder anticlockwise** to enter **Probability** mode, where you can reduce the likelihood of a step being triggered from 100% (always active) down to 12.5% (rarely active). Turn the encoder **clockwise** to move through **Conditional** and **Choke** modes where the existence of the step depends on simple rules.

Conditional determines whether a step is activated according to playback cycles. For example, **F3/7** triggers only during the first 3 passes of every 7, **2/8** triggers only on the 2nd pass of every 8, and **L2/5** triggers during the final 2 passes of every 5.

Choke suppresses a step whenever its designated choke channel fires. Because ARK evaluates channels sequentially from top to bottom, the result depends on the channel order. Assigning channel 6 to choke channel 5 ensures they never play together, while choking channel 7 allows simultaneous firing but blocks any trigger immediately following it.

Choke Example.



Chance encoder Secondary function:
Beyond its primary role, holding SHIFT while turning the CHANCE encoder changes the track's Play Mode (see chapter 7.3)

5.11 Grid Buttons

ARK's keyboard buttons (the black square ones) are the main interface to introduce Notes and commands on the ARK controller.

They are divided into two main categories:

- **4x4 GRID:** Depending on the context these buttons allow the user to introduce and/or select STEPs, NOTEs, TRACKs, SCENEs or PARTs

- **ABCD Column:** Switches to the corresponding bank of patterns or steps depending on the controller mode. In step, slide, and roll modes, clicking any of these while the sequencer is running may disable "follow playhead" — The displayed bank then lights solid while the bank containing the playhead blinks. Press the blinking bank button to turn "follow playhead" back on.They can also be used for step selection: holding SELECT and clicking bank A adds steps 1–16 to the selection.
  All light at the same time on a solid color when the current page does not use them.

The following table details the different pages alongside their corresponding grid functions and colours:

PAGE	COLOUR	4X4 GRID	ABCD COLUMN
STEP	RED	Each pad maps to a step, toggling gate states on/off. Also selects target steps for editing.	Selects active step banks (A, B, C, or D).
TRACK SEL	BLUE	Designates the active track.	NOT USED
PATTERN	MANY/GREEN	Selects or queues patterns.	Selects pattern banks (A, B, C, or D).
FILL	RED /WHITE	Triggers and releases fill patterns dynamically.	Displays and chooses active FILL modes.
MUTE	YELLOW/RED	Mutes or unmutes channel playback.	NOT USED
	MANY	Transforms into an isomorphic keyboard configured to the project scale.	Indicates active register. A and D shift pitch up or down by octaves.
MONITOR	PINK	Enables or disables signal monitoring across tracks 1 through 16.	NOT USED
SCENE	ORANGE	Selects active scene snapshots (1 through 16).	NOT USED
PART	WHITE	Selects song arrangement parts (1 through 16).	NOT USED
DIVISION	GREEN	Adjusts track clock division values (1 to 64).	Selects clock division banks: A=1–16, B=17–32, C=33–48, D=49–64
SIZE	GREEN	Sets sequence length for tracks (1 to 64 steps).	Selects sequence length banks: A=1–16, B=17–32, C=33–48, D=49–64

SLIDE	GREEN	Each pad maps to a step, enabling or disabling portamento glide curves.	Selects step banks (A, B, C, or D).
ROLL	GREEN	Each pad maps to a step, toggling ratcheting rolls on/off.	Selects step banks (A, B, C, or D).
MICROSTEP	YELLOW	The six illuminated buttons represent each Microstep inside the selected step (see chapter 6.1	Selects step banks (A, B, C, or D).

5.12 ABCD Bank Buttons secondary functions.

Beyond the primary functions detailed in Section 5.11, each control button has a secondary operational layer when combined with the SHIFT modifier, visually indicated on the panel by inverted visual labels.

The ABCD bank selection keys feature the following auxiliary operations:

5.12.1 COPY.

Stores a reference to the current part, pattern, track, scene and selected steps. This reference identifies the source for the next PASTE. Alternatively a STEP or TRACK can be copied

5.12.2 PASTE.

Pastes a different element depending on the mode the ARK Control is currently in (**steps, chords, tracks, patterns, parts or scenes**). The source is whatever was noted at the time COPY was pressed; the destination is the element selected now. For example, if COPY is pressed while a scene is active and PASTE is pressed later on a different scene, the copied scene is pasted onto the currently selected one.

Pasting steps: When the source is a single step, PASTE behaves as follows:

If no destination steps are selected, the step is pasted onto the currently selected step.

If several destination steps are selected, the single copied step is stamped onto every selected step. This is a quick way to repeat one step across a pattern (for example, filling in a hi-hat or an accent).

When the source is a multi-step selection, the whole selection is pasted while preserving the spacing between steps. The first copied step lands on the first selected destination step —

or on the currently selected step if no destination is selected — and the rest keep their relative positions. Only the copied steps are written; steps that were not selected in the source leave their destination counterparts untouched. Any step that would fall past the end of the pattern is not pasted.

Chords-track steps follow exactly the same rules.

Parameter lock behavior during copy operations: Copying a single step will omit parameter locks if pasted across different tracks or patterns. Similarly, copying an entire track excludes parameter locks when pasted to a different target track.

5.12.3 CLEAR.

Clears whatever you are editing (step, track, pattern, part…) by setting it to default values. In step mode, if any step is selected, it is cleared; without selection, all steps in the track are cleared.

Editing Shortcut.

Steps, tracks, patterns, parts and scenes can be copied, pasted or cleared without holding SHIFT. On the matching page, hold the target pad and press A (COPY), B (PASTE) or C (CLEAR). DUPLICATE always needs SHIFT + pad 11.

5.12.4 Undo.

Reverts previous operations. The track level serves as the minimum undo level. Performing an undo restores the track's initial state and reverts all modifications made during a sequence of edits (such as adjusting beats, notes, or track size). A new undo point is created whenever editing switches to a different track or item (such as a part or device).

Press SHIFT + D (UNDO). The screen asks which edit to restore (e.g. “Restore edits on track 3 pattern 1?”). Confirm to undo it, or cancel to keep the current state.

The backup buffer maintains up to 10 undo levels.

5.13 Grid Buttons secondary functions.

On top of the primary functions described in Section 5.11, the 4x4 grid keys feature the following auxiliary operations when combined with the SHIFT modifier, visually indicated on the panel by inverted visual labels.

1. **RANDOM:** Access the RANDOM Layer, where the randomness of the NOTE, VELOCITY or LENGTH can be edited by using the encoders of the same name
2. **RANDOM RANGE:** Access the RANDOM RANGE Layer from where the range of variation (maximum vs minimum values) of the NOTE, VELOCITY or LENGTH can be edited by using the encoders of the same name
3. **REPEATS:** Access the REPEATS Menu. Where repetition of each gate can be introduced (see chapter 7.9)
4. **DIVISION:** Direct access to edit track's clock division.
5. **TRIPLETS: A triplet** is a rhythmic grouping that divides a beat into three equal parts instead of the normal four subdivisions. With triplet timing, three notes occupy the same duration as four notes would in standard timing. For example, in 4/4 time, four sixteenth notes normally equal one beat; with triplets, three notes are played in the space of one beat.

ARK's time grid can be set in triplets, in sections of four steps. When a pattern has triplets, 3 steps take the same time as 4 without triplets — the last step of those 4 is ignored. This setting affects all tracks.

Engage the TRIPLETS interface by holding SHIFT and tapping pad 5 (TRIPLETS) on the controller grid. From here, select the specific regions you wish to subdivide; active triplet sections are indicated by a blue highlight.

- Triplet settings are applied globally across every track.
- The fourth step in each triplet group is bypassed.
- Project shuffle parameters do not impact triplet-enabled sections.

The Force Triplets feature allows you to impose a triplet subdivision on any pattern, regardless of its native timing. To activate this, hold SHIFT and press pad 9 (FORCE TRI) on the grid. Repeating this shortcut toggles the sequence back to a standard 4-step subdivision.

6. **SLIDE:** Opens the SLIDE Page, enabling portamento to be toggled per step across the grid.
7. **ROLL:** Opens the ROLL Page, enabling a ratcheting effect to be toggled per step across the grid.
8. **MICROSTEP:** Accesses micro-step edit mode to fine-tune events at 1/6th step resolution. The six lit pads turn yellow, corresponding to the available micro-steps that can be toggled on or off.
9. **FORCE TRIPLETS:** Toggles triplet timing on every 4-step group of the running sequence, whatever the pattern's own triplet settings. Press SHIFT + pad 9 again to turn it off. To set triplets per section, use TRIPLETS (pad 5), where each row of the grid is one 4-step section.
10. **FREEZE:** Renders the real-time channel output into static step data, deactivating all dynamic and algorithmic engines for the selected track and pattern (see chapter 7.8).
11. **DUPLICATE:** This function will perform a duplication in the following ways:

-When used within the STEP mode, if no steps are selected, the whole track will be copied and the size will be doubled (e.g. 16 steps → 32 steps).

-In STEP mode, with selected steps, they will be copied starting on the next step where the selection ends. The selection will change to the newly copied steps, and if the copied steps exceed the track size, it will expand accordingly.

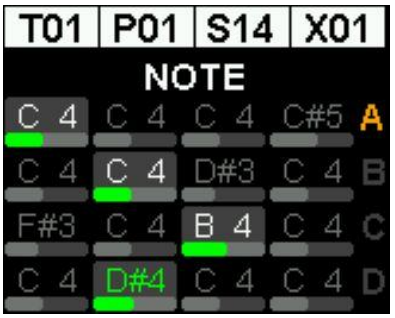
-In PATTERN mode, the current pattern is copied into the next slot, overwriting it, and the new pattern is selected for all tracks. This happens whether or not multi-pattern mode is on. On pattern 64, DUPLICATE does nothing.

-In SCENE mode, the current scene will be duplicated, overwriting the next one, this new scene will be selected.

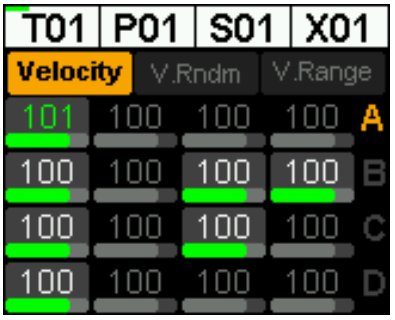
-In Chords Track mode the behaviour is the same as in STEP mode, it will duplicate the whole Chords Track or just the selected steps (if there are any).

12. **FILL PATTERN.** Extends every track in the current pattern to 64 steps by repeating its existing content (steps 1 to its current size) until the end of bank D.
13. **PART.** Opens the PART page, where one of the 16 available PARTs can be triggered
14. **EDIT PART.** Opens the PART EDITOR where patterns can be chained forming complete songs.
15. **LEGATO.** Fixes the length of the selected notes on the track so it extends until the start of the next note. If no note is selected it applies to all notes
16. **CHORDS.** Direct access to the CHORD-MASTER Track where chords can be introduced per step creating chord progressions.

6 Steps



The STEP MENU has two available modes. By default, clicking STEP shows one parameter across 16 steps. The left encoders navigate the parameters (note, velocity, chance…); the right encoder sets the value for the selected step(s). Pressing SHIFT + STEP shows the menu as a list, with several parameters of one step only.

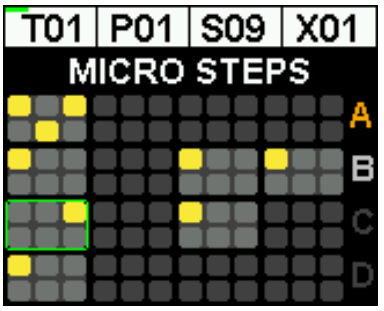


Step parameters like note, velocity and length have probability and range settings allowing random variations within a given range. Binary parameters (step on/off, roll on/off, slide on/off) use chance, which can be set to probability, structural or choke.

Parameter	Description
Step	Set the selected step(s) on/off.
Chance	Chance of the selected step(s).
Note	Note of the selected step(s).
Note Random.	Note probability of the selected step(s).
Note Range	Range of the note probability.
Velocity	Velocity of the selected step(s).
Velocity Random.	Velocity probability.
Velocity Range	Velocity probability range.
Length	Length of the note (in micro-steps).
Length Random.	Random amount for the length.
Length Range	Random range for the note length.
Slide	Enter slide edit mode. Clicking a step toggles its slide (glide / portamento). The chance encoder sets the slide chance.
Slide Chance	Chance setting for the Slide.

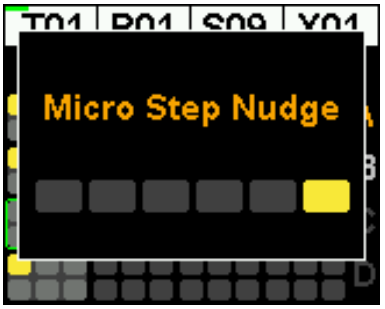
Roll	Enter roll edit mode. Clicking a step toggles its roll. The chance encoder sets the roll chance.
Roll Chance	Chance for the roll.
Micro Steps	Enter micro-step edit mode. One step is zoomed to show its 6 micro-steps. Only grid pads 1-3 and 5-7 are used in this mode, displaying the content of the last selected step.
Triplets	Triplets editing page

6.1 Microsteps



Microsteps divide each main step into 6 smaller sub-steps, allowing you to position musical events off the primary step grid. To zoom in, hold SHIFT and press MICROSTP (grid pad 8), or select Micro Steps in the STEP menu. Microsteps are not available on the master track. This opens the microstep interface and uses grid pads 1-3 and 5-7 (two rows of three; pad 4 is not used), each representing one of the 6 sub-steps within the step. Empty microsteps are lit dim amber, active microsteps light brighter (red), and a white playhead shows the current microstep during playback. From here, individual microsteps can be toggled on or off. The page shows the last selected step; if several steps are held, your edits are applied to all of them.

Please keep the following behavior in mind:



- Microsteps inherit their note pitch and velocity directly from the main step. Note, velocity and chance (including any random variation) are calculated once per step and shared by all its microsteps, so a step that fails its chance skips all of them.
- Note length is a single countdown that starts at the beginning of the step. Each active microstep retriggers the note while that countdown lasts, and the note ends when the length runs out, counted from the step start. Active microsteps after that play as short triggers.
- Every active microstep triggers the monitor output and restarts LFOs set to Step mode. If the first microstep is off, nothing plays until the first active microstep, but the length still counts from the start of the step.
- Turning a step on creates its first microstep automatically, and clearing all of a step's microsteps turns the step off.
- Live recording: with Quantize Rec ON (default), recorded notes are rounded to the nearest step. With Quantize Rec OFF, they keep their exact microstep within the step

(see 21.1). Recording a note replaces that step's microsteps. Fill recording (bank D) turns the step on and adds its first microstep, keeping any other microsteps. Roll recording (banks C, B, A) sets the first microstep and replaces microsteps 2-6 with the roll pattern. The roll itself is not stored, only the resulting microsteps.

- Warning: while Live Record is on, steps with a programmed Roll that fires also write their roll pattern into their microsteps, overwriting microsteps 2-6.
- Repeats: each active microstep restarts the Repeats engine, and repetitions only play on the step's empty microsteps (see 7.9).

You can also nudge microsteps: hold the target step pads and press the arrow keys on the Core unit to shift their microstep pattern one position left or right. This works from any page. The pattern stays inside its step, so microsteps can't be moved past the step's first or last microstep.

7 Track Menu

7.1 Euclidean.

The Euclidean rhythm generator distributes a number of beats within a number of steps in the most equidistant possible way. Three parameters affect the result: Size, Euclidean (number of beats to distribute), and Rotation (aka offset). Move the encoder to change the number of beats — minimum setting is OFF which disables the euclidean engine, maximum is the length of the current track.

This example shows how the Euclidean generator behaves in an 8-step pattern:

1	■ □ □ □ □ □ □ □	5	■ □ ■ □ ■ ■ □ ■
2	■ □ □ □ ■ □ □ □	6	■ □ ■ ■ ■ □ ■ ■
3	■ □ □ ■ □ □ ■ □	7	■ □ ■ ■ ■ ■ ■ ■
4	■ □ ■ □ ■ □ ■ □	8	■ ■ ■ ■ ■ ■ ■ ■

Using the Euclidean Rhythm Generator does not prevent you from editing that track like any other. You can add extra beats or anything else, but note that if any of the parameters affecting the Euclidean pattern generator changes, the track is redrawn with the new pattern, and the manually entered gates are lost — rolls, note pitch values, velocities or lengths remain unaffected. Should you overwrite step information by mistake, execute UNDO to restore your sequence.

This redraw happens if any of the following occur:

- Change in the Euclidean number.
- Change in the track rotation.
- Change in the track size.
- Modulation amount for the Euclidean number, Euclidean rotation or length is not 0%.

Modulation of the Euclidean parameter is only effective on tracks with an Euclidean number between 0 and 64. If a track has Euclidean set to OFF, modulating that parameter does nothing — meaning you can mix tracks with static musical content and others with dynamic rhythm modulated in real time.

Note. To permanently lock and commit your algorithmic rhythmic patterns into standard step data, utilize the **FREEZE** feature (SHIFT+FREEZE).

7.2 Rotation.

Behaves in two different ways depending on whether the Euclidean generator is activated for the current track. With Euclidean active, this sets the offset of the Euclidean pattern (which defines which steps are ON/OFF), but pitch, velocity and length of each step are unaffected. With Euclidean OFF, this rotates all the content of the pattern (including pitches, velocities, etc.).

7.3 Play Mode.

Defines how the playhead moves and if the steps are being repeated at play. Eight play modes are available:

FWD, BWD, PEND, RND

plus their Step Repeat versions:

FWD REP, BWD REP, PEND REP, RND REP.

In a REP mode with clock division greater than 1, each step is re-triggered once per clock-division tick instead of playing once.

Modulating Play Mode sweeps across all eight values.the result will go from the normal play modes to the ones with step repeat (same modes, but if the clock divider has a value greater than 1, the steps are re-triggered several times according to the clock divider, instead of only once).

7.4 Size.

The size of each track is displayed in green on the button grid. It can be edited by clicking on the grid or using the size encoder (with shift). Maximum 64, default 16. Setting a track size of 17 while the rest of the pattern is 16 steps results in interesting polyrhythmic content (master reset must be OFF or ONCE), and gives the pattern a cycle of 272 steps (17 cycles of 16 to sound the same).

7.5 Clock Division.

Set the clock division (or step length) for every track. Values from 1 to 64 steps. The value is shown with green dots on the grid. With clock division values greater than 1, the steps are re-triggered if Step Repeat is ON; otherwise, the step plays only once and its length is resized proportionally, in this scenario the microsteps will not expand, therefore they’ll be played the same as if the Division is set to 1.

