RHYTHMER

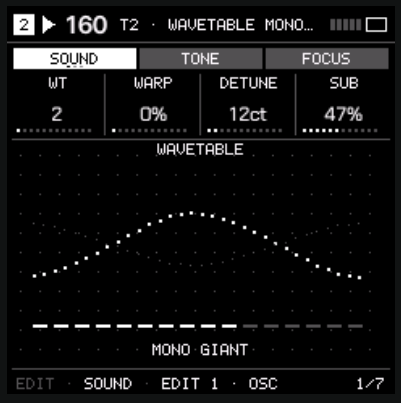
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USER MANUAL

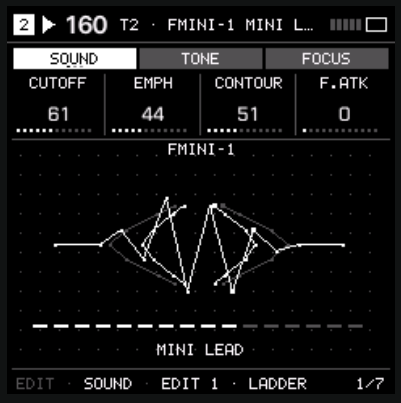
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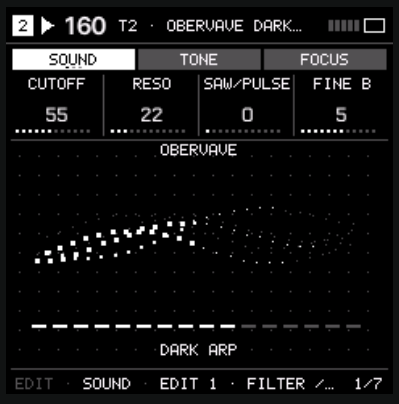
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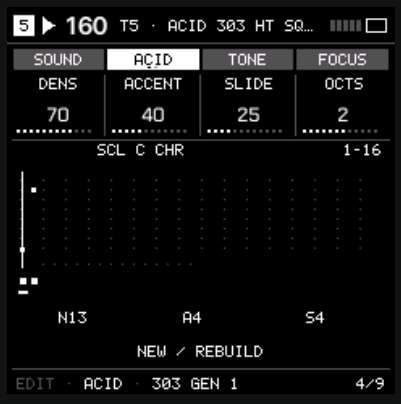
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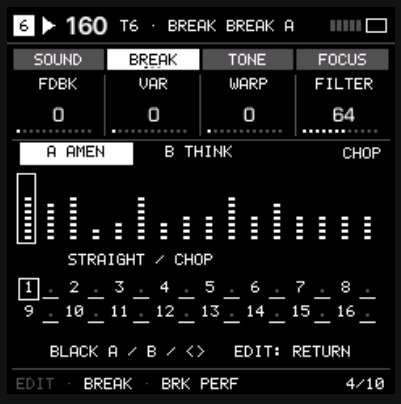
FMINI-1



OBERVAVE



ACID



BREAK

A groovebox with up to six assignable tracks.

Jazzy Rhythmer / Built on JIANT / Free and open source

Find the button.
Make the move.

Read the manual before your first session. Follow a chapter, try its controls, then return when you need the next move. This print edition contains the same sixteen chapters as the web guide, plus credits and useful links.

Up to six assignable tracks are available. Fresh settings activate four; Chapter 03 explains how to enable six and confirm the CPU notice.

Open the searchable web manual / Play in the browser

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01 / Start here

Your first groove

FMINI-1 has 43 factory sounds; OberVave has 32. Analog, Wavetable, FM6, FM+STAT, SWAV-SAW and SID-6581 are still available. PHASE, LOFI and WHEEL are retired. Projects that used a retired engine load with Analog in its place; back up the original if you want to use it with the previous release.

Rhythmer is a hands-on groovebox firmware built on JIANT, made for exploring sound, building patterns and developing ideas through play. The firmware starts in **4-track mode**. T5 and T6 retain their sounds and notes while inactive. To enable them, choose **6 TRACK MODE** in GLO / SYSTEM or MENU / AUDIO, read the CPU notice and press **OCT+**; OCT- cancels. The default layout is T1 DRUM, T2 WAVETABLE, T3 FMINI-1, T4 OBERVAVE; T5 and T6 are EMPTY (unassigned) in the initial four-track setup. When you confirm six-track mode, an empty T5 receives Acid and an empty T6 receives Break. Existing assignments and sequences are kept; if Break already belongs to another track, T6 remains empty. Choose EMPTY in the engine list to clear an instrument assignment without deleting its sequence. Empty tracks allocate no voices or instrument DSP. Any track can take another eligible sound. Multiple Acid tracks are allowed; only one Break machine is available.

> **A fresh project is intentionally silent.**
> All six sequences start empty. Break selects A / Amen, with a two-bar length ready. Loading an existing saved project keeps its music. To hear a first groove, generate an arrangement, create an Acid line, or write a straight Break sequence below.

01. On HOME, use the **ALGORITHM knob to select a track**. Despite its printed name, it selects the track in Rhythmer.

02. Hold **HOME** and turn **SELECT** until the **GEN** group appears, then release HOME.

03. On GEN 1, use knob 1 for GENRE. Use knob 4 to select **ALL LOOP**, then press **OCT+**. This fills eligible active slots: four in four-track mode or six in six-track mode. Manually assigned Acid/Break tracks and inactive slots are kept.

04. Press **PLAY**. Choose ACID or BREAK on any active track to follow its tutorial. Enable six tracks only when you need the extra slots. Save a section when you like the result.

In the browser, open PLAY and click **Start Rhythmer** to enable audio. The web editor edits project data; use PLAY to hear that data through the firmware.

02 / Buttons & navigation

Find a page without losing your place

Open **EDIT -> SOUND -> PRESETS** with EDIT or SELECT to pick an engine and browse just its sounds. Mark favorites or choose a sound type there. Away from that page the PRESETS encoder browses the full sound catalog.

