FULL REFERENCE

# LooLoo Mini

Complete parameter, display, CV and MIDI reference.

Doodov Digital Design · Rack Extension · Version 1.1

## Contents

# 1. About This Reference

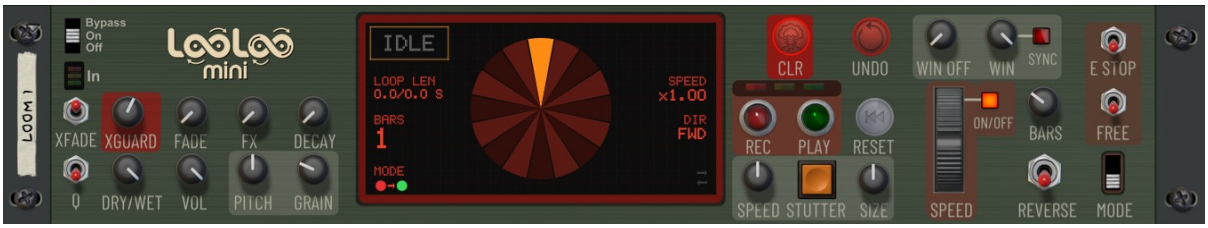
This is the complete reference for LooLoo Mini. Where the Operation Manual explains the device in the order you learn it, this document is organised for looking things up: every control, every display element, every jack, every MIDI assignment, each with its range, default and behaviour.

It deliberately leaves out the deepest engineering internals — buffer sizes in samples, read-head architecture, exact fade lengths — because those are implementation detail, not things you set or observe. Everything a player or patch-designer can touch, see, or wire is here, in real-world units.

### A note on names

LooLoo Mini's front panel uses short labels (WIN, XGUARD, E STOP) while its parameters have fuller internal names (Window Size, FX Guard, Early Stop). This reference leads with the **panel label** — what you see on the device — and gives the full name alongside. The MIDI and automation names follow the internal naming; the MIDI chart in section 10 maps between them.

# 2. Device Overview




*LooLoo Mini front panel.*

LooLoo Mini is a single-track stereo looper in a 2U Rack Extension. It records live audio into one tempo-synced loop and provides a focused set of controls for reshaping that loop as it plays: a movable audible window, a stutter section, a spring-loaded speed-bend wheel, pitch shifting, decay, and an external FX send/return path.

| Field | Value |
|---|---|
| **Device type** | Creative effect (Misc). It processes audio passed through it; it does not generate sound or accept notes. |
| **Panel size** | 2U. |
| **Tracks** | One. For more simultaneous loops, run more instances — each locks independently to the same transport. |
| **Audio I/O** | Stereo main In and Out, plus a stereo FX Send and a stereo Return. |
| **CV** | Twenty CV inputs and four CV outputs (see sections 8 and 9). |
| **Patches** | Not patch-based. Settings are stored with the song; the device has no patch browser. |
| **Tempo** | Always synced to the Reason transport — tempo, bar grid and time signature are read live. |

# 3. The Signal Path

Understanding where each control sits in the signal flow makes the rest of this reference easier to read.

Audio enters at the main **In**. During recording it is written into the loop buffer. During playback the buffer is read back, shaped by the window, stutter, speed-bend and pitch stages, and mixed with the live input according to **DRY/WET**. The result leaves at the main **Out**, with **VOL** setting the final level.

The **FX Send** taps the loop and sends it out of the SEND jacks for external processing. Whatever returns on the **Return** jacks is mixed back **into the loop buffer** by the amount set with FX MIX — so the FX path is a feedback loop, not a parallel insert. This is covered in detail in section 5 under FX MIX, with the caution it requires.

Two key points about levels: the FX Send tap is independent of the master VOL — *VOL affects only the main mix outputs, not the SEND jacks*. And the recording in the buffer is never altered by the playback-side controls; only overdubbing, DECAY and the FX write-back change what is stored.

## 4. The State Machine

LooLoo Mini is always in exactly one of nine states. The State box on the display shows the current one. Knowing the states and how the transport buttons move between them explains every behaviour of the device.