7.6 Fill Track.

The selected track repeats its content using track size as reference, until 64 steps are reached.

Tip. The **Fill Track** command provides a fast method for generating arpeggios. Simply input the pitch sequence for your arpeggio at the start of the sequence, then set the sequence size to match the final note. Executing the Fill Track utility automatically duplicates these notes across the remaining sequence up to 64 steps, instantly forming a complete arpeggiated line.

7.7 Fill Pattern.

Each track within a pattern repeats its content until 64 steps are reached (it is like Fill track but for all tracks at the same time). This repetition is independent for each track and its size — a 16-step track repeats 3 times, a 64-step track is unchanged. This is particularly useful when expanding a pattern with a single operation before adding variations.

7.8 Freeze Track.

Captures the current output of a channel and converts it into a fixed sequence. This process is effectively the same as recording the track into a fresh 64-step pattern using Forward playback, transforming all dynamic elements—including those from LFOs, the Euclidean engine, or randomness—into pure deterministic step data.

The **REPEATS**, **ARP**, and **EUCLIDEAN** functions are disabled in the resulting sequence. **PARAMETER LOCKS and MONITOR** status remains unaffected.

The **FREEZE** operation executes the following modifications:

- Sequence length is automatically expanded to 64 steps.
- The playback direction is reset to **FORWARD** mode.
- All notes previously generated by **REPEATS** are committed to steps (or microsteps if this is the case), and the engine is turned **OFF**.
- Variations from **CHANCE** or conditionals are rendered as static events, with probability reset to 100%.
- Melodic data from **LFOs** or the **ARP** is captured, and the arpeggiator is deactivated.
- Rhythms from the **EUCLIDEAN** generator are recorded, and the generator is set to **OFF**.
- If **MONITOR** is active, data from internal sources is captured while the monitor remains enabled.

FREEZE asks for confirmation because audio is briefly interrupted. The track's clock division is kept, and the Euclidean number and rotation are both reset.

Note. The REPEATS function can create pitch variations across microsteps within a single step. However, executing FREEZE retains only the last played pitch and applies it across the step or its microsteps, resulting in a single pitch change per step.

7.9 Track — Repeats

REPEATS function is a MIDI delay engine with a rich set of controls for transforming simple melodic material into a wide variety of rhythmic patterns — from atmospheric arpeggios to complex polyrhythmic textures. The Repeats engine needs at least one step ON to have material to replicate. Each track and pattern has its own Repeats settings.

- **Enable.** Turns the delay engine ON/OFF (default OFF).
- **Repeats.** Sets the number of repetitions generated, from 1 to 254 (default 3). The maximum setting is shown as 'infinite' and repeats forever.
- **Distance.** Delay time in micro-steps. (1–96 micro-steps. Default 6)
- **Quantize Grid.** Time quantization applied to the generated repetitions. Both Distance and Distance Offset values are snapped to this grid. The grid is counted from the note that started the repetitions: set to 1 step (6 micro-steps), repetitions fall on the same microstep position of later steps, so they align to the 16th-note grid only when that note is on the first microstep; set to 1 micro-step, complex rhythmic patterns are possible. (1-24 microsteps)
- **Distance Offset.** Number of micro-steps added or subtracted from Distance on every repeat — making the time between repetitions expand or contract.(+/-96 microsteps. Default 10)
- **Velocity Offset.** Velocity of the repetitions is copied from the input note; this parameter increases or decreases velocity on every repetition. (+/-64 Microsteps . Default -10)
- **Pitch Offset.** Pitch is also taken from incoming notes; this parameter may modify it on every repetition. +1 or −1 with Quantize ON yields a diatonic rise or fall; +5 creates interesting ascending 4th arpeggios.(±60 semitones/scale degrees. Default 0)
- Microsteps: every active microstep (and every roll hit) sends a new note into Repeats and restarts the repetitions, so only the echoes of the last one continue. At the start of a step, the note is sent to Repeats only if the first microstep is active.
- Repetitions only play on microsteps where the step has nothing of its own. A programmed microstep cuts the running repetitions and starts new ones.
- Each repetition is shortened so it ends before the next one starts.

Note. Although the REPEATS function can produce multiple pitch variations within a single step, applying FREEZE restricts each step (or microstep) to a single pitch change. ARK captures the final active pitch during the FREEZE process and applies it across all steps or microsteps.

8 Track Config

8.1 Quantize.

Use this function to snap track note data and incoming CV or MIDI signals to a specific harmonic reference — such as a chord, an individual note, or a scale. Detailed information on harmony tools is available in Chapter 17.

Quantize is not available on tracks using the polyphonic devices Acordes or Pad. Loading them turns track quantize off, because they build their chords themselves (see 17.2).

8.2 Slide Time.

Time in ms that the pitch curve takes from one pitch to another when the slide is ON for a given step. Slide affects the devices Acordes, Complex, Ladder Synth, Raw Osc, Rubber Synth, Super Saw and V/Oct. Acid also responds to step slides with its own fixed glide, and Slide Time does not change it.

Range 0 to 1 second in 8 ms steps.

8.3 MIDI Output.

Enable and configure the MIDI output channel alongside the target port for the active track. Supported destinations comprise TRS, USB-C device, and USB host outputs. Available options span from OFF to channels 1–16 across each physical port sequentially: TRS, USB Host, USB Device, and Expander.

Rotating the encoder rapidly jumps across entire 16-channel port blocks.

8.4 GATE Out.

Access the Gate Routing interface to assign the active channel (displayed in the top-left area of the header) to any of the eight hardware outputs.

Note that ARK treats gate triggers and analog signals independently, requiring individual assignment setups.
You can configure multiple gate outputs by navigating across channels with the |< and >| arrow buttons to designate your selected ports.

8.5 Device Out

Open the Device Routing menu to route the current track (shown in the screen header's top-left corner) to any of the eight physical CV/Audio jacks.

As mentioned in Section 8.4, gate signals and analog outputs are managed separately, so each requires its own routing setup.
Use the |< and >| navigation buttons to cycle through tracks and assign your desired output jacks.

When loading a new audio engine, the module automatically routes it to the main mix bus by default. From this page, you can assign it directly to individual physical outputs or send it to

the secondary submix (if enabled in CONFIG → MIXER CONFIG).
Since CV devices bypass the internal mixing system, loading a CV generator automatically opens this screen, prompting you to assign a physical output port immediately.

When you assign a stereo device to output N, ARK asks 'Assign R channel to output N+1?'. Answer YES for stereo on N and N+1, or NO for mono on N only. No prompt appears when output N+1 is reserved by the mixer (7/8, or 5/6 in group mode).

8.6 Input

The controller's grid can play or record in real time, but several other input methods are available, like using a MIDI keyboard. Available input sources:

- **Track (1 -16):** The signal generated by a channel can be captured onto a different one. To obtain an exact copy, the source must precede the destination channel (e.g., track 2 can only receive track 1), since processing happens in numerical order. Selecting a higher-numbered source while Monitor is active in Input or IN & Track mode results in silence.
- **MIDI (1–16):** the incoming MIDI is recorded.

Note-only track input sources (only pitch captured, the original rhythm remains — sort of sample-and-hold):

- LFO (1–16)
- Note (1–16)
- Velocity (1–16)
- CV in (A to F)
- Track Output (1–16)
- Macro (1–4)
- MIDI CC (0–127)

8.7 Monitor

Displays the PINK monitoring matrix across the 4x4 controller layout to toggle channel monitoring, while simultaneously launching the Monitor menu for input routing. For comprehensive details, consult Section 3.5.

8.8 Track Name

Launches the naming interface to customize the track label. Unless modified, each channel automatically inherits the title of its currently assigned device.

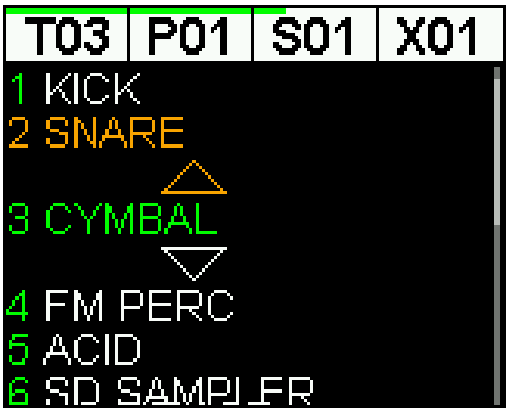


8.9 Move Track

Rearranges entire channels, swapping all sequence data, assigned engines, modulation LFOs, mixer levels, and associated parameters.

This feature proves handy for:

- Channel layout (such as keeping percussive parts grouped together).
- Choke functionality, which responds depending on whether the suppressing channel precedes or follows the target track.
- Input and Monitoring routing, as a channel can only receive signals from a lower-numbered track.



Within the Move Track interface, the active channel is highlighted in green and the target channel in Yellow. Rotating any left encoder allows you to shift the selection up or down, indicated by an arrow showing the target direction. Pressing the encoder confirms the move, relocating the channel to the adjacent position. Since tracks are shifted incrementally one step at a time, repeat this process as necessary to reach your desired channel position.

8.10 Duplicate Track

Copies the current track (device, FX, LFO, modulation, mixer and the sequence data of all 64 patterns) onto the next track after a confirmation. The next track's previous content is overwritten, but its Gate Out and Device Out assignments are kept.

Not available on track 16.

8.11 Load Preset

Recalls complete channel sound setups stored using the Save Preset utility (explained in the next section).

8.12 Save Preset

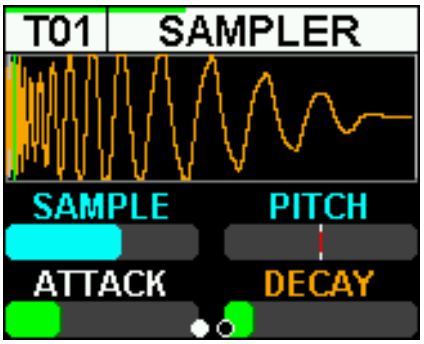
Saves complete channel configurations as “Channel Sound Presets” for later recall.

The preset captures all sound-related channel parameters (excluding sequence data).

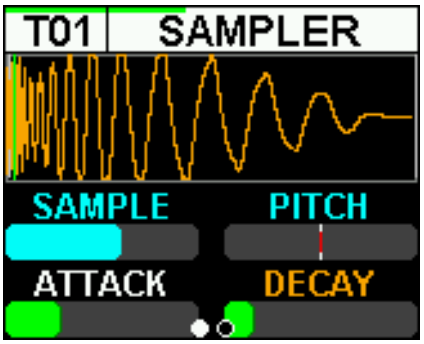
Stored parameters include:

- Device & parameters
- Device FX & settings
- Channel LFO & configurations
- Modulation routings & depths
- Mixer parameters for this channel

Selecting this menu item prompts you to enter a label via the Name Editor interface. Once confirmed, the file will be available for future recall via **Load Preset** command (see previous section)



9 Parameter Locks



Parameter locks (Plocks) fix a parameter value to a specific step. Each track has 12 Parameter Lock lanes, meaning a maximum of 12 different parameters per track can be locked on each pattern. When a locked parameter is also modulated, the locked value becomes the modulation base.

To lock any parameter, hold the step (or use multi-selection with [SELECT]) while setting the value with the encoder. Parameter lock (P-lock) labels change their color to cyan, and their associated indicator bars appear in cyan whenever a step is held or while the lock is actively triggered.

Parameter locks of per-track parameters can also be captured in real time: activate Live Record (SHIFT + REC) while the sequencer is running. Global (master track) parameters cannot be recorded live; lock them by holding steps.

Global parameters (those that affect all tracks simultaneously) are managed exclusively by the master track. Locking any global parameter automatically selects the master track.

Per-track parameters	Global (master track) parameters
• **Device:** parameters 1–8 • **Device effects:** parameters 1–4 • **Mixer:** All Parameters • **Slide time** • **LFO:** All parameters on first two pages • **Repeats:** All Parameters	• **Project tempo** • **Project key** • **Scale** • **Shuffle amount** • **Reverb:** All Parameters • **Delay:** All parameters • **Scene Number**

Hold CONFIG and press MOD to open the PARAMETER LOCKS list, which shows the 12 lanes of the track with their assigned parameter (or 'unassigned'). Click a lane to open its editor with the following items:will get to the parameter lock menu where you will find the following:

- **Lane Number.** Select the lane you want to inspect, edit, or clear.
- **Lane Mode.** Shows the lane type and lets you change it: turn the encoder to switch a track lane between Step (momentary) and Pattern (latch). Master-track lanes are always Pattern.
    - **Step:** Is used for device & mixer parameters. If a step has a parameter locked, its value is used; if the next step has no lock, the default value is applied (momentary).

    - **Pattern:** Is used for LFO parameters, tempo, scale… When a step has a parameter locked in this mode, its value is used and persists until another step locks that parameter or the pattern changes (latch)
    - **High Res**: is shown on tracks using the CV Recorder (see 24.1.2). Locks recorded in real time with Live Record are stored in This Pattern (latch) mode, so a recorded value holds until the next recorded change.

- **Parameter.** Displays the name of the parameter assigned to the current lane.
- **Value.** Displays the value of the parameter stored for the last selected step.
- **Clear Lane.** Clears all values and the parameter assignment for the selected lane.
- **Clear All Lanes.** Erases all existing parameter locks within the selected track and the current pattern.

Shortcut.

To clear a parameter lock that maybe was created by mistake, hold SHIFT and click the corresponding encoder. This applies only to the current pattern.
If steps are held or selected, only their locks are removed; otherwise the whole lane for that parameter is cleared in the current pattern.

10 Devices

Devices serve as the link between a track and a physical CV/audio output. These can be categorized as:

- **CONTROL SOURCES**: These components manage control signals, such as CV (Control Voltage) or MIDI, and must be assigned to a physical output to become active (e.g., V/Oct generators, envelopes). An exception is the CV recorder, which can produce MIDI CC messages for modulation without a direct physical output connection.

- **AUDIO SOURCES**: These devices produce sound (e.g., synthesizers, sample players). By default, they connect to the audio mixer (if the mixer is active), with the mixer's stereo output (Left and Right) automatically routed to CV/audio outputs 7 and 8.

The Devices are organized into categories, which are as follows:

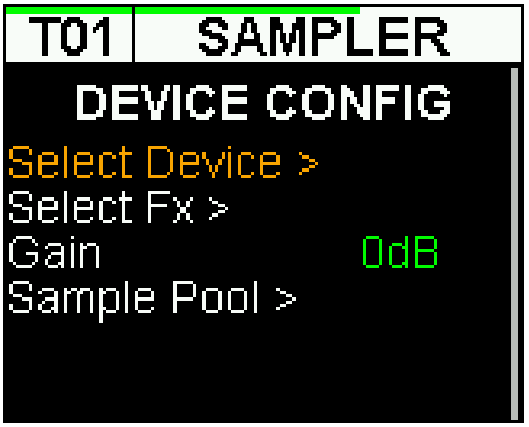
Category	Devices
CV	ENVELOPE, CV RECORDER, LFO, V/OCT
Drums	KICK, BASS DRUM, SNARE, CYMBAL, FM PERC, TOM, NOISE.
Sampling	SAMPLER, SD SAMPLER, SLICER, GRANULAR
Synth voices	ACID, BELLS, HARM. OSC, LADDER SYNTH, RUBBER SYNTH, SUPER SAW, VOICE
Oscillators	RAW OSC, COMPLEX
Polyphonic	ACORDES, PAD
Physical modelling	PLUCK, MODAL

For detailed explanations of each device and its use, see the Devices Reference in Chapter 24.

Stereo operation. Several of the ARK's audio instruments generate stereo signals. By default, these sound sources are routed through the internal mixer as stereo pairs. However, when directing an instrument to a specific physical output rather than the main mix, the system allows you to select between stereo or mono routing (refer to Chapter 8.5 for details on output assignments).

10.1 Device Config

Provides management tools for sound engines and audio processors, such as loading, swapping, or setting pre-mixer gain. This section also grants access to the sample pool when a sampler engine is assigned.



The **Device Configuration** menu provides tools for device management, such as adding, replacing, and accessing the sample pool used by certain devices.

You can access this menu in two ways:

1. Navigate to **CONFIG / DEVICE CONFIG**.
2. Simultaneously press the **CONFIG** and **DEVICE** buttons.

Available Options

- **Select Device:** Choose a device for the currently selected track. It loads with default settings.
- **Select Fx:** Add an audio processor to the track (only available for tracks that already have an audio device).
- **Gain:** Introduces pre-mixer amplification, adjustable from 0 dB to +12 dB in steps of 2 dB.
- **Sample Pool:** Available when the device is Sampler, Slicer or Granular. Up to 16 samples can be loaded into RAM for the track.; the samples available for playback are those loaded using this tool. This feature loads up to 16 different samples into RAM.

11 Device Effects

Audio devices can have one effect inserted after them. These effects are conceived as mixing tools. All effects process stereo and mono tracks, and some turn mono tracks into stereo.

Available effects		
Bit Crusher	Cut	Comb Filter
Delay Pan	Gater	LP Gate
Side Chain	Stereoizer	Saturation

For comprehensive details on the available Device FX, consult Chapter 25.

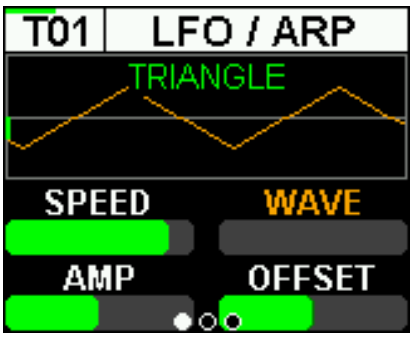
12 LFO

ARK is equipped with 16 LFOs, which function as versatile modulation sources. They can also generate CV signals when used with the LFO device.

A key feature is that any LFO can be freely utilized across different tracks, whether acting as a modulation source or a CV device.

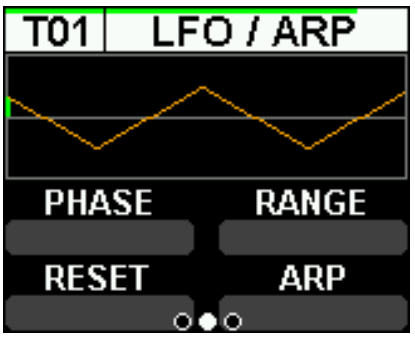
Additionally, in arpeggiator mode, LFOs can introduce melodic variations by modifying the pitch, velocity, and length of notes on their own track. These generated melodies adhere to the track's harmony settings (chords and Scales) and are shaped by the LFO's chosen form and rate.