Control	What it does
ALGORITHM	Selects the active track. Four-track mode limits selection to T1-T4.
PRESETS	On HOME and other EDIT pages, browses sounds across eligible engines. In EDIT / SOUND / PRESETS, stays within the engine chosen with knob 2 and follows the LIST filter. In SEQ it opens PHRASES, and in GEN it selects the genre.
SELECT	Moves one page at a time in either direction and stops at each end.
Section buttons	Tap to enter a section. Tap again to advance one page, including pages under the same tab. The last page wraps to the first.
Knobs 1-4	Edit the four labeled values currently on screen. Read those labels before turning.
HOME	Returns to the main instrument view. Hold HOME + turn SELECT to reach GEN. It does not reset the Break sound.
EDIT	Cycles the selected machine's editing pages. Acid and Break have dedicated tabs; other tracks do not show those tabs.
SEQ	Opens sequence editing. Hold on a Break track for the special Break authoring keyboard. Release to return to ordinary playing.
SCL / ARP	Root, scale and chord controls / arpeggiator pages.
ENV / LFO	Track envelopes and destinations / modulation slots and two LFOs.
FX	Track sends and effects. Hold for the shared performance-effect key map. This is a separate context from Break's BRK PERF page.
GLO	Live controls, mixer, global settings and SYSTEM, including four-/six-track mode.
SAVE	Sound storage, A-D sections, arrangement and project library. Tap SAVE again or turn SELECT to move between pages.
PLAY / REC	Transport / recording. REC behavior depends on whether you are on a step editor or live performance page; check the armed indicator.

> **The same key can have different roles.**
> The Break performance map, held-SEQ authoring map and held-FX map are separate contexts. Follow the page and button-hold instructions in each tutorial; release a held button before playing normally.

03 / Four & six tracks

Enable six tracks when you need them



6 TRACK MODE / CPU NOTICE / OCT+ CONFIRM / actual host-rendered firmware UI

Rhythmer starts in **4-track mode**: T1-T4 play and can be selected. T5 and T6 keep their sounds, notes and automation while inactive. Enabling six tracks makes those two parts available without generating a pattern. Existing machines and sequences are preserved. On confirmation, an empty T5 receives Acid and an empty T6 receives Break; if Break is already assigned elsewhere, T6 is kept empty.

GLO -> SYSTEM

01. Press **GLO**, then use **SELECT** to reach the **SYSTEM** page. You can also tap GLO repeatedly to find its pages.

02. Turn **knob 1 / TRACKS** from **4 TRACK MODE** to **6 TRACK MODE**. The CPU notice shown here opens, while four tracks remain active.

03. Read the notice. **Busy six-track patterns may cause noise or glitches.** If this happens, mute tracks or reduce simultaneous voices and effects.

04. Press **OCT+** to confirm and enable T5-T6. Press **OCT-** to cancel and stay in four-track mode.

05. Use **ALGORITHM** to select an extra slot. After confirmation, empty T5/T6 receive the default Acid/Break machines as described above. Change an engine with PRESETS / ENG whenever needed. Your confirmed track-mode choice is saved.

Alternative: MENU -> AUDIO

Hold **HOME** to open MENU. Use **SELECT** to reach the **AUDIO** page, then turn **knob 2 / TRACKS** to six tracks. The same notice requires **OCT+**; choosing the setting alone does not activate the extra tracks. MENU / SYSTEM is a different page used for CPU cores and clock.

> **Return to four tracks at any time.**
> Choose 4 TRACK MODE on GLO -> SYSTEM or MENU -> AUDIO. T5-T6 become inactive immediately, and their music is preserved for the next time you enable six tracks.

Track count is independent of the machines assigned to those tracks. Four complex parts can still exceed the CPU budget. For track-mute keys, polyphony and effects advice, see CPU load & troubleshooting -> .

04 / GEN & new genres

ALL uses the active track count: four slots in four-track mode, six in six-track mode. EMPTY slots may receive a new drum or synth. Manually assigned ACID and BREAK tracks are preserved wherever they are placed; use TARGET MIDI or BREAK to regenerate them explicitly. The existing SR_ACID sound recipe now selects native Hortator Acid for its mono bass part (for example Acid House and Breaks). Acid is not added to ordinary bass, melody or chord sound pools. Automatic sound selection still excludes BREAK, FM6, FM+STAT and SWAV-SAW. SID-6581 is a rare mono lead only, never a chord/pad assignment. Wavetable remains available with one automatic instance. No extra MD-only hit cap is added.

Generate a song, or replace just one part



HOME / GEN / TARGET MIDI / actual host-rendered firmware UI

01. Hold HOME + turn SELECT to GEN; open **GEN 1**.

02. Choose GENRE with knob 1. Choose the scope with knob 4, labeled **TARGET**.

03. Set ENERGY, then use SELECT for the other GEN pages: role amounts, COMPLEX, SWING and HUMAN.

04. Press **OCT+**. Repeating with the same settings chooses another seed. **OCT-** goes back; it is not the Acid MUTATE action here.

05. To recover the previous generated music, hold **GLO and press G4** for the existing undo action. Save the result as a section.

TARGET	Changed	Kept
ALL LOOP / ALL PARTS / ALL SONG	The whole-arrangement generator for eligible active slots (four or six). LOOP is the initial form.	Current Acid/Break parts are not automatically regenerated by ALL.
T1 MIDI ... T6 MIDI	Only that track's sequence, using the genre currently selected in GEN.	Tempo, sound/preset, scale, loop settings, effects, envelopes, both LFOs, automation, other tracks and active track count.

TARGET	Changed	Kept
BREAK	The existing Break machine's chop sequence, wherever it is assigned.	Audio banks A/B, selected source, sound settings and all other tracks. If no Break exists, NO BREAK TRACK appears and nothing is changed.

