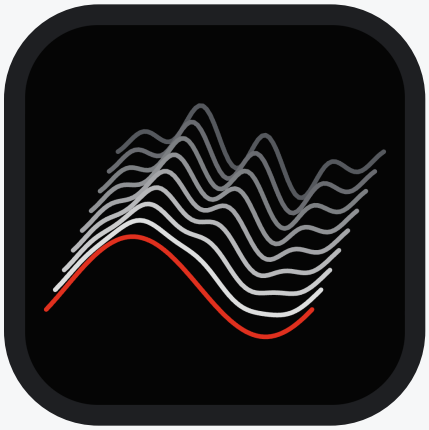
TONAUT

User Manual



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01 Welcome

Tonaut is an instrument for iPhone and iPad, played sideways on one panel: eight lanes of sound, a sequencer for each of them, a mixer and a tape recorder with a track for every lane. This chapter covers what you need to run it, how to install it and find its version, what isn't in it yet, and how to read this manual.

1.1 What Tonaut is

Tonaut is an instrument for iPhone and iPad from Coast Creative. You hold it sideways and play it with your fingers, like a synthesizer with its own sequencer, mixer and tape recorder built in. Everything you make lives in a project, and the project saves itself as you play.



Figure 1.1 The panel in the dark theme, from top to bottom: lane buttons, two screen windows, the band of four sliders, the button row and the keyboard. Chapter 2 names every part.

Everything happens in lanes. A new project has eight; a project can have six instead, with a longer tape (13.15). A lane holds one sound: either a synth sound, played across the keys like a keyboard, or a drum kit, with a different drum on each key. Any lane can hold either kind, and a lane can also play your own synth or drum machine over MIDI instead (chapter 16). Each lane

has its own sixteen patterns, its own arpeggiator (or, on a kit lane, a groove player), its own channel on the mixer and its own track on the tape. The keys and a MIDI keyboard always play the lane you have selected, which the manual calls the focused lane.

What's inside:

- Ways to play beyond the keys: an octave for each lane, LEAN (switch it on, then hold a key and tilt the phone to bend the note or move a control), eight quick slots for synth sounds and eight for kits, and DIE, which rolls new random settings for the page you're on at every press, with UNDO to step back through the rolls (chapter 3). On a synth lane the KEY page lights a scale on the keys, can hold what you play to it, and can turn one key into a whole chord (3.11).
- Chords: set a lane's key and scale, and a key can play a whole chord in it, or CHORD PAD can turn a lane's keyboard into seven chord keys and a stick that changes the chord as you play, from the screen or a MIDI keyboard (3.11, 3.12).
- PERFORM, a TONE fader and a SPACE fader for every lane to ride while the song plays, and the X/Y pad, which bends the pitch and works the mod wheel, or the sound's brightness, from one window (chapter 15).
- Nine synth engines: SLOPE, CROSS, SAMPLER, GUT, SCAN, PULSE, SWARM, DUST and DIVINER. On CORE, each engine draws a 3D picture that turns slowly and answers your playing, and a tap on it brings back the CLASSIC picture (4.5). Every sound has four effect slots and one modulator (chapter 4, and every control in EDIT, chapter 7). Each slot holds one of sixteen effects, among them Echo, a tape echo, Space, a reverb whose tail can last a minute, Dist, a hard distortion, Pump, which ducks the sound on the beat, and Lo-Fi, an old record's crackle and wobble.
- Three kit engines: KNOCK, where every pad is its own synthesized drum; SLICER, which plays slices of a recording; and CINDER, where every pad is two synthesized layers and the whole kit shares a ring (chapter 6).
- 532 factory sounds: 489 synth patches, among them 147 recorded instruments played on the SAMPLER, and 43 kits, in the PATCHES and KITS browsers, where a star marks your favorites. Your own sounds go in USER, and you can send them to someone else as a file. Audio files from the Files app can become a SAMPLER sound or a kit (chapter 5).
- A step sequencer, SEQ: 16 patterns per lane, each up to 64 steps (four bars), up to eight notes on a step, entered by hand or recorded live. PATTERN PLAY takes every lane to another pattern together, and PATTERNS copies, swaps and clears them (chapter 8).
- An arpeggiator on synth lanes and a drum groove player, GROOVE, on kit lanes, with sixteen groove styles. Both run on one shared clock (chapter 9).
- A mixer, MIX: a level, balance and mute for each lane, an EQ for each lane (10.5), a master EQ, a master effect and the output stage, OUT (chapter 10).
- The tape, TAPE: up to 30 minutes of tape per project, as eight tracks of 20 minutes or six of 30, chosen for each project with SHAPE (13.15). It loops, it has editing tools and a mixer of its own, TAPE MIX, and CATCH keeps the last thirty seconds of what you played even when you weren't recording. SHARE sends the tape as a vertical video or as audio only, ready to post (11.19).

- A recorder for sampling the microphone, a USB audio input or Tonaut itself, and a sample editor for trimming what you recorded (chapter 12).
- PROJECTS: a version to go back to, save as, new, open, rename and delete, and SHARE, which sends a whole song as a file that opens in Tonaut on someone else's iPhone or iPad (chapter 13).
- MIDI: USB and Bluetooth keyboards and controllers play Tonaut (chapter 3), and a lane set to EXTERNAL plays your own synths and drum machines, and Tonaut can send them its clock and its start and stop (chapter 16).
- Settings, export to WAV files in the Files app (the whole mix, or one file per track), MIDI file export, one file per lane, as it plays (14.8), and iCloud sync, which carries your projects between your iPhone and iPad, tape and all (chapter 14, 14.9).
- Five looks for the iPhone panel: LIGHT and DARK, and three hardware-style housings, TN-1, TN-1 DARK and TN-XY, whose keys carry LEDs that light as they play (2.1.1).
- iPhone and iPad. On iPad, Tonaut draws a panel of its own, with a 32-key keyboard and up to four rows of sliders in view (chapter 17).

A typical session goes like this: choose a sound for each lane from the browsers, play it on the keys, make patterns in SEQ, balance the lanes in MIX, record the result onto TAPE, and export the tape as a WAV file or share it as a video. You can skip any of those steps. TAPE records your hands as well as the sequencer, and nothing has to be saved by hand.

1.2 What you need

To run Tonaut you need one of these:

- **An iPhone with a 5.4-inch or larger screen, on iOS 26 or later.** To see which iOS you have, open Settings › General › About. The 4.7-inch iPhone SE can install Tonaut, but the panel doesn't fit its screen, so Tonaut shows `THIS IPHONE'S SCREEN IS TOO SMALL` over the lines `IT NEEDS A 5.4-INCH IPHONE OR LARGER` and `WITH DISPLAY ZOOM SET TO DEFAULT`, and nothing else. Display Zoom set to Larger Text can do the same on other iPhones: set it to Default in Settings › Display & Brightness › Display Zoom.
- **An iPad on iPadOS 26 or later.** Tonaut runs full screen there, with a panel drawn for the larger screen (chapter 17). An iPad whose screen is too narrow for that panel, as some older and smaller models are, shows the iPhone panel instead, which works exactly as this manual describes it for iPhone.

And whichever you have:

- **The device held sideways.** Tonaut runs in landscape only, either way round. Turning it upright doesn't rotate the panel.
- **Something to listen through.** The built-in speaker works. Headphones are better, especially for bass.

And for some jobs:

- **Headphones to record the microphone onto the tape.** While sound comes out of the built-in speaker, the recorder won't record its microphone onto TAPE, because the speaker would feed straight back into the microphone. Plug in headphones (wired or Bluetooth) or an audio interface first. Without them, REC on the recorder (with DEST set to TAPE) answers PLUG IN HEADPHONES TO RECORD INPUT. Sampling the microphone into a lane works without headphones. See 12.4 and 12.5.
- **A MIDI keyboard or controller, if you like.** It's optional. A USB class-compliant keyboard plugs in (through an adapter if your device needs one) and plays the focused lane, with velocity, pitch bend, the mod wheel and a sustain pedal. A Bluetooth MIDI keyboard pairs from Tonaut's own Settings: in the MIDI section, press BLUETOOTH (14.3.1). iOS asks once for permission to use Bluetooth. See 3.8.
- **A MIDI connection to your own gear**, if you want Tonaut to play a synth or a drum machine, such as a USB MIDI cable or interface (chapter 16).
- **Microphone permission**, the first time you sample. iOS asks once. If you said no, turn it back on in **Settings › Apps › Tonaut › Microphone**.

NOTE

> Silent mode doesn't mute Tonaut. Set the level with the volume buttons. If you hear nothing at all, see 14.10.

TIP

> Bluetooth headphones add a delay between your touch and the sound. The **Latency** row in Tonaut's Settings (AUDIO, 14.4) shows the delay iOS reports for whatever you're listening through. For playing the keys, wired headphones or the speaker feel tighter.

1.3 Installing and updating

Tonaut comes from the App Store. Install it as you would any app, open it, and turn your iPhone or iPad sideways. Updates come through the App Store too, and an update keeps your projects and settings (1.3.3).

1.3.1 Finding the version

The version tells us exactly which Tonaut you have. Give it when you write to us about a problem, at hello@coastcreative.studio. This manual describes version **1.1**. If yours reads **1.0**, update Tonaut from the App Store to get everything described here.

To read it on iPhone:

01 Hold SHIFT and press HELP, the last key of the keyboard's upper row (on TAPE, the last key of the lower row). HELP turns on, and the help panel opens in the left window.

02 Press the SETTINGS cell. Settings opens.

03 Press the INFO page key. The cursor jumps to the ABOUT section.

04 Read the **Version** row. The same version is printed at the right of the Settings list's header.

05 To leave, press any mode key, or SHIFT + HELP again.

On iPad, HELP is a key of its own on the strip above the keyboard (chapter 17); the rest is the same.

The row under Version, **Render load**, shows how hard the device is working on the sound, as peak / now (for example **4.7 / 2.1%**). If you hear crackles or dropouts, read it (14.10.6). Settings › ABOUT is pictured in 14.7, and Settings is covered in full in 14.1 to 14.7.

1.3.2 The first time you open it

On a new install, Tonaut opens on SYNTH with your first project, Project 1, already loaded, and the keys already play. Project 1 is at 120 BPM, with eight lanes and up to 20 minutes of tape, and every lane already holds a sound:

LANE	SOUND	ENGINE
1	Chrome Kit	SLICER, a sample kit
2	Punch Kit	SLICER, a sample kit
3	Cellar Snap, a bass	DIVINER
4	Bottle Glass	SLOPE
5	Acid Line	SLOPE
6	Attic Strings	DIVINER
7	Arp Shards	SAMPLER
8	Bee Hive	SWARM

Lanes 1 and 2 are kits, so SYNTH shows lane 3, the first synth lane. Cellar Snap is a bass, so lane 3's keyboard starts two octaves down, where the sound belongs: its C keys read C1 and C2 (3.2). Every new project you make starts with the same eight sounds (13.8).

The very first time, a welcome board covers SYNTH's two windows. It names the new project and the focused lane, with the tempo, the tape and its flavour on the left and the lanes on the right. The keys, the band and the buttons already work: the board goes at your first touch and never comes back. Chapter 2 starts from here (2.11).

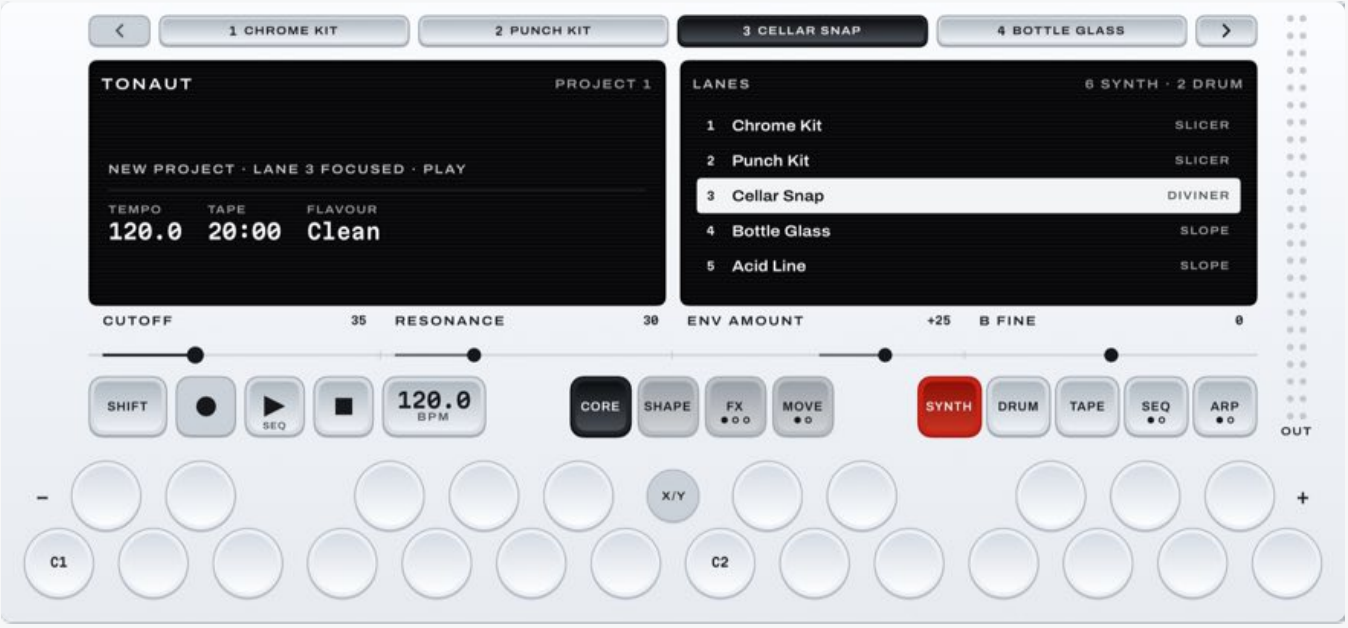


Figure 1.2 A new install opens on SYNTH, on lane 3, the first synth lane, with the welcome board over the windows until your first touch. The bass keyboard starts two octaves down.

1.3.3 Your work survives an update

Projects are stored inside Tonaut on your device, and installing an update doesn't touch them. Your theme, quick slots, favorites and other settings carry over too. With iCloud sync on, your projects are in iCloud as well (14.6). Version 1.1 gave some factory sounds new names: a lane in a project saved before the update keeps the old name until you load the sound again (5.10).

NOTE

> Deleting Tonaut from your device deletes every project stored on it, and the exports in its folder in the Files app. Move any WAV files you want to keep out of **On My iPhone** › **Tonaut** › **Exports** (**On My iPad** on an iPad) first.

1.4 Not in Tonaut yet

A few controls on the panel are drawn off because what they're for isn't in Tonaut yet, and a few MIDI messages are ignored. The table says what you'll see.

NOT IN TONAUT YET	WHAT YOU'LL FIND INSTEAD
MEMO A and MEMO B on the tape	They're on TAPE + SHIFT's tool row (11.8), drawn off, and do nothing.
The sample editor's PLAY slider	The fourth slider on the sample editor reads **PLAY** and is drawn off, showing `--`. Its help line talks about dragging to hear the sound under your finger; that doesn't work yet. To hear a slice, play its key (12.8.6).
Settings' SCREEN slider	The fourth slider on Settings reads **SCREEN** and is drawn off. In the MIDI section the BLUETOOTH key stands in its place (14.1).
MIDI program change	Ignored. It doesn't change the sound or load a quick slot.
SysEx over MIDI	SysEx messages from a MIDI keyboard are ignored. A `.syx` file of six-operator voices opens into USER as CROSS sounds (5.11.4).

1.5 How to use this manual

The chapters go from the whole instrument to its parts:

CHAPTER	COVERS
2	The panel: lanes, windows, sliders, keys, SHIFT, HELP and the transport
3	Playing: the keys, octaves, LEAN, quick slots, DIE, MIDI keyboards, the tempo, scales and chords
4 to 7	The sounds: SYNTH, the browsers, DRUM and EDIT
8 and 9	SEQ, the arpeggiator and the groove player
10 and 11	MIX and TAPE
12	Sampling: the recorder and the sample editor
13	Projects, and sending a song
14	Settings, export (audio and MIDI files), iCloud sync and troubleshooting
15	Playing live: PERFORM and the X/Y pad
16	MIDI out: playing your own gear
17	Tonaut on iPad

Chapters 2 to 16 describe the iPhone panel. The iPad does the same things with more of them in view, and chapter 17 covers what's different there. Each section starts with what a screen or control is for, then how to use it.

LOOKS LIKE	MEANS
REC	A key or cell you press, spelled exactly as the panel spells it.
SHIFT + PROJ	Tap SHIFT (it stays on) or hold it, then press PROJ. A chapter says when you must hold SHIFT rather than tap it. In a browser you always hold it.
QUANTIZE	A slider on the band, a list column, a Settings row or another named control on screen.
TAPE FULL	Words the screen prints: messages, headers, readouts. They're quoted exactly, so you can match them.
1/16	A value a control steps through or shows.
Settings › Apps › Tonaut › Microphone	A path through the device's own Settings app or the Files app. Tonaut's own Settings screen is written plainly, without this style: Settings › ABOUT.
8.10	A section number. Section 8.10 is in chapter 8.

Words from the panel are written in capitals, as the panel prints them, and the manual keeps the panel's spelling (FLAVOUR, for example). A key holds five characters at most, so some keys show a short form of a longer name: the key reads PROJ and the screen it opens is PROJECTS; TRK 1 is TRACK 1; Settings' INFO key jumps to ABOUT. The manual puts the key's legend in a box and uses the full name in the text.

Boxed notes come in two kinds. A **Tip** is a quicker way or a good habit. A **Note** is something that might surprise you or cost you work.

The **index** at the back lists every control by its panel name and by the words a musician might look up instead, so "Save As", "Metronome" and "Rename" all lead to the right place. Where a word means two things, the index says which: `UNDO (tape)`, `UNDO (SEQ)`.

The **pictures** show an iPhone 17 Pro Max in the LIGHT housing, unless the caption names another, and most of them show the song Night Drive playing. Other iPhones show the same controls in the same places. The iPad pictures are in chapter 17.

We'll update the manual as Tonaut changes.

02 The panel at a glance

Tonaut is one panel, held sideways, and it never scrolls. This chapter names every part of the iPhone panel, says what each kind of key looks like when it can and cannot act, and covers the rules that hold on every screen: lanes, SHIFT, HELP and the transport. The iPad's panel is in chapter 17.

2.1 Five bands, top to bottom

The panel is built in five horizontal bands. They sit in the same place on every screen; only what they carry changes.

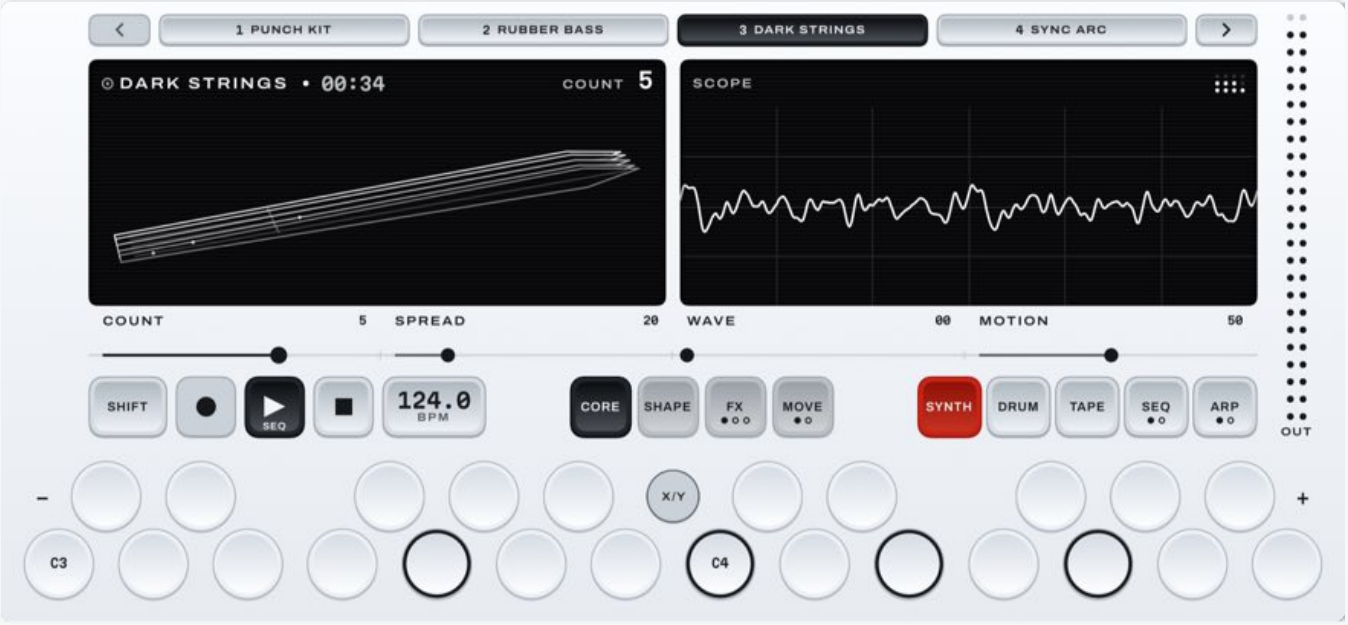


Figure 2.1 The five bands, top to bottom, with the OUT meter in the right margin. The windows take whatever height your iPhone leaves; the bands you touch keep theirs.

01 **Lane buttons.** One pill per lane, each naming the sound on it. The filled one is the lane you are playing. In an eight-lane project the iPhone shows four at a time, with an arrow key at each end.

02 **Screen windows.** Two black windows side by side, or one wide window for SEQ's steps. What the current screen draws: pictures, lists, the tape, the pattern grid.

03 **The band.** Four sliders for whatever the screen is showing.

04 **The button row.** SHIFT, REC, PLAY, STOP and the tempo key on the left; the page keys in the middle; five mode keys on the right.

05 **The keyboard.** Twenty-four round keys in two rows across the width of the phone, with –, X/Y and + in the gaps of the upper row.

The **OUT** meter sits in the right margin, from the top of the lane row to the bottom of the button row. It shows what leaves the instrument: two columns of 24 dots, left channel and right channel, lit from the bottom. The scale is in decibels, 2 dB a dot. The bottom dot lights at –48 dBFS (very quiet) and the top dot at full scale. When a channel reaches full scale, the top dot of that column turns red (in LIGHT, DARK and TN-XY; a deep red in TN-1 and TN-1 DARK). That is a clip: the signal is as loud as it can get and will distort. Turn something down on MIX (chapter 10). The meter is information only; you can't touch it.

On iPhone the panel comes in five housings: **LIGHT**, the one this manual's pictures show, **DARK**, and three hardware-style looks, **TN-1**, **TN-1 DARK** and **TN-XY** (2.1.1). You choose one in Settings, on the **Housing** row (14.2.1). Every control works the same in all five; only the look changes.



Figure 2.2 The dark housing, here on DRUM. LIGHT and DARK draw every key the same way; the TN looks differ in a few places (2.1.1).

2.1.1

The housings: LIGHT, DARK and the TN looks

The **Housing** row in Settings › THEME offers **AUTO**, **LIGHT**, **DARK**, **TN-1**, **TN-1 DARK** and **TN-XY** (14.2.1). AUTO follows your iPhone's light or dark appearance within the pair you chose last: TN-1 and TN-1 DARK if your last choice was one of those, LIGHT and DARK otherwise. TN-XY has no pair, so AUTO chosen after it switches between LIGHT and DARK. Changing the housing changes only the look: the music keeps playing, and the project, its sounds and every slider stay as they were. The TN looks are on iPhone only; an iPad offers AUTO, LIGHT and DARK (17.17).

HOUSING	WHAT IT LOOKS LIKE	THE LIT MODE KEY	REC AND RECORD MARKS	OUT METER
LIGHT	A pale grey panel with dark legends, round keys and black windows	Red	Red	Dark dots
DARK	The same panel in graphite, with light legends	Red	Red	Light dots
TN-1	A warm ivory housing with raised buttons, ivory white keys under a row of round black caps, and near-black windows with ivory lettering	Orange	Orange	Graphite dots, the top four rows orange
TN-1 DARK	TN-1 in charcoal, with TN-1's windows, and its orange where LIGHT and DARK use red	Orange	Orange	White dots, the top four rows orange
TN-XY	Black and grey, with white keys that run from dark grey at the left to near white at the right, and the windows LIGHT and DARK draw	Silver	Red: a red dot on REC	White dots, the clip dot red

In the three TN looks a key that is on, such as the page you are on, a latched SHIFT or the focused lane's button, turns black with light lettering, where LIGHT and DARK fill it. In TN-XY that black key also wears a thin grey border just inside its edge, so it stands out from the black housing. TN-1 and TN-1 DARK draw their windows without scan lines, so Settings' **Scan lines** row is drawn off there and reads **NONE IN TN-1**; TN-XY follows it, as LIGHT and DARK do (14.2.2). On TAPE, TN-1 and TN-1 DARK draw spools with three openings, so you can see them turn.

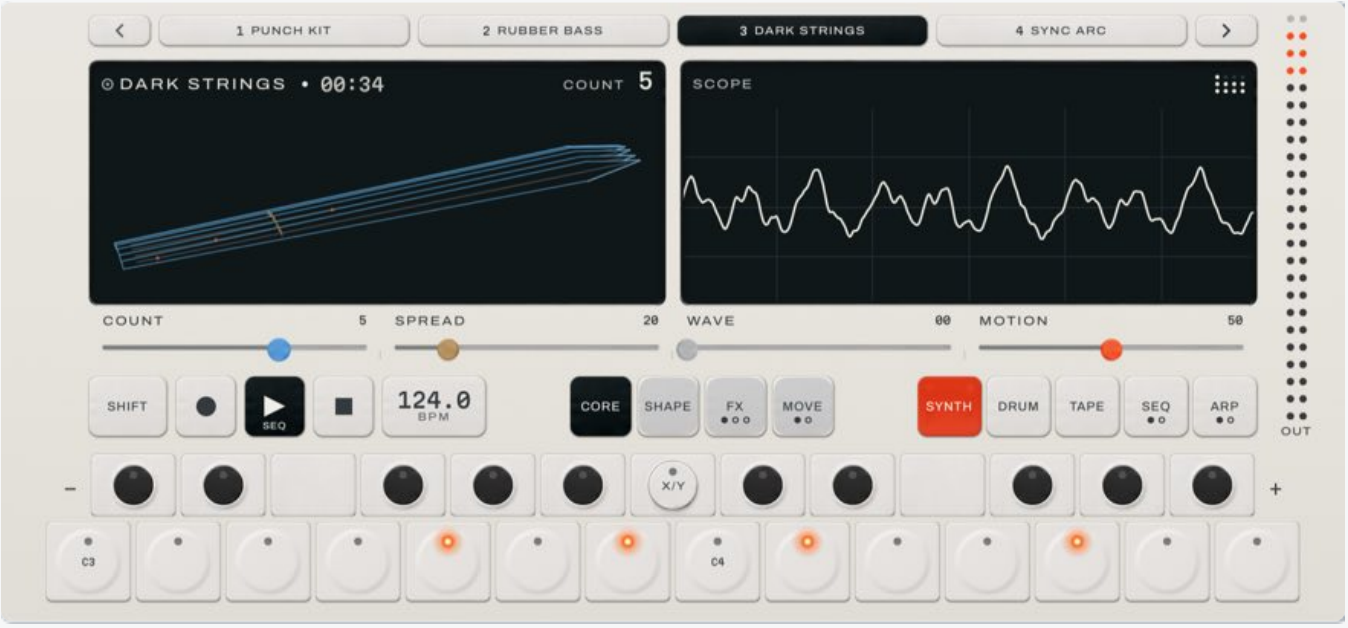


Figure 2.3 TN-1 while a song plays. The four handles' colors match the parts of the picture they move, and the keys that are sounding light their LEDs.

Key LEDs. In the TN looks every white key and every black cap carries a small LED near the top of its round raised face: orange in TN-1 and TN-1 DARK, red in TN-XY. It takes the place of the ring LIGHT and DARK draw inside a playing key (2.8). An LED shows one of three states:

- **Bright**, with a white-hot middle and a wide glow: the key's note is sounding, from your finger, a MIDI keyboard, the sequencer, the arpeggiator or a chord.
- **Half**, a softer glow: a note of the step selected or held on SEQ, or a note LATCH holds. Those keys don't sink, as they do in LIGHT and DARK; the half glow says it instead.
- **Unlit**: a dull dot that is always there, like a real LED switched off.

The LEDs stay on under SHIFT. There, a key that holds a screen or a state open lights its LED bright for as long as it lasts, and that is its only sign: HELP while the help panel is open, and on TAPE + SHIFT, LOOP while the tape loops and RESET while it is armed. LIGHT and DARK fill those keys instead. The X/Y key has an LED too: bright while its pad shows, and that is its only sign there too. How keys light as they play: 3.4.

Colored handles. On every page of SYNTH and DRUM the TN looks give the band's four handles a color each, left to right: blue, ochre, light grey and orange in TN-1 and TN-1 DARK, and four greys, dark to light, in TN-XY. In TN-1 and TN-1 DARK the left window draws the part of the picture each slider changes in that slider's color, on the NEW and CLASSIC pictures alike, and on a kit for the pad you are editing (4.5). A handle stays neutral where its slider has nothing behind it, under SHIFT, on a lane playing your own gear and on every other screen.

Keys that can't act. The TN looks have no flat wells: a key with no job keeps its raised face. A key with no legend has no job in this layer, and most named keys that can't act say why when you press them (2.3.1).



Figure 2.4 TN-XY: black and grey, a silver mode key, red LEDs, and the pictures of LIGHT and DARK in its windows.

2.2 Lanes

A lane is one of Tonaut's instruments. A new project has eight; a project can have six instead, with a longer tape (13.15). Each lane holds one sound, a synth patch or a drum kit, and any lane can hold either kind (chapter 5). A lane can also play your own synth or drum machine over MIDI instead (chapter 16). Each lane has its own patterns, arpeggiator or groove, mixer channel and tape track.

The **lane buttons** across the top name what is on each lane: the lane's number, then the sound's name in capitals. A sound with no name of its own (an engine's starting point) shows the engine's name instead, such as `SLOPE`, and a lane playing your own gear shows its MIDI channel, such as `MIDI CH 13`.

To focus a lane, tap its button. The button fills (inverts) to show it is the focused lane. The tap acts when you lift your finger, and the touch area reaches a little above and below the drawn pill.

The focused lane is the one you play and edit:

- the round keyboard plays it, at the lane's own octave;
- a MIDI keyboard plays it (chapter 3);
- SYNTH, DRUM and EDIT show its sound; SEQ shows its pattern; ARP shows its arpeggiator or groove;
- the quick slots load into it and save from it, and the X/Y pad plays it (chapter 15).

Changing focus releases any keys you are holding, so nothing hangs on the old lane. A step selected on SEQ is let go. Tapping the lane that is already focused does nothing.

On ARP and GROOVE the page keys LANE 1, LANE 2 and so on are the lanes: pressing LANE 3 and tapping lane button 3 do exactly the same thing.

2.2.1 The mode follows the lane

SYNTH edits a synth lane and DRUM edits a kit lane. So when you are on SYNTH and tap a lane holding a kit, Tonaut moves you to DRUM; tap a synth lane from DRUM and you are back on SYNTH. TAPE, SEQ and ARP are about every lane, so they stay put whatever you tap. ARP shows the arpeggiator on a synth lane and GROOVE on a kit lane.

It works the other way round too. Press DRUM while a synth lane is focused, and Tonaut focuses a kit lane for you: the kit lane you used last, or the first one if you haven't used one yet. SYNTH on a kit lane does the same with synth lanes. If the project has no lane of that kind, the key refuses and says so:

- NO KIT LANE IN THIS PROJECT
- NO SYNTH LANE IN THIS PROJECT

With PATCHES or KITS open, tapping another lane moves the list's cursor to that lane's sound, or to the top of the list if the sound isn't in it. Nothing loads until you move the cursor yourself. On PROJECTS, tapping a lane puts the cursor back on the open project.

2.2.2 Lane pages: the arrow keys

In an eight-lane project the iPhone's lane row shows four of its lanes at a time, 1 to 4 or 5 to 8, with an arrow key at each end: ‹ at the left and › at the right. A six-lane project shows all six across and has no arrows. On the larger iPads all eight show across (chapter 17).

- Press › to show lanes 5 to 8 and ‹ to go back. The line says which lanes now show: LANES 5-8. An arrow with no page in its direction is a well; pressed, it says which lanes are showing.
- An arrow changes the page, not the focus: the keys still play the lane they did. While the focused lane is on the other page, the arrow that leads to it is filled, so you can always tell where the lane you're playing is.
- Focusing a lane any other way, such as with ARP's lane keys, a swap or opening a project, shows the page that lane is on.

Every window and key that shows one thing per lane follows the same page, and none of them has a page control of its own: TAPE's TRK keys and its TRACKS rows, MIX's faders, balances and MUTE keys, TAPE MIX, SEQ's map of the other lanes and its MUTE page, ARP's and GROOVE's lane keys and their list of lanes, PATTERN PLAY's lanes and PERFORM's faders. In a six-lane project those rows of keys are six narrower keys instead of four. Every one of these keys says what it is, never the number alone: TRK 1 on TAPE, LANE 1 on ARP and GROOVE, MUTE 1 under SHIFT. Where the word and the number don't fit on one line, as on a narrow key, the word sits over the number.

2.3 The screen windows

The two black windows are where each screen draws. Most screens use two: on SYNTH, the sound and its picture on the left (on the CORE page, a slowly turning picture of the engine, 4.5) and the live trace on the right; on PATCHES and KITS, the engine column (and on PATCHES a type column) on the left and the list of sounds on the right; on PROJECTS, the projects on the left and the lanes of the one under the cursor on the right, with RENAME and DELETE at its foot. SEQ's step grid uses one wide window. While the X/Y pad is on, it takes the right-hand window (chapter 15).

The windows take whatever height your iPhone leaves after the fixed bands, so on a smaller phone they are shorter and lists show fewer rows.

Windows are mostly pictures and lists. **Every window that takes a finger wears a small grey mark** at the left of its header, before its name, and the mark names the gesture. A window without a mark is a picture. While your finger is on a marked window, its mark fills in.

MARK	GESTURE	WHERE
A dot in a ring	Tap	SYNTH's left window on the CORE page, where a tap switches the engine picture between NEW and CLASSIC (4.5.1); DRUM's left window on a KNOCK or CINDER kit, the same way (6.2.1); DRUM's pad map, SEQ's steps, PATTERN PLAY's boxes and PATTERNS' tiles, the help panel's cells, PROJECTS' right window with its two buttons, and a list of one sound that a tap loads

Two chevrons, one above the other	Drag up or down	MIX's faders and its EQ, TAPE MIX's faders and PERFORM's faders
The same two chevrons with a dot between them	Tap a row, or drag through the list	Every list: the browsers, PROJECTS, Settings, the tempo page, the speed test, EDIT's groups, the effect and modulator lists, and CONTROLS' slots
Two chevrons side by side	Drag across to wind	TAPE's deck, before the word TAPE
Two corners pointing out, with a dot between them	Pinch to zoom, double-tap to go back	TAPE's TRACKS (11.18)
Four chevrons: up, down, left and right	Drag in any direction	The X/Y pad

A pad, a step or a list row shows a thin outline while your finger is on it. The mark is never in color: red on the panel still means recording. With HELP latched, a tap on a marked window shows its line (2.9.2).

2.3.1 Reading a control that is off

Tonaut never hides a control that can't act. It draws it off, and most of the time pressing it tells you why.

- A key that can act is **molded**: it has a face, a rim and a shallow dish in the middle. A key that can't act is a **well**: a flat recess with no dish. Its name stays at full strength. A well does not flash or move when you touch it. The TN looks draw no wells: a key that can't act keeps its raised face there (2.1.1).
- A well with **no legend at all** means the key has no job in this layer. You will see these on the page keys under SHIFT on most screens.
- Some wells still take a press and answer with one line on the screen saying why they can't act. The – and + octave keys on a kit lane, DIE on SEQ, DIE's UNDO and SEQ's UNDO when there is nothing to undo, the X/Y key on a screen where the pad can't show, the sound pages of a lane playing your own gear, and the PROJECTS keys all do this.
- A slider that is off keeps its label but loses its line and its handle, and its value reads ––. A slider whose label reads – has nothing behind it at all. Neither takes a touch.

A key always looks the way it acts. If one looks live and does nothing, or looks off and still acts, please tell us (14.10).

2.3.2 The header line on SYNTH

The top of SYNTH's left window is its header line. From left to right it carries:

- **The tap mark**, a small dot in a ring, on the CORE page: a tap on the window switches the engine's picture between NEW and CLASSIC (4.5.1).
- **The sound's name**, or the engine's name if the sound has none. A long name loses its tail before anything else on the line does; the lane button spells it out.
- **The picture marks**, on the CORE page: one small dot for each view the engine's picture has, the current one bright. On the NEW screen every engine shows one. SLOPE shown CLASSIC shows three, and under SHIFT they spell out their names, **`PLOTS`**, **`CURVE`** and **`DOTS`** (4.5.3).
- **The record dot**, a small red dot, while the tape is recording. It shows on SYNTH whichever screen you started the take from.
- **`MIDI`**, while a MIDI keyboard is connected. It is there or not there; it never dims.
- **`ARP`**, while the focused lane's arpeggiator is on. The arpeggiator belongs to the lane, so the mark tells you it is running even though you are on SYNTH and not ARP. While it shows, the sound's name may lose a few more letters.
- **The tape position** in minutes and seconds, such as **`02:14`**.
- **The readout**, at the right, on the same line as the name: the label and value of the slider you touched last. Under SHIFT it follows the second four sliders.

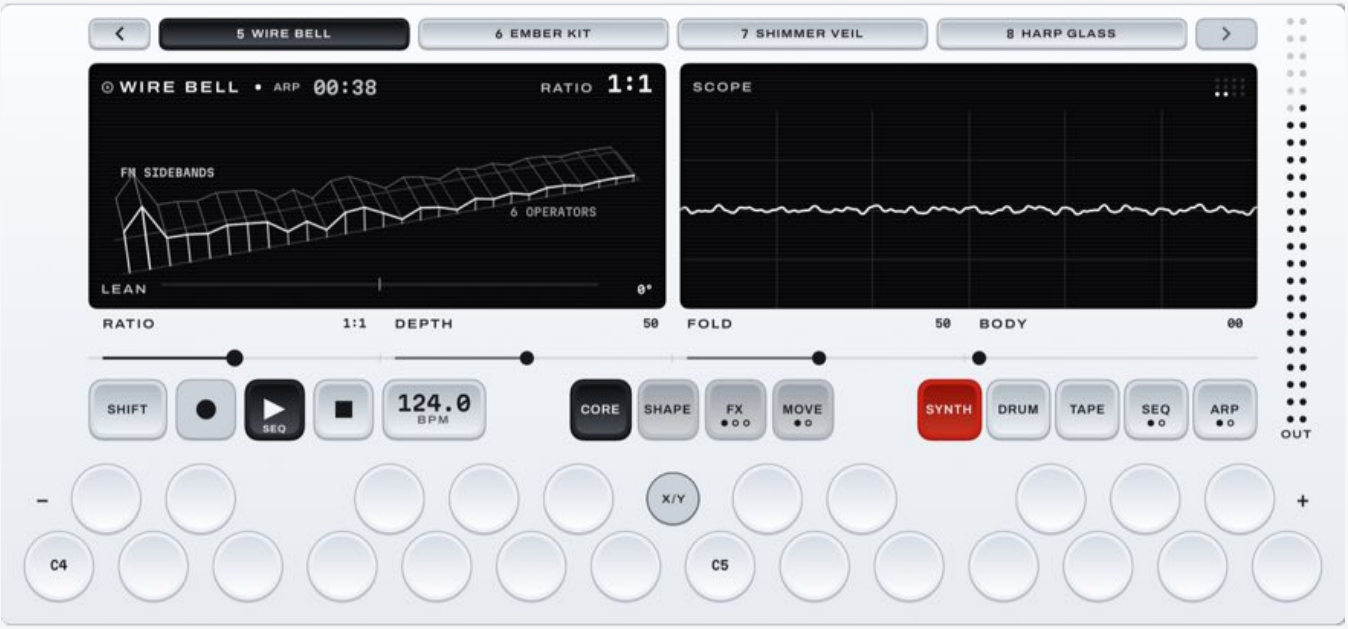


Figure 2.5 The ARP mark beside the sound's name says this lane's arpeggiator is playing, even though you are on SYNTH.

The other screens carry headers of their own, described in their chapters. On iPhone the MIDI and ARP marks are on SYNTH's header and nowhere else. When a MIDI device is plugged in or unplugged, every screen says so in its notice line: **MIDI CONNECTED · *name*** or **MIDI DISCONNECTED**.

While HELP is latched, the readout gives way to the help line of the control you touched (2.9).

2.3.3 The notice line

When a control's effect happens somewhere you can't see, or it has to refuse, it answers in the notice line: a small strip of text at the bottom left of the left window (on SEQ's grid, the bottom left of its one window).

- Most notices are one line and stay up for about a second and a half.
- A warning before something is erased takes two lines and stays up for eight seconds, the same time the key that raised it stays armed. For example, DELETE on PROJECTS says DELETE GLASS HARBOR? / PRESS DELETE AGAIN · CANNOT BE UNDONE. Press the same key again within those eight seconds to go ahead. Moving to another page or screen, moving a list's cursor, or waiting cancels it, and the line says so, such as DELETE CANCELLED or RESET CANCELLED.
- A few other notices also take two lines, such as CANNOT DELETE THE OPEN PROJECT / OPEN ANOTHER PROJECT FIRST. They stay up for the usual second and a half.
- A new notice replaces the one showing.



Figure 2.6 OPEN pressed on the project that is already open: the key is drawn off, and the press says why in the notice line.

Throughout this manual, the words a notice prints are set in white on a black strip, like the screen itself, exactly as the screen spells them.

2.4 The band

The band is the row of four sliders under the windows. It always shows the controls of whatever the screen is on: a sound page's four, MIX's four, the tape's four. The browsers are the exception, with fewer, wider sliders: PATCHES and the USER lists have two, **CURSOR** and **EXPORT**; the factory list on KITS has three, **CURSOR**, **FROM** and **EXPORT**; PROJECTS has all four, **CURSOR**, **SHAPE**, **TAPE** and **EXPORT**. In Settings' MIDI section a BLUETOOTH key stands in the fourth place. Each slider has its label at top left, its value at top right, and a line along the bottom with a round handle at the current value. All four are drawn in the same ink, except in the TN looks, where on SYNTH and DRUM each handle has a color of its own (2.1.1).

Values read as two digits from **00** to **99**; controls that swing both ways (a balance, an EQ band) read from **−50** to **+50**; stepped controls read their word, such as **1/16** or **ON**. A few show their own units, such as TAPE's position or a level in decibels.

The slider you touched last is the **live** one: its line is at full strength and its handle a little larger, while the others are paler. On SYNTH its label and value are also in the header's readout.

2.4.1 Dragging, and fine adjust

To change a value, put a finger on the slider and drag left or right.

- Touching a slider changes nothing. The value moves from where it was, with your finger; it never jumps to where you touched.
- **How far a drag goes depends on how fast you move.** Drag slowly and the value moves finely: a slow drag across the slider's whole line moves it about a quarter of the way. Sweep quickly and one sweep across the line still takes it from one end to the other. In between, the faster you move, the further it goes. Your finger can leave the slider while you drag; the value stops at either end.
- A quick tap with no movement changes nothing (with HELP latched, it shows the slider's help line). The one exception is the FX page on SYNTH and DRUM: a tap on a slot's name, the word above its line, opens that slot's effect list (4.7.1).
- Each slider follows one finger. You can move two or more sliders at once with different fingers, and play keys at the same time. A second finger on a slider that is already being dragged is ignored.

To make a **fine adjustment**:

01 Touch the slider and hold still for about a third of a second.

02 A small **×8** badge appears beside the label, and with haptics on you feel a firm tap.

03 Drag. The value now moves slowly however fast you go, twice as finely as a slow drag, and reads with one decimal place, such as **15.4**.

04 Lift your finger. Fine adjust ends with the touch.

Fine adjust only starts from stillness: once a drag has begun, holding still mid-drag does not switch it on. Slow for fine, quick for far, hold still for finest. With HELP latched, a drag on a slider says **DRAG SLOW FOR FINE · QUICK FOR FAR**, and a slider held still says

HOLD STILL, THEN DRAG FOR FINEST. The slider still moves.

2.4.2 Stepped controls and list cursors

A stepped control has a fixed set of positions, such as a rate, a mode or ON and OFF. Dragging moves it through the positions one at a time, and with haptics on you feel a light tick at each. Its line fills in steps. A slow drag moves it one position for about every 11 points your finger travels (a quarter of a page key's width), however many positions it has, so you can stop on the one you want; a quick sweep still crosses them all. A control with only a few positions keeps its wider spacing.

A CURSOR slider (the browsers, Settings, the tempo page, the effect list) moves the list's highlight. At an ordinary speed it moves one row for every short stretch of finger travel; a quick flick goes further, so a long list can still be crossed in a few strokes.

2.4.3 The second four: SH

Most screens have eight controls, not four. Under SHIFT (2.7) the band shows the second four, and each slider carries a small filled SH badge. Release SHIFT and the first four come back. A drag that started on one layer stays on that layer even if SHIFT changes under your finger.

Some screens have nothing in their second four: under SHIFT the browsers' band and MIX's OUT page show only sliders that are off, and MIX's LEVEL page shows the lanes' balances in both layers, with no badge.

2.4.4 Double-tap to reset, SHIFT + double-tap to undo

A quick double-tap on a slider puts it back to its starting value: where a fresh sound of that engine starts, which is what its ENGINE DEFAULT row holds (5.2.3), not the value the sound you loaded had. It works on every page of SYNTH, DRUM and EDIT, stepped controls included (they land on the nearest step), and on MIX. On a kit, a pad's controls go back to that pad's own starting values, so a kick's tune is not a hat's. On the FX page an effect's amount goes back to 00: a double-tap takes the effect out rather than adding it. On MIX a balance goes to center and an EQ band to flat. On ARP and GROOVE only the smooth controls reset, such as GATE and SWING. MIX's faders, in the window above the band, and MIX's effect sliders don't reset this way. With haptics on you feel a light tap.

With SHIFT on, held or latched, a double-tap puts back the slider's last change instead: the value it had before you last moved it, and the line names it, such as UNDONE · TONE. Do it again and your change comes back, so you can hear the two one after the other. Each of the band's four sliders remembers one change, made with SHIFT or without: SHIFT may have turned the slider under your finger over to its second-four control, and the line says which control came back. If there is nothing to put back, or something else has moved the control since (DIE, a MIDI keyboard's knob, another sound), it says NOTHING TO UNDO HERE and changes nothing. This works on SYNTH, DRUM, EDIT, MIX, ARP and GROOVE.

> NOTE
>
> On TAPE's band and SEQ's a double-tap does nothing, with SHIFT or without. With HELP latched, a double-tap on a slider that has either job reads TAP TWICE: DEFAULT · WITH SHIFT: UNDO instead of acting.

2.5 The button row

The button row runs under the band. From left to right:

- SHIFT, the second layer of the whole panel (2.7);
- REC, PLAY and STOP, the transport (2.10), drawn as a dot, a triangle and a square. PLAY carries a small word under its triangle, **SEQ** or **TAPE**, for what it will start;
- the tempo key, showing the tempo in beats per minute;
- the page keys, whose words change with the screen (2.5.3), centered between the tempo key and the mode keys. There are four, except where the keys are the lanes themselves in a six-lane project: then the track keys on TAPE and the recorder, ARP's lane keys and the MUTE keys of MIX and TAPE MIX are six narrower keys (2.2.2);
- five mode keys: SYNTH, DRUM, TAPE, SEQ, ARP.

SHIFT, REC, PLAY, STOP and TAP TEMPO act the moment your finger lands. Page keys, mode keys, a tap on the tempo key without SHIFT, the lane buttons and their arrows act when you lift your finger, so you can slide off one to cancel a press. A key remembers whether SHIFT was on when your finger landed and does that layer's job, even if SHIFT changes before you lift.

2.5.1 What a key's look means

Every key on the row, and every round key, is drawn in one of these looks. In LIGHT and DARK red is the only color on the housing; the TN looks have colors of their own (2.1.1).

LOOK	WHAT IT MEANS	EXAMPLES
Molded: face, rim and a dish in the middle	The key can act. Press it.	Most keys, most of the time
Well: flat, no dish	The key can't act now. With no legend, it has no job in this layer. The TN looks keep the key's face instead (2.1.1).	REC on SYNTH; an empty quick slot; blank page keys under SHIFT
Filled: the face inverted, dark on the light housing, light on the dark one; in the TN	On, selected, or being pressed.	The page you are on; a latched SHIFT; a muted track's MUTE; LATCH on SEQ; the HELP key while latched (in the TN looks it lights its LED instead); PLAY while the transport runs; the tempo key while the metronome is on; a key armed to confirm; the focused lane button; the X/Y key while the pad shows

looks, black with light lettering		
Framed: a thin ring round the key, under SHIFT	The key's SHIFT job can act right now.	SEQ's UNDO with something to undo; the lane buttons while you hold SHIFT with the transport stopped, when a tap picks a lane for a swap (2.12)
Red: in TN-1 and TN-1 DARK orange; in TN-XY the mode key is silver and REC wears a red dot	Armed to record, or the mode you are on. Nothing else.	REC: steady while armed or ready, blinking while a take is really being written (2.10); the lit mode key
Dots under the name	Pressed again and again, the key takes you round more than one place, and comes back to the first. One dot per place. On the lit key the filled dot is where you are; on a key that isn't lit, it is the place a press will take you, such as the view CORE was left on.	CORE on a SAMPLER sound (its controls, then its FILTER page) and on a SLOPE sound shown CLASSIC (three views); FX on SYNTH and DRUM (the page, its list, then the slot's CONTROLS); MOVE and MIX's FX (the page, then its list); PAT on SEQ (the steps, PATTERN PLAY, PATTERNS); PATCH on PATCHES and KIT on KITS (the factory list, then USER); EDIT's section keys (one per group); INFO in Settings (ABOUT, then the speed test); the SEQ mode key (SEQ, then PERFORM); the ARP mode key (ARP or GROOVE, then KEY)

Elsewhere, red marks recording (the record dot on SYNTH's header, the armed dot on TAPE and the recorder), a muted channel on MIX or muted pads on DRUM, and a clip at the top of the OUT meter. In TN-1 and TN-1 DARK all of these but the clip are orange. A key armed to delete or erase is filled, not red, and its warning says what it will do.

The page keys, whatever a screen puts on them, rest a shade apart from the mode keys, so the two groups are easy to tell apart: greyer in LIGHT and TN-1, a step lighter in DARK, TN-1 DARK and TN-XY. Lit, a page key looks like any other lit key.

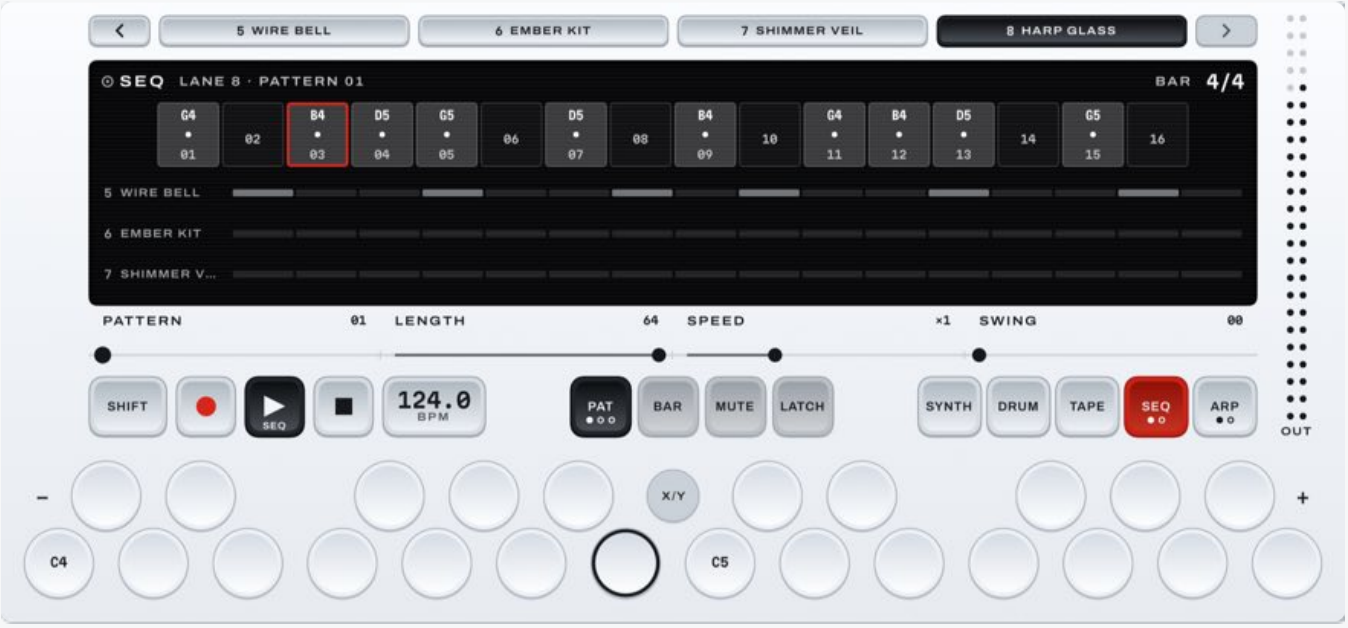


Figure 2.7 PLAY is filled for as long as the transport runs, on every screen.

A key with no dots has one place. SHAPE, DRUM's KIT and KEY, and CORE on every engine but SAMPLER (and SLOPE shown CLASSIC) do nothing when pressed again, and MIDI 's second press opens the Bluetooth list over the panel, which closes with its own Done or a swipe down (14.3.1). Under SHIFT the dots go, with the key's name. Keys that do something else when pressed again, such as STOP (back to the start) or DIE (another roll), have no dots either: the dots mark places, not every second press. A few keys SHIFT brings up wear dots of their own, one per setting they step through, the current one filled: CHORD and STRUM on SYNTH (3.12.1), and REC on SEQ, whose two dots show the record mode, LIVE or STEP (2.10).

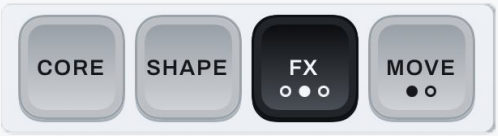


Figure 2.8 FX's effect list is open: FX is lit and its second dot is filled. On MOVE, which isn't lit, the filled dot is where a press goes: its page. CORE has one place here, because SLOPE's picture is on NEW.



Figure 2.9 The same keys in the dark housing. The dots take the key's own ink, so they turn over with it.

TIP

VoiceOver reads each key's full name, so TRK 1 is read as TRACK 1 and a blank key under SHIFT as "nothing under shift". A lit key with dots adds where you are, such as "VIEW 2 OF 3, CURVE" or "LIST OPEN".

2.5.2 The tempo key

The tempo key shows the project's tempo, such as **124.0** over **BPM**. On its own it is the metronome's switch, and it is filled while the metronome is on. Under SHIFT it reads TAP TEMPO under the digits.

- To turn the metronome on or off: tap the tempo key. The notice line reads **CLICK ON** or **CLICK OFF**. It acts when you lift your finger.
- To tap a tempo: with SHIFT on, tap the key in time. The first tap says **TAP AGAIN**; from the second tap on, the digits change to the tempo you are tapping. It averages your last few taps, starts a fresh count if you pause for two seconds, and stays between 40 and 300 BPM.
- To open the tempo page: hold the tempo key for a little over half a second, with SHIFT or without. Do the same again to close it. Chapter 3 covers the page (3.9.1).

2.5.3 The page keys on each screen

The page keys belong to the screen you are on. A key's legend is five characters at most, so some are short forms of a longer name: TRK 1 is TRACK 1, PROJ is PROJECTS. A key with dots under its name goes round more than one place when you press it again (2.5.1).

SCREEN	PAGE KEYS	WHAT THEY DO	UNDER SHIFT
SYNTH	CORE SHAPE FX MOVE	Show that page of the sound. The page you are on, pressed again: CORE goes to a SAMPLER sound's FILTER page and back (4.4.3), or on a SLOPE sound shown CLASSIC turns the picture to its next view (4.5.3), FX opens the effect list and then the slot's CONTROLS, MOVE opens the modulator list. On a lane playing your own gear the keys read MIDI, then SHAPE, FX and MOVE drawn off (chapter 16).	Blank
DRUM	KIT KEY FX MOVE	The same, for a kit. FX and MOVE pressed again open their lists.	Blank
TAPE	TRK 1 and on, one per track on the lane page	Choose the tape track to record onto.	MUTE 1 and on: mute or unmute that track. Filled while muted.
SEQ	PAT BAR	Three pages, and LATCH, an on/off switch, filled while on (chapter 8).	UNDO REDO

	MUTE LATCH	PAT pressed again goes to PATTERN PLAY, then to PATTERNS, where the keys read PAT COPY SWAP CLEAR (8.13, 8.14). On PERFORM they read PAT BAR MUTE KEEP (chapter 15). During a STEP REC pass they read UNDO REDO REST TIE, with SHIFT or without (chapter 8).	CLEAR RESET; on PATTERNS, COPY, SWAP and CLEAR for every lane at once
ARP, GROOVE and KEY	LANE 1 and on, one per lane on the lane page	Focus that lane. On KEY the page then shows that lane's key and chords (3.11). KEY reached from SYNTH with SHIFT + KEY keeps SYNTH's CHORD KEY STRUM BASS instead, and KEY takes you back (3.11.1).	Blank
MIX	LEVEL EQ FX OUT	MIX's four pages. FX pressed again opens the master effect list.	MUTE 1 and on, one per channel on the lane page: mute or unmute that channel. Filled while muted.
TAPE MIX	LEVEL EQ FX OUT	The same four pages; LEVEL holds the tape tracks' own levels and balances (10.10).	MUTE 1 and on: mute or unmute that tape track.
EDIT	The sound's sections, such as OSC FILTR AMP MOD	Go to that section's first group; pressed again, its next group (chapter 7). A key with no section is a well.	Blank
PATCHES, KITS	PATCH KIT PROJ IMP	Switch between the browsers without leaving. The lit one pressed again shows USER, your own sounds, where the keys read PATCH KIT SAVE TICK. IMP brings audio in (5.7).	Blank; in USER SHARE, NAME, DEL, ALL
PROJECTS	SAVE SAVE AS NEW	Mark a version to go back to, save as, make a new project and open one (chapter 13). RENAME and	REVERT on the second key,

	OPEN	DELETE are buttons at the foot of the right window.	SHARE on the fourth
Settings	THEME MIDI AUDIO INFO	Jump to that section of the list (chapter 14). MIDI pressed again while MIDI is lit opens the Bluetooth pairing list, as the BLUETOOTH key does (14.3.1), and INFO pressed again on ABOUT opens the speed test (14.7.1).	Blank
Tempo page	BPM CLICK TAPE SYNC	Jump to that section (chapter 3).	Blank
Recorder	TRK 1 and on	Choose the tape track (chapter 12).	MUTE 1 and on
Sample editor	TRIM LOOP FADE PITCH	Four pages of the slice (chapter 12).	Blank
An effect or modulator list	The keys of the screen underneath	Close the list and go to that page.	As the screen underneath

2.6 The five mode keys and their SHIFT doors

The five mode keys at the right of the button row choose the screen. The one you are on is red (orange in TN-1 and TN-1 DARK, silver in TN-XY). Under SHIFT each key becomes a door to another screen.

KEY	OPENS	UNDER SHIFT	OPENS
SYNTH	SYNTH: the focused synth lane's sound (chapter 4)	PATCH	PATCHES, the patch browser (chapter 5)
DRUM	DRUM: the focused kit lane's sound (chapter 6)	KITS	KITS, the kit browser (chapter 5)
TAPE	TAPE: the tape (chapter 11)	PROJ	PROJECTS, your saved projects (chapter 13)
SEQ	SEQ: the focused lane's pattern (chapter 8); pressed again, PERFORM (chapter 15)	EDIT	EDIT, every control of the focused sound (chapter 7)
ARP	ARP on a synth lane, GROOVE on a kit lane (chapter 9); pressed again, KEY, the scale and chord page (3.11)	MIX	MIX, the mixer (chapter 10); on TAPE, TAPE MIX, the tape's own mixer (10.10)

A mode key pressed again. On its own screen a mode key pressed again stays where it is, except SEQ and ARP. On SEQ it opens PERFORM, and on PERFORM it brings you back to the pattern. On ARP or GROOVE it opens KEY, where you set the lane's key, scale and chords, and on KEY it brings you back (3.11). So SEQ and ARP are the mode keys with dots under their names, two each: SEQ and PERFORM, ARP and KEY. The filled one is where you are, or where the key's press will take you; leave ARP from KEY and the key's next press lands on ARP again.

Which mode key is red. The browsers light the key they belong to: SYNTH under PATCHES, DRUM under KITS. The recorder lights TAPE and the sample editor DRUM. An effect or modulator list keeps SYNTH or DRUM lit, whichever it was opened from; MIX's master effect list lights none. SEQ stays red on PATTERN PLAY, PATTERNS and PERFORM, and ARP on KEY. MIX, TAPE MIX, EDIT, PROJECTS, Settings and the tempo page light no mode key, because each is about the whole instrument rather than one mode. Under SHIFT no mode key is red: all five are doors then.

Seeing which door is open. While MIX, EDIT or PROJECTS is showing, its door key is filled when you bring SHIFT on. That is the one place those screens say they are up.

Closing what a door opened. Press the same door again (SHIFT + the same key) and the screen closes. Any mode key also closes it and takes you to that mode. A browser also closes with a tap of SHIFT (2.7.3). MIX remembers the page you were on before it and gives it back when it closes; MIX itself always opens on LEVEL.

On a lane playing your own gear the EDIT door is a well, and a press says A MIDI LANE HAS NO SOUND OF ITS OWN.

TIP

> MIX is SHIFT + the fifth mode key on every screen; on TAPE the same press opens TAPE MIX. Nothing else on the panel opens either of them.

2.7 SHIFT

SHIFT gives most of the panel a second job. Under SHIFT the band shows its second four, the mode keys become doors, the tempo key becomes TAP TEMPO, some page keys take a second job, the keyboard's upper row turns into quick slots, UNDO, DIE and HELP, and on SEQ the two end keys of the lower row move the pattern an octave and REC changes the record mode. While you hold SHIFT down, a lane button picks that lane for a swap. On TAPE the whole keyboard becomes the tape's tool row instead.

2.7.1 Tap to latch, or hold

You can use SHIFT two ways:

- **Tap it** to latch it. SHIFT fills, **LATCHED** appears under the word, and the second layer stays on while you use it. Tap SHIFT again to turn it off.
- **Hold it**, use something in the second layer, and let go. The layer is on only while your finger is down. This is quicker once you know where things are.

Which one you get is decided when you let go: if you used a second-layer control while SHIFT was down, the layer drops; if you didn't, SHIFT latches.

NOTE

> Playing a note and pressing PLAY or STOP don't count as using the layer, because neither changes with SHIFT, and nor does REC anywhere but SEQ, where SHIFT + REC changes the record mode (2.10). Hold SHIFT, tap PLAY, let go: SHIFT latches. A lane button tapped while you hold SHIFT does count: it picks its lane for a swap (2.12). With SHIFT latched, a lane button only focuses its lane, so you can latch SHIFT for the chord keys and still change lanes.

A few screens drop a latched SHIFT as they open, so their own controls are live when you arrive: the browsers, Settings, the tempo page, the recorder and the sample editor. MIX and EDIT keep it, because they have second layers of their own; MIX opens showing its MUTE keys.