The parameters available for the LFOs include:

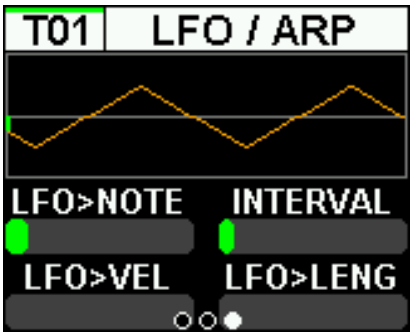


- **Speed.** Sets the length of one LFO cycle in steps (1–128), multiplied by RANGE. When you change it during playback, the LFO stays phase-locked to the global clock, so it stays in sync (useful with parameter locks).
- **Wave.** Triangle, Saw, Ramp, Square, Random, Sample & Hold.
- **Amp.** Magnitude of the LFO.

- **Offset.** At 0 the LFO swings over the center (positive and negative). Increasing the offset increases positive values — the LFO can be made unipolar. If amplitude exceeds 50%, too much offset flattens the waveform edges.
- **Phase.** Shifts the starting position of the waveform left or right in time.
- **RANGE.** Multiplies the LFO period by 1–32 (shown as X1…X32). The total cycle length is SPEED (steps) × RANGE, so higher values give much slower LFOs.Sets the LFO clock division, determining how the LFO frequency relates to the sequencer tempo. Higher division values result in slower LFO cycles relative to the BPM.



- **Reset.** Defines when the LFO resets to the initial state set by Phase control:
    - Free – uns continuously.
    - Once – resets only when the pattern changes
    - Pattern – resets when the pattern changes or the master track resets.
    - Track – resets each time this track's sequence loops.
    - Step – resets on every active step (each time the track plays a note). Remove the 'Note' option.



- **Arp Mode.** Set the ARP ON/OFF. Arp Mode: sets the ARP ON/OFF. This parameter and the four below it (LFO → Note, Min Interval, LFO → Velocity, LFO → Length) apply only to this track and are stored per pattern, so each pattern can have its own arp settings.
- **LFO → Note.** How much the LFO affects pitch.
- **Min Interval.** Minimum pitch change in semitones.
- **LFO → Velocity.** How much the LFO affects velocity.
- **LFO → Length.** How much the LFO affects length.

13 Modulation Routing

Versatile modulation routing engine designed to control various parameters. Access this interface by pressing the MOD button.

Modulation assignment are done ina Per-Target basis, meaning that first you choose the target and second the modulation source

The hardware automatically assigns your most recently adjusted control as the active target, and designates the channel's LFO as the primary modulation source, allowing you to quickly set the modulation by just two clicks.

The system provides a wide variety of modulation sources, including note pitch and velocity data from any track, which facilitates complex cross-track interactions. While every parameter is restricted to a single modulation source, one source can be assigned to multiple targets simultaneously. Furthermore, any track utilizing a CV device can also serve as a modulation source.

Modulation sources operate in either Unipolar or Bipolar mode. Unipolar signals exclusively boost the destination value, whereas bipolar sources can both elevate and reduce it. Always consider this behavior and adjust your target parameter base levels accordingly.

As a general rule, reduce the baseline level for parameters modulated by unipolar signals (allowing positive modulation to raise the value), while positioning targets near the center for bipolar modulation (enabling dynamic shifts both above and below the base setting

Target

This parameter sets the modulation destination, and by the default is the last parameter you have interacted with.

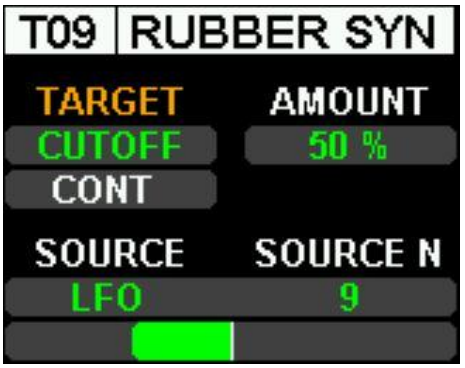
The following destinations are possible:

Mod Targets	Description
Euclidean	The number of active triggers inside the Euclidean sequence
Rotation	Shift the sequence dynamically to the Left or Right
Play mode	Dynamically alters the playback Mode of the sequence.
Track size	Length Of the sequence
Clock division	Number of steps per Clock pulse
Device parameters 1–8	Adjust the various device parameters.
Device FX parameters 1–4	Adjust the various Track FX parameters.

Mod Targets	Description
Mixer volume	Controls the volume level for the track.
Mixer pan	Controls the balance between Left and Right for the track.
Mixer reverb send	Controls the volume level for Reverb Send of the track.
Mixer delay send	Controls the volume level for Delay Send of the track.

If a CV device is active on a track, it is automatically included in the list of available modulation sources.

Continuous Modulation vs Stepped /S&H)



Modulation is always stepped (like S&H). CV inputs and MIDI CCs are continuously read, but changes apply only when a step (or micro-step) is ON.

Mixer parameters (volume, pan and FX sends) and a selection of device parameters can be modulated continuously.

When the mode is toggled by tapping the target encoder, the label under the mod target changes from 'S&H' to 'CONT'.

The following devices have specific parameters that admit continuous modulation:

Device	Parameters
Acid	Wave, Dist, Cutoff, Res
Complex	Index, Timbre
Ladder Synth	Cutoff, Res
Rubber Synth	Timbre, Width, Cutoff, Res
Supersaw	LP.BP.HP, Cutoff, Res
Sampler	Loop Pos, Loop Size, Crossfade
SD Sampler	Filter
Granular	Sample, Size, Density, Texture, Position, Spray

Voice	Formant
Modal	Struct, Bright, Damp, Scrap
Acordes	Cutoff, Res

Sources

The following modulation sources can be assigned to manipulate the settings outlined in the preceding section. These controls encompass external signals (such as incoming CV or MIDI messages) as well as internal generators (including onboard LFOs and sequence data from other channels).

Available modulation sources:

Mod Sources	Description	Range
LFO (1–16)	LFO signals from tracks 1 through 16.	Bipolar
Velocity (1–16)	Per-track velocity data (MIDI Velocity equivalent).	Unipolar
Note (1–16)	Per-track note values (MIDI Note number equivalent).	Bipolar, C4=Center
CV In (A–F)	Signals from the six physical CV input ports.	Bipolar
Track Output (1–16)	Control signal from any track containing an active CV device.	Same as Device
Macro (1–4)	Manual control via the four internal Macros (refer to Chapter 14).	Unipolar
MIDI CC (0–127)	MIDI CC (0–127): incoming MIDI Control Change messages on any MIDI channel (omni), from the MIDI DIN/TRS input or USB.	Unipolar
MIDI CC Learn	Automatically assigns the next detected MIDI CC message as the source.	

Amount

The AMOUNT ranges from −100% to +100%. With a positive amount a unipolar source raises the target. With a negative amount it lowers it, so you can invert any source.

13.1 Example — modulate a track's mixer volume with a MIDI controller

1. On the mixer, set the volume of the track to 0 %.
2. Click MOD — the modulation settings for that parameter appear. Choose MIDI CC learn.
3. Move the fader/pot of the MIDI controller you want to assign.
4. Set the amount to 100 %. Done.

13.2 Mod List



Double-tap the MOD button to view all active modulations (any with a non-zero source and amount), organized by their source. This view is particularly useful for managing complex projects with numerous simultaneous modulations. You can click any entry in the list to jump directly to its editing page.

Modulation is ideal for achieving continuous, fluid control over parameters like track volume or LFO-driven filter movement. For targeted, one-off changes—such as adjusting the reverb level for a single specific step—parameter locks are the recommended tool (refer to Chapter 9).

Note. For modulating the Euclidean number the initial value must be greater than OFF; otherwise, modulation applied to it has no effect.

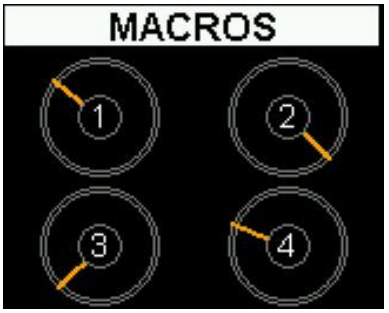
13.3 Note and velocity as modulation sources

Both **Note** and **Velocity** values are accessible as sources within the **MOD MATRIX**, allowing any track to function as a modulator for any other channel.

ARK processes each track sequentially, starting with the first. When the note or velocity of a track is used to modulate parameters of another track that is in an earlier position, there is an offset of 1 step.

For example, if you use the note from track 5 to modulate the filter of a device on track 2, when track 2 is being processed the step note read from track 5 will be one step earlier, because the current one has not been processed yet. This shouldn't be a problem when some unpredictable cross-modulation effects are desired; for accurate behaviour, prefer a previous track as the source.

14 Macros

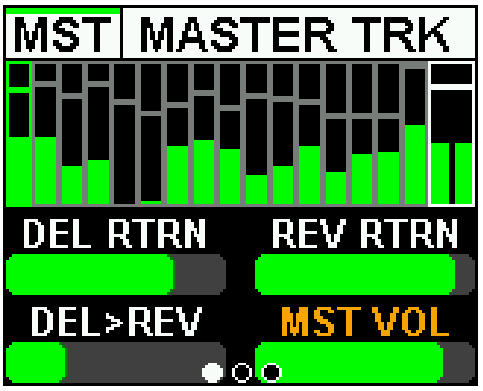


Designed for live performance or environments requiring rapid, hands-on adjustments, Macros function as internal, manual modulation sources. You can think of them as assignable controllers built directly into the system.

Accessing the Macros page via the MC/SC button transforms the four core encoders into versatile master controls. In this mode, each encoder can simultaneously manipulate several parameters across the module. Keep in mind that Macros operate independently of channels; a single macro can be mapped to various parameters across multiple channels simultaneously.

Since Macros are treated as standard internal modulation sources inside the system, you can manage their assignments through the Modulation Matrix. For a thorough walkthrough of this mapping procedure, please refer to the detailed instructions in Chapter 13.

15 Mixing System



15.1 Mixer Overview

ARK includes a comprehensive "16x2x2" stereo mixer designed for routing internal signals, managing relative volume levels, and applying global effects.

Key mixer features include:

- 16 stereo input channels
- Dual output buses (Master and Submix)
- Two post-fader Effect sends
- Integrated Delay and Reverb effects
- A master dynamics processor (compressor + limiter)

To enter the mixer interface, tap the MIXER button on the ARK Core module. Consecutive taps cycle through the three primary mixer layers:

- Main Page
- Delay Page
- Reverb Page

FX pages appear only when the mixer is ON. In R.Send or D.Send mode, the page of the effect sent externally is skipped.

The mixer utilizes 32-bit float resolution for all audio processing. It provides per-track control over volume, panning, and effect sends, while the master chain features a combined compressor and limiter for final dynamics control.

15.2 Mixer Routing

The mixer features two stereo buses and two post-fader effect sends. By default, only the Master Bus is enabled, with all audio tracks automatically routed to it. The Submix can be enabled via the MIXER CONFIG page; once active, it becomes available as a routing destination on the Device Out page (located on CONFIG/TRACK/Device Out).

The two FX sends can be assigned to physical outputs within the MIXER CONFIG menu. Here, you can also deactivate the Master Bus if you prefer to use an external mixing setup (refer to the following chapter for details).

Note. Even when a track is not mixed with other signals because it has been routed to a physical external output, its FX sends and volume level remain active within the mixer.

15.3 Mixer Config

Access the Mixer Config menu to adjust various mixer settings. You can do this by selecting CONFIG/MIXER within the menu system or by pressing the MIXER and CONFIG keys at the same time.

The menu contains the following configuration settings:

Mixer Mode. Choose from the various signal routing setups and mixer preferences:

- **ON:** Enables the internal mixer, assigning outputs 7 and 8 as the primary Left and Right master channels.
- **OFF:** Bypasses the mixer completely, freeing up physical outputs 7 and 8 and reducing some CPU consumption.
- **ON & Submix:** Activates both the main mixer and a dedicated secondary stereo bus at outputs 5 and 6. This configuration allows track signals to be routed independently to either the master (7 and 8), the submix (5 and 6), or directly to a physical output. While the submix lacks effects and dynamics processing, it remains subject to track volume and maintains standard access to both Reverb and Delay auxiliary sends.
- **ON & R.Send:** Routes the Reverb auxiliary send to physical outputs 5 and 6 while disabling the internal Reverb engine to conserve system resources. This mode is designed for integration with external hardware processors.
- **ON & D.Send:** Directs the Delay auxiliary send to outputs 5 and 6 and deactivates the internal Delay engine to free up memory and CPU. Ideal for utilizing external effects units.

Compressor (On/Off). Enables the compressor. When active, auto make-up increases volume as the threshold lowers.

Limiter (On/Off). Enables the limiter at the end of the chain.

Limiter Gain. Gain Stage Before limiter (post compressor)

Delay Mode. Select between standard **Stereo** mode, featuring independent Left and Right channels, or **Ping-Pong** mode, where echoes alternate between sides to produce dynamic spatial motion.

Reverb Mode. Choose Hall or Plate reverb algorithms, or turn off the reverb to free up CPU and memory resources.

FX Pan. Inverts the L&R balance of the built-in reverb and delay.

15.4 Delay

The primary effect send is directed to the delay unit, a resource shared across all channels.

To access the delay settings, tap the MIXER button twice.

The following delay parameters are available:

Parameter	Description
Delay Time	Measured in steps and synchronized with the project tempo.
Feedback	Sets the number of echoes, ranging from a single repeat to infinite feedback.
Delay HP	A high-pass filter located within the feedback loop.
Delay LP	A low-pass filter located within the feedback loop.



Additional configurations, such as the Delay Mode (Stereo/Ping-Pong), can be adjusted in the Mixer Configuration page.

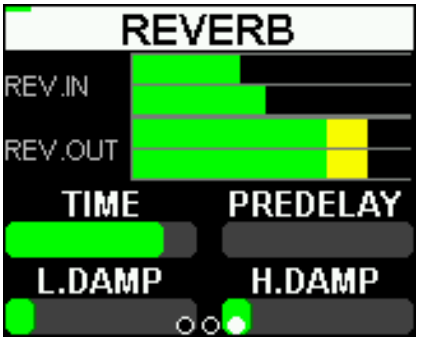
15.5 Reverb

The second effect sent is directed to the Reverb unit, a resource shared across all channels.

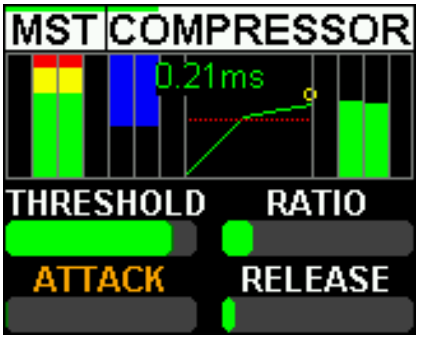
To access the Reverb settings, tap the MIXER button three times.

The following Reverb parameters are available:

Parameter	Description
Reverb Time	Length of the reverb tail.
Predelay	TimePredelay: time before the reverberation starts (Hall mode). In Plate mode this control acts as a tone/low-pass control for the plate.
Reverb L. Damp	Damps the low frequencies of the reverb tail (high-pass)
Reverb H. Damp	Damps the high frequencies of the reverb tail (low-pass)



15.6 Compressor and Limiter



ARK includes a highly comprehensive dynamics processor designed to consolidate the master output while effectively preventing signal clipping. This integrated chain incorporates both a compressor and a limiter, arranged in that specific sequence on the master bus immediately preceding the final volume stage.

The compressor can be accessed by pressing DEVICE while being on the MASTER TRACK and has the following parameters:

C.Threshold The level (in dB) at which the compressor begins to work. Any signal above this threshold will be compressed, while signals below it pass through unaffected. Lower threshold values mean more of the signal gets compressed.

C.Ratio Determines how much compression is applied to signals exceeding the threshold. Expressed as a ratio (e.g., 4:1), it indicates how many dB of input above threshold are needed to produce 1 dB of output. Higher ratios mean more aggressive compression.

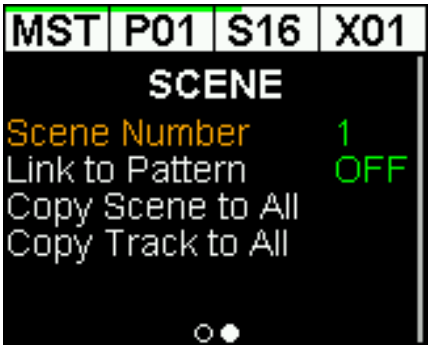
C.Attack The time it takes for the compressor to respond once the signal crosses the threshold. Fast attack times (milliseconds) quickly reduce peaks, while slower attacks allow transients to pass through before compression engages.

C.Release The time it takes for the compressor to stop reducing gain after the signal drops below the threshold. Fast release returns to normal quickly but can sound pumpy, while slower release provides smoother, more natural compression.

The limiting circuit operates with a non-adjustable threshold (just before 0dBFS). The only control provided to the user is a gain stage (located at MIXER CONFIG), which resides after the compressor and before the final limiter.

Both Compressor and Limiter can be deactivated if desired at the MIXER CONFIG liberating some CPU load

16 Scenes



Scenes are snapshots of the parameters for all devices and mixer channels. There are 16 scenes — think of them as sound presets or kits. The transition between scenes is artifact-free because new track settings are applied per track only when a step is ON. For example, if a synth sound has a long decay in one scene and you switch to a scene where it has a short decay, the note played in the previous scene continues until another note of that track plays.

To use Scenes, press the MC/SC button two times, the grid will light up orange, allowing you to select any of the 16 scenes using the grid buttons. Click a pad to select a scene instantly.

The active Scene is shown in the upper-right corner of the display header as X01, X02 … X16.

A menu will also show up with the next options:

Parameter	Description
Scene Number	Set the current scene.
Link to pattern	By pressing the encoder it will link the current scene to the current pattern (by using a parameter lock lane). When linked, loading the pattern also calls the linked scene. This operation occupies 1 lane of parameter locks of the master track on the current pattern. Press again on the same scene to unlink it. If all master-track parameter-lock lanes are used, the message 'No free lanes' appears and the link is not created.
Copy Scene to all	Copies the current scene to all 16 scenes.
Copy Track to All	Copies the current track’s device & mixer settings to all scenes (1 track only).

Note. If a pattern is linked to a scene, you may need to stop the sequencer before manually switching to another scene. Otherwise, the sequencer will re-trigger the linked scene at the start of every pattern loop. Changing scenes does *not* alter the device assigned to a track.

Any parameter adjustments made within an active scene update that scene immediately. Switching to a different scene and returning later preserves those edits rather than resetting the parameters to the project's last saved state.

