Kid Bunka / M-VAVE FM-1

Mutable Dreams 2.2

The complete user manual

Play a Biome. Shape a part. Keep what you make.



15 November 2026 · release review edition

Before you update

KEEP YOUR OWN GARDEN

Updating can erase your Favorites and personal / User Biomes.

Do not rely on automatic retention during an update or a return to stock firmware. Make a backup before installing.

1. Note your Favorites

Write down or photograph your Biome Favorites and Tone stars. Keep this list separately; do not assume a bank backup will restore every preference.

2. Export saved banks and the live Biome

Connect the FM-1 in the Live Device Editor and use Back up all device banks to save a .mddb file. Export your current edited live Biome separately as JSON: unsaved edits are not a named User Bank entry. Keep both files before installing.

3. Restore and check after updating

Reconnect the editor, use Restore device banks and confirm the prompt with SEL on the FM-1. Recall a known User Biome and check its name and sound. Import your separate live export if required. Recreate Favorites from your notes if they were reset.

Open the Live Device Editor

Wichtig: Beim Update können Favoriten und persönliche Biomes verloren gehen. User-Bänke und das bearbeitete Live-Biome vorher getrennt exportieren; Favoriten zusätzlich notieren.

Find your way

Before you update 2

Find your way 3

Your instrument, this build 5

01 Start here 6

02 Walkthrough I - play a Biome 7

03 Walkthrough - make an evolving melody 8

04 Walkthrough II - write a part 9

05 Walkthrough III - finish a take 10

06 Home and performance 11

07 Shape and mix voices 13

08 Rhythm and melodic patterns 15

09 Program and record steps 16

10 Phrase edits, fills and harmony 17

11 Itinera - take and shape a dream 19

12 Arrange a Journey 20

13 Granular and spatial effects 21

14 LFOs and interactions 22

15 Drift and lo-fi kits 23

16 System and MIDI 25

17 MIDI Learn and recordings 26

18 User Banks and browser editor 27

19 Install, recover and diagnose 29

20 Sound engines and scale choices 30

21 Engine reference 31

22 MIDI messages and shortcuts 32

23 Operate the browser instrument 34

24 Answers to community questions 35

The 46 hardware pages 38

HOME and the dream screen 61

Keep exploring 64

Your instrument, this build

Firmware

2.2 · build 23F2FA0E

Library

275 musical Biomes + Blank; 640 tones; 24 engines

Update and return

Exact final 23F2FA0E: direct updates from V15 and published 2.1, and both return paths verified. V15 return requires backup and physical SEL restore.

Stored data

Published 2.1: all 22 objects preserved. After V15: all 22 objects and the unsaved live project restored exactly from backup.

Final data verification

Test slots cleared; two final bank exports and the separate live project match

Cold start

User-reported pass, 15 November 2026

Hardware limit

Exact UC25HQ80 and real Screen Reader validation remain open

Audio/MIDI/mirror

Measured: 4482 / 5090 us; 5804 us block budget. 180 seconds FULL, twice 180 seconds dense ECO with different seeds, and 60 seconds with eight USB channels; 0 XRuns, USB overflows or automatic quality reductions. Lowest measured ECO headroom: 12.3 percent.

Storage timing corrected

12 bank checks, SAVE/SEL, cancellation, clearing and four tone-bank writes with active mirroring: no additional timing warnings. Audio arithmetic is byte-identical in the comparisons; safety reserves are unchanged.

This handbook accompanies the owner-approved 2.2 package. Keep the previous firmware and a current backup for recovery. The handbook does not qualify an SMK-37 or claim a four-hour hardware endurance run. The owner has accepted the cold-start and listening tests.

01 Start here

From the first note to a saved sound

1. Turn MASTER down, connect power or USB, then bring the volume up gently.

2. Tap HOME to reach BIOMES. Turn K1 for a family and K2 or PRESET to browse. Press SEL to load Saltglass Drift, then PLAY.

3. Return to Live Atlas with HOME. Raise Space a little and listen for the shared granular cloud. Try Motion and Density one at a time.

4. Open Tracks with HOME. Turn SELECT to highlight a voice, play the keys and press SEL to mute or unmute that voice.

5. Press PLAY to stop, select Internal clock in MIDI / Performance, then save an edited copy to an empty User Biome slot.

What the instrument stores

A Biome includes sounds, rhythm, harmony, effects, modulation and Journey settings. A Tone is one sound preset. Save the full Biome to keep the relationships between its tracks. Captured audio in the granular buffer is temporary.

How to read this manual

K1-K4 are the four context knobs. SELECT is the track encoder; SEL is a separate button. Turn SELECT normally to choose a track. Hold EDIT, SEQ, FX or GLO and turn SELECT to move through that menu's page wheel. Each menu remembers its last page; the header shows its page number.

Hold a function button for about 0.85 seconds for help. Releasing after a long hold does not also perform the short action. HOME has a special long hold: it opens Itinera. While a dream runs, PLAY stops it and SEL keeps its current Biome playing.

02 Walkthrough I - play a Biome

Follow along on the FM-1

1. Use headphones or the FM-1 speaker at a comfortable level. Under GLO / MIDI Performance set K1 to Internal. Under GLO / USB Audio turn K1 right if local audio is muted.

2. Press HOME until BIOMES appears. Set K1 to All. Find Saltglass Drift with K2 or PRESET and press SEL. If the change guard opens, cancel with HOME and save work you want to keep before retrying.

3. Press PLAY, then HOME to reach Live Atlas. Set Density lower until there is space between notes. Turn Colour left a little, then raise Space. Wait several beats for the texture to settle.

4. Press HOME to reach Tracks. Turn SELECT to choose the first active track, then play a note on the keys. Press SEL once to hear the arrangement without that track. Press SEL again to bring it back.

5. Press ARP to lock the current random seed. Listen to how tracks with different lengths continue to cross. Use REC on the Atlas to try a variation. ENV returns to the previous one.

What you should hear

The transport keeps playing the same Biome. The events and their interaction keep changing. For a Biome that changes sections by itself, load Pearl Fern and listen to both parts before coming back here.

03 Walkthrough - make an evolving melody

From Blank to an open-ended pattern

An enabled step sequence intentionally repeats the notes you wrote. To develop it, use Flow's generator and the Phrase Tools, or edit probability, conditions and lengths. Motion alone is not a command to rewrite a programmed melody.

Generative does not mean that no note or motif ever repeats. The aim is a musical changing relationship between parts. Save an inspiring result before making a larger variation.

1. Stop PLAY. Open HOME > Live List and load row 00 Blank. Choose track 1 with SELECT, turn ALGO to Velvet Keys and raise SOUND K4 Level gently.

2. On GLO > Harmony, choose a root and a scale, for example C Dorian. Leave Journey Arrange Off for this exercise.

3. On SEQUENCE / 32 STEPS, set the sequence to Off so fixed programmed notes do not mask the generative route. On BASS / MOTIFS choose Euclid and a motif.

4. On RHYTHM, try 5 hits over 13 steps, rotation 0 and probability around 80%. On MIX / NOTES choose a comfortable base note. Start PLAY.

5. Return to Live Atlas. Raise Motion and Density a little at a time. Compare ARP locked and unlocked. REC offers a new variation; ENV returns to the preceding one.

6. Add track 2 with a contrasting sound, 3 hits over 11 steps, a different clock division and a lower level. Different cycle lengths make their relationship unfold.