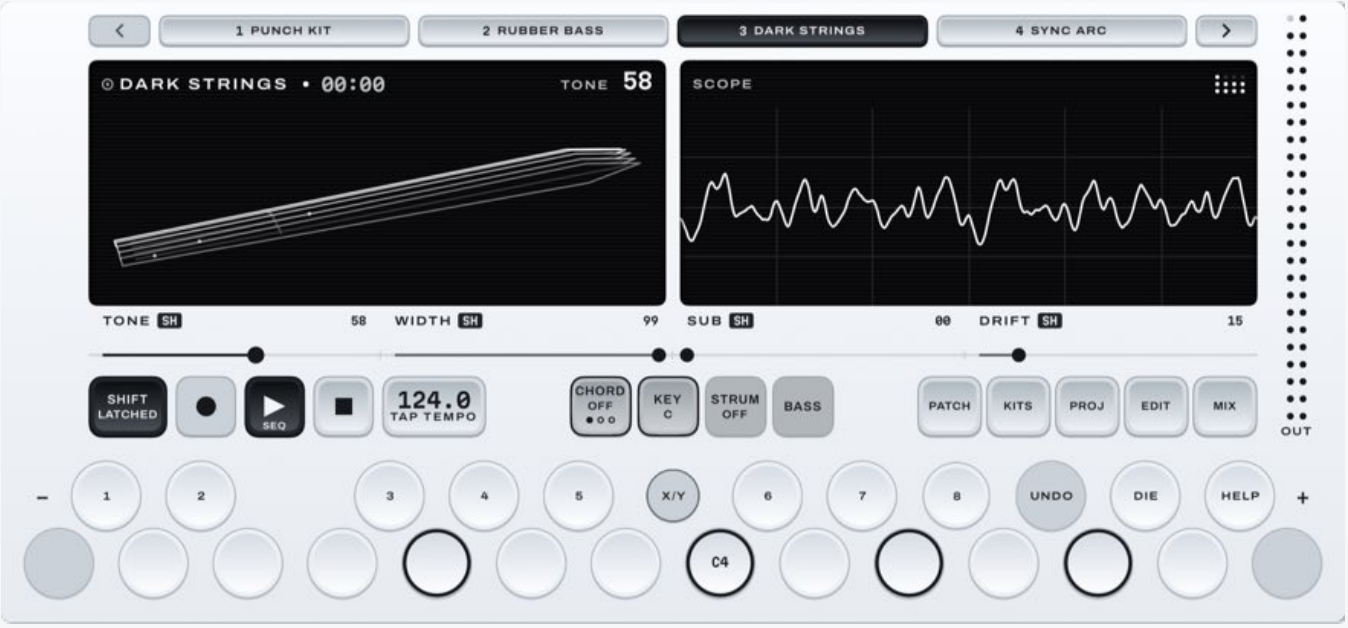


Figure 2.10 SHIFT latched on SYNTH. The page keys are the chord keys (3.12.1). The quick slots hold sounds, so they are live; an empty slot is a well, and holding it still saves into it.

2.7.2 What SHIFT changes on each screen

On every screen, SHIFT does these things the same way:

- the mode keys become PATCH KITS PROJ EDIT MIX;
- the tempo key becomes TAP TEMPO;
- the band shows the screen's second four sliders, marked **SH**;
- while you hold SHIFT down, a lane button picks its lane to swap with another (2.12), and with the transport stopped every lane button wears a thin frame to say so. With SHIFT latched, a lane button focuses its lane as usual;
- PLAY and STOP do not change at all, and REC changes only on SEQ, where SHIFT + REC sets the record mode (2.10). You can latch SHIFT, sit on MIX's mutes and still run the transport.

The page keys and the keyboard depend on the screen:

SCREEN	PAGE KEYS UNDER SHIFT	KEYBOARD UNDER SHIFT
SYNTH	On a synth lane, the chord keys CHORD KEY STRUM BASS (3.12.1): CHORD and STRUM name their setting under the word, over three dots, and KEY names the lane's key and scale, such as B♭ MIN; KEY takes you to the KEY page and back (3.11.1). On a kit lane, blank.	Quick slots, UNDO, DIE and HELP (2.8.1). With CHORD PAD on, the pad stays, with DIE and HELP in its bottom corners and no slots or UNDO (3.12.5). On SLOPE's CORE page shown CLASSIC, the header also spells out the picture's three views.
DRUM	Blank	The same
TAPE	MUTE 1 and on, one per track key	The tool row (2.8.2), with HELP on the lower row's last key. No slots or DIE.
SEQ	UNDO REDO CLEAR RESET	Slots, HELP, and PAT OCT- and PAT OCT+ on the lower row's end keys. DIE and UNDO are wells: DIE WORKS ON THE SOUND PAGES
ARP, GROOVE	Blank	Slots, UNDO, DIE, HELP
MIX, TAPE MIX	MUTE 1 and on, one per channel or tape track on the lane page	Slots, UNDO, DIE, HELP
EDIT	Blank	Slots, UNDO, DIE (rolls the group showing), HELP
PATCHES, KITS	Blank; in USER SHARE, NAME, DEL, ALL (hold SHIFT)	Slots, UNDO, DIE, HELP (hold SHIFT)
PROJECTS	REVERT on the second key and SHARE on the fourth (hold SHIFT)	As the browsers
Recorder	MUTE 1 and on, one per track key	Slots, UNDO, DIE, HELP

Settings, tempo page, sample editor	Blank	Slots, UNDO, DIE, HELP

2.7.3 BACK: SHIFT in a browser

In PATCHES, KITS and PROJECTS, SHIFT is filled and reads **BACK** under the word. There, a tap of SHIFT does not latch. It closes the browser and takes you back to where you opened it from: the same mode, the same page, and MIX or EDIT reopened if one of them was up (MIX reopens on LEVEL, as it always does). If you loaded a kit onto a synth lane (or the other way round) on the way, you land on DRUM instead of SYNTH, or SYNTH instead of DRUM.

To use a SHIFT job inside a browser, **hold** SHIFT while you press it, such as SHIFT + KITS to switch from PATCHES to KITS, or SHIFT + REVERT on PROJECTS. A press that used the layer neither goes back nor latches, so the browser's own keys are live the moment you let go. Chapter 5 pictures it (5.1.1).

2.8 The keyboard

The keyboard is 24 round keys across the width of the phone, laid out like two octaves of a piano: 14 naturals, like a piano's white keys, on the lower row, and 10 sharps, like its black keys, on the upper row, sitting between them. The keys stand in from the sides of the glass by the same space as below them. The keyboard is on every screen, and it always plays the focused lane. On a synth lane with CHORD PAD on, seven chord keys and a stick take its place (3.12).

- On a synth lane, the two C keys name the note they play: **C3** and **C4** on most sounds. A sound that belongs lower or higher, such as a bass, puts its lane's keyboard there when you load it, so a bass lane reads **C1** and **C2** (3.2). Move the octave and they change, so the keys always tell you where the keyboard is.
- Each lane keeps its own octave, and the project saves it: move the keyboard up on lane 2, focus lane 3, and lane 3 plays where you left it.
- On a kit lane, each key is one sound of the kit and reads its number: **1** to **14** along the lower row, **15** to **24** along the upper row.
- You can slide a finger from note to note for a run; each note starts as you reach it.
- A key with a ring drawn inside its rim is a note the focused lane's sequencer, arpeggiator or groove is playing right now (chapter 3). Only keys that play notes can ring, so under SHIFT only the twelve naturals in the middle do, and under TAPE + SHIFT none do. A key a MIDI keyboard is holding lights as if a finger were on it. In the TN looks there are no rings: an LED on each key lights instead (2.1.1).

Chapter 3 covers playing: velocity, octaves, quick slots, DIE, LEAN and MIDI.

2.8.1 The keyboard under SHIFT

On every screen but TAPE, SHIFT changes the outer keys and leaves the middle ones playing:

KEY	UNDER SHIFT
Upper row, keys 1 to 7 from the left	Quick slots `1` to `7`. Tap to load the slot's sound onto the focused lane (**LOADED SLOT 3**); hold for a little over half a second to save the lane's sound into it (a ring grows round the key, then **SAVED TO SLOT 3**). An empty slot is a well; tapping it says **NOTHING HERE YET · HOLD TO SAVE**, and holding it still saves. Synth lanes and kit lanes have separate sets of eight.
The gap after key 7	Quick slot `8`, a key that appears under SHIFT in the gap between the upper row's seventh and eighth keys. It loads and saves as the other seven do.
Upper row, key 8	`UNDO`: take back DIE's last roll, putting the values back exactly. Press it again for the roll before, up to eight rolls back. A well while there is nothing to take back; a press then says **NOTHING TO UNDO**.
Upper row, key 9	`DIE`: a new random set for the eight values of the page showing (on EDIT, the group showing), every time you press it. Moving a slider yourself, or changing page, lane or sound, drops the rolls UNDO could take back. A well on SEQ.
Upper row, key 10	`HELP`: latch HELP (2.9). Filled while latched; in the TN looks its LED lights instead.
Lower row, leftmost and rightmost	Blank: no job. The – and + in the gaps move the octave (2.8.3). On SEQ they are `PAT OCT-` and `PAT OCT+`: every note of the focused lane's current pattern down or up an octave, one step for SEQ's UNDO, as PAT's own keys do (8.6.5). Where the move can't happen, on a drum lane, a pattern with no notes, a note at the end of the range or while a take records, the key is drawn off and a press says why, such as **A NOTE WOULD GO ABOVE THE TOP**.
Lower row, the 12 between	Keep playing: on a kit lane, pads 2 to 13.

NOTE

> DIE works on every screen that has it except SEQ (TAPE has none: its SHIFT layer is the tool row), even where no sound page is showing. On MIX, ARP, GROOVE, the browsers, Settings, the tempo page and the recorder it rolls a page of the focused lane's sound that you can't see from there. Press UNDO straight away to put the values back. On a lane playing your own gear DIE and UNDO are wells: **A MIDI LANE HAS NO SOUND OF ITS OWN**.

2.8.2 TAPE + SHIFT: the tool row

On TAPE, SHIFT turns the whole keyboard into the tape's 21 tools: the loop, momentary effects such as BRAKE and STUTTER, cutting, joining and erasing takes, UNDO and REDO, TOP and CATCH. The lower row's last key is HELP (2.9.3), and the two before it have no job and are blank. MEMO A and MEMO B are drawn off and do nothing yet. LOOP is filled while the tape loops and RESET while it is armed; in the TN looks their LEDs light instead. Chapter 11 covers every tool and pictures the row (11.8).

There are no notes, slots or DIE on the keys under SHIFT on TAPE; the – and + in the gaps still move the octave (2.8.3). Without SHIFT, the keyboard on TAPE plays the focused lane as usual.

2.8.3 The keys in the gaps: –, X/Y and +

The upper row has three small keys of its own in its gaps. They are the same in every layer, they act when you lift your finger, and they never take a note's touch: a press on the line between a gap key and a playing key goes to the playing key. Under SHIFT a fourth key, quick slot 8, takes the gap after the upper row's seventh key (2.8.1).

- – , at the left end, moves the focused lane's keyboard down an octave, and + , at the right end, up an octave, with SHIFT or without. The line names the new range, such as KEYBOARD C2 TO B3. Each is a bare sign; while you hold it, it shows as a filled disc. The keyboard starts at C3 to B4 on most sounds (lower for a bass) and moves between C0 to B1 at the bottom and C7 to B8 at the top; at either end a press changes nothing and repeats the range. A key held while the octave moves keeps its own note and stops cleanly when you let go. On a kit lane both signs are dimmed, and a press says A KIT HAS 24 SOUNDS, NOT 24 PITCHES.
- X/Y , the small disc in the middle gap, turns the X/Y pad on and off: the right-hand window becomes a pad you drag to bend the pitch and work the mod wheel, or the brightness on a sound that doesn't use the wheel (15.6). It is filled while the pad shows; in the TN looks it keeps its resting face and its LED lights instead. The pad works on SYNTH, DRUM, TAPE and ARP; anywhere else the key is a well, and a press says X/Y PAD: SYNTH, DRUM, TAPE OR ARP.



Figure 2.11 The three gap keys: – and + move the octave, and X/Y opens the pad.

2.9 HELP

HELP lets you ask any control what it does. While it is latched, a control answers with one plain line instead of acting. It works on every screen.

To latch HELP:

01 Go to the screen and the page you want to read about. While HELP is latched, the page keys answer instead of turning the page.

02 Hold SHIFT and press HELP, the last key of the upper row (on TAPE, the last key of the lower row). It fills (in the TN looks, its LED lights), and the left window shows the help panel: the line
TAP ANY CONTROL TO READ WHAT IT DOES · HOLD A KEY AND TILT THE PHONE TO LEAN
and under it the cells that can act right now (2.9.1). Until you tap a control, the top of the window reads A MARKED WINDOW TAKES A FINGER (2.3).

03 Let go of SHIFT. The band and the keyboard go back to their first layer, and HELP stays on.

04 Tap a control. Its help line appears at the top of the window: on SYNTH in place of the readout, elsewhere at the right of the help window's title. A line too long to sit beside the title takes the whole top line instead of being cut short. On SYNTH's SHAPE page, for example, tap **ATTACK** and you read HOW FAST A NOTE RISES.

NOTE

> If you tapped SHIFT to latch it before pressing HELP, SHIFT is still latched afterwards: the band shows its second four, so ATTACK is not on it, and the page keys don't turn the page. Tap SHIFT once to drop it. HELP stays on.

To turn HELP off, press SHIFT + HELP again. In a browser, where a tap of SHIFT goes back, hold SHIFT while you press HELP.

While HELP is latched, SHIFT reads **HELP** under its word, on every screen, so a page key that answers with its line instead of turning the page never looks broken: the key that turns HELP off is one press away. If SHIFT is latched too it reads **LATCHED**, and in a browser **BACK**; under SHIFT the HELP key itself is filled, or in the TN looks lights its LED.

On SYNTH the help panel takes the place of the picture, so the engine picture can't be tapped while HELP is on; CORE answers with TAP SCREEN: CLASSIC WHILE ON THIS LANE instead (4.5.1). On DRUM, SEQ, ARP, GROOVE, MIX, EDIT and TAPE it fills the left window, under the screen's name; on SEQ it covers the left half of the pattern grid. The browsers swap their lists for it. On an effect's CONTROLS (4.7.3) the slot list stays, and the line shows in its header.

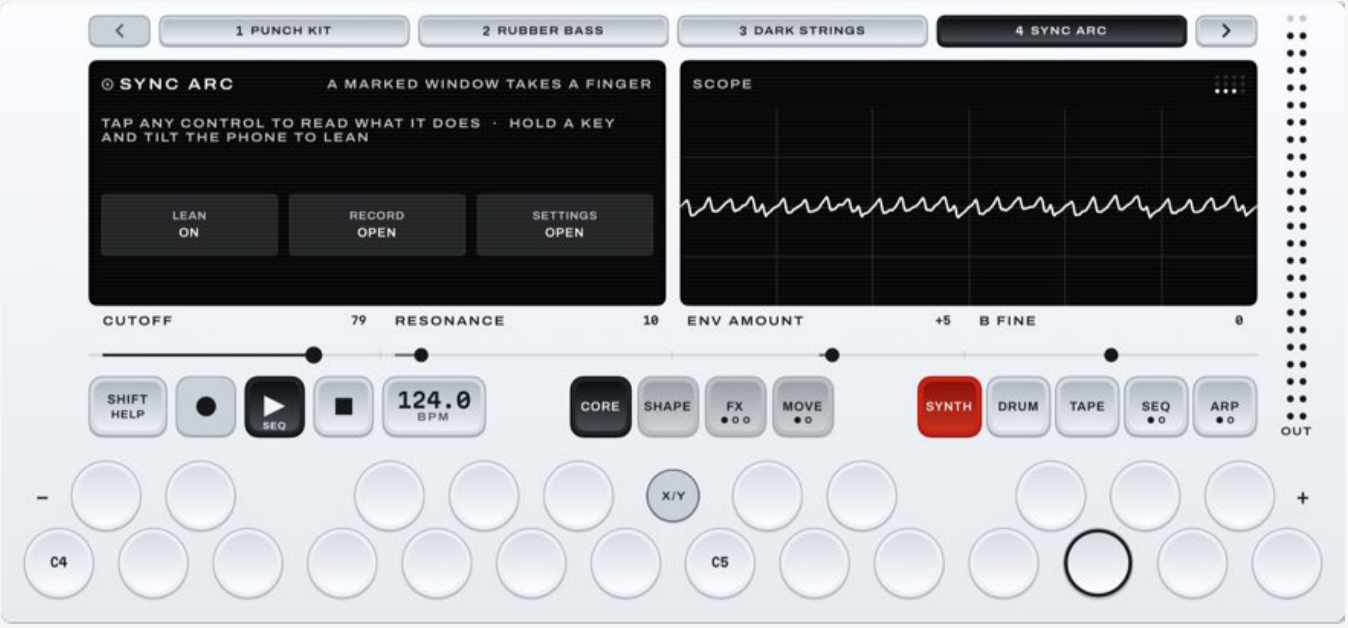


Figure 2.12 HELP latched on SYNTH: the hint and the cells take the engine picture's place, and the scope keeps drawing. Sync Arc holds no recording, so SAMPLE is hidden and the other three share the row.



Figure 2.13 On every other screen the same panel fills the left window, under the screen's name. Punch Kit holds a recording, so SAMPLE shows and all four cells fill the row.

2.9.1 The help panel's cells

The help panel also holds up to four doors that have no other home on the panel. Only a cell that can act right now is shown. One that can't is hidden, and the cells left share the row's width between them, in the same order, so three or two cells are simply wider.

CELL	WHAT IT DOES	SHOWN
LEAN (ON or OFF)	Turns LEAN on or off for the focused lane's sound: hold a key and tilt the phone to bend it (chapter 3). The line says LEAN ON or LEAN OFF.	Always, except on a lane playing your own gear
SAMPLE (OPEN)	Opens the sample editor for the focused lane (chapter 12).	Only when the focused lane holds a SLICER kit, a kit made from a recording
RECORD (OPEN)	Opens the recorder, for sampling the microphone, a USB input or the app itself (chapter 12).	Only while a project is open
SETTINGS (OPEN)	Opens Settings (chapter 14). This is the only way in.	Always

Opening Settings, the recorder or the sample editor turns HELP off. While one of them is showing, SHIFT + HELP closes it and returns you to the page you were on, with HELP off.

2.9.2

What HELP does to the controls

While HELP is latched:

- **Sliders**: a quick tap shows the line. A drag still moves the value. A double-tap says what a double-tap does, TAP TWICE: DEFAULT · WITH SHIFT: UNDO, and changes nothing (2.4.4).
- **Page keys,** REC **,** PLAY **,** STOP **and the tempo key**, in both its layers, answer with their line and do nothing else. A well that refuses the touch, such as REC on SYNTH, gives no line.
- **The keyboard's second-layer keys**, quick slots, UNDO, DIE, SEQ's PAT OCT- and PAT OCT+ and TAPE's tools, answer with their line and do nothing else, and so do the gap keys and the lane row's arrows.
- **The keyboard's note keys keep playing**, so you can try LEAN while you read about it.
- **A marked window** (2.3): a tap shows the window's line and does nothing else, and a drag still acts, as on the sliders. DRUM's pad map answers instead of muting a pad, a SEQ step answers instead of being chosen, a tap on MIX's EQ answers while a drag still moves a band, and a tap on a list answers while a drag still moves through it.
- **A lane button** still focuses its lane and shows its line, PLAY THIS LANE · HOLD SHIFT TO SWAP. With SHIFT held down it shows SWAP LANE, MIX AND TRACK WITH ANOTHER and picks nothing.
- SHIFT **and the five mode keys keep working**, so you can walk from screen to screen and lane to lane with HELP on.

Opening MIX, EDIT, an effect or modulator list, Settings, the tempo page, the recorder or the sample editor turns HELP off. Pressing a mode key or opening a browser doesn't.

Every line is 40 characters or fewer. A control that has no line yet says **THERE IS NO LINE FOR THIS ONE YET**. If you see it, please tell us the control and the screen.

2.9.3 HELP on TAPE

TAPE + SHIFT turns the keyboard into the tool row, and HELP is on it too: the lower row's last key, the corner opposite to where it sits on the other screens. Hold **SHIFT** and press it to latch HELP or turn it off, on TAPE itself. While it is on, the help panel fills TAPE's left window, and the sliders, track keys and tools answer with their lines.

2.10 PLAY, REC and STOP depend on the screen

The transport keys act on the screen you are looking at. A screen drawn over a mode (a browser, MIX, EDIT, Settings) counts as that screen, not the mode underneath.

SCREEN	PLAY	REC
SEQ, with PATTERN PLAY, PATTERNS and PERFORM	Plays the patterns. The tape stays where it is.	Records into the pattern in the record mode, LIVE or STEP (below). LIVE arms the pattern to record what you play: **PATTERN REC ON** or **PATTERN REC OFF**. Armed with the transport stopped, the first note you play starts the take: **PATTERN REC ON · FIRST NOTE STARTS**. STEP, with the transport stopped, starts a STEP REC pass, one step at a time (chapter 8).
TAPE	Rolls the tape. It plays the patterns too only when the next take has REC SEQ on and the tape is armed (chapter 11).	Arms the tape. Press PLAY to start the take.
The recorder	Rolls both, for a punch-in or a bounce.	Arms whatever the recorder's DEST names (chapter 12).
PATCHES, KITS, PROJECTS	Plays the patterns.	Starts an export of what the EXPORT slider names (chapter 14).
Everywhere else: SYNTH, DRUM, ARP, GROOVE, MIX, TAPE MIX, EDIT, Settings, the tempo page,	Plays the patterns. The tape stays where it is.	Nothing. The key is a well, and VoiceOver calls it "only on SEQ and TAPE".

the sample
editor

PLAY is filled while anything is running or counting in, on every screen. Pressing PLAY again adds to what is running rather than restarting it: PLAY on SEQ and then PLAY on TAPE gives you the patterns over the tape without the clock jumping. Only STOP stops.

A small word under PLAY's triangle says what it will start: **TAPE** on TAPE and the recorder, where it rolls the tape, and **SEQ** everywhere else, where it runs the sequencer. Pressed from stopped with nothing to play, PLAY still starts, and the line says why you hear nothing: PATTERN EMPTY when the pattern on screen is empty on SEQ, or elsewhere when no lane's playing pattern holds a note; on ARP with no key held, HOLD KEYS. On SEQ the playhead runs through the empty pattern, so you can see it is playing.

REC is red while the thing it arms on this screen is armed or recording, and the red tells you which, as on a hardware recorder. **Steady** red means armed or ready. **Blinking** red means a take is really being written: the tape rolling armed, a LIVE pattern take past its count-in, the recorder writing, or an export rendering on a browser. A STEP REC pass stays steady: nothing moves until you play. A take you start on TAPE keeps going if you move to another screen. On a screen where REC has no job it is a well, and PLAY's fill and SYNTH's record dot tell you the take is still running. Go back to TAPE to work with it.

The record mode on SEQ. On SEQ, PATTERN PLAY, PATTERNS and PERFORM, SHIFT + REC changes what REC records with: LIVE, the default, or STEP. The line says which, REC MODE · LIVE or REC MODE · STEP, and while SHIFT is on, two dots under REC show it, the current one filled. Without SHIFT, REC has no dots. The mode is kept, so a plain REC press then records the way you chose. While the patterns play, REC is always LIVE on or off, so ending a take is one press. Changing the mode ends a STEP REC pass, and changing it to STEP lets go of a LIVE arm that hasn't started.

STOP stops everything: the patterns, the tape and any take. Pressed again while everything is stopped, it rewinds the tape to the start, or to LOOP IN while the tape's loop is on. On a browser while an export runs, STOP cancels the export: EXPORT STOPPED · NOTHING KEPT. STOP also puts the X/Y pad back to rest and glides PERFORM's faders home, unless PERFORM's KEEP is lit (chapter 15), and with a lane playing your own gear, a press while everything is stopped also sends that gear all notes off: MIDI · ALL NOTES OFF (chapter 16).

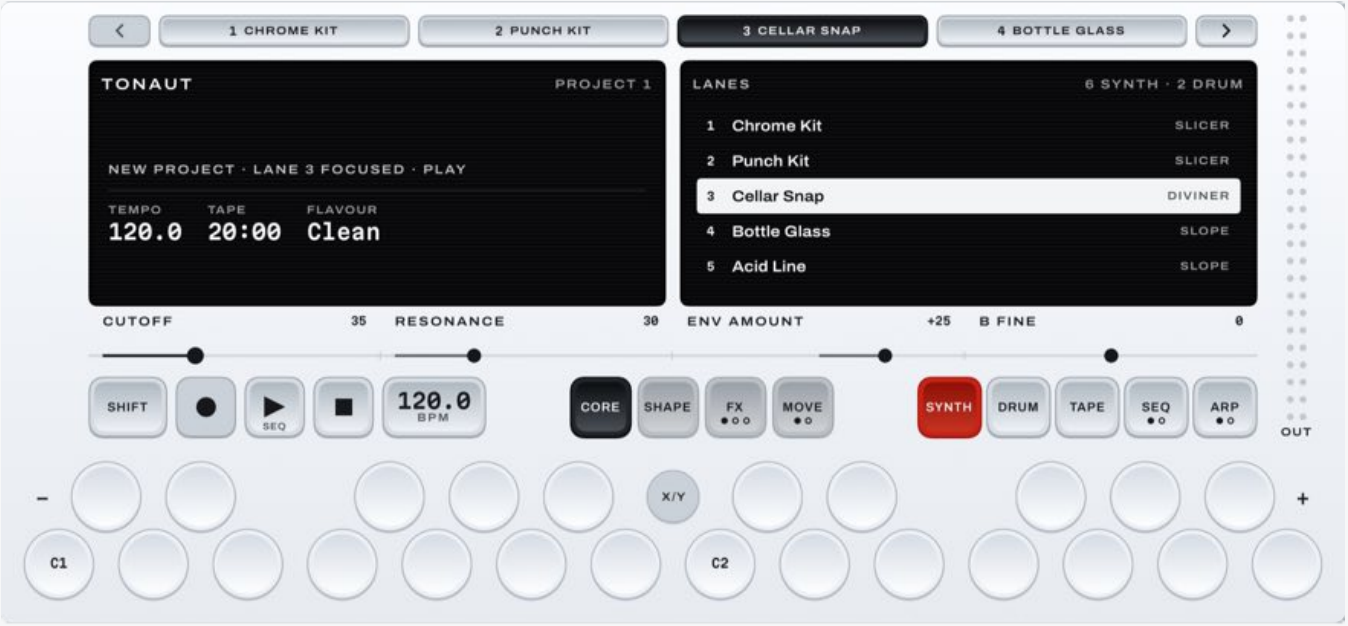
If the tape is full and armed, PLAY on TAPE refuses with TAPE FULL - NOTHING TO RECORD.

PLAY and STOP have no second layer, and REC has one only on SEQ's screens, for the record mode. Everywhere else the three work the same with SHIFT held, latched or off, and they don't count as using SHIFT.

2.11 The first launch

The first time you open Tonaut, it makes a new project called **`Project 1`** and opens it on SYNTH, ready to play: 120 BPM, eight lanes, and a tape track of up to 20 minutes for each lane (13.15). Lanes 1 and 2 hold drum kits, so SYNTH opens on the first synth lane, lane 3.

On that first launch only, a welcome board takes the place of SYNTH's two windows. The left window reads **NEW PROJECT · LANE 3 FOCUSED · PLAY** over the tempo, the tape's length and its flavour; the right window, **LANES**, lists the lanes and their engines, the focused one filled. Everything else is SYNTH, ready to play. The board goes at your first touch, a key, a slider or a button, and the windows show the engine picture and the scope. It never comes back, even if you make a new project. The button row under the board is the one you'll always see, the page keys already wearing their dots, so nothing on it changes at your first press.



`Figure 2.14` The first launch: Project 1 on SYNTH, on lane 3, the first synth lane, under the welcome board. Its bass puts the keyboard two octaves down.

Every new project starts with the same eight sounds, one per lane:

LANE	SOUND	WHAT IT IS
1	Chrome Kit	A drum kit
2	Punch Kit	A drum kit
3	Cellar Snap	A DIVINER bass
4	Bottle Glass	SLOPE keys
5	Acid Line	A SLOPE lead
6	Attic Strings	A DIVINER pad
7	Arp Shards	A SAMPLER pluck
8	Bee Hive	A SWARM texture

The iPhone shows lanes 1 to 4 at first; press `›` for lanes 5 to 8 (2.2.2). Lane 3's keyboard opens two octaves down, at C1 and C2, because Cellar Snap is a bass (3.2). Play the keys, press `PLAY`, or change any lane's sound in PATCHES or KITS (chapter 5): the project saves itself as you go (13.2).

2.12 Swapping two lanes

A lane swap trades two lanes whole, so you can put your drums on lanes 1 and 2, or bring the lanes you play most onto the first page. It works only while the transport is stopped.

To swap two lanes:

01 Press `STOP` if anything is playing. While the transport runs or counts in, SHIFT + a lane button picks nothing and says **STOP FIRST**.

02 Hold `SHIFT` down. Every lane button wears a thin frame, and after a moment the line reads **TAP A LANE TO SWAP**.

03 Still holding SHIFT, tap the first lane's button. It fills, the others keep their frame, and the line reads **LANE 3 · TAP A LANE TO SWAP WITH IT**. You can let go of SHIFT now.

04 Tap the other lane's button. You don't need SHIFT for this tap. The two lanes swap, and the line names them, lower number first: **LANES 1 AND 3 SWAPPED**.

NOTE

> Only a held SHIFT picks a lane. With SHIFT latched, for the chord keys on SYNTH for example, a tap on a lane button focuses that lane as it always does, and nothing is picked.



Figure 2.15 Lane 3 is picked. A tap on any other lane button swaps the two.

- In an eight-lane project the other lane may be on the other page. The arrow keys don't let go of the pick, so holding SHIFT and tapping lane 2, then › and lane 6, swaps lanes 2 and 6.
- To let go of a pick, tap the picked lane again, or leave the screen, or wait: the pick lasts eight seconds. The line says LANE SWAP CANCELLED.
- While the project is busy with something else, such as OPEN, SAVE AS, REVERT or a file loading onto a lane, a pick says NOT NOW · THE PROJECT IS BUSY.

What moves. Everything that is the lane's: its sound (or its MIDI channel, for a lane playing your own gear), all sixteen patterns with the one selected and each pattern's UNDO history, its mute on SEQ's MUTE page, its arpeggiator or groove, its pad mutes, its keyboard octave and its recording; its MIX strip, with level, balance and mute; and its tape track, with that track's TAPE MIX strip and mute, so the takes stay with the lane that played them. PERFORM's faders go with their sounds. The tempo, the master section, the loop, REC SEQ and every other project setting stay where they are.

The focus stays on the sound under your fingers: if you were playing lane 3 and swap it with lane 1, lane 1 is focused afterwards, and the lane row shows its page. The selected tape track follows its recording the same way. Keys you were holding are let go, a selected SEQ step is let go, and SHIFT + double-tap forgets the band's last changes (2.4.4).

A swap has no UNDO of its own. To swap back, swap the same two lanes again.

03 Playing

The round keyboard plays the focused lane on every screen. This chapter covers everything that happens under your fingers: notes, chords and slides, the octave, kit pads, the keys that light while Tonaut plays for you, LEAN, the quick slots, DIE, MIDI keyboards, the tempo, where to find PERFORM and the X/Y pad, and the KEY page, which keeps your playing in a scale and turns one key into a whole chord.

Several jobs here sit on the SHIFT layer. You can tap SHIFT to latch it (it stays on until you tap it again) or hold it while you press the other key. Both work for everything in this chapter except in the PATCHES and KITS browsers and PROJECTS, where a tap on SHIFT takes you back to where you were, so hold it there. See 2.7.

The keyboard's SHIFT jobs (the quick slots, UNDO, DIE and HELP) are on every screen but TAPE. On TAPE, SHIFT turns the whole keyboard into the tape's tool row instead (11.8), with HELP on the last key of the lower row (2.9.3). The keys in the gaps of the keyboard's top row, –, X/Y and +, are not part of any SHIFT layer: they are there on every screen, TAPE included.

This chapter describes the iPhone keyboard. On iPad the keyboard has 32 keys, and the quick slots, DIE, UNDO, HELP and the octave keys sit on a strip above it, so it needs no SHIFT layer (chapter 17). Everything else here works the same on both.

3.1 Playing the keys

The keyboard has 24 round keys covering two octaves. The lower row holds the 14 naturals (the white keys of a piano) and the upper row the 10 sharps (the black keys). It stands in from the left and right edges of the screen by the same space as below it. On most lanes the lowest key is C3 and the highest is B4; a bass sound puts its lane's keyboard lower (3.2.1). The two C keys print the note they play, such as **C3** and **C4**, so you can always read where the keyboard sits.

Three more keys sit in the gaps of the top row: – at its left end and + at its right end move the octave (3.2), and X/Y in the middle gap turns the right-hand window into the X/Y pad, which bends the pitch and moves the mod wheel, or the brightness, with one finger (15.6). None of the three ever plays a note.

A note sounds the moment your finger lands, not when you lift it. It plays the focused lane, the lane button that is filled at the top of the panel (2.2). The keyboard keeps playing on every screen: SYNTH, DRUM, SEQ (PERFORM and PATTERN PLAY included), ARP, MIX, EDIT, the browsers, Settings and the tempo page. On TAPE it plays too, until you press SHIFT, which turns it into the tool row (11.8). A few screens give a key an extra job: on SEQ a key can write its note into a step (8.3); on DRUM, EDIT and the sample editor a kit lane's key also picks the pad you edit (3.3); and on the recorder, with the lane armed for sampling, a key starts a capture instead of playing (12.4).

Three lane settings change what a held key does. If the focused lane's arpeggiator is on, the keys you hold don't sound on their own: they feed the arpeggiator, and you hear what it plays (9.1). On a kit lane with GROOVE on, holding any pad also starts the groove (9.5). And on a lane set to EXTERNAL MIDI, the keys play your own synth or drum machine instead of a Tonaut sound (3.8.7).

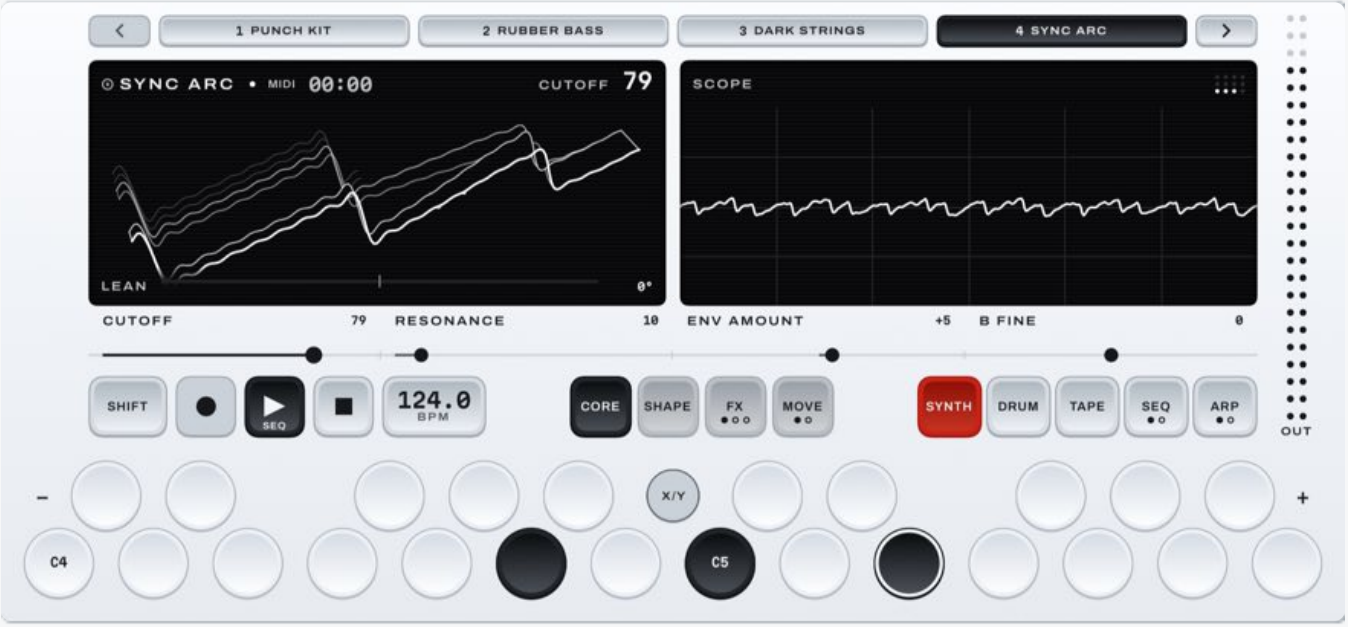


Figure 3.1 Held keys fill, whether a finger or a MIDI keyboard holds them, and the scope draws what the lane is playing. Each lane keeps its own octave: this one starts on C4.

3.1.1 Where to touch

The keyboard band is split across the middle. Touch anywhere in the lower half and you get the nearest natural, so you never miss a white key; the two end naturals take a touch right out to the edge of the glass. Touch the upper half and you get the sharp whose key is under your finger. The upper row has the gaps a piano has, between E and F and between B and C:

- a touch in an E–F gap plays nothing (under SHIFT the right-hand one holds quick slot 8, 3.6);
- the B–C gap in the middle holds X/Y;
- the two ends of the upper row, out to the glass, belong to – (left) and + (right).

A key always wins over a gap: on the line between them, the note plays.

3.1.2 Chords

Put down as many fingers as you like. Tonaut follows up to sixteen touches at once, and each one plays its own key. Two fingers on the same key count as one note: it stops when the last of them lifts. How many notes actually sound at once depends on the sound (its **PLAY MODE** on SHAPE, 4.6).

To play a whole chord from one key instead, switch on CHORDS for the lane on the KEY page (3.11.4).

3.1.3 Sliding across the keys

Drag a finger along the keyboard and it plays every key it reaches, letting go of the one it left. One finger is always one note, so a fast slide never piles up voices. This works on both rows and on a kit lane's pads, and two fingers can slide in opposite directions at the same time.

- Slide off the keyboard band (above or below it) and the note stops. Slide back on and the key you land on plays again.
- On the upper row, sliding through a gap stops the note; the next sharp you reach starts a new one. Sliding over `X/Y`, `–` or `+` never presses them.
- Only a touch that starts on a note slides. A touch that starts on any other key (a quick slot, `UNDO`, `DIE`, `HELP`, a gap key or a tape tool) stays on that key however far you drag, so a stray slide can't fire a row of them.
- Under SHIFT you can slide along the twelve naturals between the two end keys, which are blank there. Sliding onto an end key ends the note and presses nothing.

3.1.4 Velocity

Every note you play on the screen has the same velocity (how hard a key is struck, in MIDI terms), about 102 on MIDI's 1 to 127 scale. Pressing harder, longer or with more of your finger changes nothing, and a note you slide into has the same velocity as one you strike. For playing with dynamics, use a MIDI keyboard (3.8).

3.1.5 When held notes let go

A note you hold stops by itself, with your finger still down, in these cases:

- **You focus another lane.** The notes belong to the lane you were playing, so they end before the focus moves. Lift and touch again to play the new lane. Paging the lane row with its arrows doesn't move the focus, so it lets nothing go.
- **You swap two lanes** (2.12). The held notes belong to the lanes as they were.
- **SHIFT changes what the key does.** Pressing or latching SHIFT stops a note held on the upper row or on either end key, because the upper row becomes the slots, UNDO, DIE and HELP, and the end keys stop playing. A note held on any of the twelve naturals between them keeps sounding. On TAPE, SHIFT stops every held note, because the whole keyboard becomes the tool row.
- **Tonaut leaves the foreground.** Pulling down Control Center, a call or switching apps releases every key.
- **A pop-up or an iOS sheet opens**: the name pop-up of SAVE AS or RENAME on PROJECTS (13.5), the share sheet, Apple's Bluetooth MIDI list or the file picker. Every key you were holding is let go first.

Changing the octave does *not* stop or bend a held note. It keeps the pitch it started with and ends normally when you lift.

TIP

> With HELP latched (2.9) the note keys still play, so you can read about a control and keep playing. Only the keys that are not notes (slots, UNDO, DIE, –, + and X/Y) answer with their help line instead of acting.

3.2 Moving the octave

Each lane keeps its own octave. Move the keyboard up on a lead lane and down on a bass lane, and each one is where you left it when you focus it again, until you load another sound onto that lane: a new sound puts the keyboard where it belongs (3.2.1). – and +, at the two ends of the keyboard's top row, move it, on every screen and on every layer, SHIFT's included. They are bare signs; the one you hold lights up as a disc.

Each press moves the focused lane's keyboard down or up by one octave. The move happens when you lift your finger.

Under SHIFT the two end keys of the lower row are blank and play nothing, since – and + are always there. On SEQ they have a job of their own: PAT OCT- and PAT OCT+ move the focused lane's pattern down or up an octave, the same move as on PAT (8.6.5).

To move the keyboard down an octave:

01 Press – and let go.

02 The notice line reads KEYBOARD C2 TO B3. The C key in the middle of the lower row now reads **C3**, and the leftmost key **C2**.

Press + to go up the same way. Every press names the new span in the notice line, in the form KEYBOARD C3 TO B4, and from then on the C legends on the keys carry it.

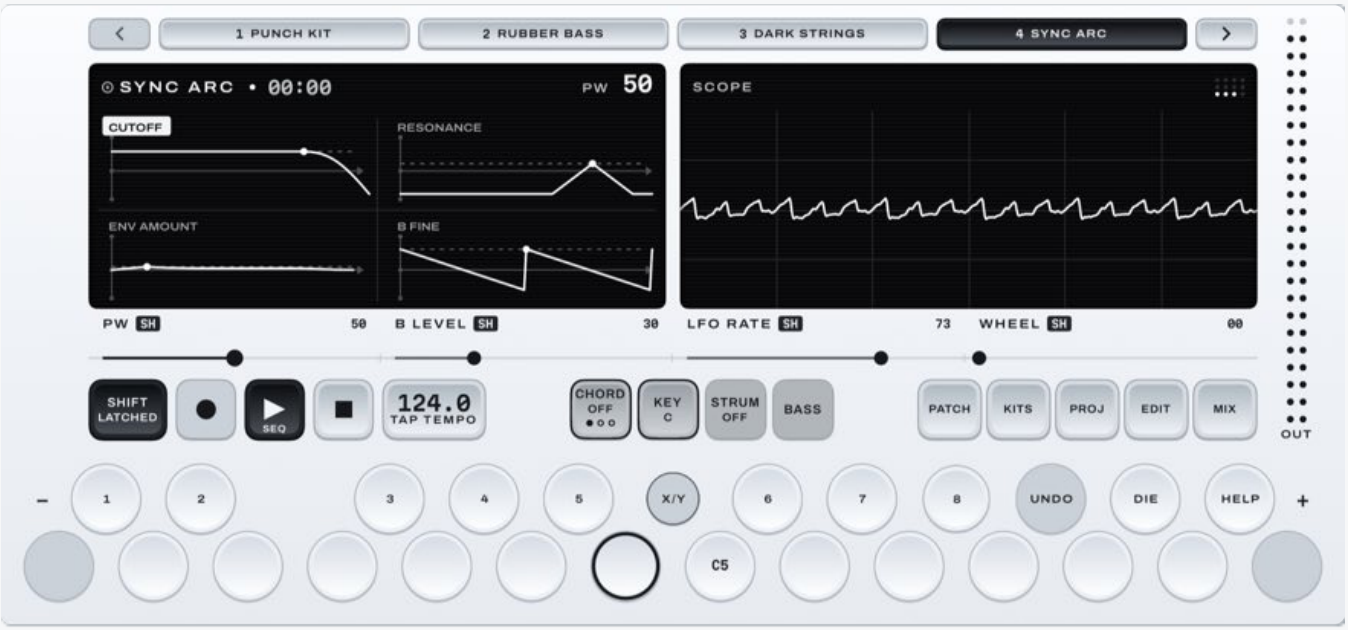


Figure 3.2 Under SHIFT the end keys are blank: the – and + at the ends of the top row move the octave on every layer.

The lowest key can sit on any C from C0 to C7, eight positions in all:

LOWEST KEY	NOTICE	FROM C3
C0	KEYBOARD C0 TO B1	three presses of – (the bottom)
C1	KEYBOARD C1 TO B2	two presses of –; where a bass sound puts it (3.2.1)
C2	KEYBOARD C2 TO B3	one press of –
C3	KEYBOARD C3 TO B4	where most sounds put it, and where most lanes of a new project start
C4	KEYBOARD C4 TO B5	one press of +
C5	KEYBOARD C5 TO B6	two presses of +
C6	KEYBOARD C6 TO B7	three presses of +
C7	KEYBOARD C7 TO B8	four presses of + (the top)

At either end a further press changes nothing, and the notice repeats the span you are already on, so you know you have hit the end.

Tonaut names notes the way most synthesizers do: middle C (MIDI note 60) is C4, so the keyboard's starting span, C3 to B4, is MIDI notes 48 to 71. Some keyboards and apps call middle C "C3"; if a MIDI keyboard's labels seem an octave off from Tonaut's, that is why.

- **Saved with the project, lane by lane.** A project reopens with every lane where you left it (13.2), and a lane swap takes the lane's octave with it.
- **Kit lanes ignore it.** A kit's keys are pads, not pitches (3.3).
- **A MIDI keyboard is not affected.** Its notes reach the sound unchanged, whatever the screen keyboard's octave.
- **While SHIFT is on, the two end keys don't play.** At the starting span that means no C3 and no B4 until you release or unlatch SHIFT. `-` and `+` never take a key away.
- **On iPad** the strip's `OCT-` and `OCT+` move the octave (chapter 17).
- **With HELP latched**, a press says what the key does (`MOVE THE KEYBOARD DOWN AN OCTAVE`) and moves nothing.

3.2.1 Home octave: where a sound puts the keyboard

Every synth sound has a home octave, the place on the keyboard where it sounds best. When you land on a sound in PATCHES, Tonaut moves the lane's keyboard there before you play it:

- **Basses** go two octaves down, so the iPhone's keyboard runs from C1 to B2. A bright bass, or one recorded fairly high, goes one octave down instead.
- **Some dark drones and low recordings** go one octave down, to C2.
- **A few high recordings** go one octave up, to C4.
- **Everything else** sits at C3.

So a bass you load is low enough to hear as a bass straight away, and a lane you had moved up for a lead comes back to C3 when you load a pad onto it.

- **Your own octave stays until the next sound.** Move the octave with `-` and `+` (on iPad, the strip's octave keys) and it stays where you put it, through changes of focus, screen and setting, saving, and closing and opening the project. Loading another sound from PATCHES is the one thing that moves it.
- **A new project's bass lane opens low.** Lane 3, Cellar Snap, starts at C1; the other synth lanes start at C3.
- **A USER sound remembers its octave.** Saving a sound to your USER bank keeps the octave the lane was at when you saved it, and loading it puts the lane back there (5.11).
- **Other ways of changing the sound keep the octave.** Loading a quick slot (3.6), UNDO, importing or recording a sample, and opening a project leave the keyboard where it was.
- **Kits are not moved.** A kit's keys are pads (3.3), and loading one leaves the lane's synth octave as it was.

3.3 Kit lanes: keys are pads

When the focused lane holds a kit, its 24 keys are 24 separate sounds, and they read **1** to **24** on every screen. The lower row is pads 1 to 14, left to right, and the upper row pads 15 to 24. Tap a key to play its pad; slide across to play each pad in turn. This is the same on all three kit engines, KNOCK, SLICER and CINDER (6.1).



Figure 3.3 On a kit lane the keys are numbered pads: 1 to 14 below, 15 to 24 above.

On DRUM and on EDIT, touching a pad also makes it the pad the band edits (6.3). In the sample editor it picks the slice you trim (12.8.3). On a SLICER kit made from your own recording, a pad with no slice on it is drawn as a well: pressing it still picks it, plays nothing and says so, for example `PAD 14 IS EMPTY`.

3.3.1 No octave on a kit

A kit has no octave to move. On a kit lane `−` and `+` are dimmed. Press either and nothing moves; the notice line says `A KIT HAS 24 SOUNDS, NOT 24 PITCHES`. Each synth lane keeps its own octave meanwhile, so focusing a kit lane and coming back changes nothing.



Figure 3.4 On a kit lane under SHIFT, pads 2 to 13 still play; the end keys are blank and – and + are dimmed.

NOTE

> While SHIFT is held or latched on a kit lane, only pads 2 to 13 play. Pad 1 and pad 14 are the blank end keys, and pads 15 to 24 are the quick slots, UNDO, DIE and HELP. On most kits pad 1 is the kick, so let go of SHIFT before you reach for it.

3.3.2 Which note plays which pad

A MIDI keyboard, and SEQ's pattern, reach a kit's pads through fixed notes. The pads sit on the two octaves from C3 to B4, laid out like the screen keyboard: the white notes are pads 1 to 14 and the black notes pads 15 to 24.

PAD	NOTE	PAD	NOTE	PAD	NOTE
1	C3	9	D4	17	F#3
2	D3	10	E4	18	G#3
3	E3	11	F4	19	A#3
4	F3	12	G4	20	C#4
5	G3	13	A4	21	D#4
6	A3	14	B4	22	F#4
7	B3	15	C#3	23	G#4
8	C4	16	D#3	24	A#4

Notes outside C3 to B4 wrap around every two octaves: C1, C3 and C5 all play pad 1, and C2, C4 and C6 all play pad 8. So any key on a MIDI keyboard plays some pad.

3.4 Keys lit by playback

When Tonaut plays notes for you on the focused lane, each key it is playing wears a ring: a thin circle inside the key's rim, in the same ink as the key's legend. The ring comes on with the note and goes out when the note ends, and it stays on for at least 40 to 50 milliseconds, so even a very short note shows. You see the ring on every screen, because every screen has the keyboard. That is the LIGHT and DARK housings, and the iPad; in the iPhone's TN looks the keys have LEDs instead (3.4.2).

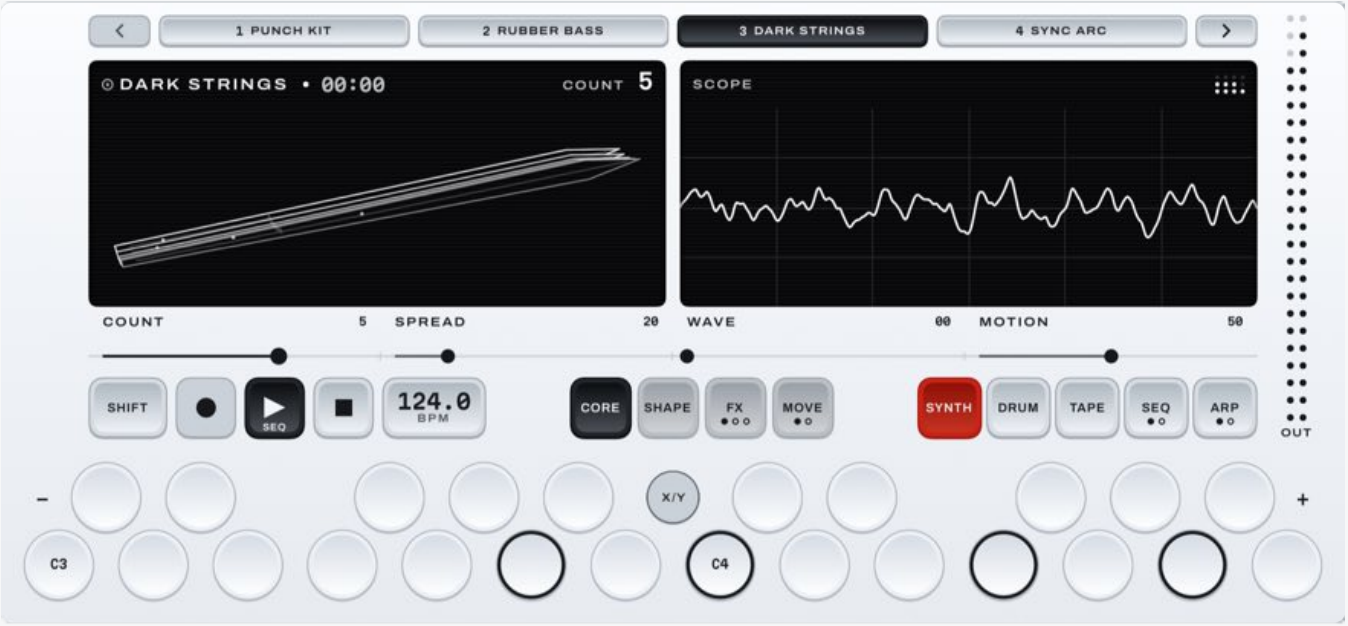


Figure 3.5 Rings mark the notes the lane's pattern is playing right now.

What rings a key: the lane's pattern playing (SEQ, 8.2), its arpeggiator, its GROOVE (9.4), including the groove preview in the kit browser, and a SEQ step you tap to hear it (8.3). An arpeggio or a groove rings keys even with the transport stopped. On a lane set to EXTERNAL MIDI the keys ring for the notes sent to your gear, the same way.

What never rings a key: your own fingers (a pressed key already shows filled), notes from a MIDI keyboard (they light the key instead, 3.4.1), and audio on the tape. Pressing PLAY on TAPE over a recorded take rings nothing, because a take is sound, not notes.

To see it:

01 Put a pattern on lane 1 (8.3) and focus lane 1.

02 On SYNTH, press PLAY. PLAY plays the patterns on every screen but TAPE.

03 Watch the keyboard. Each step's notes ring as they sound.

- **Only note keys ring.** Under SHIFT only the twelve naturals between the two end keys can ring; on a kit lane that is pads 2 to 13. On TAPE + SHIFT nothing rings, and neither do `–`, `+` or `X/Y`.
- **A synth lane** rings the key that plays the note. A note above or below the two octaves on screen has no key, so it shows nowhere. Move the octave (3.2) to bring it into view.
- **A kit lane** rings the pad that is sounding, whatever note the pattern used to reach it (3.3.2).
- **On SEQ, ring and fill mean different things.** A filled key is in the selected step; a ringed key is sounding now. A key can be both. In the TN looks the two are a half and a bright LED (3.4.2).
- **Mutes.** A lane muted on MIX still rings: the pattern plays and the fader takes the sound away. A lane whose pattern is muted on SEQ's MUTE page (8.9) plays nothing from it, so nothing rings. A pad muted on DRUM's pad map (6.7) does not ring for the pattern or the groove, because those hits are not played at all.

3.4.1 Keys lit by a MIDI keyboard

A key you hold on a MIDI keyboard lights the matching key on the screen exactly as a finger would: filled while the key is down (in the TN looks, pressed with its LED bright), back to rest when you let go. The same rules as the rings decide which key lights. Only a key whose job is a note lights; a note outside the two octaves on screen lights nothing until you move the octave; and on a kit lane the note lights the pad it plays. A note you hold through a change of focus keeps playing its old lane (3.8.3), so it stays dark on the new one until you play it again.

- **The light is the key you pressed, not every note it plays.** With LOCK or CHORDS on (3.11), one MIDI key can play a different note or a whole chord, but it still lights only its own key. The KEY page's window names the notes, and with the arpeggiator on, the rings show what it plays.
- **With MIDI in set to BY CHANNEL** (3.8.8), only a note that reaches the focused lane lights a key. Notes playing other lanes on their own channels light nothing.

3.4.2 Key LEDs in the TN looks

The iPhone's three TN looks, TN-1, TN-1 DARK and TN-XY (14.2.1), show what is playing the way hardware does. Every white key and every black cap carries a small LED near the top of its round raised area, and the LED does the job the ring does in LIGHT and DARK. Unlit, it is a dull dot you can always see. It lights at two strengths:

THE LED	WHEN
Bright: a near-white core with a wide glow	its note is sounding: your finger on it, a MIDI keyboard holding it, or the lane's pattern, arpeggiator or groove playing it
Half: a softer glow	its note is in the SEQ step you have selected or are holding (8.3), or LATCH holds it (8.5)
Unlit	the rest of the time

- **Orange in TN-1 and TN-1 DARK, red in TN-XY.**
- **No rings.** A key Tonaut plays for you lights its LED and wears no ring. A key you press still goes down, and its LED lights with it.
- **On SEQ the selected step's notes glow at half** instead of being drawn pressed, so a bright LED is always a note sounding now and a half one a note in the step. A key can be both: then it is bright.
- **Under SHIFT the LEDs stay.** The twelve naturals that still play light for their notes, and a key whose screen or state is on lights bright while it lasts, as its only sign: HELP while the help panel is open (2.9), and on TAPE + SHIFT, LOOP while the tape loops and RESET while it is armed (11.8).
- X/Y **has an LED too**, bright while its pad shows, and that is its only sign; the key itself keeps its resting face (15.6).
- **SCALE's lights move** to the foot of the raised circle, under the key's name, so they never meet the LED (3.11.2).



Figure 3.6 The selected step's chord, lit on the keys. A note sounding now lights brighter, with a near-white middle.

3.5 LEAN: tilt to change the sound

LEAN lets you bend a note, or move one control, by tilting the phone while you hold a key. Every factory sound comes with LEAN on. On most of them the tilt bends the pitch, up to a semitone either way; on the DIVINER sounds it works the sound's WHEEL control instead, as a mod wheel would. LEAN belongs to the sound, so each lane's sound has its own LEAN switch and settings, and they are saved with the sound: in the project, in a quick slot and in your USER bank. Load another sound onto the lane and that sound's own LEAN settings come with it. A sound started from an engine's ENGINE DEFAULT row has LEAN off.

3.5.1 Switching LEAN on

To switch LEAN on or off for the focused lane's sound:

01 Press SHIFT + HELP (on TAPE, HELP is the last key of the lower row). The help panel opens in the left window; on SYNTH it takes the picture's place.

02 Press the LEAN cell, the first in the row. It reads `OFF` or `ON`, and each press flips it.

03 The notice line reads **LEAN ON** (or **LEAN OFF**).

04 Press SHIFT + HELP again to put the picture back.

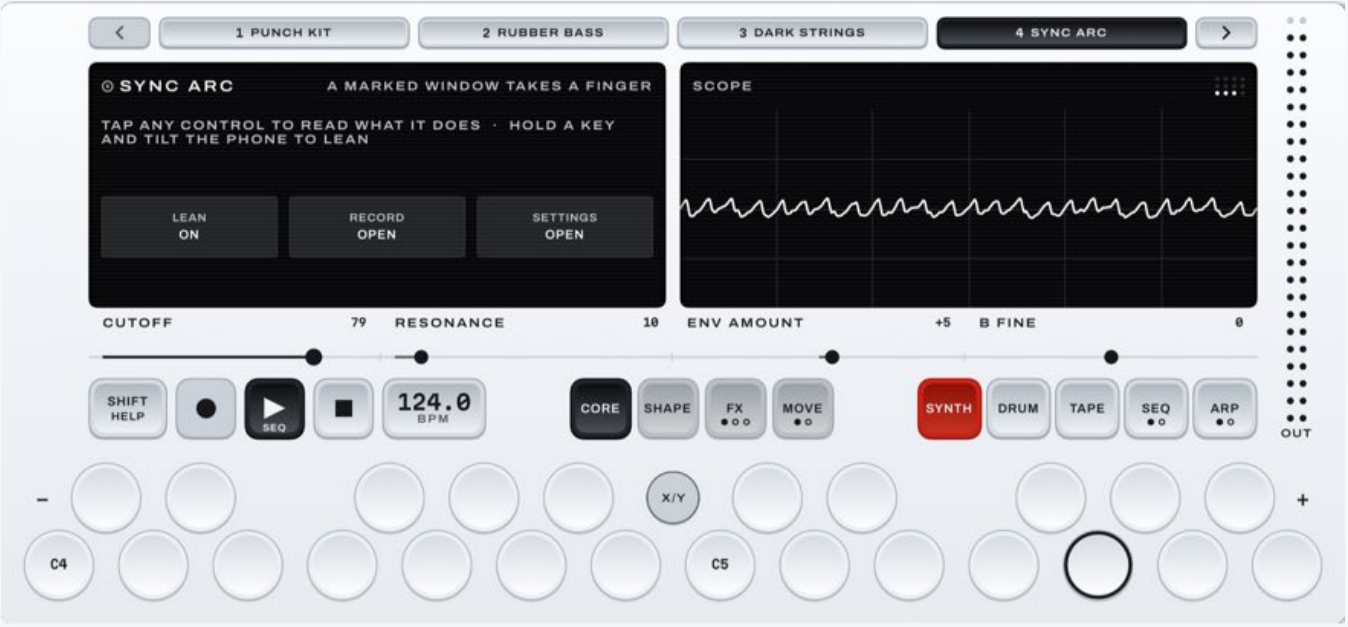


Figure 3.7 The LEAN cell is the first in the help panel. It switches LEAN for the focused lane's sound.

The cell changes the focused lane only. Focus another lane and the cell shows that lane's own setting. On a lane set to EXTERNAL MIDI the cell is hidden: the lane has no sound of its own for LEAN to move.

3.5.2 Playing with LEAN

To lean a note:

01 Hold the phone up in front of you, screen facing you, the way you play it.

02 Press and hold a key. The angle the phone is at right now becomes "level"; you do not need to hold it straight.

03 Turn the phone like a steering wheel. With the starting settings, dipping the right end raises the pitch and dipping the left end lowers it.

04 Let go of the key. The sound springs back to normal over about 0.15 seconds, so LEAN never leaves a sound out of tune.

On SYNTH, a bar labelled **LEAN** appears over the bottom of the picture while you hold a key with LEAN on. A line grows left or right from the middle as you turn, and the number at the right shows the angle in degrees from where you started, `0°`, `+12°`, `−20°` and so on. The line reaches its end at 30 degrees, which is a full lean. The bar does not show while HELP is latched, because the help panel takes the picture's place.

- **A full lean is 30 degrees** either way. Turning further does no more.
- **LEAN works only while a key is held**, on the screen or on a MIDI keyboard. Tilting with no key down does nothing. The pattern, arpeggiator and groove don't start a lean on their own.
- **With several keys held**, "level" is taken when the first goes down and kept until the last one lifts. A one-finger slide lets go of each key before it takes the next, so each note of the run starts level from wherever the phone is at that moment.
- **Lying flat, the phone can't tell a turn**, so LEAN holds still. Hold the phone up.
- **The motion sensor runs only while some lane's sound has LEAN on.**

3.5.3 Where the tilt goes: EDIT's LEAN group

Every sound has four LEAN controls. They live in the LEAN group on EDIT (7.1).

To set what LEAN moves:

01 Press SHIFT + EDIT (the SEQ mode key under SHIFT). EDIT opens on the focused lane's sound.

02 Press MOD, the fourth page key, until the left window's list reaches LEAN. On DIVINER that is the third press (POLY-MOD, WHEEL-MOD, then LEAN); on every other sound and on kits, LEAN is the only group under MOD. You can also tap LEAN in the list.

03 The band now holds the four LEAN controls.

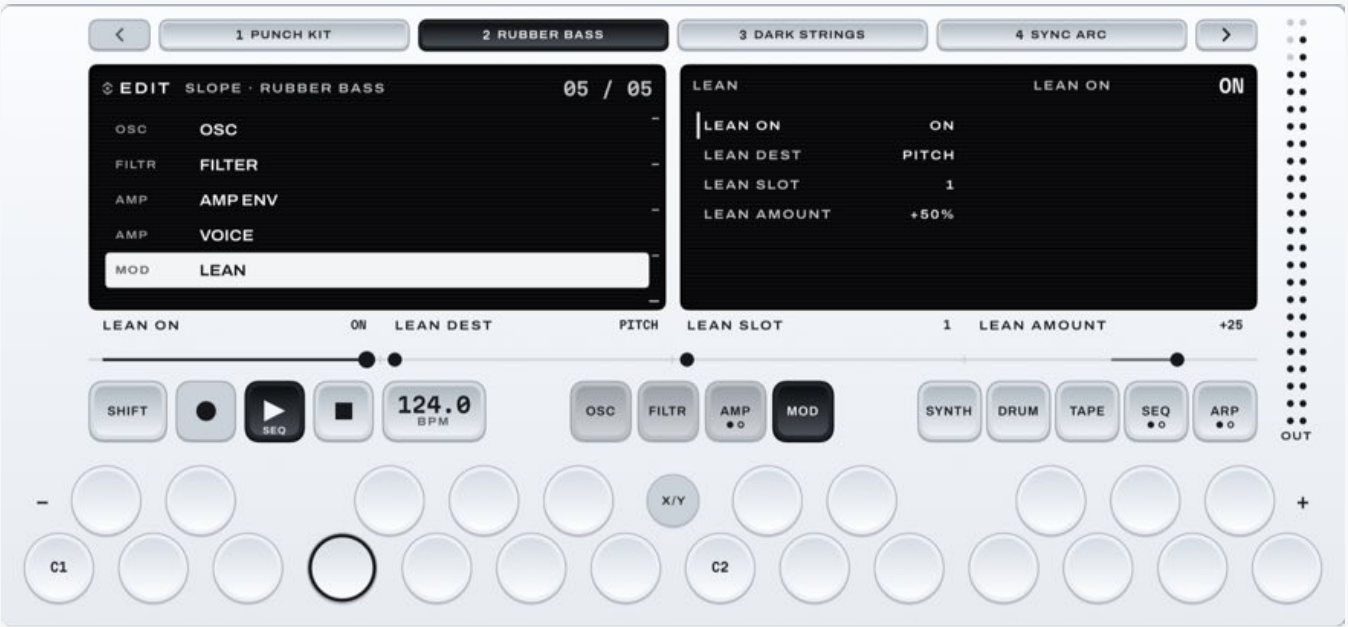


Figure 3.8 EDIT's LEAN group: whether LEAN is on, which page it reaches, which control, and how far. A factory sound arrives with LEAN on.

CONTROL	VALUES	WHAT IT DOES
LEAN ON	**OFF**, **ON**	The same switch as the help panel's LEAN cell. On for every factory sound, off for an ENGINE DEFAULT one.
LEAN DEST	**PITCH**, **CORE**, **SHAPE**, **FX**	Which page the tilt reaches. PITCH bends the note.
LEAN SLOT	**1** to **8**	Which control on that page it moves, counting the band's four and then the four under SHIFT. Ignored when LEAN DEST is PITCH.
LEAN AMOUNT	**−100%** to **+100%**, **+50%** to start	How far a full lean moves it, and which way. A minus amount reverses the direction.