Ten new profiles / 59 styles in total

- BOUNCE HOUSE
- 90S HOUSE
- G-FUNK
- NOCTURNAL HH
- TRIP HOP
- LOFI HOUSE
- ABSTRACT IDM
- AMBIENT IDM
- ATMOS BREAKS
- DRUNKEN HH

Existing R&B, Neo Soul, Jazzy Chords, Boom Bap, Jungle, Liquid DnB, UK Garage and Future Bass profiles are also refined. Genre-specific sound choices guide full-arrangement GEN without locking every result to one synth. Wavetable remains eligible with an automatic instance allowance.

ENERGY changes activity, **COMPLEX** changes detail, and **HUMAN** scales humanized timing and dynamics. For a loose beat, try DRUNKEN HH with a moderate HUMAN value. For rolling space and pads, try ATMOS BREAKS. Start with lower complexity, then add detail.

> **MIDI-only means your sound stays yours.**
> Selecting T1-T6 MIDI does not replace an expensive manually selected synth with a cheaper one, activate a disabled track, or analyze every possible polymetric chord change. Pitched notes follow SCL; Break chops are audio commands and are not retuned to the scale.

05 / Drum kits & individual sounds

Change one drum, keep the rest of the kit



DRUM / EDIT / SOUND / SELECT / actual host-rendered firmware UI

01. Select a DRUM track with ALGORITHM. Choose a starting kit with PRESETS.

02. Press EDIT repeatedly, or use SELECT, to reach **SOUND -> SELECT**. The page title is DRUM VOICE.

03. Knob 1 **LANE** selects the drum, such as BD, SD or CH. Knob 2 **BANK** filters ALL, KITS, MD TRX, MD EFM or LXR-X.

04. Knob 3 **SOUND** loads a real sound into only that lane. Tap its lane key to audition. Knob 4 **LEVEL** balances it.

05. Use SOUND / SOUND 2 / SOUND 3 for the selected sound's macros, then save the section/project.

There are **55 Hortator MD factory sounds** alongside the original drum sounds, alongside **12 LXR-X kits** made with Drum-X synthesis. The LXR-X kit voices can also be selected individually. MD LAB 1 and MD LAB 2 are the two experimental kits. Conventional kits use shorter, more general-purpose closed hats. MD is synthesized percussion; it is not a folder of Machinedrum recordings. Hortator MODERN and CLASSIC banks are not included.

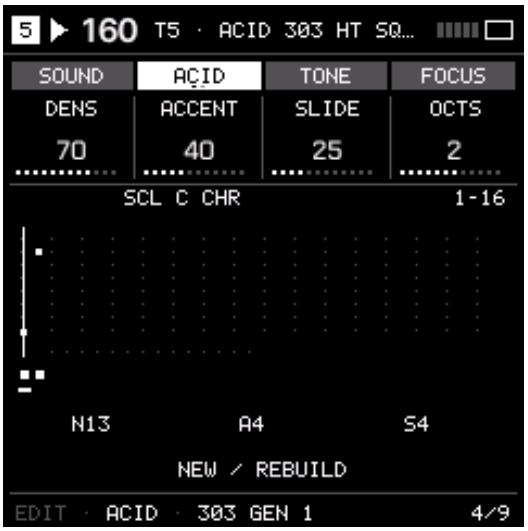
> **Drum kit sharing**
> The section's kit is shared by its Drum tracks. A lane sound change therefore affects Drum tracks using that kit in the same section; track tuning and effects remain independent. Save a separate section if you want another version of the kit.

MD uses the ordinary drum voice pool: up to eight physical lanes per Drum track, without a separate MD-only limit. Each new drum transient is protected for approximately 40 ms. After that, old drum tails participate in the normal shared-budget and overload management; long percussion tails are not exempt from CPU protection. Same-lane retriggers and intentional hi-hat choke still apply.

06 / Acid: create your first line

A 303 line in your key

Fresh factory presets open the Acid filter at 80, except HT SCREAMER at 50. Loading an existing project keeps its saved cutoff.



ACID / EDIT / 303 GEN 1 / actual host-rendered firmware UI

01. Select any active track using ALGORITHM, then choose the **ACID** engine and **HT SQUELCH** preset. The generator edits that selected track; Acid is not tied to a track number.

02. Open **SCL**. Set ROOT and SCALE before generating. The default SCL is CHR (chromatic). Acid displays and uses this same ROOT/SCALE; choosing another scale changes the next NEW/MUTATE result.

03. Press EDIT repeatedly, or use SELECT, until the **ACID** tab and **303 GEN 1** appear.

04. Try **DENS 70, ACCENT 40, SLIDE 25, OCTS 2**. Press **OCT+** for NEW. It replaces this Acid track's line.

05. Press PLAY. Press **OCT-** on the Acid generator page to MUTATE the current line. NEW and MUTATE always follow the current SCL root/scale.

06. Open SEQ to edit individual notes, lengths and articulation. Save the section when you want to keep it.

303 GEN 1	Meaning
DENS	How much of the sequence is occupied by notes. Reduce it for more space.
ACCENT	How often generated notes use the 303 accent articulation.
SLIDE	How often generated notes use slides between pitches.
OCTS	Generated pitch span: one, two or three octaves.

303 GEN 2	Meaning
ROOT / SCALE	The same key settings as SCL, kept linked rather than a second independent key.

303 GEN 2	Meaning
OCTAVE	The register used for the generated line.
MUT BARS	Automatic mutation every chosen number of global bars while playing; 0 disables it. This changes the sequence, so save a version before enabling it.

Shape the sound separately

SOUND provides cutoff, resonance, envelope amount and decay, then accent response, wave, slide and drive. Generator ACCENT/SLIDE control the pattern's articulation; sound ACCENT/SLIDE shape how that articulation is heard. Try lower cutoff with a medium envelope amount, then introduce resonance gradually.