7. Use a small room send on the HOME mixer. Listen for the dry attacks as well as the tail. Stop and save the whole patch to an empty User Biome slot.

04 Walkthrough II - write a part

Turn a sound into a loop

1. Stop PLAY. Choose a synth track with SELECT. From a non-SEQ page, tap SEQ to enter Rhythm. Keep tapping until SEQUENCE / 32 STEPS. Set K1 to On and K4 to 12. Set K2 to step 1.

2. Tap REC until Step entry is active. Play four notes on the built-in keys. Use K2 to move to an empty step and enter another note. Tap REC through Live to Off.

3. Tap SEQ to Step / Expression. Raise velocity for one accent. Lower the gate on one step to make it short. Use chance below 100% on a single step. Press PLAY and let the 12-step line turn against another track.

4. To put a fill on the next bar, continue through SEQ to the Grid, Phrase Tools and Step Rules. Choose a synth track and step with K1 and K2. Set K3 to Fill Only, then press SEL while playing.

5. Open EDIT / Global Mixer and send a little of the chosen track to reverb with K4. On FX / Shared Space, set the return and tail. If the new part masks the rest, lower the track level before raising the effect.

What you should hear

The recorded notes repeat at your own length. The fill step appears for one queued bar. A small room send connects the tracks while their dry attacks stay audible.

05 Walkthrough III - finish a take

Arrange, keep and record what you made

1. Stop PLAY. From Step Rules, tap SEQ for Journey Arrange. Set K1 to Loop, K4 to 2 sections. Set section 1 to THIS BIOME. In section 2, choose a complementary factory Biome.

2. On Journey Timing set each section to four bars and one repeat. On Journey Anchors select section 2 and carry the voice you recorded. Press PLAY and listen for it to survive the change. Set Arrange to Off at any time with transport stopped if you want one evolving Biome instead.

3. Stop. From HOME Tracks open GLO / User Banks. Use K2 to select Biomes and K1 to choose an empty slot. Use K4 and PRESET to enter a name, then SAVE. Turn K3 right to recall it after any later edit.

4. Connect USB to your computer. In your 44.1 kHz DAW project set the FM-1 as input. Arm inputs 1-2 for the complete mix. For individual voices arm six mono tracks on inputs 3-8. Record at least two Journey sections.

5. Open the Live Device Editor and export both the current patch JSON and the saved .mddb banks. Verify your new slot can be recalled before you install another firmware.

What you should hear

The recording preserves the full piece on the stereo track. The six mono tracks give you independent sources for the mix. If you used Rack Mode, the kit is on input 6 and inputs 7 and 8 are silent.

06 Home and performance

LIVE ATLAS / 2.2

HOME

K1 Density · K2 Motion · K3 Colour · K4 Space

Density changes how often generated events occur. Motion changes melodic movement; it does not rewrite fixed notes you entered in an enabled step sequence. Colour changes brightness and Space raises the shared granular return. Let a change settle before turning the next macro.

HOME cycles Live Atlas, Large Tracks, Biome Browser, Live List and Biome Stage. PLAY starts/stops; SELECT chooses the track; SEL mutes that track on the Atlas. MASTER controls the physical output and the stereo USB mix.

LARGE TRACKS

HOME > Large Tracks

K1 Level · K2 Grain send · K3 Room send · K4 Touch

Turn SELECT to select a track. K1 changes its level, K2 its granular send and K3 its room/reverb send. K4 changes playing-strength response on supported voices such as Willow Bow, Aero Flute and Felt Mallet. Mute with SEL; muted voices dim.

EDIT from Large Tracks opens Voice Detail. HOME from Voice Detail returns here. GLO from a non-Atlas HOME view opens User Banks. Changes to the musical patch need a Biome or project save; Touch and other preferences need SAVE while stopped with Internal clock.

BIOME BROWSER

HOME

K1 family or Favorites · K2 or PRESET Biome · SEL load · REC favorite

Browsing lets you inspect candidates. The change guard asks before discarding unsaved edits. SEL confirms, HOME cancels, and SAVE takes you toward saving. Stop and SAVE to retain favorites. PRESET from the Atlas is also a Biome shortcut.

Make and undo variations

ARP locks or unlocks the random seed. Tap REC on the Atlas to vary the patch. ENV returns to the previous variation. Stop leaves effect tails to decay. REC on System or MIDI / Performance is Panic and clears notes and tails. REC has other roles on recording, bank and mapping screens.

LIVE LIST

HOME > Live List

K1 List / Tones / Starred · K2 or PRESET row · K3 row content · SEL load

There are 16 ordered positions, 01-16, plus permanent row 00 for Blank. K3 assigns a User Biome slot, factory Biome or an empty row. The list is a set of references: it does not store a new copy of your edited sound. Save custom work into User Banks first.

REC on an empty row puts the currently loaded factory/User Biome there. REC on a filled row clears that reference; it does not erase the underlying Biome. SEL loads the chosen row through the existing unsaved-edit guard. HOME cancels that guard; SEL discards unsaved edits and loads.

With transport stopped and Internal clock, SAVE on this view stores the list and favourites as preferences. It does not replace the saved project.

TONE LIST / STARRED

HOME > Live List > K1 Tones / Starred

K1 Tones or Starred · K2 or PRESET browse · REC star · SEL apply

Browse all 640 tones by name. REC adds/removes a star. The Starred mode filters the list. SEL applies the highlighted tone to the selected synth

track; SELECT still chooses that track. A kit lane cannot receive a synth tone.

Tone stars and Biome favourites are separate. Stop and SAVE from this view to retain stars. Saving stars is not saving the edited composition.

BIOME STAGE

HOME > Biome Stage

The fifth HOME view expands the current Biome into a full-screen botanical stage without numeric clutter. The music remains playable. HOME continues the view cycle; ordinary track and macro controls still affect the instrument. This is distinct from the long-form Itinera dream.

07 Shape and mix voices

SOUND

EDIT

K1 Tone · K2 Harmonics · K3 Shape or Decay · K4 Level

Select a voice, then turn ALGO for its synthesis model or PRESET for a Tone. Tone and Harmonics shape colour and overtones. Shape controls the character of models that offer it. Drum models use Decay. The on-device help changes for several models.

VOICE / DETAIL

HOME > Large Tracks > EDIT

K1 Tone · K2 Harmonics · K3 Shape / Decay · K4 Level

A larger view of one selected voice: its engine, tone and filter are easier to read. SELECT changes the voice, ALGO changes the engine and PRESET chooses a tone. K3 uses Shape for envelope-equipped voices and Elements, and Decay for other percussion. HOME returns to Large Tracks.

VELVET FILTER

EDIT

K1 Cutoff · K2 Resonance · K3 Filter mode · K4 Breathe

Low-pass modes LP12 and LP24 soften brightness. LPG darkens as the sound decays. Off bypasses the filter. Breathe adds slow filter movement. Start with little resonance on bright sounds.

ENVELOPE / BLOOM

EDIT

K1 Attack · K2 Decay · K3 Level · K4 Granular send

Attack controls the onset and Decay controls the tail. Melodic voices can sustain from MIDI. Percussive models also shape the tail internally. Increase Attack on pads and lower it on plucks.

MIX / NOTES

EDIT

K1 Granular send · K2 Base note · K3 Pan · K4 Clock division

Set the voice position in stereo and its pitch centre. The division slows the selected voice independently. The granular send feeds the shared buffer.