On PITCH, a full lean at **+100%** bends two semitones, so **+50%** bends one. On CORE, SHAPE or FX, a full lean at **+100%** moves the chosen control by up to its whole range, up or down from wherever it is set.

TIP

> The DIVINER factory sounds use LEAN DEST **CORE** with LEAN SLOT **8**, which is the WHEEL control, so dipping the right end brings in what a mod wheel would: vibrato, with DIVINER's WHEEL-MOD settings. With WHEEL at 0%, dipping the left end does nothing.

3.6 Quick slots

Quick slots keep sounds you want close at hand. Under SHIFT, the first seven keys of the upper row are slots `1` to `7`, and slot `8` sits in the gap just after 7, where the upper octave's E and F meet. Tap a slot to load its sound onto the focused lane; hold it to save the lane's sound there. Slot 8 works exactly like the others. On iPad the eight slots sit on the strip above the keyboard, with no SHIFT.

- There are two sets of eight: one for synth sounds and one for kits. A synth lane sees the synth slots and a kit lane sees the kit slots, so a kit can never land on a synth lane.
- **Slots belong to the phone, not to a project.** Every project sees the same sixteen. They are not saved in a project, and iCloud sync does not carry them to another phone or iPad. Deleting the app deletes them. For sounds you want to keep for good, under a name, use your USER bank (5.11).
- **A slot holds the whole sound**: its engine, every control on every page, its effects, its modulator and its LEAN settings. It does not hold the lane's level, mute, patterns, arpeggiator, groove or pad mutes.
- If the sound plays a recording of yours (a SAMPLER patch or a SLICER kit, 12.9), the slot keeps its own copy of the recording, so it still works after the project it came from is gone.

3.6.1 Saving a sound to a slot

To save the focused lane's sound into slot 3:

01 Press SHIFT. The upper row reads 1 to 7, 8 in the gap after 7, then UNDO, DIE and HELP.

02 Press and hold 3. A ring draws itself around the key, clockwise from the top.

03 Keep holding for about 0.6 seconds, until the ring closes. The phone gives a short tap (if Haptics is on, 14.2.3) and the notice line reads SAVED TO SLOT 3.

04 Let go. The key now has its dish, which means it holds a sound.

NOTE

> Saving does not ask first. Holding a slot that already holds a sound replaces it, and there is no undo for a slot.

A lane set to EXTERNAL MIDI has no sound to save: the hold says A MIDI LANE HAS NO SOUND TO SAVE.

3.6.2 Loading a slot

To load slot 3 onto the focused lane, press SHIFT and tap 3, letting go before the ring closes. The lane's sound changes and the notice line reads LOADED SLOT 3. The sound you replaced is gone from the lane unless it is saved somewhere else, so save it first if you want it back. Loading a slot onto a lane set to EXTERNAL MIDI puts that Tonaut sound back on the lane in place of your gear.

A slot that holds nothing is drawn as a well, with its number but no dish. Tapping it loads nothing and the notice line reads NOTHING HERE YET · HOLD TO SAVE. Holding it saves into it as usual. If a slot looks full but its sound can't be read, a tap says SLOT 3 IS EMPTY (with that slot's number).

TIP

> With SHIFT latched you can load slot after slot to compare them, and the layer stays on. With SHIFT held instead, the layer goes the moment you let go.

3.7 DIE: a random page

DIE rolls new values for the page of controls you are looking at: all eight of them, the four on the band and the four under SHIFT. A control with steps lands exactly on one of its steps. A position the page doesn't use is left alone. On EDIT it rolls the group showing instead (up to eight controls), and on an effect's CONTROLS (4.7.3) that effect's eight.

Every press of DIE is a new roll, and UNDO, the key on its left, takes rolls back. To roll a page, and to take it back:

01 Go to the page you want to change, for example SYNTH's CORE.

02 Press SHIFT + DIE (the upper row's second key from the right, between UNDO and HELP). The eight values change at once.

03 Press DIE again for another roll, as many times as you like.

04 Press SHIFT + UNDO to put the eight back exactly as they were before the last roll. Press it again to step further back, up to eight rolls.

With no roll to take back, UNDO is drawn as a well, and a press says NOTHING TO UNDO. On iPad, UNDO is the strip key after DIE. The rolls UNDO can take back are fragile. Any of these drops them all:

- moving any control by hand;
- changing page, lane or EDIT group;
- opening a browser;
- loading a sound, from a browser or a quick slot;
- on a kit lane, choosing another pad, when the page you rolled is one pad's own (6.4.4). A roll of the whole kit's controls keeps its UNDO while you play pads to hear it.

Where DIE works. It is meant for the sound pages: SYNTH, DRUM and EDIT. On SEQ, and on its other places (PATTERN PLAY, PATTERNS and PERFORM), the key is drawn as a well, because SEQ shows patterns, not a sound; pressing it changes nothing and the notice line reads DIE WORKS ON THE SOUND PAGES. On a lane set to EXTERNAL MIDI it is drawn off too and says A MIDI LANE HAS NO SOUND OF ITS OWN. UNDO is drawn off wherever DIE is, and says the same. On TAPE there is no DIE key at all, since SHIFT turns the keyboard into the tool row.

NOTE

> On MIX, ARP, the browsers, Settings, the tempo page, the recorder and the sample editor, DIE is not drawn off. What it changes from those screens is a page of the focused lane's sound that you can't see. Use it on SYNTH, DRUM or EDIT.

3.8 MIDI keyboards and controllers

A MIDI keyboard gives you velocity, pitch bend, a sustain pedal and more keys than the glass has room for. Tonaut listens to every MIDI device connected to the phone at once, over USB or Bluetooth. It can also send MIDI, to play your own synths and drum machines from a lane (3.8.7).

3.8.1 Connecting a USB keyboard

To play Tonaut from a USB MIDI keyboard:

01 Plug a class-compliant USB MIDI keyboard (one that needs no driver) into the phone, through an adapter if your phone needs one. Tonaut can already be running.

02 After about a second the notice line reads **MIDI CONNECTED · *name***, with the name the keyboard gives itself, or **MIDI CONNECTED** alone if it gives none.

03 Play. The keyboard plays the focused lane.

When the last device goes away, the notice line reads **MIDI DISCONNECTED**.

- While any MIDI device is connected, SYNTH's header shows a small **MIDI** mark after the sound's name (2.3.2).
- A keyboard that was already plugged in when Tonaut started gets no notice; the MIDI mark still shows it.
- A device that drops out and comes back within a second gets no notice either. Some hubs and keyboards connect more than once while they start up, and you would otherwise see a string of notices for one device.
- Plugging in a second device while one is connected gets no new notice.

Settings shows what Tonaut sees (14.3). Open it with **SHIFT** + **HELP** (on TAPE, HELP is the last key of the lower row), then the **SETTINGS** cell, and press the **MIDI** page key. The MIDI section's header counts what is connected, such as **1 IN · 0 OUT**, or reads **NONE**. Its rows:

ROW	READS
Bluetooth	**PRESS MIDI**: the way to pair a Bluetooth keyboard (3.8.2). **NOT ALLOWED** or **BLOCKED** if iOS has said no
Input	the name of the first connected device, or **NONE**
MIDI in	**LANE** (every note plays the focused lane) or **BY CHANNEL** (each lane on its own channel) (3.8.8)
Channel	**OMNI**, or **CH 01** to **CH 16**, under LANE (3.8.5)
Lane 1 to **Lane 8**	each lane's channel, **CH 01** to **CH 16**, under BY CHANNEL (3.8.8)
Output	where Tonaut's own MIDI goes: the first output's name, with **+1** and so on for more, or **NONE** (chapter 16)

3.8.2 Bluetooth MIDI

To pair a Bluetooth MIDI keyboard or controller:

01 Open Settings and press the MIDI page key. The cursor lands on the Bluetooth row.

02 While the cursor is in the MIDI section, the band's fourth lane is a BLUETOOTH key. Press it (pressing MIDI again does the same). Apple's Bluetooth MIDI list opens over the panel.

03 Tap your keyboard in the list, then close the list (14.3.1).

Once it is connected it plays like a USB keyboard. If iOS has not allowed Tonaut to use Bluetooth, the press says ALLOW BLUETOOTH IN THE SETTINGS APP instead, and the Bluetooth row reads NOT ALLOWED.

3.8.3 What a MIDI keyboard plays

- **The focused lane.** Change the focus and the next note goes to the new lane. A note you are holding when the focus changes keeps sounding on its old lane until you release it; this is the opposite of the screen keys, which let go at once (3.1.5). That is MIDI in's **LANE** setting, the one Tonaut starts with; with **BY CHANNEL**, each lane plays the notes on its own channel instead (3.8.8).
- **Every note, at its own pitch.** The screen keyboard's octave (3.2) does not apply. A MIDI keyboard reaches the sound's whole range.
- **LOCK and CHORDS.** The KEY page's rules apply to a MIDI keyboard as to the screen keys, in both MIDI in settings, with each lane's own key and scale: with LOCK on, a note outside the scale plays the nearest one in it, and with CHORDS on, one key plays a chord (3.11). With CHORD PAD on, the white keys play the pad's seven chords and the wheels and black keys move its stick (3.12.7).
- **Pads on a kit lane**, through the map in 3.3.2.
- **Velocity.** How hard you strike reaches the sound. On most sounds a harder note is louder; what else it changes depends on the sound. On DIVINER, the VELOCITY control in EDIT's VOICE group sets how much a soft note also darkens the filter (7.6.6). The Expression modulator can send velocity to any control (4.8).
- **The arpeggiator, the GROOVE and SEQ's live recording** hear MIDI notes exactly as they hear the screen keys (9.1, 9.5, 8.8). A MIDI note can start a SEQ take that waits for the first note. On SEQ, a MIDI key also writes its note into the selected cell, as a key on the glass does (8.3), and SEQ's STEP REC takes MIDI notes step by step (8.8.8). LEAN counts a held MIDI key too, and a take on TAPE records what you play from MIDI like anything else you play.
- **The keys light.** Each key you hold lights its key on the screen (3.4.1).
- **A held note keeps its channel.** Listening on OMNI, a note you hold belongs to the channel that started it: the same note arriving on another channel, from a controller's pads or its own arpeggiator, can't restart it or cut it short.

3.8.4 What Tonaut reads

MESSAGE	WHAT IT DOES
Note on and note off	Plays the focused lane, with velocity, or under BY CHANNEL the lanes listening on its channel. A note on with velocity 0 counts as a note off.
Pitch bend	Bends the focused lane by up to the sound's **BEND** range either way: 0 to 24 semitones, 2 on a new sound. BEND is on SHAPE under SHIFT (4.6); on a kit lane it is on KEY under SHIFT (6.5).
Sustain pedal (CC 64)	Holds the notes you play on the MIDI keyboard after you lift. Down is any value of 64 or more. It does not hold notes played on the screen.
Mod wheel (CC 1)	Nothing on its own. Each becomes a source for the Expression modulator (3.8.6).
Breath (CC 2)	
Expression (CC 11)	
Channel pressure and polyphonic pressure (aftertouch)	
All sound off (CC 120) and all notes off (CC 123)	Stops every note on every lane at once, whoever started it: you, MIDI or the sequencer. It also lets go of the sustain pedal. The transport keeps running, so a playing pattern's next step still sounds.
Start, Continue and Stop	Only with **Transport** on the tempo page set to **IN** or **BOTH** (3.9.4): Start or Continue presses **PLAY** on the screen you're on, and Stop presses **STOP**. Otherwise they are ignored.

With polyphonic pressure, Tonaut uses the strongest pressure among the keys you are holding.

Not read: program change (it does not switch sounds or slots), SysEx (SysEx voice files come in as files instead, 5.11.4), MIDI clock and song position (Tonaut always keeps its own tempo, 3.9.4), and every control change not in the table.

3.8.5 The MIDI channel

Out of the box Tonaut listens on every channel (**OMNI**) and plays the focused lane. To listen to one channel only:

01 Open Settings: **SHIFT** + **HELP**, then the **SETTINGS** cell.

02 Press the **MIDI** page key. The cursor lands on Bluetooth.

03 Move **CURSOR** down three rows to Channel (or tap the row).

04 Drag **VALUE** to choose **CH 01** to **CH 16**, or all the way back for **OMNI**.

On a single channel, Tonaut ignores everything on the other fifteen: notes, bend, pedals and the rest.

NOTE

> The channel is not remembered. Each time Tonaut starts it listens on OMNI again.

Channel belongs to MIDI in's **LANE** setting. Under **BY CHANNEL** it is drawn off, because each lane has a channel of its own instead (3.8.8).

3.8.6 Wheel, pressure, breath and expression

These four controllers reach a sound through its modulator. To make the mod wheel move a control:

01 On SYNTH, with SHIFT off, press MOVE, then press it again. The MODULATOR list opens.

02 Tap the Expression row, or drag the list until the cursor is on it. It goes onto the sound at once.

03 Press MOVE again to go back to the MOVE page. The band reads **SOURCE**, **AMOUNT**, **DEST** and **SLOT**.

04 Set **SOURCE** to **WHEEL**. The other sources are **VELOCITY** (where a new Expression starts), **PRESSURE**, **BREATH** and **EXPRESSION**.

05 Set **DEST** and **SLOT** to the control you want, and **AMOUNT** to how far. 4.8 has the details.

A sound has one modulator, so one of these sources at a time. Choosing Expression replaces whatever modulator the sound had, an LFO for example, and its settings are lost. The X/Y pad's up-and-down moves the same mod wheel, so a sound set up this way answers the pad too (15.6).

TIP

> DIVINER has its own WHEEL control (WHEEL-MOD group on EDIT). Every DIVINER factory sound comes with the Expression modulator on **WHEEL**, DEST **CORE** and SLOT **8**, so your mod wheel reaches WHEEL straight away.

3.8.7 A lane that plays your own gear

A lane set to EXTERNAL MIDI plays a synth or drum machine connected to the phone, on a MIDI channel of its own, instead of a Tonaut sound. Choose an EXTERNAL row in PATCHES for a synth or in KITS for a drum machine (5.13). From then on everything that plays the lane goes out to the gear: the screen keys, a MIDI keyboard, the lane's pattern, and its arpeggiator or groove.

- A lane from PATCHES plays notes, with − and + moving its octave as on any synth lane.
- A lane from KITS keeps its 24 pads, and each pad sends its own drum note.
- LEAN, DIE, the X/Y pad and saving to a quick slot have no sound to work on there, and say so.
- LOCK and CHORDS work on a lane from PATCHES as on any synth lane, and your gear gets every note they play (16.4). A lane from KITS ignores them, like any drum lane.

Channels, MIX on a MIDI lane, all notes off, MIDI delay, Transport and clock out, and why a MIDI lane isn't recorded to tape are all in chapter 16.

3.8.8 MIDI in: LANE or BY CHANNEL

The **MIDI in** row in Settings decides where incoming notes go:

- **LANE**, the setting Tonaut starts with: every note plays the focused lane, as this section describes, and **Channel** chooses which channels Tonaut hears.
- **BY CHANNEL**: each lane listens on a channel of its own, whichever lane is focused. Out of the box lanes 1 to 8 listen on channels 1 to 8. Change any of them on the **Lane 1** to **Lane 8** rows, **CH 01** to **CH 16**.

BY CHANNEL is for a keyboard with split zones, a sequencer or another app that plays several parts at once: each part plays its own lane. Everything on a channel goes to its lanes, the pedal, bend and pressure included. Two lanes set to the same channel both play it, layered. A channel no lane listens on is ignored, and in a six-lane project lanes 7 and 8 hear nothing. All notes off (CC 120 or 123) still stops every lane.

Under BY CHANNEL the screen keys light, and SEQ's step entry hears, only a note that reaches the focused lane. Changing MIDI in, or any lane's channel, ends every note the MIDI keyboard is holding. Both settings belong to the phone, not the project, and are kept when you close Tonaut. 14.3 has the Settings rows.

3.9 Tempo

The tempo is the speed of the whole instrument: patterns, the arpeggiator, the groove, the metronome and every effect that keeps time. It is set per project, from 40 to 300 beats per minute (BPM), and a new project starts at 120.

The tempo key sits in the button row between STOP and the page keys. It shows the tempo to one decimal place, **120.0**, over the word BPM. It has three jobs:

PRESS	WHAT IT DOES
tap	Turns the metronome (the click) on or off (3.9.2).
hold, about 0.6 seconds	Opens the tempo page (3.9.1).
SHIFT + tap	TAP TEMPO: tap the beat and Tonaut sets the tempo from your taps.

A tap turns the metronome on or off. The key lights while the metronome is on, and the notice line reads CLICK ON or CLICK OFF. It is the same switch as Metronome on the tempo page and CLICK on SEQ, so all three always agree. The tap counts when you lift your finger, so a hold never turns the metronome over.

TAP TEMPO. Under SHIFT the word under the digits changes from **BPM** to **TAP TEMPO**, and the key is not lit for the metronome. To tap a tempo:

01 Press **SHIFT**. The key reads **TAP TEMPO** under the digits.

02 Tap the key on the beat. The first tap has nothing to measure yet, so the notice line reads **TAP AGAIN**.

03 Tap again. The digits change to the tempo of your two taps.

04 Keep tapping. Each tap refines it, averaging your last four gaps (five taps).

- A tap counts the moment your finger lands, not when you lift.
- Wait more than two seconds and the next tap starts a new count.
- Changing lane or page, or leaving the app, also starts a new count.
- The result is kept to one decimal place and held between 40 and 300.
- It works while the music plays, and the new tempo applies at once.

3.9.1 The tempo page

The tempo page holds the tempo, the metronome, the count-in, how the tape follows the tempo, and how Tonaut keeps time with MIDI gear.

To open it, hold the tempo key for about 0.6 seconds. Holding **SHIFT** + the tempo key (**TAP TEMPO**) opens it too. SHIFT drops when it opens, and no mode key is lit while it shows.

NOTE

> Under SHIFT a hold starts as a tap, so you may see **TAP AGAIN** for a moment as the page opens. If you tapped the key under SHIFT in the last two seconds, the hold's touch counts as one more tap and sets a tempo. Hold it without SHIFT and it never does.

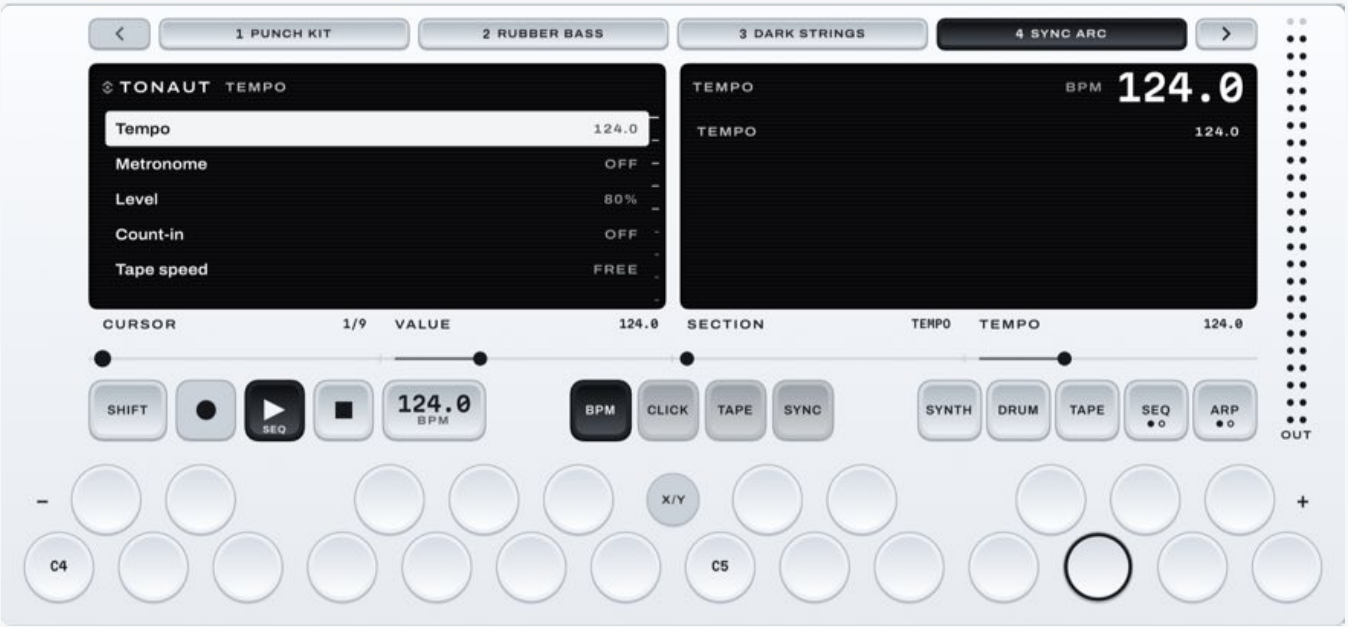


Figure 3.9 The tempo page: the list on the left, the section the cursor is in on the right, with the tempo in large digits.

The left window is a list, headed **TONAUT** and **TEMPO**. The right window shows the section the cursor is in, the section's state and the tempo in large digits.

SECTION	ROW	VALUES	TO START	KEPT BY
TEMPO	**Tempo**	40.0 to 300.0	120.0	the project
CLICK	**Metronome**	`ON`, `OFF`	OFF	the project
	Level	0% to 100%, in tens	80%	the project
	Count-in	`OFF`, `1 BAR`, `2 BARS`, `3 BARS`, `4 BARS`	1 BAR	the project
TAPE	**Tape speed**	`FOLLOWS`, `FREE`	FREE	the project
SYNC	**Source**	nothing to choose (3.9.4)		
	Clock out	`ON`, `OFF`	ON	the phone
	Transport	`OFF`, `OUT`, `BOTH`, `IN`	OUT	the phone
	MIDI delay	`−50 MS` to `+50 MS`, a millisecond a step	0 MS	the phone

The first five rows are saved with the project. Clock out, Transport and MIDI delay are about the gear plugged into the phone, so they belong to the phone and stay the same whichever project is open.

The band.

LANE	WHAT IT DOES
CURSOR	Moves through the nine rows. It reads the row number, `1/9` to `9/9`.
VALUE	Changes the row at the cursor. On Source it is drawn off and reads `––`.
SECTION	Jumps the cursor to the first row of TEMPO, CLICK, TAPE or SYNC.
TEMPO	Sets the tempo from any row, in whole BPM from 40 to 300.

The band has nothing under SHIFT here. You can also tap a row, or drag in the list, to move the cursor.

The page keys jump the cursor to a section:

KEY	JUMPS TO
BPM	TEMPO
CLICK	CLICK (Metronome, Level, Count-in)
TAPE	TAPE (Tape speed)
SYNC	SYNC (Source, Clock out, Transport, MIDI delay)

To close the tempo page, hold the tempo key again, or press any mode key, which takes you to that screen. A SHIFT door (a browser, MIX, EDIT) closes it too. The keyboard keeps playing the focused lane the whole time the page is open.

TIP

> Tap tempo (SHIFT + the tempo key) works on this page too, and the large digits follow your taps. A tapped tempo can have a decimal, **121.4**; moving the TEMPO lane sets a whole number. A tap on the tempo key without SHIFT turns the metronome on or off here as anywhere, and the Metronome row follows.

3.9.2 Metronome and count-in

With **Metronome** on, Tonaut clicks on every beat while the transport runs (PLAY lit), when you play and when you record alike. The first beat of every four has a higher click, so you can hear where the bar starts. The quickest way to turn it on or off is a tap on the tempo key, which lights while it is on (3.9). **Level** sets how loud the click and the count-in are. At 0% both are silent.

Count-in plays one to four bars of clicks before a recording starts, four clicks a bar. A new project counts in one bar, and the count-in belongs to the metronome: with the metronome off, nothing counts in, whatever Count-in says. It applies only when the metronome is on and a play starts with something armed to record into:

- on TAPE, REC then PLAY (11.3);
- on SEQ, REC then PLAY (8.8);
- on the recorder, recording the input to tape (12.5.2).

A plain PLAY with nothing armed starts at once, metronome or not: playback never counts in. A SEQ take started by its first note, rather than by PLAY, has no count-in either. Set Count-in to **OFF** to record with the metronome on and no count-in.

These are the same settings as COUNT-IN, CLICK and CLK LEVEL on SEQ's BAR page under SHIFT (8.7.2), and Count-in is the recorder's COUNT too. Change one place and the others follow.

3.9.3 Tape speed: FOLLOWS or FREE

This decides what a tempo change does to the tape.

- **FREE** (new projects): the tape plays at its own speed, set on TAPE, whatever the tempo.
- **FOLLOWS**: the tape's speed follows the tempo, measured against the tempo the tape was first recorded at. Raise the tempo and the tape plays faster and higher, like speeding up a real tape machine. Lower it and it plays slower and lower.

The section header on the right reads the choice. 11.15 has more on speed and tempo.

3.9.4 SYNC

Tonaut always keeps its own tempo. The SYNC section's header reads INTERNAL, and its first row, **Source**, has nothing to choose. MIDI clock coming in from other gear doesn't change Tonaut's tempo, and neither does another app.

The other three rows are for MIDI gear plugged into the phone:

- **Clock out** `ON` sends Tonaut's tempo as MIDI clock, so a drum machine or sequencer can follow it.
- **Transport** decides what PLAY and STOP share with your gear: `OUT` sends Start and Stop, `IN` lets the gear's Start and Stop play and stop Tonaut, `BOTH` does both, and `OFF` neither. Tonaut keeps its own tempo in every case.
- **MIDI delay** sends everything Tonaut plays over MIDI up to 50 milliseconds earlier or later, to line your gear up with Tonaut's own sounds.

Chapter 16 covers all three in full.

3.10 PERFORM and the X/Y pad

Two more ways to play while the song runs have a chapter of their own (chapter 15):

- **PERFORM** gives every lane two faders, TONE for darker or brighter and SPACE for drier or wetter. To open it, go to SEQ and press SEQ again (15.1). Nothing you do there changes a saved sound, and STOP puts every sound back as it was, unless KEEP is lit (15.4).
- **The X/Y pad** takes the right-hand window while X/Y, the key in the middle gap of the keyboard's top row, is lit. Drag across to bend the pitch, and up or down to move the mod wheel, or the brightness on a sound that doesn't use the wheel (15.6). It works on SYNTH, DRUM, TAPE and ARP, and plays the focused lane while your other hand plays the keys.

3.11 Scales and chord mode: the KEY page

KEY sets the key a lane plays in and how its keys play in it. Choose a root note and a scale, and the keys of that scale light up on the keyboard. Turn LOCK on and every note you play stays in the scale. Turn CHORDS on for a lane and each key plays a whole chord. The keyboard's layout never changes: KEY changes what lights and what sounds, not where the keys are. For seven chord keys and a stick in the keyboard's place, turn on CHORD PAD (3.12).

3.11.1 Opening KEY

KEY is ARP's second place. To open it:

01 Press ARP. The ARP screen opens, or GROOVE on a kit lane (chapter 9).

02 Press ARP again. The left window's header reads KEY and the lane, such as LANE 3, and the band reads KEY, SCALE, LOCK and CHORDS.

The ARP key wears two dots under its name, one for each place, and the filled one shows where you are (2.5.1). Press it again to go back to the arpeggiator. Going to any other mode leaves KEY, so the next press of ARP opens the arpeggiator again.

- **The page keys are still the lanes**, LANE 1 and on (9.2.1). Press one, or tap a lane button, and you stay on KEY with that lane focused, its own key, scale, LOCK and CHORDS on the band.
- **The right window is LANES**, as on ARP (9.2.3).
- **The keyboard plays the focused lane** the whole time, so you can hear a scale or a chord while you set it.
- **On iPad** KEY's eight controls sit in one row in place of ARP's, so none of them needs SHIFT (chapter 17).

Every control on KEY belongs to the focused lane. **Each lane has its own key, scale and LOCK**, so one lane can play in C major while another plays in A minor, and changing one lane's key leaves the others where they are. A project made with an earlier version of Tonaut opens with every lane in the key the project had.

To keep every synth lane in one key instead, use Settings › CHORD PAD (14.11). Three of its settings are each **PER LANE**, the setting Tonaut starts with, or **ALL SYNTH**: **Key** (KEY, SCALE and LOCK), **Chords** (CHORDS) and **Chord pad** (CHORD PAD, 3.12). On ALL SYNTH, changing that setting on one synth lane changes it on every synth lane; switching to ALL SYNTH copies the focused lane's to the others. Drum lanes always keep their own, and so do lanes playing your own gear (3.8.7), except that with Key on ALL SYNTH a key you set while such a lane is focused goes to it as well as to every synth lane.

There is a quicker way in from SYNTH, and back. On a synth lane, hold or latch SHIFT and tap KEY, the second page key (3.12.1):

- **The KEY page opens on its first four controls**, KEY, SCALE, LOCK and CHORDS, with SHIFT let go, so you can choose a key straight away. The notice line reads KEY · PICK A KEY AND SCALE · TAP KEY AGAIN TO GO BACK.
- **The chord keys stay** on the page keys in place of the lanes: CHORD, KEY (lit), STRUM and BASS, and they keep working, so you can set the scale and the chord mode in one place. SHIFT here still shows TYPE, 7THS, LEARN and CHORD PAD, with the same four page keys.
- **Tap KEY again** to go back to SYNTH, on the page you left, with SHIFT latched again if it was. The line says where you are, such as BACK TO SYNTH CORE · KEY C MAJ.
- **Any mode key** leaves the KEY page the usual way.

CONTROL	LAYER	VALUES	A NEW PROJECT STARTS AT	BELONGS TO
KEY	band	C, C♯ or D♭, D ... B: the root, the note the scale starts on, spelt for the key (3.11.2)	C	the lane
SCALE	band	OFF and twelve scales (3.11.2)	OFF	the lane
LOCK	band	OFF, ON (3.11.3)	OFF	the lane
CHORDS	band	OFF, ON (3.11.4)	OFF	the lane
TYPE	SHIFT	MAJ, MIN, 7, MAJ7, MIN7, SUS2, SUS4, POWER, MEM	MAJ	the lane
7THS	SHIFT	OFF, ON	OFF	the lane
LEARN	SHIFT	a key, not a slider (3.11.5)		the lane
CHORD PAD	SHIFT	OFF, ON (3.12)	OFF	the lane

The header's right side shows the control you touched last and its value, such as SCALE MINOR.



Figure 3.10 KEY: the lane's scale on the left, the chord the last key played named under it, and on the band the lane's root, scale, LOCK and CHORDS.

A control that has nothing to do is drawn off, and a tap on it says why in the notice line:

CONTROL	DRAWN OFF WHEN	A TAP SAYS
LOCK	SCALE is **OFF**	CHOOSE A SCALE FOR LOCK TO KEEP TO
TYPE	a scale is set	WITH A SCALE THE CHORDS FOLLOW THE KEY
7THS	SCALE is **OFF**	7THS IS FOR CHORDS IN A SCALE
CHORDS, **TYPE**, **7THS**, **LEARN**, **CHORD PAD**	the focused lane holds a kit, or plays a drum machine	A DRUM LANE PLAYS NO CHORDS

3.11.2

KEY and SCALE: lighting the keys

KEY is the root, the note the scale starts on. **SCALE** chooses the scale. The band shortens the longer names; the left window spells them out with the root, such as D HARMONIC MINOR.

Key and chord names are spelt the way the key is written, with the real ♯ and ♭: sharps in a sharp key and flats in a flat one, so the sixth note of D minor is **B♭**, not A♯, and the third of E major is **G♯**. With no scale, a black-note root reads as a flat, such as **E♭**. KEY on the band, the left window, the chord pad's keys (3.12.3) and SYNTH's **KEY** under SHIFT (3.12.1) all spell them this way. Note names elsewhere, on the keys and in SEQ's cells, keep the plain sharp, as in **C#4**.

SCALE READS	THE WINDOW SAYS	ITS NOTES, WITH C AS THE KEY, AS THE WINDOW SPELLS THEM
OFF	NO SCALE	no lights, no LOCK, and chords by TYPE
MAJOR	MAJOR	C D E F G A B
MINOR	MINOR	C D E♭ F G A♭ B♭ (natural minor)
DORIAN	DORIAN	C D E♭ F G A B♭
PHRYG	PHRYGIAN	C D♭ E♭ F G A♭ B♭
LYDIAN	LYDIAN	C D E F♯ G A B
MIXO	MIXOLYDIAN	C D E F G A B♭
LOCRI	LOCRIAN	C D♭ E♭ F G♭ A♭ B♭
H.MIN	HARMONIC MINOR	C D E♭ F G A♭ B
M.MIN	MELODIC MINOR	C D E♭ F G A B (the rising form)
MAJ.P		C D E G A

	MAJOR PENTATONIC	
MIN.P	MINOR PENTATONIC	C E♭ F G B♭
BLUES	BLUES	C E♭ F G♭ G B♭

With a scale set, every key whose note is in the scale carries a small round light above its middle, in the same ink as its legend. The root's light is larger and brighter. In the TN looks it sits at the foot of the key's raised circle, under the key's name, clear of the LED (3.4.2). The lights follow the focused lane's own scale, on every screen with a keyboard, and on iPad's 32 keys too.

- **They show where the notes are, not what a key can do.** Every key still plays its own note unless LOCK is on, and the lights look the same with LOCK on or off.
- **They are not the rings.** A ring, or in the TN looks a lit LED, means a note is playing now (3.4); a light stays put. A pressed key keeps its light, in the pressed key's ink.
- **Only note keys light.** Under SHIFT the quick slots, UNDO, DIE, HELP and the two end keys carry none, and neither do –, X/Y and +.
- **A drum lane shows none.** Its keys are pads, and SCALE and LOCK leave it alone.

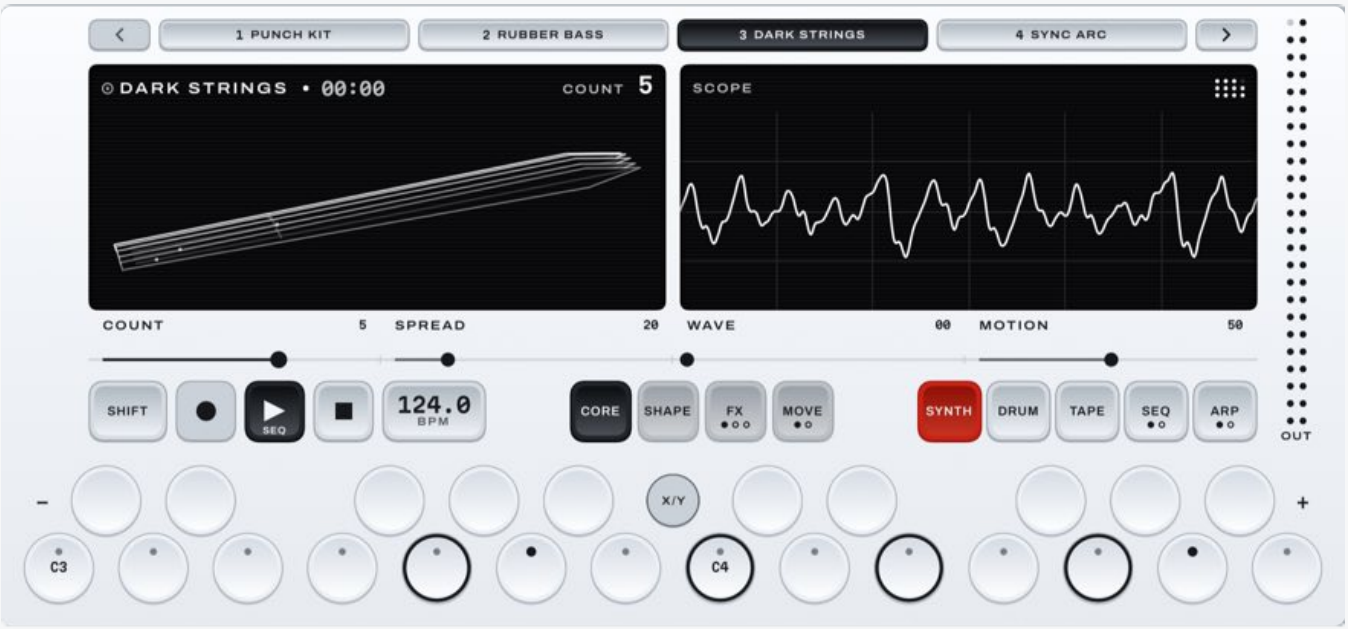


Figure 3.11 A minor on the keys: a small light on each note of the scale, a larger one on each A. Every key still plays.

3.11.3 LOCK: staying in the key

LOCK ON moves every note you play to the nearest note of the scale. A key already in the scale plays its own note. A note exactly halfway between two scale notes goes down: in D minor, the black keys outside the scale each play the white note just below them (the one between C and D plays C), and B plays B♭.

LOCK reaches every note a hand plays on the lane:

- the screen keys;
- a MIDI keyboard, with MIDI in set to LANE or BY CHANNEL (3.8.8);
- SEQ's step entry: the cell gets the note you heard, not the key you pressed (8.3);
- the arpeggiator, which holds the moved notes (chapter 9);
- MIDI out: a lane playing your own synth sends the moved note (16.4).

It never rewrites anything already recorded. A pattern plays the notes it holds, LOCK or not, and changing the scale later changes no pattern and no take. Drum lanes ignore it.

- **Two keys on one note share it.** In D minor, C and the black key above it both play C: hold C and then press that black key, and the C already sounding is not struck again. It stops when the last key holding it lets go.
- **A held key ends what it started.** Change SCALE, LOCK or CHORDS while you hold a key and that key still stops the notes it began with when you lift it, so nothing is left hanging.

3.11.4 CHORDS: one key, a whole chord

CHORDS ON makes each key of the focused lane play a chord built on its note. It is set lane by lane: switch it on for a pad or keys lane and leave the bass and lead lanes playing single notes. What the chord is depends on SCALE.

With a scale set, the chords follow the key. A key plays its own note and every second note of the scale above it: three notes, a triad, or four with 7THS ON. So in D minor the seven notes of the scale play D minor, E diminished, F major, G minor, A minor, B♭ major and C major, the chords a song in D minor is made of.

- A key outside the scale, with LOCK off, stacks the same way from its own note: in D minor, the black key above C plays its own note with E and G. With LOCK on the key moves into the scale first, then the chord is built on that note.
- Pentatonic and blues scales follow the same rule: in C major pentatonic, C plays C, E and A.
- TYPE is drawn off while a scale is set.

With SCALE OFF, TYPE chooses the chord, and every key plays that shape from its own note:

TYPE	PLAYS, FROM C
MAJ	C E G, a major triad
MIN	C D# G, a minor triad
7	C E G A#, a dominant seventh
MAJ7	C E G B
MIN7	C D# G A#
SUS2	C D G
SUS4	C F G
POWER	C G C: the root, the fifth and the octave
MEM	the shape the lane learnt with LEARN (3.11.5)

7THS is drawn off without a scale.

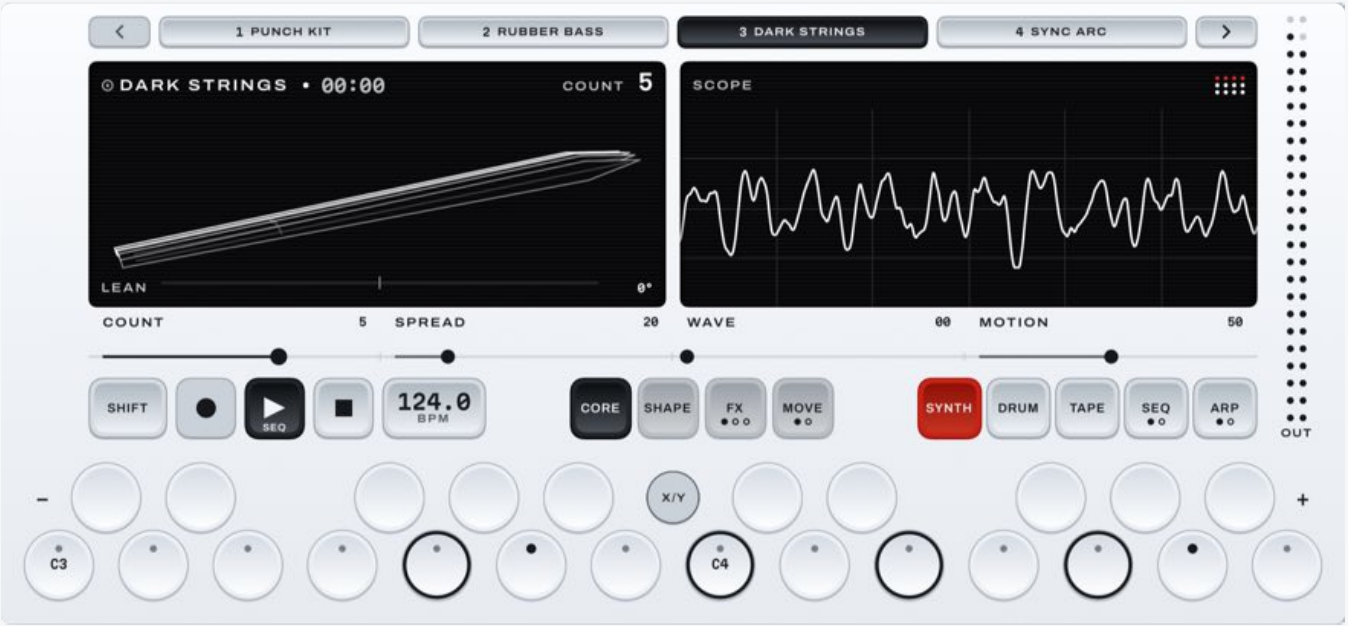


Figure 3.12 One key, a whole chord: with CHORDS on in A minor, A3 plays A, C and E. The LEAN line at the foot of the window shows a key is down.

- **The key you press is the one that fills.** The other notes of the chord sound without lighting a key; the KEY page's window names them all (3.11.6).
- **How many notes sound depends on the sound**, as for a chord of fingers (3.1.2): a sound set to play one note at a time plays one.
- **The lane keeps its CHORDS** when you load another sound onto it, as it keeps its arpeggiator. A kit lane plays no chords: CHORDS and its three SHIFT controls are drawn off there.
- **CHORDS is not the arpeggiator's MODE `CHORD`**, which repeats the notes you hold in rhythm (9.3.3). The two work together: CHORDS gives the arpeggiator a chord from one key (9.9).

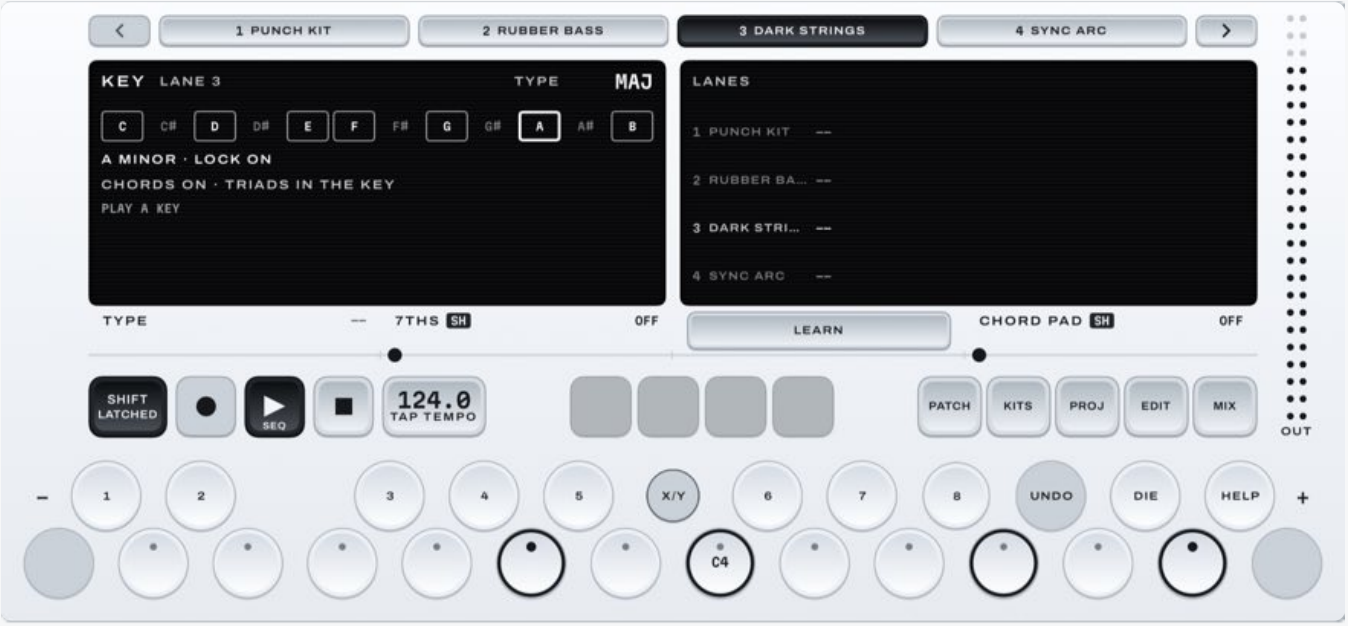


Figure 3.13 KEY's second layer. With A minor set, TYPE is off and 7THS is live; LEARN is a key, and CHORD PAD switches the lane's chord pad (3.12).

3.11.5 LEARN and MEMORY: a chord of your own

LEARN keeps the shape of a chord you play as the lane's MEMORY. With TYPE on **MEM**, every key then plays that shape from its own note. LEARN latches: press it first, then play the chord. To teach a lane a chord on iPhone:

01 On KEY, set SCALE to **OFF**. MEMORY is a TYPE, and TYPE is for playing without a scale.

02 Hold SHIFT and press LEARN. LEARN lights, and the notice line and the left window read **LEARN · PLAY A CHORD, THEN LET GO**.

03 Let go of SHIFT. The band and the keyboard go back to their first layer, so all 24 keys play notes again, the upper row and the two end keys included. (If SHIFT was latched, tap it once to drop it.)

04 Play the chord: two to eight keys, on the screen or on a MIDI keyboard. You can roll it, one key after another; every key you press counts until the last one comes up.

05 Let go. When the last key comes up, the notice line reads, for a three-note chord, **LEARNT 3 NOTES · MEMORY ON**, and TYPE reads **MEM**.

06 Switch **CHORDS** on if it isn't, and play: every key plays your shape.

- **The shape is counted from its lowest note** and can span up to 31 semitones, about two and a half octaves.
- **One key teaches nothing.** If you play a single key and let it go, the line reads **LEARN NEEDS TWO OR MORE KEYS**, LEARN goes out and MEMORY stays as it was. Press LEARN again to have another go.
- **To cancel, press LEARN again** before you play: the line reads **LEARN CANCELLED**. Focusing another lane, leaving KEY or opening a project cancels it too.
- **A chord you are already holding is learnt at once.** Hold the keys first, on a MIDI keyboard for example, and press LEARN: it takes them straight away.
- **LEARN takes the keys you hold, not the chords they play.** With CHORDS on, each key you hold plays a chord, but it is the keys that are learnt.
- **Each lane has one MEMORY.** Learning again replaces it. It is saved with the project.
- With TYPE on **MEM** and nothing learnt yet, a key plays its own note, and the window reads **CHORDS ON · MEMORY EMPTY, LEARN ONE**.

On iPad LEARN sits in KEY's row with no SHIFT: press it, then play the chord and let go, as above.

3.11.6 The left window

KEY's window shows the scale, how a key plays on this lane, and what you played last. From the top:

- **The twelve notes**, C to B, spelt for the key (3.11.2). The scale's notes are bright and outlined, the root boxed with a heavier line, and the rest dim. With no scale all twelve are dim.
- **The scale and LOCK**, such as **D MINOR · LOCK ON** or **D MINOR · LOCK OFF**, or **NO SCALE**.

- **How a key plays on this lane**, one of:
  - `CHORDS OFF · ONE KEY, ONE NOTE`
  - `CHORDS ON · TRIADS IN THE KEY`, or `CHORDS ON · SEVENTHS IN THE KEY` with 7THS on
  - `CHORDS ON · MIN7` and the like: the TYPE, with no scale
  - `CHORDS ON · MEMORY 0 4 7`: the learnt shape, in semitones above its lowest note
  - `CHORD PAD · THE 7 CHORDS OF C MAJOR` with CHORD PAD on (3.12.3)
  - `A DRUM LANE PLAYS NO CHORDS` on a kit lane
- **The last key you played on the screen**: the chord's name and its notes, such as `D MIN · D4 F4 A4`, or `PLAY A KEY` before you have played one. A shape with no common name shows its notes alone. The names count from the lowest note: MAJ, MIN, DIM, AUG, 7 (as in G7), MAJ7, MIN7, HALF DIM, DIM7, MIN MAJ7, SUS2, SUS4, and 5 for a root and fifth (as in C5). This line follows the screen keys; a MIDI keyboard's notes don't change it. The chord's name is spelt for the key and its notes as the keys name them, so in D minor the sixth chord reads `B♭ MAJ · A#3 D4 F4`. A kit lane has no such line.

3.11.7 With the arpeggiator, SEQ and MIDI

LOCK and CHORDS change a key into its notes before anything else hears it, so everything that listens to your playing gets those notes:

- **The arpeggiator** holds the chord's notes, so one key with ARP on is an arpeggio of the whole chord, in every MODE (9.9). With LOCK on it holds the moved notes.
- **SEQ's live recording** records every note that sounded (8.8), so a recorded chord is ordinary notes you can edit.
- **SEQ's step entry** writes what the key plays (8.3): a CHORDS key puts its whole chord into the cell as one UNDO step, and pressing the same key on the cell again takes the chord out. LOCK writes the moved note, and LATCH writes the chord too (8.5). A MIDI keyboard writes the same way, and SEQ's STEP REC takes a CHORDS key's whole chord as one step (8.8.8).
- **A MIDI keyboard** plays chords and keeps to the scale like the screen keys, in both MIDI in settings (3.8.3). Its keys light only themselves (3.4.1).
- **MIDI out** sends every note of a chord, and LOCK's moved note, to your gear (16.4).

The notes a pattern plays go straight to the sound: they are never moved by LOCK or turned into chords, so a pattern sounds the same whatever KEY says.

3.11.8 What is saved and shared

- **KEY, SCALE, LOCK, CHORDS, TYPE, 7THS and MEMORY are saved with each lane**, in the project, and so are CHORD PAD, STRUM and BASS (3.12.8). A new project starts with no scale on any lane. They belong to the lane, not the sound: loading another sound keeps them, a lane swap takes them along (2.12), and a quick slot or a USER sound doesn't hold them.
- **A song you share** (13.13) that uses LOCK with a scale, or CHORDS on a synth lane, or lanes in different keys, needs version 1.1 or later to open: an older Tonaut says UPDATE TONAUT TO OPEN IT. A song with a scale only for its lights, or with CHORDS set up but off, opens on an older version without them.

> NOTE
>
> If your other iPhone or iPad runs an older version of Tonaut, update it too. Through iCloud sync (14.9) it opens the project without its scale and chords, with every lane in one key, and if you save it there, they are gone.

3.12 CHORD PAD: seven chords and a stick

CHORD PAD puts seven chord keys and a stick where a synth lane's keyboard was. The keys play the seven chords of the lane's key and scale, so nothing you press is out of key. The stick changes the chord while you play it: push up for a seventh, to the side for a suspended chord, down to turn major into minor. Play it with two hands, a thumb on the stick and your fingers on the keys.

3.12.1 SYNTH's chord keys: CHORD, KEY, STRUM and BASS

On SYNTH, on a synth lane, SHIFT turns the four page keys into the chord keys. Each reads its name over its setting, and CHORD and STRUM also wear three dots under the words, the filled one their setting now:

KEY	READS	A TAP
CHORD	OFF, ON or PAD	Goes OFF, ON, PAD and back to OFF. ON is CHORDS, one key plays a whole chord (3.11.4): CHORDS ON · ONE KEY, ONE CHORD. PAD is the chord pad: CHORD PAD ON · STICK LEFT, CHORDS RIGHT. OFF: CHORDS OFF · ONE KEY, ONE NOTE.

KEY	the lane's key and scale, spelt for the key, such as **C MAJ**, **C♯ HMIN** or **B♭ MIN**; the root alone, **C**, with no scale	Opens the KEY page on its first four controls, KEY, SCALE, LOCK and CHORDS, with SHIFT let go; KEY stays lit there (3.11.1). The chord keys stay where they are and keep working there. Tap KEY again to go back to SYNTH, on the page you left, with SHIFT as it was.
STRUM	**OFF**, **SHORT** or **LONG**	Rolls each chord's notes upward, lowest first, like a strummed guitar, in time with the tempo: **SHORT** puts a 64th note between one note and the next, **LONG** a 32nd. At 120 BPM that is about 31 and 62 ms, and the roll speeds up and slows down with the tempo (3.9). The line says STRUM LONG · NOTES ROLL UPWARD or STRUM OFF · NOTES TOGETHER.
BASS	its name; lit while on	Adds the chord's root in the octave below its lowest note: under C E G from C4, C3. BASS ON · THE ROOT AN OCTAVE DOWN or BASS OFF.

- **CHORD, STRUM and BASS are lit while they're on.** A latched SHIFT stays latched after a tap, so tap CHORD again for its next setting; a held SHIFT goes when you let go of it.
- **STRUM and BASS need CHORD.** With CHORD on OFF they're drawn off, and a tap says TURN ON CHORD FIRST. Both work with CHORDS and with the pad.
- **CHORD and the KEY page are one setting.** KEY's CHORDS and CHORD PAD controls change the same thing, so whichever you use, the other follows. Everything on the KEY page is still there.
- **A stick move during a strum** keeps the notes the two chords share sounding and rolls in only the new ones. The arpeggiator ignores STRUM, and so does a MIDI keyboard: their chords start together.
- **The keys belong to SYNTH on a synth lane**, a lane playing your own gear included, where the chords go out over MIDI. On DRUM, SEQ, TAPE, MIX and the rest, SHIFT's page keys keep their own jobs (2.7.2). On iPad they're the first four page keys under SHIFT too.
- **Each lane keeps its own CHORD, STRUM and BASS**, saved with the project. Settings › CHORD PAD can make CHORDS and CHORD PAD the same on every synth lane (3.11.1); STRUM and BASS are always the lane's own.

3.12.2 Turning the pad on

01 Focus a synth lane and press SYNTH.

02 Hold or latch SHIFT and tap CHORD until it reads **PAD**. The chord pad takes the keyboard's place at once, and the line says CHORD PAD ON · STICK LEFT, CHORDS RIGHT.

03 Let go of SHIFT, or tap it to drop the latch, and play.

The KEY page has the same switch: **CHORD PAD**, the fourth control under SHIFT, set to **ON** (on iPad, in KEY's row). To go back to the keyboard, tap CHORD until it reads **OFF**, or set CHORD PAD to **OFF**: CHORD PAD OFF · THE KEYBOARD IS BACK.

- **It's set lane by lane**, like CHORDS. Put a pad sound on the pad and leave the bass and lead on the keyboard. The lane keeps it when you load another sound. To switch it on every synth lane at once, set Settings › CHORD PAD's **Chord pad** to **ALL SYNTH** (3.11.1).
- **The pad shows wherever the keyboard plays notes** for that lane: SYNTH, ARP, KEY, SEQ and TAPE. TAPE + SHIFT still turns that area into the tape's tool row (2.8.2).
- **A kit lane has no pad.** KEY's CHORD PAD is drawn off there and says A DRUM LANE PLAYS NO CHORDS.

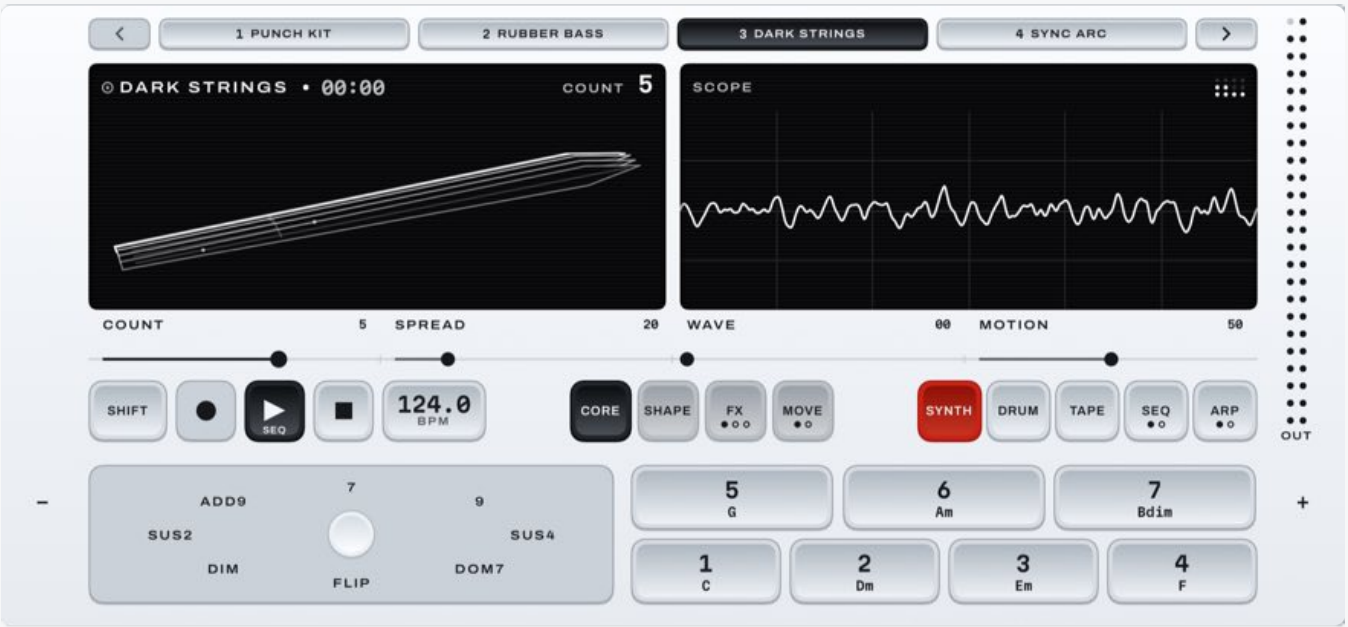


Figure 3.14 CHORD PAD on: the stick on the left, the seven chords of C major on the right, and the octave's – and + at the ends.

3.12.3 The seven keys

The keys sit on the right, 1 to 4 along the bottom and 5 to 7 above them. Each plays the chord built on one note of the lane's scale, and shows its number with the chord's name under it.

- **The chords come from KEY and SCALE** on the KEY page (3.11.2). In C major, the keys play C, Dm, Em, F, G, Am and Bdim; in A minor, Am, Bdim, C, Dm, Em, F and G; in D minor, Dm, Edim, F, Gm, Am, B♭ and C. With SCALE **OFF** the pad plays the major scale on KEY's root, so a new project's pad is in C major. The pentatonic scales and BLUES have no seven chords of their own: major pentatonic plays the major key's chords, minor pentatonic and BLUES the minor key's. KEY's window says whose chords they are, such as CHORD PAD · THE 7 CHORDS OF C MAJOR.
- **The names are written as a chord chart writes them**: **C**, **Dm**, **Bdim**, **Cmaj7**, **Bm7♭5**, **Gsus4**. It's the one place Tonaut uses lowercase letters, so **Dm7** can't be read as D major seven. Sharps and flats are the real ♯ and ♭, spelt for the key: **B♭** in D minor, not A♯ (3.11.2).

- **One chord at a time.** The newest key you hold sounds. Press another while holding one and the first stops; let the newer one go and the first sounds again if you're still holding it. A finger stays on the key it landed on: sliding doesn't change chords.
- **Each key always plays the same notes**, whatever you played before it: the chord in close position, its root at the bottom, and the root between F3 and E4 with the lane's keyboard at C3, where most lanes start. In C major, key 1 plays C4, E4 and G4, and key 4 plays F3, A3 and C4. The stick's chords keep the same root at the bottom, and – and + move the whole pad up or down an octave (3.12.5).
- **Voice leading** is the other way to play the pad. Turn it on in Settings › CHORD PAD (14.11) and each chord is voiced next to the one before it, the inversion whose notes move least, so a progression glides from chord to chord; the same key can then play a different inversion each time. It is off when you install Tonaut. It belongs to the app, not the project, so it applies to every project, and Settings' list sums it up on its **Chord pad** row, which starts `FIXED` (off) or `SMOOTH` (on).
- **LOCK and CHORDS don't touch the pad.** Its chords are already in the key, and the stick's changes are meant to step outside it.
- **How many notes sound depends on the sound**, as for a chord of fingers (3.1.2): a sound set to play one note at a time plays one.

3.12.4

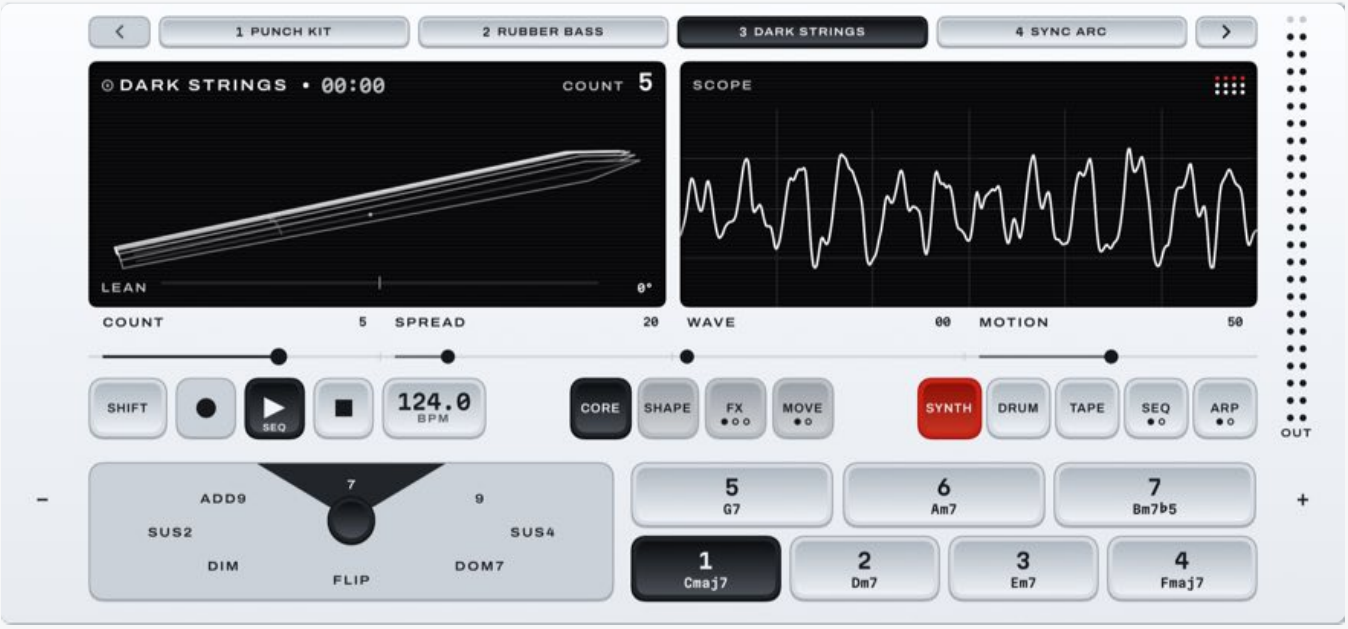
The stick

The stick is the panel on the left, with a round knob in the middle and eight words around it. Put your thumb down anywhere on the panel: where it lands is the middle, and you push from there. Push in one of eight directions and the chord changes:

PUSH	WORD	THE CHORD BECOMES	FROM C
Up	`7`	the seventh in the key added	Cmaj7
Up, right	`9`	the seventh and a ninth added	Cmaj9
Right	`SUS4`	the fourth for the third	Csus4
Down, right	`DOM7`	major with a flat seventh	C7
Down	`FLIP`	major to minor, minor to major	Cm
Down, left	`DIM`	diminished	Cdim
Left	`SUS2`	the second for the third	Csus2
Up, left	`ADD9`	a ninth added, no seventh	Cadd9
The middle		the plain chord of the key	C

Up always adds the seventh that belongs to the key, so on the other keys of C major it gives Dm7, G7 or Bm7♭5. DOM7 is the quick way to a chord that wants to move on, such as E7 before Am.

- **You can see where it is.** The direction you push lights as a wedge from the knob to the panel's edge, its word lit, and the knob slides a little that way. In the TN looks the wedge is a soft grey shade of the panel.
- **The keys' names follow the stick.** Every key shows the chord it will play with the stick where it is, before you press it: push up and the keys read Cmaj7, Dm7, Em7 and so on.
- **A move while a chord sounds changes it at once.** Notes the two chords share keep sounding; only the others change.
- **It springs back.** Let go and the knob returns to the middle, and the next chord is plain again. A small push, under about a third of the way, still counts as the middle, so a resting thumb plays the plain chord.
- **Or it holds.** In Settings › CHORD PAD, set **`Stick`** to **`HOLD`** (**`SPRING`** is the setting Tonaut starts with) and the stick stays in the direction you let it go in, so your thumb is free for the sliders. Every chord you play takes that change, and the wedge stays lit, until you push another way or tap the stick: a touch that doesn't push sends it back to the middle. It belongs to the app, like Voice leading.
- The ninth is always a whole step above the root, so 9 and ADD9 never sound like a wrong note.



`Figure 3.15` Chord 1 with the stick pushed up: Cmaj7 sounds, the 7 lights, and every key shows its seventh chord before you press it.