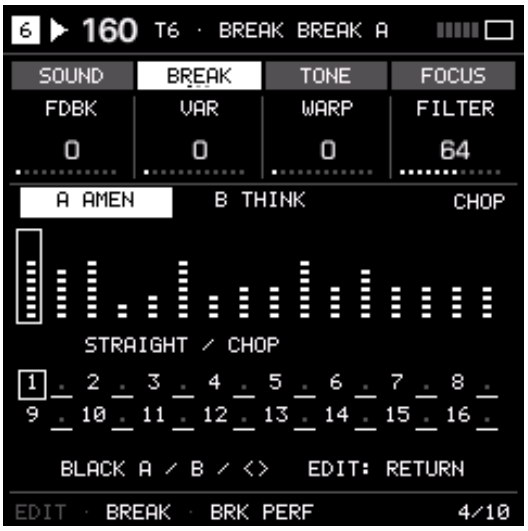
The Acid machine is a native Hortator-based monophonic synth with four presets: **HT SQUELCH, HT DEEPBASS, HT SCREAMER and HT SQUAREAC**. WAVE selects SAW or SQR. The X0X audio engine is removed; only its TB-3PO-derived MIDI generation and mutation remain. Other synth presets have distinct names.

> **Two kinds of generation**
> EDIT -> ACID -> 303 GEN is the dedicated X0X-derived NEW/MUTATE interface. HOME -> GEN -> the assigned track's TARGET MIDI is the genre-driven mono-bass sequence generator and keeps your chosen Acid sound. ALL LOOP/PARTS/SONG can also select this engine through the existing, explicitly named Acid sound recipe; it is excluded from ordinary bass, melody and chord pools. You can run more than one Acid track, each with its own sound and sequence.

If STOP SONG TO GENERATE appears, stop the arrangement/chain before generating. If you cannot find the ACID tab, confirm that this track is actually assigned an Acid preset.

07 / Break: first two-bar loop

From silence to a straight break



BREAK / EDIT / BRK PERF / actual host-rendered firmware UI

01. Select any active track using ALGORITHM, then choose the **BREAK** engine. It starts with source A (Amen) and the track's existing sequence is preserved. Clear its sequence if you want to start empty. Break follows its assigned track; enable six-track mode only if you need T5 or T6.

02. Hold **SEQ**. The keyboard now shows Break authoring commands. Press the white key **F3 / STRAIGHT**, then release SEQ.

03. Press **PLAY**. STRAIGHT writes a 32-step, two-bar sequence: C1-C16 in source order, each followed by a TIE. It also sets the straight length, division, swing and gate needed for that reconstruction.

04. Open SEQ to see and edit those actual events. This is the same sequence that plays with all other tracks.

05. Press EDIT to reach **BREAK -> BRK PERF** for hands-on variations. Keep that page open for the performance key map.

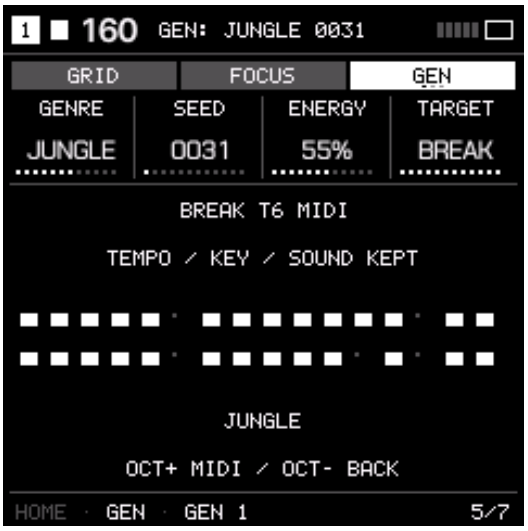
Each bank is a two-bar loop, divided into 16 evenly spaced chops. At 160 BPM the full loop is three seconds. A / Amen and B / Think are two global audio slots shared by all projects. B uses the corrected drums-only, level-matched Think edit.

> **A performance reset is not a sequence rewrite.**
> EDIT -> BREAK -> BRK RETURN, then OCT+ APPLY, returns the manipulator's variation/warp to its straight state. It does not replace the sequence with ordered chops or undo every track effect. To rewrite ordered two-bar playback, hold SEQ + F3 STRAIGHT. HOME remains the normal Home button.

Only one Break machine can be assigned. While it is assigned, its presets/models are hidden from other tracks. Change that owner to another sound before moving Break to a different track.

08 / Break: edit & generate chops

The sequence is the playback



GEN / BREAK target / actual host-rendered firmware UI

Event	What it means
C1-C16	Trigger one of the 16 chops. These are chop labels in the editor, not the names of physical piano keys.
R1-R16	Performance commands, such as repeats, pitch up/down and shrinking rolls. See the table in the performance section.
A / B	Select the global sample bank. A source-only event does not itself create a new chop.
RET	Return the manipulator toward its straight state. It is distinct from writing a STRAIGHT sequence.
NOTE / TIE / REST	Trigger the step / keep the held event going / release the sequence gate. A TIE needs an earlier event. Empty sequences remain silent.

SEQ contains the shared pattern controls and a BREAK group with **BRK SET, BRK STEP and BRK PLAY**. SOURCE chooses LOOP or CHOP: CHOP follows explicit cut triggers; LOOP keeps source-position playback while sequence gating and performance commands still control what is heard. Use STRAIGHT for an unambiguous starting pattern.

A simple edit in the web editor

01. Open the matching editor, then Sequencer. Select the track assigned to Break.

02. In the first NOTE step, enter **C1 A**. Let following steps TIE it. Put **C9** at the second bar for a different cut.

03. Near the end, try **C13 R9**: trigger a chop, then apply a 1/16 repeat. A later chop releases the prior roll. Use **B C1** to start a chop from bank B.

04. Use REST to leave a deliberate gap. Up to four commands fit in a step. Export SAVE FOR PLAY and import it into PLAY to audition browser edits.

Genre-aware Break GEN

01. Keep your other parts running. Hold HOME + turn SELECT to GEN.

02. Choose a genre. Set TARGET to **BREAK** and press OCT+. GEN finds the machine on any track; it does not assign a second Break.