### The nine states

| State | What it means |
|---|---|
| **Idle** | Empty. No loop recorded. Audio passes through; nothing is stored. |
| **WaitToRec** | Armed to record. Waiting for the next bar line to begin. Audio passes through. (Skipped when FREE REC is on.) |
| **Recording** | Writing input into the buffer. Counts bars; auto-stops at the BARS length. |
| **RecStopPending** | Early Stop was pressed during recording. Still recording, waiting for the next quarter-note to finish the loop. |
| **Playing** | Looping the buffer. Live input passes through on top (dry), unless Loop Mode is Solo. |
| **WaitToOverdub** | Armed for a quantised overdub (QUANT OVERDUB on). Loop plays normally; waiting for the next bar line to begin overdubbing. |
| **Overdubbing** | Looping while layering new input into the buffer. |
| **Stopped** | Playback stopped, but the loop is intact in the buffer. |
| **WaitToPlay** | Armed to resume from Stopped. Waiting for the next bar line. |

### Transition table

How each button acts depends on the current state. Blank cells mean the button does nothing in that state.

| From state | REC | PLAY | CLR | Other |
|---|---|---|---|---|
| **Idle** | → WaitToRec (or → Recording if FREE REC on, or transport stopped) | — | — (buffer already empty) | — |
| **WaitToRec** | → Idle (cancels arming) | — | → Idle | — |
| **Recording** | If EARLY STOP on: → RecStopPending. If off: ignored. | — | → Idle (buffer cleared) | Auto: at BARS length → Playing |
| **RecStopPending** | — | — | → Idle | Auto: next quarter-note → Playing |

| From state | REC | PLAY | CLR | Other |
|---|---|---|---|---|
| **Playing** | → Overdubbing (or → WaitToOverdub if QUANT OVERDUB on) | → stops → Stopped | → Idle (buffer cleared) | RESET re-syncs playhead; STUTTER toggles |
| **WaitToOverdub** | → Playing (cancels arming) | — | → Idle | Auto: next bar line → Overdubbing |
| **Overdubbing** | → Playing (ends the dub) | → stops → Stopped | → Idle (buffer cleared) | UNDO reverts the current layer; RESET re-syncs |
| **Stopped** | → Recording a new loop (replaces buffer) | → Playing (or → WaitToPlay if transport running) | → Idle (buffer cleared) | — |
| **WaitToPlay** | — | → Stopped (cancels arming) | → Idle | Auto: next bar line → Playing |

> **NOTE**
>
> CLR always returns the device to Idle and empties the buffer, from any state. There is no confirmation step — treat it as a hard reset of the loop. The window arc and knob settings are preserved (they are control positions, not loop content), so the display still previews them in Idle.

## 5. Front Panel — Control Reference

Every front-panel control, grouped the way the device groups them internally. For each: the panel label, the full parameter name, its range and default, and what it does.

### Transport

| Control | Range / Default | Function |
|---|---|---|
| **REC (Record)** | Button | Arms, starts and ends recording, and starts overdubs — its exact effect depends on the current state (see section 4). The core control of the device. |
| **PLAY** | Button | Starts and stops loop playback. From Stopped with the transport running, it arms a quantised resume (WaitToPlay). |
| **CLR (Clear)** | Button | Empties the buffer and returns to Idle, from any state. Knob and window-arc settings are kept. |
| **UNDO** | Button | Reverts the current overdub layer. Single level, and available only while Overdubbing — once used, the layer cannot be restored, and UNDO does not act outside the Overdubbing state. |
| **RESET** | Button | Re-syncs the playhead to the loop start without clearing audio. Works during Playing and Overdubbing. Use it to re-align a loop that has drifted out of phase after free recording or heavy bending. |
| **STUTTER** | Button | Toggles the stutter engine on and off. Active only while a loop is Playing or Overdubbing. |

### Recording

| Control | Range / Default | Function |
|---|---|---|
| **BARS (Loop Bars)** | 11 steps: 1/4, 1/2, 3/4, 1–8 bars. Default: 1 bar | Sets the loop length. Fractional values give short rhythmic cells; whole numbers give phrases. The recording is trimmed to exactly this length. See section 11 for the 32-second buffer limit at low tempos. |
| **MODE (Loop Mode)** | 3 positions. Default: Stop › Play | Determines what happens when recording ends and playback begins. Stop › Play: loop plays, live input passes through dry. Loop › Overdub: loop plays and keeps recording layers. Loop › Solo: loop plays, live input is muted during playback. |
| **FREE (Free Record)** | Off / On. Default: Off | On: recording starts the instant REC is pressed, with no wait for the bar line. The loop is still trimmed to the BARS length. Off: recording waits for the next bar line. |