GLOBAL MIXER

EDIT

K1 Level · K2 Granular send · K3 Delay send · K4 Reverb send

Turn SELECT to move between tracks. SEL mutes or unmutes the selection. Sends follow the voice level. The shared effects also need an audible return on their own pages.

08 Rhythm and melodic patterns

RHYTHM

SEQ

K1 Hits · K2 Length · K3 Rotation · K4 Probability

The Euclidean generator distributes hits through the pattern. Length sets the cycle. Rotation moves accents around it. Probability makes eligible hits intermittent. Try five hits over twelve steps against a sixteen-step track.

GROOVE / REPEATS

SEQ

K1 Global swing · K2 Repeats · K3 Accent · K4 Clock division

Swing delays alternate subdivisions. Ratchets divide one hit into one to four repeats. Accent changes its emphasis. The division belongs to the selected track.

BASS / MOTIFS

SEQ

K1 Off / Euclid / Step · K2 Motif · K3 Glide · K4 Base note

Use Euclid to play the motif with generated hits. Step lets the phrase drive playback. Glide smooths the movement between pitches. Any synth voice can use this mode.

PHRASE / NOTES

SEQ

K1 Phrase step · K2 Note offset or rest · K3 Accent · K4 Probability

Edit one of sixteen phrase positions. A rest leaves the position empty. Scale snapping still applies. This page sets the track's accent and probability. Use Step Expression for per-step dynamics in the 32-step sequencer.

09 Program and record steps

SEQUENCE / 32 STEPS

SEQ

K1 Enable · K2 Edit step · K3 Note or rest · K4 Length

Each synth track has its own sequence. The display shows a rest at the bottom of the note selector. Tap REC to cycle Step entry, Live overdub and Off. In Step, play the keyboard or routed MIDI to enter notes. In Live, start PLAY and play into the moving sequence.

STEP / EXPRESSION

SEQ

K1 Velocity · K2 Gate · K3 Chance · K4 Generator

Velocity changes emphasis. Gate changes duration. Chance governs the selected step. Generator choices such as Sparse, Arp, Pulse and Drift replace this track's sequence. ENV can undo the edit.

SEQUENCE / FLOW

SEQ

K1 Direction · K2 Offset · K3 Velocity variation · K4 Generator

Try Forward, Reverse, Pendulum, Orbit or Seed. Offset changes which step is heard first while keeping the stored order. Feel adds velocity variation. REC enters the sounding step while live recording.

SEQUENCER / GRID

SEQ

K1 Track · K2 Step · K3 Note or kit pad · K4 Length

Compare the six rows, then press SEL to open the selected track's editor. REC cycles recording. In Rack Mode, the kit row opens its pad sequencer. Tap SEQ again for Phrase Tools.

10 Phrase edits, fills and harmony

SEQUENCER / TOOLS

SEQ

K1 Step or Phrase · K2 Position · K3 Amount · K4 Action

Set the scope before choosing an action. Copy and Paste transfer the chosen scope between synth tracks. Transpose shifts pitches. Phrase scope adds Reverse, Accent and Articulate to change order, velocity and gate lengths. Open a track before recording. Press SEL to apply the chosen tool and ENV to undo the last operation.

SEQUENCER / FILL

SEQ

K1 Track · K2 Step · K3 Rule · K4 Note

Rules decide which passes can play the step, including First, Every second and Fill. During playback press SEL to queue a single fill bar. Press SEL again before it starts to cancel it. Fill steps play only inside that bar.

HARMONY / GLOBAL

GLO > Harmony

K1 Root · K2 Scale · K3 Transpose · K4 Tempo

Root and scale choose the pitch pool. Transpose moves the whole patch; tempo sets the internal BPM. External clock can drive transport independently of this BPM.

SEL toggles KEEP SETTING for manual Biome selection: retain key, scale, transpose, tempo and chords while loading the new Biome's sounds, rhythm and space. This is not a command to rewrite the harmonic story of every Itinera or Journey.

REC cycles BIOME CHANGE: NOW, NEXT BAR or TRACK BY TRACK. NOW changes immediately and clears effect memory as before. The other modes keep reverb, echo, grain and tape tails. The handover order is pads/bass, leads, rhythm; stages may combine when a mixed old/new ensemble would exceed the device budget. Individual per-track fade times are not available.

Stop, select Internal clock and SAVE to retain these preferences together with the normal saved project. With the transport stopped, a manually selected Biome loads directly.

CHORD JOURNEY

GLO

K1 Progression · K2 Bars per chord · K3 Follow or Stay · K4 Root movement

Pick a four-chord progression and allow one to sixteen bars for each chord. Set Follow on the selected voice to move it with the chords. Use Stay on percussion or a held drone. K4 switches the root movement between Nearby and Original. Set the root and scale on Harmony. This progression works with Journey Arrange Off.

11 Itinera - take and shape a dream

Choose before you play

Hold HOME / GLO > Itinera

K1 Dream · K2 Length · K3 Pace · K4 Room

Stop transport and hold HOME, or reach Itinera through the GLO cycle. Choose among fourteen dreams. Length offers 30 minutes, 1 hour, 2 hours or 4 hours. Pace changes how often the journey moves; Room shapes its space. REC resets the current dream's adjustments.

Turn Motion on under LOOK / STARTUP for animated worlds. Press PLAY to begin. Length is the journey duration, not a guarantee that an attached computer/radio service will remain online.

Play during the dream

K1 Density · K2 Motion · K3 Colour · K4 Space

Once running, the knobs change role. They shape the current dream on top of its own development, and that nudge remains through later Biomes until you stop. A brief overlay shows the change. The screen identifies the Biome you hear.

PLAY stops the dream. SEL ends the journey while keeping the sounding Biome playing. You can then edit it, star it or save it. ENV brings back the project from before the dream. To store the kept result, stop playback, choose Internal clock and save a full User Biome.

Listen and look

Expect slow changes in texture, notes and space, not a fixed song file. The same dream may revisit musical material. Each theme has its own visual story. Graphic Motion can be turned off without removing the sound design.

The Mac Radio Studio and OBS are separate products. Starting a hardware dream does not automatically publish a stream.

12 Arrange a Journey

JOURNEY / ARRANGE

SEQ

K1 Off / Once / Loop · K2 Section · K3 Biome · K4 Section count

Stop playback to edit. Choose up to eight sections. THIS BIOME takes its source from the current saved sounds. Other positions can recall factory Biomes. PLAY starts the first section. Once finishes after the last section. Loop returns to the start.

JOURNEY / TIMING

SEQ

K1 Section · K2 Bars · K3 Repeats · K4 Pitch offset

Set one to sixty-four bars per section. A bar is sixteen sixteenth notes. Repeats extend that section. The pitch offset is ±24 semitones. All sections follow the home tempo.

JOURNEY / ANCHORS

SEQ

K1 Section · K2 Track · K3 Carry · K4 Journey mode

Carry preserves the selected incoming voice and its pattern. The new root and scale still apply. Across kit changes, only tracks 1-3 can be carried. Live mutes and macros reset on Stop.

Reproduce the factory example

Load Pearl Fern, press PLAY and hear Hands Into Clouds enter while track 5 carries the bass. Pearl Fern, Chapel of Fog and Copper Step ship with Loop. The other 273 factory entries, including Blank, ship with Off. Save any preference and section edits to a User Biome.