03. Try DRUNKEN HH for repeatable push/pull and dynamics; BOOM BAP for space; JUNGLE for active cuts and phrase-end answers; ATMOS BREAKS for a less aggressive rolling pattern.

04. Press OCT+ for another result. Your tempo, sample A/B, Break sound, loop settings and other tracks stay. Hold GLO + G4 to undo.

Hip-hop profiles avoid high-rate roll banks. At 120 BPM or above, hip-hop Break GEN uses a half-time event grid without changing master BPM or LEN. Jungle uses bounded 1/16 answers; higher complexity can add short 1/32/up/down responses. HUMAN scales the intentional timing offsets. Simultaneous events in one step share that step's timing.

> **Start with an aligned source.**
> GEN slices evenly; it does not detect which transient is a kick or remove pitched instruments. Use a clean, correctly aligned two-bar drum loop. A custom loop with different hit placement may need manual chop edits. SCL does not retune Break audio.

09 / Break: perform & record

Play the repeat, up/down and cut controls

Open **EDIT -> BREAK -> BRK PERF**. Here the white keys are performance commands, the lower black keys trigger selected chops, and the upper black keys select A/B. These assignments are only for the BRK PERF page, with SEQ and FX released.

Physical white key	Editor command	Performance
F3	R1	1/4 repeat
G3	R2	Build
A3	R3	Stretch
B3	R4	Echo
C4 / D4 / E4 / F4	R5 / R6 / R7 / R8	1/8 repeat / down / up / shrink
G4 / A4 / B4 / C5	R9 / R10 / R11 / R12	1/16 repeat / down / up / shrink
D5 / E5 / F5 / G5	R13 / R14 / R15 / R16	1/32 repeat / down / up / shrink

C#5 selects A, D#5 selects B, F#5 toggles A/B. The lower black keys are cut triggers. Hold a white key for its effect and release it to release that held performance; the underlying sequence continues. Leaving BRK PERF also releases held live repeats.

01. Create a straight or generated sequence and start playback. Open BRK PERF.

02. Try C4 for a 1/8 repeat. Release it; then try E4 for the upward variation. Add short G4 repeats near the end of the phrase.

03. Switch A/B with the upper black keys. With recording disarmed, these are live changes.

04. For a saved performance, arm live recording with REC, confirm the recording indicator, then play the gestures while transport runs. Press REC again to leave recording.

05. Return to SEQ and inspect the written chop/repeat/A/B events. Correct unwanted events, save the section, and replay with recording off.

> **Edit shapes the sound; SEQ keeps the performance.**
> FBDK, VAR, WARP and the Amenity-style FILTER shape the manipulator. The ordinary track filter, ENV and both LFOs also affect Break. Knob changes are not automatically a saved sequence of changes: use the recording/automation controls when you want motion. The held-FX punch-in map is a separate shared effect layer.

10 / Break: variations & automation

Hold SEQ for a different keyboard

Select the Break track, then hold SEQ. These keys author the sequence and are not recorded as played notes. Releasing SEQ returns normal playing.

Held-SEQ white key	Action
F3	STRAIGHT: replace with the ordered 32-step two-bar loop.
G3	MUTATE: vary off-beat chops while retaining quarter-note anchors.
A3	RANDOM: a new cut order, keeping an opening downbeat. AMOUNT controls added activity.
B3	FILL: author a repeated/rolled phrase tail.
C4	SHUFFLE: reorder complete beats, preserving each beat's internal events.
D4	REVERSE: reverse event order, not the sample audio.
E4 / F4	SHIFT the sequence left/right by one step, with its recorded motion.
G4	A/B SEQ: bank A at the beginning, B at the midpoint.
A4 / B4	Select loaded bank A / B.
C5	CLEAR the selected sequence inside LEN.
D5	REVERT using the available mutation anchor.
E5	CLR MOTION: clear this track's recorded automation and locks.
G5	Existing CLR STEP command.

Have a new variation every four bars

01. Make a pattern you like and save a section. Hold SEQ on the Break track.

02. Set knob 2 **AMOUNT** to a modest value. Set knob 3 **EVERY** to 4 bars.

03. Set knob 4 **AUTO ACT** to MUTATE, FILL or RANDOM. Knob 1 controls LEN.

04. Use the black-key ORBIT/DRIFT choice: **ORBIT** varies the captured starting anchor; **DRIFT** keeps evolving the latest pattern. Release SEQ and play.

05. Set EVERY to OFF to stop scheduled generation. FREEZE pauses automatic edits. Save the project to retain the interval/action/mode and authored events.

The black keys offer OFF, 2/4/8/16-bar shortcuts, the three actions, and ORBIT/DRIFT. Enabling an interval on an empty pattern can create a straight starting pattern. A generated FILL remains part of the sequence and repeats until replaced; it is not a one-shot momentary fill. Clearing motion does not disable generation: use OFF for that.

11 / Upload your own Breaks

From your loop to the FM-1's A/B bank

OPEN SAMPLE PREPARATION ->

01. Keep your original file. Choose a clean **two-bar, 4/4 drum loop** with its first downbeat exactly at the crop start. WAV or FLAC is recommended. Use audio you have permission to use.

02. Open **Web Editor -> SAMPLES**. Choose A or B, then choose audio. Enter the **known original BPM**. BPM is not detected automatically; any initial value is only a whole-file/two-bar assumption.

03. Set **START / SECONDS**. Check the waveform and selected region: two bars means **eight quarter-note beats**, not two seconds.

04. Click **CONVERT TWO BARS**. Conversion runs locally in the browser and creates a fixed-size bank.

05. Listen to **ORIGINAL TWO-BAR CROP**, then **DEVICE PREVIEW / 160 BPM**. Check the downbeat, loop boundary, pitch and loudness. Re-cut or change source BPM if the rhythm is wrong.

06. Check the crop/preview and audio-permission confirmations. In Browser Workspace, save the browser slot. For a device write, switch to **USB FM-1**, connect the matching Rhythmer, review the slot replacement and explicitly confirm.