| Control | Range / Default | Function |
|---|---|---|
| **E STOP (Early Stop)** | Off / On. Default: Off | On: pressing REC during recording ends the loop early, at the next quarter-note. The loop becomes the length actually recorded, beat-snapped. Off: recording always runs to the full BARS length. |
| **Q (Quant Overdub)** | Off / On. Default: Off | On: pressing REC during playback arms a quantised overdub that begins at the next bar line (WaitToOverdub). Off: overdubbing begins immediately on the REC press. |
| **FADE (Fade Time)** | 0–2.0 s. Default: 0 | Length of the fades applied when the loop starts and stops. 0 is abrupt; higher values give smoother transitions. |
| **XFADE (Crossfade)** | Off / On. Default: On | Loop crossfade. Blends the loop's end into its beginning so the wrap point is seamless. Generally best left on; turn off only if you specifically want the raw wrap. |
| **REVERSE** | Off / On. Default: Off | Inverts playback direction. Works during Playing, Overdubbing and Recording — the buffer is available in both directions. The change takes effect at the next loop wrap. |

## Audio

| Control | Range / Default | Function |
|---|---|---|
| **VOL (Volume)** | 0–1.00. Default: 1.00 | Output level of the loop at the main mix outputs. Does not affect the FX Send jacks. |
| **DRY/WET (Dry Mix)** | 0–1.00. Default: 1.00 | Balance between the live input and the loop at the main outputs. Fully up passes the live input; the loop sits alongside it. In Solo loop mode the live-input portion is muted while the loop plays, regardless of this setting. |
| **DECAY** | 0–1.00. Default: 0 | Fades the buffer's contents on each loop pass. At 0 the loop repeats unchanged indefinitely. Higher values make each repeat quieter than the last, so the loop evolves and thins. DECAY is also the control that holds the FX feedback loop in check (see FX MIX below). |
| **FX MIX** | 0–1.00. Default: 0 | How much of the FX Send/Return signal is folded back into the loop buffer. See the caution below — this is part of a feedback path. |

> ⚠️ **CAUTION — FX MIX IS A FEEDBACK PATH**
>
> The FX Send/Return writes the processed return signal back into the loop buffer. If the external chain on the Send/Return adds any gain — a reverb tail, a delay with feedback, a resonant filter — that gain compounds on every loop pass and the loop can build very quickly, exactly like any high-feedback device.
>
> Raise FX MIX gradually while listening, apply DECAY to bleed off what accumulates (medium DECAY is usually enough to hold it stable), and keep XGUARD up as a backstop. See section 7 for XGUARD.

## Effects

| Control | Range / Default | Function |
|---|---|---|
| **SPEED (Speed Bend wheel)** | Spring-loaded. Centre detent = normal speed | The bend wheel. Push up or down for real-time pitch-and-speed bend; release and it springs back to centre, the playhead recovering smoothly to normal speed. Built for gestures rather than static detune. Has a centre deadzone so small offsets read as no bend. Honoured only when BEND is on. |
| **BEND (Bend Active)** | Off / On. Default: On | When off, the bend wheel and the speed-bend CV are both ignored and the loop holds steady at normal speed. Turn off for guaranteed stable playback. |
| **WIN (Window Size)** | 0–1.00. Default: 1.00 | How much of the recording is audible, as a fraction of the whole. 1.00 is the entire loop. Below roughly 5% the window collapses into pulse mode — a single repeating beat (see section 6). |
| **WIN OFF (Window Offset / Start Offset)** | 0–1.00. Default: 0 | Where the audible window begins within the recording. 0 starts at the loop's beginning; raising it slides the window forward, wrapping around past the loop end. |

| Control | Range / Default | Function |
|---|---|---|
| **SYNC (Window Quantize)** | Off / On. Default: Off | Snaps window size and offset to quarter-note boundaries, so carved slices stay beat-aligned. When on, a small red triangle appears at the window arc's midpoint on the display. |
| **STUTTER SIZE** | 0–1.00. Default: 0.50 | Length of the stuttered slice, measured relative to the current window. Cannot exceed the window length — the window sets the playground, SIZE chooses how much of it repeats. |
| **STUTTER SPEED** | 0–1.00. Default: 0.50 (≈ normal) | Playback rate of the stuttered slice. At the low end the slice is held frozen; mid-way is normal speed; at the top it plays at double speed. |
| **PITCH (Pitch Shift)** | −24 to +24 semitones. Default: 0 | Independent pitch shift applied to the loop, in semitones, up or down two octaves. |
| **GRAIN (Grain Size)** | 10–300 ms. Default: ≈ 73 ms | Grain size the pitch shifter works with. Smaller grains give a tighter, more articulate shift; larger grains are smoother. Each setting has its own character — part of the sound, not just a quality control. |