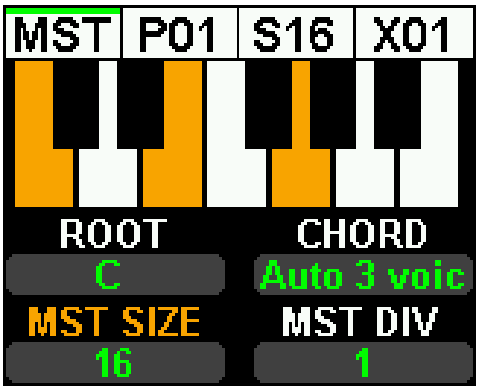
Scenes can also be copied, pasted, and duplicated as needed.

To construct a sound set, select a scene and configure each track's device and mixer settings. For subsequent sounds, either select a new scene to start from scratch or duplicate the current scene to the next slot using SHIFT + DUPLICATE. You can also use "Copy Scene to All" to replicate the current scene across all slots, or "Copy Track to All" to apply only the active track's settings to every slot.

Note. changing the Scene does *not* change the device assigned to a track.

17 Harmony Tools

ARK is designed with music theory at its core. Every track within a pattern can be constrained to specific harmonic frameworks, such as custom scales or chord progressions. This ensures that random note generation or live recording remains musically coherent and aligned with the project's harmonic structure.



Additionally, polyphonic devices like **Acordes** and **Pad** can generate chords independently or follow the Chords Track.

Note. While ARK tracks are monophonic, polyphonic devices enable the generation of polyphonic audio and MIDI.

To quantize the notes of any track, ARK provides two scales (Main scale and Aux scale), plus three additional scales generated by the Chords Track (Chords, Chords root & Chords no root).

Track notes (as well as its incoming MIDI or CV signals) can be quantized to any of the available scales, to a specific chord or chord note, or left unquantized.

By default, tracks are set to follow the Project Main Scale. If you require a different quantization behavior, you must manually adjust it within the specific track configuration menu.

The available options for quantization are:

- **OFF:** leaves the track unquantized. This setting is not persistent after power cycle
- **Main scale**: Constrains all notes on the track to the notes defined in the project's primary scale.
- **Chord track**: Restricts track notes to only those currently present in the Chord track's active chords.
- **Aux scale**: Forces notes to align with the secondary scale setting.
- **Chords root**: Limits the track to playing only the root notes of the chords defined on the Chord track.
- **Chords no root**: Restricts notes to playing any of the notes of the chord except for its root.

Note. Although Polyphonic engines can track the harmonic guide, the Chords Track does not output audio or MIDI signals natively. Producing sound requires the assignment of a Polyphonic device, like ACORDES or PAD, to the channel. See next chapter

Global Pitch. It is possible to modify the overall tuning of all internal synth-like engines by altering the global sample rate, allowing you to adapt the module to alternative pitch references beyond standard A440. Note that this parameter does not influence the physical V/Oct control voltages output by ARK.
Navigate to CONFIG → GLOBAL CONFIG → Global Pitch and adjust the value using the right encoder.

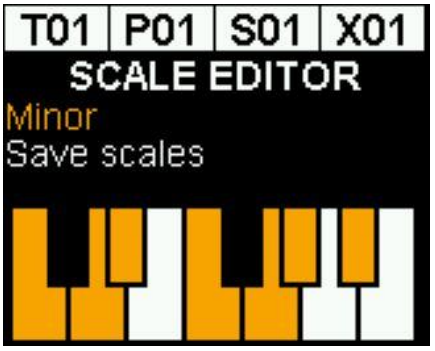
17.1 Scales

The system provides 20 factory scales alongside 10 customizable user slots for saving custom harmonic setups.

The system includes twenty built-in scale options:

- Chromatic
- Major
- Minor
- Dorian
- Phrygian
- Lydian
- Mixolydian
- Locrian
- Minor Harmonic
- Minor Melodic
- Pentatonic
- Blues
- Hamsadhvani
- Charukeshi
- Unknown
- Shakti
- Byzantine
- Diminished
- Whole Tone
- Octaves

To customize the 10 user scales or visualize the notes of the factory ones, navigate to CONFIG → UTILITIES → Scale Editor. This interface displays the built-in library transposed to C, while allowing modification of the 10 user presets (factory configurations remain locked).



Executing the Save Scales command is required to retain your modifications. To do so, select Save Scales and click one of the left encoders to store your changes.

You can also open the editor by clicking Scale (main scale) or Aux.scale (aux scale editor) in PROJECT CONFIG.
Use the left encoders to browse menu options and step through notes, the right encoders select the target scale (while being on this menu item) and toggle individual notes ON/OFF.

Note. Choosing a scale within the editor automatically updates the project's main scale, and adjusting the main scale updates the editor accordingly.

17.2 Chord Track and Polyphonic Devices

While ARK tracks are monophonic, the Polyphonic devices (Acordes and Pad) allow for the generation of polyphonic audio and MIDI. Additionally, the Chord Track serves to generate chords for these polyphonic devices and can quantize the notes of any track.

Usage Guidelines:

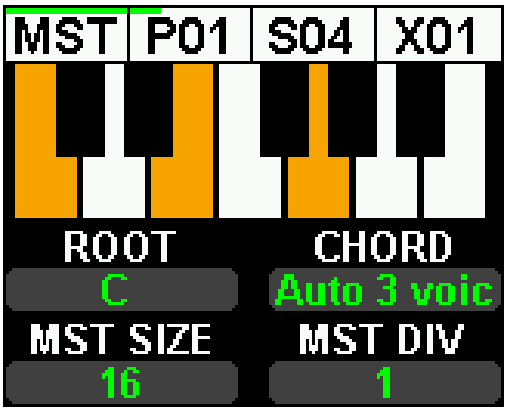
- **Polyphonic Devices:** Use if your primary goal is to **generate chords** as audio or MIDI.
- **Chord Track:** Use if you plan to **quantize tracks** (e.g., arpeggios, harmonically consistent material) to chords. *Note: The Chord Track does not produce audio or MIDI itself; it solely defines the chord or scale used for quantization or by polyphonic devices.*

Polyphonic Device Generation Methods:

Polyphonic devices can generate voices in the following ways:

- **Via the Chord Track:** The Chord Track determines the **tuning** of each voice, while the notes on the device's pattern define the **octave and gate**.
- **In Auto Mode:** The device takes the input note as the **root** and uses the project's **main scale** to construct the chord. Modes include Auto 3 (triads) and Auto 4 (4-voice).
- **Defining the Exact Chord:** Users can select from a reasonable set of specific chords. This is useful for **parallel harmonies**, as the generated chord may contain notes outside the project's scale.

17.3 Chords Track



The Chords Track belongs to the master track and serves two primary roles within the ARK environment: it can generate complex polyphonic data for internal audio devices like Acordes and Pad, and it can act as a global harmonic reference to quantize the note data of any other track in the pattern. Crucially, the Chords Track is hard-wired to the master track's playhead; it automatically inherits the master track's sequence

size, clock division, and playback direction to ensure perfect synchronization across the pattern.

Uses for the Chords Track:

- Generate chords playable with the polyphonic audio devices.
- Generate scales to quantize tracks.

Auto mode generates 3-note (triad) or 4-note (quadriad) chords from the main scale and a root note. For non-7-note scales like blues, define the chord type and root manually.

To access the Chords Track, tap the key number 16 (CHORDS) of the grid while holding SHIFT. Inside this interface, each of the 64 pads on the controller grid represents a step where harmonic data can be stored. Tap a step to toggle chord activation; when a step is active, hold it (or use the [SELECT] button for batch editing) while rotating the Core encoders to define the chord's root note and its specific type.The Chords Track offers several generation modes to suit different musical needs. The "Auto 3" and "Auto 4" options are designed to automatically generate triads or four-note chords that strictly adhere to the project's main scale. For more complex arrangements, other chord types allow for the inclusion of notes outside the primary scale. For a comprehensive overview of every available option, please refer to the complete chord list in Appendix 1.

17.4 Chords Modes

The Chords Track can be adapted to your specific musical workflow. To configure these settings, navigate to the **CONFIG / PROJECT** interface by sustaining **CONFIG** while tapping the **PROJECT** button, then use the Core's primary upper-left encoder to select the Chord Mode.

Expanding upon the standard chord library and those extracted from the primary scale, ARK incorporates several additional modes—ideal for performing harmonic sequences via an external MIDI keyboard.

The four supported modes include:

- **1st Track:** the content of the chord track is ignored as notes on track 1 are taken as the roots for chords. All the notes in the track are going to generate chords, so a complex bass line may produce a large number of chord events.
- **Chords Track:** default mode. Any step of the chord track can store a root note and chord type to generate the chord. In this mode you need to first activate a step, and then while holding it choose the root and the chord you want from the list of available harmonies. Note that the chord you wrote is held until the next active step.

- **Expert:** In this mode you can write every chord with an external MIDI keyboard (which is required). Select a step and while holding it, place the notes you want in the MIDI keyboard. The lowest pitched note will be taken as root (or bass note). Here there's no limit on the number of chord notes, meaning that you can put the 12 notes in a step if wanted. The written chord is held until the next active step.
- **Input:** same as expert mode, but chords/scales are taken in real time from a MIDI device. The lowest pitched note will be taken as the bass note here as well. The octave of the 4 lower MIDI notes is used; an octaves offset is available in CONFIG → GLOBAL CONFIG → C.Input Offset to avoid pitches being too high.

The system will try to help when moving from one mode to another, but it can only do that in one direction, so if you have the **1st Track** mode active and switch to **Chords Trk**, chords will be generated by the 1st track, also if you have **Chords Trk** mode and move to **Expert**, the previously existing chords will be migrated too. Moving from **Expert** to **Chords Trk** will clean the chords. So keep in mind that this setting may clear the content of the Chords Track.

17.5 Project Key

In harmony the key is the basis upon which chords and scales are built. It's the global framework for all the notes layered on top of it.
The Project Key parameter sets the root note of the project's main scale. All scale quantization is transposed accordingly, affecting both the main and secondary scales simultaneously.

To change the project key, open PROJECT CONFIG (hold CONFIG and press PROJECT) and adjust the Key parameter.

It is possible to use parameter locks to modulate the key on a per-step basis.

If you change the project key (using parameter locks), both the main and the secondary scale are affected.

TIP.

To explore how the global scale shapes your material in practice:

1. Load a synth voice (such as Ladder Synth) onto channel 1, enable all 16 steps, and turn the Note dial on ARK-Control to assign varying pitches across the grid. This creates an unquantized, arbitrary sequence.
2. Enter the Track Config interface (CONFIG + TRACK) and verify that Quantize is set to Main Scale (default behavior).
3. Open the Project Config menu (CONFIG + PROJECT) and switch the Scale parameter to C Major. The active pattern immediately conforms to a coherent harmonic framework.
4. Cycle through various preset scales while listening to familiarize yourself with their distinct musical characters.

18 Project Menu

The PROJECT Button accesses project-related options like save, load, and configurations.

It opens the Project Menu with the following options:

Load

Click to navigate the stored projects. These are numbered. Select the ‘slot’ containing the project you’d like to open and click on it to load it.



Save

Click to navigate the project slots, select where you’d like to store it and click to save. The project on that slot will be overwritten.

Quick Save

By pressing SHIFT and clicking on the PROJECT button the project will be saved without asking.

Quick Save overwrites the slot the project was last loaded from or saved to. For a new, never-saved project it does nothing, so use Save first.

New Project

This will create a project with the default values. The first empty project slot will be selected for saving it.

Load Template

This will load the full project configuration with all devices, effects, modulation settings etc but the patterns and parts will be empty.

Delete Project

This will delete the selected project from the SD card. There’s no way back once this is done, unless a backup was made.

Edit Name

Enter the project name editor. As projects are stored in ‘slots’, project names are not unique, which means that there may be several projects with the same one. For that reason when saving a project on a different slot this editor will be opened after confirmation, similar to a ‘Save as’ function.



Patterns & Parts.
Managing pattern queuing, part configurations, and sequence management. (see next chapter)

19 Patterns and Parts

ARK provides 64 patterns per project, acting as the primary musical loops or bars. Each pattern captures step data for all 16 tracks simultaneously, allowing independent step counts, clock divisions, and sequence content per track. While navigating the pattern page (marked by a green **PATTERN** key), tapping the 4x4 grid during operation queues the chosen slot for the following cycle, according to the master track duration. To force an instantaneous transition, maintain a hold on **PATTERN** during your selection. In Pattern mode, the bank buttons (A, B, C, D) switch between the four banks of 16 patterns each.

Pattern Reset. Governs playback synchronization across all channels. When engaged for a selected pattern, every track realigns its active playhead position to the start point in sync with the Master Track cycle. Channels running in reverse playback jump directly to their final step to begin the sequence afresh.

To adjust this parameter, navigate to PROJECT → PATTERNS & PARTS → Pattern Reset and select your preferred setting:

OFF: Channels cycle independently without synchronization.
ONCE (default): Playheads realign exclusively upon switching patterns.
ON: Continuous playhead synchronization occurs on every master loop.

Note. Keep in mind that a pattern with the Pattern Reset set to OFF will keep each track's playhead where it was, therefore if the previous pattern has some polymetrics (different track sizes across the same pattern) or different clock division, the tracks may play unaligned.

19.1 Multipattern

Multi-pattern mode enables each track to play a different pattern independently. To activate, hold SHIFT + click PATTERN (it will light red), then select a pattern on the grid; the selection applies only to the current track (or group of tracks grouped via [SELECT]). When active, PATTERN turns red and parts have no effect.

19.2 Parts

Functioning as the instrument's internal song mode, a Part is an automated chain containing as many as 64 sequential patterns. Up to 16 distinct parts can be saved within any single project.

Part Selection.

Navigating the PART page (SHIFT + PART) with an active sequence allows you to select any pad from 1 to 16 to queue the next part once the active pattern cycle finishes.

You can seamlessly transition between part playback and pattern playback at any time

during a session by simply choosing a pattern while in Part mode or selecting a part while in Pattern mode.

19.2.1 Creating Parts.

There are two ways of creating parts: one by one by using the Part Editor or chaining patterns in real time on the PATTERN page.

Composing Parts with the Part Editor

Engage the Part Editor interface by holding SHIFT and pressing EDIT PART. The 4x4 grid transforms into a 64-step sequence timeline, where each illuminated pad represents a full Master Track pattern loop.
Use the Core's left encoders or tap a grid button to select a target slot, then adjust the right encoder to designate the pattern assigned to that step. The grid pads update dynamically to give you a clear visual map of your sequence arrangement, while the bank keys let you cycle through all 64 timeline positions.

Real-time Part Creation in PATTERN Mode

You can easily build pattern chains during live performance. Navigate to the PATTERN interface by pressing the **PATTERN** key, then sustain **[SELECT]** while pressing target grid pads (patterns) in your intended playback sequence.
Pressing a specific pad repeatedly appends multiple iterations of that loop directly into the active chain.

If a stored part is currently active, SELECT + pad appends the patterns to that stored part directly.

Rhythmic chains generated within PATTERN mode function temporarily and will clear unless explicitly saved. To save your custom arrangement to any of the 16 session slots, execute **SHIFT + COPY**, enter PART mode to pick your target location, and apply **SHIFT + PASTE**.

> **Note.** Parts are disabled when Multi-pattern mode is active, as tracks are then playing independent patterns.

19.3 Part Playback Modes

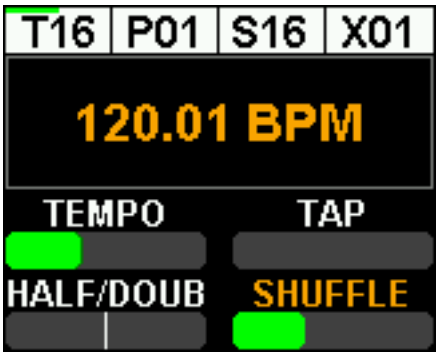
Determines the sequencer behavior when reaching the final slot of a sequence.
To configure the Part Mode, navigate to PROJECT → PATTERNS & PARTS → Part Mode and select one of four available options:

- **Loop:** Repeats the entire part sequence continuously.
- **Loop Last:** Loops the final pattern endlessly upon reaching the end of the sequence.
- **Play Next:** Automatically advances playback to the subsequent part after completion.

- **Stop:** Halts playback automatically once the part reaches its end.

Part Mode is stored separately for each part and applies to the currently selected part, so each part can have its own end behaviour (e.g. part 1 'Play Next', part 2 'Loop'). Select a stored part before changing it.

20 Tempo



Provides access to timing controls, including manual BPM selection, tap tempo, nudging, and shuffle depth. Press the **TEMPO** button to open this interface.

Project Tempo.

Adjusts the internal master clock in BPMs. Rotating the encoder fine-tunes decimal values, whereas pressing down while turning alters whole BPM units. Minimum 10, maximum 300 BPM.

Tap Tempo.

Set tempo manually by Tap Tempo. Tap the TAP encoder (2nd core encoder) in time. ARK averages the last 4 intervals between taps, so the new tempo is set from the 5th tap on. Pauses longer than 6 seconds restart the count.clicking any of the 4 core encoders. ARK needs at least 4 taps to learn the new tempo.

Half/Double Tempo.

Rotate the third Core encoder (HALF/DOUB) clockwise to double the speed or counter-clockwise to halve it. This functionality

halves or doubles sequence speed, taking effect at the following quarter note to preserve rhythmic fluidness. Under internal timing, tempo can be halved provided it remains above 20 BPM (10 BPM floor). When synchronized to an external clock (MIDI or analog pulse), the clock can be divided down to two steps to ensure micro-timing and ratchet stability.

Multiplies current playback speed, engaging on the following quarter note. Active solely when the timing reference is internal, or if division was previously applied. ARK cannot multiply incoming external timing signals.

Note. Half and double tempo also have the limit of maximum/minimum BPM. For example, with an internal clock at 240 BPM, double tempo does nothing because it would exceed the 300 BPM limit.

Shuffle Amount.

Adjusts the swing intensity by extending even sixteenths while contracting odd ones proportionally. This rhythmic offset applies strictly to designated channels—all sixteen by default—though active assignments can be customized via the TEMPO CONFIG interface (refer to the Shuffled Tracks section below).

ARK can generate a shuffled grid from a straight MIDI clock or clock trigger input.

Shuffle amount = 0%



Shuffle amount = 100%



Tempo Nudge.

Tempo nudge is a temporary adjustment to the playback speed, used by DJs and producers to align beats by ear. It briefly speeds up or slows down the tempo before returning to the original BPM, making it essential for manual beatmatching. holding |< lowers the tempo by 4 BPM and holding >| raises it by 4 BPM until released.

20.1 Tempo Config.

Provides settings for controlling the timing and synchronization of the sequencer. Use it to adjust the **shuffle, reset and clock** settings that determine how the sequence runs and interacts with external devices.