13 Granular and spatial effects

GRANULAR BUS

FX

K1 Return / Space · K2 Grain size · K3 Position · K4 Feedback

This is one shared audio buffer. A track send changes how much of that track goes in. Size changes each fragment's length, Position chooses where to read, and Feedback recirculates material. Press LFO to freeze, then press it again to resume input.

TAPE / MOTION

FX

K1 Grain pitch · K2 Direction · K3 Duck source · K4 Duck amount

Transpose the grains by up to two octaves and choose forward or reverse playback. Ducking reduces the other tracks when the chosen source plays. Choose 0 to turn the duck source off. Set its release in System.

SHARED SPACE

FX

K1 Delay time · K2 Echo feedback · K3 Reverb tail · K4 Shared return

The delay spans 40-350 ms. Feedback adds repeats. Reverb tail controls decay. Use the Mixer to choose which voices feed delay or reverb. Start low and raise the return gradually.

CLOUD / AIR

FX

K1 Noise into tape · K2 Granular return · K3 Selected voice send · K4 Freeze

Add a little noise to the shared buffer for texture. The selected track's send remains separate. Freeze holds the recorded buffer and stops new noise and track inputs from entering.

14 LFOs and interactions

MARBLES / TIDES / WARPS

FX

K1 Marbles · K2 Tides depth · K3 Tides cycle · K4 Warps blend

Marbles adds remembered variation to phrases in Euclid or Step. Tides moves the selected LFO A target. Warps blends nonlinear colour. Start with one low-depth change to hear each contribution.

TIDAL / LFO A

FX

K1 Target · K2 Wave · K3 Depth · K4 Cycle

Assign slow movement to a synth voice. Try a soft swell on level or gentle motion on pan or filter. The cycle spans 0.5-20 seconds. Grain, FX and Warps targets need the corresponding base signal.

TIDAL / LFO B

FX

K1 Target · K2 Wave · K3 Depth · K4 Cycle

Set an independent movement for the same voice. Use a different cycle from A to avoid repeating the same motion together. Soft Swell keeps the peak within the original level. Kit pads use their own controls.

LIVING / LINKS

FX

K1 Slot · K2 Source voice · K3 Destination voice · K4 Target

Set up one of four connections. For example, choose a percussion track as the source, a sustained track as destination and Pan as target.

LINK / MOTION

FX

K1 Slot · K2 Signal · K3 Signed depth · K4 Hit release

Select Hit, Envelope or LFO A/B from the source. Raise depth from zero and listen. Negative depth reverses motion. Hit release sets how quickly a hit fades from the destination. Muted sources stop sending motion.

15 Drift and lo-fi kits

BIOME / DRIFT

FX

K1 Off / Manual / Auto · K2 Position · K3 Cycle · K4 Depth

Drift blends captured sound parameters from A to B. In Manual, move K2. In Auto, set a 10-300 second round trip. Lower depth for a smaller change. Capture both scenes first.

DRIFT / SCENES

FX

K1 Capture A · K2 Capture B · K3 Depth · K4 Mode

Turn Drift Off. Capture A, change tone, filter, decay, mix or macros, and capture B. Turn Drift on afterwards. ENV can undo the last capture.

LO-FI / RACK MODE

GLO

K1 Rack mode · K2 Kit · K3 Pad · K4 Hiss

Rack mode provides three synths and an eight-pad kit on track 4. Play its pads on the keyboard. The eight pads repeat across the keys. REC auditions the selected pad from kit edit screens.

KIT / PAD COLOUR

EDIT (track 4)

K1 Tune · K2 Level · K3 Filter · K4 Tail

Set pad pitch up to ±12 semitones. Adjust the selected pad's level, low-pass filter and sample decay. Each pad stores independent settings.

KIT / SENDS

EDIT (track 4)

K1 Pad · K2 Pad granular send · K3 Kit delay · K4 Kit reverb

The pad feeds the same granular tape as the synths. Track 4's Mixer send sets the overall kit contribution. Delay and reverb sends apply to the kit.

KIT / 32 STEPS

SEQ (track 4)

K1 Step · K2 Hit · K3 Length · K4 Generator

Choose the pad with PRESET. Each pad has its own rhythm gates. REC cycles step entry, live overdub and Off. Save the full Biome to keep the kit and patterns.

16 System and MIDI

QUALITY / SYSTEM

GLO

K1 Tempo · K2 ECO / FULL · K3 Duck release · K4 Reset peak

ECO uses lighter processing on dense sounds. FULL allows more resonator modes and grains. The CPU display shows the observed peak. REC is Panic. System shares its tempo with Harmony.

LOOK / STARTUP

GLO

K1 Motion · K2 Startup sound · K3 Replay intro · K4 LEDs

Motion controls display and light movement. K2 toggles the startup chime, K3 replays the animation, and K4 selects OFF, DIM or FLOW for button lighting. SEL switches colour polarity. Stop and SAVE to keep preferences.

MIDI / PERFORMANCE

GLO > MIDI / Performance

K1 Clock · K2 Scale snap · K3 Track input channel · K4 Macro shortcut

Select Internal, USB, TRS or BLE clock. An external source must send MIDI Clock and Start. Set the selected track's receive channel to Off or 1-16 with K3. Input scale snapping constrains played notes. CH16 CC16-19 can control the four macros.

In 2.2, PRESET sets the selected synth track's generated USB MIDI note-output channel: Off or 1-16. Repeat for each track and SAVE while stopped with Internal clock. Assign different channels when controlling separate instruments.

This output is monophonic per synth track and carries generated notes. The Lo-Fi kit, notes played into the keyboard/MIDI input, clock output and

BLE/TRS note output are outside this feature. Stop, mute, Panic, clock changes and Biome changes must release held notes.

MIDI channels are control messages, not separate audio outputs. USB audio inputs 3-8 are the six mono voices.

WIRELESS MIDI

GLO

K1 BLE on/off · K2 Discover/select · K3 Connect/release · K4 MIDI thru

Stop before enabling the radio. To connect to a BLE MIDI peripheral, turn K2 to scan or browse, then K3 right to connect. For a phone or computer connecting to the FM-1, leave discovery mode and use its Bluetooth MIDI panel. Enable thru only when routing is intentional to avoid MIDI loops.

17 MIDI Learn and recordings

MIDI / LEARN

GLO

K1 Slot · K2 Target · K3 Track · K4 Arm

Choose a slot, then turn K4 right and move a controller. Cross the current value to pick it up without a jump. REC clears the selected slot. Stop and SAVE to store the sixteen mappings.

MIDI / MAPPING

GLO

K1 Port · K2 Channel · K3 CC · K4 Enable

Restrict the mapping to USB, BLE, TRS or Any. Channel 0 means Any. Reserved CCs are skipped. Disable a mapping to preserve it without using it, or press REC to clear it.

USB AUDIO

GLO

K1 Local monitoring

Turn K1 left to mute speaker and headphones or right to restore them. USB recording continues. MASTER sets the stereo USB level. SAVE on this page keeps the preference with transport stopped and Internal clock selected.

Record six separate tracks in Logic or another DAW

Choose Mutable Dreams FM-1 as input and set the project to 44.1 kHz. Create six mono audio tracks, one each on inputs 3-8. Enable recording on all six, press PLAY and record. Inputs 1-2 give the effected stereo mix. The mono tracks are taken before pan and shared effects and use a fixed USB level. With Rack Mode on, input 6 carries the kit and inputs 7-8 are silent. Set MIDI input channels separately when using the FM-1 as a controller.