3.12.5 The octave, and SHIFT on the pad

- **The** `-` **and** `+` **keys** stay at the ends of the pad on iPhone, with no SHIFT needed. They move the lane's octave, as on the keyboard (3.2), and the chords with it. On iPad the octave keys are on the strip, as always.
- **Under SHIFT the pad stays on screen**, so CHORD can switch the pad on and off with the result in view. `DIE` and `HELP` move to the pad's bottom corners, DIE on the left and HELP on the right. DIE rolls a new page on every press, as on the keyboard, and is a well on SEQ and on a lane playing your own gear (3.7); the pad has no `UNDO` key. HELP is filled while the help panel is open (in the TN looks, the black lit button, as every lit button there).
- **The quick slots aren't on the pad on iPhone.** Load and keep sounds in PATCHES and USER (chapter 5), or turn the pad off to use the slots. On iPad they stay on the strip.
- **With HELP latched, the chord keys still play**, as the keyboard's keys do.

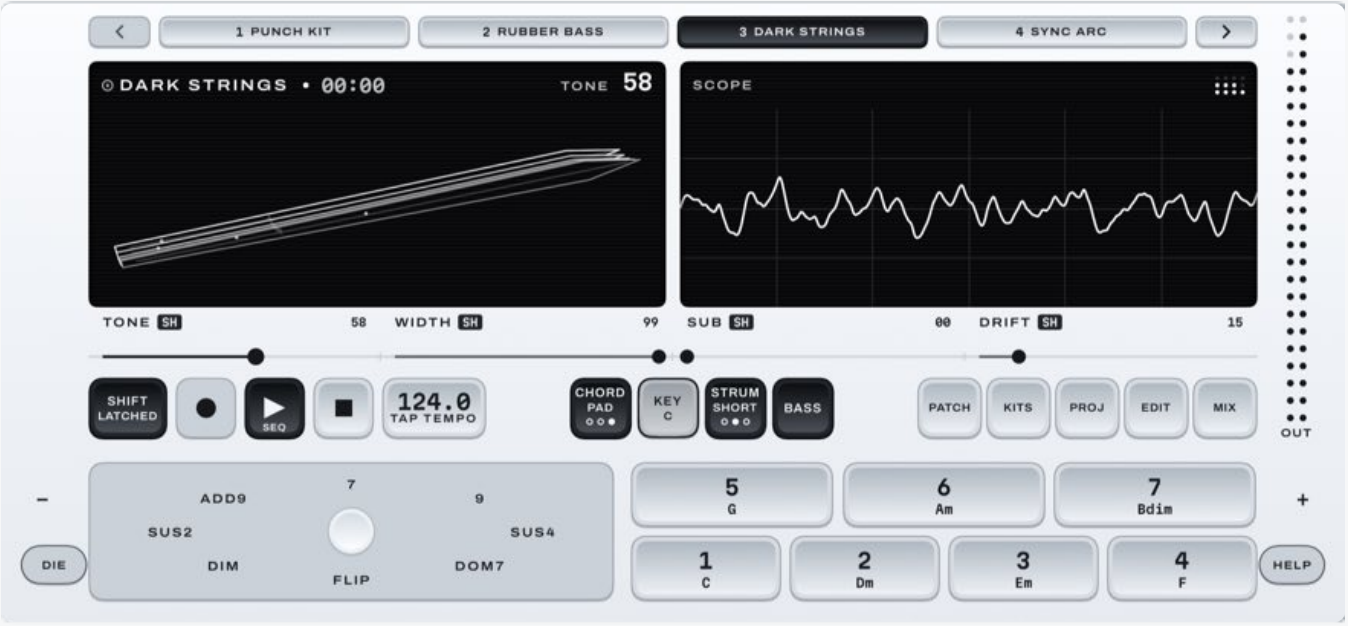


Figure 3.16 SHIFT on the pad: the chord keys CHORD, KEY, STRUM and BASS on the page keys, and DIE and HELP in the pad's corners.

3.12.6 With the arpeggiator, SEQ and MIDI out

The pad's chords are ordinary notes to everything that listens to your playing, as CHORDS' are (3.11.7):

- **The arpeggiator** holds the chord: with ARP on, one chord key is an arpeggio of its chord, in every MODE, and moving the stick changes what it plays from the next note (9.9).
- **SEQ's live recording** records every note of the chord, and a stick move as the notes that changed (8.8.4). With STRUM on, each note is recorded where it sounded.
- **SEQ's step entry** takes a whole chord from one key: into the selected cell, which you hear, or into a step you hold, silently. Press the same key again to take the chord out. With STRUM on, each note sits a little later in its step, as it was rolled, so the pattern plays the strum back (8.3.7).
- **SEQ's STEP REC** takes one chord key as one step, with the stick's chord, and moves on (8.8.8).
- **LATCH** latches a chord key's whole chord, and every cell you tap takes it (8.5).
- **MIDI out** sends every note of the chord, BASS's note included, on the lane's channel, so the pad can play your own synth (chapter 16).

3.12.7 Playing the pad from a MIDI keyboard

With the pad on, a MIDI keyboard plays the pad instead of single notes:

ON THE KEYBOARD	ON THE PAD
The white keys C, D, E, F, G, A and B	Chords 1 to 7. From C4 to B4 they play exactly the notes the pad's keys play with the lane's keyboard at C3: C4 plays C4, E4 and G4, F4 plays F3, A3 and C4. Each octave up or down plays the same chords an octave higher or lower. The screen's octave keys don't apply.
The pitch bend wheel	The stick left (SUS2) and right (SUS4)
The mod wheel	The stick up (7); with the bend wheel, up and left (ADD9) or up and right (9)
Any black key, held	The stick down (FLIP); with the bend wheel, down and left (DIM) or down and right (DOM7). The black keys play no chord.

- **On a pad lane the wheels move the stick only**, not the sound's pitch or its mod wheel.
- **Voice leading and HOLD apply here too** (3.12.3, 3.12.4). With the stick on HOLD, letting the wheels come back to the middle, or letting go of the black key, keeps the direction; move them another way, or tap the stick on screen, to change it.
- **The pad on screen follows the controller**: the direction lights, the knob leans and the chord key lights.
- **Both MIDI in settings work** (3.8.8). With BY CHANNEL, a pad lane plays its channel's keys as chords, and the other lanes keep LOCK and CHORDS.
- **On SEQ** a white key writes its chord into the selected cell, as a chord key does.
- **STRUM is for the screen only.** A MIDI keyboard's chords start together.

3.12.8 On iPad, and what is saved

- **On iPad** the pad takes the keyboard's area, the stick on the left and the seven keys on the right, with OCT– and OCT+ on the strip (17.7.1).
- **CHORD PAD, STRUM and BASS are saved with each lane**, in the project, like CHORDS (3.11.8). A lane swap takes them along. A song you share keeps them; a Tonaut older than 1.1 opens it with the keyboard, and the song plays the same, because the pad only changes how the screen plays.

04 SYNTH

SYNTH is where you shape the sound on a synth lane: the engine's own controls, how each note rises and falls, four effects and one modulator. On CORE the left window draws the engine as a moving picture; the right-hand window shows the sound itself, as a live trace.

4.1 The SYNTH screen

To open SYNTH, press SYNTH on the mode row. SYNTH always shows the focused lane's sound, and only a synth lane can be shown here:

- If the focused lane holds a kit, SYNTH moves the focus to the synth lane you used last (or the first synth lane) and opens SYNTH on it.
- If no lane in the project holds a synth sound, the key says NO SYNTH LANE IN THIS PROJECT and nothing changes.
- Tap a lane button that holds a kit while you're on SYNTH and the screen changes to DRUM, because DRUM is where kits are edited (2.2.1). Any notes you're holding stop when the focus moves.
- A lane set to EXTERNAL MIDI plays your own gear and has no sound of its own, so SYNTH shows its MIDI channel instead of these pages (chapter 16).

Pressing SYNTH while you're already on SYNTH closes anything drawn over it (a browser, MIX, EDIT, the effect or modulator list, an effect's CONTROLS, Settings, the tempo page, the recorder or the sample editor) and leaves you on SYNTH.

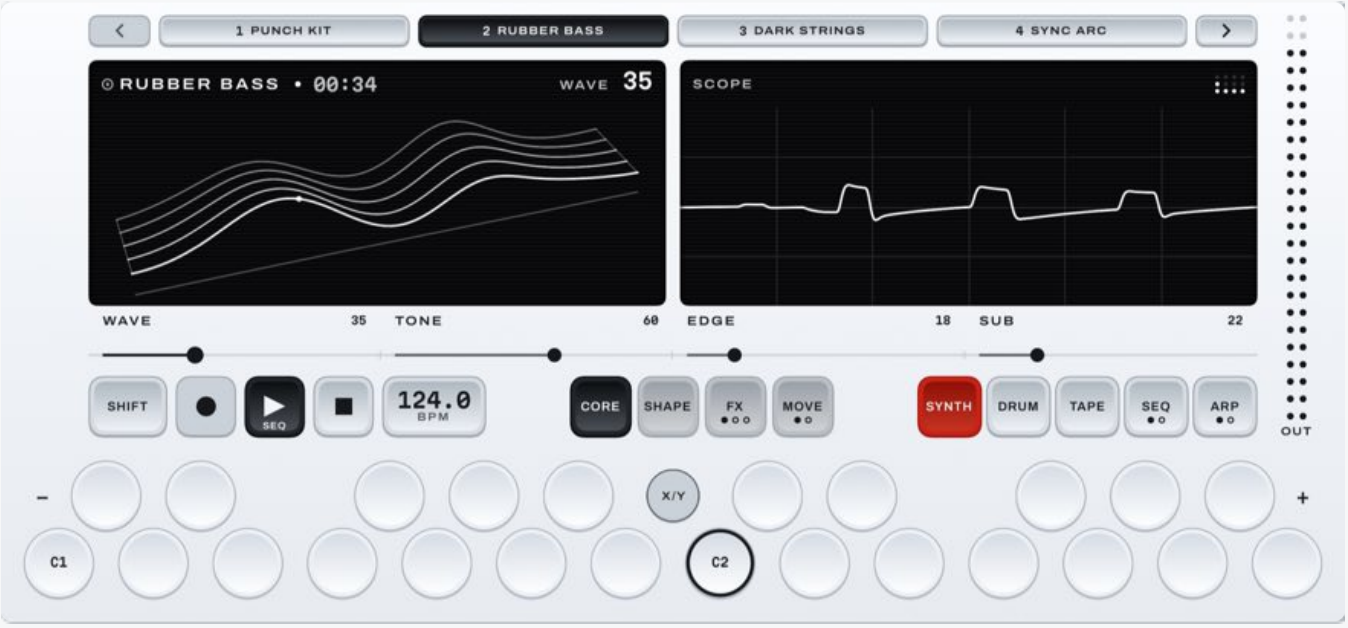


Figure 4.1 SYNTH on CORE, with Night Drive playing. Left: the header and the engine's NEW picture, which turns slowly and moves with the notes. Right: the SCOPE. The band holds the page's first four controls.

PART	WHAT IT SHOWS ON SYNTH
Lane buttons	One per lane, each named for its sound; the focused lane's is filled (2.2).
Left window	The header line, then a picture of the page you're on. On CORE that is the engine's own picture, NEW or CLASSIC, and a tap on the window switches between them (4.5); on SHAPE, FX and MOVE it is four plots of the page's controls. With HELP latched, the help panel takes the picture's place (2.9). While you hold a key on a sound with LEAN on, a **LEAN** bar runs across the bottom of the picture (3.5).
Right window	**SCOPE**: the live trace of what the lane is playing (4.9). While the X/Y pad is on, the pad takes this window, with the trace still drawn behind it (15.6).
Band	The four sliders of the page you're on. Under SHIFT, that page's other four.
Page keys	CORE, SHAPE, FX, MOVE (4.2).
Keyboard	Plays the focused lane. Three keys sit in the gaps of its upper row: the bare signs – at the left end and + at the right move this lane's keyboard down or up an octave (3.2), and the small round X/Y key in the middle turns the X/Y pad on and off. Under SHIFT the upper row becomes the quick slots 1 to 8 (slot 8 in the gap after 7), UNDO, DIE and HELP, and the two end keys of the lower row go blank (2.8.1).

X/Y turns the right-hand window into the **X/Y pad**: drag across to bend the pitch, and up or down to move the mod wheel, or the tone on a sound that has no mod wheel set up. How far X bends is the sound's **BEND** on SHAPE (4.6.2). Chapter 15 explains the pad (15.6). The pad

works on SYNTH, DRUM, TAPE and ARP; anywhere else the key is drawn off and says **X/Y PAD: SYNTH, DRUM, TAPE OR ARP**.

On the CORE page the left window takes a tap, so it wears the tap mark, a small dot in a ring, at the start of its header (2.3): a tap there switches the engine picture between NEW and CLASSIC (4.5.1). On SHAPE, FX and MOVE the left window is a picture and has no mark, and so is the SCOPE on the right. The lists that **FX** and **MOVE** open over SYNTH wear the list's mark, the help panel wears the tap's while HELP is latched, and the X/Y pad wears a four-way mark of its own.

SHIFT + **PATCH** (the SYNTH key under SHIFT) opens the PATCHES browser, where you pick a different sound for the lane (chapter 5). **SHIFT** + **EDIT** (the SEQ key under SHIFT) opens EDIT, which lays out every control of the sound in groups (chapter 7).

On iPad, SYNTH shows all eight controls of a page at once instead of four and four (chapter 17). This chapter describes the iPhone.

4.1.1 Reading the header

The header line across the top of the left window reads, from left to right:

01 **The tap mark**, a small dot in a ring, on the CORE page while a tap on the window switches the picture (4.5.1).

02 **The name.** The sound's own name, such as **RUBBER BASS**. A sound with no name of its own shows its engine's name, such as **SLOPE**. A long name is cut short at the end. On SAMPLER's second CORE page the name is followed by the page's, such as **ARP SHARDS · FILTER** (4.4.3).

03 **The view marks**, on the CORE page only: one small dot per picture view, the current one bright. Under NEW every engine shows one; SLOPE shown CLASSIC shows three (4.5.3).

04 **A red dot** while the tape is recording.

05 **MIDI** while a MIDI keyboard or controller is connected (3.8).

06 **ARP** while this lane's arpeggiator is on (chapter 9). It shows on SYNTH because the arpeggiator belongs to the lane and keeps running whichever screen you're on.

07 **The tape position**, in minutes and seconds. It counts while TAPE is in front; on SYNTH it holds the position the tape had when you left TAPE.

08 **The readout**, at the right, on the same line as the name: the name of the slider you touched last and its value. Under SHIFT it follows the layer you're looking at. On FX it names the effect slot as well, such as **SLOT 2 · DELAY** (4.7).

How a value reads:

- Most controls read from **00** to **99**. In fine adjust (2.4.1) they gain a decimal place, such as **15.4**.
- Controls that swing either way from a center read from **−50** to **+50**, with **0** in the middle. On SYNTH's pages these are CROSS's **BRIGHT**, DIVINER's **ENV AMOUNT** and **B FINE**, SAMPLER's **ENV AMOUNT** on its FILTER page, every modulator's **AMOUNT**, and the CURVE controls on MOVE.
- Stepped controls show their setting in words or numbers: **POLY**, **1:1**, **+2 ST**, **SINE**. They click from one setting to the next as you drag.
- A slider with nothing behind it is labeled – and reads **––**. It is drawn off and takes no touch.

4.2 Pages and the second press

A sound has four pages. Each page has eight controls: four on the band, and four more under SHIFT. The lit page key is the page showing. Press a page key to go to that page. Press the page key you're already on, and some pages open a list, a second page or another view of the picture instead.

KEY	ON THE BAND	UNDER SHIFT	PRESSED AGAIN	DOTS
CORE	The engine's first four controls	The engine's other four	SAMPLER: its FILTER page, then back (4.4.3). SLOPE shown CLASSIC: the next picture view (4.5.3). Otherwise nothing.	SAMPLER: two, one per page. SLOPE shown CLASSIC: three, one per view. Otherwise none.
SHAPE	**ATTACK** **DECAY** **SUSTAIN** **RELEASE**	**PLAY MODE** **GLIDE** **BEND** **LEVEL**	Nothing.	None.
FX	The four effects' amounts	The four effects' main controls	The EFFECT list for the lit slot (4.7.1), then that slot's CONTROLS (4.7.3), then back to the page.	Three: the page, the list, CONTROLS.
MOVE	The modulator's first control, **AMOUNT**, **DEST**, **SLOT**	The modulator's other four	The MODULATOR list (4.8.1), then back to the page.	Two: the page, then the list.

The dots under a key's name are its places (2.5.1). On the lit key the filled dot is where you are; on any other key it is where a press of that key takes you. Open FX's list and FX's second dot fills; open CONTROLS and the third does. No key shows dots while SHIFT is on.

The first press only goes to the page. The second press does the page's own job. So nothing happens by accident: the page you came to is already showing when the second press lands.

On SYNTH you can **tap** SHIFT to latch it (it stays on until you tap it again), or **hold** it while you move a control (it drops when you let go). The four sliders under SHIFT carry a small **SH** badge. Numbered across both layers, the band's controls are 1 to 4 and SHIFT's are 5 to 8; MOVE uses those numbers (4.8.2).

NOTE

> While SHIFT is on, the four page keys are the chord keys, CHORD, KEY, STRUM and BASS (3.12.1), so they don't turn the page. To change page, or give a page key its second press, turn SHIFT off first. A lane button still changes lanes with SHIFT latched; only while you **hold** SHIFT does it pick that lane for a swap, or say STOP FIRST while the transport runs (2.12).

Changing lanes keeps you on the same page: if you're on FX on lane 4 and tap lane 2, you see lane 2's FX.

With HELP latched, each page key explains itself in the header instead of acting:

KEY	HELP LINE
CORE	TAP SCREEN: CLASSIC WHILE ON THIS LANE; on SAMPLER, PRESS AGAIN: THE FILTER · AGAIN: BACK; on SLOPE shown CLASSIC, PRESS AGAIN: NEXT VIEW · TAP: SWITCH
SHAPE	HOW A NOTE RISES AND FALLS
FX	EFFECTS · AGAIN: LIST FOR THE LIT SLOT
MOVE	MODULATION · PRESS AGAIN FOR THE LIST

4.3 CORE: the engine's own controls

An engine is the part of a sound that makes the tone: a filter synth, an FM synth, a plucked string and so on. Tonaut has nine synth engines. CORE holds the eight controls that make each engine what it is, so every engine has a different eight. The engine comes with the sound: to use a different engine, load a sound that uses it from PATCHES (5.2). With the type column on ALL, each engine's list there ends with an ENGINE DEFAULT row: the engine with its starting values, no modulator and every effect at 00 (5.2.3).

ENGINE	BAND (1–4)	UNDER SHIFT (5–8)	FACTORY SOUNDS
SLOPE	WAVE, TONE, EDGE, SUB	DRIFT, TRACK, WIDTH, NOISE	42

CROSS	RATIO, DEPTH, FOLD, BODY	DETUNE, RATIO FINE, BRIGHT, SPREAD	52
SAMPLER	START, LOOP, END, PITCH	FADE IN, FADE OUT, REVERSE, GAIN	158
GUT	TENSION, DECAY, DAMP, PLUCK	POSITION, BODY, DETUNE, NOISE	36
SCAN	TABLE, POSITION, WARP, TONE	SCAN, WIDTH, SUB, NOISE	43
PULSE	WIDTH, OFFSET, PWM DEPTH, PWM RATE	TONE, SYNC, NOISE, SPREAD	37
SWARM	COUNT, SPREAD, WAVE, MOTION	TONE, WIDTH, SUB, DRIFT	35
DUST	DENSITY, PITCH SPREAD, TONE, MOTION	GRAIN SIZE, SHIMMER, WIDTH, CRACKLE	35
DIVINER	CUTOFF, RESONANCE, ENV AMOUNT, B FINE	PW, B LEVEL, LFO RATE, WHEEL	51

SAMPLER's CORE has a second page as well: press CORE again on a SAMPLER lane for its FILTER page, **CUTOFF**, **RESONANCE**, **ENV AMOUNT** and **KEY TRACK** (4.4.3).

The same word can mean different things on different engines. **WIDTH** is stereo width on most engines, a second voice on SLOPE and the pulse's shape on PULSE. With HELP latched, each slider explains what it does on the engine in front of you, so trust the help line over the word.

Every change saves itself with the project (13.2). There is no store button.

NOTE

> A double-tap puts a slider back where a fresh sound of this engine starts, not where the sound you loaded had it, and SHIFT + double-tap puts back its last change (2.4.4).

4.4 The nine engines

Each engine below has a table of its eight CORE controls. The **#** column is the control's number: 1 to 4 on the band, 5 to 8 under SHIFT. To hear an engine, load one of its sounds from PATCHES (pick the engine in the browser's engine column, 5.2), hold a key, and move each slider in turn. Six of the nine play in the song Night Drive, and the figures show them there; the other three are put on a lane for their pictures. Each figure shows the engine's NEW picture as the song plays it; the table in 4.5.2 says what each of the four band controls does to it.

4.4.1 SLOPE

SLOPE is a subtractive synth: one oscillator whose shape morphs from a ramp to a square, through a resonant filter, with a sub oscillator underneath. It is the classic bass, lead and pad engine. Two lanes of a new project start on SLOPE sounds: Bottle Glass on lane 4 and Acid Line on lane 5. 42 factory sounds.

SLOPE's NEW picture is a field of five wavy lines, one behind another, each with two humps, over a fainter line for the sub. WAVE changes the humps' width and balance, TONE how tall they stand, EDGE how sharp the first one peaks, and SUB lifts and brightens the line underneath. A slow ripple runs along the lines all the time, and it swells as notes play. On CLASSIC, SLOPE is the one engine with three views of its picture (4.5.3).

#	CONTROL	WHAT IT DOES
1	**WAVE**	The shape of each cycle, from a ramp (bright and buzzy) at **00** to a square (hollow) at **99**.
2	**TONE**	Where the high end is cut away: the filter. Low is dark and muffled, high is open.
3	**EDGE**	Resonance at the cut: a ringing peak right at the TONE point. Sweep TONE with EDGE up to hear it.
4	**SUB**	A second oscillator an octave below, mixed underneath. **00** is none.
5	**DRIFT**	A slow wander in pitch, the way an old analog synth drifts.
6	**TRACK**	How far the cut follows the keys. Higher, and high notes open the filter more than low ones.
7	**WIDTH**	A second voice, spread wide across the stereo field.
8	**NOISE**	Hiss mixed into the sound. **00** is none.

The overview figure in 4.1 is SLOPE's NEW picture: Night Drive's bass, Rubber Bass, on lane 2. Its CLASSIC views are in 4.5.3. EDIT holds SLOPE's controls in groups too (chapter 7).

4.4.2 CROSS

CROSS is FM synthesis: one tone bends the pitch of another so fast that it changes the timbre instead of the tune. It makes bells, electric pianos, glassy keys, hard basses and metallic hits. Each CROSS sound carries its own FM setup inside it; the eight CORE controls reshape that setup rather than replace it, so the same control can sound quite different from one CROSS sound to the next. 52 factory sounds, and a SysEx file of six-operator voices can bring in more (5.11.4).

#	CONTROL	WHAT IT DOES
1	**RATIO**	How the two tones are tuned against each other. Eleven steps: **1:4**, **1:3**, **1:2**, **2:3**, **3:4**, **1:1**, **4:3**, **3:2**, **2:1**, **3:1**, **4:1**. The whole-number ratios (**1:1**, **2:1**, **3:1**, **4:1**) give the most in-tune tones; the others lean toward bells and metal.

2	**DEPTH**	How hard one tone bends the other. **50** is the sound's own setting; higher adds brightness and bite, lower calms it, and at **00** the bending stops and the tone goes plain.
3	**FOLD**	How ragged the tone gets. **00** is clean, **50** is the sound's own setting, and higher gets rougher.
4	**BODY**	How hard the note lands: extra weight at the start of each note.
5	**DETUNE**	How far apart the tones inside the sound are tuned, for a slow, chorus-like beating.
6	**RATIO FINE**	Small moves of the RATIO tuning, from half to one and a half times it. **50** is no change. Off-center settings give clangy, out-of-tune overtones.
7	**BRIGHT**	How much harder and higher notes open up. Centered at **0** (no effect); toward **+50** high notes get brighter, toward **−50** darker.
8	**SPREAD**	How wide it sits across the stereo field.

CROSS's NEW picture is a row of upright lines, the overtones an FM tone is built from, joined at their tops like a skyline. RATIO spaces them, DEPTH spreads the energy over more of them, FOLD makes the row busier and more jagged, and BODY sets how far the first line, the note itself, stands out (4.5.2).

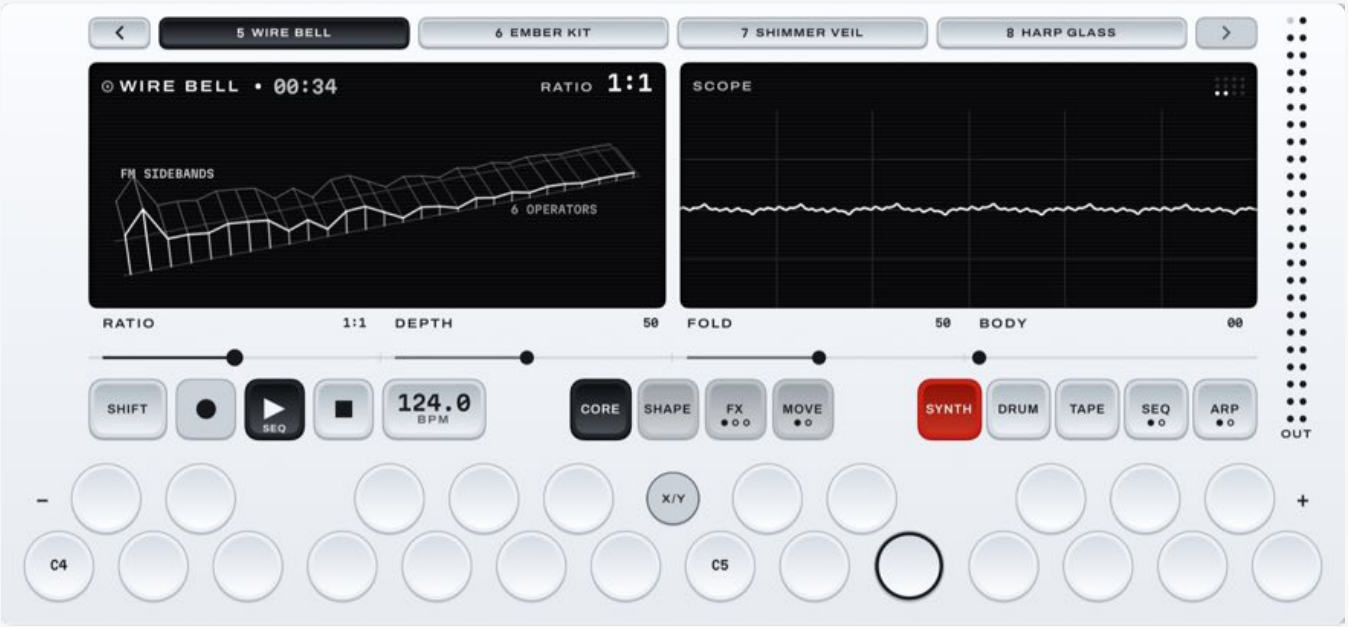


Figure 4.2 CROSS: Night Drive's bell on lane 5. Each upright line is one overtone, and the row breathes with every note. The same sound on CLASSIC is in 4.5.3.

On CROSS, SHAPE stretches and shortens the sound's own built-in envelopes instead of replacing them (4.6.3).

CROSS's ENGINE DEFAULT row (5.2.3) is a plain FM tone, one tone bending another at **1:1**, so every CORE control acts on it from the first note: at **00** DEPTH it is a pure sine, and DEPTH, FOLD, RATIO and the rest bring the overtones in. It is the place to make a CROSS sound from scratch.

4.4.3 SAMPLER

SAMPLER plays a recording up and down the keyboard, higher for higher keys. 158 factory sounds, of two kinds:

- **147 sampled instruments.** Each is a recording of a synthesizer, tuned to the keyboard: pads, basses, leads, keys, plucks and textures. The recording is the sound, so it plays the same on any lane; a recording of your own on that lane stays there, untouched. Most of them loop for as long as you hold the key; the rest play out to their natural end.
- **11 treatments.** Each comes with a stand-in recording so it makes a sound the moment you load it. Once the lane holds a recording of your own (made with the recorder, 12.4; an audio file brought in with IMP on PATCHES, 5.7.2; or lifted from the tape, 5.7.1), these sounds play your recording instead (5.9). Arp Shards, on lane 7 of a new project, is one of them.

#	CONTROL	WHAT IT DOES
1	START	Where in the recording the sound starts playing.
2	LOOP	Where the loop sits between START and END: at **00** it starts at START, at **99** it ends at END. It is only heard once the loop is switched on and shorter than the whole sound (below).
3	END	Where the sound stops playing.
4	PITCH	How high or low it plays, in semitones, from **−24 ST** to **+24 ST**.
5	FADE IN	How gently it starts, up to five seconds.
6	FADE OUT	How gently it ends, up to five seconds.
7	REVERSE	**ON** plays the sound backwards.
8	GAIN	How loud the sound itself is.

The loop's switch, its length and how smoothly it joins (**LOOP ON**, **LOOP LENGTH**, **LOOP XFADE**) and **NORMALIZE** are in EDIT's LOOP group (7.5.3). On a new SAMPLER sound the loop is off and **LOOP LENGTH** is **100%**, so **LOOP** on CORE changes nothing until you set **LOOP ON** to **ON** and bring LOOP LENGTH down. At 100% the loop already fills the space between START and END, and there is nowhere for it to move. Some factory SAMPLER sounds, Harp Keys among them, come with a short loop already on.

SAMPLER's NEW picture is the lane's recording itself, drawn as a thick slab in relief. Its top edge follows the recording's loud and quiet parts and the texture of the wave at each point, so a steady pad shows its grain and a pluck its sharp start. Two upright frames are START and END, and the stretch between them is lit. A dot and a short line under the slab mark the loop, dim while the loop is off. The words under the picture give PITCH as a playback speed, such as **+12**

ST / 2.00x, and a dot runs along a small rail at that speed. While a note plays, a bright read head runs along the slab at the point the newest note has reached. PITCH never redraws the recording: higher or lower, it is the same recording played faster or slower.

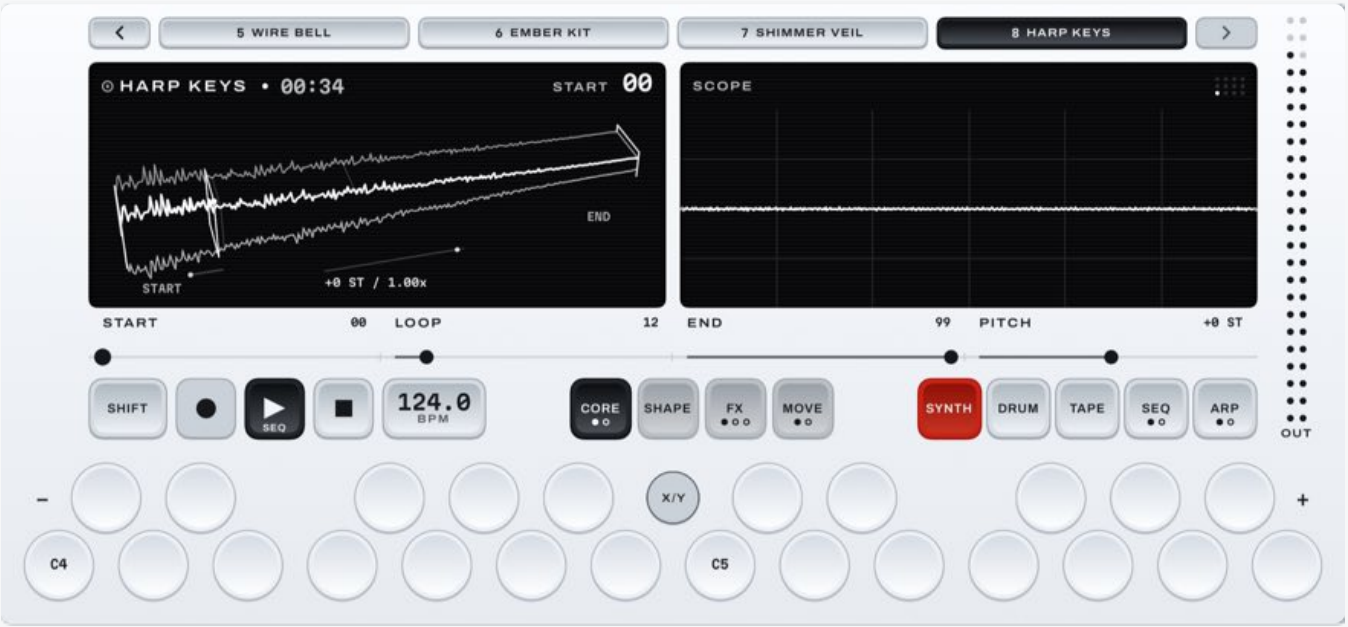


Figure 4.3 SAMPLER, with Harp Keys put on lane 8 for the picture. The slab is the recording itself; START and END are the frames, and the words under it are PITCH as a playback speed. CORE's two dots say this sound has a second page, FILTER.

The FILTER page. SAMPLER has a filter of its own, built like DIVINER's: a low-pass filter that darkens the recording, rings at its edge and can sweep with each note. It is CORE's second page.

To open SAMPLER's FILTER page:

01 On a SAMPLER lane, go to CORE.

02 Press CORE again. The header reads the sound's name and **· FILTER**, such as **ARP SHARDS · FILTER**, CORE's second dot fills, and the band shows the filter's four controls.

03 Press CORE again to go back to the first page. Going to another page or focusing another lane also brings CORE back to its first page.

#	CONTROL	WHAT IT DOES
1	**CUTOFF**	How open the filter is. At **99** it is fully open.
2	**RESONANCE**	How hard the filter rings at its edge.
3	**ENV AMOUNT**	How far each note sweeps the cutoff, following the note's own envelope from SHAPE (4.6). Toward **+50** it opens the filter; toward **−50** it closes it; **0** is no sweep.
4	**KEY TRACK**	How much the cutoff follows the keys. At **00** it stays put; at **99** it moves about an octave for every octave you play away from C4.

Every factory SAMPLER sound starts with the filter open: **CUTOFF 99**, **RESONANCE 00**, **ENV AMOUNT 0**, **KEY TRACK 00**. There the filter is out of the way and the sound plays exactly as it was made; move any of the four and it comes in. Under SHIFT the band has nothing on this page, and its four sliders are drawn off. The left window draws the four controls as plots, and a tap on it does nothing. EDIT holds the same four in SAMPLER's FILTR section (chapter 7).



Figure 4.4 SAMPLER's FILTER page, with the filter open as every SAMPLER sound starts. CORE's second dot is filled and the header names the page; the window takes no tap here.

4.4.4 GUT

GUT is a plucked string. Every note is two strings, plucked together, ringing through a small wooden body. It makes guitars, harps, kotos, plucked basses and struck metal. 36 factory sounds.

#	CONTROL	WHAT IT DOES
1	**TENSION**	How stiff the string is. A stiffer string pulls its overtones apart and sounds more like wire or a bell.
2	**DECAY**	How long the string rings, from a short thunk to about thirty seconds.
3	**DAMP**	How fast the highs die away compared with the note itself.
4	**PLUCK**	How brightly the string is plucked: soft finger at the bottom, hard pick at the top.
5	**POSITION**	Where along the string it is plucked. Near the end sounds thin and bright; toward the middle, round and hollow.
6	**BODY**	How much of the wooden box you hear.
7	**DETUNE**	How far apart the two strings are tuned. A little gives a twelve-string shimmer.
8	**NOISE**	Noise mixed in with the pluck, like the scrape of a pick.

GUT's NEW picture is a string stretched between two blocks, with two fainter strings behind it and a small carriage beneath, where the string is plucked. The strings lie still until a note plucks them, then swing and ring out. TENSION sets how fast they swing, DECAY how long they keep going, DAMP smooths away their small fast ripples and PLUCK adds more of them; **POSITION**, under SHIFT, slides the carriage along (4.5.2).

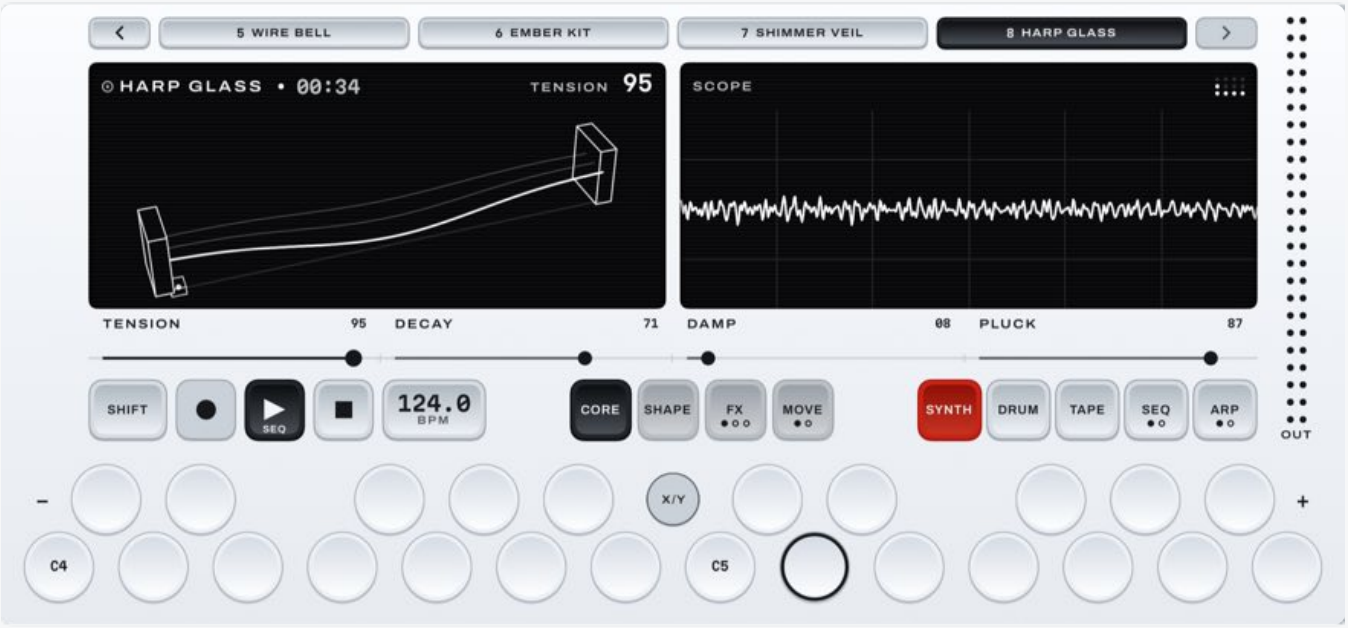


Figure 4.5 GUT: Night Drive's harp on lane 8, caught mid-swing after a pluck. With POSITION near the end of the string, the carriage sits close to the left block.

NOTE

GUT rings by its own **DECAY**, so SHAPE's **DECAY** and **SUSTAIN** do nothing on it (4.6.3).

4.4.5 SCAN

SCAN is a wavetable synth. A table is a set of 64 related wave shapes, and SCAN plays one point in that set. Moving through the set, by hand or on its own, makes the tone shift and morph. 43 factory sounds.

#	CONTROL	WHAT IT DOES
1	**TABLE**	Which set of shapes it reads. Twelve tables: **BASIC**, **PULSE**, **ORGAN**, **VOWEL**, **BELL**, **GLASS**, **REED**, **HOLLOW**, **BUZZ**, **FOLD**, **STEPS**, **SPECTRA**.
2	**POSITION**	Where in the set it reads.
3	**WARP**	How far the shape is bent.
4	**TONE**	Where the high end is cut away.
5	**SCAN**	How fast it moves through the set on its own. **00** is off; higher sweeps faster, up to several times a second.
6	**WIDTH**	How wide it sits across the stereo field.
7	**SUB**	An octave below, underneath.
8	**NOISE**	Hiss mixed into the sound.

SCAN's NEW picture is the set itself: six faint waves lined up one behind another and, among them, the bright wave SCAN is playing. TABLE changes the family of shapes, POSITION moves the bright wave forward or back through the set, WARP bends each wave and TONE adds finer ripples on top (4.5.2).

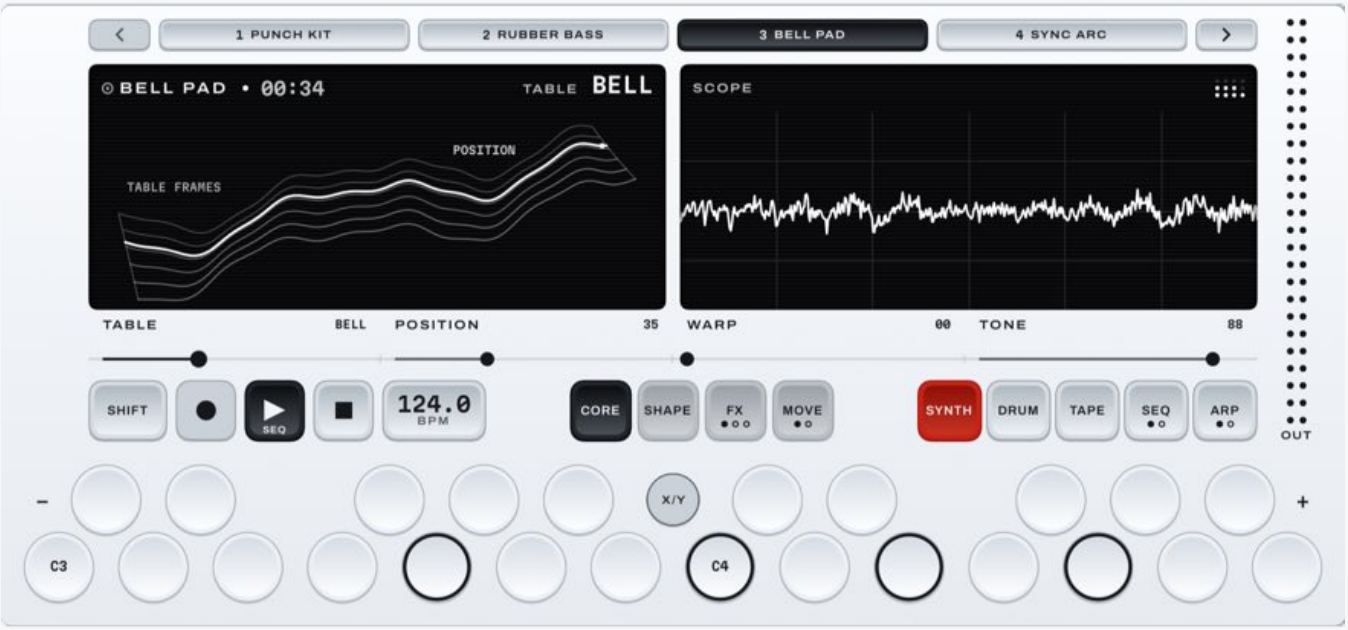


Figure 4.6 SCAN, with Bell Pad put on lane 3 for the picture. The bright wave is the point in the set that POSITION picks.

4.4.6

PULSE

PULSE is two pulse-wave oscillators. A pulse wave's width sets its tone, from a hollow square to a thin, nasal buzz, and PWM (pulse-width modulation) swings that width back and forth for a moving, chorused sound. 37 factory sounds.

#	CONTROL	WHAT IT DOES
1	**WIDTH**	How narrow the pulse is: a square at **00**, a thin pulse at **99**.
2	**OFFSET**	How far above the first the second pulse sits, up to two octaves. At **00** the second pulse is off and only the first plays; raise it and the second fades in. It moves smoothly, so it can sit between semitones.
3	**PWM DEPTH**	How far the pulse width swings.
4	**PWM RATE**	How fast the pulse width swings, from very slow to about twenty times a second.
5	**TONE**	Where the high end is cut away.
6	**SYNC**	**ON** locks the second pulse to the first, so moving OFFSET gives a tearing, vocal sweep instead of an interval.
7	**NOISE**	Hiss mixed into the sound.
8	**SPREAD**	How far apart the two pulses sit in stereo (the first to the left, the second to the right), and how differently the width swings on each side.

PULSE's NEW picture draws the two pulses as square-topped waves, OSC A bright in front and OSC B fainter behind, with a bracket over the high part of one of A's cycles. WIDTH narrows that high part, OFFSET sets how many more cycles B draws as it plays higher, and PWM DEPTH and PWM RATE set how far and how fast the widths breathe (4.5.2).

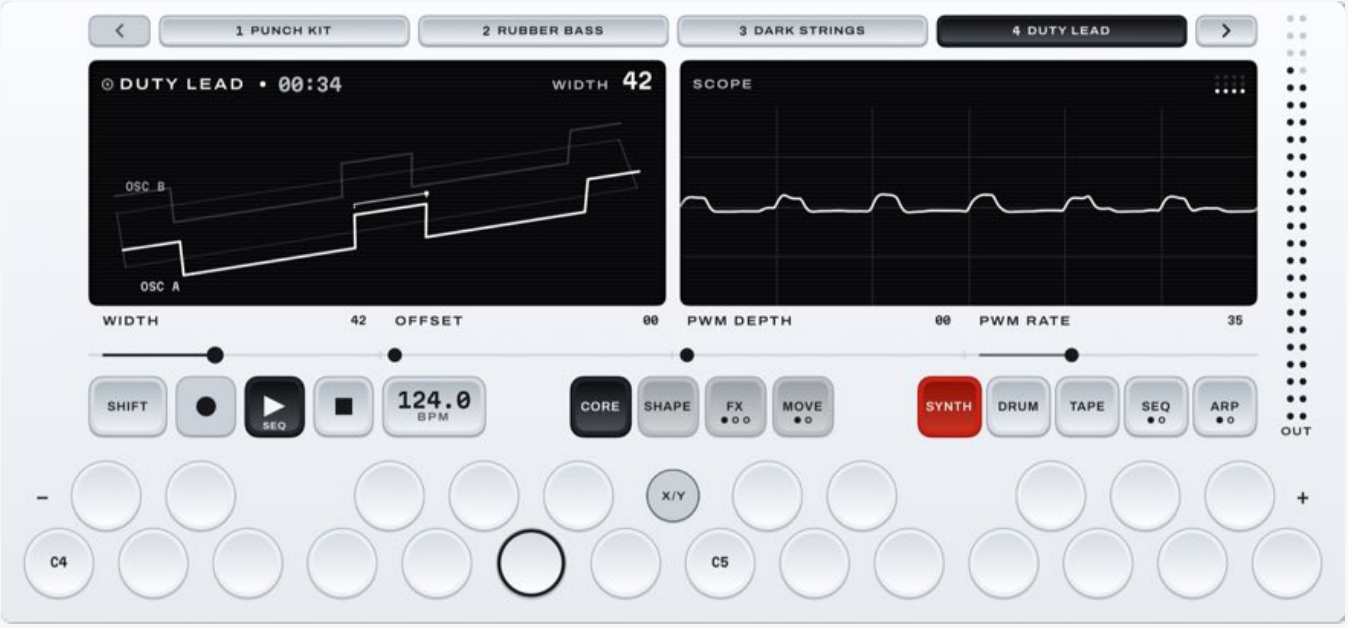


Figure 4.7 PULSE, with Duty Lead put on lane 4 for the picture. OFFSET is at 00, so OSC B is silent: it draws the same cycles as A, dimmed.

4.4.7

SWARM

SWARM stacks up to seven copies of one wave and detunes them against each other: the huge, shimmering sound of trance leads and big pads, often called a supersaw. 35 factory sounds.

#	CONTROL	WHAT IT DOES
1	**COUNT**	How many voices are stacked, **1** to **7**.
2	**SPREAD**	How far the stack is detuned, up to a semitone.
3	**WAVE**	The shape of each cycle, from a saw to a square.
4	**MOTION**	How much it keeps moving on its own.
5	**TONE**	Where the high end is cut away.
6	**WIDTH**	How wide it sits across the stereo field.
7	**SUB**	An octave below, underneath.
8	**DRIFT**	A slow wander in pitch.

SWARM's NEW picture is a stack of long, flat wings, one per voice, each coming to a point at one end. COUNT sets how many there are, SPREAD fans them apart, WAVE broadens their points and MOTION rocks each one on its own (4.5.2).

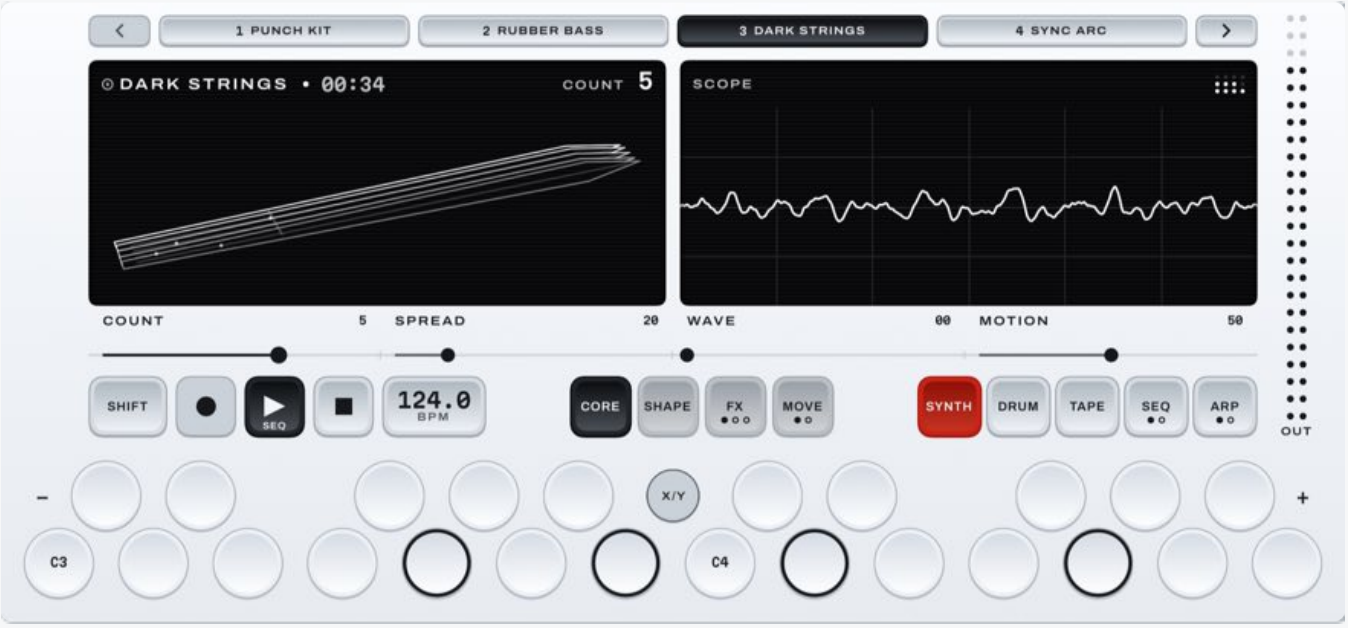


Figure 4.8 SWARM: Night Drive's strings on lane 3. Five wings for COUNT 5, close together because SPREAD is low.

TIP | With **COUNT** at **1**, **SPREAD** has nothing to detune. Raise COUNT first.

4.4.8 DUST

DUST makes a sound from grains: tiny fragments of tone, scattered in time and pitch, with noise and crackle. It makes clouds, textures, shimmering pads and broken-radio sounds. 35 factory sounds.

#	CONTROL	WHAT IT DOES
1	**DENSITY**	How thickly the grains fall, from none to a few hundred a second. At **00** there are no grains.
2	**PITCH SPREAD**	How far the grains scatter in pitch, up to two octaves either way.
3	**TONE**	Where the high end is cut away.
4	**MOTION**	How much it keeps moving on its own.
5	**GRAIN SIZE**	How long each grain lasts, from a click to half a second.
6	**SHIMMER**	How often a grain jumps an octave up.
7	**WIDTH**	How wide it sits across the stereo field.
8	**CRACKLE**	How much it spits and pops.

DUST's NEW picture is a shallow slab with bright grains floating above it, drifting from one end to the other. DENSITY sets how many grains there are, PITCH SPREAD how high and deep the cloud spreads, TONE how bright they shine and MOTION how fast they flow; every note lifts and stirs them (4.5.2).

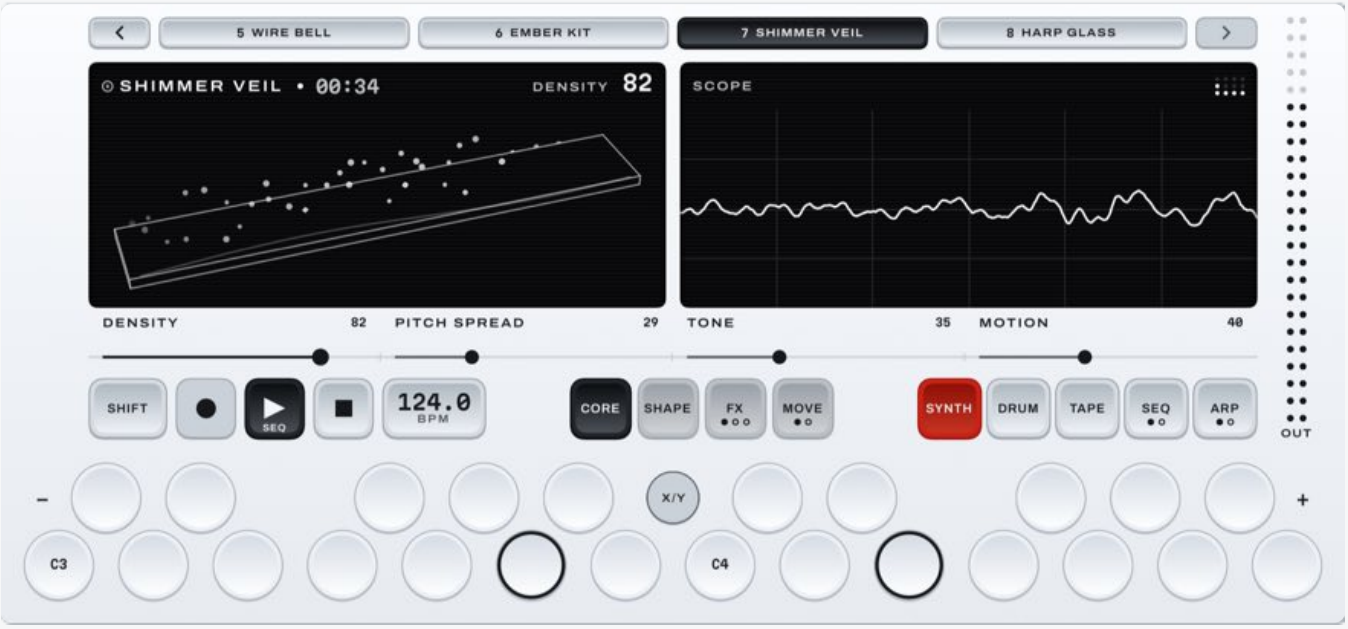


Figure 4.9 DUST: Night Drive's texture on lane 7. The grains float above the slab; raise PITCH SPREAD and the cloud spreads higher.

4.4.9 DIVINER

DIVINER is laid out like the classic analog polysynths: two oscillators (A and B) that can be synced, a four-pole filter with its own envelope, poly-mod (oscillator B and the filter envelope bending other things), and a wheel LFO for vibrato and sweeps. It has forty controls. CORE holds the eight you reach for most; the rest are in EDIT (7.6). 51 factory sounds: **`Init`**, a plain starting point listed first, and 50 others.

#	CONTROL	WHAT IT DOES
1	**CUTOFF**	How open the filter is.
2	**RESONANCE**	How hard the filter rings at its edge.
3	**ENV AMOUNT**	How far the filter envelope sweeps the cutoff on each note. Toward **+50** it opens the filter; toward **−50** it closes it; **0** is no sweep.
4	**B FINE**	How far oscillator B is detuned from A, up to half a semitone either way. **0** is in tune.
5	**PW**	How narrow oscillator A's pulse wave is.
6	**B LEVEL**	How loud oscillator B is.
7	**LFO RATE**	How fast the wheel LFO moves.
8	**WHEEL**	How much the wheel LFO moves things. It starts at **00**, so raise it to hear it. On a new DIVINER sound it moves both oscillators' pitch: vibrato. What it moves is set in EDIT's WHEEL-MOD group (7.6.8).

DIVINER's NEW picture draws the two oscillators as wave ribbons, A in front and B behind, that run in from the left and merge into one filtered ribbon. CUTOFF sets how much of their sharp detail gets through, RESONANCE adds ringing ripples, ENV AMOUNT sends a sweep along the ribbon with every note, and B FINE shifts the rear ribbon against the front (4.5.2).

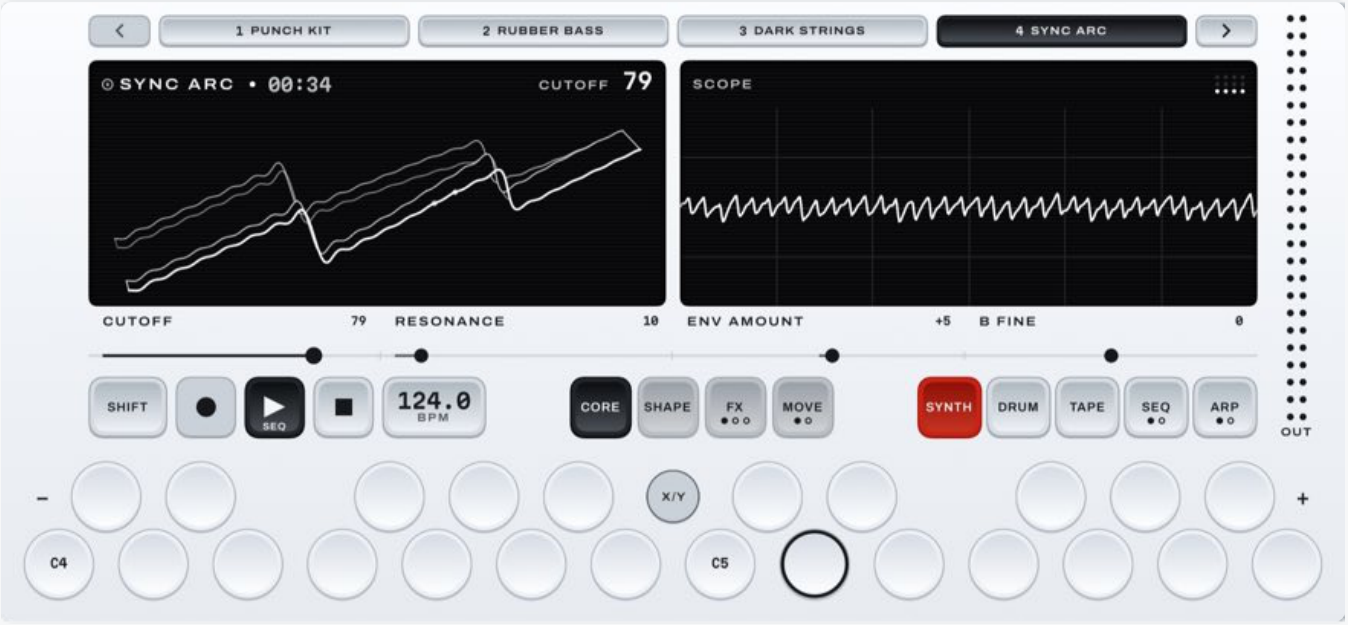


Figure 4.10 DIVINER: Night Drive's lead on lane 4. The ribbons keep the saw's sharp teeth because CUTOFF is high. The same sound on CLASSIC is in 4.5.3.

NOTE

PW only changes the sound while oscillator A's pulse wave is switched on (**A PULSE** in EDIT's OSC A group, 7.6.1). On a new DIVINER sound oscillator A plays a saw, so PW does nothing until you turn A PULSE on.

TIP

Every factory DIVINER sound, Init and Sync Arc among them, has the Expression modulator on MOVE set to **SOURCE WHEEL**, **DEST CORE**, **SLOT 8**, so a MIDI keyboard's mod wheel, or the X/Y pad's Y (15.6), turns WHEEL up. On a sound you start from DIVINER's ENGINE DEFAULT, set that up yourself (4.8.8).

4.5 The engine screen: NEW and CLASSIC

On the CORE page the left window draws the engine itself. Each of the nine synth engines has a picture of its own, built in three dimensions, and it fills the window under the header line. This is the **NEW** screen, and CORE shows it whenever you come to a lane. The plainer **CLASSIC** screen, four flat plots, is a tap away (4.5.1).

What the NEW picture does:

- **It turns slowly.** A camera drifts round the picture on its own, tilting and turning it a little so you can see its depth. It keeps drifting whatever you do, and it doesn't start over when you change page or lane.
- **It answers the notes.** Whatever plays the focused lane moves it: the keys, a MIDI keyboard, the arpeggiator or the lane's pattern. A harder note hits sooner and stronger, a chord adds energy (each held note a little more), and a higher note moves it faster. When you let go, it settles back over about a second.
- **Nothing jumps.** A new note never restarts the picture. Every movement eases in and out, and the picture keeps its place in the window however hard you play.
- **The controls reshape it.** Each of the band's four CORE controls changes one part of the picture, and the picture follows as you drag (4.5.2). The picture only shows the sound: nothing in it changes a value.

With Reduce Motion on (Settings › Accessibility › Motion › Reduce Motion), the picture holds still: the camera stops, the controls still reshape it, and a held note still shows, as a steady change in the shape. With VoiceOver on, the picture is read as the engine's name and the picture's, such as **SLOPE PICTURE, CONTOUR FIELD**.

In the TN looks (iPhone only, 2.1.1, 14.2.1), the band's four slider handles carry colors. In TN-1 and TN-1 DARK they are blue, ochre, light gray and orange, left to right, on every SYNTH page, and the left window draws the part each slider changes in that slider's color, on NEW and CLASSIC alike and on the SHAPE, FX and MOVE plots. While you drag, a part two sliders share lights briefly in the color of the one you're moving. In TN-XY the four handles are grays, darkest on the left, and the pictures are drawn as in LIGHT and DARK. Under SHIFT, on a slider with nothing behind it and on a lane set to EXTERNAL MIDI the handles stay plain.

4.5.1 Switching to CLASSIC and back

CLASSIC draws the engine as four flat plots, one per band control, and on SLOPE it has two more views (4.5.3). You switch one lane at a time, with a tap on the picture.

To switch a lane to CLASSIC:

01 Focus the lane, press SYNTH, and go to the CORE page. HELP must be off. The left window's header starts with the tap mark, a small dot in a ring.

02 Tap the left window anywhere. The switch happens as you lift your finger: the picture becomes CLASSIC's four plots.

To go back to NEW, tap the window again. KNOCK and CINDER kits switch the same way on DRUM (6.2.1).

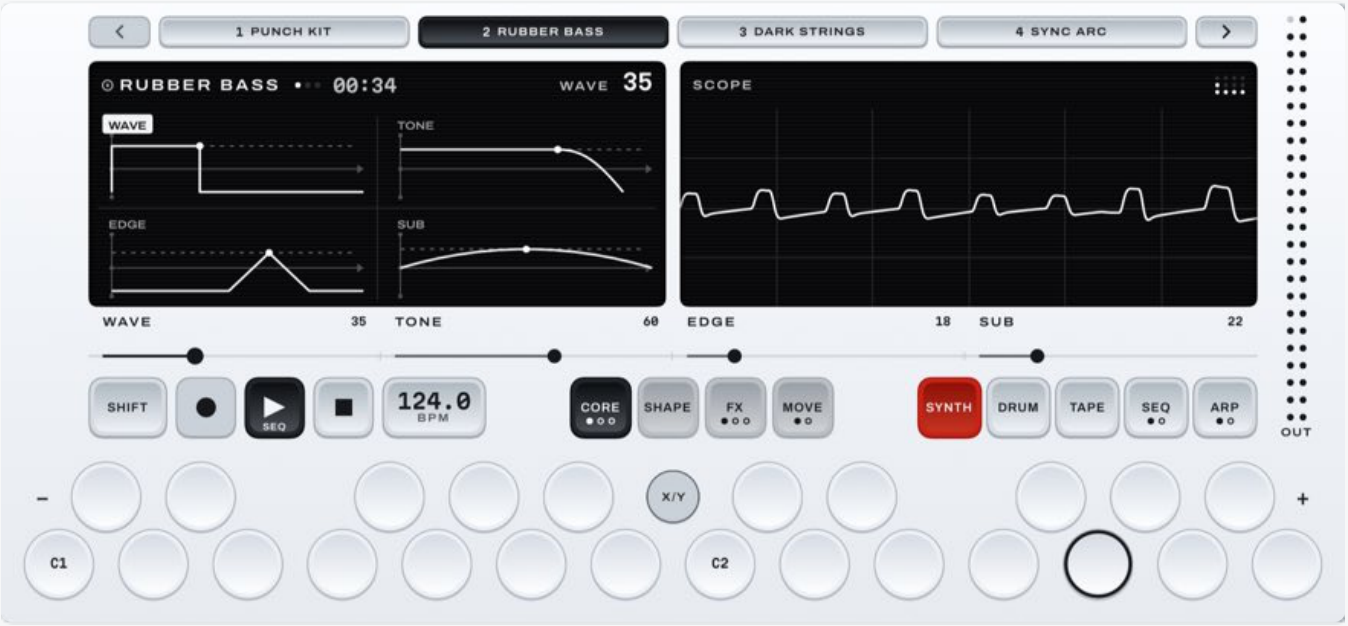


Figure 4.11 CLASSIC on the same sound. On SLOPE the header's three marks and CORE's three dots say this is the first of three views; the tap mark is still there, so a tap goes back to NEW.