07. For a device write, playback stops. Keep power/USB connected until the final bank check completes. Progress reaches COMPLETE only after the device validates the slot. If it stops, do not treat the file as installed.

08. In Browser Workspace, use **SAVE FOR PLAY / ALL PROJECTS + BOTH SAMPLES** to download the sample-inclusive session, then import it into PLAY. Save the original file or converted bank separately too.

Prepared output	Value
Musical length	Two bars at 160 BPM / 3.000 seconds
Audio	Mono / 16 kHz / packed 12-bit
Slot size	80 KiB per A/B slot
Processing	Anti-alias conversion, DC removal, bounded gain and short edge fades
Pitch	Classic repitch changes pitch when source BPM differs from 160

> **Keep the original pitch**
> Export a correctly aligned two-bar loop at 160 BPM from your DAW first, using your preferred pitch-preserving stretch there. Then enter 160 as SOURCE BPM. Rhythmer's web converter does not offer pitch-preserving time-stretch or automatic transient alignment.

Both slots are global across all projects. Replacing A changes A everywhere; replacing B changes B everywhere. Musical archives do not contain audio, and the device upload protocol cannot download current sample audio. Keep originals or converted .slot files. Installing a firmware package replaces A/B with its bundled factory loops.

Browser preparation and a real device write are separate. Conversion and protocol tests are automated; physical transfer/listening on this exact release is still being verified. Sample recording/composition rights are separate from Rhythmer's software license.

12 / Notes, steps & arrangement

Keep the parts editable

In **SEQ -> GEN**, pick Euclid, Mutate, Turing, Cellular or Grids. On drums choose a lane; on synths reuse notes, or choose root, scale or chords; on Break generate chops. Turn SELECT for **GEN MAP** and **GEN OPTIONS**. **OCT+** writes the result to the current sequence and **OCT-** undoes it. Choose a sound first on an empty track.

SEQ opens PATTERN, TRACK, BAR, STEP, GEN and AUTO groups; Break also has its own group. SELECT moves through pages. Read the bottom tab/title and the four parameter labels to see the current editing context.

- **Synth/Acid:** use the piano roll and NOTE/STEP pages for pitch, velocity, timing and articulation. The viewport follows the note register after track/bar changes and edits.
- **Drum:** the grid shows the selected lane; white keys toggle steps and lane selection changes which drum you are editing.
- **NOTE / TIE / REST:** a trigger, continuation, or gap. They are musically different; a TIE at the start needs an earlier held note/event.
- **LEN / DIV / OFFSET / GATE:** define each track's loop and timing. A 32-step loop at the normal sixteenth-note division is two bars in 4/4. Other divisions change its duration.
- **SCL / CHORD / ARP:** choose key, chord voicing/strum and arpeggiation for pitched tracks. Break commands do not become scale notes.
- **Automation:** use the recorded motion/step-lock controls and AUTO pages. Move a sequence with its tools when you want its motion to move with it.

A-D are section snapshots within a project. Use SAVE's SECTIONS and ARRANGE pages to keep variations and build a section sequence. Switching to four-track mode silences/disables the last two tracks without deleting their stored parts.

13 / Envelopes, LFOs & FX

Give a pattern movement

To connect a class-compliant USB MIDI controller, stop playback, unplug the computer, then enable **MENU -> USB -> USB HOST** and confirm. Connect your controller using a USB host adapter. Return to Device mode before using the browser editor or installer. Host mode is for MIDI; the USB-audio duck input uses Device mode.

01. Select the track and open **ENV**. Start with its amplitude envelope, then use the destination pages for additional modulation. A long release can keep more voices active.

02. Open **LFO -> MOD**. Pick one of the four slots, choose its source (including LFO 1 or LFO 2), destination and amount.

03. Press LFO again to move through the **MOD / LFO 1 / LFO 2 / MSEQ** tabs. Each LFO has **RATE, WAVE, MODE and FADE**; turn SELECT within that tab for its **PHASE** and **DEST** pages. Turn SELECT within each tab to find its dedicated destinations.

04. For a first Break test, choose a filter destination and a small amount. Play a straight sequence, then compare with modulation disabled. The track filter and Amenity-style FILTER are separate controls.

05. Open FX for sends and effects, including distortion, phaser, delay and reverb. Hold FX for the on-screen shared performance key map. Release the held key/button when finished.

Two independent LFOs on every track

T1-T6 each have their own LFO 1 and LFO 2: changing T2's rate does not change T3's. In **MOD**, knob 1 selects slot 1-4, knob 2 selects **LFO 1** or **LFO 2**, knob 3 selects the destination, and knob 4 sets a signed amount. Both sources can run together. A zero amount or OFF destination is silent modulation, even while the waveform moves.

Setting	What to expect
RATE	Choose a tempo division or a free rate. Tempo divisions follow the playing transport grid.
WAVE	Independent sine, triangle, saw, square or sample-and-hold shape for each LFO.
MODE / PHASE	TRIG restarts a fresh phrase from its start phase; FREE runs without that note restart. Tempo-synced rates stay aligned to the transport. PHASE is dimmed in FREE.
FADE	How slowly the modulation reaches full depth. A long fade can make a short sound seem unaffected.
LFO 1 DEST / LFO 2 DEST	Each source has its own PITCH, FILTER, SHAPE and AMP depths. These do not consume or replace the four MOD slots.
Save	Sound presets and A-D project sections keep both LFO settings and source assignments. Save a section before replacing it.

Try T2 with MOD slot 1 = LFO 1 -> PAN at a small amount, and slot 2 = LFO 2 -> FILTER at a different rate. For Break, use a straight chop sequence and a cutoff below its fully open setting so the movement is audible. In the web editor, open Sound -> LFO 1 DEST / LFO 2 DEST for the four direct depths. MOD adds other destinations; its SRC order is OFF -> LFO 1 -> LFO 2 -> ENV and the remaining sources.