18 User Banks and browser editor

USER BANKS

GLO from Tracks or Biomes

K1 Slot · K2 Biomes / Sounds · K3 Recall · K4 Name cursor

Stop and use Internal clock. Pick one of sixteen Biome slots or sixty-four sound slots. K4 moves the cursor and PRESET changes its character. SAVE stores to an empty slot. On an occupied slot, check the prompt and confirm with SEL to overwrite. REC requests clear and SEL confirms. Turn K3 right to recall. The factory library remains available.

Browser instrument and live editing

Open the 2.2 Web Studio in desktop Chrome or Edge. Start Instrument opens the independent browser synth. Use browser user banks for its own local storage. To edit the FM-1 instead, stop the standalone instrument, click Connect FM-1, allow MIDI and choose the device. The device editor sends changes to the FM-1. Disconnect when finished.

The 2.2 Web Studio runs the updated firmware engine and library. Use the black-and-mint Your FM-1 surface to follow the physical controls. The separate Global Editor has direct controls independent of the current HOME subview. Browser bank storage and physical FM-1 banks remain separate. The website radio pauses when you play the instrument; press Listen to return to the radio.

Export, import, back up and restore

Export the live patch as JSON for edits and transfer of the active sound. Use the editor's import to load a compatible patch, then save it to the desired bank on the hardware. Use Back up all device banks for a .mddb file. Restore device banks checks and stages the file, then waits for SEL on the FM-1. HOME cancels the device prompt. A full restore replaces the stored user data, so back up the destination device first.

USB Screen Mirror

Open the mirror page in Chrome or Edge, connect with a data USB cable and grant Web MIDI. Choose the FM-1. Use the mirrored image as a window source in OBS and take audio from the device or DAW. If a transfer stalls, close the mirror and retry with the editor alone.

19 Install, recover and diagnose

Before any firmware change

Updating can erase Favorites and personal/User Biomes. Before installing, export all device banks as .mddb, export the edited live Biome separately as JSON and note your Favorites. After updating, restore the saved banks and check a known User Biome; recreate Favorites from your notes if needed.

Keep the official stock firmware for your specific FM-1. Use a direct USB data connection and leave power connected until the installer confirms restart. Check the current UC25HQ80 test status. The SMK-37 version requires a separate build.

Browser installer, command line and M-UPGRADE

Use the 2.2 project installer in desktop Chrome or Edge, grant MIDI and select the FM-1. Follow its update and restart prompts. The release also supplies a Python USB-MIDI updater for the Mutable Dreams package. Use M-UPGRADE with supported official stock files. Follow the instructions supplied with each download.

Use the matching 2.2 installer and package, build 23F2FA0E. Export both saved banks and an edited live Biome first. The measured roundtrip used the USB-MIDI command-line updater; a fresh 2.2 browser/M-UPGRADE hardware roundtrip is not claimed. The installer verifies package identity and checksum before writing.

Return to stock and restore

Choose the installer's stock-return route and the official stock file that works on that unit. Returning to stock can erase saved Mutable Dreams data. After reinstalling a compatible Mutable Dreams build, restore .mddb via the Live Device Editor and press SEL on the FM-1. Recall a known User Biome to check the restore.

Troubleshoot by symptom

No sound: turn up MASTER, use Internal clock, unmute the chosen voice and turn on local monitoring. Unexpected section changes: check Journey Arrange. No MIDI device: try a data cable, allow MIDI, close other editor or mirror sessions and reconnect. Stereo only in the DAW: select separate mono inputs 3-8. Startup click: switch off the optional chime in Look / Startup and compare speaker and headphones on a cold start. A click at the power switch can come from the analogue circuit.

20 Sound engines and scale choices

Choose a sound by how you want to play it

Start with Felt Mallet for a soft strike, Bow or Aero for sustained voices, and Skin Percussion for hand percussion. Use ALGO to change the selected voice's engine. PRESET changes its Tone. The next section groups the algorithms by musical use. Hold EDIT on Sound to see that engine's knob roles.

Play in a different scale

Harmony offers Chromatic, Minor, Major, Dorian, Minor Pentatonic, Major Pentatonic, Whole Tone, Phrygian, Ukrainian Dorian, Harmonic Minor, Double Harmonic Minor, Harmonic Major and Double Harmonic Major. Choose the root before shaping a chord progression. Try Ukrainian Dorian for a raised fourth against a minor third. Harmonic Minor adds a leading tone. Harmonic Major lowers the sixth against a major third.

A practical sound design pass

With effects low, audition a single voice at a modest level. Set its envelope, pitch, filter and pan. Raise just one send, listen in the full mix and make room for the next track. Save a Tone to reuse the voice and a Biome to preserve the whole mix.

21 Engine reference

Percussion and strikes

PLAITS KICK makes a pitched low drum. PLAITS SNARE combines body and noise. PLAITS HAT makes short metallic ticks. SKIN PERCUSSION moves from palm to rim with Tone and Harmonics shaping the skin and its overtones. FELT MALLET softens the initial strike while its pitched body rings.

Resonators and strings

RINGS MODAL produces pitched, ringing partials. ELEMENTS STRIKE excites a resonating body with mallet, plectrum or particles. CEDAR STRING gives you a woody pluck with separate brightness, body and plectrum settings. WILLOW BOW sustains a string with bow pressure. COPPER BLOOM mixes ringing sidebands into a strike.

Oscillators and keys

PLAITS FM creates sidebands around a carrier. PLAITS VA covers classic oscillator colours. PLAITS HARMONIC balances a harmonic stack. SINE CHOIR layers gentle partials. ROUND BASS gives a soft low foundation. VELVET KEYS makes a rounded melodic attack. REED ORGAN adds pipe and reed harmonics, with gentle beating.

Pads, air and ensembles

MELLOW DRIFT makes a slowly moving soft voice. SATIN MORPH moves between smooth timbres. SPECTRAL BLOOM develops a spread of partials. BREATH TEXTURE adds airy noise. AERO FLUTE balances pipe overtones and breath. SILK ENSEMBLE spreads and drifts two side voices. VOWEL BLOOM sweeps through oo, ah and ee.

22 MIDI messages and shortcuts

Performance messages

The assigned track accepts Note On/Off with velocity, Pitch Bend and CC64 sustain. CC11 controls expression. RPN 0,0 adjusts bend range up to ±24 semitones using CC6 and CC38. Reset All Controllers is CC121. CC120 silences the assigned voice and CC123 releases its notes. Keyboard and MIDI recording use the selected sequence and routed channel.

Direct control and recall

CC7 volume, CC10 pan, CC74 filter cutoff, CC71 resonance, CC91 reverb send, CC12 delay send, CC13 grain send and CC5 glide. On CH16 with the macro shortcut enabled, CC16-19 provide coarse Density, Motion, Colour and Space. Optional CC48-51 add fine resolution. Bank Select MSB CC0 plus Program Change selects a factory Tone for the routed track outside an active Journey. The slot index is bank × 128 + program. Use zero-based numbers as sent on the wire.

External timing and connection

Select USB, TRS or BLE in MIDI / Performance, then send Clock and Start, Continue or Stop over that input. Select Internal for standalone playback and saving. Enable BLE MIDI in Wireless MIDI before pairing. If notes double or hang, turn thru off, check channel assignments and use Panic on System or MIDI / Performance.