How long CLASSIC lasts:

- **Only while you stay on that lane.** Go to SHAPE, FX or MOVE, or to another screen, and come back: CORE still shows CLASSIC, even if you have loaded another sound on the lane. Focus another lane, with its lane button or any other way, and every lane is NEW again, the one you left included.
- **Opening the app** brings NEW back on every lane.
- **It isn't saved.** NEW or CLASSIC is not part of the project or the sound, no setting keeps a lane on CLASSIC, and switching never changes a value or the sound.

A tap switches the picture only on CORE, and only where the header wears the tap mark. Elsewhere the left window takes no tap:

- **SHAPE, FX and MOVE.** Their plots are pictures of the page.
- **SAMPLER's FILTER page** (4.4.3). Press CORE to go back to the first page, and tap there.
- **SLOPE's CURVE and DOTS views**, which only CLASSIC has. Press CORE until PLOTS shows, then tap; or focus another lane.
- **HELP latched.** The help panel takes the picture's place, so there is nothing to tap. CORE 's help line says how to switch: TAP SCREEN: CLASSIC WHILE ON THIS LANE, or on SLOPE shown CLASSIC PRESS AGAIN: NEXT VIEW · TAP: SWITCH. Turn HELP off to tap.
- **A lane set to EXTERNAL MIDI.** It has no engine, and SYNTH shows its MIDI channel instead (chapter 16).

4.5.2 The nine pictures

Each NEW picture shows the kind of sound its engine makes, and each of the four band controls on CORE moves one part of it. The controls under SHIFT leave the picture alone, except CROSS's **RATIO FINE**, GUT's **POSITION** and SAMPLER's **REVERSE**. The name under each engine is the one VoiceOver reads.

ENGINE	THE PICTURE	WHAT CONTROLS 1 TO 4 DO TO IT
SLOPE Contour field	Five wavy lines, one behind another, each with two humps, over a fainter line for the sub. A dot rides the front line. A slow ripple runs along the lines and swells as notes play.	**WAVE**: the humps' width and balance. **TONE**: how tall they stand. **EDGE**: how sharp the first hump peaks. **SUB**: lifts and brightens the lower line.
CROSS FM sidebands	A row of 28 upright lines on a floor, their tops joined front and back, labeled **FM SIDEBANDS** and **6 OPERATORS**: the overtones an FM tone is built from. Notes make them breathe and jump. The row is drawn from the four controls, not measured from the sound.	**RATIO**: how the tall lines are spaced along the row (**RATIO FINE** moves them too). **DEPTH**: spreads the energy over more lines. **FOLD**: adds folded overtones, a busier, more jagged row. **BODY**: how far the first line, the note itself, stands out from the rest.
SAMPLER Sound relief	The lane's recording as a thick slab, its top edge the recording's loud and quiet parts and the texture of its wave. START and END are upright frames, the loop is marked beneath, and the playback speed is written	**START** and **END**: move the two frames, and the lit stretch between them. **LOOP**: moves the loop's mark once LOOP LENGTH is under 100%; the mark is dim while LOOP ON is off. **PITCH**: the speed in words, such as **+12 ST / 2.00x**, and a dot running along a small rail at that speed. The recording itself never changes shape.

	under it. While a note plays, a read head runs along the slab.	
GUT Tension bridge	Strings stretched between two blocks, three of them in depth, with a small carriage on a rail beneath. The strings lie still until a note plucks them.	**TENSION**: how fast they swing. **DECAY**: how long they keep swinging after the pluck. **DAMP**: smooths away the small, fast ripples. **PLUCK**: how much fast ripple a pluck adds. **POSITION**, under SHIFT, slides the carriage to where the string is plucked.
SCAN Wavetable frames	Six faint waves lined up in depth, labeled **TABLE FRAMES**, and one bright wave among them, labeled **POSITION**, with a dot riding it. The waves roll slowly sideways. They are drawn for each table's family of shapes, not read from the table itself.	**TABLE**: the family, so every wave changes. **POSITION**: moves the bright wave forward or back through the set. **WARP**: bends each wave's shape. **TONE**: adds smaller, faster ripples on top.
PULSE Pulse width A + B	Two square-topped waves, **OSC A** bright in front and **OSC B** fainter behind, with a bracket over the high part of one of A's cycles. The widths breathe in and out, B a quarter-turn after A.	**WIDTH**: how narrow the high part of each cycle is; the bracket follows it. **OFFSET**: how high B plays above A, so B draws more cycles across the window; at **00** B is silent, and dim. **PWM DEPTH**: how far the widths breathe. **PWM RATE**: how fast they breathe, slowed down so you can follow it.
SWARM Oscillator wings	Long, flat wings stacked in depth, one per voice, each coming to a point at one end, with a dot sliding along it.	**COUNT**: how many wings, 1 to 7. **SPREAD**: fans them apart in depth. **WAVE**: how broad each wing's point is. **MOTION**: how much each wing rocks on its own; at **00** they hold still.
DUST Levitation bed	A shallow slab with bright grains floating above it, drifting from left to right, fading in at one end and out at the other. Notes lift and stir them.	**DENSITY**: how many grains (a number for the eye, not the engine's own). **PITCH SPREAD**: how high and deep the cloud spreads. **TONE**: how bright the grains are. **MOTION**: how fast they flow.
DIVINER Analog confluence	Two wave ribbons, oscillator A in front and B behind, run in from the left and merge into one filtered ribbon on the right, with a dot riding it. A chord adds faint layers behind B.	**CUTOFF**: how much of the waves' sharp detail reaches the merged ribbon. **RESONANCE**: adds ringing ripples along it. **ENV AMOUNT**: each note sends a sweep along the ribbon, a crease that travels out and back; above **0** it opens and lifts the ribbon, below **0** it closes and lowers it, and at **0** there is none. **B FINE**: shifts the rear ribbon against the front and sets it drifting, many times more than the sound is detuned, so you can see it.

4.5.3 CLASSIC's views: PLOTS, CURVE and DOTS

On CLASSIC every synth engine draws PLOTS: four small graphs, one per band control, in the same order as the sliders below them. Each graph has its own axis, a dashed guide at the current value and a dot on the reading, so you can see what the control is doing to the sound. The graph of the control you touched last has its label filled in.

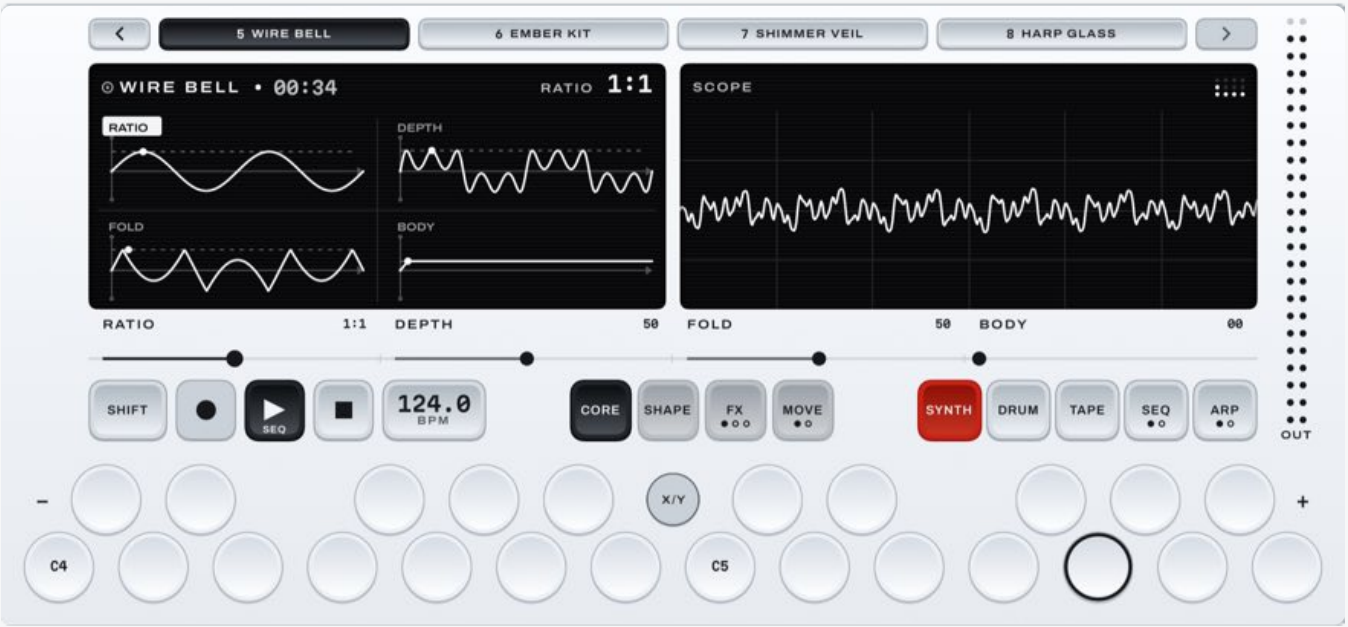


Figure 4.12 CROSS on CLASSIC. Each plot draws what its control does: a plain sine for RATIO at 1:1, the bent wave for DEPTH and the folded one for FOLD. BODY is at 00 on this sound, so its plot is a flat line.

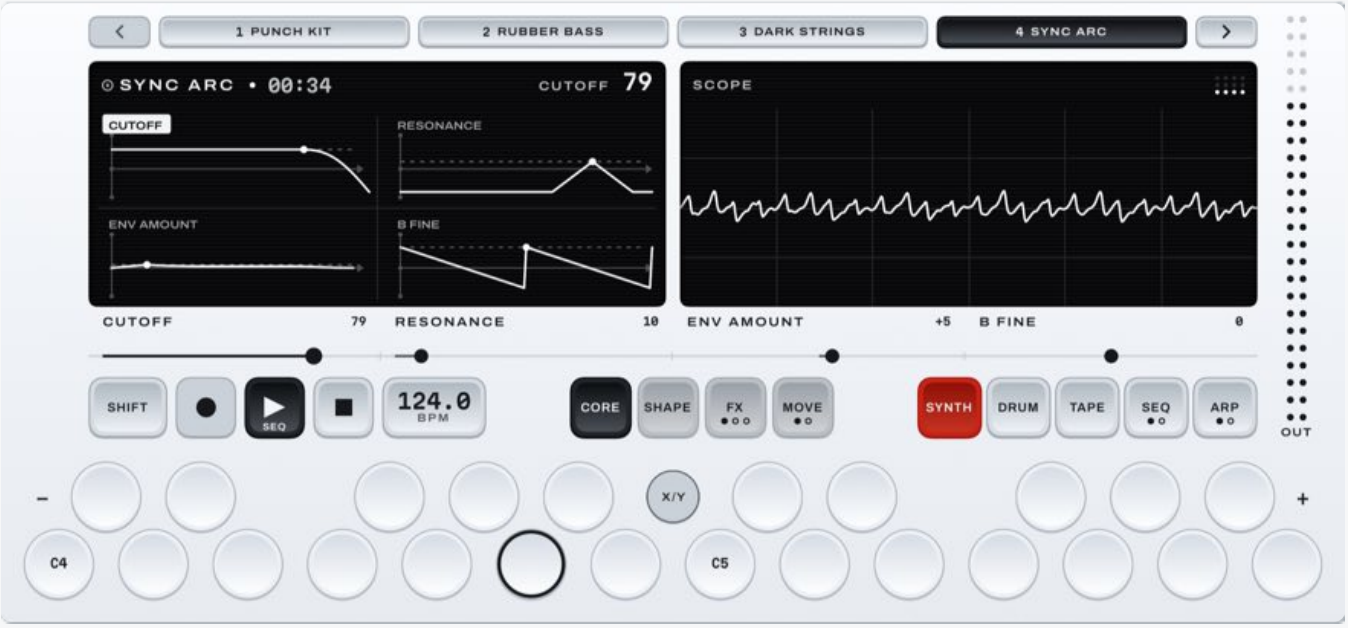


Figure 4.13 DIVINER on CLASSIC. CUTOFF draws the filter's knee and RESONANCE its peak. B FINE draws B's saw over A's; at 0 the two are one line.

SLOPE has two more views on CLASSIC, of the same sound:

- CURVE: one picture of the sound's harmonics on a frequency axis, with each control owning a feature of it (the filter's knee, the resonant peak, the sub, the wave's harmonics). Its four labels run along the foot in the band's order, **WAVE**, **TONE**, **EDGE**, **SUB**, and the one you're moving is filled, so you can see which feature it owns.
- DOTS: the same picture drawn in the panel's own dot-meter style, with its labels in the same order.

All three views read the same four values, so moving **TONE** moves the knee by the same amount in each.

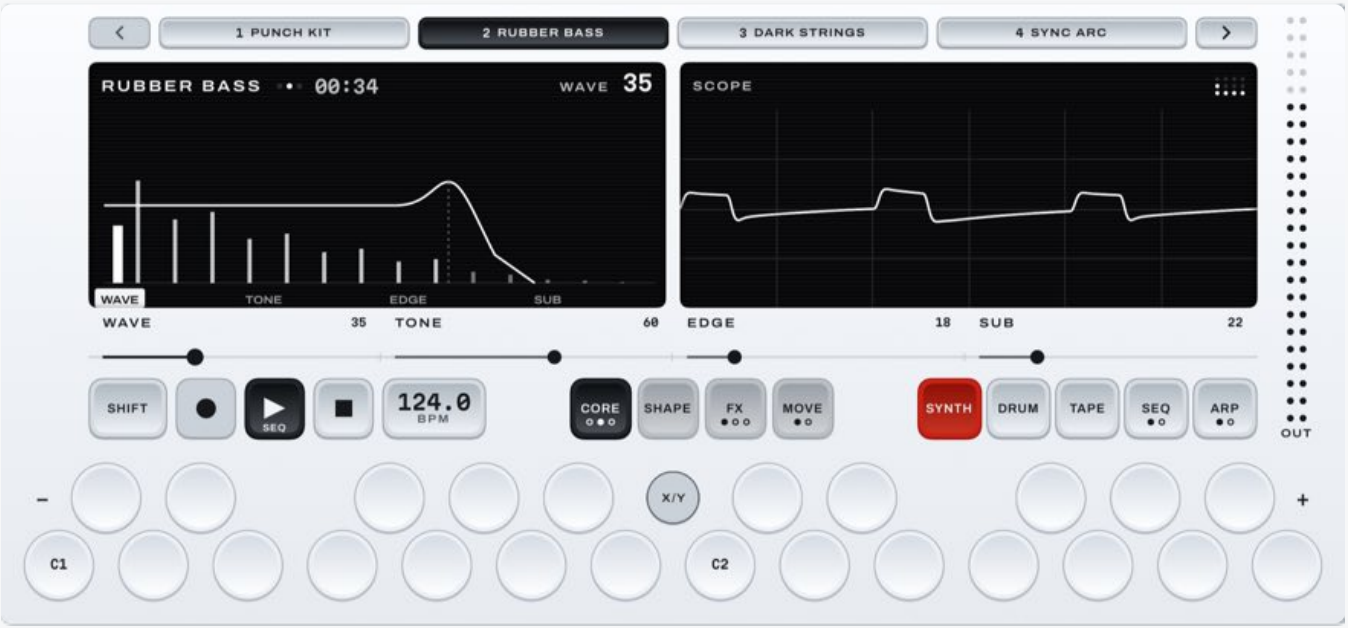


Figure 4.14 CURVE: the four controls as one picture of the sound's harmonics. The second view mark and CORE's second dot say which view this is. CURVE takes no tap, so its header has no tap mark.

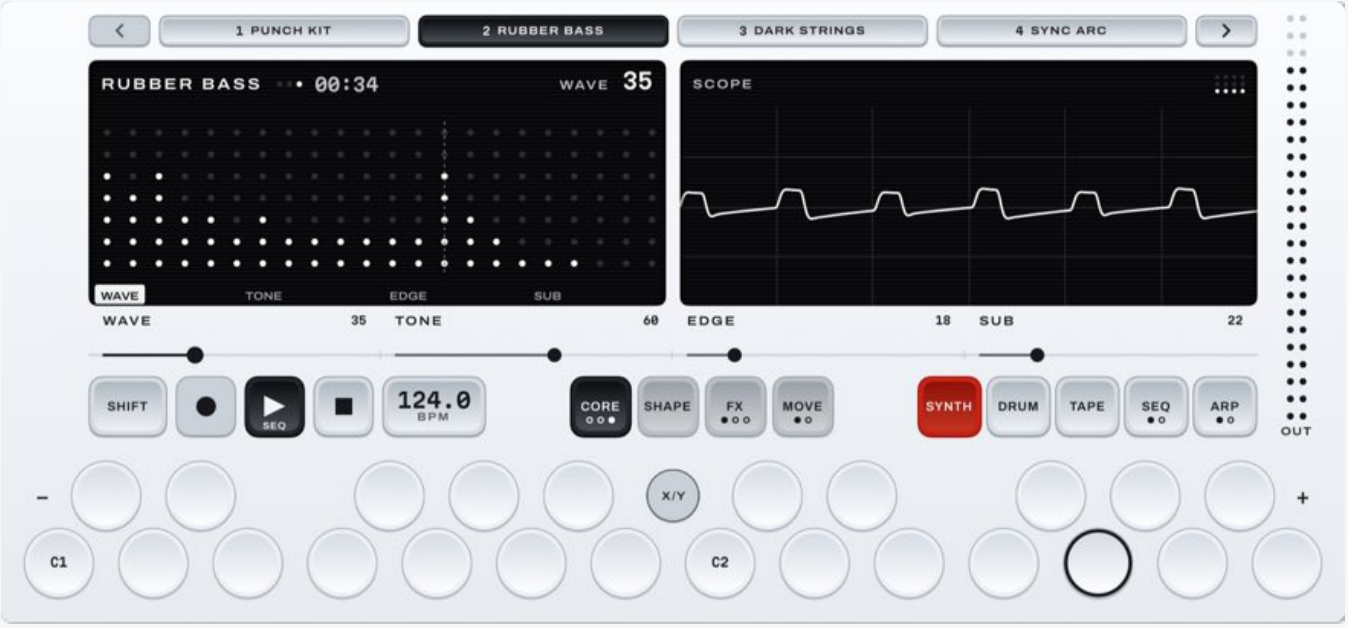


Figure 4.15 DOTS: the same picture as CURVE, in the meter's dot language.

To change the view on SLOPE:

01 Switch the lane to CLASSIC (4.5.1). Make sure SHIFT is off and you're on the CORE page.

02 Press CORE again. The picture moves to the next view: PLOTS, then CURVE, then DOTS, then back to PLOTS.

On CLASSIC, CORE wears three dots on a SLOPE sound, one per view, and its filled dot moves with the header's marks: on CURVE the key's second dot is filled and the header's second mark is the bright one. CORE pressed from another page lands on the view you left, and its dot says which. On CURVE and DOTS a tap on the window does nothing; press CORE until PLOTS shows to tap back to NEW.

The small dots after the name in the header are the view marks, one per view, with the current one bright. Hold or latch SHIFT and SLOPE's spell themselves out as **PLOTS CURVE DOTS**, with the current one filled. Every other synth engine has PLOTS only: one mark, it never spells out, and pressing CORE again changes no view (on SAMPLER it opens the FILTER page instead). SHAPE, FX and MOVE have no view marks. Under NEW, SLOPE has its one picture too: one mark, no dots under CORE, and CORE pressed again does nothing.

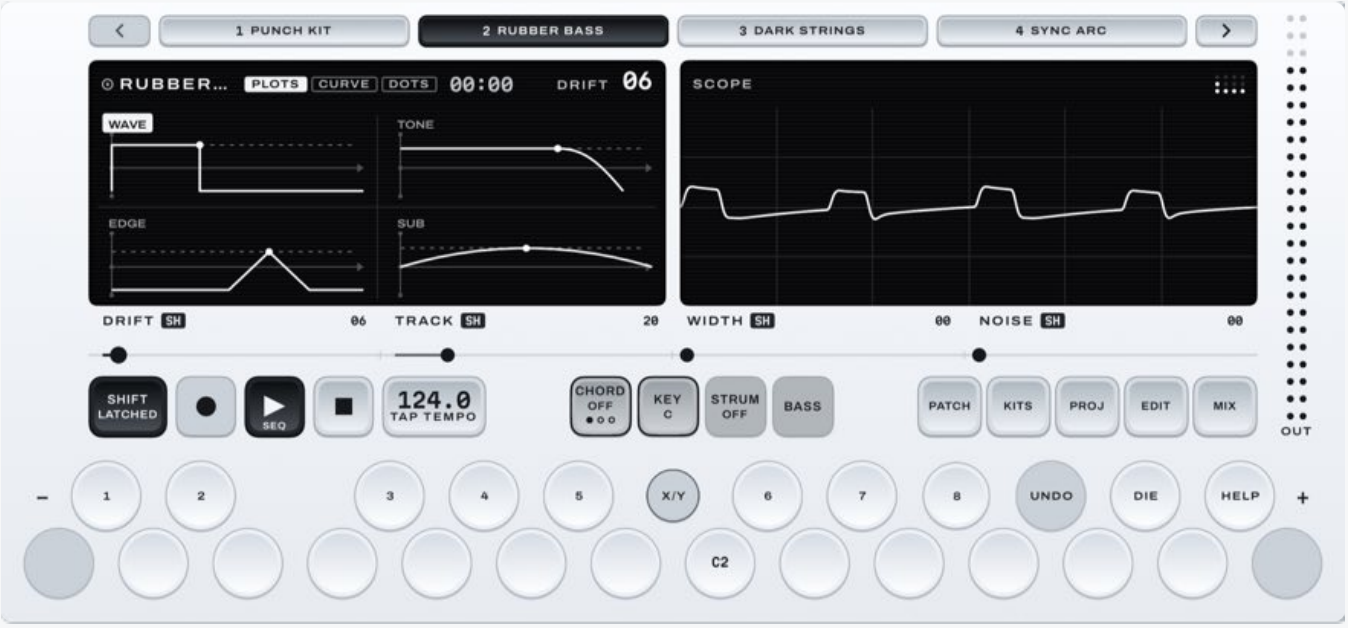


Figure 4.16 Under SHIFT the view marks spell out their names, and the band shows CORE's other four controls. The name is cut short to fit.

The view you choose is kept for SLOPE on this device, and survives quitting the app. It is not part of a project or a sound: set CURVE, and every SLOPE sound in every project opens on CURVE when you switch it to CLASSIC. Changing the view never changes a value.

4.6 SHAPE: how a note rises and falls

SHAPE sets the sound's amp envelope (how the volume of each note rises, holds and dies away, often called ADSR after its four parts) and how the sound plays: one note or many, glide, bend range and level. Every synth engine has the same SHAPE page.

#	CONTROL	WHAT IT DOES
1	**ATTACK**	How fast a note rises, from instant to about ten seconds.
2	**DECAY**	How fast it falls from its peak to the SUSTAIN level.
3	**SUSTAIN**	The level it holds at while the key is down. **`00`** means the note dies away even while you hold it.
4	**RELEASE**	How long it rings after you let go, up to about twenty seconds.
5	**PLAY MODE**	**`POLY`**, **`MONO`**, **`LEGATO`** or **`UNISON`** (4.6.1).
6	**GLIDE**	The time to slide from one note to the next. **`00`** is off; the top is about two seconds (4.6.2).
7	**BEND**	How far the pitch bends, **`+0 ST`** to **`+24 ST`**: a MIDI keyboard's pitch-bend wheel, and the X/Y pad's X. A new sound starts at **`+2 ST`**.
8	**LEVEL**	The loudness of this sound. **`80`** is the normal level; **`99`** is about twice as loud (+6 dB); **`00`** is silent.

The picture draws ATTACK, DECAY, SUSTAIN and RELEASE as four plots, whichever layer the band is on.

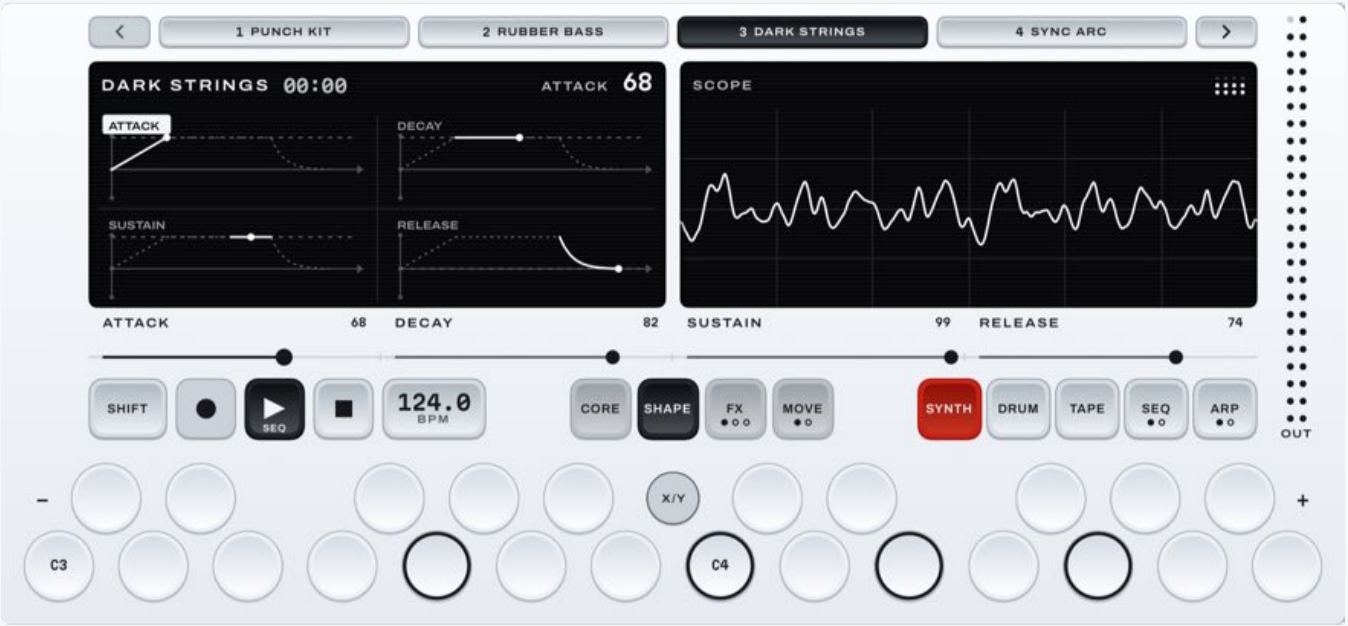


Figure 4.17 SHAPE on Night Drive's strings: a slow rise, a hold near full level and a long tail, one part to each plot. With SUSTAIN at 99, DECAY has almost nothing to fall.

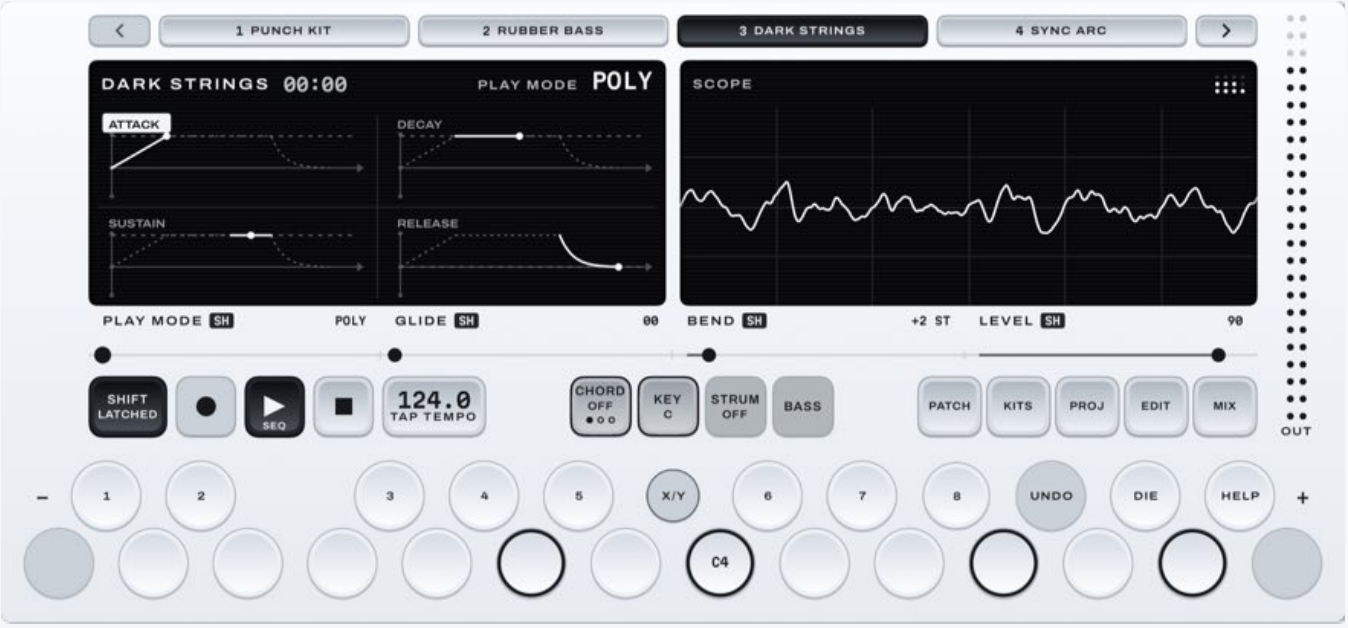


Figure 4.18 SHAPE under SHIFT: the band changes and the envelope picture stays. The page keys turn into the chord keys while SHIFT is on.

4.6.1 PLAY MODE

PLAY MODE decides how many notes sound at once and what happens when notes overlap.

SETTING	WHAT IT DOES
POLY	Chords. Up to eight notes sound at once on the lane. Play a ninth and the oldest note that is already ringing out gives way; if all eight are still held, the oldest held note does. GLIDE does nothing in POLY, though a step's SLIDE on SEQ still slides into its note (chapter 8).
MONO	One note at a time. A new note takes over and starts its envelope again. Let go of it while still holding an earlier key and the earlier note comes back. With GLIDE up, every note slides from the last one.
LEGATO	One note at a time, but a note played while another is held moves the pitch without starting the envelope again, so a run of overlapping notes is one smooth phrase. GLIDE only slides between overlapping notes; a detached note starts fresh.
UNISON	One note at a time, played by three voices at once: one in tune in the center, one slightly flat on the left, one slightly sharp on the right. It is thick and wide. Otherwise it behaves like MONO. On DIVINER, **UNI DETUNE** in EDIT widens the spread.

TIP

> On a held-chord pad, POLY. For a bass line or lead that slides, MONO or LEGATO with GLIDE up: Night Drive's bass and lead are both set that way. For a fat mono lead, UNISON.

4.6.2 GLIDE and BEND

GLIDE (also called portamento) slides the pitch from one note to the next over the time you set. It works in MONO, LEGATO and UNISON, not in POLY. To hear it: set PLAY MODE to **MONO**, raise GLIDE to about **40**, and play two keys far apart, one after the other.

BEND sets how far the pitch can bend, in semitones up and down. It sets the range of a MIDI keyboard's pitch-bend wheel (3.8) and of the X/Y pad's X, which bends the note up to BEND either way (15.6). At **+0 ST** nothing bends, and the pad says **NO BEND**.

4.6.3 SHAPE on GUT and CROSS

Two engines make their own envelopes, and SHAPE works differently on them:

- **GUT.** A string rings by itself, so **DECAY** and **SUSTAIN** do nothing. **ATTACK** softens the pluck, but only up to about a fifth of a second however high you set it. **RELEASE** sets how fast the string is stopped when you let go; it never rings longer than it would have while held. CORE's own **DECAY** sets how long the string rings.
- **CROSS.** Each CROSS sound has envelopes built into its FM setup. SHAPE stretches or shortens them, up to eight times either way, instead of replacing them: **ATTACK**, **DECAY** and **RELEASE** scale their times, and **SUSTAIN** raises or lowers their held level. The settings that leave the sound as designed are the SHAPE page's starting values.

4.7 FX: four effects on every sound

Every sound, synth or kit, has four effect slots. A new sound holds Reverb, Delay, Chorus and Drive, in slots 1 to 4, with every amount at **00**, so it starts dry. Factory sounds may have some amounts up. In the song Night Drive, the lead on lane 4, Sync Arc, has all four up.

- **On the band**: the four amounts. Each slider is named for the effect in its slot (**REVERB**, **DELAY**, **CHORUS**, **DRIVE**) and sets how much of that effect you hear. **00** is none.
- **Under SHIFT**: each slot's main control. For the four defaults these are **SIZE** (Reverb), **TIME** (Delay), **RATE** (Chorus) and **DRIVE** (Drive). The other effects' main controls are in the table in 4.7.2.

One slot is always lit. On the FX page one slider's name is lit, on the band and under SHIFT, and the header names that slot and what it holds: **SLOT 2 · DELAY**, or under SHIFT **SLOT 2 · TIME**. The lit slot is the one **FX** 's next press opens. To light another, touch its slider; the slider you touched last, on any of the four pages, picks the slot by its position, so the third slider on CORE picks slot 3. An empty slot names itself, such as **SLOT 3 · NONE**.

The sound goes through the slots in a fixed order: **slot 4 first, then 3, then 2, then 1**. With the defaults that is Drive, Chorus, Delay, Reverb, so the reverb comes last. To have an effect act earlier in the chain, put it in a higher-numbered slot.

A slot at **00** is switched off completely and costs no processing power, so four effects at 00 cost nothing. Raise one and it fades in rather than clicking.

The picture draws the four slots as plots, each showing its effect at its amount. A slot set to **None** is empty: its sliders read **–** and are drawn off. If all four slots are empty, the window says **NO EFFECT · PRESS FX AGAIN TO CHOOSE**.

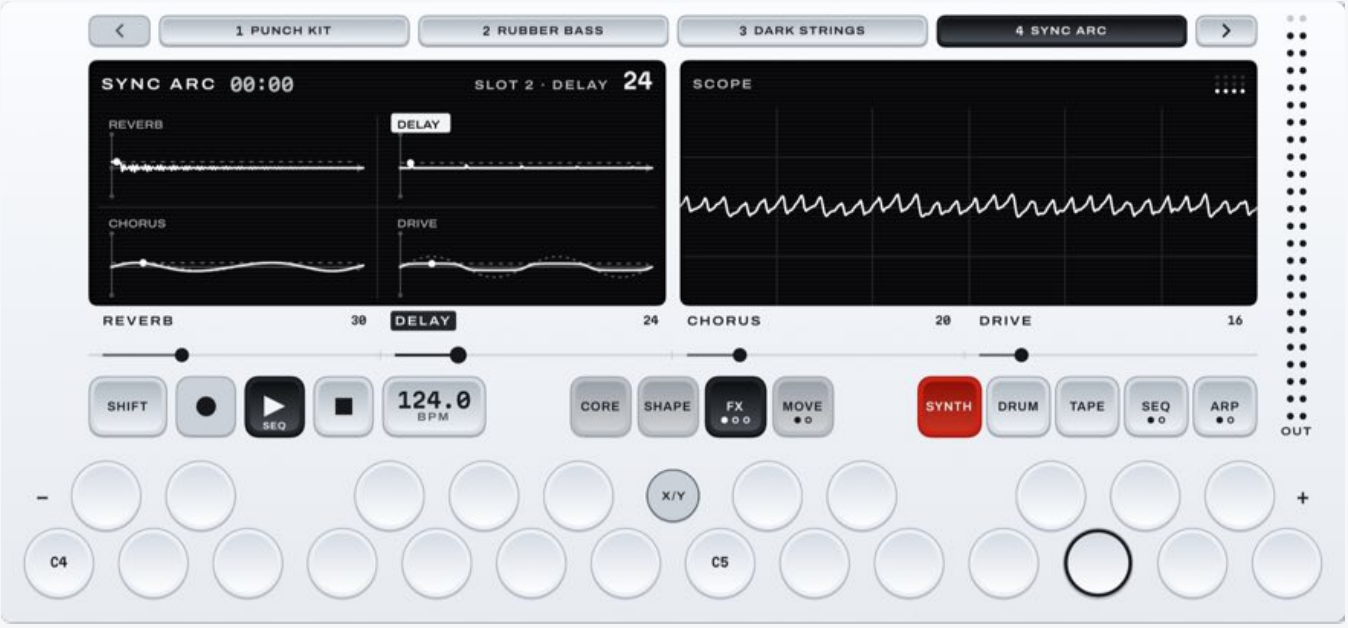


Figure 4.19 FX: four effect amounts, each slider named for the effect in its slot. The lit name, DELAY here, is the slot FX's next press opens.

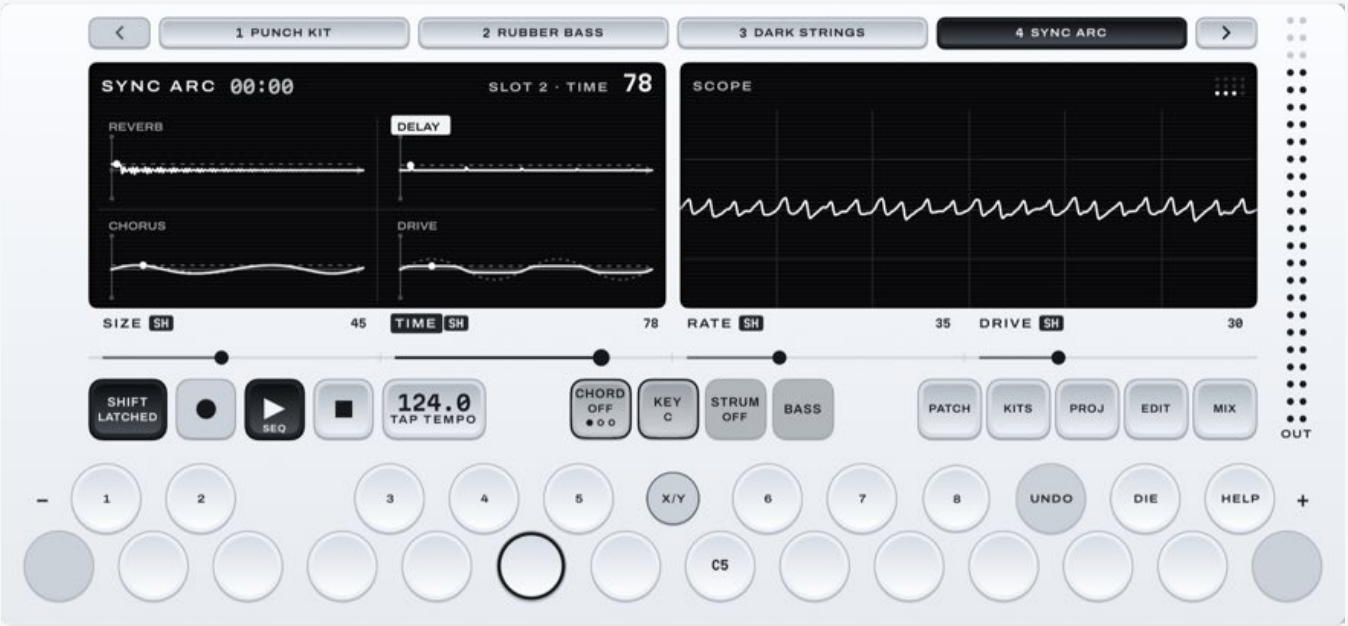


Figure 4.20 FX under SHIFT: the main control of each slot's effect.

NOTE

PERFORM's SPACE fader moves a lane's effects while you play, without changing any value on this page, and STOP puts them back unless PERFORM's KEEP is lit (15.3, 15.4).

4.7.1 Changing what a slot holds

To change the effect in a slot:

01 On FX, tap the slot's name, the word above its slider (**DELAY**, for example). The effect list opens over the page for that slot. Its header reads the slot and what it holds, such as **SLOT 2 · DELAY**, then your lane, such as **LANE 4**, with a counter such as **03 / 17** on the right.

02 Move the cursor: drag in the list, tap a row, or use the **CURSOR** slider, the band's first. The effect under the cursor goes into the slot at once and the header follows, so play the keyboard while you move it and listen.

03 When you have the one you want, press **FX** again. The slot's CONTROLS open, with all eight of the effect's controls on the band (4.7.3). Press **FX** once more to go back to the FX page. Any other page key closes the list and takes you to that page; a mode key closes it too.

The name works on both layers of the band: under SHIFT, tap **TIME** to open the list for the slot that holds Delay. It does nothing on an empty slot, whose sliders are drawn off (see the note below), and with HELP latched a tap reads the slider's help line instead. The older way still works: touch the slot's slider so its name lights, then, with SHIFT off, press **FX** again.

Another slot without leaving the list. The band's second slider, **SLOT**, reads **1** to **4**: the slot the list is changing. Move it and the list moves to that slot, its cursor on the effect the slot holds, and its header follows. SLOT changes nothing by itself; only moving the cursor puts an effect in. The slot you leave the list on is the one the FX page lights afterwards.

The list has seventeen rows: **None**, **Spring**, **Delay**, **Crush**, **Fold**, **Comb**, **Reverb**, **Chorus**, **Drive**, **Echo**, **Space**, **Dist**, **Filter**, **Pump**, **Swirl**, **Lo-Fi**, **Tremolo**. A row carries a chip for every lane that holds that effect in the same slot, such as **L4**; when five or more lanes hold it, the row shows the first three chips and a count, such as **+4**. The right window, **CONTROLS**, names the effect at the cursor and lists its eight controls in two columns of four, with **FX AGAIN: TURN THESE CONTROLS** at its foot. While the list is open the keyboard keeps playing the lane, and the band's other two sliders are drawn off.

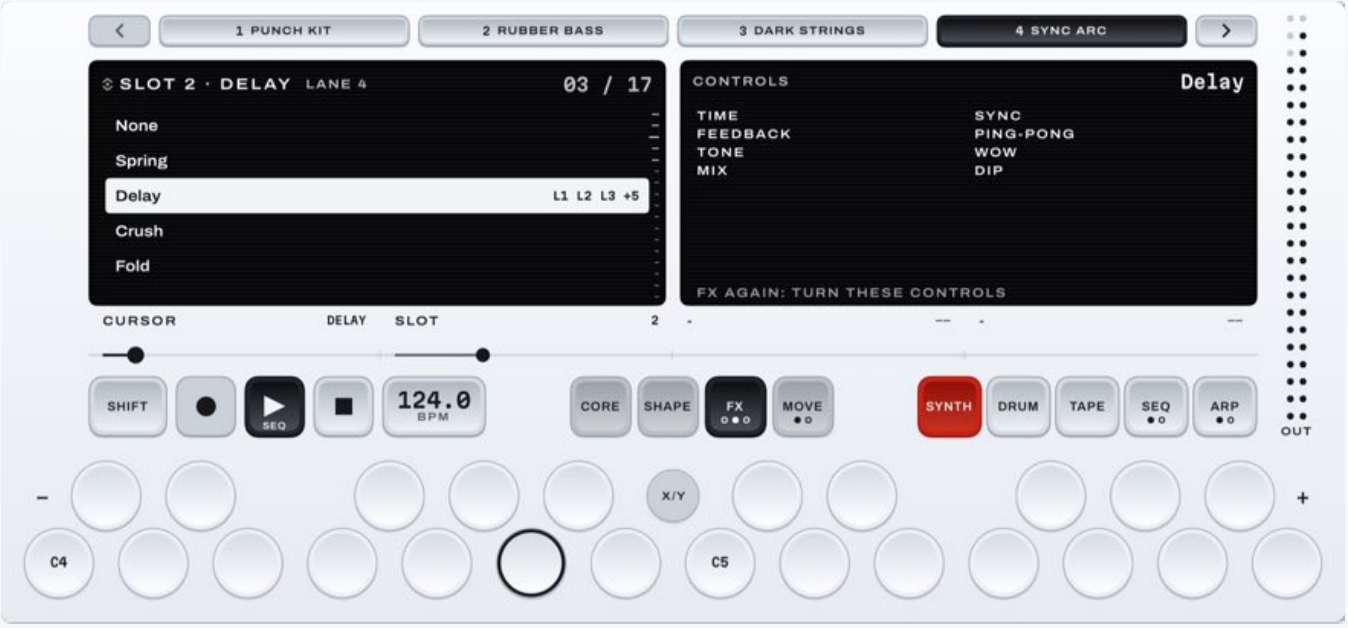


Figure 4.21 The effect list for slot 2. Every lane in Night Drive holds Delay in this slot, so its row shows three chips and +5. Moving the cursor puts that effect in the slot straight away; SLOT moves the list to another slot.

What a swap changes:

- **The slot's settings go back to the new effect's starting values.** The list remembers what each slot held when the list first showed it: move the cursor back to that effect and it comes back with your settings, not its starting values. Every other effect comes in at its starting values, and once you leave the list it remembers nothing.
- **The amount is kept if it was above 00.** If the slot's amount was **00**, the new effect comes in at its own starting amount so you can hear it: Spring **30**, Delay **30**, Crush **99**, Fold **99**, Comb **50**, Reverb **25**, Chorus **50**, Drive **99**, Echo **30**, Space **35**, Dist **99**, Filter **99**, Pump **99**, Swirl **50**, Lo-Fi **99**, Tremolo **99**. From then on the amount is above 00, so as you keep moving down the list it stays where the first effect put it. Turn it down on the FX page if that is more than you want.
- Reverb chosen from the list always starts as a plain reverb, with its gate off.
- The old effect fades out as the new one fades in, so you can swap while a note holds.

Choosing **None** empties the slot.

NOTE

An empty slot's sliders are drawn off on the FX page and can't be touched. To fill one, open the list from any slot and move **SLOT** to the empty one; then move the cursor. Or open CONTROLS (4.7.3) and tap the empty slot's row: the right window reads **NO EFFECT IN THIS SLOT** and **PRESS FX TWICE TO CHOOSE ONE**. The first press goes back to the FX page, now lighting that slot, and the second opens the list on it.

4.7.2

The sixteen effects

Controls 1 to 4 and 5 to 8 are the effect's own eight, in the order the CONTROLS window lists them. Control 4 is always **MIX**, the amount the FX band shows; control 1 is the main control SHIFT shows.

EFFECT	WHAT IT IS	CONTROLS 1–4	CONTROLS 5–8
Spring	A spring reverb, the twangy, splashy reverb of guitar amps.	**TONE** where the high end is cut; **SIZE** how big the space is; **DAMP** how fast the highs die away; **MIX**	**DRIP** how much the spring chirps; **DRIVE** how hard it is pushed; **WIDTH** how wide the spring sits; **PRE-DELAY** how long before the space starts
Delay	Echoes.	**TIME** how long between repeats; **FEEDBACK** how many repeats come back; **TONE** repeats darker or brighter; **MIX**	**SYNC** lock the repeats to the tempo; **PING-PONG** how far repeats bounce side to side; **WOW** tape wobble in the repeats; **DIP** repeats duck under what you play
Crush	A bitcrusher: fewer steps and less detail, for gritty, old-sampler sounds.	**BITS** how coarse the steps are; **RATE** how much of the detail is thrown away; **FLAVOR** which kind of old machine (**CLEAN**, **SAMPLER**, **CONSOLE**, **BROKEN**); **MIX**	**DITHER** soften the coarse steps with noise; **HISS** noise added underneath; **TONE** where the high end is cut; **DRIVE** how hard it is pushed
Fold	A wavefolder: loud peaks fold back on themselves, adding bright, metallic overtones.	**FOLD** how far the peaks fold back; **BIAS** push it off center before folding; **TONE** where the high end is cut; **MIX**	**DRIVE** how hard it is pushed; **STAGES** how many times it folds (**1** to **4**); **SMOOTH** how rounded the fold corners are; **LEVEL** how loud it comes out
Comb	A comb filter: a very short echo that rings at a pitch, for metallic, tuned or flanging sounds.	**FREQ** which note it rings at; **FEEDBACK** how hard it rings, either way up; **SPREAD** how far apart left and right are tuned; **MIX**	**DAMP** how fast the highs die away; **MOD RATE** how fast the sweep moves; **MOD DEPTH** how far the sweep moves; **SYNC** lock the sweep to the tempo
Reverb	A reverb, from a small room to a long hall. It can also be gated (the tail cut short).	**SIZE** how big the space is; **GATE** how soon the tail is cut off (off at the bottom); **COLOR** tail darker or brighter; **MIX**	**PRE-DELAY** how long before the space starts; **DAMP** how fast the highs die away; **MOTION** how much the tail keeps moving; **WIDTH** how wide it sits
Chorus	A chorus: slightly delayed, wobbling copies	**RATE** how fast the wobble moves; **DEPTH** how far	**VOICES** how many copies (**2**, **3** or **4**); **DELAY** how far behind the

	blended in, for width and shimmer.	the wobble reaches; **WIDTH** how wide it sits; **MIX**	copies sit; **HAAS** hold the right side back a little; **LOW CUT** keep the bass out of the effect
Drive	Distortion with a built-in squeeze, from warm saturation to fuzz.	**DRIVE** how hard it is pushed; **PUNCH** how much it squeezes the loud parts; **TONE** darker or brighter; **MIX**	**ATTACK** how fast it grabs a loud sound; **RELEASE** how fast it lets go; **CHARACTER** `WARM`, `TAPE` or `FUZZ`; **LEVEL** how loud it comes out
Echo	A tape echo: repeats that come back darker and more smeared each time, with a gentle wobble.	**TIME** how long between repeats; **FEEDBACK** how many repeats come back; **WEAR** how much each repeat darkens and blurs; **MIX**	**SYNC** lock the repeats to the tempo; **WOW** tape wobble in the repeats; **SATURATE** how hard the repeats hit the tape; **SPREAD** how far the repeats spread in stereo
Space	A huge reverb: tails from one second to a full minute that keep slowly moving, with an optional shimmer.	**DECAY** how long the tail lasts; **SHIMMER** how much of the tail rises an octave; **DAMP** how fast the highs die away; **MIX**	**PRE-DELAY** how long before the space starts; **MOTION** how much the tail slowly shifts; **LOW CUT** keep the bass out of the effect; **WIDTH** how wide it sits
Dist	Real distortion, much stronger than Drive: hard clipping, from crunch to fuzz.	**GAIN** how hard it is pushed into clipping; **TONE** how bright it comes out; **FUZZ** from crunch to fuzz; **MIX**	**LOW CUT** keep the bass out of the clipping; **BIAS** push it off center before clipping; **BITE** more top end into the clipping; **LEVEL** how loud it comes out
Filter	A filter that moves on its own: in time with the song, or opening as the sound gets louder, like a wah.	**CUTOFF** where the filter sits; **RESONANCE** how hard it rings at the cutoff; **DEPTH** how far the cutoff moves; **MIX**	**MODE** keep the lows, the highs or a band (`LOW`, `HIGH`, `BAND`); **MOVE** what moves it, the sound's level or the beat; **DRIVE** how hard it is pushed in; **SPREAD** how differently the two sides move
Pump	The pumping of dance music, drawn on the beat: the sound ducks and swells back up.	**DEPTH** how far it ducks; **RATE** how often it ducks; **RELEASE** how long it takes to come back; **MIX**	**CURVE** how fast it swells back up; **ATTACK** how quickly it ducks; **HOLD** how long it stays down; **OFFSET** how late in the beat it ducks
Swirl	A phaser and a flanger in one: a sweep that swirls and whooshes	**RATE** how fast it swirls; **DEPTH** how far it sweeps; **FEEDBACK** how much it rings and whooshes; **MIX**	**MODE** a phaser or a flanger (`PHASE`, `FLANGE`); **SYNC** lock the swirl to the tempo; **CENTER** where the sweep sits; **SPREAD** how far apart the two sides swirl

	through the sound.		
Lo-Fi	An old record on a worn tape: a narrow tone, a wavering pitch, crackle and hiss.	**TONE** from full range to a narrow old radio; **WOBBLE** how much the pitch wavers; **CRACKLE** how much record crackle; **MIX**	**NOISE** how much tape hiss; **GRIT** fewer bits and a lower rate, gently; **WIDTH** how wide it stays in stereo; **DRIVE** how hard it is pushed in
Tremolo	The level goes up and down on the beat or, as an auto-pan, the sound moves from side to side.	**DEPTH** how far the level or the pan swings; **RATE** how often it swings, on the beat; **SHAPE** from a smooth swing to on and off; **MIX**	**MODE** `TREMOLO` or `AUTO-PAN`; **OFFSET** how late in the beat it swings; **LOW CUT** the bass below it stays steady; **LEVEL** how loud it comes out

The ranges, starting values and pictures of Echo, Space and Dist are in 4.7.4, and those of the newest five, Filter, Pump, Swirl, Lo-Fi and Tremolo, in 4.7.5.

4.7.3

CONTROLS: all eight controls of an effect

The FX page reaches two controls of each effect: its amount (**MIX**) and its main control (control 1). **CONTROLS reaches all eight.** FX goes round three places: the FX page, then the slot's effect list, then the slot's CONTROLS, then back to the page. The key wears three dots, and the filled one shows where you are (2.5.1).

01 On FX, touch the slider of the slot you want to shape, so its name lights.

02 With SHIFT off, press FX twice: once for the list, once more for CONTROLS.

03 The band shows the effect's controls 1 to 4. Latch SHIFT for 5 to 8. Play the keyboard while you move them: it keeps playing the lane.

04 To shape another slot, tap its row in the left window. Press FX to go back to the FX page.

- **Left window**: EFFECTS and the lane (LANE 4), with a counter such as `02 / 04`. One row per slot: its number, its effect, and its amount (MIX 35). The cursor row is the slot on the band. Tapping or dragging the list only picks a slot; it never changes a value.
- **Right window**: the slot and its effect, such as SLOT 2 · DELAY, with the control you touched last and its value at the right; then the effect's eight controls and their values in two columns, the band's four on the left and SHIFT's four on the right. The control you touched last has a white bar at its left edge.
- **An empty slot** has all eight sliders drawn off, and the right window reads NO EFFECT IN THIS SLOT and PRESS FX TWICE TO CHOOSE ONE.
- **The amount and the main control are the same values the FX page shows.** Move one here and the FX page's slider has moved too.
- Double-tap a slider to put it back to where a new sound starts it; the amount goes back to **00**, as on the FX page. SHIFT + double-tap puts back its last change (2.4.4).

- DIE rolls the slot's eight, its amount included, a new set on every press. UNDO, the key beside it, takes the rolls back one at a time, up to eight, until you move something.
- With HELP latched, a tap on a slider reads that effect's own line for the control; a drag still moves it. The slot list stays on screen, and a tap on it reads PICK WHICH OF THE FOUR EFFECTS TO TURN; a drag still picks a slot.
- Changing lanes keeps you in CONTROLS on the new lane's slot. Any other page key closes CONTROLS and goes to that page; a mode key, EDIT and MIX close it too.



Figure 4.22 CONTROLS for slot 2 of Night Drive's lead: Delay's first four controls on the band, all eight with their values on the right.



Figure 4.23 CONTROLS under SHIFT: controls 5 to 8.

Every value is saved with the sound, as the FX page's are: in the project, in USER (5.11), in a song or a sound file you send, and over iCloud. MOVE and leaning reach only an effect's amount and main control, not the other six (4.8.2). EDIT does not list the effects (7.5.7). The master effect on MIX is a separate effect on the whole mix, and MIX's FX page already shows all eight of its controls (10.6).

4.7.4 Echo, Space and Dist in detail

Echo, Space and Dist follow Drive in the effect list, in every slot of every sound and as MIX's master effect; after them come the five newest, Filter, Pump, Swirl, Lo-Fi and Tremolo (4.7.5). A project or sound made before they arrived keeps the effects it had. The tables below give each control's range and starting value as CONTROLS' right window prints them (4.7.3); on the band the same controls read **00** to **99**, except Echo's **SYNC**, which shows its setting, and Dist's **BIAS**, which reads **−50** to **+50**. In a sound's slot, MIX's starting value counts only when the slot's amount was at **00**; otherwise the slot keeps its amount (4.7.1). As the master effect, every value starts where the table says (10.6).

On the FX page each of the three draws a picture of its own, at the slot's amount, like the other effects. Echo's is a row of repeats, each lower and wider than the last. Space's is a short hit that swells into a long tail, still going at the window's right edge. Dist's is the wave clipped flat, almost square, over the clean wave drawn dashed.

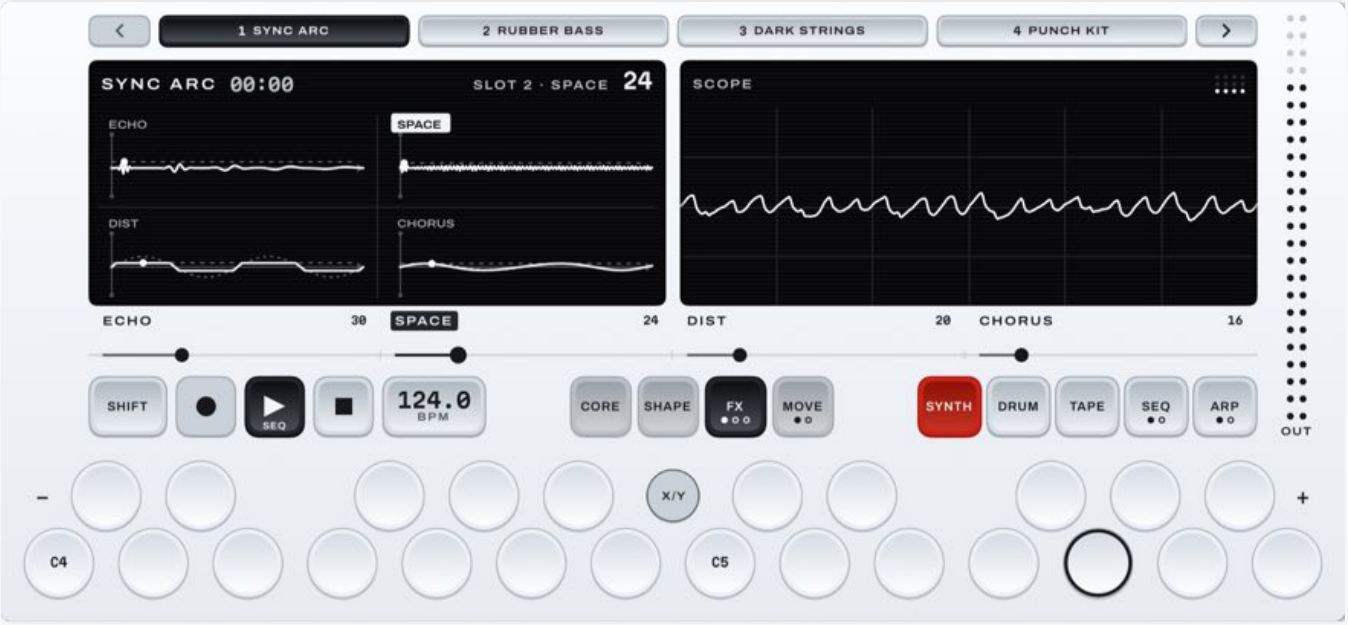


Figure 4.24 Echo, Space and Dist on one sound, each drawn at its amount: Echo's repeats wearing away, Space's tail running past the edge, Dist's flattened wave.

Echo is a tape echo. Each repeat has been round the tape once more than the one before, so it comes back a little darker, thinner and more smeared; **WEAR** sets how much. The tape wobbles gently (**WOW**), and the repeats saturate as they build up (**SATURATE**). Past **100%**, **FEEDBACK** brings each repeat back louder than the last until the tape can take no more: the echo runs away and holds there, loud but never past the tape's ceiling, until you bring FEEDBACK down. Turn **TIME** while repeats are sounding and they bend in pitch, the way a

tape machine does when its motor changes speed. **SYNC** locks the repeats to the project's tempo, and a newly added Echo starts with it on **1/4**, so the repeats fall on the beat. While SYNC is on, TIME shows the note value instead of a time, and moving TIME changes nothing; set SYNC to **OFF** for a free TIME in milliseconds. A song or sound you saved keeps the SYNC it was saved with, and every factory sound that uses Echo has SYNC on, so its repeats follow your song's tempo.

CONTROL	VALUES	STARTS AT
TIME	**20 MS** to **2.00 S**; while SYNC is on, the note value	**1/4**, from SYNC; **399 MS** with SYNC **OFF**
FEEDBACK	**0%** to **110%**	**50%**
WEAR	**0%** to **100%**	**40%**
MIX	**0%** to **100%**	**30%**
SYNC	**OFF**, **1/32**, **1/16T**, **1/16**, **1/8T**, **1/16D**, **1/8**, **1/4T**, **1/8D**, **1/4**, **1/2T**, **1/4D**, **1/2** (T is a triplet, D a dotted note)	**1/4**
WOW	**0%** to **100%**	**35%**
SATURATE	**0%** to **100%**	**40%**
SPREAD	**0%** to **100%**	**30%**

Space is a very large reverb. **DECAY** runs from a one-second room to a tail a full minute long, and the tail keeps moving slowly as it fades (**MOTION**), so a held chord smears rather than going out of tune. **SHIMMER** feeds the tail back in an octave up, so it climbs as it fades; at **0%**, where it starts, there is none. **PRE-DELAY** holds the space back by up to 400 ms, **LOW CUT** keeps the bass out of it, and **WIDTH** runs from mono at **0%** to fully wide at **100%**, where it starts.

CONTROL	VALUES	STARTS AT
DECAY	**1.00 S** to **60.0 S**	**9.51 S**
SHIMMER	**0%** to **100%**	**0%**
DAMP	**0%** to **100%**	**45%**
MIX	**0%** to **100%**	**35%**
PRE-DELAY	**0.0 MS** to **400 MS**	**22 MS**
MOTION	**0%** to **100%**	**50%**
LOW CUT	**20 HZ** to **600 HZ**	**39 HZ**
WIDTH	**0%** to **100%**	**100%**

TIP

For a pad that blooms upward, put Space in a slot, raise **SHIMMER** and **DECAY**, and hold a chord.

Dist is hard clipping, much stronger than Drive. **GAIN** starts at **+36.0 DB**, as far as Drive goes, and carries on to +60 dB. **FUZZ** runs from crunch at **0%**, soft-edged, through a hard clip at **50%** to a lopsided fuzz at **100%**, where quiet notes sputter and cut out as they fade, the way a fuzz pedal's do. The level stays about the same as you turn GAIN up, so more GAIN sounds dirtier, not louder; **LEVEL** sets how loud it comes out. Before the clipping, **LOW CUT** takes out bass that would turn to mud and **BITE** adds top end; **BIAS** pushes the wave off center for a rougher, uneven edge. After it, **TONE** rounds off the top; turned fully up, it leaves the sound alone. Dist starts with MIX at **100%**, all of the sound through it.

CONTROL	VALUES	STARTS AT
GAIN	**+12.0 DB** to **+60.0 DB**	**+36.0 DB**
TONE	**800 HZ** to **16.00 KHZ**	**4.83 KHZ**
FUZZ	**0%** to **100%**	**35%**
MIX	**0%** to **100%**	**100%**
LOW CUT	**20 HZ** to **1.00 KHZ**	**53 HZ**
BIAS	**−100%** to **+100%**	**+0%**, the center
BITE	**+0.0 DB** to **+12.0 DB**	**+3.0 DB**
LEVEL	**−INF DB** (silent) to **+6.0 DB**	**+0.0 DB**, as it is

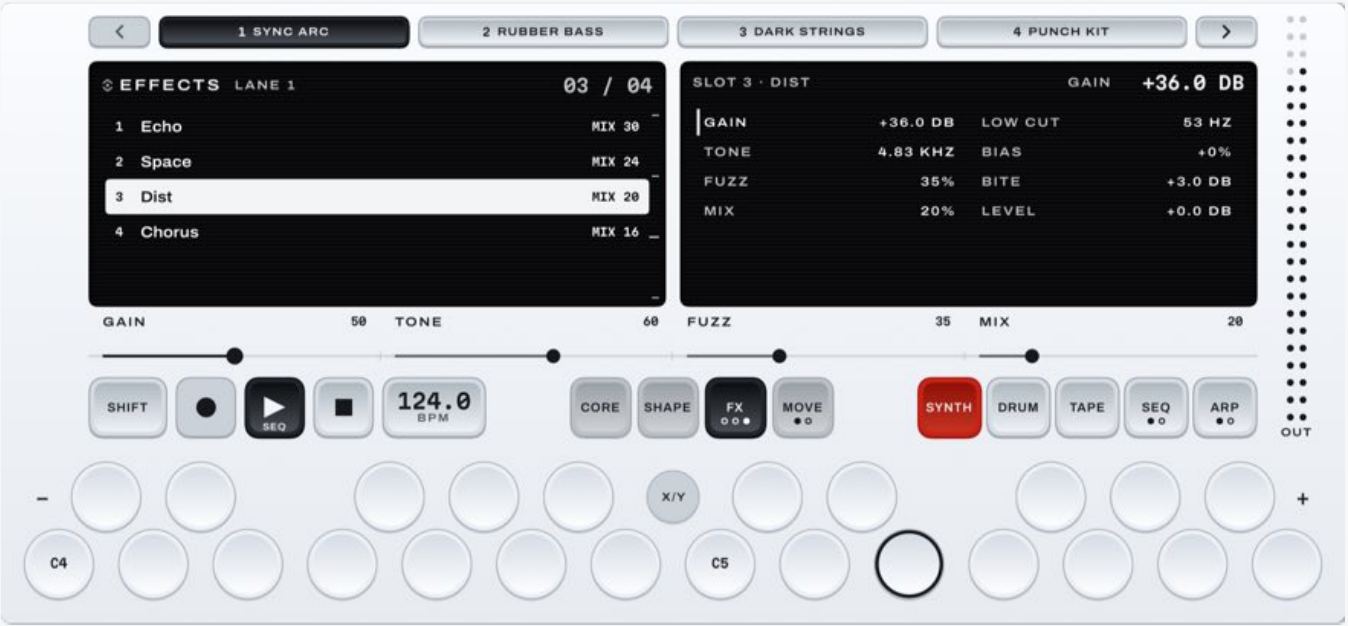


Figure 4.25 Dist in slot 3 at its starting values, with the amount the slot already had. CONTROLS shows each value in its own units.