### Global

| Control | Range / Default | Function |
|---|---|---|
| **XGUARD (FX Guard)** | 0–1.00. Default: 0.60 | A soft-knee limiter on the FX Return signal, applied before it is written into the buffer. It is a safety net against a runaway FX feedback loop — higher settings clamp the return harder and sooner. It will catch a hard blow-up, but it is a backstop, not a substitute for sensible DECAY and a careful hand on FX MIX. Keep it up. |

## 6. The Display

The display shows the loop's entire state at a glance. Every element means one thing; many are visible only in the conditions noted.

| Element | Where | What it shows |
|---|---|---|
| **State box** | Top-left | The current state: IDLE, ARMED, REC, PLAY, DUB or SOLO. Its border pulses during recording and overdubbing; its inner glow is colour-matched to the state. |
| **The ring** | Centre | A sixteen-wedge pinwheel. The bright wedge is the playhead moving through the loop. Below the pulse-mode threshold it collapses to a single pulse instead of a pinwheel. |
| **Window arc** | Outside the ring | An orange arc marking the audible window, shown whenever WIN is below 100%. It previews live even in Idle and Stopped, so the window can be set before playing. |
| **Stutter arc** | Just outside the window arc | A golden arc showing the position and length of the stuttered slice. Visible only when stutter is active. |
| **Canonical dot** | Just outside the ring | A small dot marking where the loop would be at normal speed. Visible only while bending or recovering. |
| **Q triangle** | At the window arc midpoint | A small red triangle pointing inward. Indicates that window quantize (SYNC) is on. |
| **Stutter lamp** | Top-right | A pulsing yellow lamp. Visible only while stutter is active. |
| **Mode icon** | Lower-left | A REC circle, an arrow, and a mode-coloured circle — green for Play, red for Overdub, blue for Solo. Shows what recording will hand over to. |
| **Decay disc** | Lower area | A contracting disc whose colour shifts from blue through orange to red as DECAY rises. Invisible when DECAY is 0. |
| **FX arrows** | Lower-right | Two horizontal arrows pointing opposite ways. They alternate brightness with the loop and grow brighter overall as FX MIX is raised. |
| **LOOP LEN** | Left column | The loop length in seconds. When a window is set, shown as window-length / loop-length. |
| **BARS** | Left column | The BARS setting, shown as a fractional value (1/4, 1/2, 3/4, 1, 2 … up to 8). |
| **SPEED** | Right column | Current playback speed, ×0.5 to ×2.0. |

| Element | Where | What it shows |
|---|---|---|
| **DIR** | Right column | Playback direction: FWD or REV. |

The display can be switched off as a whole (the Display parameter, available to automation). When off, the device behaves identically — only the visual feedback is hidden.

## 7. Back Panel — Audio


*LooLoo Mini back panel — audio I/O, FX send/return, and the CV system.*

LooLoo Mini has four stereo audio connections.

| Connection | Direction | Purpose |
|---|---|---|
| **In L / R** | Input | The main audio input. This is what gets recorded into the loop, and what passes through dry during playback. |
| **Out L / R** | Output | The main audio output — the finished loop mix, after VOL. |
| **Send L / R** | Output | The FX Send. Carries a tap of the loop out to an external effect chain. Independent of the master VOL. |
| **Return L / R** | Input | The FX Return. Audio arriving here is folded back into the loop buffer by the FX MIX amount. See section 3 and the FX MIX caution in section 5. |

For ordinary looping you only need the main In and Out — wire LooLoo Mini as an insert effect, or on a send. The Send/Return pair is used only when you want to route the loop through external processing and fold the result back in.

## 8. Back Panel — CV Inputs

LooLoo Mini has twenty CV inputs, in three behavioural groups: triggers, continuous, and toggles.