To access the Tempo Config go to [CONFIG]/TEMPO CONFIG, or tap TEMPO while holding [CONFIG]

Clock In.

Sets the clock input division. The division is expressed in Bar fractions and PPQNs (pulses per quarter note) The available divisions are:

- 1/16 - 4PPQN. One pulse per step. Standard analog Clock (Default Value)
- 1/32 - 8PPQN. Two pulses per step
- 1/48 - 12PPQN. Three pulses per step
- 1/96 - 24PPQN. Six pulses per step

On settings lower than 24 PPQN, the rest of the time grid is calculated by ARK.

Clock Out.

Clock-output resolution expressed in Bar fractions and PPQNs (pulses per quarter note) The available divisions are:

- 1/96 - 24PPQN. Six pulses per step
- 1/48 - 12PPQN. Three pulses per step
- 1/32 - 8PPQN. Two pulses per step
- 1/16 - 4PPQN. One pulse per step. Standard analog Clock (Default Value)
- 1/8 - 2PPQN. One pulse every two steps
- 1/4 - 1PPQN. One pulse every four steps
- 1/2. One pulse every eight steps
- 1/1. One pulse every sixteen steps
- 2/1. One pulse every thirty-two steps
- 4/1 One pulse every sixty-four steps

Reset In.

Set what happened when a gate is received at the RESET IN

Options for the Reset input:

- **Pattern Reset** (default), where a trigger resets the sequence to the start of the pattern.
- **Gate on Play**, where a high gate starts playback (internal clock) and a low gate stops it.
- **Gate on Stop**, the same with inverted polarity (ARK plays while the gate is low).

Reset Out.

Reset-out configuration. Default: trigger when ARK starts to play. Can be set to send triggers every 1, 2, 3…64 steps.

- **Gate on Play:** constant voltage at the reset output during play.
- **Gate on Stop:** constant voltage at the reset output if the sequencer is not running.
- **Pattern Reset:** trigger generated at the beginning of any pattern.
- **Trigger Once:** single trigger at the start.
- **Trigger n Steps:** clock-divided reset output mode (n = number of steps between triggers).Can be set to send a trigger every 1 to 128 steps.

Shuffled Tracks.

Shuffle affects only a selection of tracks — shuffled and straight grids are available simultaneously. Click on the grid to add or remove tracks from the selection.

by default all 16 tracks are shuffled. Deselect tracks on the grid to keep them on a straight grid. The selection is saved with the proje

21 Config Menu

Pressing CONFIG opens the configuration menu, which provides access to many of the module's settings.
Only the first three items of this menu (Global config, Utilities and Project config) will be covered in this section as the rest have already been covered in their respective chapters:

- For Tempo config see chapter 20.1
- For Track Config see chapter 8
- For Device config see chapter 10.1
- For Parameter Locks see chapter 9
- For Mixer config see chapter 15.3

Shortcut. Holding CONFIG and pressing another button accesses that section's config directly. For example, hold CONFIG and press DEVICE to access Device Config directly.

21.1 Global Config

These settings are stored and applied at power-up and function as machine-level configurations that are shared across all projects.

Synched Mutes.

Enabling this feature aligns track muting to the project tempo, ensuring all mutes trigger synchronously with the patterns.

MIDI TRS Thru.

Activates MIDI pass-through between the TRS input and output ports.

Chords MIDI Ch.

MIDI channel (1–16, default 1) used by the Expert and Input chord modes

C.Input Offset.

0–6 octaves (default 4) subtracted from incoming notes in Input mode.

RGB Brightness.

Intensity of the control grid and bank-button LEDs.

Accidentals.

Four ways to display accidentals:

Setting	Style	Notes
#	All sharps	C, C#, D, D#, E, F, F#, G, G#, A, A#, B
b	All flats	C, Db, D, Eb, E, F, Gb, G, Ab, A, Bb, B
2# 3b	Two sharps, three flats	C, C#, D, Eb, E, F, F#, G, Ab, A, Bb, B
3# 2b	Three sharps, two flats	C, C#, D, Eb, E, F, F#, G, G#, A, Bb, B

Global Pitch.

Modifies the pitch of all channels by changing the sample rate. Affects all synth-like devices; does not affect the V/OCT generated by ARK.

CPU Mode.

Adjusts internal processing clock speed to balance operational performance, thermal output, and power consumption.

Three operational clock rates are available:

- **SAFE:** 600 MHz standard operation. (Use always when possible)
- **MEDIUM:** 720 MHz optimized performance (default).
- **TURBO:** 816 MHz peak clock frequency for experimental scenarios. Avoid selecting this mode unless active case cooling is provided.

By default, the module operates in Medium setting, delivering enhanced processing suitable for standard Eurorack environments.

When using compact cases or working in warmer environments, setting the system to SAFE mode enhances overall stability while reducing heat and power consumption. This setting is also recommended for simple setups that do not require high processing capacity.

ADVICE. TURBO MODE IS NOT RECOMMENDED IN MOST OF THE CASES. It serves as an experimental clock boost for maximum processing capacity under active cooling setups.

Quantize REC.

Sets how live-recorded notes are placed in time (default ON).

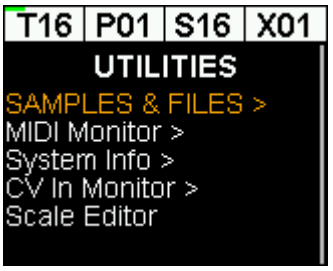
ON: each recorded note is rounded to the nearest step and placed on its first microstep. Notes played in the second half of a step go to the next step. The note length is measured from the start of that step, so the note still ends where the key was released.

OFF: each note stays in the step where it was played and keeps its exact microstep, so the original timing is preserved. On tracks slowed down with Clock Div, only notes played in the first 16th of the step keep their microstep; later notes are rounded to the nearest step.

In both modes, a recorded note replaces that step's existing microsteps. Fill and roll recording are not affected by this setting.

Note: this setting is not stored and returns to ON at every power-up.

21.2 Utilities



The Utilities section provides tools for managing files, samples, MIDI and CV, system information, scales, and module maintenance. Use these functions to manage your library, monitor incoming signals, and edit scales.

21.2.1 Samples and Files.

Access file management functions and directory options (for detailed instructions, consult Chapter 23).

Samples on SD.

Displays the quantity of sample files currently indexed by the system. Click to enter a detailed view where it is possible to use the previous and next buttons to navigate the eight banks.

Add from USB.

Copies new WAV files from the USB flash drive to the SD card and imports them into the sample library. Existing samples (and their position) in the library are preserved. Use this option to expand your library with new sounds without affecting your current samples.

Replace from USB.

Completely replaces the entire sample library with the contents of the USB flash drive

Update from SD.

Syncs sound files from the WAV folder to the active Samples directory on the SD card.

Connect to computer.

Establishes a bi-directional USB-C connection to transfer files using the web app.

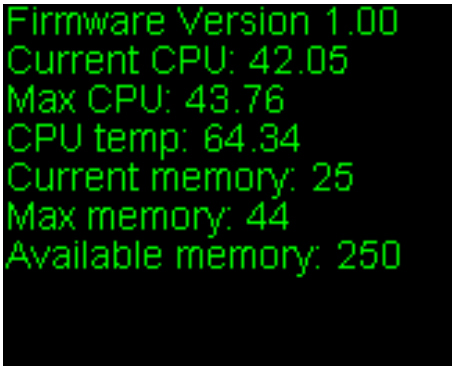
Backup to USB.

Insert a memory stick to back up all projects, samples and user scales.

Restore USB Backup.

Overwrites current module data with an archive previously stored on a USB drive.

21.2.2 System Info.



Displays Firmware version, CPU usage, temperature and available audio memory.

21.2.3 MIDI Monitor.

The **MIDI Monitor** lets you inspect MIDI messages received from connected devices in real time. It displays key details for each message, including the **port, channel, message type, and value**, making it easy to monitor and troubleshoot MIDI communication.

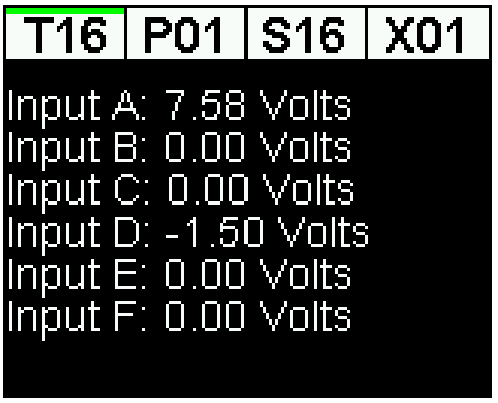
Color coding:

Message	Color
Note ON/OFF	Green
Clock/Start/Stop/Continue	Cyan
Control Change	Blue
Program Change	White
Pitch Bend	Yellow
Aftertouch	Orange



21.3.4 CV In Monitor.

Provides a real-time view of the six CV inputs, allowing you to monitor the voltage received on each input at a glance. This makes it easy to check incoming control signals and see how they change over time while the sequencer is running.



21.3.5 Scale Editor.

Access the Scale Editor where factory scales can be visualized and user scales can be edited (see Section 17.1 for further info)

21.4 Project Config

Contains project-level settings that define the overall musical and playback behavior of the current project.

They are stored as part of the project and are automatically **saved and recalled with the project**, ensuring that the project returns to the same configuration when it is loaded again.

Key. Set the project key (C, C#, D, D#, E, F, F#, G, G#, A, A#, B). Combined with main and aux scales it defines how notes are quantized. Can be used with parameter locks.

Scale. Selects the main scale of the project — used to generate chords in Auto 3 and Auto 4 modes.

Aux. Scale. Secondary scale, compatible/complementary to the main one. A good general suggestion: use the main scale but remove any note one semitone above the notes of the chord formed on the project key. E.g. in A minor, the same scale with F removed (which is one semitone above the fifth of A minor).

Slide Mode. Normal or 303 (default). In Normal mode, when a slide is set, that step performs the glide. In 303 mode, that step performs a legato and the next active step performs the glide (like a TB-303).

22 MIDI File Player

ARK supports reading standard MIDI files for playback through MIDI physical outputs and internal Devices. To achieve accurate playback, ensure the appropriate synth engines or devices are loaded on each corresponding channel.

Place your MIDI file renamed as MIDI.MID in the project's folder (PROJECTS/<project number>/) and then load (or reload) the project. The file is read at project load time, not when PLAY is pressed. To transfer the MIDI File to the SD card, extract the card from the back and connect it to a computer, or use the Connect to Computer utility to transfer it from your computer via USB).

The file starts playing every time PLAY is pressed, regardless of the selected pattern or part. MIDI data is handled similarly to an external sequencer sending data via MIDI IN — so to play the notes on channel 1 of the file in a track, set the track input (in Track Config) to MIDI CH 1 and Monitor to ON.

MIDI CC messages from the file are also available, so any device or parameter can be modulated with them.

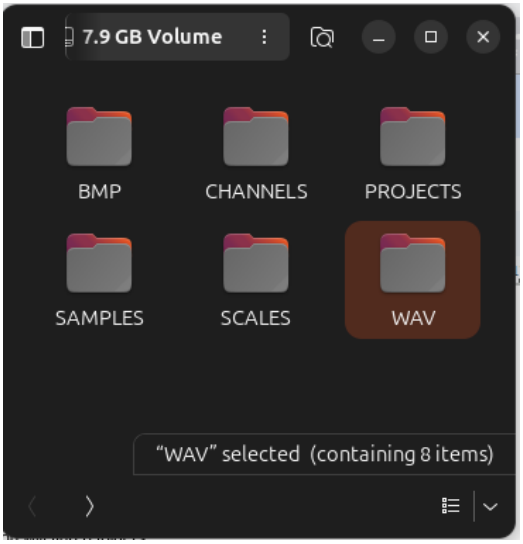
Note. ARK's resolution is 24 PPQN (6 micro-steps per step). High-density control messages are optimized when the file is processed; same for MIDI notes. ARK tracks are monophonic. ARK does not distinguish MIDI CC channel — MIDI CC 7 on channel 1 is the same as MIDI CC 7 on channel 2 — so if you plan to use MIDI modulations from a MIDI file, use different MIDI CC numbers rather than the same number on different channels.

This opens new possibilities:

- ARK can play up to 6 different notes per step (one per micro-step) when using MIDI-file data.
- Complex melodic lines, extended structures, and other patterns can be composed in the MIDI editor of your preferred DAW without the 64-step or 64-pattern restrictions.
- Intricate modulation sequences can be designed on a computer and loaded into ARK for playback.

23 Samples and files

23.1 File structure (Internal Micro SD card)



The SD card is the ARK's equivalent to a hard drive. It is placed physically between the PCB and the Screen and inside you will find 6 folders:

- BMP. Screenshots folder, Used for documentation only.
- CHANNELS. Channels Presets
- PROJECTS. One folder is created every time a new project is saved
- SAMPLES. Inside there is one folder per bank holding the RAW version of the samples for Internal use only.
- SCALES. Scale notes data.
- WAV. Unprocessed samples folder (use this to upload new samples)

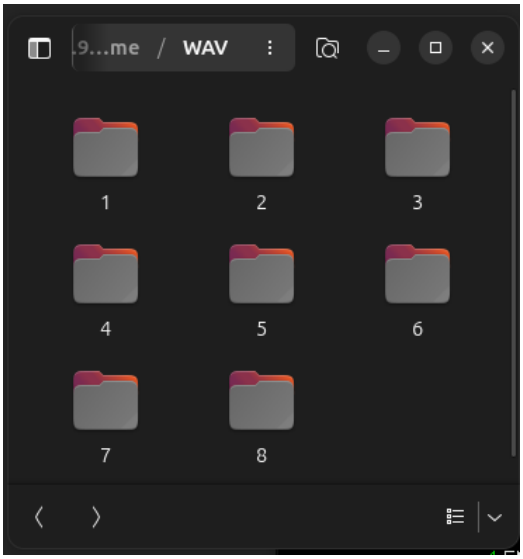
23.2 Working with samples

Some ARK devices are Sample Players, using prerecorded audio as their sound source. Samples are organized in 8 banks of 128 each.

Crucial Format. ARK expects samples to be 16-bit, 44.1kHz (mono or stereo), with a .wav filename of a maximum of 25 characters (e.g., SNARE_909_dark_final_7_ok.wav).

To load your own samples, ensure format and filename length match, then create a WAV folder in the root of a USB flash drive with numbered subfolders 1–8 (folder 1 = first sample bank):

Path	Bank
/WAV/1/	Bank 1 (first)
/WAV/2/	Bank 2
/WAV/3/	Bank 3
/WAV/4/	Bank 4



Path	Bank
/WAV/1/	Bank 1 (first)
/WAV/2/	Bank 2
/WAV/3/	Bank 3
/WAV/5/	Bank 5
/WAV/6/	Bank 6
/WAV/7/	Bank 7
/WAV/8/	Bank 8 (last)

Place your samples in the desired banks. Using the banks to organize them (kicks on bank 1, snares on bank 2, etc.) is recommended for better organization, but the arrangement is flexible. Insert the memory stick into the USB port and navigate to CONFIG → UTILITIES → Samples & Files → Replace from USB

These functions scan the WAV folder and build a reference samples table per bank, with consecutive numbers assigned to each file in alphabetical order. ARK compares the new content with the reference table:

- New samples are added.
- Removed samples are deleted from the table.
- Changing the file size or channel count updates the entry.
- Empty slots are filled with newly found samples.
- If empty slots remain after scanning the array will be compacted so there aren't any, which changes the numbers assigned so it may affect existing projects.

Customizing Bank Labels

The eight sample banks automatically display descriptive titles reflecting the factory library content.

Bank names are read from a text file found on each bank folder (SAMPLES/1/BANK.TXT … SAMPLES/8/BANK.TXT). Each file holds a single name for its bank; only the first 7 characters are shown.. To adjust these titles, open the text document in a standard editor and modify the entries one by one.

23.3 SD Card Sample file operations.

The options detailed below dictate sample file operations for the internal card, available by navigating to CONFIG → UTILITIES → Samples & Files:

Samples on microSD.

To verify which audio files have been loaded, navigate to **CONFIG / UTILITIES / Samples and files / Samples on SD**. This utility shows the total number of audio files indexed across the library; click the encoder to open a comprehensive view and use the navigation controls to browse the eight sample banks.

Update from SD.

Syncs sound files from the WAV folder to the active Samples directory on the SD card. Newly added WAVs are indexed, while modified files (reflecting altered sizes or channel configurations) undergo re-conversion. Fresh samples populate vacant slots before appending to the sequence end. **Utilize this utility following manual additions, removals, or edits within the SD card directory**. Navigate to CONFIG → UTILITIES → Samples and files to execute.

> **Note:** if any WAV files have been manually deleted from the SD card's WAV folder, their corresponding samples will be removed from the library. After deletion, new samples (if there are any) will fill these gaps, and finally the sample table is automatically compacted so that all remaining samples have consecutive reference numbers with no empty slots between.

23.4 USB Drives Sample management

Beyond standard MIDI communication, the front panel USB Host port facilitates comprehensive file management—enabling you to organize your sample collection or archive your complete ARK system.

The following parameters govern sample management via external storage devices, accessible through CONFIG → UTILITIES → Samples & Files:

Add from USB.

Transfers fresh audio data from an attached thumb drive onto the internal card, appending it directly to your existing sound collection. Previously loaded audio files and their assigned

memory locations remain unaltered, making this feature ideal for supplementing your current library.

files whose name already exists on the SD are skipped. To update an edited sample, rename it, use Replace from USB, or copy it to the SD's WAV folder and run Update from SD.

Note: if any WAV files have been manually deleted from the WAV folder, their corresponding samples will be removed from the library. After deletion, new samples (if there are any) will fill these gaps, and finally the sample table is automatically compacted so that all remaining samples have consecutive reference numbers with no empty slots between.

Replace from USB.

Replaces, bank by bank, every bank that has a matching folder (/WAV/1 … /WAV/8) on the USB stick. Those banks are deleted from the SD and rebuilt in alphabetical order. Banks with no folder on the stick keep their current samples. All existing samples and WAV files on the SD card are deleted before importing. The library is rebuilt from scratch using only the files from the WAV folder on the USB drive. Samples are imported in alphabetical order, ensuring a clean and organized library. Use this option when you want a fresh start or to load a completely new sample collection.

USB Supported formats include FAT16, FAT32 (recommended) and exFAT. Please avoid other formats such as NTFS (Windows), ext2 / ext3 / ext4 (Linux) or HFS+ / APFS (Mac)

Recommended. FAT32 format, allocation unit size 4096 bytes (4 K), USB 2.0 (not USB 3.0), capacity up to 16 GB. USB sticks larger than 32 GB may be very slow with ARK.