NOTE

At its starting values Dist already distorts hard, and at **100%** MIX none of the clean sound is left. Bring MIX down to keep some of the note's attack.

4.7.5 Filter, Pump, Swirl, Lo-Fi and Tremolo in detail

Filter, Pump, Swirl, Lo-Fi and Tremolo are the five newest effects. They come last in the effect list, after Dist, in every slot of every sound and as MIX's master effect. The tables below give each control's range and starting value as CONTROLS' right window prints them (4.7.3). On the band the same controls read **00** to **99**, except the ones that step through a list, which show their setting: Filter's **MODE** and **MOVE**, Pump's **RATE**, Swirl's **MODE** and **SYNC**, and Tremolo's **RATE** and **MODE**. As in 4.7.4, MIX's starting value counts in a sound's slot only when the slot's amount was at **00**; as the master effect, every value starts where the table says (10.6).

Four of them keep time with the project's tempo: Filter when MOVE is on a note value, Pump, Swirl when SYNC is on, and Tremolo. While the music plays they move with its beat, so a sweep or a duck lands in the same place each time round; while it is stopped they keep running at the tempo.

On the FX page each of the five draws a picture of its own, at the slot's amount, like the other effects. Filter's is a jagged wave that goes dull and bright again across the window, ringing where the cutoff sits, over the plain wave drawn dashed. Pump's is a wave that ducks hard four times and swells back after each. Swirl's is a wave sliding ahead of itself and back, swelling and thinning as it goes, over a plain wave drawn dashed. Lo-Fi's is a wobbling wave in coarse steps with a few spikes of crackle on it, over a plain wave drawn dashed. Tremolo's is a wave that rises and falls twice across the window.

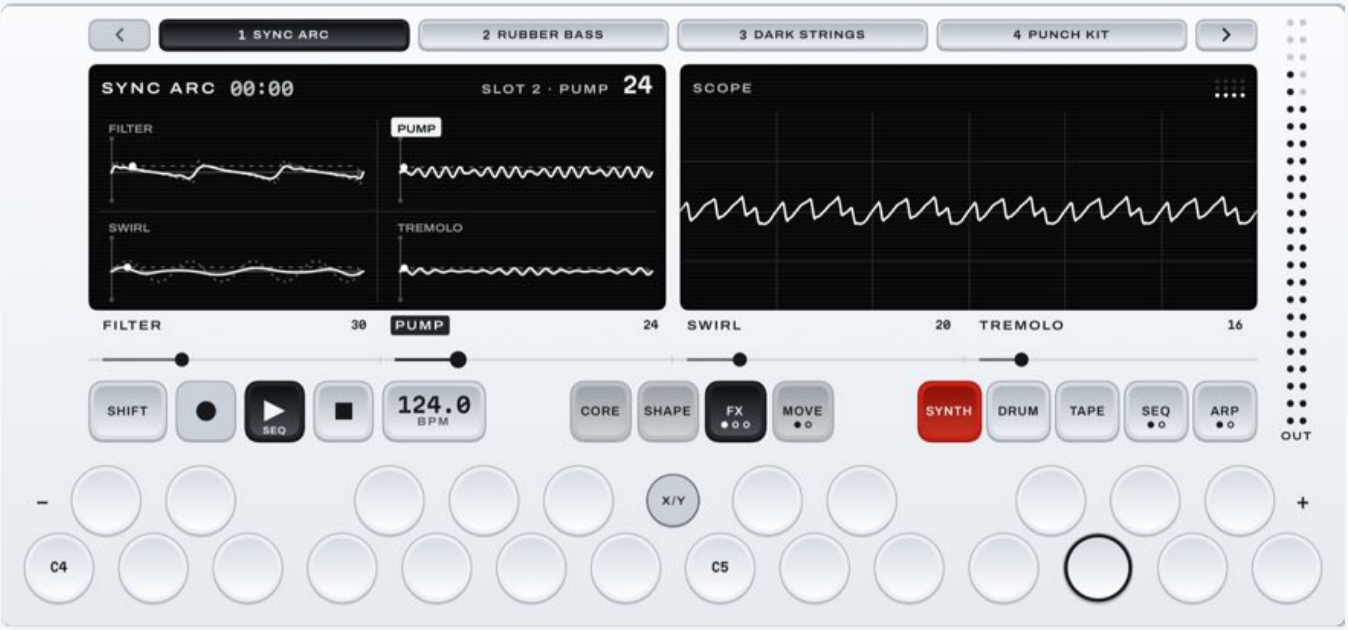


Figure 4.26 Four of the five newest effects on one sound, each drawn at its amount.

Filter is a filter that moves on its own. **MODE**, under SHIFT, picks what it keeps: **LOW**, where it starts, keeps the lows and takes away what is above **CUTOFF**; **HIGH** keeps the highs; **BAND** keeps a band around the cutoff. **RESONANCE** makes it ring at the cutoff; even at **100%** it rings but never runs away into a whistle of its own. **MOVE** picks what moves the cutoff. On a note value, from **1/32** to **4 BAR**, the cutoff sweeps up and down in time with the song, up to four octaves either way at full **DEPTH**; it starts on **1 BAR**, one slow sweep a bar. On **ENV** it follows the sound's level instead, opening as the sound gets louder, up to five octaves above CUTOFF at full DEPTH: play harder and it opens further, like a wah. **SPREAD** moves the two sides apart: on a note value the right side's sweep runs up to half a cycle behind the left's, and on ENV the right side opens up to an octave higher. **DRIVE** pushes the sound into a soft saturation before the filter, at about the same level. Changing MODE or MOVE glides from one to the other, with no click.

CONTROL	VALUES	STARTS AT
CUTOFF	**20 HZ** to **20.00 KHZ**	**1.26 KHZ**
RESONANCE	**0%** to **100%**	**40%**
DEPTH	**0%** to **100%**	**50%**
MIX	**0%** to **100%**	**100%**
MODE	**LOW**, **HIGH**, **BAND**	**LOW**
MOVE	**ENV**, **1/32**, **1/16T**, **1/16**, **1/8T**, **1/16D**, **1/8**, **1/4T**, **1/8D**, **1/4**, **1/2T**, **1/4D**, **1/2**, **1 BAR**, **2 BAR**, **4 BAR**	**1 BAR**
DRIVE	**+0.0 DB** to **+24.0 DB**	**+0.0 DB**, none
SPREAD	**0%** to **100%**	**25%**

Pump makes a sound duck and swell back up in time with the song: the pumping a dance track gets when everything is pushed down under the kick, usually with a sidechained compressor (one that turns a sound down whenever another sound plays). Pump draws the same curve from the tempo instead. Once every **RATE**, a quarter note to start with, the sound ducks and swells back. It doesn't listen to the kick or to any other lane, so it pumps the same way whatever is playing. **DEPTH** sets how far it ducks (at **100%**, to silence) and **RELEASE** how much of the RATE it takes to come back. Under SHIFT, **CURVE** shapes the way back: low, it starts slowly and swells; about a third of the way up, it comes back in a straight line; high, it snaps back fast. **ATTACK** sets how quickly it ducks, **HOLD** how long it stays down, up to half the RATE, and **OFFSET** moves the duck later: at **50%** it ducks halfway between two beats, on the off-beat.

CONTROL	VALUES	STARTS AT
DEPTH	**0%** to **100%**	**70%**
RATE	**1/16**, **1/8**, **1/4**, **1/2**, **1 BAR**	**1/4**
RELEASE	**10%** to **100%** of the RATE	**60%**
MIX	**0%** to **100%**	**100%**
CURVE	**0%** to **100%**	**60%**
ATTACK	**0.5 MS** to **40 MS**	**1.5 MS**
HOLD	**0%** to **50%** of the RATE	**0%**
OFFSET	**0%** to **100%** of the RATE	**0%**, on the beat

TIP

Put Pump on a pad or a bass with RATE at **1/4** and it pumps against a kick on every beat.

Swirl is a phaser and a flanger in one, switched with **MODE** under SHIFT. **PHASE**, where it starts, sweeps three soft notches up and down through the sound: the slow, watery swirl of a phaser. **FLANGE** mixes in a copy of the sound delayed by a few milliseconds and moves the delay: the sharper, jet-like whoosh of a flanger. **RATE** sets how fast it sweeps, from one slow pass every 50 seconds to ten a second. To lock it to the tempo instead, set **SYNC** to a note value; while SYNC is on, CONTROLS shows RATE as that value, and moving RATE changes nothing. **DEPTH** sets how far it sweeps, **CENTER** where the sweep sits (higher sounds brighter, in either mode; CONTROLS shows it in hertz for PHASE and as a delay for FLANGE), and **FEEDBACK** how much it rings and whooshes. **SPREAD** puts the right side's sweep up to half a cycle behind the left's, so the swirl moves across the stereo picture. Swirl starts with MIX at **50%**, where the notches are deepest: the classic sound.

CONTROL	VALUES	STARTS AT
RATE	**0.02 HZ** to **10 HZ**; while SYNC is on, the note value	**0.33 HZ**
DEPTH	**0%** to **100%**	**70%**
FEEDBACK	**0%** to **90%**	**40%**
MIX	**0%** to **100%**	**50%**
MODE	**PHASE**, **FLANGE**	**PHASE**
SYNC	**OFF**, **1/32**, **1/16T**, **1/16**, **1/8T**, **1/16D**, **1/8**, **1/4T**, **1/8D**, **1/4**, **1/2T**, **1/4D**, **1/2**, **1 BAR**, **2 BAR**, **4 BAR**	**OFF**
CENTER	PHASE: **150 HZ** to **3.00 KHZ**; FLANGE: **12 MS** to **0.5 MS**	**671 HZ** (**2.4 MS** on FLANGE)
SPREAD	**0%** to **100%**	**50%**

Lo-Fi makes a sound play like an old record on a worn tape. **TONE** narrows the sound from both ends, taking away bass and treble together, until at **100%** it is as thin as an old radio. **WOBBLE** makes the pitch waver: a slow wow, a faster flutter and a gentle drift, like a tape that doesn't run quite true. **CRACKLE** adds record crackle, mostly small clicks with now and then a loud pop, and under SHIFT **NOISE** adds hiss. The crackle and the hiss play only while there is sound and fade with it, so a quiet lane stays quiet. **GRIT** lowers the number of bits and the sample rate together, gently, for a grainy, older-digital edge; at **0%**, where it starts, it is off. For a harder crush, use Crush (4.7.2). **WIDTH** narrows the stereo toward mono, the narrow middle of an old record, and **DRIVE** warms the sound with a soft saturation on the way in, at about the same level.

CONTROL	VALUES	STARTS AT
TONE	**0%**, full range, to **100%**	**35%**
WOBBLE	**0%** to **100%**	**30%**
CRACKLE	**0%** to **100%**	**30%**
MIX	**0%** to **100%**	**100%**
NOISE	**0%** to **100%**	**25%**
GRIT	**0%**, off, to **100%**	**0%**
WIDTH	**0%**, mono, to **100%**, fully wide	**60%**
DRIVE	**+0.0 DB** to **+15.0 DB**	**+3.8 DB**

Tremolo moves the level up and down on the beat. **RATE** is always a note value, from **1/32** to **4 BAR**, and starts on **1/4**, one swing a beat. **DEPTH** sets how far the level dips: at **100%** it falls to silence at the bottom of each swing. **SHAPE** runs from **SINE**, a smooth swing, to **SQUARE**, a hard on and off whose edges are rounded enough not to click; in between it reads a percentage. Under SHIFT, **MODE** switches to **AUTO-PAN**, which moves the sound from side to side instead, DEPTH of the way to each side. **OFFSET** moves the swing later, by up to a whole cycle. **LOW CUT** keeps the bass steady: below it nothing moves, so a bass line keeps its weight while the top pulses. At **20 HZ**, where it starts, everything moves. **LEVEL** sets how loud it comes out.

CONTROL	VALUES	STARTS AT
DEPTH	0% to 100%	60%
RATE	1/32, 1/16T, 1/16, 1/8T, 1/16D, 1/8, 1/4T, 1/8D, 1/4, 1/2T, 1/4D, 1/2, 1 BAR, 2 BAR, 4 BAR	1/4
SHAPE	SINE, then a percentage, then SQUARE	SINE
MIX	0% to 100%	100%
MODE	TREMOLO, AUTO-PAN	TREMOLO
OFFSET	0% to 100% of a cycle	0%
LOW CUT	20 HZ to 800 HZ	20 HZ
LEVEL	-INF DB (silent) to +6.0 DB	+0.0 DB, as it is

4.8 MOVE: modulation

A modulator moves one control for you, over and over or note by note, so the sound changes while you play: a filter that sweeps, a wobble in pitch, a level that pumps. Each sound has one modulator, and MOVE is where you choose it and aim it.

A sound with no modulator shows NO MODULATOR · PRESS MOVE AGAIN TO CHOOSE in the left window, and all eight sliders are drawn off.

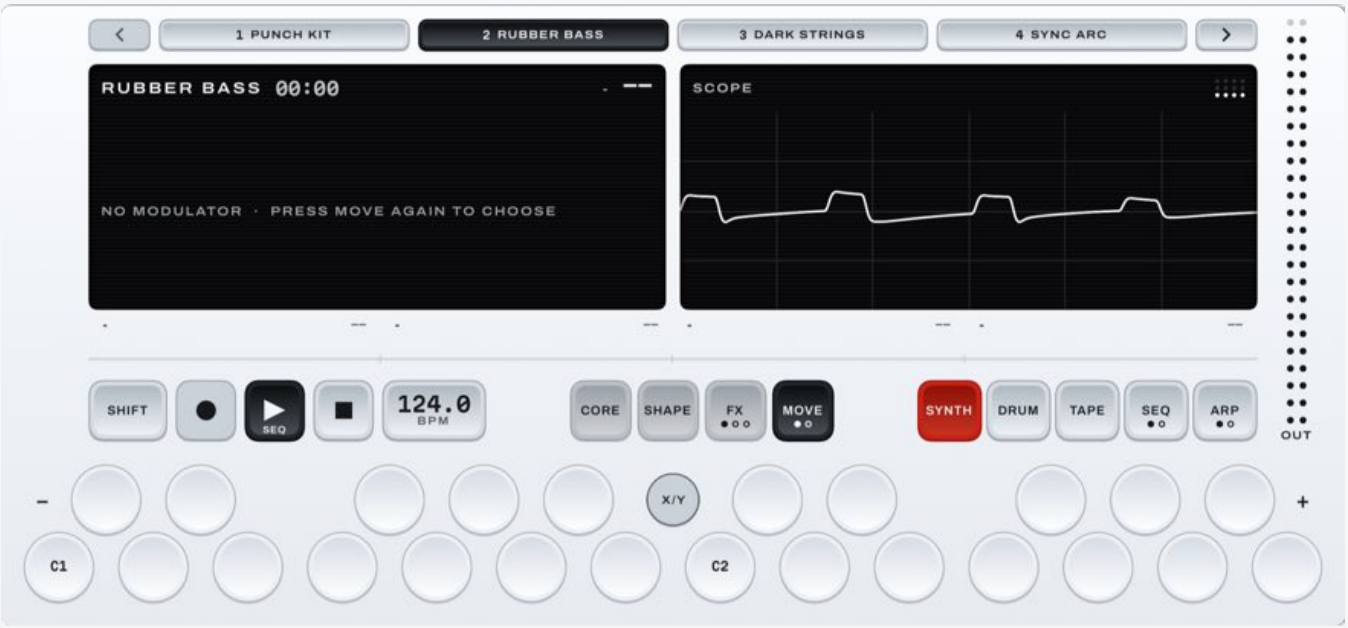


Figure 4.27 MOVE with no modulator chosen. The window says which key to press.

4.8.1 Choosing a modulator

To choose or change the modulator:

01 Go to MOVE, make sure SHIFT is off, and press MOVE again. The modulator list opens. Its header reads MODULATOR and your lane, such as LANE 4, with a counter.

02 Move the cursor: drag in the list, tap a row, or use the **CURSOR** slider. The modulator under the cursor goes onto the sound at once. The right window, CONTROLS, names it and lists its eight controls.

03 Press MOVE again to go back to the MOVE page, or any page key to go to that page.

The rows are **None**, **Envelope**, **LFO**, **Steps**, **Drift**, **Follower** and **Expression**, with lane chips for every lane using each one. **None** removes the modulator.

NOTE

> Changing the modulator resets all eight of its controls to the new modulator's starting values, including AMOUNT, DEST and SLOT. Passing over another modulator loses the settings you had.



Figure 4.28 The modulator list. One modulator per sound; Sync Arc's is Expression.

4.8.2 AMOUNT, DEST and SLOT

Every modulator has the same three aiming controls, at band positions 2, 3 and 4. Position 1 is the modulator's own first control (its speed, time or source), and SHIFT holds its other four.

- **AMOUNT**: how far the movement reaches. **0** in the middle is none; toward **+50** it pushes the control up, toward **−50** it pushes the same movement the other way.
- **DEST**: which page it moves: **CORE**, **SHAPE**, **FX**, or the lane's **PITCH** or **LEVEL**.
- **SLOT**: which control on that page, **1** to **8**. 1 to 4 are the band's four, 5 to 8 the four under SHIFT.

DEST	WHAT SLOT PICKS
CORE	One of the engine's eight CORE controls, numbered as in the engine tables in 4.4. On SLOPE, SLOT **2** is TONE.
SHAPE	1 ATTACK, 2 DECAY, 3 SUSTAIN, 4 RELEASE, 5 PLAY MODE, 6 GLIDE, 7 BEND, 8 LEVEL.
FX	1 to 4 are the four effect amounts; 5 to 8 their main controls.
PITCH	Nothing: the whole lane's pitch moves, up to twelve semitones either way at full AMOUNT. SLOT is ignored.
LEVEL	Nothing: the lane's loudness moves, from silence up to twice as loud. SLOT is ignored.

The modulator moves the control around the value you set by hand, and stops at its ends. A stepped control, such as PLAY MODE or a SYNC setting, jumps between its settings as it is moved.

The picture draws the first four controls as plots: the modulator's own movement, how far AMOUNT reaches, and which DEST and SLOT are chosen.

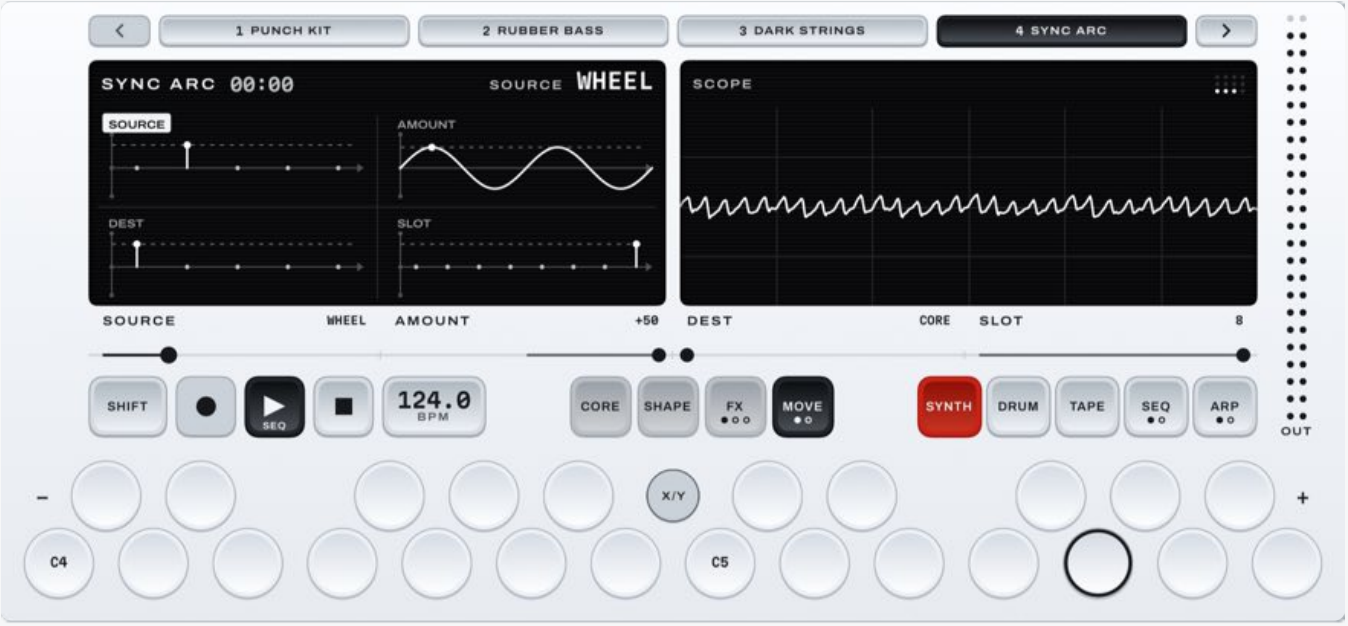


Figure 4.29 MOVE with Expression chosen: the mod wheel, at AMOUNT +50, aimed at CORE's eighth control, WHEEL.

TIP

A new LFO, Steps, Envelope, Follower or Expression starts aimed at CORE, SLOT 2. On SLOPE that is TONE, so you hear the filter move straight away. A new Drift starts aimed at PITCH, with a small AMOUNT.

4.8.3 Envelope

Envelope rises and falls once each time you play a note: the classic filter sweep or pluck. Each note has its own. With MODE on **LOOP** it rises and falls over and over while the note sounds.

#	CONTROL	WHAT IT DOES
1	**DECAY**	How fast the sweep falls away, from a few milliseconds to about ten seconds.
2–4	**AMOUNT** **DEST** **SLOT**	See 4.8.2.
5	**ATTACK**	How long it takes to rise. **00** is instant.
6	**CURVE**	How evenly the move is spread: bowed one way or the other, straight at **0**.
7	**VELOCITY**	How much a harder note adds. The on-screen keys all play at the same strength, so this matters with a MIDI keyboard, or with sequenced steps whose **LOUDNESS** you have set on SEQ (8.6.3).
8	**MODE**	**ONE-SHOT** plays once per note; **LOOP** plays round and round.

4.8.4 LFO

An LFO (low-frequency oscillator) is a slow, repeating wave that moves a control back and forth: vibrato on PITCH, tremolo on LEVEL, a wah on TONE.

#	CONTROL	WHAT IT DOES
1	**RATE**	How fast it moves, from one cycle in nearly a minute to about forty a second.
2–4	**AMOUNT** **DEST SLOT**	See 4.8.2.
5	**SHAPE**	Which way the movement runs: **SINE**, **TRIANGLE**, **RAMP** or **SQUARE**.
6	**SYNC**	Lock it to the tempo. **OFF**, or a note length from **1/32** to **4 BAR**, with triplet (**T**) and dotted (**D**) values between.
7	**RETRIG**	**ON** starts the wave again at every note.
8	**FADE-IN**	How long it takes to reach its full amount after you start playing. **00** is at once.

With SYNC on a note length, the LFO follows the tempo and **RATE** no longer does anything, though its readout still moves. While the transport is playing, a synced LFO lines up with the beat and starts again from the top when you press **PLAY**.

4.8.5 Steps

Steps moves the control through a row of random values, one step at a time, and repeats the row: a stepped, sequenced movement.

#	CONTROL	WHAT IT DOES
1	**RATE**	How fast it steps along.
2–4	**AMOUNT DEST SLOT**	See 4.8.2.
5	**LENGTH**	How many steps before it repeats, **2** to **16**.
6	**GLIDE**	How far it slides between steps. **00** jumps.
7	**SYNC**	Lock the steps to the tempo, with the same note lengths as the LFO's SYNC.
8	**CHANGE**	How often a step takes a new value as it comes round. At **00** the row repeats exactly; at **99** every step is new every time.

As with the LFO, SYNC on a note length makes **RATE** do nothing.

4.8.6 Drift

Drift is a slow, random wander, like an old instrument that won't quite stay put. A new Drift is aimed at PITCH with a small AMOUNT, for gentle detuning.

#	CONTROL	WHAT IT DOES
1	**RATE**	How fast it wanders.
2–4	**AMOUNT DEST SLOT**	See 4.8.2.
5	**SMOOTH**	How rounded the wander is, from straight-line moves at **00** to soft curves.
6	**VOICE SPREAD**	How much each note wanders on its own. At **00** every note in a chord moves together.
7–8	–	Not used: drawn off.

4.8.7 Follower

Follower follows how loud something is and moves the control with it. Aim it at LEVEL with a negative AMOUNT and a loud sound pushes the lane down. No factory sound uses Follower, so choose it yourself from the modulator list (4.8.1).

#	CONTROL	WHAT IT DOES
1	**SOURCE**	What it listens to: **LANE** (this lane's own sound, after its effects), **INPUT** (the sound coming into the device) or **OUTPUT** (everything Tonaut plays).
2–4	**AMOUNT** **DEST** **SLOT**	See 4.8.2.
5	**ATTACK**	How fast it follows a rise.
6	**RELEASE**	How fast it follows a fall.
7	**THRESHOLD**	How loud the source has to be before it counts.
8	**INVERT**	**ON** turns the movement upside down: loud moves the control down.

NOTE

> **INPUT** only moves while Tonaut has the device's input open, which is while the recorder is listening (chapter 12). The rest of the time there is nothing coming in to follow.

4.8.8 Expression

Expression turns the way you play into movement: how hard you hit the keys, the mod wheel, or a MIDI controller's pressure, breath or pedal.

#	CONTROL	WHAT IT DOES
1	**SOURCE**	What drives it: **VELOCITY** (how hard each note is played), **WHEEL** (a MIDI keyboard's mod wheel, or the X/Y pad's Y), **PRESSURE** (aftertouch), **BREATH** (a breath controller) or **EXPRESSION** (an expression pedal).
2–4	**AMOUNT** **DEST** **SLOT**	See 4.8.2.
5	**CURVE**	How evenly the movement is spread across the source's range: **0** is straight.
6	**SMOOTH**	How much the movement is evened out, so a jumpy controller moves the sound smoothly.
7–8	–	Not used: drawn off.

With **SOURCE** on **WHEEL**, the X/Y pad's Y works the wheel without a MIDI keyboard: drag up on the pad and the control moves (15.6). Every factory DIVINER sound is set up this way, aimed at its WHEEL control.

NOTE

> **PRESSURE**, **BREATH** and **EXPRESSION** need a MIDI controller (3.8). The on-screen keys play every note at the same strength, so **VELOCITY** gives one fixed amount when you play on the screen. A pattern's steps follow their **LOUDNESS** (8.6.3).

4.9 The SCOPE

The right-hand window on SYNTH is the **SCOPE**: an oscilloscope, a live picture of the wave the focused lane is playing right now, whether you play it or its pattern does. It is the same on every engine and every page.

- **It is the real sound.** When the lane is silent, the line goes flat along the center and stays still. Movement in this window always means sound.
- **It holds still on a note.** While a note sounds, the trace locks to the pitch of the lowest note playing, so a steady tone draws a wave that stands still instead of scrolling. A sound that drifts or beats against itself (detuned voices, DRIFT, a chord) still moves a little. On SAMPLER and DUST the trace never locks, because the note you play doesn't tell Tonaut the shape of the wave; it runs free.
- **The scale is fixed.** Play harder or louder and the trace gets bigger. A very loud chord flattens against the top and bottom of the window rather than being shrunk to fit.
- **The meter.** The twelve dots at the top right light from the bottom with the level, and the top row turns red when the sound reaches full scale.
- The line is thicker while the lane is sounding. A short while after the sound stops, the window stops redrawing.
- While the X/Y pad is on, the pad covers this window and the trace keeps running behind it (15.6).

With VoiceOver on, the window is read aloud as `LIVE PICTURE`, then the engine's name and `PLAYING` or `SILENT`.

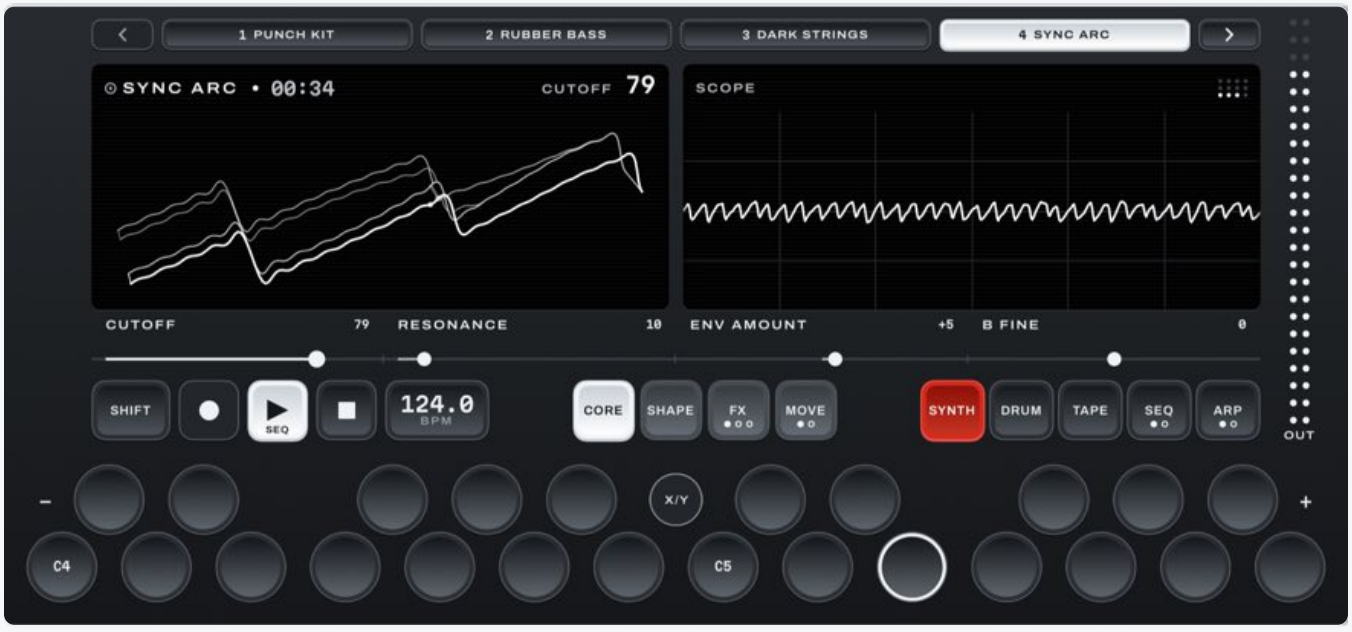


Figure 4.30 Night Drive's lead in the dark housing. The SCOPE locks to the note's pitch, so the wave stands still, while the engine picture beside it keeps moving.

4.10 Things worth knowing

- **A sound belongs to its lane in the project.** Every change you make on SYNTH is saved with the project on its own (13.2). There is no save button for a sound on this screen.
- **Loading another sound replaces your edits.** Moving the cursor in PATCHES loads that sound onto the lane at once (5.3), and the edits you had are gone. To keep a sound you've shaped, save it first: in USER, with SAVE (5.11.1), or to a quick slot with SHIFT + hold a slot key (3.6.1). REVERT on PROJECTS takes the whole project back to its last save point (13.6).
- **Changing an effect or modulator resets its settings** to the new one's starting values (4.7.1, 4.8.1). The effect list brings back an effect you shaped only while the list is still open.
- **SHIFT turns the page keys into the chord keys**, and while you hold it a lane button picks a lane to swap. Turn SHIFT off to change page or to press a page key again.
- **The second press needs the page first.** FX and MOVE open their lists only when you're already on that page.
- **Undo is one slider at a time.** SHIFT + double-tap puts back a slider's last change, and again puts your change back (2.4.4); UNDO, beside DIE, puts back what DIE scrambled, one roll at a time. A plain double-tap goes to where a fresh sound starts, not to where the patch had the control: to get the whole patch back, load it again.
- DIE (SHIFT + DIE) scrambles the eight controls of the page you're on, a new set on every press, and SHIFT + UNDO takes the rolls back one at a time, up to eight (3.7). On FX that includes the four amounts, so it can get loud.
- **LEAN** can move a control when you tilt the device; it is set per sound (3.5). Every factory sound comes with it on: most aim it at pitch, and DIVINER's sounds at WHEEL. If a held note bends when you move the device, that is LEAN.
- **PERFORM and the X/Y pad don't change these pages.** PERFORM's TONE and SPACE faders and the pad's bend and wheel move the sound while you play, and no value on SYNTH moves with them. The pad's bend springs back when you lift your finger and its wheel goes back at STOP; PERFORM's faders go back at STOP unless KEEP is lit (chapter 15).
- **CLASSIC lasts only while you stay on the lane.** Focus another lane, or open the app again, and CORE shows NEW; SLOPE's choice of CLASSIC view is kept on the device, not in the project (4.5).
- **Factory sounds play at about the same loudness.** Each one's level is set so that moving from one sound to the next doesn't jump in volume, which is why LEVEL on SHAPE isn't the same on every sound.

05 Sounds and the browsers

PATCHES and KITS are where you choose what a lane sounds like. Move the cursor onto a sound and the lane is already playing it.

Tonaut has two sound browsers. PATCHES lists every patch (a synth sound) and KITS lists every kit. They are one screen with different contents, and a third screen of the same family, PROJECTS, lists your saved projects (chapter 13). In a browser, always hold SHIFT to use a SHIFT job; a tap on it means BACK.

5.1 Opening and leaving a browser

Each browser has a door on the shift layer of the mode keys (2.6). On the iPad the doors are keys of their own on the button row (chapter 17).

KEY	OPENS	MODE KEY LIT WHILE IT'S OPEN
SHIFT + PATCH (the SYNTH key)	PATCHES, the synth sounds	SYNTH, red
SHIFT + KITS (the DRUM key)	KITS, the drum kits	DRUM, red
SHIFT + PROJ (the TAPE key)	PROJECTS (chapter 13)	None. Under SHIFT, PROJ is filled while PROJECTS is up.

To open PATCHES:

01 Tap SHIFT. It reads LATCHED and the mode keys change to their shift words.

02 Press PATCH, the key that reads SYNTH without SHIFT.

03 PATCHES opens. SYNTH turns red, SHIFT is filled with BACK under it, the four page keys read PATCH KIT PROJ IMP, and the band has two lanes, **CURSOR** and **EXPORT**. KITS has a third lane between them, **FROM** (5.7.3).

You can hold SHIFT instead of tapping it. Either way the browser arrives with SHIFT off, so its own controls are live at once. The lit mode key belongs to the browser, not to the screen you came from: open KITS from TAPE and DRUM is the key that turns red.

The left window's header reads PATCHES (or KITS) and, on the right, LANE with the focused lane's number in large digits. That is the lane every sound you choose goes onto. The keyboard keeps playing that lane the whole time.

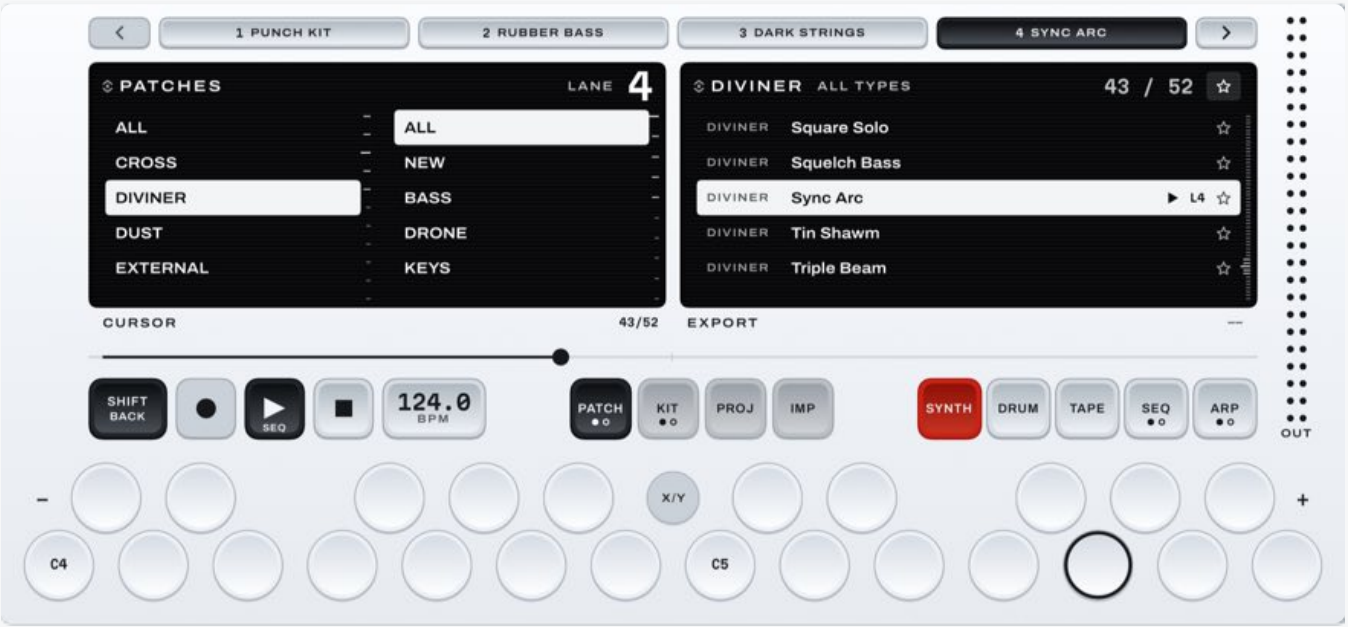


Figure 5.1 PATCHES opens on the engine the lane is playing, with the cursor on the lane's own sound.

To leave, use any of these:

PRESS	WHERE YOU LAND
SHIFT (tap; it reads BACK)	Where you opened the browser from: the same screen and the same page. If MIX or EDIT was open, it opens again (MIX on LEVEL). If you came from SYNTH or DRUM, you land on whichever of the two edits what the lane holds now, so loading a kit onto a synth lane brings you back to DRUM. Any press of SHIFT that does nothing else counts as BACK, however long you hold it.

Hold SHIFT, press the same door again (PATCH on PATCHES, KITS on KITS)	The same as BACK.
A mode key: SYNTH, DRUM, TAPE, SEQ, ARP	That screen. SYNTH and DRUM keep their usual rule (2.6): pressed on a lane of the other kind, they move to the last lane of their own kind, or say NO SYNTH LANE IN THIS PROJECT or NO KIT LANE IN THIS PROJECT. The browser closes even when they refuse, and you land on the screen for what the lane holds.
Hold SHIFT, press EDIT (the SEQ key) or MIX (the ARP key)	EDIT or MIX opens and the browser closes.

Going from one browser to another (5.7) does not change where BACK goes. Open PATCHES from SEQ, switch to KITS, then to PROJECTS, tap BACK, and you are on SEQ again.

5.1.1 SHIFT inside a browser

In a browser SHIFT never latches. A tap that does nothing else is BACK. To use a SHIFT job while a browser is open, hold SHIFT down, press the key, then let go. Because you used the layer, letting go keeps you in the browser. Under SHIFT:

- the mode keys are the doors, so SHIFT + KITS on PATCHES switches to KITS, and EDIT or MIX leaves the browser for that screen;
- the four page keys go blank and do nothing, except on USER, where the first reads SHARE and the last ALL (5.11);
- the tempo key taps the tempo (TAP TEMPO), as on every screen (3.9);
- the keyboard is its usual shift layer: quick slots 1 to 8, UNDO, DIE and HELP on the upper row, the two end keys of the lower row blank, and the keys between them still playing (2.8.1).

NOTE

> Playing a note on the lower row doesn't count as using SHIFT. Hold SHIFT, play a note, let go, and the browser closes as if you had tapped BACK.

HELP works here too. Hold SHIFT and press HELP. The left window turns into the help panel. A tap on the sound list, a star, a band lane or a page key then prints that control's line in the left window's header, where LANE was, instead of acting. The sound list's line is TAP ONE TO HEAR IT ON THIS LANE. A drag on the sound list still moves through it and loads, as a drag on a slider still moves it. Hold SHIFT and press HELP again to get the columns back.

5.2 The patch browser's three lists

PATCHES has three lists. The left window holds two of them side by side: the engine column on the left and the type column on the right. The right window holds the sound list: the patches those two leave.

LIST	WHAT IT HOLDS
Engine column	**ALL**, then the nine synth engines A to Z: CROSS, DIVINER, DUST, GUT, PULSE, SAMPLER, SCAN, SLOPE, SWARM. Chapter 4 (4.4) says what each one is. EXTERNAL sits among them, between DUST and GUT. It is not an engine: it sends the lane's notes to your own gear over MIDI (5.13).
Type column	**ALL**, then **NEW** where the chosen engine has new sounds, then the types the chosen engine has patches in, A to Z (5.4). A type that would list nothing is not shown.
Sound list	The patches the two columns leave, A to Z by name, then the **ENGINE DEFAULT** rows (below).

ALL heads both columns. **ALL** in the engine column means every engine, so ALL and then BASS lists every bass in the instrument, whatever made it.

The sound list is A to Z by name. Capitals and accents are ignored and numbers sort as numbers, so the order is the same on every phone. One exception: DIVINER's Init comes first whenever DIVINER is chosen. With ALL engines it sits among the I's. The star at the top of the list can put your favorites first instead (5.12).

The right window's header says what the list is: the engine (or **ALL ENGINES**), then the type (or **ALL TYPES**), and at the right a counter and the favorites star. **04 / 07** means the cursor is on the fourth of seven rows.

Each row shows the engine's name in small capitals, then the patch's name. On the right, a lane chip (**L1** to **L8**) marks a patch a lane is playing (5.3), and every row ends in a star (5.12).

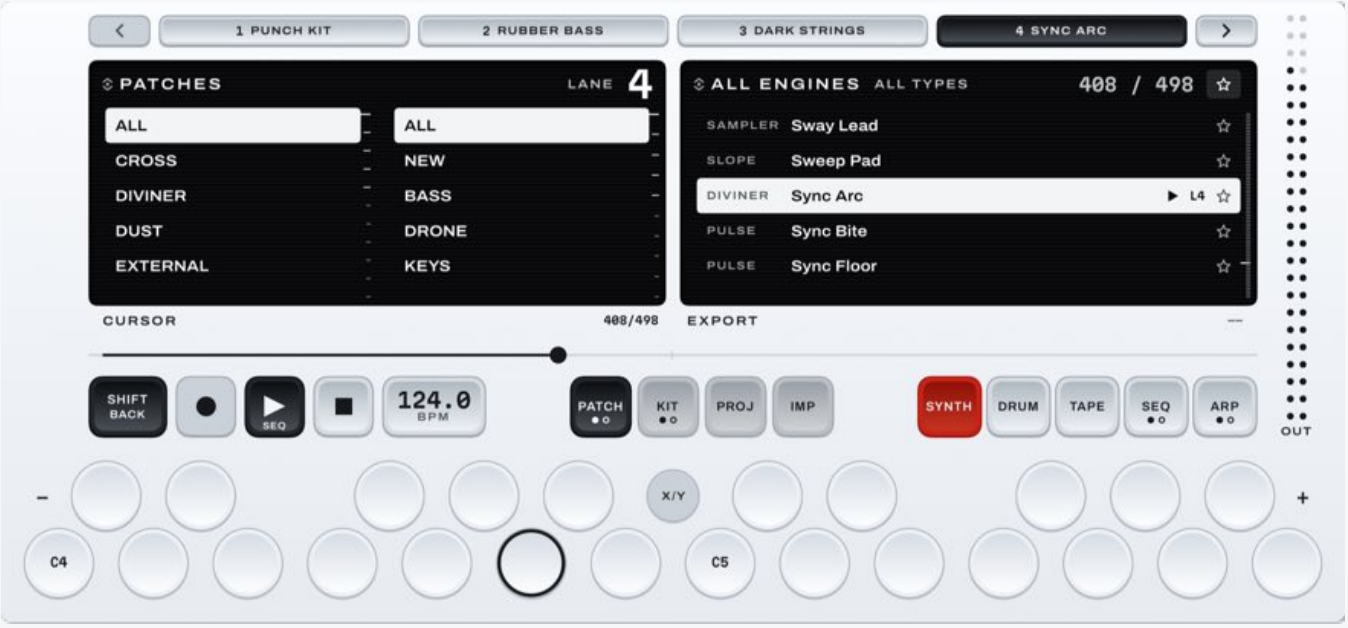


Figure 5.2 With the engine column on ALL, the list holds every patch in the instrument, A to Z.

5.2.1 Moving through a list

Every list in a browser works the same three ways, and each one moves the cursor:

- **Tap a row.** The cursor goes to it.
- **Drag inside the list.** A row of finger travel moves one row. A quick flick goes further, more so on a long list.
- **Drag the CURSOR lane on the band** (sound list only). It steps through the list a row at a time and reads your place, for example **4/7**.

A column of ticks along the right edge of each list shows where you are. The longest tick is the cursor, the middle ticks are the rows on screen, and the short ones are the rest. On a small phone a column shows only a few rows at once. Drag it to reach the rest. The small mark at the left of each header says the window takes a finger (2.3).

5.2.2 Narrowing the list

To find a pad sound on DIVINER:

01 Tap DIVINER in the engine column. The type column changes to DIVINER's types and sits on ALL. The sound list shows DIVINER's 52 rows, Init first.

02 Tap PAD in the type column. The list shows DIVINER's nine pads.

03 Tap a patch. The lane plays it now.

The rules the columns follow:

- **A column never changes what the lane is playing.** Only the sound list loads.
- **Choosing an engine puts the type column back on ALL,** because one engine's types are not another's. Tapping the engine that is already lit does the same, which is the quick way back from a type to the engine's whole list.
- **After a column moves, the cursor goes to the lane's own sound** if the new list has it. If not, it stays on the row it was on, if that row is still listed. Otherwise it goes to the top. Nothing loads, so a row without the lane's chip is a row you haven't loaded yet. Tap it to load it.

5.2.3 ENGINE DEFAULT rows

An ENGINE DEFAULT row is an engine at its own starting values, with no name. It is printed in small capitals, where a designed patch is in ordinary letters. There is one per engine, at the bottom of the list, and only while the type column is on ALL, because it has no type. Load one to make a sound from scratch: the lane button then shows the engine's name, SLOPE for example, instead of a patch name. The SAMPLER and SLICER rows play a stand-in recording (5.9).

5.3 Auditioning is loading

There is no separate preview and no OK button. The moment the cursor lands on a sound, the focused lane is playing it: the keyboard, the lane's patterns and MIDI all play the new sound. Leaving the browser keeps it.

To try sounds on a lane:

01 Tap the lane's button at the top of the panel. In an eight-lane project the iPhone's lane row shows its lanes four at a time, and its arrow keys bring the others into view (2.2.2).

02 Open PATCHES (SHIFT + PATCH).

03 Press PLAY to run the patterns, or play a few notes after each move.

04 Tap or drag through the sound list. Each sound plays as the cursor reaches it.

05 Stop on the one you want and tap SHIFT (BACK). The lane keeps it.

WHAT YOU DO IN THE SOUND LIST	WHAT LOADS
Tap a row the cursor isn't on	That row.
Drag through the list, or drag CURSOR	Each row as the cursor reaches it. A fast drag skips rows it passes while the previous one is still loading, and always ends on the row you stop on.
Tap the row the cursor is already on	That row, if the lane isn't playing it (this is how you load the top row a browser sometimes opens on). If the lane is playing it: nothing on PATCHES, so your edits are safe; on KITS, the preview beat (5.5.1).
Move the engine or type column	Nothing.
Tap a star	Nothing. It marks a favorite (5.12).

Three marks tell rows apart, and a row can carry all three:

- The cursor row is filled, its writing reversed.
- A row some lane is playing has a thin outline and a lane chip, **L1** to **L8**. If two lanes play the same sound, the chip names the lower lane. PATCHES shows chips only for synth lanes and KITS only for kit lanes.
- A small triangle shows on the focused lane's row while that lane is sounding.

Nothing in a browser list is red. Red on this panel means recording.

5.3.1 What loading replaces, and what it keeps

Loading replaces the lane's sound: the engine and every control of the sound (CORE, SHAPE, FX and MOVE on SYNTH; KIT, KEY, FX and MOVE on DRUM; everything in EDIT). Changes you made to the old sound are gone. These belong to the lane and stay: its patterns, its MIX strip (level, balance and mute), its ARP and GROOVE settings, its DRUM pad mutes and its recording (5.9).

Loading a synth sound from PATCHES, from the factory list or from USER, also puts the lane's keyboard where that sound belongs: most sounds at the usual octave, basses two octaves down (C1 to B2 on the iPhone's keys), some dark drones and low recordings one octave down and a few high recordings one up. A USER sound goes back to the octave the lane was at when you saved it (5.11.1). An octave you set yourself (3.2) stays until the lane loads another sound. A kit never moves the octave, and nor do a quick slot, UNDO, an import or opening a project.

The lane chip follows the sound's name, so a patch you have edited still shows its chip on the factory row it came from. Tapping that row does not reload it. Moving to another row and back does: you get the factory version and your edits are lost.

TIP

To keep an edited sound before you browse, save it in USER (5.11) or to a quick slot. For a slot, hold SHIFT and hold one of the slot keys 1 to 8 for a little over half a second. The screen says SAVED TO SLOT 3. This works inside a browser too (3.6).

5.3.2 The band and the transport in a browser

CONTROL	WHAT IT DOES HERE
CURSOR	Moves through the sound list and loads what it lands on. Its readout is your place, **4/7**.
FROM (KITS only)	Where IMP takes its sound from: **TAPE** or **FILES** (5.7.3).
EXPORT	Chooses what REC would write out of the focused lane's recording: **WHOLE** or **TRIM** on PATCHES, **WHOLE**, **TRIM** or **SLICES** on KITS. It starts on **TRIM**. It is drawn off and reads **--** when the lane holds no recording. A lane holds one when it plays a SAMPLER patch or a SLICER kit, factory ones included. Full details in 14.8.
PLAY	Plays the patterns, so you hear each sound inside your music. The tape stays put.
REC	Starts an export in the format EXPORT shows. The screen says EXPORTING TRIM (or the format you chose), REC turns red and the counter at the top of the list counts the job. When it's done the screen says SAVED IN FILES · TONAUT / EXPORTS. With nothing to export, REC is drawn off but still answers: NO RECORDING ON THIS LANE. A second press while one runs says AN EXPORT IS ALREADY RUNNING.
STOP	Stops the transport. While an export runs, it cancels it: EXPORT STOPPED · NOTHING KEPT. While files load, it cancels the load (5.7.2).

NOTE

If a sound fails to load, the screen says SOUND COULD NOT BE LOADED and you keep hearing the old sound, even if the lane button already names the new one. Move off the row and back to try again. If you ever see it, please tell us (14.10).

5.4 Types

Every factory patch has one of eight types. The type column shows them in capitals, A to Z, after ALL and, on most engines, NEW (below).

TYPE	PATCHES	WHAT YOU'LL FIND
BASS	81	Low sounds for bass lines
DRONE	31	Long held sounds to sit under a piece
KEYS	81	Keyboard-style sounds
LEAD	64	Single-line melody sounds
PAD	86	Soft, sustained chords
PERCUSSIVE	31	Struck, hit and bell-like sounds
PLUCK	61	Short, plucked notes
TEXTURE	54	Noise, movement and effects

Every engine but DUST has patches of all eight types. DUST has no LEAD or PAD patches, so its type column leaves those two out. This table shows how many each pair lists.

ENGINE	BASS	DRONE	KEYS	LEAD	PAD	PERC.	PLUCK	TEXT.
CROSS	9	4	15	5	4	4	7	4
DIVINER	7	4	8	8	9	5	6	4
DUST	4	5	2	–	–	1	1	22
GUT	5	2	8	2	5	3	9	2
PULSE	8	3	4	6	4	3	7	2
SAMPLER	31	2	27	27	37	4	18	12
SCAN	5	3	7	6	10	4	5	3
SLOPE	8	4	6	5	8	4	5	2
SWARM	4	4	4	5	9	3	3	3
ALL	81	31	81	64	86	31	61	54

Patches per engine and type

NEW. Besides the eight types, the type column can offer **NEW**, first after **ALL**, on every engine that has new sounds. It lists the forty newest factory sounds (CROSS has 8, PULSE 7, DUST and SWARM 5 each, DIVINER, GUT and SLOPE 4 each, SCAN 3): nine electric pianos on CROSS, GUT and DIVINER, nine hard, industrial basses on SLOPE, PULSE and CROSS that run through Dist, and twenty-two more, among them big Space pads and atmospheres and Echo plucks and leads (effects, 4.7.4). NEW is not a type of its own: each new sound is also listed under its own type, so a new pad shows under NEW and under PAD. To hear only the

new sounds, tap ALL in the engine column, then NEW. The SAMPLER has none, so its type column has no NEW, and no kit is new.

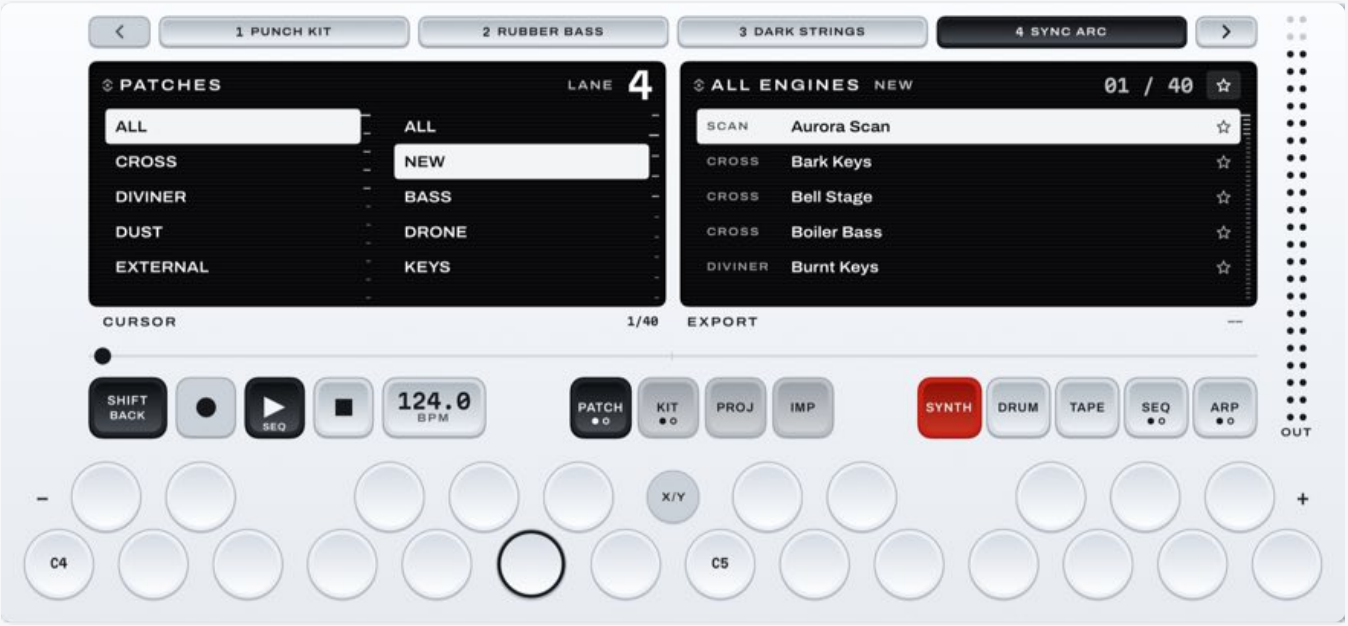


Figure 5.3 ALL engines and NEW: the forty newest sounds and nothing else. Lane 4 isn't playing any of them, so the cursor sits on the first row and nothing has loaded.

DIVINER's Init counts as KEYS. With a type chosen, the ENGINE DEFAULT rows disappear, because they have no type. Put the type column back on ALL to reach them.

In version 1.1 some sounds moved to the type that fits them better: Church Bank is KEYS now, Solo Wire is PLUCK and Shimmer Veil is TEXTURE, for example. A few were renamed too (5.10.1).

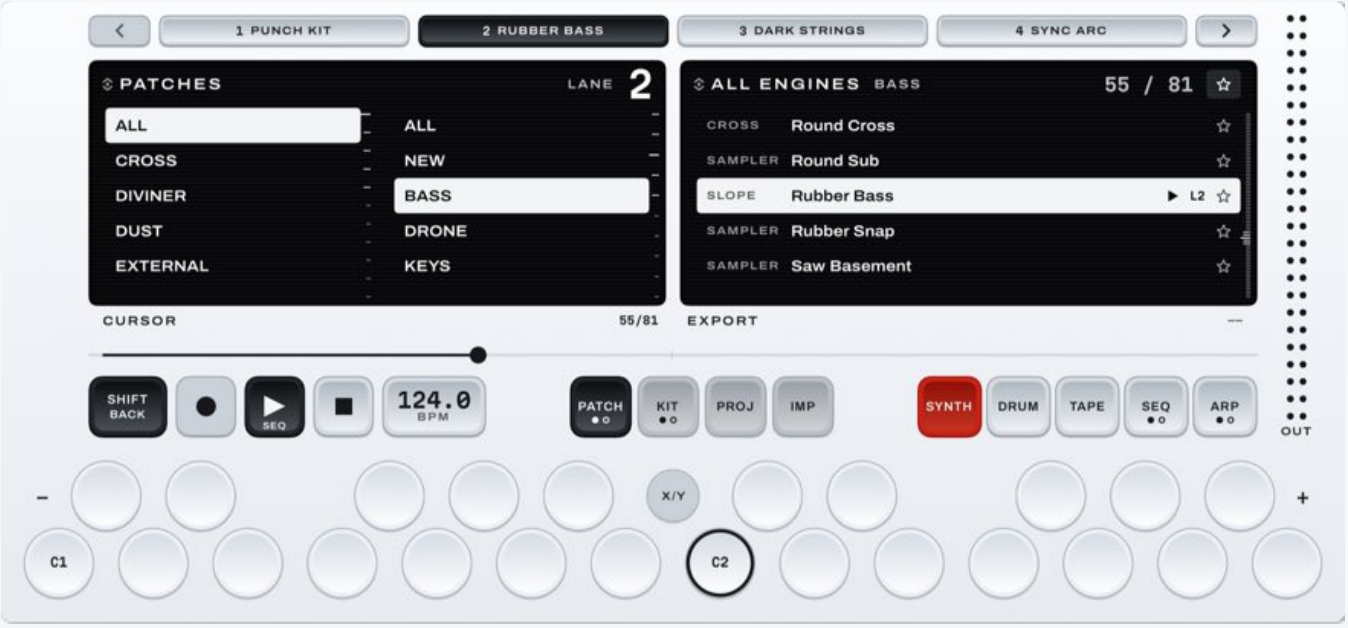


Figure 5.4 ALL engines and one type: every bass in the instrument, whichever engine makes it.

5.5 The kit browser

KITS is the same screen as PATCHES with three differences. The left window has only the engine column, with **ALL**, CINDER, EXTERNAL (5.13), KNOCK and SLICER. There is no type column, so the right window's header shows the engine, the counter and the star, and no type. And the band has a third lane, FROM, for IMP (5.7.3).

KNOCK kits make every pad's drum from scratch. A SLICER kit is one recording cut across the 24 pads. A CINDER kit makes each pad from two layers and sends it into a ring the kit shares. Chapter 6 covers all three. To make a kit from your own drum samples, see 5.7.3.

The seven sample kits come first. Each is one recording of real drum hits (kicks, snares, claps, rims, hats, rides, crashes and toms) sliced across the pads. After them come the other kits, A to Z, then the three ENGINE DEFAULT rows. With ALL engines the list has 46 rows:

ENGINE COLUMN	ROWS, IN ORDER
ALL (46)	Arena Kit, Boom Kit, Chrome Kit, Hall Kit, Pop Kit, Punch Kit, Smoke Kit; then Air Kit, Back Slices, Bamboo Kit, Bell Kit, Bone Kit, Canyon Kit, Card Kit, Cave Kit, Clay Kit, Click Kit, Deep Kit, Dry Kit, Echo Kit, Ember Kit, Floor Slices, Fuzz Kit, Gate Kit, Gate Slices, Ghost Kit, Glass Kit, Ice Kit, Init Kit, Iron Kit, Pulse Kit, Room Kit, Rubber Kit, Scrap Kit, Slice 24, Split Kit, Static Kit, Sub Kit, Tape Kit, Tar Kit, Tin Kit, Wide Slices, Zither Kit; then the ENGINE DEFAULT rows of CINDER, KNOCK and SLICER
CINDER (7)	Init Kit first; then Bamboo Kit, Canyon Kit, Ember Kit, Scrap Kit, Zither Kit, ENGINE DEFAULT
KNOCK (26)	Air Kit, Bell Kit, Bone Kit, Card Kit, Cave Kit, Clay Kit, Click Kit, Deep Kit, Dry Kit, Echo Kit, Fuzz Kit, Gate Kit, Ghost Kit, Glass Kit, Ice Kit, Iron Kit, Pulse Kit, Room Kit, Rubber Kit, Split Kit, Static Kit, Sub Kit, Tape Kit, Tar Kit, Tin Kit, ENGINE DEFAULT
SLICER (13)	Arena Kit, Boom Kit, Chrome Kit, Hall Kit, Pop Kit, Punch Kit, Smoke Kit; then Back Slices, Floor Slices, Gate Slices, Slice 24, Wide Slices, ENGINE DEFAULT

The seven sample kits are Arena, Boom, Chrome, Hall, Pop, Punch and Smoke. The five SLICER rows that are not kits of their own (Back Slices, Floor Slices, Gate Slices, Slice 24 and Wide Slices) are ways of playing a recording; see 5.9.

The KNOCK kits, the CINDER kits and the seven sample kits share one layout for the main parts: pad 1 kick, 2 snare, 3 closed hat, 4 open hat, 5 to 7 toms, 8 clap, 9 rim, 11 ride and 12 crash. A beat written on one of these kits plays the matching parts on another, so you can change kits under a running pattern. GROOVE and the preview beat play these pads. The five SLICER treatments don't follow it: their pads are slices of one recording, in order.

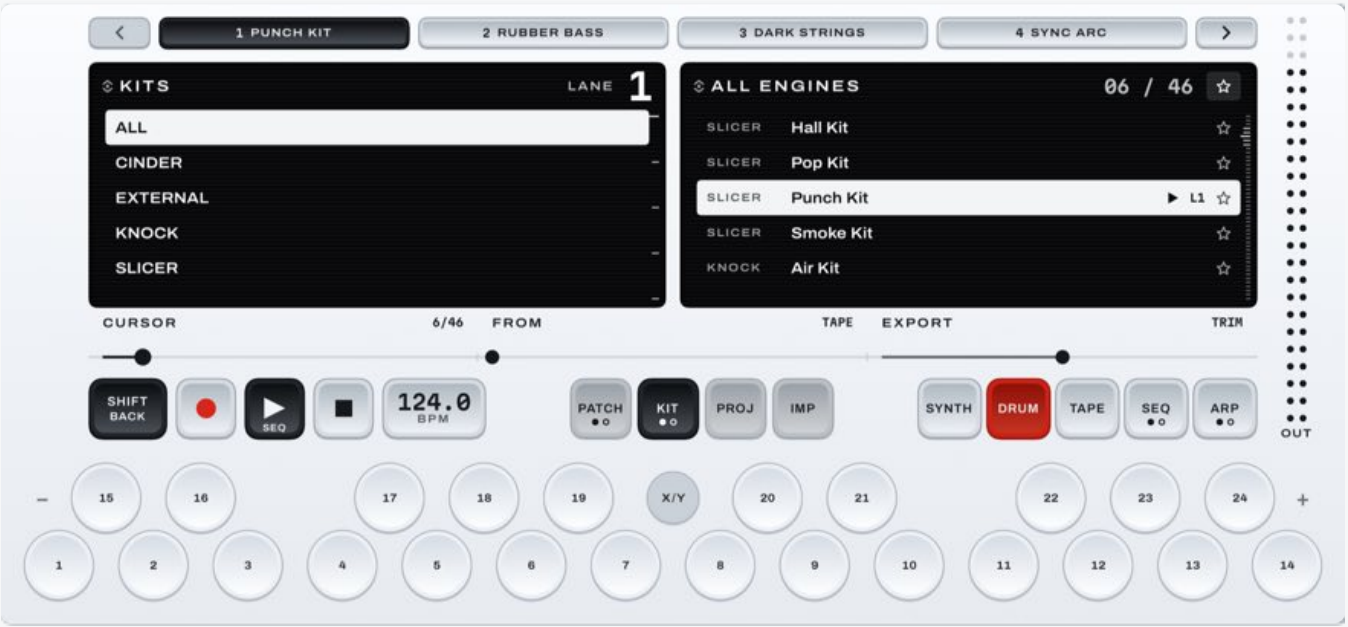


Figure 5.5 KITS has an engine column and no types, and a FROM lane on the band for IMP.