Track filters, ENV and both LFOs affect Break as well as the ordinary engines. If a filter seems inactive, confirm the selected track, filter type/cutoff, audible sequence gate and modulation source/amount. Sound shaping and sequence generation remain separate operations.

Duck sidechain

Press **FX** to reach the **MASTER** tab, then turn SELECT to **DUCK**. Choose AUTO kick, a local track (T1-T6), USB audio, or MIDI with **SRC**. For a local drum track, choose **ALL** or a lane such as **BD** or **SD**. The selected local source track stays at its own level.

With **SRC = MIDI**, set **CH** to 1-16 or **ANY**, and set **NOTE** to the trigger note (36 by default). A matching MIDI Note On triggers the envelope at that instant. Every positive velocity uses the same envelope settings. Other channels and notes keep their normal MIDI routing. For an audio-level trigger, set MENU -> USB AUDIO to IN+OUT or STEMS+IN and route the isolated external track to Rhythmer from a USB host such as a computer. Use **THR** to set when the audio triggers. Mute Rhythmer's last active track if you want to use the USB feed as a key signal without hearing it.

Turn SELECT from **DUCK** to **DUCK ENV**. **ATK** sets how quickly the level drops (0 gives the fast response), **REL** sets how quickly the level returns (40-600 ms), and **AMT** sets how far the level drops. At 0% there is no ducking. The envelope controls gain directly. Save the section to keep these settings.

For two FM-1s, set the sender's **MENU -> MIDI OUT** to **KICK LINK** and leave the receiver's DUCK source on **AUTO**. Enable USB HOST on one unit and leave the other in Device mode. A local kick takes priority for two beats, then incoming kicks can trigger again. Factory kick sounds remain kick triggers when assigned to another drum lane in EDIT -> SOUND -> DRUM VOICE. The MD bass-drum family uses its model to identify kicks.

14 / Projects, sections & backups

Save the music in more than one place

SAVE tabs are **SONG -> PROJECT -> SOUND**. To empty a saved section or project, stop playback and open **SAVE -> PROJECT -> CLEAR**. Select the project and section, choose the matching clear action and confirm with OCT+. Export a backup before clearing work you may need again.

Save type	Contains	Use it for
Device project / A-D	Four projects with section music, sounds and settings.	Keep a groove on the instrument; save a section before loading another.
Browser workspace	Current edits and four separate browser projects with A-D sections.	Work without a device. Browser storage can be cleared and is not a downloaded backup.
Musical archive	All four projects, sections, sounds and settings; no Break audio.	Back up or restore matching Rhythmer music through the editor.
SAVE FOR PLAY / .fm1save	Emulator firmware/session data, all projects and both sample banks.	Move a browser workspace into PLAY with its audio. It is not a file for the stock firmware updater.
Original audio / .slot	Your original sample or a converted A/B bank.	Preserve custom Break audio independently of musical archives.

On the instrument

Press SAVE. Hold SAVE + SELECT to reach SECTIONS, ARRANGE or PROJECTS. Follow the displayed save/load action and OCT+ confirmation. Save the current section before recalling another; use the on-screen project library for the four project slots. Saving a sound preset and saving project music are separate actions.

In the web editor

01. Use **Browser Workspace** for local editing or explicitly select **USB FM-1** to work with the device. They are different destinations.

02. In the project manager, choose a section A-D and click **SAVE CURRENT MUSIC**. Confirm replacement if that section is already used.

03. Choose **OPEN PROJECT** for another project. The Save & Open dialog saves outgoing music to the selected section before switching. Cancel if you are unsure. A failed save does not complete the switch.

04. Use the musical archive export, then click its prepared **DOWNLOAD** link and check that the file is on your computer. Preparing a download is not the same as saving the file.

05. If you also need audio, use SAVE FOR PLAY and keep your sample originals. Before firmware changes, keep both musical and sample backups outside browser storage.

Browser data stays at that browser and site origin. The local test site and the public GitHub Pages site have different storage. Export from one and import into the other deliberately. Loading a new firmware hash in PLAY does not erase older saved sessions; choose the matching import rather than assuming an old session became the new version.

15 / CPU & troubleshooting

CPU load, warnings & keeping the groove

Six tracks are available, but the cost depends on what they play. Dense chords, overlapping release tails, unison layers, demanding engines and complex effects can exceed the FM-1's processing capacity, even with both cores working. Five busy tracks can cost more than six simple ones. A combination becoming too heavy does not identify Acid, Break or any single machine as the cause.

Before enabling six tracks

Follow the four-/six-track setup guide and see the confirmation screen ->

Busy six-track patterns may cause noise or glitches. If this happens, mute tracks or reduce simultaneous voices and effects. The mode changes only after **OCT+** confirms the notice. Returning to four tracks keeps the music on T5 and T6 for later.

The on-screen CPU warning

> **CPU HIGH: REDUCE INSTRUMENTS**
> Rhythmer briefly shows this message during sustained high load or recent audio deadline misses. It is rate-limited so it does not interrupt every transient, and existing dialogs or held-button maps take priority. A missing warning is not a guarantee of spare capacity.

The CPU meter measures the time needed to deliver the next audio buffer. Near 100%, there is little room for the next chord or effect change; peaks can exceed the deadline even when the average looks lower. Check **MENU -> ABOUT -> OCT+ / PROFILE** to compare track and effect costs while the same passage plays.

Reduce load without rebuilding your song

01. Keep the same passage playing. Hold **FX** to see the key map; the first six black keys toggle track mutes for T1-T6. Mute one track, release FX and listen. Press that track-mute key again to restore it.

02. If muting one part restores stable playback, simplify that part: use fewer simultaneous notes, shorter releases or less unison, or try a lighter sound. Muting a different part may also free enough time; the combined load matters.

03. Reduce demanding shared effects, long feedback or layered processing. Effect tails may remain briefly after a track is muted. Lowering the track volume alone usually does not remove the work of rendering its voices.