### Trigger inputs

These fire on a **rising edge** — a low-to-high transition acts as a single button press. Wire them from gate generators, LFOs or other CV sources. They duplicate the front-panel transport buttons.

| CV input | Acts as |
|---|---|
| **Gate Rec** | A press of REC. |
| **Gate Play** | A press of PLAY. |
| **Gate Clear** | A press of CLR. |
| **Gate Undo** | A press of UNDO. |
| **Gate Reset** | A press of RESET. |
| **Gate Stutter** | A press of STUTTER (toggles the stutter engine). |

### Continuous inputs

These **sum with** their corresponding front-panel knob — the CV value is added to the knob position, and the result is clamped to the parameter's range. An unconnected input contributes nothing. Use them to automate or modulate a control while still being able to offset it by hand.

| CV input | Adds to |
|---|---|
| **CV Volume** | VOL. |
| **CV Dry Mix** | DRY/WET. |
| **CV Decay** | DECAY. |
| **CV FX Mix** | FX MIX. Note the feedback caution in section 5 — it applies to CV-driven changes too. |
| **CV Speed Bend** | The bend wheel position, bipolar. An LFO here automates the wheel. Honoured only when BEND is on. |
| **CV Window Size** | WIN. |
| **CV Start Offset** | WIN OFF. |
| **CV Stut Speed** | STUTTER SPEED. |
| **CV Stut Size** | STUTTER SIZE. |
| **CV Pitch Shift** | PITCH. |
| **CV Grain Size** | GRAIN. |

### Toggle inputs

These act on the corresponding on/off switch. A connected input above its halfway point **inverts** the front-panel switch setting; an unconnected input leaves the switch as set. In other words, CV and panel combine by exclusive-or: either one alone turns the function on, both together turn it off.

| CV input | Inverts |
|---|---|
| **CV Reverse** | The REVERSE switch. |
| **CV Bend Active** | The BEND switch. |
| **CV Window Sync** | The SYNC (Window Quantize) switch. |

## 9. Back Panel — CV Outputs

Four CV outputs report the loop's state, so the loop can drive other devices in time with itself.

| CV output | Emits |
|---|---|
| **CV EOL (End of Loop)** | A pulse at each loop wrap — the moment playback returns to the loop start. Use it to trigger other devices once per loop cycle, locked to the loop's actual length. |
| **CV Pos Follow** | A continuous ramp tracking the playhead's position through the loop, from start to end. Use it as a loop-synced modulation source — it follows speed-bend and reverse, so it always reflects where the loop actually is. |
| **CV Rec State** | High while the device is recording, in any of its recording states (Recording, RecStopPending, Overdubbing). Low otherwise. |
| **CV Play State** | High while the loop is sounding — Playing, Overdubbing, or either recording state. Low when Idle or Stopped. |

## 10. MIDI CC Chart

LooLoo Mini's parameters respond to the following MIDI Continuous Controller numbers. CCs not listed are unassigned; the standard reserved performance-pedal range is deliberately left clear.

| CC | Parameter | CC | Parameter |
|---|---|---|---|
| 13 | Loop Bars (BARS) | 52 | Window Quantize (SYNC) |
| 14 | Volume (VOL) | 54 | Pitch Shift (PITCH) |
| 15 | Early Stop (E STOP) | 55 | Grain Size (GRAIN) |
| 17 | Decay (DECAY) | 58 | Record button (REC) |
| 18 | FX Mix (FX MIX) | 59 | Play button (PLAY) |
| 19 | Reverse (REVERSE) | 60 | Clear button (CLR) |
| 20 | Speed Bend (SPEED wheel) | 61 | Undo button (UNDO) |
| 21 | Crossfade (XFADE) | 62 | Reset button (RESET) |
| 30 | Quant Overdub (Q) | 63 | Stutter button (STUTTER) |
| 31 | Free Record (FREE) | 76 | Dry Mix (DRY/WET) |
| 35 | Fade Time (FADE) | 78 | FX Guard (XGUARD) |
| 37 | Loop Mode (MODE) | 79 | Bend Active (BEND) |
| 40 | Stutter Speed | 50 | Window Size (WIN) |
| 42 | Stutter Size | 51 | Window Offset (WIN OFF) |

## 11. Behaviour Notes & Edge Cases

Specific behaviours worth knowing — most are intentional design choices rather than quirks.