Navigation in one glance

HOME cycles Atlas, Tracks and Biomes. EDIT cycles sound shaping and mixing. SEQ cycles rhythm, patterns, tools and arrangement. FX cycles grain, spatial effects and movement. GLO cycles harmony, settings, MIDI, storage and Rack Mode. Holding a function key displays its help without applying the tap action.

23 Operate the browser instrument

Start and play

Use Start instrument to enable audio, then Play for the transport. Try the featured starting points for Silk Estuary, Chapel of Fog, Cedar After Rain or a Lo-Fi kit. Choose a Biome in the Atlas, use Blank Biome for a clean start, and star favourites. Select a track in its list. The on-screen keys and the typing keys A W S E D R F G Y H U J play notes. OCT - and OCT + shift the range. Connect MIDI input brings in an external controller.

Use the panel while a pattern runs

Select an editor page and move its four controls. Use Tempo for the internal BPM and Master for overall level. SEL mutes the current track, ARP locks the seed, REC makes a variation and ENV undoes it. LFO freezes the granular buffer. Panic immediately releases notes and clears tails. Sound, rhythm, sequence, effects and motion controls follow the same roles listed in the device reference.

Save in the browser

Name and save to a free browser slot, load it later from the same browser, or clear a slot to reuse it. Use Export patch to save JSON independently of browser storage. Import patch reopens a compatible JSON. If a Biome change would discard edits, choose Keep editing, Open User Banks or Discard and load.

Use the FM-1 as the instrument

Choose Connect FM-1 to edit the actual unit. Back up all device banks exports .mddb and Restore device banks stages a replacement for confirmation on the synth. Return to browser releases the device. Use the dedicated mirror page to capture the physical display. The browser synth and device keep separate banks.

24 Answers to community questions

Save seems to do nothing

Stop playback, select Internal clock, then open GLO / USER BANKS from HOME Tracks or Biomes. Choose Biomes with K2 and a User slot with K1. Set the name using K4 and PRESET. Press SAVE. If that slot is occupied, read the overwrite prompt and press SEL to confirm. Recall that slot with K3 and verify the name and sound. A Tone save only keeps one sound; choose Biomes to save the whole composition. Back up before updating or restoring banks.

Can I overwrite or initialise a factory Biome?

Factory Biomes remain in the library. Edit one and save your own version to a User Biome slot. Start with Blank for a clean patch. User slots can be overwritten or cleared with the confirmation shown on the device. Live List gives them direct HOME access without modifying the factory ROM.

Which kind of transition am I hearing?

Manual 2.2 selection uses the NOW / NEXT BAR / TRACK BY TRACK choice on Harmony. KEEP SETTING retains harmony and tempo for those manual changes. These controls are not the same as BIOME / DRIFT, which interpolates captured A/B sound settings.

Journey Arrange follows up to eight authored sections; Anchors can carry selected tracks across boundaries. Itinera is a separate long dream. With Journey Arrange Off, an ordinary Biome can still run generatively without a linear arrangement. The Mac Radio Studio is a separate program with its own mixing engine.

MIDI channels are not separate audio tracks

Record the stereo mix from USB inputs 1-2 and individual voices from mono inputs 3-8, at 44.1 kHz. Input MIDI channels distribute received notes to tracks. The new 2.2 MIDI-out channels send generated synth notes to other instruments. These three routes are independent.

Does an update require a detour through stock V15?

Use the installer and starting-version instructions supplied with the exact release. Do not return to V15 merely because a previous update used it. First export the live patch and all User Banks, check the detected FM-1 identity and keep the appropriate stock package for that unit. If the installer explicitly reports that it refused the update before transferring data, that attempt did not write the package. A zero-requests message alone does not identify the cause or prove a damaged flash. Record the complete message and USB identity before trying another route.

Newer flash chips, recovery and accessibility

UC25HQ80/B36014 support exists in code, but exact 2.2 installation, save, full cold boot and return on that chip still need a real unit. A tester's successful 2.0 save/reload is not a qualification of this candidate. The current test uses the owner's existing FM-1.

For Screen Reader support, retain older word files and use the matching 2.2 word list 968fedaf29.json when released. Automatic loading with a real reader has not yet been fully qualified here. A word-list file alone is not a complete accessibility test.

What this candidate does not claim

This guide describes FM-1 2.2, build 23F2FA0E: Live List, tone stars, HOME mixer and revised navigation are included. MY CHORDS is deferred. Sampling is deferred. A dedicated Solo mode, arbitrary per-track crossfades, USB host functionality and comprehensive BLE/clock output are not claimed.

The 46 hardware pages

Page captures from the qualified predecessor 482E2C4F show the same 2.2 interface. Build 23F2FA0E retains the help corrections and reduces effect-loop overhead without changing the tested audio output. Use the written controls at phone size. Playback measurements at the front apply to 23F2FA0E.