04. Bring tracks back one at a time and leave headroom for accents, chord changes and live FX. Use four-track mode if the arrangement does not need six tracks.

Ordinary parts have an engine-dependent ceiling of up to eight voices per track and twelve shared on two cores, subject to mode and CPU protection. Polyphony includes held notes, release tails and unison voices. DRUM hits, including MD, have approximately 40 ms of transient protection from shared-budget stealing and overload shedding. After the attack, their old tails can fade under the ordinary voice/CPU budget. MD uses the same eight physical lanes per drum track, without a separate MD-only 2/3/4-hit ceiling. Same-lane retriggers and intentional hi-hat choke still apply. Protected drums still consume CPU; dense MD arrangements can overload the device. Break does not take ordinary synth-note voices, but its sample manipulation, filter and modulation still use CPU. These are ceilings, not a promise that every combination can meet the deadline.

Automatic protection is a fallback, not extra CPU capacity. It may thin notes or produce brief gaps under overload. Follow the exact build's test notes: an experimental protection build is not proof that timing or audio is resolved on hardware. If the groove slows, timing wavers or high-pitched artifacts remain, mute/simplify a part and report the

pattern and build rather than relying on the protection to keep a dense arrangement intact.

Symptom	Try this
CPU warning, crackle or high peaks	Use the track mutes to compare the same passage, then lower chord density/voice count, shorten releases or simplify shared FX. Turning down volume alone is not a CPU fix. Leave headroom rather than relying on overload protection.
New project is silent	The initial sequences are empty and T5/T6 are unassigned. Use ALL LOOP, or select ACID/BREAK on an active track before Acid NEW or Break STRAIGHT. Confirm PLAY, track level, mute state and four-/six-track mode.
Break is silent	Confirm the Break owner is active, A/B is loaded, and a NOTE/chop starts the sequence. A source-only A/B command or leading TIE does not create a new chop. Try held SEQ + F3 STRAIGHT.
NO BREAK TRACK in GEN	Assign one Break machine first, or select its existing owner. GEN does not create another automatically.
Break loops badly after upload	Check original BPM, eight-beat crop and downbeat alignment. Fades reduce clicks; they cannot repair wrong musical timing.
A generated Acid line is in an unexpected key	Set SCL explicitly before NEW/MUTATE. GEN 2 displays the same ROOT/SCALE as SCL. CHR stays chromatic; there is no separate Acid default. Check the register/OCTS too.
Custom sample disappeared after installation	Firmware installation restores the package's factory A/B audio. Re-upload from your retained original or .slot bank.
Editor or installer cannot connect	Use desktop Chrome/Edge with Web MIDI, one FM-1 and a data cable. Close other MIDI apps/installers; do not open the USB editor during a transfer.
Browser emulator stutters	Pause other emulator tabs and heavy browser work. Browser speed is not a measurement of physical FM-1 CPU performance.

For an audio report, include release version/hash, track engines, chord density, effects, CPU average/peak and what ABOUT / PROFILE shows. A minimal saved pattern is more useful than only a screenshot of a high percentage. Keep private device dumps and tokens out of public issues.

16 / Installation & V15 return

Back up, review, then install

01. Download musical backups and retain your own sample originals. For a first installation or a transition from another custom firmware, use **official V15 first**. Direct foreign-custom transitions are unsupported.

02. Open the Rhythmer installer in desktop Chrome/Edge. Check the version and firmware hash, connect only the intended FM-1 and stop playback.

03. The installer prepares verified firmware, Amen/Think and official V15 recovery. Read the final device/target/backup/risk/audio-rights review and confirm only when it matches your intended device.

04. Keep USB and stable power connected through loader staging, firmware transfer, restart and the final firmware/bank checks. **100% means the installer's required checks finished**; test sound and controls on the instrument next.

05. To change to another custom firmware, return to V15 using RETURN TO V15 first. Use that firmware's own instructions afterward.

Rhythmer is independent of M-VAVE. This is a development beta; automated/host/emulator checks are separate from physical installation, listening and recovery results for the exact build. Interrupted power can leave a dark device without USB. A browser cannot recover a unit that exposes no responding loader; external hardware service/recovery may be needed.

> **During your device test**
> Use the release hash shown on the installer. Test Amen and Think, Acid generation, saves/loads and custom sample handling separately. Keep the currently working installation and a backup until you are ready to change. Do not deliberately interrupt an update to test recovery.

Credits & useful links

Built on shared work

Rhythmer is developed by Jazzy Rhythmer on JIANT's sequencing and system foundation. Felucca provides the platform; Hortator provides native Acid and MD percussion; X0X / TB-3PO contributes MIDI generation; Amenity contributes Break manipulation; Garden-FM and MONO2K contribute synthesis models; Felucca and OberVave contribute the two new synths; Elixir contributes SEQ generation and inspires the LXR-X kits. Original authors, source links and component licenses remain credited in the repository.

Code and recordings are different

The source is GPL-3.0-only with retained component notices. Amen / The Winstons and Think / Lyn Collins are third-party recordings, separate from the code license. The owner directs their inclusion with credits; recording/composition redistribution permission is not documented. Credits or installation acknowledgements do not grant a sample license. Replace either audio bank with your own material or obtain rights appropriate to your use.

Independent community firmware

Rhythmer is not affiliated with M-VAVE or Elektron. Product names belong to their owners. Follow the installer's backup, power, risk and audio-rights notices. This manual describes the current controls; it does not establish physical installation or recovery results for a package.

Project / manual
https://jazzyrhythmer.github.io/Rhythmer/#guide

Install / official V15 return
https://jazzyrhythmer.github.io/Rhythmer/installer/

Web editor
https://jazzyrhythmer.github.io/Rhythmer/editor/

Source / licenses
https://github.com/JazzyRhythmer/Rhythmer

Third-party credits
https://github.com/JazzyRhythmer/Rhythmer/blob/main/docs/THIRD_PARTY.md

Creator
https://jazzyrhythmer.github.io/