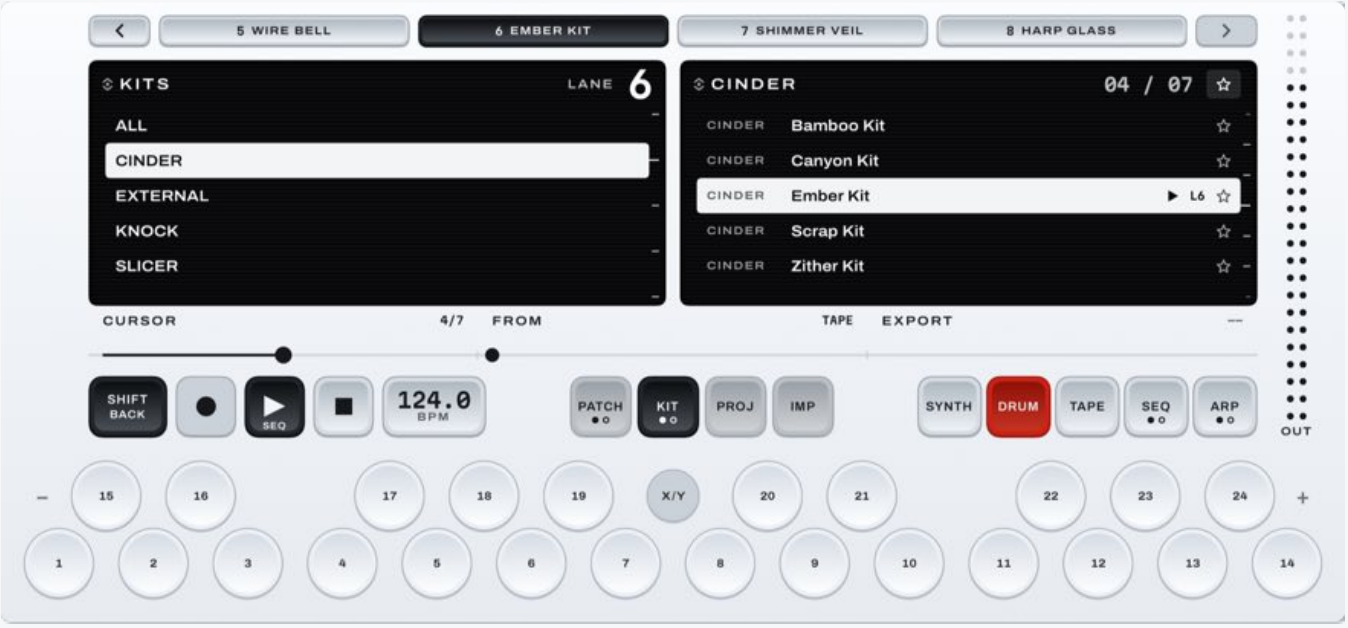


Figure 5.6 CINDER's kits. Ember Kit is fourth because Init Kit, the plain starting point, is listed first, above the rows in view.

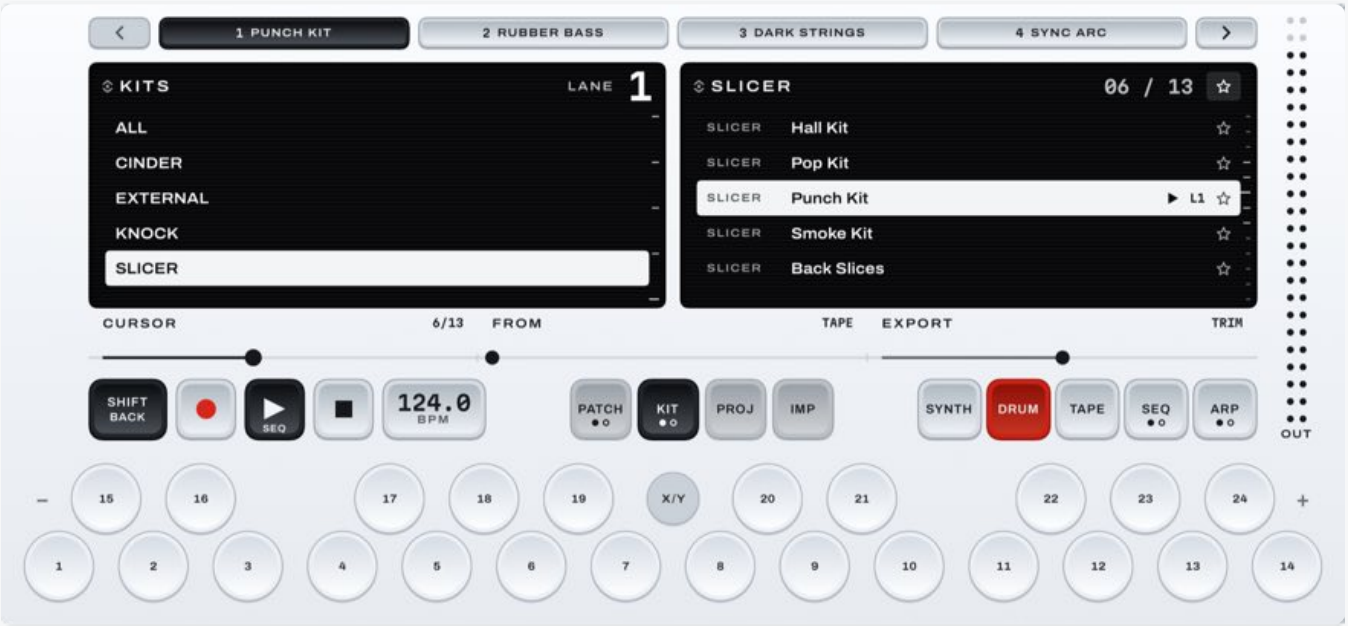


Figure 5.7 The seven sample kits lead the SLICER list, and the ALL list too.

5.5.1 The preview beat

Tap the kit the lane is already playing and it plays two bars of a beat, live, through the kit and its effects. You don't need to hold anything.

To hear a kit play a beat:

01 Open KITS on a kit lane.

02 Tap a kit. It loads, and its row takes the lane's chip.

03 Tap the same row again. Two bars play, at the project's tempo, and stop.

KITS opens with the cursor on the kit the lane is playing, so the first tap on that row plays the beat. If you left the engine column on another kit engine (5.8), tap ALL first. The preview works on your own kits in USER too, and on an EXTERNAL channel it plays the beat through your drum machine (5.13).

What the preview does:

- It plays the lane's own GROOVE settings (9.4): **STYLE**, **COMPLEXITY**, **SWING** and the **KICK**, **SNARE** and **HAT** pads, whether GROOVE is switched on or not. On a lane nobody has changed that is **ROCK** with **COMPLEXITY** at **30%**. Change the style on GROOVE and the preview changes with it.
- Moving the cursor stops it, and so does leaving KITS with BACK or a mode key. Tapping the row again starts it from the top.
- With the transport stopped it starts at once. With it running, it starts on the next sixteenth.
- It ignores DRUM's pad mutes, so you hear the whole kit.
- It changes nothing that is saved.

5.6 Any sound on any lane

A lane is not fixed to synths or kits. A new project starts with kits on lanes 1 and 2 (Chrome Kit and Punch Kit) and synth sounds on lanes 3 to 8 (5.10), but KITS will put a kit on lane 5 and PATCHES will put a synth on lane 1. The lane changes kind the moment the sound loads: the keys turn into pads **1** to **24**, or back into notes, under your fingers. A project whose SHAPE is **6 × 30** (six lanes and tracks of 30 minutes) has lanes 1 to 6 only (13.15).

To put a synth on lane 1 of a new project:

01 Open PATCHES.

02 Tap lane 1's button at the top of the panel. The header reads LANE 1. Lane 1 holds a kit, so no row carries its chip and the cursor sits at the top of the list.

03 Tap a patch. Lane 1 is now a synth lane and the keyboard plays notes.

04 Tap BACK. If you opened PATCHES from DRUM, you land on SYNTH now, because SYNTH is the screen for a synth lane.

The lane buttons work inside a browser, and so do the lane row's arrow keys. Tapping a lane moves the browser to it, and the browser shows that lane's own place: its list, its columns and its sound (5.8). Changing lanes never loads anything.

NOTE

> If every lane holds a kit, SYNTH has no lane to show and says **NO SYNTH LANE IN THIS PROJECT**. DRUM says **NO KIT LANE IN THIS PROJECT** when every lane is a synth. Open PATCHES or KITS and load one back; both doors open from any lane.

5.7 The page keys inside a browser

On PATCHES and KITS the four page keys switch between the browsers and bring sound in from outside. The key of the browser you are in is filled.

KEY	ON PATCHES	ON KITS
PATCH	Filled; pressed again, shows your own patches, USER (5.11)	Opens PATCHES
KIT	Opens KITS	Filled; pressed again, shows your own kits, USER (5.11)
PROJ	Opens PROJECTS	Opens PROJECTS
IMP	Loads an audio file into the SAMPLER, or a SysEx file's voices into USER (5.7.2)	As the FROM lane says: lifts a tape track into the lane as a kit (5.7.1), or makes a kit from audio files (5.7.3)

PATCH and KIT wear two dots: the factory list and USER, your own sounds. The filled dot is the list you are looking at. Under SHIFT the four keys go blank, except while USER is showing (5.11).

PROJ opens PROJECTS, where your saved projects are (chapter 13). PROJECTS has its own four page keys, so to come back from it, hold SHIFT and press PATCH or KITS. A tap of SHIFT there is BACK, as in the other two browsers: it takes you to where you opened the first browser from.

5.7.1 IMP: lifting a tape track into a kit

IMP (Import) copies a tape track into the focused lane as a SLICER kit, cut into 24 equal slices, one per pad, while the KITS band's **FROM** lane reads **TAPE**, which is where it starts. It is one of four ways to get your own audio into a kit; chapter 6 has them all (6.8).

To turn tape track 2 into a kit on lane 3:

01 On TAPE, press TRK 2 to select track 2 (11.2).

02 Hold SHIFT and press KITS.

03 Tap lane 3's button if it isn't focused already.

04 Check that **FROM** reads **TAPE**, and press IMP. The screen says **TRACK 2 IS NOW THE KIT**.

05 Play the keys. Each pad plays the next twenty-fourth of the recording.

What you get: the lane holds a bare SLICER kit, so its button reads SLICER and the lane's chip moves to SLICER's ENGINE DEFAULT row. On a synth lane, IMP turns it into a kit lane. The recording is saved inside the project and is still there after a relaunch. From here you can set each slice's start and end on DRUM (6.4.2) or in the sample editor (12.8), and try the SLICER and SAMPLER patches on it (5.9).

If the track is empty, the screen says NOTHING ON TRACK 2 and the lane keeps its sound.

NOTE

> IMP copies from the very start of the tape (0:00) to the end of the track's last take, silence included, and a kit can hold 20 seconds at most. If the track's last take ends after 0:20, IMP says NOTHING ON TRACK 2 even though the track has audio on it. Record what you want to lift at the top of the tape. IMP replaces the lane's sound and cannot be undone.

With FROM on TAPE, IMP's help line reads TURN THE TAPE TRACK INTO A KIT.

5.7.2 IMP on PATCHES: an audio file into the SAMPLER

On PATCHES, IMP opens the iPhone's Files picker. Pick one audio file and it goes into the SAMPLER on the focused lane and plays at once. If the lane already plays a SAMPLER sound (a SAMPLER patch, or the bare SAMPLER row), that sound keeps its settings and plays your file instead; anything else becomes the bare SAMPLER. Either way the sound takes the file's name, and it is kept in USER under that name: import **Low Pluck.wav** and the lane and USER both read `Low Pluck`. The same file imported twice is numbered, `Low Pluck (2)`. The file becomes the lane's own recording, so every SAMPLER and SLICER patch in the table in 5.9 plays it afterwards.

- **What opens**: WAV, AIFF, CAF, M4A (AAC or Apple Lossless), MP3 and FLAC. Tonaut looks at what is in the file, not at its name. Anything else is refused: CAN'T LOAD and the file's name, over NOT A FORMAT TONAUT OPENS. The other refusals are listed in 6.8.1.
- **What Tonaut does to it**: converts it to its own format at 48 kHz, keeps the first two channels, trims silence off both ends the way the factory kits were trimmed, and keeps the file's own level. The bare SAMPLER plays it with **NORMALIZE** on, as it plays a recording you make with the recorder (7.5.3).
- **Limits**: a sound holds 20 seconds (a longer file keeps its first 20 and says KEPT ITS FIRST 20 S · ALSO IN USER), and a file over 256 MB is refused.
- Done, the screen says SAMPLER and the sound's name, over ALSO IN USER PATCHES: what IMP makes is also kept in USER (5.11), with the type KEYS (5.11.6).
- While the file loads the notice line counts LOADING 01 / 01 · STOP CANCELS, and STOP on this screen cancels it: LOADING STOPPED over NOTHING CHANGED. The music keeps playing. During a take the load waits (WAITING FOR THE TAKE TO END) and goes on when the take stops.
- A SysEx file picked here goes into USER instead (5.11.4).

IMP is drawn flat, and says why when pressed, while it cannot act: NOT WHILE RECORDING, ALREADY LOADING · ONE MOMENT, AN EXPORT IS ALREADY RUNNING, A FILE IS STILL BEING PACKED (a song or

sounds you are sending) or **STILL COPYING · ONE MOMENT**. Its help line reads **AUDIO INTO THE SAMPLER · SYSEX TO USER**.

A load never lands on a project or a lane that changed while it ran. If you OPEN another project or REVERT while a file loads, the load waits for that to finish and then lands nothing: **NOTHING LOADED** over **THE PROJECT CHANGED WHILE IT LOADED**. A SAVE in the meantime changes nothing, and the file lands after it. If the lane's sound was replaced, it says **THE LANE CHANGED WHILE IT LOADED**.

5.7.3 A kit from your own drum samples: IMP with FROM on FILES

On the factory KITS list the band has three lanes: **CURSOR**, **FROM** and **EXPORT**. FROM chooses where IMP takes its sound from: **TAPE** (5.7.1) or **FILES**. It changes nothing by itself; IMP is the press. It starts on TAPE and keeps your choice until you quit the app. Its help line reads **WHERE IMP TAKES ITS SOUND FROM**. USER KITS has no IMP and no FROM.

With FROM on FILES, IMP opens the Files picker and its help line reads **MAKE A KIT FROM AUDIO FILES**. To make a kit from your own drum samples:

01 In the Files app, put the samples in one folder and name them for what they are, such as **Kick**, **Snare**, **Hat**, **Open Hat** and **Clap**. The folder's name becomes the kit's name.

02 Tap the button of the lane you want the kit on. A synth lane becomes a kit lane.

03 Hold SHIFT and press KITS.

04 Drag **FROM**, the middle lane of the band, to **FILES**.

05 Press IMP and pick the files, up to 24. The screen says, for example, **KIT MADE · 12 FILES ON 12 PADS** over **ALSO IN USER KITS**.

Each file goes on its own pad, and kicks, snares, hats, toms, claps, rims, rides and crashes land on the pads Tonaut's own kits use for them, read from the file names. Pick one file instead, a loop or a break, and it is sliced across the 24 pads, and the kit takes the file's name. A kit holds 20 seconds of audio in all. The kit is on the lane now, and a copy is in USER KITS for every project (5.11). Which names go where, the formats, the limits and the refusals are in 6.8.1.

One sample onto one pad. To put your own sample on one pad of a kit you already have, one of the seven sample kits or a kit you made, or to fill an empty pad, use the sample editor instead of KITS: play the pad, open the sample editor (latch HELP with SHIFT + HELP and press SAMPLE), then hold SHIFT and press LOAD, the first page key. The file goes on that pad and every other pad keeps its sound. LOAD works on SLICER kits; the steps are in 6.8.2. A kit changed with LOAD isn't put in USER for you: save it there yourself (5.11.1).

5.8 Each lane remembers its place

Each lane remembers where you left it in PATCHES and in KITS: which list was showing (the factory list or USER), the engine column, the type column and the row the cursor was on. Leave a lane in the middle of browsing, and when you come back to it, by opening the browser again or by tapping its lane button while the browser is open, it is where you left it.

- **The cursor comes back to the lane's own sound** when the columns list it. If they don't, it goes to the row you left it on, and failing that, to the top. Coming back never loads anything.
- **A lane you haven't browsed yet** opens on its own engine with the types on ALL and the cursor on its sound, or on USER if it holds one of your own sounds. A lane of the other kind (a kit lane in PATCHES) opens on ALL with the cursor at the top. A lane on EXTERNAL MIDI opens its own browser (PATCHES for a synth, KITS for a drum machine) on EXTERNAL, with the cursor on its channel (5.13).
- **The places stay** when you quit and relaunch, and when you open the project again later. They are kept on this iPhone or iPad, not in the project, so moving a column is not a change to the project: REVERT doesn't move the places, and iCloud sync and a song you send don't carry them. The 64 projects you browsed most recently keep theirs.
- **A lane swap takes each lane's places with it** (2.12).

The favorites star at the top of the list is one setting for each browser, not for each lane, and it stays after you quit too (5.12).

5.9 SAMPLER and SLICER patches without your audio

A SAMPLER patch, or a SLICER row that isn't a sample kit, is a way of playing a recording: the whole take, backwards, a looped tail, cut into slices. Each one ships with a stand-in recording, made with Tonaut's own sounds, so it plays the moment you choose it.

STAND-IN	SAMPLER ROWS	SLICER ROWS
A held chord	Whole Take, Keys Swell, ENGINE DEFAULT	–
A plucked harp-like note	Back Spin, Harp Keys	–
A long vowel-like note	Tail Loop, Vowel Cave	–
A brass note	Chop Head, Brass Solo	–
A bass note	Octave Floor	–
A bar and a half of groove	Groove Chop	Slice 24, Back Slices, Gate Slices, ENGINE DEFAULT
An arpeggio	Arp Shards	Wide Slices
A bassline	–	Floor Slices

Once the lane holds a recording of yours, every row in that table plays your recording instead of its stand-in. A lane gets one from IMP on the tape (5.7.1), IMP on PATCHES (5.7.2), one file sliced on KITS (6.8.1) or the recorder (12.4). The seven sample kits are different: they always play their own drums. So does a kit made from several files, which leaves the lane's recording

as it was, and so do the SAMPLER's 147 recorded instruments (5.10): each plays its own recording on any lane, and leaves the lane's recording for the rows in the table.

The lane keeps your recording whatever you load next. Load a SLOPE patch, then come back to Slice 24, and your recording is still there.

NOTE

> No row says which recording it will play. On a lane that holds your recording you can't hear the stand-ins at all; try them on another lane.

5.10 The factory library

Tonaut ships 532 factory sounds: 489 synth patches across the nine synth engines and 43 kits across the three kit engines. Forty of the patches are the newest, listed under NEW as well as their own type (5.4). Two of the sounds are plain starting points rather than finished sounds: DIVINER's Init and CINDER's Init Kit. Each engine also has its ENGINE DEFAULT row, so PATCHES lists 498 rows with both columns on ALL, and KITS lists 46.

ENGINE	FACTORY SOUNDS	ROWS WITH TYPES ON ALL
CROSS	52	53
DIVINER	51: Init and 50 patches	52
DUST	35	36
GUT	36	37
PULSE	37	38
SAMPLER	158: 147 recorded instruments and 11 ways of playing a recording	159
SCAN	43	44
SLOPE	42	43
SWARM	35	36
PATCHES, all	**489**	**498**
CINDER	6: Init Kit and five kits	7
KNOCK	25	26
SLICER	12: seven sample kits and five treatments	13
KITS, all	**43**	**46**

147 of the SAMPLER's patches are recorded instruments: basses, keys, pads, leads, plucks and more, each one a recording that ships with Tonaut, played across the keys. Like the seven sample kits, each always plays its own recording, on any lane. The SAMPLER's other eleven patches are ways of playing a recording (5.9). To browse them, tap SAMPLER in the engine column, then a type to narrow the list.

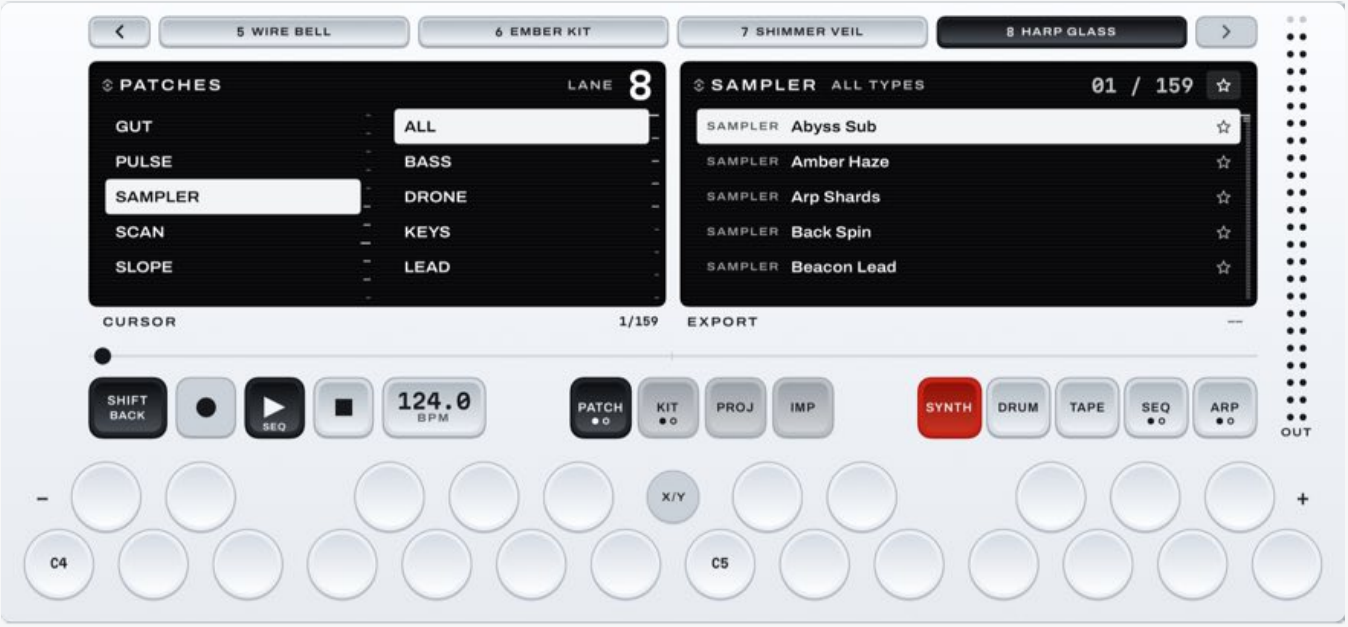


Figure 5.8 The SAMPLER's list: 147 recorded instruments and the eleven ways of playing a recording, A to Z. Lane 8 holds a GUT sound, so the cursor starts at the top and nothing has loaded.

DIVINER's Init is a plain starting point, there to make your own DIVINER sounds from in EDIT (7.6). It is listed first whenever DIVINER is chosen. CINDER's Init Kit does the same job for CINDER (6.4.5).

A new project starts with the sample kits Chrome Kit and Punch Kit (SLICER) on lanes 1 and 2, Cellar Snap (DIVINER) on lane 3, Bottle Glass and Acid Line (SLOPE) on lanes 4 and 5, Attic Strings (DIVINER) on lane 6, Arp Shards (SAMPLER) on lane 7 and Bee Hive (SWARM) on lane 8. Cellar Snap is a bass, so lane 3's keyboard starts two octaves down (5.3.1). A six-lane project has the first six.

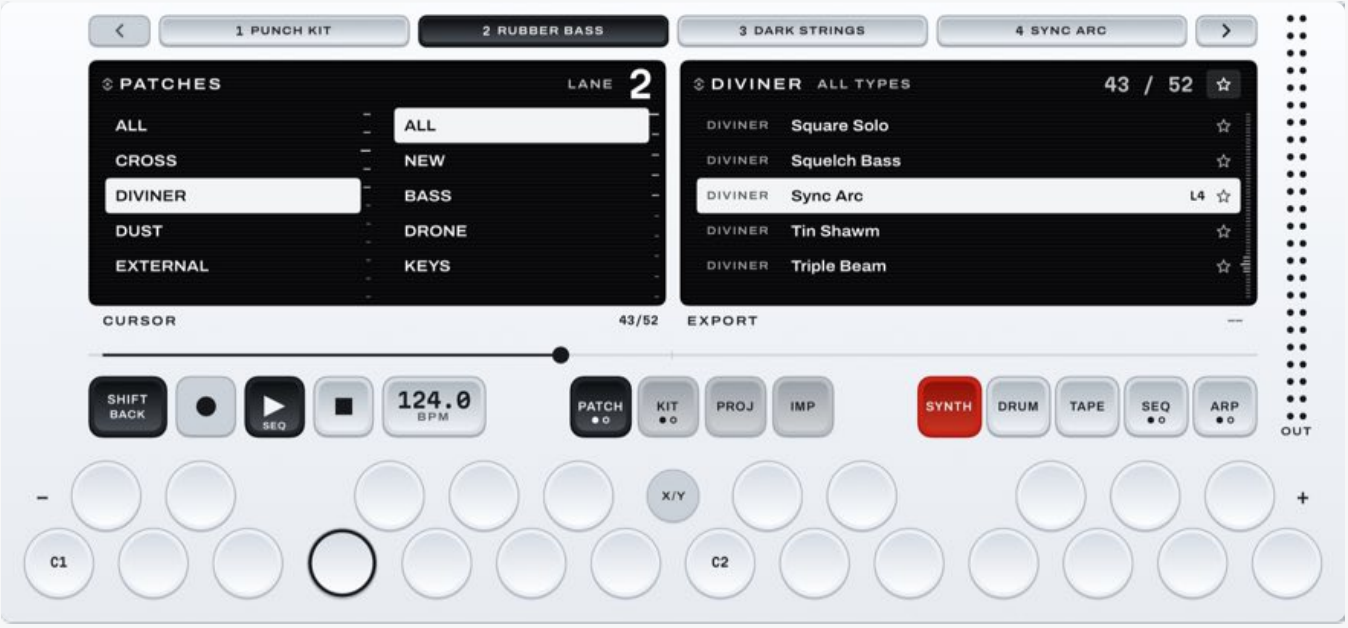


Figure 5.9 DIVINER's list on lane 2, which holds a SLOPE sound. Sync Arc carries lane 4's chip, not lane 2's, and nothing has loaded here; Init leads the list, above the rows in view.

5.10.1

Sounds with new names

Version 1.1 gave twelve factory sounds names that say better what they are.

NAME IN 1.0	NAME NOW	ENGINE	TYPE
Beat Organ	Hollow Beat	PULSE	DRONE
Buzz Lead	Buzz Texture	DUST	TEXTURE
Choir Drone	Choir Pad	SCAN	PAD
Drawbar Swarm	Hollow Bloom	SWARM	PAD
Garage Organ	Combo Square	DIVINER	KEYS
Grain Pluck	Grain Texture	DUST	TEXTURE
Grit Bass	Grit Texture	DUST	TEXTURE
Organ Air	Drift Air	SCAN	PAD
Seed Pluck	Seed Texture	DUST	TEXTURE
Sitar Drone	Sitar Keys	GUT	KEYS
Snap Organ	Square Stab	SLOPE	KEYS
Wire Organ	Wire Square	SLOPE	KEYS

- **A lane in a project saved before the update keeps the old name.** The lane holds its own copy of the sound, and Tonaut never rewrites it. PATCHES still knows it: the renamed row carries the lane's chip, the cursor comes back to it, and tapping it keeps the lane's edits, as for any sound the lane is playing (5.3.1). Load the sound again, from another row and back, and the lane takes the new name.
- **Stars and places stay.** A star on a renamed sound is still there, and so is a lane's place on it (5.8, 5.12).
- **Your own sounds keep the names you gave them**, even one saved in USER under an old factory name.

5.11 Your own sounds: USER

On PATCHES, press PATCH again; on KITS, press KIT again. The list becomes **USER**: the sounds you have saved yourself. The left window's header reads **USER PATCHES** or **USER KITS**, and the columns work exactly as on the factory list, counted from your own sounds. Moving the cursor onto a sound puts it on the lane, as always. Press the same key again to go back to the factory list. An empty USER list says NO SOUNDS YET · PRESS SAVE.

USER belongs to the phone (or iPad), not to a project: every project you open sees the same USER sounds. iCloud sync doesn't carry it. To move sounds to another device, send them (5.11.2).

While USER is showing, the four page keys are:

KEY	DOES	HOLD SHIFT
PATCH	On PATCHES, back to the factory list; on KITS, opens PATCHES	SHARE: sends the ticked sounds as one file
KIT	On KITS, back to the factory list; on PATCHES, opens KITS	Blank
SAVE	Keeps the focused lane's sound in USER: over the lane's own USER sound, or as a new one (5.11.1)	Blank
TICK	Ticks the sound at the cursor to send it, or unticks it. Lit while it is ticked	ALL: ticks every sound in the list, or none

Renaming and deleting aren't page keys. With a sound under the cursor, two buttons stand at the foot of the USER list, at the bottom right of the right window: RENAME and DELETE, the same two as on PROJECTS (5.11.5). On USER PATCHES the band has a TYPE lane between CURSOR and EXPORT (5.11.6).

PROJECTS is still SHIFT + PROJ, and IMP is on the two factory lists.

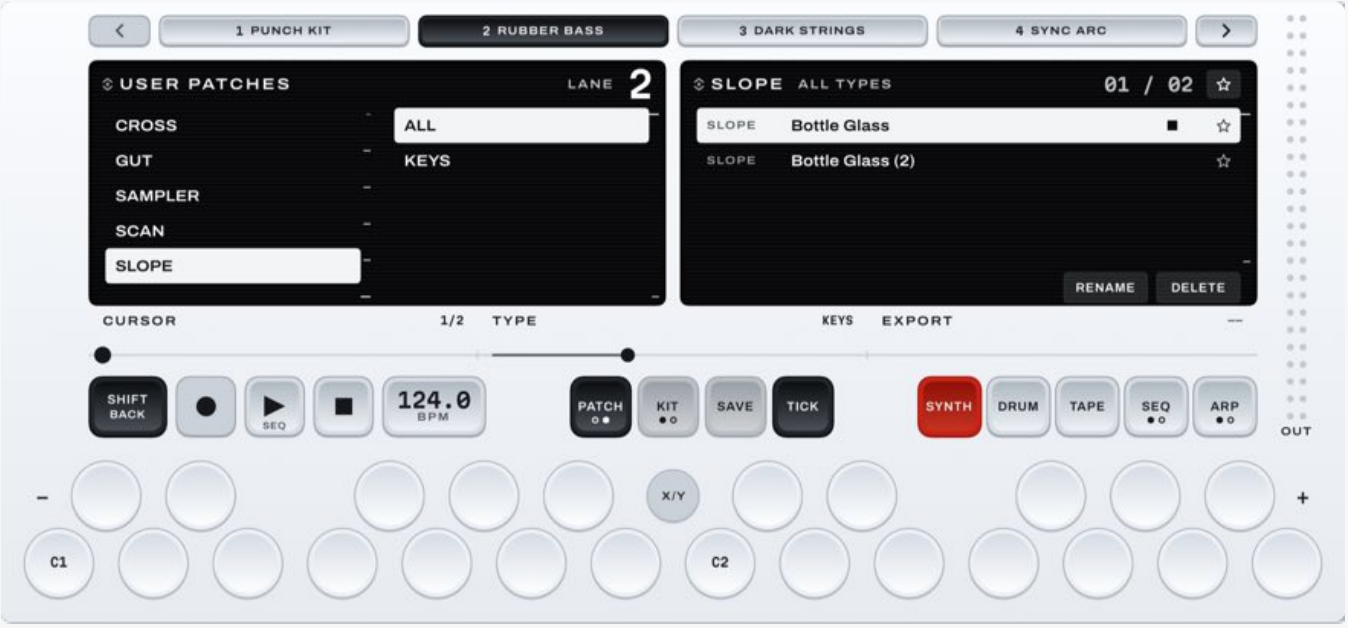


Figure 5.10 USER on PATCHES. PATCH's second dot is filled: this is your own list. The ticked row shows a square, and RENAME and DELETE wait at the foot.

5.11.1

Saving a sound

SAVE keeps the focused lane's sound in USER, and the name you type decides how. Keep the name of the lane's own USER sound and you save over it. Type a new name and you get a new sound beside it.

01 Make the sound on a lane: choose one, and change it on its pages or in EDIT.

02 Open PATCHES (or KITS, for a kit) and press PATCH (or KIT) again for USER.

03 Press SAVE. A pop-up comes up with the iPhone keyboard and a name to start from (the table below).

04 Keep the name or type another, up to 32 characters, and press SAVE. The cursor lands on the sound in USER, and the lane carries its name.

THE LANE HOLDS	THE POP-UP	WHAT SAVE DOES
A factory sound, or any sound that isn't one of your USER sounds	SAVE AS over 32 CHARACTERS AT MOST, starting with the sound's name	Makes a new USER sound. The screen says SAVED TO USER PATCHES (or SAVED TO USER KITS) over the name. A factory sound is never written over.
One of your USER sounds: loaded from USER, saved from this lane, or imported	SAVE SOUND over SAME NAME SAVES OVER IT, starting with that sound's name	The same name, in any capitals, saves over that sound: SAVED OVER over the name. A new name makes a new USER sound, as SAVE AS does.

If the name you type belongs to another of your USER sounds, Tonaut asks first: REPLACE IT? over A USER SOUND HAS THIS NAME. CANCEL writes nothing. REPLACE writes the lane's sound over that one, and the screen says REPLACED over the name. After any SAVE the lane is that USER sound, so the next SAVE on the lane starts from its name.

- **What you hear is what is kept**: the whole sound with every change, and its recording. A SAMPLER or SLICER sound playing your own recording keeps that recording; a kit keeps its own.
- **A patch keeps its octave.** SAVE stores the octave the lane is at, and loading the patch later puts the lane back there (5.3.1).
- **A new USER patch takes the type of the sound it came from**, and saving over a sound keeps the type it has (5.11.6).
- Kits are saved on KITS and patches on PATCHES. SAVE is drawn flat when the lane holds the other kind, and pressed it says, for example, LANE 2 HOLDS A KIT over SAVE IT IN KITS. A lane on EXTERNAL MIDI says A MIDI LANE HAS NO SOUND TO SAVE.

5.11.2 Sending sounds

01 In USER, move to each sound you want to send and press TICK. A ticked row shows a small filled square. Ticks on PATCHES and KITS go together, so one file can hold patches and kits.

02 Hold SHIFT and press SHARE. Name the file in the SEND SOUNDS pop-up (USER SOUNDS to begin with, up to 24 characters) and press SEND.

03 The header counts PACKING 02 / 05; STOP stops it. Then the iPhone's share sheet opens: AirDrop, Messages, Mail, Files.

The file is USER SOUNDS.tonautsounds, and it carries each sound's own recording. With nothing ticked, SHARE is drawn flat and says TICK THE SOUNDS TO SEND FIRST. Ticks go when you leave PATCHES and KITS. While an audio file is loading, SHARE (here and on PROJECTS) is drawn flat and says ALREADY LOADING · ONE MOMENT: one thing at a time.

A sound that uses Echo, Space, Dist, Filter, Pump, Swirl, Lo-Fi or Tremolo in any of its effect slots (4.7.4, 4.7.5) needs a Tonaut that has them. On an older version that sound is left out and the phone asks for an update, with the lines in 5.11.3. A sound that uses none of them is not held back by them.



Figure 5.11 Hold SHIFT on USER for SHARE and ALL. RENAME and DELETE stay at the foot of the list.

5.11.3 Sounds someone sent you

Tap a **.tonautsounds** file in Messages, Mail, AirDrop or Files. Its sounds go into USER, each with its recording, and the screen says ADDED 20 SOUNDS TO USER. A name you already have becomes `Name (2)`. If PATCHES or KITS is open it shows USER. Nothing is put on a lane until you choose it.

- Sounds made with a newer Tonaut are left out, and a second line says how many: 3 NEED A NEWER TONAUT. If none can be used, the line is CAN'T OPEN THIS FILE over UPDATE TONAUT TO OPEN IT.
- A damaged file is refused whole, as a song is (13.14).
- A sound in USER that a newer Tonaut wrote reads **NEWER** and can't be loaded, renamed, saved over or sent. DELETE can still remove it.

5.11.4 SysEx files: six-operator voices into USER

A **.syx** file of six-operator FM voices opens into USER: tap it in Messages, Mail, AirDrop or Files, or pick it with IMP on PATCHES (5.7.2). One file can hold one voice or dozens: single voices and 32-voice banks, in any mix. Every voice becomes a CROSS sound in USER PATCHES, named after the file, its number in the file and the voice's own name, so a bank's voices list together and in order: `Rom1A 01 BRASS 1`, `Rom1A 02 BRASS 2` ... The screen says IMPORTED 32 VOICES over IN USER PATCHES · ROM1A, and if PATCHES is open it shows USER with the cursor on the first voice. Nothing is put on a lane until you choose it.

- **Damage**: when part of a file is damaged, every good voice still comes in and the line says how many did not: IMPORTED 37 VOICES · 1 DAMAGED. A voice is damaged when its message was cut short, or when its bank's checksum fails and the voice holds a value no voice can have.
- **Refused**: a file with no voice in it says CAN'T OPEN THIS FILE over one reason: THE FILE IS EMPTY, IT IS NOT A SYSEX FILE, ITS SYSEX IS FOR ANOTHER INSTRUMENT, ONLY SINGLE VOICES AND 32-VOICE BANKS, IT ENDS IN THE MIDDLE OF A VOICE or ITS VOICES ARE DAMAGED. Nothing is written until the whole file has been checked.
- **Limit**: a file over 256 KB is refused (IT IS OVER 256 KB): that is 63 banks, about two thousand voices.
- Imported voices are your own sounds from then on: save, rename, delete and send them like any USER sound. Tonaut ships no voices of anyone else's.

5.11.5 Renaming and deleting a sound

RENAME and DELETE are two buttons at the foot of the USER list, at the bottom right of the right window, as on PROJECTS (13.7). They act on the sound under the cursor and take a plain tap, with no SHIFT. They're there only while USER is showing a sound under the cursor, never on the factory lists, and the list gives up a row to make room for them.

To rename a sound in USER, move the cursor onto it and press RENAME. The RENAME SOUND pop-up comes up over 32 CHARACTERS AT MOST, with the sound's name; type the new one and press RENAME. The screen says RENAMED over the new name. A name already in USER is numbered, `Bass (2)`, and the sound keeps its star. Leave the name as it was and the screen says NAME UNCHANGED.

To delete one:

01 Move the cursor onto the sound.

02 Press DELETE. It lights, and the screen says DELETE THIS SOUND? PRESS DELETE AGAIN over its name.

03 Within eight seconds, press DELETE again. The screen says DELETED over the name, and the sound is gone from USER for good.

Moving the cursor, or waiting longer than eight seconds, lets the first press go: DELETE CANCELLED. With HELP latched, RENAME's line is RENAME THE SOUND AT THE CURSOR and DELETE's THROW THIS SOUND AWAY · PRESS TWICE.

NOTE

> Your quick slots are unchanged (3.6). A lane that holds a USER sound holds its own copy: renaming or deleting the sound in USER doesn't change the lane. REC on PATCHES and KITS still exports the lane's recording, on USER too.

5.11.6 TYPE: sorting your own patches

Your own patches sort into types as the factory patches do, so USER's type column can show only your basses or only your pads. On USER PATCHES the band has three lanes, **CURSOR**, **TYPE** and **EXPORT**. TYPE reads and sets the type of the sound under the cursor.

To give a patch a type:

01 On USER PATCHES, move the cursor onto the sound.

02 Drag **TYPE** to the type you want: **NONE**, then **BASS**, **DRONE**, **KEYS**, **LEAD**, **PAD**, **PERCUSSIVE**, **PLUCK** and **TEXTURE**.

03 The screen says, for example, **TYPE · PAD** over the sound's name (**NO TYPE** for NONE), and the type column lists the sound under its new type.

- **A new USER patch starts with a type**: the type of the sound it was saved from, so a factory pad saved is a PAD. An audio file imported into the SAMPLER starts as KEYS. A sound with no type to take, such as an ENGINE DEFAULT sound or a SysEx voice, starts on NONE, and so does a patch saved before version 1.1. A patch on NONE is listed under ALL only.
- **TYPE changes the sound in USER, not the lanes.** A lane holding a copy keeps what it had, and saving over a sound keeps the type it has in USER.
- TYPE is drawn off, showing the type, on a sound from a newer Tonaut and while SAVE, RENAME or DELETE is working. With no sound under the cursor it reads **––**. Its help line reads **SET THE TYPE OF THIS USER SOUND**.
- USER KITS has no type column and no TYPE, as the factory KITS list has none.

5.12 Favorites

Star the sounds you reach for, and the list can put them first. Every row on PATCHES and KITS ends in a star: the factory lists and USER, the ENGINE DEFAULT rows included.

- **Tap a row's star** to make that sound a favorite. The star fills in. Tap it again to take it off. A tap on a star loads nothing and leaves the cursor where it is.
- **The star at the top of the list**, at the right end of the right window's header, sets the order. Tap it and it lights: your favorites come first, A to Z, then the rest of the list in its usual order. Tap it again to go back to A to Z. The cursor stays on the sound it was on, wherever that sound now sits.

The top star works with whatever the columns show. With ALL engines and ALL types, every favorite of that browser comes first; with DIVINER and LEAD, DIVINER's favorite leads come first. PATCHES and KITS each have their own top star.

To put your favorite kits at the top of KITS:

01 Open KITS and tap ALL in the engine column.

02 Tap the star at the end of each kit you want. Each one fills in.

03 Tap the star at the top of the list. It lights, and your starred kits move to the top.

Favorites are kept on this phone or iPad, and stay after you quit, as does the top star's setting. They don't belong to a project, and they don't travel with iCloud sync, a song or a sounds file. A USER sound keeps its star when you rename it. EXTERNAL's channel rows (5.13) have no stars. With HELP latched, a row's star says `STAR THIS SOUND TO FIND IT AGAIN` and the top star `LIST YOUR FAVORITES FIRST · OR A TO Z`.

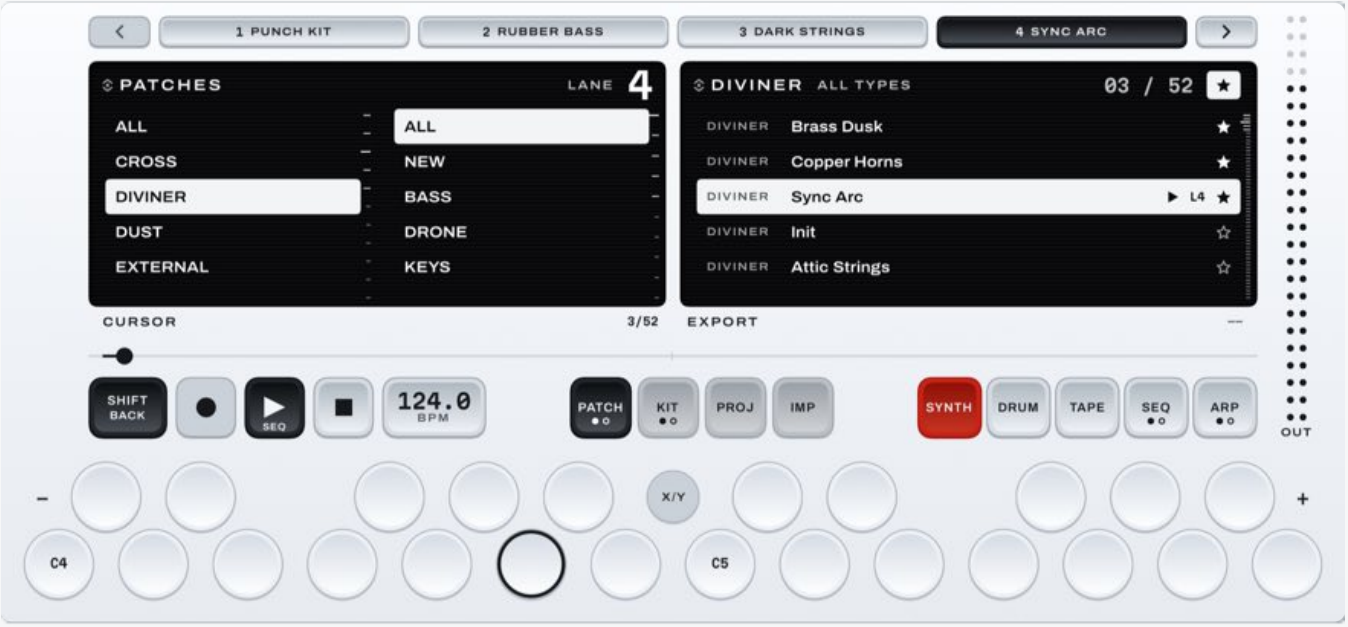


Figure 5.12 Favorites first: the starred patches lead the list, and the rest follow in their usual order.

5.13 EXTERNAL: a lane that plays your own gear

A lane can play a synth or a drum machine you plug in, over MIDI, instead of a sound of its own. The way in is the EXTERNAL row in a browser's engine column: on PATCHES for a synth, on KITS for a drum machine.

To play a synth on lane 4 over MIDI channel 4:

01 Connect the synth to the phone (chapter 16) and set it to receive on channel 4.

02 Focus lane 4 and open PATCHES.

03 Tap EXTERNAL in the engine column. The right window lists the sixteen MIDI channels, **`CH 01`** to **`CH 16`**, and the cursor waits on **`CH 04`**. Nothing has changed yet.

04 Tap **`CH 04`**. The lane now sends its notes on that channel: its button reads **`MIDI CH 04`** and the row takes the L4 chip.

On PATCHES the cursor waits on the lane's own number (lane 4 on CH 04); on KITS it waits on CH 10, the usual drum channel. A lane already on EXTERNAL opens on its own channel. Moving the cursor onto a channel, or tapping it, puts the lane on it, as landing on a sound loads it. The keys, the lane's patterns, its arpeggiator or groove and a MIDI keyboard then all play your gear. On KITS, tapping the channel the lane already plays runs the preview beat through the drum machine (5.5.1).

EXTERNAL is not under ALL and not in USER, and its rows have no stars. To make the lane play a sound of its own again, load any patch or kit onto it. Everything else about MIDI lanes is in chapter 16: the lane's own MIDI page and its CHANNEL lane, MIX on a MIDI lane, all notes off, MIDI delay, start, stop and clock out, and why a MIDI lane isn't recorded to tape. Tonaut keeps its own tempo and doesn't follow a clock coming in.

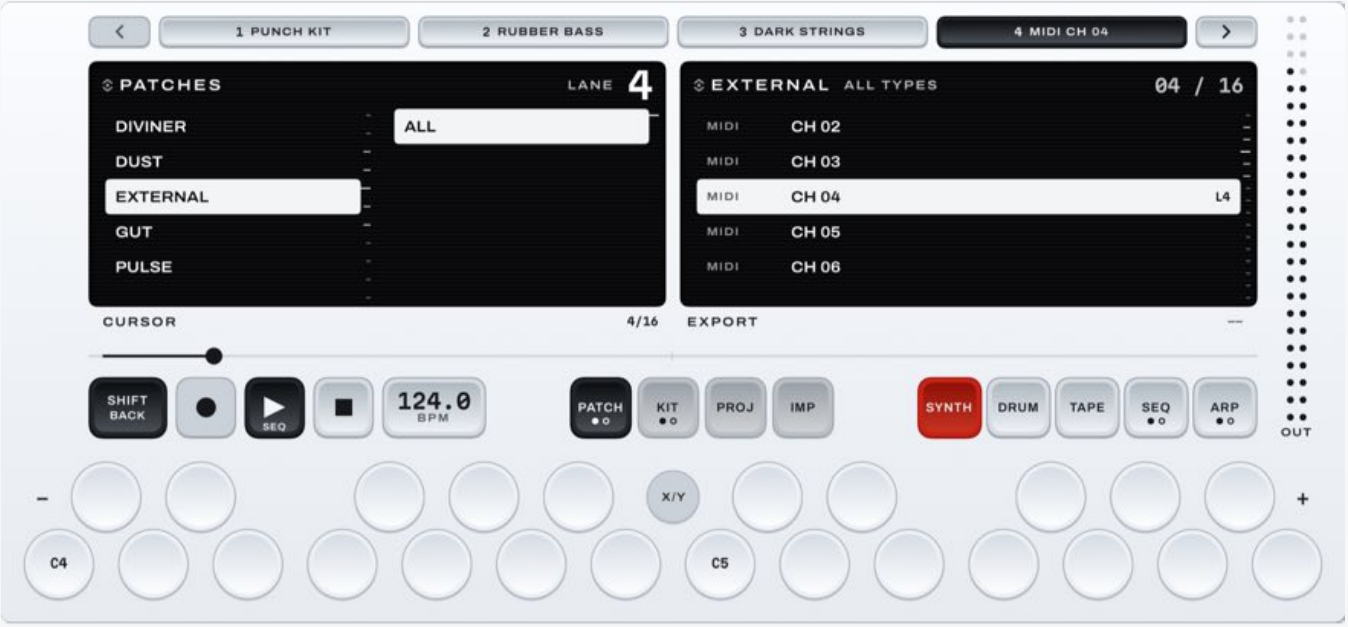


Figure 5.13 EXTERNAL lists the sixteen MIDI channels. Lane 4 plays a synth on channel 4.

06 DRUM

DRUM is where you shape a drum kit: each of its 24 pads on its own, the whole kit at once, its effects and its modulation. The pad map on the right shows every hit as it plays and lets you silence single pads in the pattern and the groove. And you can make a kit from your own drum samples: open KITS, set **FROM** to **FILES**, press IMP and pick up to 24 audio files from the Files app (6.8).

6.1 Kit lanes and the three kit engines

A kit lane is a lane that holds a drum kit instead of a synth sound. On a kit lane the 24 keys of the keyboard are 24 pads, numbered 1 to 24, and each one plays its own sound. Any lane can hold a kit. A new project starts with kits on lanes 1 and 2: Chrome Kit and Punch Kit.

Every kit is made by one of three kit engines.

ENGINE	WHAT A PAD IS	FACTORY KITS
KNOCK	A drum sound made from scratch by the engine. No recording is involved: each pad is a tuned body, a noise layer and a click, set by its own eight controls.	25, including Room Kit and Tin Kit
SLICER	A slice of one recording. The whole kit plays one recording, and each pad plays the part of it between its own start and end points. Every kit you make from your own sounds is a SLICER kit (6.8).	12: seven made from real drum recordings (Arena, Boom, Chrome, Hall, Pop, Punch and Smoke Kit) and five that slice a recording in different ways (5.9)
CINDER	A drum sound made of two layers, each a sine, a saw or a filtered noise with its own pitch movement and envelope, then roughened, folded or driven, and sent into a ring the whole kit shares. It is made the way a classic two-layer digital drum synth is.	6: Init Kit, then Bamboo, Canyon, Ember, Scrap and Zither Kit

DRUM always edits the focused lane's kit. The same four page keys appear for every engine, KIT, KEY, FX and MOVE, but the controls on the KIT page belong to the engine (6.4). A kit lane can also play a drum machine over MIDI instead of a kit (5.13); DRUM then shows that lane's MIDI page (chapter 16).

6.1.1 Getting to DRUM

Press DRUM. What happens depends on the focused lane:

- If the focused lane holds a kit, DRUM opens on that kit.
- If it holds a synth sound, the focus jumps to a kit lane first: the kit lane you used last, or else the first kit lane in the project. The lane button you land on fills in.
- If no lane holds a kit, nothing changes and the notice line says NO KIT LANE IN THIS PROJECT. Put a kit on a lane first (6.1.2).

The mode key follows the lane. While you're on DRUM, tapping the button of a lane that holds a synth sound moves you to SYNTH, and tapping a kit lane's button from SYNTH brings you back to DRUM (2.2). In an eight-lane project the iPhone's lane row shows the lanes four at a time, and its arrow keys bring the others into view; a six-lane project shows all six.

6.1.2 Putting a kit on a lane

To put a different kit on a lane:

01 Tap the lane's button to focus it.

02 Hold SHIFT and press KITS (the DRUM key's SHIFT job). The KITS browser opens.

03 Move the cursor through the list. Each kit loads onto the lane as the cursor reaches it; play the keys to hear it, or tap the kit again to hear it play a beat.

04 Tap SHIFT (it reads BACK) or press DRUM to return.

This works on any lane: loading a kit onto a synth lane turns it into a kit lane. The browser is described in full in 5.5 and 5.6.

TIP

> To play your own drum samples, make a kit from them in the same browser: drag **FROM**, the middle lane of KITS' band, to **FILES**, press IMP and pick the files. The steps are in 6.8.

6.2 The DRUM screen

DRUM shows the pad you're editing in the left window and all 24 pads in the right window. The two windows are the same on all four pages, KIT, KEY, FX and MOVE; only the band below them changes.



Figure 6.1 A SLICER kit on DRUM. The number in the left window's header, the bracket, the outlined pad in the map and the band all point at the same pad.

6.2.1 The left window

The header reads **DRUM** and the kit's name. On the right of the header is the number of the pad you're editing: **SLICE 08** on a SLICER kit, **PAD 08** on a KNOCK or CINDER kit. A kit with no name of its own, such as one lifted from the tape (6.8.4), is called by its engine's name, **SLICER**. On the FX page the header shows the effect slot instead of the pad, for example **SLOT 2 · DELAY**, because the band there edits the kit's effects (6.6).

On a SLICER kit the window draws the whole recording as a waveform, left to right. Thin vertical lines mark where the slices begin and end. Each line is a real slice point: move a pad's IN or OUT (6.4.2) and its line moves with it. The slice you're editing is drawn between two red lines over a light red wash, the slice bracket.

On a KNOCK or CINDER kit there is no recording to draw, so the window draws the kit itself, built in three dimensions. This is the **NEW** picture, and DRUM shows it whenever you come to the lane:

- **KNOCK** is a field of 24 octagonal plates, one for each pad.
- **CINDER** is a drum kit: kick, snare, toms, hi-hat and cymbals. Each pad plays one of its pieces, so several pads can share a piece.

What the NEW picture does:

- **Every hit rings.** Whatever plays the lane strikes the pad's plate or drum: your fingers, a MIDI keyboard, the lane's pattern or its groove. A harder hit rings harder, and each hit fades over the pad's own decay. A pad muted on the pad map doesn't sound, so it doesn't ring.
- **The selected pad's controls reshape it.** The band's four controls on the KIT page change the selected pad's part of the picture, and it follows as you drag. On KNOCK the selected plate is drawn brightest and carries the controls' marks: a circle that tightens as PITCH goes up, up to three more rings inside it as TONE goes up, an arc that grows longer with DECAY, and the circle drawn bolder as LEVEL goes up. On CINDER the selected pad's drum or cymbal changes: a higher PITCH makes it smaller, ATTACK changes the shape of its head, a longer RELEASE makes its shell deeper, and LEVEL strengthens its outline. The picture only shows the sound: nothing in it changes a value.
- **On CINDER every piece hops.** A drum or cymbal jumps up a little each time it's hit and settles back, a harder hit a little higher.
- **It turns slowly while it plays.** As on the synth screens (4.5), the camera sways round the kit, tilting it a little so you can see its depth.
- **It holds still when nothing moves.** With no hit ringing and no control moving, the picture stops, camera and all, until a hit or a control wakes it.

With Reduce Motion on, the camera holds still, CINDER's pieces don't hop, and the hits still ring. KNOCK's plates carry their numbers on the iPad only, where the picture is big enough (chapter 17).



Figure 6.2 A KNOCK kit's NEW picture: 24 plates, the selected one brightest, each ringing as its pad is hit.

CLASSIC. The left window wears the tap mark, a small dot in a ring, at the start of its header. Tap the window and it switches to the **CLASSIC** window, the pad's four main controls drawn as PLOTS, one cell each; tap again for NEW. As on SYNTH (4.5.1), CLASSIC lasts only while you stay on the lane: focus another lane, or open the app again, and DRUM shows NEW. It isn't

saved, and switching never changes a value or the sound. With HELP latched the help panel takes the window, so there is nothing to tap.

On a KNOCK kit, CLASSIC's cells are PITCH (more cycles drawn for a higher hit), TONE (the body's shape, round to metallic), DECAY (the ring-out) and LEVEL (the height of the hit). They are the same four controls as the band on the KIT page, in the same order, and they always show the selected pad, whichever page you're on.

On a CINDER kit the cells follow the band too: PITCH draws what the first layer is made of (cycles of its sine or saw, more for a higher pitch, or the filter its noise goes through, its edge or band at the pitch), ATTACK the rise and RELEASE the fall in the layer's ENV shape, and LEVEL the height of the hit. Hold or latch SHIFT and the cells turn with the band to layer 2's PITCH 2, ATTACK 2 and RELEASE 2, and SEND, drawn as the hit with the ring trailing after it.

In the TN looks (iPhone only, 2.1.1) the band's handles carry the same colors as on SYNTH (4.5): blue, ochre, light gray and orange in TN-1 and TN-1 DARK, four grays in TN-XY, on every DRUM page but under SHIFT. In TN-1 and TN-1 DARK the left window on KIT draws the selected pad's four features in those colors too: its part of the slice, of KNOCK's or CINDER's picture, or its CLASSIC cells. The colors always follow the selected pad.

If a SLICER kit's recording can't be found, for example a capture that could not be saved when it was made, the left window says `THIS KIT HAS NO RECORDING`, the header shows `PAD` instead of `SLICE`, and every pad is empty (`0 OF 24 FILLED`). Load another kit, or bring a recording in (6.8). Every factory SLICER kit carries its own recording, so you should not see this with them; if you do, please tell us (14.10).

6.2.2 The right window: PADS

The pad map shows all 24 pads in two rows of twelve: `01` to `12` on top, `13` to `24` below. (The iPad draws three rows of eight; chapter 17.) The numbers are the pad numbers on the keys, but the rows are not the keyboard's rows (6.3.1). The header reads `PADS` and, on the right, how many pads make a sound, such as `19 OF 24 FILLED`. Every KNOCK and CINDER pad makes a sound, so those kits always read `24 OF 24 FILLED`. A SLICER pad is filled when the kit holds a recording and the pad's slice is at least one sample long.

A PAD DRAWN	MEANS
with a faint ground and a thin border	filled: it makes a sound
with no ground and a fainter border	empty: it plays nothing
solid, number reversed out	lit: it sounded a moment ago (6.7.1)
with a heavy outline	selected: the pad the band is editing (6.3)
with a red number	muted for the pattern and the groove (6.7.2)

The looks combine. A muted pad that you strike by hand flashes solid with its number still red. In the TN looks the selected pad's outline and the flash of a hit are orange, or silver-white in TN-XY, and in TN-1 and TN-1 DARK a muted pad's number is orange rather than red.

6.2.3 The band and the page keys

The band holds four controls of the page showing; SHIFT shows the page's other four (2.7). The four page keys are:

KEY	PAGE	PRESSED AGAIN
KIT	the selected pad's own eight controls (6.4)	nothing
KEY	eight controls for the whole kit (6.5)	nothing
FX	the kit's four effects (6.6)	opens the effect list for the slot that is lit; again, that slot's CONTROLS; again, back to the page
MOVE	the kit's modulator (6.6)	opens the modulator list

Under SHIFT the four page keys go blank and take no touch (2.7). To open the effect or modulator list, press FX or MOVE again with SHIFT off. MOVE wears two dots, the page and then its list, with the filled one where you are; FX wears three: the page, the list, then the slot's CONTROLS. KIT and KEY have none (2.5.1).

6.3 Choosing the pad you edit

To edit a pad, play it. The last pad you played on the on-screen keyboard is the selected pad, and everything follows it at once:

- the number in the left window's header (PAD 05 or SLICE 05);
- the red slice bracket on a SLICER kit; on a KNOCK or CINDER kit, the part of the NEW picture the band reshapes (the brightest plate on KNOCK), or the four PLOTS cells on CLASSIC;
- the heavy outline in the pad map;
- the band's values on the KIT page;
- the PAD group in EDIT, if EDIT is open (7.5).

Only your fingers on the keyboard choose the pad. A pad played by the pattern, the groove or a MIDI keyboard sounds and flashes, but the selection stays where it was, so a running beat never pulls the band away from the pad you're working on. A tap on the pad map does not choose a pad either: it mutes one (6.7.2).

Loading another kit selects pad 01. Opening a project selects pad 01 on every kit lane.

> **TIP** Under SHIFT only pads 2 to 13 can be played, because the upper row turns into slots, UNDO, DIE and HELP and the two end keys go blank. To edit the SHIFT controls of pad 1, pad 14 or pads 15 to 24, play the pad first, then latch SHIFT. The selection stays.

6.3.1 Pad numbers, keys and MIDI notes

The pads are numbered along the keyboard, lower row first:

PADS	ON THE KEYBOARD	MIDI NOTES (TONAUT CALLS MIDI NOTE 48 C3)
1 to 14	the lower row, left to right	C3, D3, E3, F3, G3, A3, B3, C4, D4, E4, F4, G4, A4, B4
15 to 24	the upper row, left to right	C#3, D#3, F#3, G#3, A#3, C#4, D#4, F#4, G#4, A#4

A MIDI note outside C3 to B4 plays the pad two, four or six octaves away. C1, C5 and C7 all play pad 1, the same as C3. C2 and C6 play pad 8, the same as C4. A kit has no octave to move. On the iPhone the – and + signs in the keyboard's end gaps are dimmed on a kit lane, and pressing them says A KIT HAS 24 SOUNDS, NOT 24 PITCHES and changes nothing (3.3.1).

6.3.2 How hits overlap

- A pad struck again cuts its own previous hit with a very short fade, so a fast roll on one pad never piles up. Different pads ring over each other unless CHOKE is on (6.5.1).
- Up to 16 hits can sound at once on one kit lane. A 17th cuts the oldest one, a hit that has already been let go first.
- The on-screen keys all play at the same strength. A MIDI keyboard's velocity changes how hard each pad is hit (3.8).

6.4 KIT: each pad's own controls

The KIT page holds eight controls that belong to the selected pad alone. Change PITCH on pad 3 and only pad 3 changes. Four are on the band and four under SHIFT; which eight depends on the kit's engine.

How the band reads: a control that runs from nothing to full shows **00** to **99**; a control with a middle, such as PAN, shows **–50** to **+50** with **0** in the middle; a control with set positions shows the position's word. Drag slowly for fine steps and quickly to go far (2.4.1). A double-tap puts a slider back to its starting value: on the KIT page, that pad's own, from a fresh kit of this engine. SHIFT + double-tap puts back its last change (2.4.4).

6.4.1 KNOCK pads

A KNOCK pad is a tuned drum body (a sine wave whose pitch drops at the start of the hit), a layer of noise tuned around it, and a short click on top.

CONTROL	LAYER	WHAT IT DOES
PITCH	band	How high or low the hit sits: the body's pitch, from 20 Hz (a deep sub) to 5 kHz (a tiny tick).
TONE	band	From a clean body to a metal one. Low settings give a round sine; turning it up drives the body harder, and past the middle it adds two ringing overtones like a struck membrane or a bell. It also brightens the noise

		layer.
DECAY	band	How long the hit rings, from 10 ms to 4 seconds. The noise layer rings for about 60 percent as long as the body.
LEVEL	band	How loud this pad is. **80** leaves it as it is, **99** is about 6 dB louder, **00** is silent.
SNAP	SHIFT	How much click there is at the start of the hit: a short burst of bright noise. At **00** there is no click. Turning it up makes the click louder and sharper, from 3 ms long down to 0.5 ms. A harder hit from a MIDI keyboard makes it louder too.
PUNCH	SHIFT	How far the pitch drops at the hit. At **00** the body starts on its pitch; turned up, it starts higher and falls to PITCH, up to four octaves above at **99**. This is what makes a kick thump.
NOISE	SHIFT	The balance between the body and the noise layer: **00** is all body, **99** is all noise. Snares and hats sit high.
PAN	SHIFT	Where this pad sits between the speakers, **−50** left to **+50** right.



Figure 6.3 KNOCK's SHIFT four, with the window on CLASSIC: the PLOTS cells keep drawing PITCH, TONE, DECAY and LEVEL.

The KNOCK engine's own starting kit (its **ENGINE DEFAULT** row in KITS) has this layout, and Room Kit keeps it. The other factory KNOCK kits start from it and change it pad by pad.

PADS	SOUND
1, 2	kick, snare
3, 4	closed hi-hat, open hi-hat
5, 6, 7	low, mid and high tom
8, 9	clap, rim
10, 11, 12	metal bell, ride, crash
13, 14	a second kick, a second snare
15 to 24	tuned percussion on A, C, E and G, from A3 up to C6

6.4.2

SLICER pads

A SLICER pad plays the part of the kit's recording between its IN and OUT points, then shapes it with its own filter and envelope.