### Loop length and the 32-second buffer

LooLoo Mini's buffer holds 32 seconds of audio. The full 8-bar BARS setting fits within that from **60 BPM upward**. Below 60 BPM, an 8-bar loop would run past 32 seconds, so it is capped at 32 seconds — fewer than 8 bars actually fit. Stay at 60 BPM or faster to use the longest loop lengths in full. Shorter BARS settings are unaffected at any tempo.

### Memory use

Each instance of LooLoo Mini holds its loop buffer in memory. For ordinary use this is unremarkable — a single device, or a handful for a multi-instance arrangement, makes no meaningful demand on a modern machine. Loading *very many* instances at once, however, will use significant RAM, and on a constrained system or alongside a heavy project that can slow things down. It is worth keeping in mind if you work with large numbers of instances.

### Pulse mode

Turning WIN below roughly five percent collapses the window into pulse mode: a single short beat, repeating. The display's ring stops showing a pinwheel and shows a single pulse instead. WIN OFF still moves this pulse through the recording.

### Solo mode timing

In the Loop › Solo mode, the live-input mute applies *only while the device is purely Playing*. During recording or overdubbing the input is heard as normal — Solo affects the playback pass-through, not the record path.

### Recording with the transport stopped

Pressing REC with the Reason transport stopped begins recording immediately, for the pre-calculated BARS length — there is no bar line to wait for. FREE REC has no additional effect in this case. Most recording is done with the transport running so the loop stays grid-locked.

### Other intentional behaviours

- With a small window and active DECAY, there can be a slight harshness at the loop wrap — a deliberate trade-off that eliminates a worse clicking artefact.
- After playing a small-window section and returning to a full window, a slight phase offset can remain until the next speed-bend recovery resolves it. RESET also re-aligns the loop.
- FREE REC ignores transport quantisation at the start of recording, but the loop length is still set by BARS — the loop is the right length, it simply does not start on the grid.
- UNDO is single-level and active only while Overdubbing. It reverts the current overdub layer; once used, that layer cannot be restored, and earlier layers are not individually recoverable.

## 12. Appendix — Parameters at a Glance

All adjustable parameters in one table, for quick lookup.

| Parameter (panel label) | Type | Range | Default |
|---|---|---|---|
| **Loop Bars (BARS)** | 11-step selector | 1/4, 1/2, 3/4, 1–8 bars | 1 bar |
| **Loop Mode (MODE)** | 3-position | Play / Overdub / Solo | Stop › Play |
| **Free Record (FREE)** | On/Off | — | Off |
| **Early Stop (E STOP)** | On/Off | — | Off |
| **Quant Overdub (Q)** | On/Off | — | Off |
| **Fade Time (FADE)** | Continuous | 0–2.0 s | 0 |
| **Crossfade (XFADE)** | On/Off | — | On |
| **Reverse (REVERSE)** | On/Off | — | Off |
| **Volume (VOL)** | Continuous | 0–1.00 | 1.00 |
| **Dry Mix (DRY/WET)** | Continuous | 0–1.00 | 1.00 |
| **Decay (DECAY)** | Continuous | 0–1.00 | 0 |
| **FX Mix (FX MIX)** | Continuous | 0–1.00 | 0 |
| **FX Guard (XGUARD)** | Continuous | 0–1.00 | 0.60 |
| **Speed Bend (SPEED wheel)** | Spring wheel | Bend down – up, centre detent | Centre (normal) |
| **Bend Active (BEND)** | On/Off | — | On |
| **Window Size (WIN)** | Continuous | 0–1.00 | 1.00 |
| **Window Offset (WIN OFF)** | Continuous | 0–1.00 | 0 |
| **Window Quantize (SYNC)** | On/Off | — | Off |
| **Stutter Size** | Continuous | 0–1.00 | 0.50 |
| **Stutter Speed** | Continuous | 0–1.00 (held – ×2) | 0.50 |
| **Pitch Shift (PITCH)** | Continuous | −24 to +24 semitones | 0 |

| Parameter (panel label) | Type | Range | Default |
|---|---|---|---|
| **Grain Size (GRAIN)** | Continuous | 10–300 ms | ≈ 73 ms |

## One Last Thing

There is a small surprise tucked inside LooLoo Mini, waiting to be noticed. We will not spoil it here. *More about it — and what to do when you find it — will be on the dedicated LooLoo family page on the Doodov website soon.*

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*See also: the LooLoo Mini Quick Start card and the LooLoo Mini Operation Manual.*