01 / LIVE ATLAS / 2.2



HOME

K1 Density · K2 Motion · K3 Colour · K4 Space

02 / SOUND



EDIT

K1 Tone · K2 Harmonics · K3 Shape or Decay · K4 Level

03 / RHYTHM



SEQ

K1 Hits · K2 Length · K3 Rotation · K4 Probability

04 / GRANULAR BUS



FX

K1 Return / Space · K2 Grain size · K3 Position · K4 Feedback

05 / MIX / NOTES



EDIT

K1 Granular send · K2 Base note · K3 Pan · K4 Clock division

06 / QUALITY / SYSTEM



GLO

K1 Tempo · K2 ECO / FULL · K3 Duck release · K4 Reset peak

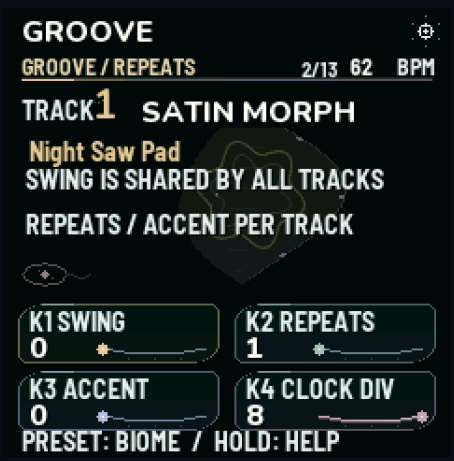
07 / ENVELOPE / BLOOM



EDIT

K1 Attack · K2 Decay · K3 Level · K4 Granular send

08 / GROOVE / REPEATS



SEQ

K1 Global swing · K2 Repeats · K3 Accent · K4 Clock division

09 / TAPE / MOTION



FX

K1 Grain pitch · K2 Direction · K3 Duck source · K4 Duck amount

10 / HARMONY / GLOBAL



GLO > Harmony

K1 Root · K2 Scale · K3 Transpose · K4 Tempo

11 / VELVET FILTER



EDIT

K1 Cutoff · K2 Resonance · K3 Filter mode · K4 Breathe

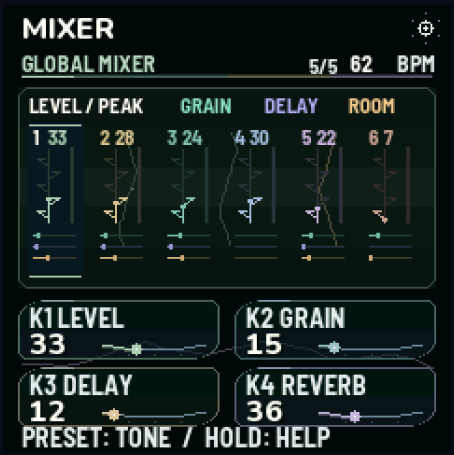
12 / LOOK / STARTUP



GLO

K1 Motion · K2 Startup sound · K3 Replay intro · K4 LEDs

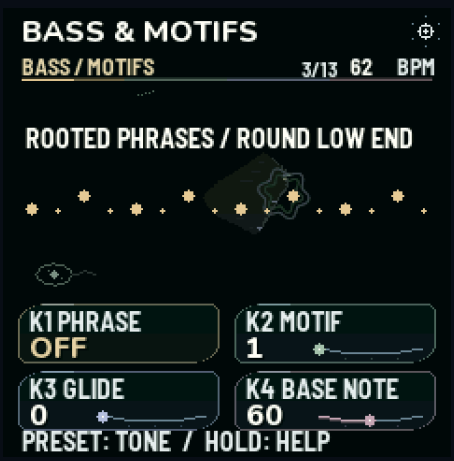
13 / GLOBAL MIXER



EDIT

K1 Level · K2 Granular send · K3 Delay send · K4 Reverb send

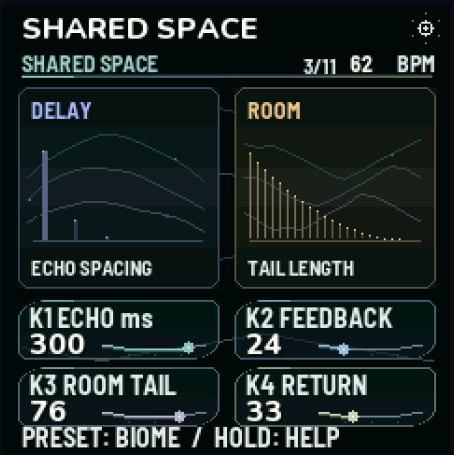
14 / BASS / MOTIFS



SEQ

K1 Off / Euclid / Step · K2 Motif · K3 Glide · K4 Base note

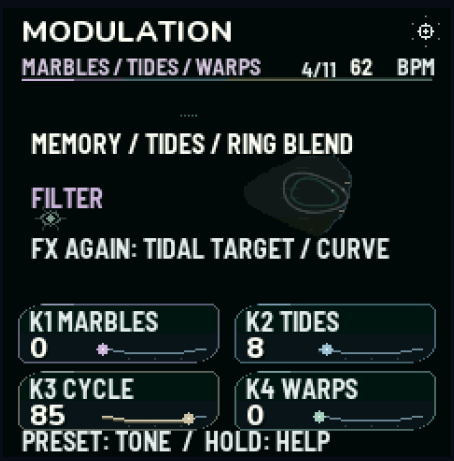
15 / SHARED SPACE



FX

K1 Delay time · K2 Echo feedback · K3 Reverb tail · K4 Shared return

16 / MARBLES / TIDES / WARPS



FX

K1 Marbles · K2 Tides depth · K3 Tides cycle · K4 Warps blend

17 / PHRASE / NOTES



SEQ

K1 Phrase step · K2 Note offset or rest · K3 Accent · K4 Probability

18 / MIDI / PERFORMANCE



GLO > MIDI / Performance

K1 Clock · K2 Scale snap · K3 Track input channel · K4 Macro shortcut

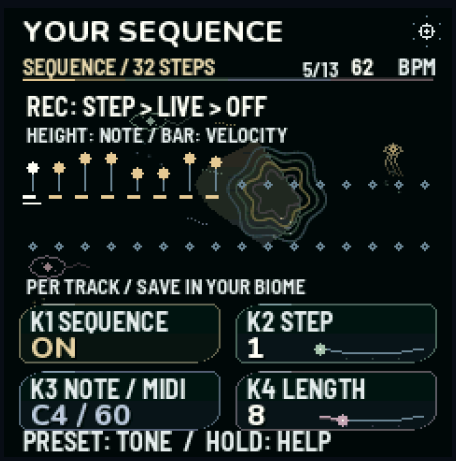
19 / USER BANKS



GLO from Tracks or Biomes

K1 Slot · K2 Biomes / Sounds · K3 Recall · K4 Name cursor

20 / SEQUENCE / 32 STEPS



SEQ

K1 Enable · K2 Edit step · K3 Note or rest · K4 Length

21 / STEP / EXPRESSION



SEQ

K1 Velocity · K2 Gate · K3 Chance · K4 Generator

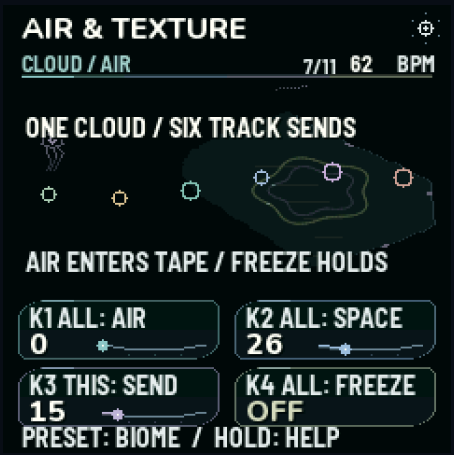
22 / CHORD JOURNEY



GLO

K1 Progression · K2 Bars per chord · K3 Follow or Stay · K4 Root movement

23 / CLOUD / AIR



FX

K1 Noise into tape · K2 Granular return · K3 Selected voice send · K4 Freeze

24 / LO-FI / RACK MODE



GLO

K1 Rack mode · K2 Kit · K3 Pad · K4 Hiss

25 / KIT / PAD COLOUR



EDIT (track 4)

K1 Tune · K2 Level · K3 Filter · K4 Tail

26 / KIT / SENDS



EDIT (track 4)

K1 Pad · K2 Pad granular send · K3 Kit delay · K4 Kit reverb

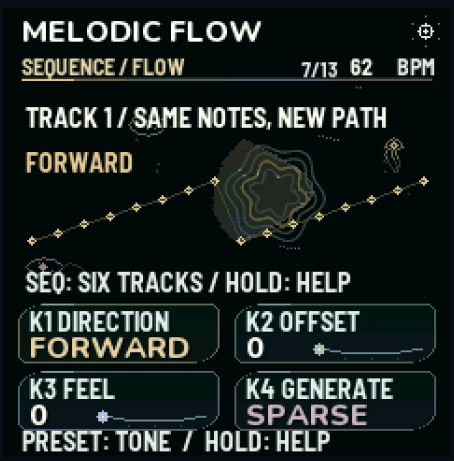
27 / KIT / 32 STEPS



SEQ (track 4)