To format your USB drive correctly please follow these instructions depending on your OS:

- **Windows.** Right-click the target volume, choose Format, set the file architecture to FAT32, define Allocation unit size to 4096 bytes, uncheck Quick Format, and initialize.
- **Mac.** Open Disk Utility, select Erase, set Format to MS-DOS (FAT), choose Master Boot Record (MBR) scheme, and proceed with Erase.
- **Linux.** Execute sudo mkfs.vfat -F 32 -s 8 /dev/sdX1 in terminal.

23.5 Web-Based File Manager

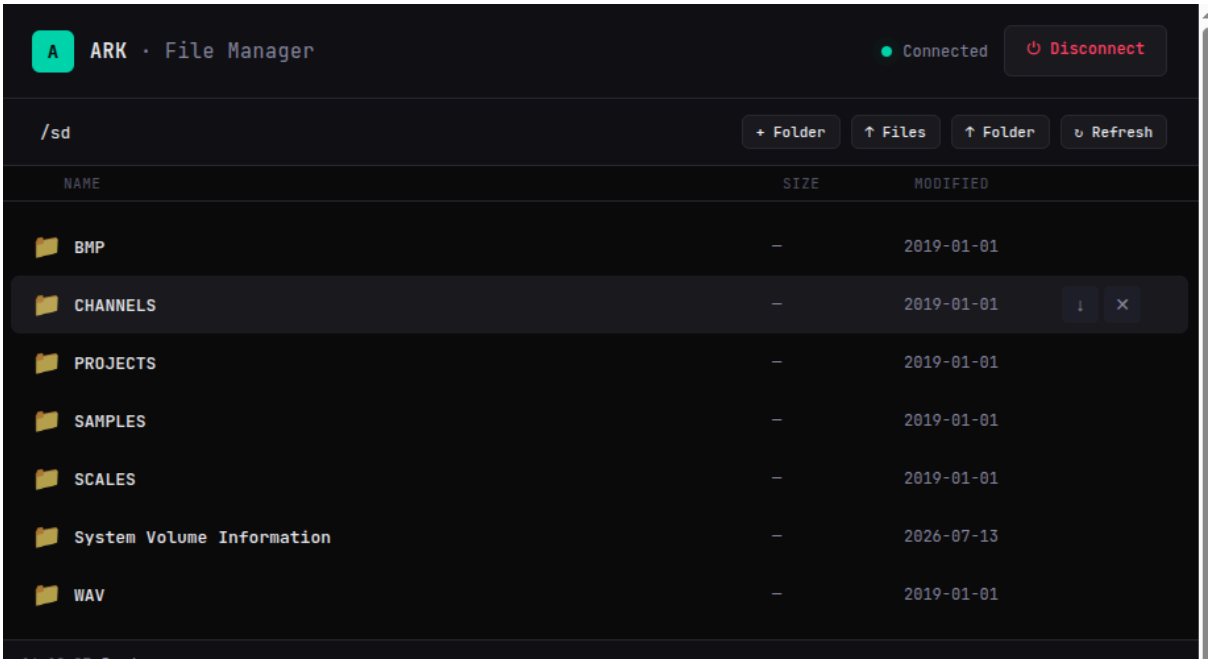
To interface the module with your computer, attach a USB-C cable and launch a Web-Serial-API compatible browser. Establish a hardware connection via USB-C, launch the online browser File Manager, then open **CONFIG / UTILITIES / Samples and files / Connect to the computer** on the Core to pair the devices.

Within the web app, press Connect and choose ARK from the device list. This reveals the microSD file tree, where you can browse directories, remove old data, or transfer fresh files.

For sample management, open the WAV directory to add or delete audio files directly.

Drop your audio files into the designated bank subfolder (WAV/[bank_number]). When finished.

File operations in the web app are applied to the SD card immediately. When finished, press the encoder to leave Computer Link mode; ARK then rescans the WAV folder and updates the sample library automatically.



Note. Operating the online file utility requires a browser with Web-Serial-API functionality, such as Chrome 89+, Edge 89+, or Opera 75+.

23.6 USB Backup System

Safeguard your project files, custom scales, and samples using the integrated USB Backup utility.

Creating a Backup

1. Insert a compatible flash drive into the front-panel USB host port.
2. Go to CONFIG → UTILITIES → Samples and files → Backup to USB.
3. Press either left encoder and select confirm when prompted.

The module copies the PROJECTS, CHANNELS (track presets), SAMPLES, SCALES and WAV folders to a BCKP_ARK folder on the flash drive.

A new backup overwrites the previous BCKP_ARK folder. Restore replaces each of those folders on the SD with the copy from BCKP_ARK.

Depending on the size of your sample library, completing this operation may take several minutes.

> **Note.** The flash drive retains only one archive file at a time; running a new backup replaces any previous backup file automatically.

Restoring a Backup

To restore saved data, connect the memory stick holding your archive and navigate to CONFIG → UTILITIES → Samples and files → Restore USB Backup. Transferring files takes time, so allow the process to finish uninterrupted.

24 Devices Reference

24.1 CV: Control Sources

Within the CV category, you will find dedicated control voltage sources designed for interfacing with external hardware. Select these devices whenever you wish to operate ARK channels like a classic analog sequencer setup.

24.1.1 Envelope.

Traditional ADSR contour generator driven by track gate events. Because gate duration directly shapes the resulting envelope, fine-tune your step length settings within the sequencer to achieve the desired response.

Available parameters:

Attack. Initial rise duration from trigger onset to peak level.

Decay. Transition time from the maximum peak down to the sustain level.

Sustain. Held voltage amplitude while the incoming gate remains active.

Release. Fade duration to zero after gate closure.

Amplitude. Governs the output voltage scale (-10V to +10V).

Offset. Applies a base voltage shift (-10V to +10V).

Lin/Exp. Smoothly transitions the curve profile between linear and exponential responses.

Delay. Introduces an initial wait before the attack phase initiates.

24.1.2 CV Recorder.

Functions as a specialized control voltage digitizer and CV-to-MIDI CC conversion engine operating at a resolution of 1 sample per micro-step.

To record CV, select the CV Recorder track and engage in live recording. While recording, the selected CV input is sampled into the pattern at 6 values per step. If the track follows the project scale, the output is quantized to it.

The Smooth control provides linear interpolation between step values, delivering a continuous 44.1 kHz output response.

Parameter locks are disabled on the active track while this device is loaded.

When no control voltage is recorded in the pattern, incoming signals pass directly through to the output.

Available parameters:

CV In. Selects the physical analog input jack (A, B, C, D, E or F).

Smooth. Interpolates continuously between captured voltage steps.

In Range. Scales incoming or captured control voltage into MIDI CC values (±5V, +5V, or +10V).

MIDI Out. Assigns the target MIDI CC controller number for the converted signal. Values can be OFF or CC 0-127.

24.1.3 LFO.

Generates modulation signals by routing any of the 16 channel LFOs to physical outputs.

Available parameters:

Slew. Interpolates the control voltage; deactivating it generates stepped values

LFO Num. Designates the active LFO source

Mode. Switches between standard smooth operation and Sample & Hold, where an active step on the sequencer freezes the LFO amplitude at that moment.

24.1.4 V/OCT.

Generates control voltages adhering to the 1V/Oct standard from various internal sources—including track note data, the Chords Track root, Project Key, or velocity settings. The module fully respects system-wide quantization, ensuring connected hardware remains synchronized with your harmonic setup.
Auxiliary functions include portamento slew and dedicated vibrato controls.

Available parameters:

Octave. Applies voltage offsets in precise 1V steps.

Slew. Glide transition time between consecutive pitch levels (portamento).

Source. Designates the operational data stream translated into control voltage:

- **Note:** Tracks active sequence pitch data, holding the value until the subsequent trigger.
- **Velocity:** Translates the channel's velocity settings.
- **Project Key:** Follows global key changes, including per-step parameter locks.
- **Chord Root:** Tracks the active root note defined on the Chords Track.

S Mode. (slew mode) Processes the selected Source signal using Linear or Exponential response curves.

Vibrato Amount. Adjusts the overall depth of the pitch modulation.

Vibrato Frequency. Governs the speed of the LFO driving the vibrato.

Vibrato Att. Rise time for the vibrato effect envelope.

Vibrato Decay. Vibrato Decay. Fade-out time of the vibrato envelope. At maximum (INFINITE, the default) the vibrato is held for the whole note.

24.2 Drums: Complete drum synthesizers

24.2.1 Kick.

Versatile kick synthesizer offering an expansive sonic palette, capable of generating everything from classic 80s analog punch to heavy, mix-eating kick-bass voices.

Available parameters:

Pitch. Primary pitch center of the oscillator.

Wave. Selects between Sine, Triangle, Saw, or Square shapes.

Cutoff. Controls internal filter corner frequency.

Res. Adjusts resonance peaking near the cutoff point.

Decay. Amp envelope tail duration.

Mod.Decay. Fall time for the modulation contour.

Mod>Freq. Routes modulation depth directly onto pitch.

Mod>Filt. Directs modulation depth toward filter frequency.

24.2.2 Bass Drum.

Analog-style low-end drum algorithm adapted from MI Plaits, expanded with additional features. Generates kick drum sounds from a synthesized resonant body and a short excitation transient, allowing it to range from short and compact kicks to deeper and more resonant sounds.

Available parameters:

Pitch. Base fundamental tuning.

Tone. Adjusts timbre and harmonic brightness.

Dirt. Introduces subtle drive and punch saturation.

Accent. Controls dynamic emphasis on higher-velocity hits.

Decay. Fade length of the main amplitude envelope.

Mod Pitch. Pitch sweep envelope depth.

Mod.Dec. Decay speed for internal pitch sweep.

Amp. Master output volume for the voice.

24.2.3 Snare.

Analog snare synthesis algorithm adapted from MI Plaits.

Available parameters:
Pitch. Base fundamental tuning of the voice.

Decay. Overall amp envelope tail duration.

Tone. Adjusts timbre and harmonic balance.

Ptch.Env. Depth of the internal pitch modulation contour.

Accent. Controls dynamic emphasis on higher-velocity hits.

Ns.Decay. Fade length for the noise component.

Snappy. Balance between the drum shell body and snappy.

Ns.Color. Character of the noise generator.

24.2.4 Cymbal.

Vintage-style cymbal/hi-hat synthesizer with 4 detuned oscillators plus noise as base sources.

Available parameters:

Pitch.

Texture. Distance between 4 oscillators frequency

Noise.

Decay. Volume envelope tail duration

Filter Frequency. Hi-Pass filter Cutoff

Resonance. Hi-Pass filter Resonance

Attack. Envelope attack time

Amp. Volume control

24.2.5 FM Percussion.

Metallic-like percussive engine utilizing sine FM synthesis, a noise generator, and a band-pass filter.
Available parameters:

Mod Pitch. Tuning offset for the modulating FM operator.

Noise. Adjusts the level of the white noise component.

FM Amount. Overall frequency modulation index depth.

FM Decay. Fade duration for the modulating operator contour.

O.Decay. Release tail length for the primary carrier oscillator.

N.Decay. Envelope decay time for the noise source.

BP Freq. Center frequency of the band-pass filter.

Res. Resonance level of the band-pass stage.

24.2.5 FM Tom.

Classic 1980s drum machine tom synthesis algorithm.

Available parameters:

Pitch. Base fundamental tuning of the oscillator.

5th Lvl. Level of the harmonic fifth component.

Decay. Amp envelope tail duration.

Pitch Mod. Intensity of the pitch sweep modulation.

24.2.6 Noise.

Filtered white noise percussive engine featuring a continuous multimode filter and dual independent envelopes for amplitude and filter modulation.

Available parameters:
Cutoff. Controls internal filter corner frequency.

Resonance. Adjusts resonance peaking near the cutoff point.

Mod>Filt. Routes modulation depth directly toward filter frequency.

LP.BP.HP. Transitions smoothly across low-pass, band-pass, and high-pass modes.

Attack. Initial rise duration of the amplitude envelope.

Decay. Overall amp envelope tail duration.

Mod Attack. Rise time for the modulation envelope.

Mod Decay. Fade duration for the filter modulation contour.

24.3 Sample Players

ARK includes a versatile selection of instruments powered by pre-recorded audio, each tailored for specific workflows—ranging from dynamic beat slicing and sonic experimentation to long-form file playback. Work with the included sound banks or import your favorite audio files. For comprehensive details regarding file requirements and sample management on ARK, please consult Chapter 23.

24.3.1 Sampler.

Stereo playback engine. Loads audio data into internal RAM for near-zero latency, delivering superior responsiveness compared to direct card streaming.
When loaded you will be redirected to the Sample Pool interface (or you can go at any moment at CONFIG / DEVICE CONFIG / Sample Pool) to assign up to 16 files into RAM.

We recommend using Sampler over the SD Sampler unless handling extended audio files that exceed memory capacity is needed. SD Sampler is otherwise only needed when requiring more than 16 distinct sound sources per session.
Playback rate and pitch automatically follow track note data.

Available parameters:

Sample. Assigns one of the 16 active Sample Pool slots.

Pitch. Voice tuning. Governed by sequence notes by default.

Attack. Initial rise duration of the amplitude envelope.

Decay. Release tail duration for the volume contour.

Mode. Selects from eight distinct operational behaviors:

- One Shot: plays the full sample, the decay and loop parameters do nothing here.
- Gate: plays the sample with the duration of the gate, loop parameters have no effect.
- Loop: same as ‘gate’ but with loop controls (loop position, size & crossfade).
- Ping Pong: same as above but the loop is in pingpong mode.
- S. One Shot: same as ‘one shot’ but starts on the left locator of the loop.
- S. Gate: same as ‘gate’ but starts on the left locator of the loop.
- S. Loop: same as ‘loop’ but starts on the left locator of the loop.
- S. Ping Pong: same as ‘ping pong’ but starts on the left locator of the loop.

Xfade. Overlap duration for smooth loop transitions.

Loop Position. Sets the loop start marker within the waveform.

Loop Size. Sets the loop length measured from the Loop Position marker (looping modes only).

24.3.2 SD Sampler.

Streams audio directly from the microSD card, granting access to the entire 1024 sample library. This method introduces slight latency, so it is not recommended for time-critical applications across multiple channels simultaneously.

Available parameters:

Sample. Selects the audio file within the active bank. Following track note data by default.

Bank. Chooses between the eight sample directories.

Pitch. Voice tuning.

Start. Playback offset point.

Amplitude. Master voice gain, scaled by channel velocity by default.

Decay. Volume tail length (maximum setting yields sustained playback).

Filter. Bipolar DJ-style low-pass and high-pass processing curve.

24.3.3 Slicer.

This sampler takes an audio file and divides it into a specified number of slices, being particularly well suited for **l**ive remixing and rearranging rhythmic loops. It can chop loops into smaller sections and rearrange them while keeping them synchronized with the project's tempo.

The sampler can work with up to **16 audio files at the same time**. These files are loaded from the **Sample Pool / RAM**, where they must be placed beforehand. You can switch between different samples from the Sample Pool on the fly while the sampler is running.

For the best results, the slices should correspond to the rhythmic structure of the original audio. When the slices are aligned with the musical grid of the source material, the sampler can rearrange them while maintaining a coherent rhythmic relationship with the project tempo.

Each time a slice receives a **Gate** signal from the sequencer, the sampler performs an action determined by the selected **Mode**.

Depending on the Mode, each incoming Gate can make the sampler:

- Reset to the Init point.
- Play the next slice.
- Play the previous slice.
- Play a random Slice.
- Repeat the last slice.

TIP: To remix a loop, you may want to make extensive use of parameter locks on the Mode and Init parameters. For example, leave Mode set to Forward and set it to Reset on the steps where the loop should restart at the init slice. (see Chapter 9 for information about using parameter locks).

For rhythmic loops, it is recommended to use **properly trimmed loops representing an exact number of bars**. The number of slices should also be chosen so that it fits evenly within the loop's bar structure. Powers of two are generally a good choice, such as **4, 8, 16, 32, or 64 slices**.

For example, a perfectly trimmed 4-bar loop divided into 16 slices produces four slices per bar. This makes it possible to create rhythmic variations and perform live rearrangements while keeping the material synchronized with the project's musical grid.

Available parameters:

Sample. Selects the audio file loaded from the Sample Pool.

Slices. Determines the number of divisions across the audio file.

Init. Sets the starting slice for sequence execution. This is the slice selected by Reset Mode.

Mode. Governs playback behavior upon receiving a trigger: Reset, Forward, Backward, Random, or Repeat.

Attack. Initial rise duration of the amplitude envelope.

Decay. Release tail length for the volume contour.

Pitch. Adjusts playback rate and slice tuning. Tracks sequencer note by default.

Filter. Bipolar DJ-style high-pass and low-pass processing curve, remaining neutral at the center position.

Try this as first Slicer test:

1. Import a drum loop into the Sample Pool (selecting a loop with a tempo similar to your project BPM yields optimal results).

2. Set SLICES to 16, activate all 16 steps in the sequence, and press PLAY.
   The complete audio loop will now begin playback.

3. Experiment by creating Parameter Locks on specific steps: hold down a step pad while adjusting parameters—such as switching the step Mode to Reset or Random.

Have fun!

24.3.4 Granular.

Granular divides an audio sample into short segments called **grains**. These grains are independently generated and can be varied in length, timing, position, and density. By changing these parameters, the original sample can be reorganized in time and transformed into different forms of audio material.

The voice follows the **pitch and timing information of the sequencer**, allowing it to be used for melodic as well as non-melodic material. The ability to produce recognizable melodies depends on the audio content of the selected sample and on the granular parameters.

The audio used by the Granular voice is stored directly in **RAM memory**. Up to **16 samples can be loaded into the Sample Pool** and selected as sources for granular processing.

The voice has eight parameters that determine how the selected sample is read and how the grains are generated. The interaction between these parameters determines how the source sample is distributed over time and how it responds to the sequencer's notes.

Available parameters:

Sample. Selects the audio source from the Sample Pool.

Size. Controls the length of each grain.

Density. Determines the rate at which grains are generated.

Texture. Controls the variation and character of the generated grains.

Attack.Controls the attack time of each grain.

Decay. Controls the decay time of each grain.

Position. Sets the position in the sample from which grains are taken.

Spray. Introduces variation around the selected sample position.

24.4 Synth Voices

24.4.1 Acid.

This voice is a classic acid bassline synthesizer based on a resonant low-pass filter and a distinctive filter-envelope modulation. It is designed for creating the characteristic squelchy, dynamic bass sounds associated with acid music, with emphasis on accent, resonance, and fast pitch and filter movement.

Available parameters:

Octave. Coarse tuning in octave steps.

Wave. Provides seamless morphing across waveform profiles from Sawtooth to Square, simultaneously adjusting the pulse width duty cycle.

Dist. Adds waveshaping drive and aggressive saturation.