K1 Step · K2 Hit · K3 Length · K4 Generator

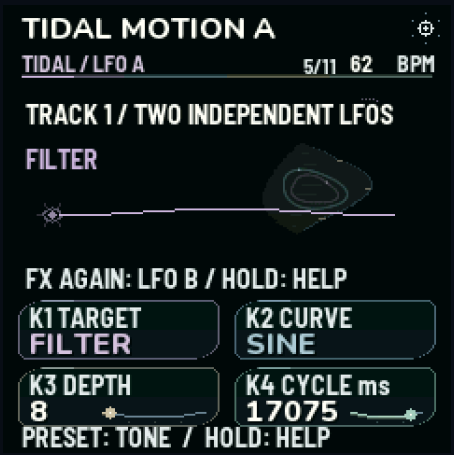
28 / SEQUENCE / FLOW



SEQ

K1 Direction · K2 Offset · K3 Velocity variation · K4 Generator

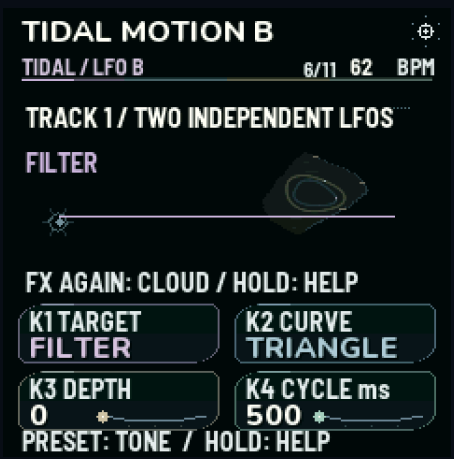
29 / TIDAL / LFO A



FX

K1 Target · K2 Wave · K3 Depth · K4 Cycle

30 / TIDAL / LFO B



FX

K1 Target · K2 Wave · K3 Depth · K4 Cycle

31 / WIRELESS MIDI



GLO

K1 BLE on/off · K2 Discover/select · K3 Connect/release · K4 MIDI thru

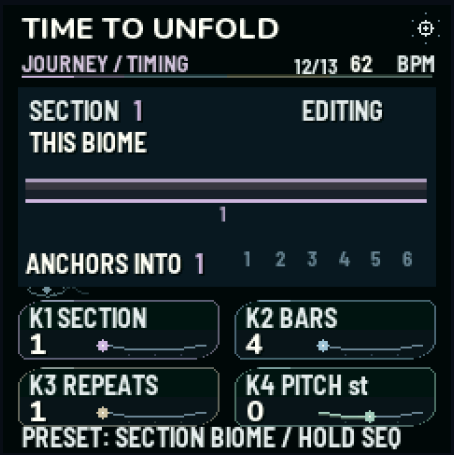
32 / JOURNEY / ARRANGE



SEQ

K1 Off / Once / Loop · K2 Section · K3 Biome · K4 Section count

33 / JOURNEY / TIMING



SEQ

K1 Section · K2 Bars · K3 Repeats · K4 Pitch offset

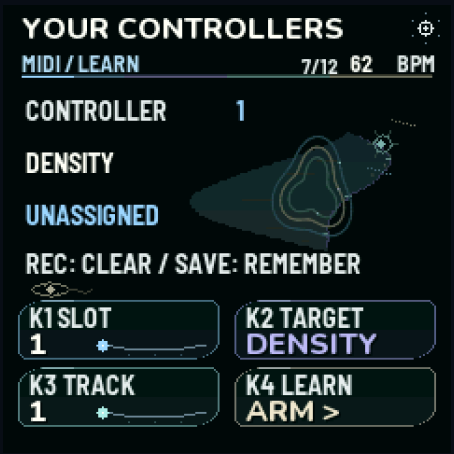
34 / JOURNEY / ANCHORS



SEQ

K1 Section · K2 Track · K3 Carry · K4 Journey mode

35 / MIDI / LEARN



GLO

K1 Slot · K2 Target · K3 Track · K4 Arm

36 / MIDI / MAPPING



GLO

K1 Port · K2 Channel · K3 CC · K4 Enable

37 / LIVING / LINKS



FX

K1 Slot · K2 Source voice · K3 Destination voice · K4 Target

38 / LINK / MOTION



FX

K1 Slot · K2 Signal · K3 Signed depth · K4 Hit release

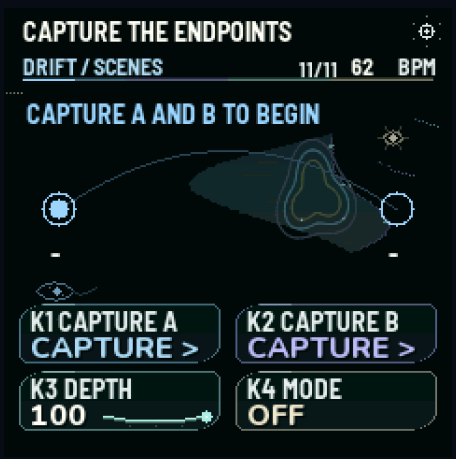
39 / BIOME / DRIFT



FX

K1 Off / Manual / Auto · K2 Position · K3 Cycle · K4 Depth

40 / DRIFT / SCENES



FX

K1 Capture A · K2 Capture B · K3 Depth · K4 Mode

41 / SEQUENCER / GRID



SEQ

K1 Track · K2 Step · K3 Note or kit pad · K4 Length

42 / SEQUENCER / TOOLS



SEQ

K1 Step or Phrase · K2 Position · K3 Amount · K4 Action

43 / SEQUENCER / FILL



SEQ

K1 Track · K2 Step · K3 Rule · K4 Note

44 / USB AUDIO



GLO

K1 Local monitoring

45 / ITINERA / BIOME RADIO



Hold HOME / GLO > Itinera

K1 Dream · K2 Length · K3 Pace · K4 Room

46 / VOICE / DETAIL



HOME > Large Tracks > EDIT

K1 Tone · K2 Harmonics · K3 Shape / Decay · K4 Level

HOME and the dream screen

HOME / Large Tracks



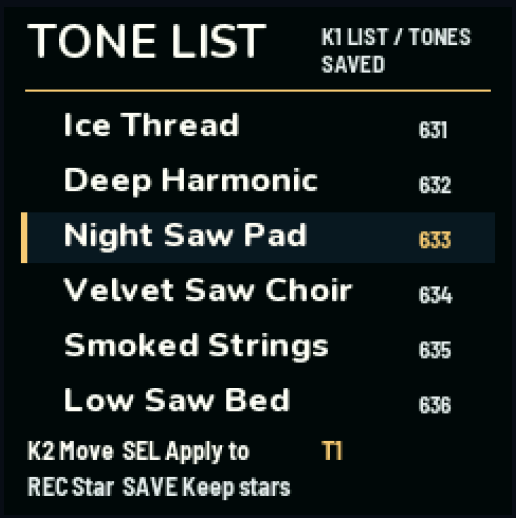
HOME / Biome Browser



HOME / Live List



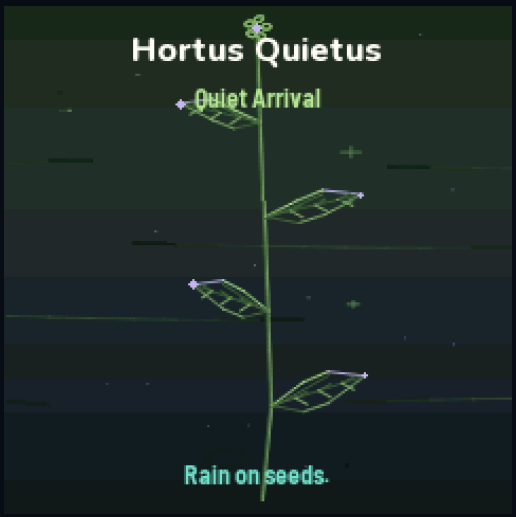
HOME / Tone List



HOME / Biome Stage



Itinera / running dream



Keep exploring

First piece / illustrated learning route

Project / current public firmware

Source and issues

Instagram / Mutable Dreams

YouTube / Kid Bunka

Support development

Voluntary donations support firmware updates, new firmware and synthesizer-software projects. Thank you for playing and for the feedback.