LP/BP/HP. Filter mode selector: Low-pass, band-pass, and high-pass modes.

Mod→Filt. Depth of envelope modulation applied to the filter cutoff.

Decay. Release tail duration for the filter and amplitude envelope.

Cutoff. Primary filter corner frequency.

Res. Adjusts resonance peaking near the cutoff point.

24.4.2 Bells.

A bell-like synth voice driven by phase modulation and a resonant bandpass filter. It generates short-decay, pitched metallic sounds, using phase and filter modulation to shape timbre, brightness, and spectral motion. Independent envelopes for phase and filter frequency offer precise control over the sound's attack and evolving tonal character. Intentionally pushing the resonance to high levels introduces clipping for a more aggressive edge.

Available parameters:

Octave. Coarse tuning adjustment in octave increments.

Phase Mod. Overall phase modulation index depth.

Decay. Main volume envelope tail duration.

Mod→Phase. Bipolar depth control routing modulation envelope directly onto phase index.

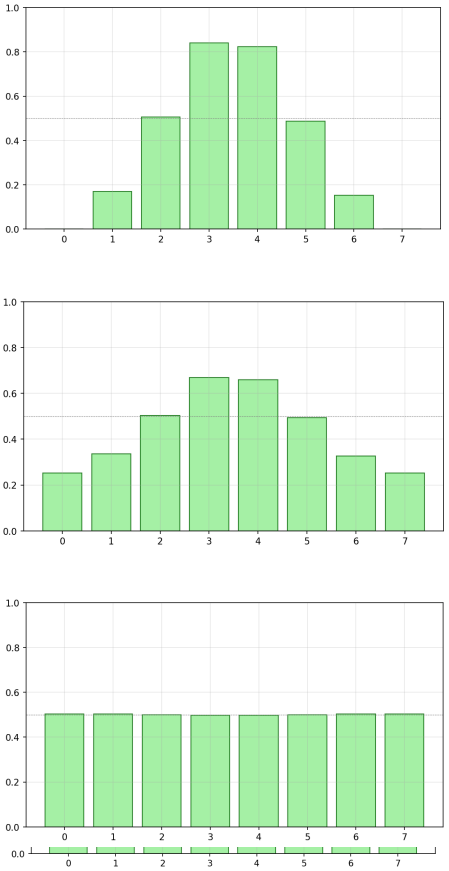
Mod.Decay. Modulation envelope fade duration.

Mod→Filt. Bipolar modulation routing toward filter corner frequency.

Filt.Freq. Center frequency of the band-pass filter.

Res. Adjusts resonance peaking near the filter frequency.

24.4.3 Harm Osc.



Additive synth voice built around a harmonic oscillator with multiple harmonic series ratios, alongside intelligent scanning parameters that control the levels of eight sine waves aligned to the harmonic spectrum.

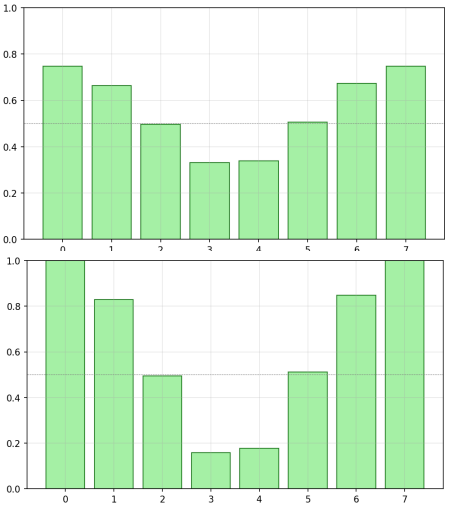
The graphics represent the amplitude of the eight harmonics with the scan position at 50%, the scan width at 70%, and the scan gain ranging from 100% to -100% (with 0% shown in the center image).

There is also an envelope that acts inversely to the scan gain: if the scanner adds gain to a band, the envelope subtracts it, and vice versa. With these settings and the scan gain set to 100% (represented by the top image), applying the envelope at a 100% level results in the gains shown in the bottom image when the envelope reaches its maximum amplitude.

Additionally, all gains feature final compensation, maintaining a constant instrument amplitude regardless of how many voices are active.

Finally, a set of harmonic series has been implemented to expand the sonic range of this device, spanning from natural and metallic tones to dissonant timbres.

Available parameters:



Octave. Coarse tuning adjustment in octave increments.

Scn.Pos. Controls the spectral scanning position across the harmonic series.

Scn.Gain. Bipolar gain control for the active scan window.

Scn.Width. Determines the bandwidth of the harmonic scanner.

Attack. Initial rise time of the internal envelope.

Decay. Decay duration for envelope.

Env.Lvl. Adjusts the overall depth of the envelope on the scanning system.

Harmonic. Selects the pitch ratio profile between the sine waves:

- Natural
- Odd
- Odd fold

- Ultra fold
- Fibonacci
- Strings
- Oct & fifth
- Bell
- Primes
- Powers
- Random

24.4.4 Ladder Synth.

Full synth voice with sub-oscillator and analog modeling ladder low-pass filter.

Available parameters:

Octave. Coarse tuning adjustment in octave increments.

Wave. Sets the waveform profile for both primary and secondary oscillators simultaneously, alongside their relative pitch offset method. Cycles through four classic oscillator shapes, each providing options for sub-octave layering or fine detuning.

- Sine Sub
- Triangle Sub
- Saw Sub
- Square Sub
- Sine DTN
- Triangle DTN
- Saw DTN
- Square DTN

Within “Sub” modes, the second generator acts as a sub-oscillator tuned one octave down, with the Sub/Dtn control adjusting its amplitude. In DTN modes, the relative level remains locked while Sub/Dtn governs the pitch offset of the secondary voice.

Sub/Dtn. Adjusts sub-oscillator blend and pitch offset depending on Wave parameter.

Env→Filt. Depth of envelope modulation applied to filter cutoff.

Attack. Initial rise duration of the contour generator.

Decay. Tail duration for the volume and filter envelopes.

Cutoff. Filter corner frequency.

Res. Adjusts resonance peaking near the cutoff point.

24.4.5 Rubber Synth.

Expressive synth voice with shifting timbre and a tight, resonant tone. Built around a single oscillator with continuous timbre control, followed by high-pass and low-pass filters in series.

Available parameters:

Octave. Coarse tuning adjustment in octave increments.

Wave. Designates the primary oscillator wave shape.

Timbre. Morphs the harmonic spectrum of the voice smoothly.

Width. Determines the octave gap separating high-pass and low-pass filter cutoffs.

Attack. Rise duration of the amplitude envelope.

Decay. Fade length of the volume tail once the gate closes.

Cutoff. Primary corner frequency for the high-pass and low-pass stages.

Res. Adjusts resonance peaking near the cutoff point.

24.4.6 Super Saw.

Powerful stereo synthesizer engine designed for generating expansive basslines, lush pads, and cutting lead voices.

Driven by stacked, detuned sawtooth oscillators routed through a continuous multimode filter stage.

Available parameters:

Octave. Coarse pitch adjustment in octave steps.

Wave. Chooses the core oscillator waveform.

Detune. Governs pitch spread across the stacked saw generators.

LP.BP.HP. Transitions smoothly across low-pass, band-pass, and high-pass filter modes.

Attack. Initial rise time for the volume envelope.

Decay. Fade duration for the amplitude contour.

Cutoff. Primary filter corner frequency.

Res. Adjusts resonance peaking around the cutoff point.

24.4.7 Voice.

Formant synthesizer designed to generate vocal-like, resonant timbres by shaping an internal source through dedicated formant controls. Provides an expressive tonal palette capable of producing organic vowel sounds or sharp synthetic textures.

Available parameters:

Octave. Coarse pitch adjustment in octave steps.

Formant. Morphs the vowel frequency character.

Ratio. Controls the source harmonic frequency relationship.

Shape. Selects base waveform contour.

Attack. Initial rise time of the volume envelope.

Decay. Release tail duration for the amplitude contour.

Amp. Master output volume for the voice.

24.5 Oscillators.

Precise pitch tonal sources designed for external processing, perfectly aligned with the project's global scale and harmonic framework.

24.5.1 Raw Osc.

Classic style dual oscillator + suboscillator. It needs at least one note on the sequencer or keyboard to be activated.

Available parameters:

Octave. Coarse tuning adjustment in octave increments.

Wave. Selects core waveform shape for the primary generator.

Slew Time. Portamento glide duration between consecutive pitch levels.

Pitch 2. Frequency offset for secondary oscillator.

Level 2. Mix amplitude for secondary voice.

Wave 2. Waveform for secondary generator.

Level 3. Sub-oscillator volume control.

Wave 3. Waveform selector for sub-oscillator.

24.5.2 Complex.

West-Coast dual generator featuring audio-rate FM, phase, and ring modulation capabilities. Requires an active gate trigger or sequencer note to initiate playback.

Available parameters:

Octave. Coarse pitch adjustment in octave steps.

Wave. Selects primary oscillator profile (folded sine, folded triangle, morphing saw/triangle, or variable-width square).

Index. Governs modulation intensity between primary and secondary cores.

Timbre. Controls wavefolding, symmetry, or pulse width depending on the active shape.

Mod.Type. Selects cross-modulation routing: Frequency, Phase, Timbre or ring.

Mod.ATT. Rise time for the modulation envelope contour.

Mod Dec. Decay time for the modulation envelope contour.

Mod.Tune Pitch offset of the modulating oscillator in semitones (default +7 st).

24.6 Polyphonic.

Polyphonic synth engines synthesize multi-note textures via integrated chord presets or by aligning with ARK's harmonic framework. Furthermore, enabling MIDI transmission on the channel allows these devices to output polyphonic MIDI data to drive outboard equipment.

The **C.Type** parameter determines how harmonic voicings are produced by these engines, offering the following options:

- **Chords Track:** Tracks the active harmonic progression defined on the dedicated Chords layer.
- **Auto 3 / Auto 4:** Automatically builds diatonic triads or four-note voicings anchored to sequence pitch data and the project scale.
- **Fixed Harmony:** Applies a static chord preset from the internal library across all active steps.
- **Root / Octave:** Restricts the voice output to single-note monophonic playback or simple octave doubling.

24.6.1 Acordes.

Four-voice stereo synthesizer, for creating full, lush, and evolving harmonic textures. Shape the harmony with **Chord Type** and **Inversion**, then sculpt its character with **Waveform**, filter controls, and envelope settings.

Available parameters:

C.Type. Determines harmonic structure derived from the Chords Track, project scale, or fixed harmony setups. Depending on the mode this instrument can:

Inversion. Rearranges voice voicing positions across higher or lower octaves.

Waveform. Selects the core oscillator wave shape profile.

Env→Filt. Adjusts the overall depth of envelope modulation applied to filter cutoff.

Attack. Initial rise duration of the amplitude contour.

Decay. Release tail length for volume and filter envelopes.

Cutoff. Primary corner frequency for internal filter processing.

Res. Controls resonance emphasis near the filter frequency point.

24.6.2 Pad.

A stereo pad synthesizer designed for spacious, evolving atmospheres. Its chord generator creates rich harmonic movement, while the chorus adds width and gentle motion.

Available parameters:

C.Type. Harmonic structure mode (Chords Track, Auto 3/4 via main scale, or static chord selection).

Inv. Reorders pitch positions across octaves.

Ch.Rate. Speed of the stereo chorus LFO.

Ch.Depth. Modulation intensity of the chorus effect.

Attack. Rise time for the volume envelope.

Decay. Release tail duration for amplitude contouring.

Cutoff. Main filter corner frequency.

Env→Filt. Bipolar envelope depth routed to filter cutoff.

24.7 Physical Modelling

24.7.1 Pluck.

Physical modeling engine based on the Karplus-Strong algorithm, engineered for string synthesis simulation. It models the behavior of struck or plucked acoustic strings by generating a brief excitation impulse routed into a tuned delay network. This delay length defines the core fundamental tuning, whereas the feedback network governs acoustic decay and timbral evolution.

The initial excitation energy circulates continuously through the feedback path, filtering high frequencies on each pass to mimic natural string damping. Adjusting controls like **Bright**, **Decay**, and **Harmonic** transitions the voice smoothly from tight, muted impulses to resonant, extended acoustic textures.

Available parameters:

Octave. Coarse pitch adjustment in octave steps.

Mode. Selects voice behavior

- Duophonic
- Harmonic
- Harmonic gated

Stereo. Spatial stereo spreading across outputs.

Bright. Controls high-frequency content and damping inside the loop.

Decay. Governs resonance decay time within the delay line.

Release. Fade duration after gate closure.

Harmonic. Controls the pitch of the overtone generator

Harmonic Level. Adjusts the amplitude of the overtone.

24.7.2 Modal.

Adapted from Mutable Instruments Elements, this synthesis engine simulates a physical exciter paired with a resonant acoustic cavity. The exciter provides an initial burst of acoustic energy, while the resonator models physical materials to transform that impulse into rich pitched, harmonic, or metallic timbres.

The dynamic pairing of impulse and resonance creates an organic physical voice, seamlessly morphing from struck and plucked tones to bowed, blown, or experimental sonic textures.

This voice demands significant CPU resources; avoid initializing multiple instances and maintain lower quality settings whenever possible.

Octave. Coarse pitch adjustment in octave steps.

Struct. Morphs the physical material characteristics of the resonant body.

Bright. Controls the brightness and presence of the sound,

Damp. Controls absorption within the resonator.

Scrap. Switch between percussive, struck excitation (at 0) or continuous scraping/friction excitation that sustains while the gate is held (at 1)

Amplitude. Master output level for the voice.

Quality. Sets processing resolution (six possible values); each higher tier increases CPU load by approximately 2.7%.

Accent. Governs dynamic response to higher-velocity triggers.

25 Device Effects Reference

25.1 Bit Crusher.

Digital degradation effect designed to transform clean audio into gritty, lo-fi textures. By reducing bit depth and sample rate, it introduces quantization and aliasing artifacts that range from subtle digital coloration to harsh, aggressive distortion. Use the built-in filters to further shape the resulting sound and control its frequency content.

Available parameters:

Bits. Reduces bit depth resolution (16 bits provides dry bypass, while lower settings add aggressive digital degradation).

Freq. Reduces sample rate frequency.

HP. High-pass filter cutoff.

LP. Low-pass filter cutoff.

25.2 Cut.

Simple tone-shaping tool for removing unwanted low or high frequencies from an audio signal. Both filters offer adjustable slopes of up to 48 dB/oct, allowing anything from a gentle frequency cut to a more pronounced filtering effect.

Available parameters:

High Pass. removes frequencies below the selected cutoff point.

Low Pass. removes frequencies above the selected cutoff point.

HP Poles. sets the hipass filter slope: Bypass, 12, 24, 36 or 48 dB/oct (default 48 dB/oct)

LP Poles. sets the lowpass filter slope: Bypass, 12, 24, 36 or 48 dB/oct (default 48 dB/oct)

25.3 Comb Filter.

Creates resonant, metallic and hollow tones by combining the original signal with a delayed version of itself. Adjusting the delay changes the comb filter frequency, while feedback controls the intensity and resonance of the effect. The Dry/Wet control sets the balance between the original and processed signals.

Available parameters:

Delay. Sets the comb filter frequency.

Feedback. Controls the amount of signal fed back into the filter, increasing resonance.

Dry/Wet. Controls the balance between the original (dry) and processed (wet) signal.

25.4 Delay Pan.

The Delay Pan uses a short delay to create movement and spatial placement within the stereo field. By offsetting the delayed signal between the left and right channels, it can add width, separation, and if modulated, a sense of motion to an audio element.

Available parameters:

L↔R. Controls the stereo placement, positioning the delayed signal from left to right.

25.5 Gater.

Rhythmic amplitude effect that creates repeating volume patterns by opening and closing the audio signal according to the notes (gates) of a track. It can be used to create rhythmic movement, pulsing effects, and dynamic patterns.

Available parameters:

Mode. Selects the gating behavior:

- **Normal:** audio passes while the source track's gate is high.
- **Dynamic:** the opening level follows note velocity.
- **Inverted:** audio is muted while the gate is high and passes between notes.

Slew. Smooths the gate transitions to help avoid clicks and unwanted artifacts.

Amount. Controls the intensity of the gating effect.

Track. Source track to get the notes from.

25.6 LP Gate.

Combines a low-pass filter with a VCA and an envelope generator to shape both the tone and amplitude of a sound dynamically. Inspired by the behavior of classic low-pass gates, it produces smooth, organic responses that can range from short, percussive sounds to softer textures.

Available parameters:

Attack. Controls how quickly the envelope opens the gate.

Decay. Controls how quickly the envelope closes after being triggered.

Cutoff. Sets the low-pass filter cutoff frequency.

Env→Filt. Controls how much the envelope affects the filter cutoff, adding dynamic tonal movement to the sound.

25.7 Side Chain.

Ducks the signal each time a note (gate) plays on another track. Uses track gates to dynamically control the level of the processed signal. This allows one sound to react to another, creating effects such as rhythmic ducking, pumping, or dynamic attenuation.

Delay. Sets the time between the side-chain trigger and the start of the attack.

Attack. Controls how quickly the effect responds to the side-chain signal.

Amount. Controls the intensity of the side-chain effect. At 0%, the effect is bypassed.

Track. the track (1-16) whose notes trigger the ducking.

25.8 Stereoizer.

Enhances the stereo image by splitting the signal into low and high frequency bands. The low frequencies remain centered in mono, while the high frequencies are widened using a short ping-pong delay, adding width and spatial movement without affecting the low-end foundation.

Available parameters:

Delay. Sets the delay time applied to the high-frequency band.

Freq. Sets the crossover frequency between the low mono and high stereo bands.

Feedback. Controls the amount of delayed signal fed back into the effect, increasing the stereo movement and resonance.

Amount controls the intensity of the Delay effect.

25.9 Saturation.

Adds harmonic content to the audio signal, giving it from subtle coloration to more pronounced distortion. It can be used to enhance the presence and texture of a sound.

Available parameters:

Drive. Controls the amount of saturation applied to the signal.

Style. Selects the character or type of saturation. The available styles are:

- **Clean** — Subtle, transparent saturation. Adds gentle harmonic richness without noticeably coloring the sound. Ideal for warming up digital sources while preserving their original character.
- **Warm** — Smooth, tape-like compression with asymmetric saturation. Softens transients and adds body, particularly effective on bass and vocals.
- **Crunch** — Aggressive clipping with a hard edge. Emphasizes odd harmonics for a punchy, in-your-face character. Great for drums and percussive sounds.
- **Distort** — Rich, full-spectrum saturation with a complex harmonic blend. Adds both even and odd harmonics for a thick, heavy tone that fills out the mix.
- **Destroy** — Extreme saturation with rectification. At high drive levels the signal is progressively folded and crushed. Use with caution.

Tone. Shapes the tonal balance of the saturated signal.

Dry/Wet. Controls the balance between the original and processed signals.

26. SD Card Selection and format.

The internal microSD card functions as ARK's central storage unit, housing all factory and user content—including sample libraries, project files, and channel presets. The card included with your module offers ample capacity for typical use and is unlikely to need replacement. Should you ever need to swap it out, please carefully review the guidelines in the following two sections.

26.1 Card Selection

Select A1 or A2 Application Performance Class media, which excel at small random reads (precisely matching the 1-2KB buffer access pattern of the playback engine).

Recommended models include **SanDisk Extreme or Samsung EVO series**.

Optimal audio playback from the microSD card relies heavily on the allocation unit size. As a rule of thumb, always format media using large cluster blocks (32 KB or 64 KB) in FAT32 or exFAT.

Whenever the engine requests an audio buffer, the media must locate and serve those bytes immediately. Selecting larger cluster sizes guarantees contiguous data storage, resulting in linear sequential reads with minimal seek overhead (effectively suppressing worst-case latency spikes). Conversely, compact cluster sizes increase file fragmentation and filesystem overhead, exacerbating latency spikes.

26.2 Formatting Guidelines

- **Official SD Formatter:** Utilize the official SD Card Formatter tool (available for macOS and Windows). This utility guarantees precise partition alignment with the card's physical underlying memory blocks. Standard operating system formatters frequently misalign memory blocks, introducing unwanted latency spikes.
- **Filesystem by Capacity:** High-capacity SDXC media (>32 GB) ship pre-formatted in exFAT, which performs reliably. Standard SDHC cards (≤32 GB) typically use FAT32. Both architectures are supported by the firmware, though exFAT is recommended when streaming larger audio files.
- **32 KB or 64 KB Clusters:** Avoid default small cluster sizes. While SD Card Formatter automatically assigns optimal block sizes when performing an overwrite format, manual tools should be explicitly configured for 32K or 64K allocation units.

- **Fresh Initialization:** Always format media using a computer prior to transferring samples onto the card. Repeatedly writing and erasing files on a full card causes severe fragmentation, degrading read performance over time.

While optimal formatting minimizes latency spikes, it cannot transform a slow card into a high-performance one—selecting media rated A1 or A2 with strong random read performance remains the primary factor. To evaluate whether formatting improved performance, run the built-in SD card test (Appendix 4) before and after formatting and compare the rd worst-case values.

Note: exFAT formatting is strictly intended for high-capacity cards (>32 GB), which typically utilize this standard out of the box.

27. Technical Specifications

Electromechanical

- **Width:** 40 HP (Core 18 HP + Controller 22 HP)
- **Depth:** 30 mm, including connectors
- **Weight:** Approx. 400 g
- **Power:** +12 V 270 mA / −12 V 50 mA / +5 V 0 mA
- **Power connectors:** Core module only; Controller powered from Core
- **USB Host max current:** 350mA (for MIDI controllers & pendrives)

Audio & Digital

- **Sample Rate:** 44.1 kHz
- **Audio Resolution:** 16-bit
- **Internal Processing:** 32-bit floating point
- **DACs:** 8 × 16-bit DC-coupled
- **Output Impedance:** 1k
- **CPU:** ARM Cortex-M7, 600 MHz (overclock possible)
- **SRAM:** 16+1 MB (~12MB available for Sampling)
- **Signal-to-Noise Ratio:** ~95 dB(A), typical
- **Maximum Audio Level:** +19 dBu (≈7 Vrms)
- **1.77″ TFT color display:** (160*128 pixel)

CV & Gate

- **8 x CV Outputs:** ±10 V DC (20 Vpp)
- **6 x CV Inputs:** −5 V to +10 V DC (8bit resolution)
- **Gate / Reset / Clock Outputs:** +10 V
- **Clock / Reset Inputs:** 10 V tolerant >1 V = ON

MIDI connectivity

- **MIDI TRS In.** Standard input port for external control, compatible with both Type A and B specifications.
- **MIDI TRS Out.** Standard Type A output for transmitting MIDI data to external gear.
- **USB Host.** Front-panel port designed for connecting MIDI peripherals and USB flash drives.
- **USB-C Port.** Located on the rear, this port facilitates firmware updates and direct MIDI communication with a computer.
- **Expander Port.** Rear-mounted serial connection for the Befaco MIDI Thingy (soon in production) or future expansion modules.

Sequencer

- 16+1 tracks
- 64 patterns
- 16 parts (up to 64 patterns each)
- Size, clock divider, and play mode are independent per track
- 16 scenes (settings for devices & mixer)
- 64 steps per track
- Probability & probability range per step for note, velocity, and length
- Chance per step for note on, slide and roll
- Conditional triggers
- Micro grid (24 PPQN)
- Euclidean generator
- 16 internal LFOs
- Modulation matrix
- 12 Parameter locks per track (per pattern)
- MIDI file player

28 Credits

ARK was made with love, solder, code, and probably too much coffee.

The **Befaco Team** and **Tesseract Modular** came up with the concept, designed the interface, and generally poked at it until it made sense, while Mangu Díaz**,** transformed the raw concepts, physical interface, and every "what if" brainstorm into the final code. He also utilized his multi-instrumentalist background to imagine and implement those specialized musical nerd functions that make the module unique.

Open Source
ARK also stands on the shoulders of other great open-source projects and libraries. Huge thanks to the people who share their code and knowledge with the world. We promise we didn’t reinvent every wheel. Special thanks to:

Emilie Gillet

Paul Stoffregen

Beta Testers
And a massive thank you to all our **early adopters**. You found bugs we didn’t know existed, did things with ARK we never imagined, and gave us invaluable feedback and ideas along the way.

Alberto (Numerico)

Alex Theakston (Mylar Melodies)

Andrew Kuttor

Espinoza

Fernando Clemente

Fredrik Larsson (Krumelur)

Jon Modular

Juan Valverde (Perla)

Leos Hort (HRTL)

Pablo Rizo

Patricia Usero (Puntalaberinto)

ARK is the result of a bunch of people making things, breaking things, fixing things, and having fun along the way.

Thanks for being part of it. ❤️

Appendix 1: Chords List

Short name	Long name	Semitones
Auto 3	Auto 3 voices	—
Auto 4	Auto 4 voices	—
major	Major	0, 4, 7
maj7	Major 7th	0, 4, 7, 11
7	Dominant 7th	0, 4, 7, 10
minor	Minor	0, 3, 7
m7	Minor 7th	0, 3, 7, 10
m maj7	Minor Major 7th	0, 3, 7, 11
dim	Diminished	0, 3, 6
m7b5	Half-Diminished	0, 3, 6, 10
dim7	Diminished 7th	0, 3, 6, 9
sus2	Suspended 2nd	0, 2, 7
7sus2	Dominant 7th sus2	0, 2, 7, 10
sus4	Suspended 4th	0, 5, 7
7sus4	Dominant 7th sus4	0, 5, 7, 10
aug	Augmented	0, 4, 8
aug maj7	Augmented Major 7th	0, 4, 8, 11
aug7	Augmented 7th	0, 4, 8, 10
5	Power Chord	0, 7
add9	Major Added 9th	0, 4, 7, 14
m add9	Minor Added 9th	0, 3, 7, 14
6	Major 6th	0, 4, 7, 9
m6	Minor 6th	0, 3, 7, 9
mb6	Minor ♭6th	0, 3, 7, 8
maj9	Major 9th	0, 4, 11, 14, 7

9	Dominant 9th	0, 4, 10, 14, 7
m9	Minor 9th	0, 3, 10, 14, 7
7b9	Dominant 7th (♭ 9)	0, 4, 10, 13, 7
7#9	Dominant 7th (♯9)	0, 4, 10, 15, 7
7(b13)	Dominant 7th (♭ 13)	0, 4, 10, 20, 7
6/9	Major 6th 9th	0, 4, 9, 14, 7
maj11	Major 11th	0, 11, 14, 17, 4, 7
maj9#11	Major 9th (♯11)	0, 11, 14, 18, 4, 7
m11	Minor 11th	0, 10, 14, 17, 3, 7
root	Root	0
oct	Octave	0, 12

Appendix 2: Shortcuts (key combos) Cheat Sheet

Key 1	Key 2	Action
SHIFT	PROJECT	SAVE PROJECT
SHIFT	CLICK ENCODER	CLEAR PARAMETER LOCK
SHIFT	[SELECT]	CLEAR SELECTION
SHIFT	PLAY (While while stopped)	CONTINUE PLAY AT THE SAME POINT
SHIFT	TRACK SEL	ENTER MONITOR PAGE
SHIFT	FILL	SCREENSHOT (To BMP Folder on SD card)
CONFIG	MIXER	ENTER MIXER CONFIG
CONFIG	PROJECT	ENTER PROJECT CONFIG
CONFIG	MOD	PARAMETER LOCKS EDIT MENU
CONFIG	TRACK	ENTER TRACK CONFIG
CONFIG	TEMPO	ENTER TEMPO CONFIG
CONFIG	DEVICE	ENTER DEVICE CONFIG
[SELECT]	STEP (+GRID KEY)	SELECT SIMILAR STEPS (same note, velocity etc)
[SELECT]	BANK KEY (ABCD)	SELECT BANK
HOLD STEP	Arrow Keys	MOVE THE STEP ON MICROSTEP GRID

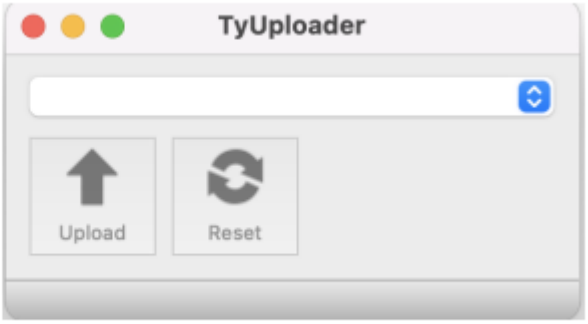
Appendix 3: Firmware Update Procedure

Updating the firmware requires a computer and a USB-C cable.

A3.1 Updating ARK Core Firmware

1. Download the TyTools (https://koromix.dev/tytools). And follow the specific instructions for your operating system.
2. Open the TyUploader application.





macOS Security. Upon launching TyUploader for the first time, a system notification may indicate that the software identity remains unverified. To authorize the application, access System Preferences and navigate to the Security & Privacy section. Within the General tab, select the "Open Anyway" button to permit execution.

3. Connect the module using the USB port on the back of ARK. Ark should be detected in the TyUploader dropdown.
4. Download the latest ARK Core firmware from the Releases section of the ARK repository .
5. Load the firmware into the TyTools using the Upload Button.
6. Allow the progress bar to finish and Ark to automatically reboot.
7. Check the splash screen for a new version to show up.
8. Done.

A3.2 Updating ARK Control Firmware

Firmware revisions for ARK-Control are rarely released. If an update becomes required, proceed with the following steps:

1. Download the latest firmware (see firmware download link).
2. Power off the module (turn off the rack or disconnect it from the Control).

3. Connect a USB cable to the USB port on ARK-Control.
4. Before connecting the USB cable to the computer, press and hold the button on the back of the controller.
5. Connect USB to the computer. A new removable device appears.
6. Drag and drop the firmware file into the new removable device.
7. Done.

8.

Appendix 4: Testing and calibration



DANGER ZONE:

All information in this appendix refers to “factory” tests and calibrations that can make your ARK malfunction if not used wisely. They are meant to be used only by DIYers or advanced users, so please do not attempt to use this if you don't know well what you are doing.

Accessing Testing & Calibration

The options within this menu remain hidden under normal operation. To reveal them, hold CONFIG while powering on the system. The Test & Calibration entry will momentarily appear under CONFIG → UTILITIES → Test & Calibration for the current session, disappearing automatically upon the next power cycle.

CV Out calibration:

Enters the CV output calibration method. This will disable the stereo mixer, will replace the first 8 devices, and set connections to all outputs, so save your project first or do it from a blank project (recommended).

To calibrate an output, connect a multimeter to it. 2 points need to be calibrated only, 0 volts and +5 volts. By rotating the encoder, adjust the value of the calibration until you get the desired voltage at the output. Once everything is correct, navigate to GLOBAL CONFIG and click on *Save settings*.

Test SD card

The SD Card Test (in the Utilities menu) checks whether your microSD card is fast enough to stream samples reliably. The sampler reads each sample from the card in small chunks while it plays; if the card cannot deliver those chunks in time, you hear dropouts or glitches. This test measures exactly that and reports the result on the display.

When you start the test, the sequencer stops and a temporary file is written to the card, then read back many times. This takes a few seconds — the display shows Testing SD... while it works. The temporary file is removed when the test finishes.

Run the test with playback stopped and no samples loaded. Background audio activity competes with the test and will distort the results.

Reading the results

wr — Write speed, in KB/s. This is how fast the card accepts data, which matters when saving data to the card. Higher is better. Anything above a few thousand KB/s is correct.

rd — Read time for one buffer, shown as average / worst-case in milliseconds. This is the core measurement. The worst-case figure (the second number) is the one that matters most: a single slow read is what causes a dropout. Lower is better, and the two numbers being close together means the card behaves consistently.

safe — The highest playback speed the card can sustain even on its worst read, where 1.0x is normal playback speed. This is the conservative, trust-this number. A value of, for example, 10x means the card has roughly ten times the speed it needs for normal playback.

avg — The same idea based on the average read instead of the worst case. It is usually higher than safe and represents typical performance rather than the guaranteed minimum.

Verdict line — A plain summary:

- OK @1.0x — (green) means the card keeps up at normal playback speed even on its worst-case read (safe >= 1.0x)
- TOO SLOW —(red) means the worst-case read cannot keep up at 1.0x.

What is a good result?

A healthy card shows a high safe value (well above 1.0x), a low rd worst-case, and the two rd numbers close to each other. The larger the gap between average and worst-case read times, the more unpredictable the card is — that gap is what this test is designed to reveal.

Why the numbers change slightly between runs

Running the test twice will give slightly different figures. This is normal. Cards perform internal housekeeping at their own pace, the temporary file lands on different physical areas of the card each time, and the read positions are randomised. Small movements in the average and in the last decimal of safe mean nothing. What should stay stable is the worst-case read time. If that jumps around dramatically between runs (for example, a few milliseconds one time and much higher the next), the card has unpredictable slow spikes and is best avoided for sample playback.

How many voices can the card handle?

This test reflects a single sample stream. Playing several samples at once puts more load on the card. To estimate how many simultaneous sample voices a card can sustain, use the Max Voices test, which reports that figure directly. Bear in mind the card has only one limit; the number of voices the processor can mix is a separate ceiling, and your real maximum is whichever is lower.

MicroSD card formatting impacts performance significantly. Key factors include:

Allocation Unit Size: The most critical setting. Smaller clusters (such as default 4KB) force data across numerous sectors, requiring frequent FAT lookups. Larger cluster sizes streamline sequential data retrieval.

For uncompressed audio playback, format using 32KB or 64KB clusters:

- Windows: Right-click drive → Format → Allocation unit size → Select 32768 or 65536 bytes.
- Alternatively, utilize the official SD Card Formatter (sdcard.org) to ensure proper partition alignment.

FAT32 Architecture: Maintain FAT32 formatting for optimal compatibility with the Teensy SD library.

Fresh Initialization: Reformat media and copy all audio files in a single pass. File fragmentation degrades sequential read speed; a complete reformat restores peak throughput.

Save Settings.

Manual Save command for system settings.

Appendix 5: Menus and Parameters

This table summarises every top-level menu and its sub-pages with direct links to the most relevant reference to this item inside the manual so it works as an index ordered by menu.

MAIN MENU (Core button) · **SUB-MENU >** · Page / parameter · Indentation shows the menu depth. Every item links to its section.

CONFIG

- **GLOBAL CONFIG >**
  - Synched Mutes
  - MIDI TRS thru
  - Chords MIDI channel
  - Chords Input Offset
  - RGB Brightness
  - Accidentals
  - Global Pitch
  - CPU Mode
  - Quantize Rec
  - Save settings
- **UTILITIES >**
  - **Samples & Files >**
    - Samples on SD
    - Add from USB
    - Replace from USB
    - Update from SD
    - Connect to Computer
    - Backup to USB
    - Restore USB Backup
  - MIDI Monitor
  - System Info
  - CV In Monitor
  - Scale Editor
  - **Test & Calibration >**
    - CV Out Calibration
    - CV In Offset
    - Test SD Card Speed
    - Test SD Max Voices
    - MidiThingy Config
    - Hardware Test
- **TEMPO CONFIG >**
  - Clock in / out
  - Reset in / out
  - Shuffled Tracks

CONFIG (continued)

- **PROJECT CONFIG >**
  - Key / Scale / Aux. scale
  - Chords Mode
  - Slide Mode
- **DEVICE CONFIG >**
  - Select Device / Fx
  - Gain
  - Sample pool
- **TRACK CONFIG >**
  - Quantize
  - Slide Time
  - MIDI output
  - Gate Out
  - Device Out
  - Monitor: Mode / Monitor / Source / Source N
  - Track Name
  - Move Track
  - Duplicate Track
  - Load / Save Preset
- **PARAMETER LOCKS >**
  - Lane number / mode
  - Parameter / Value
  - Clear lane / all lanes
- **MIXER CONFIG >**
  - Mixer Mode / Compressor
  - Limiter / Limiter Gain
  - Delay Mode
  - Reverb Mode
  - FX Pan

PROJECT

Load / Save
New Project
Load as Template
Delete / Edit Name

PATTERNS / PARTS >

- Pattern Select
- Pattern Reset
- Part Select
- Part Mode
- Edit Part

TEMPO

Tempo
Tap
Half / Double
Shuffle Amount

CHORDS TRACK >

Chord progression editor

SCENE

Scene Number
Link to Pattern
Copy Scene to All
Copy Track to All

TRACK

Euclidean / Rotation
Play Mode / Size
Clock Div
Fill track / pattern
Freeze track

REPEATS >

- Enable / Repeats
- Distance / Quantize Grid
- Dist. Offset / Vel. Offset / Pitch Offset

STEP

Step / Chance
Note / Probability / Range
Velocity / Probability / Range
Length / Probability / Range
Slide / Chance
Roll / Chance
Micro Steps / Triplets

LFO

Speed / Wave / Amp / Offset
Phase / Range / Reset / Arp
LFO>Note / Interval
LFO>Vel / LFO>Length

MODULATION

Target / Amount
Source / Source N
Mod List

MIXER

Delay / Reverb
Pan / Volume

DELAY

- Time / Feedback
- HP / LP

REVERB

- Time / Predelay-High Cut
- L.Damp / H.Damp

Made with love in Barcelona.