CONTROL	LAYER	WHAT IT DOES
IN	band	Where this pad's slice starts, as a position across the whole recording: **00** is the start, **99** the end. The slice's left line moves as you drag.
OUT	band	Where the slice ends, on the same scale. With OUT on IN the pad plays nothing: it turns empty on the map, the filled count drops by one, and the red bracket disappears.
PITCH	band	How high or low this slice plays, up to two octaves either way. **+25** is an octave up and **−25** an octave down. Like tape, higher also plays faster and shorter.
GAIN	band	How loud this slice is. **80** leaves it as it is, **99** is about 6 dB louder, **00** is silent.
CUTOFF	SHIFT	How dark or bright this slice is: a low-pass filter from 20 Hz to 20 kHz. All the way up (**99**, where every kit starts) the filter is out of the sound altogether.
RESONANCE	SHIFT	How much the filter rings at CUTOFF, from no peak at **00** to a strong one at **99**. You hear it only with CUTOFF below the top.
ATTACK	SHIFT	How slowly the slice fades in. **00** starts at once; turned up, from 1 ms to 1 second.
DECAY	SHIFT	How fast the slice dies away from the moment it starts, from 10 ms to 4 seconds. All the way up (**99**, where every kit starts) there is no decay and the slice plays out to its OUT.



Figure 6.4 SLICER's SHIFT four: a filter and an envelope for each pad. CUTOFF and DECAY start at the top, which leaves the slice untouched.

To cut a slice by ear:

01 On the KIT page, play the pad you want to change. Its slice is bracketed in red.

02 Drag **IN** until the left red line sits a little before the hit you want. Play the pad to hear where it starts.

03 Drag **OUT** until the right red line sits where the sound should stop.

04 Play the pad again. If it clicks at the end, lengthen its FADE in EDIT (6.4.3).

Slices don't have to touch, and they can overlap: two pads can play the same hit at different pitches. A slice with IN past OUT plays the part between them, forwards, and is drawn filled. A kit made from one recording starts with 24 equal slices, pad 1 from **00** to **04**, pad 2 from **04** to **08**, and so on to pad 24. For close work, the sample editor draws the same slice with a zoom (12.8); it edits the same values as this page.

6.4.3 PLAY MODE, DIRECTION, PAN and FADE (SLICER, in EDIT)

Each SLICER pad has four more controls of its own. They are not on DRUM's band; they are in EDIT's PLAY group (7.5.6), and on the sample editor's LOOP, FADE and PITCH pages (12.8.4).

To reach them:

01 On DRUM, play the pad you want to change.

02 Hold SHIFT and press EDIT (the SEQ key's SHIFT job). EDIT opens for the lane's kit.

03 Press PAD, the first page key, until the PLAY group shows. Each press steps through PAD, PLAY and SAMPLE.

CONTROL	VALUES	WHAT IT DOES
PLAY MODE	ONE-SHOT, GATE, LOOP	ONE-SHOT plays the whole slice however briefly you touch the key. GATE plays while the key is held and fades out by FADE when you let go. LOOP repeats the slice from IN to OUT while the key is held, then fades out by FADE.
DIRECTION	FORWARD, REVERSE	Plays the slice forwards or backwards.
PAN	−50 to +50	Where this slice sits between the speakers.
FADE	1 ms to 2 seconds	How gently the slice lets go: the fade at its end, and after you release the key in GATE and LOOP.

The SAMPLE group after it holds **NORMALIZE**, which matches the recording's loudness to the other sounds. It is one setting for the whole kit: on for the factory kits and a kit cut from one recording, off for a kit made from several files (6.8.1). EDIT's KIT and KIT VOICE groups show the eight KEY-page controls of 6.5. A KNOCK kit's EDIT has the PAD, KIT, KIT VOICE and LEAN groups and nothing else; it has no hidden pad controls.

6.4.4 DIE on a pad

On the KIT page, SHIFT + DIE scrambles the selected pad's eight controls and no other pad's. On a SLICER kit that includes IN and OUT, so the slice moves too. Each press rolls a new set; SHIFT + UNDO, the key beside DIE, takes the rolls back one at a time, up to eight (3.7). On the KEY page, DIE scrambles the eight whole-kit controls instead, CHOKE and TUNE included.

NOTE

> Press SHIFT + UNDO before you play another pad. You can play the scrambled pad as often as you like to hear it, but playing a different pad drops what UNDO could take back: UNDO is drawn off and the scrambled pad keeps its new values. A scramble on the KEY page belongs to the whole kit, so its UNDO waits while you play any pad.

6.4.5 CINDER pads

A CINDER pad is two layers. Each is a sine, a saw or a filtered noise with its own pitch, attack and release, and its own way of moving in pitch. Both go through the pad's dirt (BITS, FOLD and DRIVE), then to the mix at the pad's LEVEL and PAN, and, by SEND, into a ring the whole kit shares. Every one of the 24 pads is a complete sound of its own.

	LANE 1	LANE 2	LANE 3	LANE 4
KIT page	PITCH	ATTACK	RELEASE	LEVEL
Under SHIFT	PITCH 2	ATTACK 2	RELEASE 2	SEND

The band is layer 1 and the pad's level; **SHIFT is layer 2**, with SEND in the fourth lane. PITCH runs from 20 Hz to 16 kHz; on a noise layer it moves the filter rather than a pitch. ATTACK runs from instant to 1 second and RELEASE from 5 ms to 8 seconds. LEVEL and SEND run from off

to +6 dB. SEND is taken beside LEVEL, so a pad with LEVEL down and SEND up plays only through the ring.

To make the whole kit dry, turn RING down to 0% in EDIT's RESONATOR group (KIT , under SHIFT; 7.5.8). The tails most CINDER kits have are the ring, the kit's own echo, so the lane's effects at 0 leave them in; RING takes the ring out of every pad at once. To keep it on a few pads only, leave RING up and turn SEND down on the others.

The rest of a pad, its two layers' SOURCE, ENV, MOD, AMOUNT, RATE and level, its dirt, PAN and CHOKE, and the ring's MODEL, DECAY, BODY, TUNE and RING, are in EDIT (7.5.8), where you can also copy one pad onto another.

The Init Kit puts the same parts on the same pads as KNOCK (6.4.1), so grooves, patterns and the preview beat play every CINDER kit: a swept sine for the kick, a sine body and a noise rattle for the snare, closed and open hats that choke each other, three toms, a clap on the many-peaked envelope, and tuned pads on the upper row. The five other kits start from it. Ember is the warm, classic kit; Bamboo rings through the tube; Zither through the string; Scrap is all dirt; and Canyon turns the ring into an echo, with Lean on SEND so tilting the phone throws more of the kit into it.



Figure 6.5 A CINDER kit's NEW picture. Under SHIFT the band turns to layer 2 and SEND; on CLASSIC the cells turn with it.

6.5 KEY: the whole kit

The KEY page sets how every pad of the kit is struck. Its eight controls act on all 24 pads at once, and they are the same for KNOCK, SLICER and CINDER.

CONTROL	LAYER	WHAT IT DOES
PUNCH	band	How much snap the hits keep. **0** leaves them alone. Above 0, the first few milliseconds of every hit are pushed up to 6 dB louder, for a harder attack. Below 0, every hit fades in over up to 20 ms, for a softer one.
GAIN	band	Boosts every hit, from no boost at **00** (where it starts) to 12 dB at **99**. It sits before the kit's effects, so it also pushes a Drive effect harder (4.7).
RELEASE	band	How long a hit is let ring. All the way up (**99**, where it starts) every hit rings as long as the pad makes it. Turned down, every hit is cut short after TIMING, fading out over 10 ms to 4 seconds.
LEVEL	band	How loud the whole kit is. **80** leaves it as it is, **99** is about 6 dB louder, **00** is silent.
TIMING	SHIFT	How long each hit plays untouched before RELEASE starts to shorten it: 0 to 1 second, starting at **25** (a quarter of a second). It does nothing while RELEASE is all the way up.
TUNE	SHIFT	Moves the whole kit up or down, in semitone steps, reading **−12 ST** to **+12 ST**. It starts at **+0 ST** and adds to each pad's own PITCH.
CHOKE	SHIFT	**OFF** or **ON**. With CHOKE on, a new hit cuts every other pad of this kit that is still ringing (6.5.1).
BEND	SHIFT	How far a MIDI keyboard's pitch-bend wheel bends the whole kit, from **+0 ST** to **+24 ST** (semitones). It starts at **+2 ST**.



Figure 6.6 The KEY page. The windows above still show the selected pad; the band now acts on the whole kit.



Figure 6.7 KEY under SHIFT: TIMING, TUNE, CHOKE and BEND.

6.5.1 CHOKE

Without CHOKE, each pad only cuts its own previous hit, and different pads ring over each other. With CHOKE on, every hit cuts all the other pads of the kit that are still sounding, with a very short fade. Use it for an open hi-hat that a closed one should silence, or for a sliced loop where each slice should stop the last. CINDER pads also have a CHOKE of their own, in EDIT, which cuts only the other CHOKE pads (7.5.8).

To hear it:

01 On the KEY page, latch SHIFT and set **CHOKE** to **OFF**.

02 Play a long pad (on Room Kit, pad 4, the open hat, or pad 12, the crash), then a short one straight after. Both ring.

03 Set **CHOKE** to **ON** and play the same two. The long one stops the moment the second lands.

CHOKE works on every hit, whoever plays it: your fingers, MIDI, the pattern and the groove. It only cuts pads of the same kit; other lanes ring on. A pad muted on the pad map (6.7.2) does not play for the pattern or groove, so it does not choke anything either.

6.5.2 Shortening every hit with RELEASE and TIMING

To tighten a kit whose cymbals and toms ring too long:

01 On the KEY page, drag **RELEASE** down from the top. Every hit now fades out after a quarter of a second.

02 Latch SHIFT and set **TIMING** to how much of each hit you want to keep before the fade begins.

03 Tap SHIFT again to unlatch it, and set **RELEASE** for how quickly the fade runs.

Hits shorter than TIMING are not changed at all.

6.6 FX and MOVE on a kit

The band on FX and MOVE works on DRUM as it does on SYNTH (4.7 and 4.8), and it acts on the whole kit, all 24 pads together.

- **FX**: the kit has four effect slots. Each slider on the band is named after the effect in its slot and sets how much of it you hear; under SHIFT you get each slot's main control. The slot that FX 's next press opens has its name lit, and the left window's header names it, for example SLOT 2 · DELAY. To change what a slot holds, tap its name, the word above its slider: the effect list opens for that slot (4.7.1). Touching the slider and then, with SHIFT off, pressing FX again does the same. The list holds the same sixteen effects as on SYNTH, among them Echo, Space and Dist (4.7.4) and the five newest, Filter, Pump, Swirl, Lo-Fi and Tremolo (4.7.5). Press FX once more for the slot's CONTROLS, all eight of its controls on the band, exactly as on SYNTH (4.7.3). CONTROLS draws its own two windows, the four slots and the eight values, in place of the pad and the pad map. The effects come after the KEY page, so turning up the kit's GAIN (6.5) drives them harder.
- **MOVE**: one modulator for the kit. Press MOVE again, with SHIFT off, to choose it (4.8.1). Its **DEST** still reads the SYNTH words: **CORE** means the KIT page and **SHAPE** means the KEY page. Aimed at the KIT page, a modulator moves that control on every pad by the same amount at the same time; it does not pick one pad.

The windows are the one difference. On SYNTH, FX and MOVE draw the effects and the modulator as plots. On DRUM the left window keeps showing the selected pad and the right window the pad map, so you won't see the effect plots, or the lines NO EFFECT · PRESS FX AGAIN TO CHOOSE and NO MODULATOR · PRESS MOVE AGAIN TO CHOOSE. Read the band instead: each slider names its effect, and a slot set to None has its sliders drawn off.

6.7 The pad map: lights and mutes

The pad map does two jobs. It lights each pad as it sounds, and a tap on a pad silences it in the lane's pattern and groove.

6.7.1 Pads lit by playback

Every pad flashes solid each time it starts a sound, whoever played it: the pattern, the groove, your fingers or a MIDI keyboard, with the transport running or not. A pad struck again while it still rings flashes again. Each flash lasts about 80 ms, or half a sixteenth note when that is shorter (above about 94 BPM; at 124 BPM a flash lasts about 60 ms), so hats on every sixteenth still show as separate flashes.



Figure 6.8 A groove playing. The solid pads are the ones that sounded in the last moment.

Things worth knowing about the lights:

- They run only while DRUM is the screen in front of you. Open MIX, EDIT, a browser or Settings over DRUM and they stop.
- The light comes a hair before you hear the hit (the time the sound takes to reach the speaker; longer over Bluetooth). The SEQ playhead and the lit keys do the same.
- The keys of the keyboard light too: a ring on each pad the pattern or groove is playing, or in the TN looks the key's LED (3.4).
- Your tape doesn't light them. A take is audio, so only hits the lane plays now flash.

6.7.2 Muting a pad

A pad mute silences one pad in the lane's pattern and groove, so you can drop the snare out of a beat, or play it yourself over the top.

To mute a pad:

01 Start a pattern or a groove on a kit lane and go to DRUM.

02 Tap the pad's number in the pad map. It mutes the moment your finger lands, so it can fall on the beat.

03 The number turns red, and the PADS header reads **1 MUTED** in red. That pad stops playing in the pattern and the groove.

04 Tap it again to unmute it. It plays again from its next hit.

The header counts the muted pads: **2 MUTED**, **3 MUTED**, and so on. With none muted the word goes.



Figure 6.9 Pads 2 and 4 muted: red numbers, and the count in the header.

What a pad mute silences, and what it does not:

- **Silenced:** that pad's hits from the lane's pattern and from its groove. If the pad is ringing from either when you tap it, it stops at once.
- **Still plays:** the pad under your finger, the pad from a MIDI keyboard, the kit browser's preview beat (5.5.1), and anything already recorded on the tape. A hit you are playing by hand on a pad keeps ringing when you mute it.
- **Still drawn:** SEQ keeps showing the muted pad's notes in the grid (8.11). They are still in the pattern.

A pad that has nothing in it and is not muted takes no tap. A tap anywhere in the map, gaps included, lands on the nearest pad, so you don't have to hit the number exactly.

NOTE

> The pads are small, about 28 points wide on an iPhone 13 mini. If you mute the pad beside the one you meant, its number turns red at once; tap it again to undo.

Tonaut has four mutes. They are not the same act:

MUTE	WHERE	SILENCES	STILL SOUNDS
pad mute	DRUM, a tap on the pad map	one pad's hits from the lane's pattern and groove	your fingers, MIDI, the preview, the tape
pattern mute	SEQ's MUTE page (8.9)	the lane's whole pattern	your fingers, MIDI, the groove, the tape
MIX mute	MIX, SHIFT + a MUTE key (10.4)	everything the lane plays, live	the lane's tape track
tape track mute	TAPE, SHIFT + a TRK key (11.2.1), or TAPE MIX (10.10)	one tape track's playback	every lane, live

6.7.3 Pad mutes are saved, and stay until you clear them

- Pad mutes are saved with the project, like every other mute. Quit and reopen, and they are still there. SAVE AS on PROJECTS (13.5) carries them into the new project, and REVERT (13.6) puts them back as they were at the last SAVE.
- They belong to the lane, not to the kit. Load another kit onto the lane and the same pad numbers stay muted.
- Nothing clears a pad mute but a tap on the pad. SEQ's RESET does not.
- If a pad is muted but empty on the kit you're using now (a SLICER pad with no slice, for example), it still shows its red number, and one tap clears it. After that it takes no tap.

Because a saved mute is easy to forget, look for the red count in the header, such as 2 MUTED, when a beat seems to be missing a part. On GROOVE, a part whose pads are all muted shows its name in red (9.4).

6.7.4 Mutes and recording

- **Recording into SEQ** (8.8): a hit you play by hand on a muted pad is heard, so it is recorded. Its copy in the pattern then stays silent until you unmute the pad.
- **A groove** leaves a muted part out at the source, so a muted groove part is never recorded into the pattern.
- **The tape** records what the lane plays. With REC SEQ (11.7), a muted pad is not in the take. A take already on tape keeps every hit it was recorded with.

6.7.5 HELP and SHIFT on the pad map

With HELP latched (2.9), a tap on any pad shows the map's line at the top of the left window, MUTES A PAD FOR THE PATTERN AND GROOVE, and mutes nothing. Empty pads answer too. SHIFT, held or latched, changes nothing on the map: a tap mutes or unmutes as usual, and a latched SHIFT stays latched.

The PADS header carries the tap mark (2.3) while any pad can take a tap, and a pad shows a white outline while your finger is on it.

6.8 Getting your own sound into a kit

You can play your own drums in Tonaut: a folder of one-shot samples, a loop or a break, a sound you make into the microphone, or something already on the tape. Each one becomes a SLICER kit on the focused lane (6.4.2), with every pad playing a piece of your audio, and you can keep it in USER for every project.

WHAT YOU HAVE	WHAT TO DO	SECTION
A folder of drum samples: kick, snare, hats and so on	KITS, set **FROM** to **FILES**, press IMP, pick them all	6.8.1
One loop or break	The same, and pick the one file: it is sliced across the 24 pads	6.8.1
One sample for one pad of a kit you already have	The sample editor, SHIFT + LOAD	6.8.2
A sound you can make now, into the microphone or a USB input	The recorder, on a kit lane	6.8.5
Something already on the tape	KITS, **FROM** on **TAPE**, IMP	6.8.4

To make a kit from your own drum samples:

01 In the Files app, put the samples in one folder (on the phone, in iCloud Drive or on a USB drive). Name them for what they are, for example **Kick**, **Snare**, **Hat**, **Open Hat** and **Clap**: Tonaut puts each on the pad its own kits use for that drum. The folder's name becomes the kit's name.

02 In Tonaut, tap the button of the lane you want the kit on. Any lane will do; a synth lane becomes a kit lane.

03 Hold SHIFT and press KITS (the DRUM key). KITS opens. If its header reads USER KITS, press KIT once to go back to the factory list: FROM and IMP are only there.

04 Drag **FROM**, the middle lane of the band, to **FILES**.

05 Press IMP, the fourth page key. The Files picker opens, showing the audio files Tonaut can open.

06 Go to your folder, tap Select, tap each file you want (up to 24), then tap Open. To slice one loop across the pads instead, tap that one file.

07 The notice line counts the files as they load, LOADING 03 / 12 · STOP CANCELS, and then says, for example, KIT MADE · 12 FILES ON 12 PADS over ALSO IN USER KITS.

08 Play the keys. Each filled pad plays one of your files, and the pads left over are empty. Press DRUM to tune, filter and shape each pad (6.4).

The kit is in the project now, and a copy is already in USER KITS under the folder's name, so you can load it in any project (6.8.6).



Figure 6.10 FROM, the middle lane of KITS' band, decides what IMP does. Drag it to FILES for your own files; on TAPE, IMP lifts a tape track instead.

6.8.1

From audio files: IMP on KITS

On the factory KITS list the band has three lanes, **CURSOR**, **FROM** and **EXPORT**. **FROM** has two positions: **TAPE**, where it starts, and **FILES**. It keeps your choice until you quit the app. With FROM on FILES, IMP opens the Files picker, and its help line reads MAKE A KIT FROM AUDIO FILES. USER KITS has no IMP and no FROM: files come in on the factory list. The music keeps playing while you pick and while the files load.

What opens: WAV, AIFF, CAF, M4A (AAC or Apple Lossless), MP3 and FLAC, from 8 to 384 kHz, mono, stereo or up to eight channels (the first two are kept). Tonaut looks at what is in a file, not at its name. Every file is converted to Tonaut's own format, and the silence at both ends of each is trimmed off, with a short fade at the end so a cut never clicks.

One file is sliced across the 24 pads, in 24 equal slices, as a tape track is: a loop or a break, ready to cut (6.8.3). The kit is named after the file. If the lane already plays a SLICER kit whose 24 slices haven't been moved (one of the slice treatments in 5.9, for example Gate Slices), that kit keeps its name and plays your file instead, with its own play modes and pitches. The file also becomes the lane's recording, so the SAMPLER and SLICER treatments play it too. Done, the screen says KIT MADE · SLICED ACROSS 24 PADS over ALSO IN USER KITS.

Several files make a kit, one file per pad. Tonaut reads each file's name and puts the drums it recognizes where its own kits keep them:

A WORD IN THE FILE'S NAME	GOES ON PAD
`kick`, `kik`, `bd`, `bassdrum`	1, then 13
`snare`, `snr`, `sd`	2, then 14
`hat`, `hh`, `hihat`, `chh`, `ch`, `chat` (a closed hat)	3
`open` with `hat`, `hh` or `hihat`; or `oh`, `ohh`, `ohat`	4
`tom`, `lt`, `mt`, `ht`, `floor`	5, 6, 7
`clap`, `clp`, `cp`	8
`rim`, `rimshot`, `rs`, `stick`, `sidestick`	9
`ride`, `rd`	11
`crash`, `cr`, `cymbal`, `cym`	12

- **How a name is read**: capitals don't matter, and a word with an `s` on the end counts (`Kicks`). A name is split into words at spaces, punctuation, a change from small letters to capitals, and digits, so `OpenHat2.wav` is an open hat and `HH_Closed-03.wav` a closed one. Part of a longer word doesn't count: `Hatchet` is not a hat.
- **The order**: files are taken in the order the Files app sorts them, so `Kick 2` comes before `Kick 10`. Each recognized drum gets its first pad; a second kick or snare, and the second and third toms, take the later pads. Everything else, and a drum whose pads are all taken, fills pad 10 and pads 15 to 24 first, in name order, then any pad still free, lowest first. So a stray file can never take the kick's pad.
- **When no name is recognized**, the files go on pads 1 to 24 in name order: a folder of `Glass 01` to `Glass 24` lands in order.
- **At most 24 files**: the first 24 in name order. The rest are left out and the second line says so: `6 LEFT OUT · 24 PADS AT MOST`.
- **The kit's name** is the folder the files came from, for example `808 Selects`. Files from more than one folder, or a folder with no usable name, make `Imported Kit`.
- **Levels**: each file keeps its own level. A file that peaks at full scale plays as loud as the loudest hit of a factory kit, and a quieter file plays quieter. NORMALIZE is off on a kit made this way, so adding one more file later never changes the level of the others; GAIN on each pad (6.4.2) balances them.
- **Each pad plays its file as it is**: no pitch change, the filter open, ONE-SHOT. The lane's recording, if it had one, stays as it was (5.9).

A kit holds 20 seconds of audio in all, not 20 seconds per pad. The files go in pad order. One that doesn't fit whole is cut to what is left, if there is at least a twentieth of a second, and the line says `ONE CUT TO FIT · A KIT HOLDS 20 S`; otherwise it is left out unread:

3 LEFT OUT · A KIT HOLDS 20 S. A single file you slice keeps its first 20 seconds: KEPT ITS FIRST 20 S · ALSO IN USER.

Pads with no file are empty: DRUM draws them empty, their keys are drawn flat, and pressing an empty pad's key selects that pad, plays nothing, and says PAD 14 IS EMPTY. A kit made from seven files has seventeen of them, which is normal. To fill one later, select it and use LOAD (6.8.2).

While the files load, the notice line counts them: LOADING 03 / 12 · STOP CANCELS. STOP on KITS cancels the load: LOADING STOPPED over NOTHING CHANGED. On any other screen STOP is the transport and the load carries on. During a take the load waits (WAITING FOR THE TAKE TO END) and goes on when the take stops. If you close the picker without choosing, the screen says NOTHING LOADED.

When IMP can't act, it is drawn flat and a press says why: NOT WHILE RECORDING, ALREADY LOADING · ONE MOMENT, AN EXPORT IS ALREADY RUNNING, A FILE IS STILL BEING PACKED or STILL COPYING · ONE MOMENT. A load never lands on a project or a lane that changed while it ran (5.7.3).

When a file is refused, nothing about the lane changes. One file says CAN'T LOAD and its name, over the reason. Several that all fail say CAN'T LOAD THESE FILES over the reason they share, or NONE COULD BE READ. When some load and some don't, the kit is made and the second line counts the others: 2 COULD NOT BE READ.

THE REASON SAYS	BECAUSE
NOT A FORMAT TONAUT OPENS	it isn't WAV, AIFF, CAF, M4A, MP3 or FLAC inside
IT IS OVER 256 MB	the file is bigger than 256 MB
IT HAS MORE THAN 8 CHANNELS	more than eight channels
ITS SAMPLE RATE IS NOT SUPPORTED	a sample rate outside 8 to 384 kHz
IT IS DAMAGED OR PROTECTED	the iPhone can't decode it: damaged, or copy-protected
THERE IS NO SOUND IN IT	it is silent, or silent for its first 10 seconds
COULD NOT DOWNLOAD IT	a file still in iCloud Drive that didn't come down
NOT ENOUGH SPACE ON THIS IPHONE	the phone is too full to take it
THE KIT IS FULL · A KIT HOLDS 20 S	the kit's 20 seconds were used up before this file

6.8.2 One file onto one pad: LOAD in the sample editor

LOAD puts an audio file on the pad you are editing and leaves every other pad as it was. It works on any SLICER kit with a recording: the factory SLICER kits, and every kit you made yourself. So you can drop your own snare into Punch Kit, or fill the empty pads of a kit made from a few files.

To put your own snare on pad 2 of Punch Kit:

01 Focus the lane that holds Punch Kit and play pad 2. It is now the selected pad. (An empty pad's key selects it too, and says PAD 14 IS EMPTY.)

02 Open the sample editor: latch HELP with SHIFT + HELP, then press the help panel's SAMPLE cell (12.8.1). Its header reads SAMPLE and SLICE 02.

03 Hold SHIFT. The first page key reads LOAD and the other three go blank. Press LOAD. The Files picker opens.

04 Tap your snare's file. The screen names the pad and the file over how much of the kit's 20 seconds is used, for a file called Snare: PAD 02 · SNARE / KIT NOW 12.4 S OF 20 S.

05 Play pad 2. It is your snare; the other 23 pads sound exactly as before.

- **Several files** go in name order onto the selected pad and the pads after it, up to pad 24: PADS 08-12 · 5 FILES. Files past pad 24 are left out: 3 LEFT OUT · PAD 24 IS THE LAST. Names aren't read for drums here: you chose the pad.
- **The loaded pad starts fresh**: its own settings go back to SLICER's starting values, so the file plays as it is. Every other pad keeps its audio, its level and all its settings.
- **Room**: the kit still holds 20 seconds in all, but audio that no pad plays any more is dropped, so replacing a hit gives its room back. A file that doesn't fit is cut or left out, as in 6.8.1, and a pad whose file is left out keeps the sound it had.
- **Levels**: the new file keeps its own level, and LOAD turns the kit's NORMALIZE off, first building the level NORMALIZE gave into the pads it keeps, so nothing you already hear gets louder or quieter.
- **The kit keeps its name, and nothing goes into USER.** Save it yourself to keep it (6.8.6).
- The formats, the refusals and STOP are as in 6.8.1; STOP cancels on the sample editor. LOAD's help line reads PUT AN AUDIO FILE ON THIS PAD. On a KNOCK or CINDER kit LOAD is drawn flat and says NOT A SAMPLE KIT · USE IMP IN KITS; on a SLICER kit whose recording can't be found, THE KIT'S RECORDING IS MISSING.

NOTE

> After LOAD the kit still carries its factory name, so KITS still marks the factory row with the lane's chip. Moving the cursor off that row and back loads the factory kit again, and your pad is gone. Save the kit in USER under a new name first.



Figure 6.11 Hold SHIFT in the sample editor and the first page key is LOAD: a file onto the pad you are editing.

6.8.3 Cutting the slices

A kit cut from one recording (a loop from the Files app, a tape track or a capture) starts with 24 equal slices, which you then cut to fit. Cut them on DRUM's KIT page with IN and OUT (6.4.2), or in the sample editor, which shows the selected slice with a zoom. To open the sample editor, latch HELP and press SAMPLE. The SAMPLE cell is live only when the focused lane is a SLICER kit holding a recording (12.8). The sample editor and DRUM change the same values; whichever you use, the other shows the result.

Your recording stays with the lane when you browse to other kits. The SLICER kits that slice a built-in recording (5.9) play yours instead while the lane holds one. To get a kit's audio back out as files, one per slice if you like, use the KITS browser's EXPORT lane (14.8.2).

6.8.4 From a tape track: IMP with FROM on TAPE

With FROM on TAPE, IMP turns a tape track into a kit (5.7.1). To turn a track into a kit:

01 On TAPE, press the TRK key of the track that holds the audio (11.2).

02 Focus the lane you want the kit on.

03 Hold SHIFT and press KITS to open the KITS browser.

04 Check that **FROM** reads **TAPE**, and press IMP. The notice says TRACK 2 IS NOW THE KIT (with your track's number).

05 Press DRUM. The left window draws the track's audio, cut into 24 equal slices.

If the track holds nothing, IMP says NOTHING ON TRACK 2 and changes nothing.

NOTE

> IMP takes the track from the very start of the tape to the end of its last take, and it can take 20 seconds at most. Silence before your take comes along with it, so a take that starts at 0:08 leaves the first pads silent. A track whose audio ends later than 0:20 is refused with NOTHING ON TRACK 2, even though it is not empty. To get a later passage in, move it near the start of the tape with LIFT and DROP first (11.11), or use the recorder (6.8.5).

IMP replaces whatever the lane held. On a synth lane, the lane becomes a kit lane. The new kit has no name, so the lane and the DRUM header call it SLICER.

6.8.5 From the microphone, a USB input or Tonaut itself: the recorder

The recorder can capture straight onto a lane (12.4). On a kit lane the capture lands as a new SLICER kit; on a synth lane it lands as a SAMPLER sound.

01 Focus the kit lane.

02 Latch HELP (SHIFT + HELP) and press RECORD. The recorder opens, and its armed line reads REC LANE 3 (with your lane's number).

03 Choose the **SOURCE** on the band: **MIC**, **USB** or **APP** (Tonaut's own output). For MIC or USB, set **LEVEL** by the meter.

04 Under SHIFT, check that **DEST** reads **LANE**.

05 Press REC. The notice says HOLD A KEY TO CAPTURE.

06 Hold any key and make the sound. The key records instead of playing, for up to 20 seconds.

07 Let go. The notice says CAPTURED 2.4 S, with the length you recorded.

08 Press DRUM. Leaving the recorder disarms the lane, and DRUM draws your recording cut into 24 slices.

NOTE

> The lane stays armed after a capture until you leave the recorder or press REC again. While it is armed, the next key you hold records a new capture that replaces the last one.

The recording is saved inside the project, so it is there next time you open it. The full recorder, TRIG included, is in chapter 12 (12.4).

6.8.6 Keeping your kit: USER

A kit you make lives in the project it was made in. To use it in other projects, keep it in USER. A kit made from files with IMP is already there (ALSO IN USER KITS). A kit lifted from the tape, a capture, and any kit you changed with LOAD or on DRUM's pages are not: save them.

To save the lane's kit in USER:

01 Open KITS (SHIFT + KITS) and press KIT again. The header reads **USER KITS**.

02 Press SAVE, type a name, and press SAVE. The screen says SAVED TO USER KITS over the name.

From then on, any project can load it from USER KITS, recording and all (5.11). USER stays on this phone or iPad; to move kits to another device, tick them and send them with SHIFT + SHARE (5.11.2). You can also keep a kit in one of the eight quick slots for kits (3.6), and star

it so it sits at the top of KITS (5.12).

6.9 SEQ, GROOVE and MIX with kits

A kit lane works with the rest of Tonaut the way a synth lane does, with a few differences covered in their own chapters:

- **SEQ**: on a kit lane the cells show pad numbers instead of note names, and the keys read 1 to 24 (8.11).
- **GROOVE**: on a kit lane the ARP key opens GROOVE, the drum groove player. With GROOVE on, hold any pad and the whole kit plays a beat (9.4, 9.5). Its KICK, SNARE and HAT controls, under SHIFT, choose which pads play those parts, which matters on a kit cut from a loop.
- **MIX**: the kit lane has one strip on MIX, which sets its live sound and what it sends to the tape (10.2). Its tape track has a strip of its own on TAPE MIX (10.10). The kit's LEVEL on the KEY page is set before the MIX fader.
- **Quick slots**: on a kit lane, SHIFT + a slot key (1 to 8 on the upper row) loads the kit saved there; hold the key to save the lane's kit into it. Kits have their own eight slots, separate from the synth sounds' eight (3.6).
- **A drum machine**: KITS' EXTERNAL row puts a kit lane on a MIDI channel (5.13). Its pads then send a General MIDI drum map, DRUM's page keys read MIDI, KEY, FX and MOVE (the last three drawn off), the left window shows what the last pad sent, and the pad map still lights and mutes (chapter 16).

07 EDIT

EDIT puts every control of the focused lane's sound on one screen, sorted into named groups the way a hardware synth's front panel is. It is the only place to reach thirty-two of DIVINER's forty controls, the SAMPLER's loop and NORMALIZE, a SLICER kit's NORMALIZE, most of a CINDER pad and the ring its kit shares, and LEAN's DEST, SLOT and AMOUNT. A SLICER pad's PLAY MODE, DIRECTION, PAN and FADE are here and in the sample editor.

7.1 Opening and closing EDIT

On iPhone, EDIT has no mode key of its own. It lives on the SEQ key's SHIFT layer, where the key reads EDIT. It always edits the sound on the focused lane.

To open EDIT:

01 Tap the lane button of the sound you want to edit. Its button fills.

02 Hold SHIFT and press EDIT (the fourth mode key, SEQ).

03 Let go of SHIFT. EDIT fills both windows, the four page keys become the sound's section keys (7.3), and no mode key is red.

It works from every screen. Whatever was drawn over the mode closes first: a browser, MIX, Settings, the tempo page, the recorder, the sample editor, an effect or modulator list, or an effect's CONTROLS. Opening EDIT also turns HELP off.

A lane set to EXTERNAL MIDI has no sound to take apart: there EDIT is drawn off, and pressing it says A MIDI LANE HAS NO SOUND OF ITS OWN (chapter 16).

On iPad, EDIT has a key of its own beside the mode keys, and its screen shows all of a section's groups at once (chapter 17). This chapter describes the iPhone.

NOTE

> EDIT keeps a latched SHIFT. If you tap SHIFT to latch it and then press EDIT, EDIT opens with SHIFT still on: the band shows the group's second four controls and the page keys are blank. Tap SHIFT once to see the first four and the section keys. Holding SHIFT while you press EDIT avoids this.

7.1.1 Leaving EDIT

Nothing you change in EDIT is undone when you leave. EDIT and the sound's own pages show the same values: a CUTOFF moved in EDIT is CUTOFF on SYNTH's CORE page, and the page you return to shows the new value.

PRESS	WHAT HAPPENS
SHIFT + EDIT	EDIT closes. You are back on the mode underneath it, on the page you left. A browser or MIX you opened EDIT from does not come back.
The mode key underneath (for example SYNTH)	The same: EDIT closes and that screen comes back on the page you left.
Another mode key	EDIT closes and that mode opens, by the usual rules (2.6). DRUM with no kit lane in the project still closes EDIT, then says NO KIT LANE IN THIS PROJECT and leaves you on the mode underneath.
SHIFT + MIX	MIX replaces EDIT. Closing MIX later takes you to the mode, not back to EDIT.
SHIFT + PATCH, KITS or PROJ	That browser opens. Tap SHIFT (it reads BACK) and EDIT comes back, showing whatever sound the lane now holds (2.7.3).

While EDIT is open, the EDIT key is drawn filled whenever SHIFT is on. That is how the panel tells you EDIT is up, since it lights no mode key.

7.1.2 Which group EDIT opens on

The first time you open EDIT after starting Tonaut, it opens on the sound's first group. After that it opens on the group you left it on. If the lane now holds a sound with a different layout, EDIT looks for a group with the same name: leave it on **AMP ENV** of a DIVINER sound, focus a SLOPE lane, and it opens on SLOPE's **AMP ENV**. When the new sound has no group of that name, it opens on the group in the same place in the list, or on the last group if the list is shorter.

7.2 The screen

EDIT uses both windows. The left one is the list of groups; the right one is the chosen group's controls and their values. The band below holds that group's controls.



Figure 7.1 EDIT on Night Drive's bass. The list on the left picks the group; the right window shows all of its controls at once.

7.2.1 The group list

The left window's header reads **EDIT**, then the engine's name and the sound's name (**SLOPE · RUBBER BASS**, or only **DIVINER** for an ENGINE DEFAULT sound with no name). The counter at the right says which group is showing and how many there are: **03 / 10** is the third of ten. The list wears the touch mark for a list: tap a row, or drag (2.3).

Each row of the list is one group. The small word at the left of a row is the section key that reaches it (7.3); the larger word is the group's name. The chosen group's row is filled. Three to five rows fit in the window at a time, depending on the size of your iPhone; drag the list to see the rest.

To choose a group from the list, tap its row, or drag the list up or down; the filled row follows your finger one row at a time, and a quick flick goes further. Choosing a group only changes what the band and the right window show. It never changes a value.

7.2.2 The controls window

The right window's header names the group on the left, and on the right shows the name and value of the control you last touched. Below it, the group's controls sit in two columns of four. The left column is what the band shows; the right column is what the band shows under SHIFT. The window is a picture: you change the values with the band, not by touching here.

The control you last touched has a white bar at its left edge. When EDIT opens, or when you change group, the first control has it. Under SHIFT the bar moves to the right column. A group with fewer than eight controls leaves the rest of its rows empty.

7.2.3 Two readings of one value

The band and the right window show the same value in two ways.

- **The band** shows the position of the slider: **00** to **99**, or **−50** to **+50** for a control that has a center. A control with steps shows the step's word or number on both.
- **The right window** shows what the sound engine does with that position, in real units: **HZ** and **KHZ** for frequencies, **MS** and **S** for times, **%**, **ST** for semitones, **CT** for cents (hundredths of a semitone), **DB** for level, or a word such as **ON**, **OFF** or **TRI**.

On a new DIVINER sound, for example, **PW** reads **50** on the band and **50%** in the window, and **CUTOFF** reads **55** on the band and **893 HZ** in the window. Read the window when you need the exact figure.

7.3 Section keys

On EDIT the four page keys are **sections**. A section is a set of related groups, and each key is named for its section: OSC FILTR AMP MOD on DIVINER and SLOPE, SOUND FILTR AMP MOD on SAMPLER, SOUND AMP MOD on the other synth engines, PAD KIT MOD on KNOCK and SLICER kits, and LAYER PAD KIT MOD on CINDER kits. The key of the section showing is lit.

What a section key does depends on where you are:

- **From a group in another section**, it goes to its section's first group.
- **From a group in its own section**, it goes to the next group in that section, and from the last one back to the first.
- **In a section with one group**, pressing it again stays where you are.

On DIVINER, EDIT first opens on OSC A, so pressing OSC repeatedly goes to OSC B, MIXER, OSC A, OSC B, and so on. Pressing FILTR from any of those goes to FILTER; pressing it again goes to FILTER ENV.

A sound with only three sections leaves the second key with no section. It is drawn as a blank well and does nothing. That is the case on CROSS, GUT, SCAN, PULSE, SWARM and DUST, and on KNOCK and SLICER kits. A CINDER kit uses all four keys (7.5.8).

A section with two or more groups puts one dot per group under its key. On the lit key the filled dot is the group showing; on another key it is the group a press lands on. On DIVINER, OSC has three dots, FILTR and AMP two, and MOD three. A section of one group has none (2.5.1).

Under SHIFT the four section keys go blank and have no job, except on a CINDER kit, where the first two read COPY and PASTE (7.5.8). Use the group list, or let go of SHIFT, to change group. With HELP latched, a section key prints its line instead of moving: GO TO A GROUP · AGAIN FOR THE NEXT ONE on a section of two or more groups, and GO TO THIS SECTION'S ONLY GROUP on a section of one.

7.4 The band and SHIFT on EDIT

The band holds the chosen group's first four controls. Under SHIFT it holds controls five to eight, each with an **SH** badge (2.4.3). No group holds more than eight, so every control of a group is on one layer or the other.

SHIFT on EDIT is an ordinary SHIFT, not the **BACK** it is in a browser:

- **Tap** SHIFT to latch it. The band stays on controls five to eight until you tap it again.
- **Hold** SHIFT, move one of controls five to eight, and let go. The band drops back to the first four as soon as you lift your SHIFT finger.

With SHIFT latched, a lane button still changes lanes. While you **hold** SHIFT it doesn't: it picks that lane for a swap, or says **STOP FIRST** while the transport runs (2.12).



Figure 7.2 OSC B has eight controls. Under SHIFT the band takes the right-hand column of the window.

Groups with fewer than eight controls. A band lane past the end of a group reads – with –– for its value, has no value bar and does not move. DIVINER's MIXER has three controls, so its fourth lane is empty and all four are empty under SHIFT. OSC A has five, so under SHIFT you see **SYNC** and three empty lanes.

Everything else about the band works as it does on the sound pages (2.4):

- Drag left or right; the value moves from where it was, with no jump. A slow drag moves it finely, a quick sweep covers the whole range (2.4.1).
- Fine adjust: touch, hold still for about a third of a second until **×8** appears, then drag. The value moves slowly however fast you go, and shows a decimal.
- A switch or a choice (**OFF**/**ON**, **TRI**/**SAW**…) is changed by dragging through its steps. A tap does nothing.
- A double-tap puts a control back where a fresh sound of this engine starts, a switch or a choice included; SHIFT + double-tap puts back its last change (2.4.4).
- A drag belongs to the control it started on. If you change group or press SHIFT with another finger mid-drag, the drag keeps changing the control it began on, not the one now showing.

Every change is written to the sound the moment you make it and saved with the project within about a second (13.2). Saving the sound in USER (5.11.1) or to a quick slot (3.6) keeps what you set in EDIT too. In USER, SAVE with the name of the lane's own USER sound saves over it, and a new name keeps a new sound beside it; a factory sound is never written over, so an edited factory sound always goes into USER as a sound of its own.

7.4.1 DIE on a group

On EDIT, DIE rolls new values for the group showing, both layers, and nothing else. Every press rolls a new set. Controls outside the group are left alone, even ones on the same sound page: rolling FILTER on DIVINER changes CUTOFF, RESONANCE and ENV AMOUNT but not the other five CORE controls.

To roll a group, and to take it back:

01 Choose the group.

02 Press SHIFT + DIE (on the keyboard's upper row, between UNDO and HELP). Every control in the group jumps to a new value at once; a switch or choice lands on one of its steps. Press it again for another roll.

03 Press SHIFT + UNDO to put the group back exactly as it was before the last roll. Each press goes back one roll, up to eight.

Moving any control by hand, changing group, focusing another lane, loading a sound or closing EDIT drops the rolls UNDO could take back, and UNDO is drawn off; pressed then, it says NOTHING TO UNDO (3.7).

NOTE

> DIE uses each control's whole range. On MIXER, AMP ENV or VOICE a roll can leave the sound silent (both oscillator levels near zero, or LEVEL at the bottom) or much louder (LEVEL near the top, up to **+6.0 DB**). Press SHIFT + UNDO before you touch anything else.

On a kit, the PAD and PLAY groups, and CINDER's LAYER 1, LAYER 2, PAD and DIRT, belong to the pad you last played (7.5.5), so DIE rolls that pad only.

NOTE

> On a kit, press SHIFT + UNDO before you play another pad. You can play the rolled pad to hear it, but playing a different pad drops its rolls: UNDO is drawn off and the rolled pad keeps its new values. A roll of a whole-kit group (KIT, KIT VOICE, SAMPLE, LEAN, CINDER's RESONATOR) keeps its UNDO while you play any pad.

UNDO on EDIT takes back only rolls of the group showing. A roll made on a sound page of SYNTH or DRUM can't be taken back from EDIT: there UNDO says NOTHING TO UNDO. Press SHIFT + UNDO before you open EDIT.

7.4.2 What else works while EDIT is open

- **The keyboard** plays the focused lane, so you hear every change: notes on a synth lane, pads 1 to 24 on a kit lane. The − and + keys in its end gaps move a synth lane's octave (3.2); X/Y in the middle gap is drawn off here and says X/Y PAD: SYNTH, DRUM, TAPE OR ARP. Under SHIFT the upper row is the quick slots 1 to 8, UNDO, DIE and HELP, and the end keys of the lower row are blank (2.8.1).
- **The lane buttons** work. Tap another lane and EDIT follows it, switching layout if the new lane holds a different kind of sound. A kit lane gives you the kit layout and the keys turn into numbered pads. In an eight-lane project the iPhone shows four lane buttons at a time; the arrow key at either end shows the other four (2.2).
- **Quick slots.** Loading a slot puts its sound on the lane and EDIT shows that sound. Saving a slot stores the sound as EDIT has left it.
- **The transport.** PLAY starts the patterns, so you can shape a sound while its pattern plays. STOP stops everything. REC is a well on EDIT, even when EDIT is drawn over SEQ or TAPE (2.10).
- **HELP.** SHIFT + HELP latches it (2.9). The help panel, titled EDIT, takes the group list's place. A quick tap on a band lane shows that control's line, and a drag still moves the value; a section key shows its line instead of changing group. Press SHIFT + HELP again to get the group list back.
- **The tempo key** works as it does everywhere else (3.9).

7.5 Layouts per engine

Each kind of sound has its own set of groups. The table lists them in the order the group list shows them, a middle dot between sections; the subsections after it give each group's controls.

SOUND	SECTION KEYS	GROUPS	GROUPS IN ALL
DIVINER	OSC FILTR AMP MOD	OSC A, OSC B, MIXER · FILTER, FILTER ENV · AMP ENV, VOICE · POLY-MOD, WHEEL-MOD, LEAN	10

SLOPE	OSC FILTR AMP MOD	OSC · FILTER · AMP ENV, VOICE · LEAN	5
SAMPLER	SOUND FILTR AMP MOD	SOUND, LOOP · FILTER · AMP ENV, VOICE · LEAN	6
CROSS, GUT, SCAN, PULSE, SWARM, DUST	SOUND (blank) AMP MOD	SOUND · AMP ENV, VOICE · LEAN	4
KNOCK kit	PAD (blank) KIT MOD	PAD · KIT, KIT VOICE · LEAN	4
SLICER kit	PAD (blank) KIT MOD	PAD, PLAY, SAMPLE · KIT, KIT VOICE · LEAN	6
CINDER kit	LAYER PAD KIT MOD	LAYER 1, LAYER 2 · PAD, DIRT · RESONATOR, KIT, KIT VOICE · LEAN	8

Five groups are the same wherever they appear:

GROUP	ON THE BAND	UNDER SHIFT	WHERE ELSE YOU FIND THEM
AMP ENV	ATTACK, DECAY, SUSTAIN, RELEASE	(empty)	SHAPE's band, every synth engine (4.6)
VOICE	PLAY MODE, GLIDE, BEND, LEVEL	(empty)	SHAPE under SHIFT, every synth engine but DIVINER (DIVINER's VOICE is in 7.6.6)
LEAN	LEAN ON, LEAN DEST, LEAN SLOT, LEAN AMOUNT	(empty)	Only here. LEAN ON is also the help panel's LEAN cell (3.5.1); what the four do is in 3.5.3
KIT	PUNCH, GAIN, RELEASE, TIMING	(empty)	DRUM's KEY page, every kit, in a different order (6.5)
KIT VOICE	TUNE, CHOKE, BEND, LEVEL	(empty)	

NOTE

> DRUM puts LEVEL (or a SLICER pad's GAIN) fourth on its band and shifts the rest along. EDIT keeps the sound's own order, so the KIT, KIT VOICE and PAD groups list the same controls in a different order from DRUM. They are the same controls: move one on either screen and the other shows the change.

7.5.1 DIVINER

DIVINER has the most groups: ten. Eight of them hold its forty controls, with VOICE mixing three of them in with SHAPE's PLAY MODE, GLIDE, BEND and LEVEL; the other two are the shared AMP ENV and LEAN. Eight of the forty are also on SYNTH's CORE page; the other thirty-two are only in EDIT. 7.6 goes through every one.

SECTION	GROUP	ON THE BAND	UNDER SHIFT
OSC	OSC A	A FREQ, A SAW, A PULSE, PW	SYNC
OSC	OSC B	B FREQ, B FINE, B SAW, B TRI	B PULSE, B PW, LO FREQ, B KEYS
OSC	MIXER	A LEVEL, B LEVEL, NOISE	(empty)
FILTR	FILTER	CUTOFF, RESONANCE, ENV AMOUNT, KEY TRACK	(empty)
FILTR	FILTER ENV	F ATTACK, F DECAY, F SUSTAIN, F RELEASE	(empty)
AMP	AMP ENV	ATTACK, DECAY, SUSTAIN, RELEASE	(empty)
AMP	VOICE	PLAY MODE, GLIDE, UNI DETUNE, VELOCITY	DRIFT, BEND, LEVEL
MOD	POLY-MOD	PM F-ENV, PM OSC B, PM FREQ A, PM PW A	PM FILTER
MOD	WHEEL-MOD	LFO RATE, LFO SHAPE, LFO/NOISE, WHEEL	WM FREQ A, WM FREQ B, WM PW, WM FILTER
MOD	LEAN	LEAN ON, LEAN DEST, LEAN SLOT, LEAN AMOUNT	(empty)

7.5.2 SLOPE

EDIT splits SLOPE's eight CORE controls into the oscillator and the filter after it. They are the same controls as on CORE (4.4.1), in a different order.

SECTION	GROUP	ON THE BAND	UNDER SHIFT
OSC	OSC	WAVE, SUB, WIDTH, NOISE	DRIFT
FILTR	FILTER	TONE, EDGE, TRACK	(empty)
AMP	AMP ENV, VOICE	as in the shared table above	
MOD	LEAN	as in the shared table above	

OSC holds what makes the raw tone: **WAVE** (the shape of the cycle, from a ramp to a square), **SUB** (an octave below, underneath), **WIDTH** (a second voice, spread wide), **NOISE** (hiss mixed in) and, under SHIFT, **DRIFT** (a slow wander in pitch). FILTER holds what shapes it: **TONE** (where the high end is cut away), **EDGE** (the resonance at the cut) and **TRACK** (how much the cut follows the keys).



Figure 7.3 SLOPE's FILTER group has three controls, so the fourth band lane is empty.

7.5.3

SAMPLER

SOUND is the SAMPLER's CORE page as it is on SYNTH: **START**, **LOOP**, **END**, **PITCH** on the band and **FADE IN**, **FADE OUT**, **REVERSE**, **GAIN** under SHIFT (4.4.3). The LOOP group after it, in the same section, holds four controls that no other screen has. The FILTER group, under FILTR, holds the SAMPLER's filter (below).

CONTROL	VALUES (STARTS AT)	WHAT IT DOES
LOOP LENGTH	**0%** to **100%** (**100%**)	How long the loop is, as a share of the stretch between START and END. At **100%** the loop is the whole stretch. The shortest loop is 2 ms.
LOOP ON	OFF, ON (OFF)	Whether the sound loops while you hold the key. With it off, the sound plays from START to END once.
LOOP XFADE	**0.0 MS** to **500 MS** (**16 MS**)	How smoothly the loop joins up. A longer crossfade hides a click where the end of the loop meets its start.
NORMALIZE	OFF, ON (ON)	Matches the recording's loudness to the other sounds. With it off, the recording plays at the level it was made at, which can be much louder than the synth engines.

The loop's place in the sound is **LOOP** on the SOUND group (and on CORE). At **00** the loop starts at START; at **99** it ends at END. When LOOP LENGTH is **100%** the loop already fills the stretch, so LOOP has nothing to move.

To loop a held note:

01 On a SAMPLER lane, open EDIT. Press SOUND until the LOOP group shows: once from SOUND, twice from any other group.

02 Drag **LOOP ON** to **ON**.

03 Drag **LOOP LENGTH** down to about **20**.

04 Press SOUND to go back to the SOUND group and hold a key while you drag **LOOP**. The loop slides through the sound.

05 If you hear a click each time around, press SOUND for LOOP again and raise **LOOP XFADE**.



Figure 7.4 The SAMPLER's LOOP group on Harp Keys, put on lane 8 for the picture: a factory sound that comes with a short loop already on.

The FILTER group is the SAMPLER's filter, the same four controls as the second page of CORE on SYNTH, which you reach by pressing CORE again on a SAMPLER lane (4.4.3). It is DIVINER's four-pole low-pass filter (7.6.4), on every note. At its starting values the filter is wide open and plays no part, so the sound is exactly as recorded; it comes in as soon as you move one of the four.

CONTROL	VALUES (STARTS AT)	WHAT IT DOES
CUTOFF	20 HZ to 20.00 KHZ (20.00 KHZ)	How open the filter is. Down is darker.
RESONANCE	0% to 100% (0%)	How hard the filter rings at its edge. Near the top it whistles.
ENV AMOUNT	−100% to +100% (+0%)	How far each note's own envelope, the one SHAPE sets (4.6), sweeps the cutoff. Minus values sweep down instead of up. The SAMPLER has no separate filter envelope. On the band it reads −50 to +50.
KEY TRACK	0% to 100% (0%)	How much the cutoff follows the keys, measured from C4. At 100% it moves an octave for every octave you play.

7.5.4 CROSS, GUT, SCAN, PULSE, SWARM and DUST

These six engines have no filter group. Their SOUND group is the engine's eight CORE controls, in the same order as on CORE (4.4): the first four on the band, the other four under SHIFT. AMP ENV, VOICE and LEAN follow. The second page key is a blank well.



Figure 7.5 A CROSS sound: one SOUND group holding the whole CORE page, and four groups in all.

7.5.5 KNOCK kits

On a kit lane, the PAD group is **the pad you last played**, exactly as DRUM's band is (6.3). Play a different pad's key and the band and the right window change to that pad's values; your next move changes that pad only.

SECTION	GROUP	ON THE BAND	UNDER SHIFT
PAD	PAD	PITCH, TONE, DECAY, SNAP	PUNCH, NOISE, PAN, LEVEL
KIT	KIT, KIT VOICE	as in the shared table above, for the whole kit	
MOD	LEAN	as in the shared table above	

The pad controls do what they do on DRUM (6.4.1). A KNOCK kit has no other pad controls: EDIT shows the same eight, in the sound's own order.

NOTE

> EDIT doesn't say which pad you are editing; the header names the kit, not the pad. It is the last key you played on the on-screen keyboard. A pad played by the pattern, the groove or a MIDI keyboard doesn't change it (6.3). When in doubt, play the pad you mean before you move anything, or check DRUM's header (PAD 11 on a KNOCK kit, SLICE 11 on a SLICER kit).

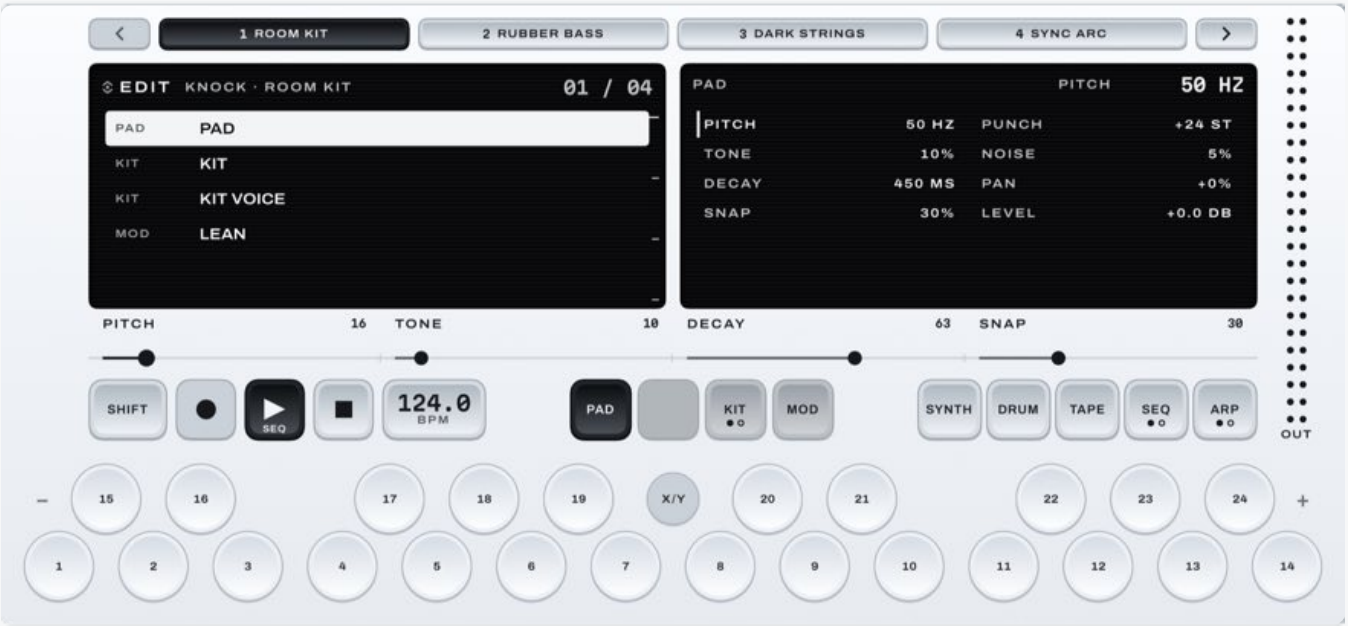


Figure 7.6 A KNOCK kit's PAD group, with Room Kit put on lane 1 for the picture: the eight controls of the pad last played.

7.5.6 SLICER kits

A SLICER kit has two more groups in its PAD section. The PAD group is the last-played pad's eight CORE controls: **IN**, **OUT**, **PITCH**, **CUTOFF** on the band and **RESONANCE**, **ATTACK**, **DECAY**, **GAIN** under SHIFT (6.4.2). Press PAD again for PLAY, and again for SAMPLE.

PLAY holds four controls that belong to each pad and are not on DRUM's band; the sample editor has them too, on its LOOP, FADE and PITCH pages (12.8.4):

CONTROL	VALUES (STARTS AT)	WHAT IT DOES
PLAY MODE	**ONE-SHOT**, **GATE**, **LOOP** (**ONE-SHOT**)	ONE-SHOT plays the whole slice however briefly you touch the key. GATE plays while the key is held and fades out by FADE when you let go. LOOP repeats the slice from IN to OUT while the key is held, then fades out by FADE.
DIRECTION	**FORWARD**, **REVERSE** (**FORWARD**)	Plays the slice forward or backward.
PAN	band **-50** to **+50**; window **-100%** to **+100%** (center, **+0%**)	Where this slice sits between the speakers.
FADE	up to **2.00 S** (about **2.1 MS**)	How gently the slice lets go: the fade at its end, and after you release the key in GATE and LOOP. Even at the bottom a slice fades over 1 ms, so it never clicks off.

SAMPLE holds one control, **NORMALIZE** (**ON** to start), which matches the kit's recording to the loudness of the other sounds. Unlike PAD and PLAY it is one setting for the whole kit. Its other seven lanes are empty.

TIP

> The SAMPLE group is not the sample editor. To trim slices against the waveform, use the help panel's **SAMPLE** cell (6.8.3).



Figure 7.7 A SLICER pad's PLAY group, on Night Drive's drums. These four are not on DRUM's band.

7.5.7 What EDIT does not show: FX and MOVE

EDIT has no effect or modulator groups. Use the sound's own FX and MOVE pages on SYNTH or DRUM for those (4.7, 4.8). All eight controls of each of the four effects are on CONTROLS, FX 's third place on SYNTH and DRUM (4.7.3), so EDIT doesn't list them: one place for each control.

A modulator's DEST and LEAN DEST name a page, not an EDIT group. Of the controls in EDIT, they can reach only those that are also on CORE or SHAPE. On DIVINER that means the eight CORE controls and the SHAPE controls in AMP ENV and VOICE; the thirty-two that are only in EDIT can't be moved by a modulator or by leaning. The same goes for the SAMPLER's LOOP group and a SLICER pad's PLAY group.

7.5.8 CINDER kits

A CINDER pad is two layers, the dirt after them, and a send into a ring the whole kit shares (6.4.5). EDIT shows all 25 of the last-played pad's controls and the ring's five, in eight groups. As on every kit, the pad groups are **the pad you last played**.

SECTION	GROUP	ON THE BAND	UNDER SHIFT
LAYER	LAYER 1	SOURCE, PITCH, ATTACK, RELEASE	ENV, MOD, AMOUNT, RATE
	LAYER 2	SOURCE 2, PITCH 2, ATTACK 2, RELEASE 2	ENV 2, MOD 2, AMOUNT 2, RATE 2
PAD	PAD	LEVEL 1, LEVEL 2, PAN, LEVEL	SEND, CHOKE
	DIRT	BITS, FOLD, DRIVE	
KIT	RESONATOR	MODEL, DECAY, BODY, TUNE	RING
	KIT, KIT VOICE	the KEY page's eight, as in the shared table above, for the whole kit	
MOD	LEAN	as in the shared table above	

LAYER pressed again flips between layer 1 and layer 2, like the LAYER button on a hardware drum synth. PAD goes round PAD and DIRT, and KIT round RESONATOR, KIT and KIT VOICE.

CONTROL	VALUES	WHAT IT DOES
SOURCE	**SINE**, **SAW**, **HI NOISE**, **LO NOISE**, **BAND NOISE**	What the layer is made of. The noises are hiss through a filter that keeps the highs, the lows or a band; on a noise, PITCH moves the filter.
ENV	**LINEAR**, **CURVED**, **MULTI**	The shape of the layer's rise and fall: straight lines, a natural drum fall, or three quick claps before the main hit (ATTACK spaces them).
MOD, **AMOUNT**, **RATE**	**SWEEP**, **WOBBLE**, **RANDOM**; AMOUNT ±48 semitones; RATE follows MOD	How the layer's pitch moves: a jump that falls back (a kick's boom), a swing up and down, or jumps to random values. AMOUNT is how far and which way; at its middle the pitch stays put, and MOD and RATE change nothing.
LEVEL 1, **LEVEL 2**	off to +6 dB	Each layer's level in the pad. A layer at off costs nothing.
BITS, **FOLD**, **DRIVE**	OFF, then 16 to 2 bits; OFF to full; OFF to +24 dB	The dirt, after both layers: coarser steps, peaks folded back into buzz, and overdrive that adds edge rather than volume.

SEND	off to +6 dB	How much of the pad goes into the ring. It's taken beside LEVEL, so LEVEL down and SEND up plays the pad through the ring alone.
CHOKE	`OFF`, `ON`	Pads with CHOKE on cut each other off; if two land together, the lower pad plays. On the Init kit the two hats have it. The KEY page's CHOKE still cuts every pad.
MODEL, **DECAY**, **BODY**, **TUNE**	`TUBE`, `STRING`; 20 ms to 20 s; 0 to 100%; 1 Hz to 4 kHz	The ring the whole kit shares: a hollow tube or a metal string, how long it rings, how dark or bright it is, and its pitch, shown with the nearest note. Below 20 Hz it turns into an echo, and TUNE shows the echo's time.
RING	0 to 100%	How much of the ring you hear, for every pad at once. The ring is the kit's own echo: the tail that sounds like a reverb, or like a delay when TUNE is low, comes from it, not from the lane's effects. At **`0%`** the whole kit is dry, as if every pad's SEND were off, and the ring does no work; **`100%`**, where every kit starts, is the ring as the kit was made. Each pad's SEND still sets how much of that pad goes in.



Figure 7.8 A CINDER pad's first layer, on Night Drive's second kit. Press LAYER again for the second.

Copying a pad. Under SHIFT on a CINDER kit, the first two section keys read COPY and PASTE. This is how you make three toms from one.

01 Play the pad you want to copy, and press SHIFT + COPY. The screen says PAD 05 COPIED / PLAY A PAD, THEN PRESS PASTE.

02 Play the pad you want to change, and press SHIFT + PASTE. All 25 of its controls become the copied pad's: PAD 05 PASTED ONTO PAD 06.

The copy stays until you quit Tonaut, so you can paste it onto several pads, or onto a CINDER kit on another lane. Pasting onto the pad you copied puts it back as it was when you copied it, and says PAD 05 PUT BACK AS COPIED. Until you copy a pad, PASTE is drawn off and says COPY A PAD FIRST. A paste is a change to the sound like any other: REVERT or loading the kit again undoes it. The ring's five controls belong to the kit, not to a pad, so they aren't copied.



Figure 7.9 SHIFT on a CINDER kit: COPY and PASTE on the first two section keys. PASTE waits until a pad is copied.

7.6 DIVINER, control by control

DIVINER is a two-oscillator analog-style polysynth (4.4.9). Oscillators A and B go through a mixer into a four-pole low-pass filter, which has its own envelope. Poly-mod lets oscillator B and the filter envelope bend A's pitch, A's pulse width and the filter. A wheel LFO adds vibrato and sweeps. It has forty controls: eight are also on CORE, marked *(CORE)* below; the other thirty-two are only in EDIT.

The tables give each control's layer (band, or SHIFT), its range as the right window reads it, and the value it **starts at** on DIVINER's ENGINE DEFAULT sound (5.2.3). Factory sounds set their own values; the figures show Night Drive's lead, Sync Arc, on lane 4.

Every switch and choice on DIVINER changes without a click, even while a note sounds: the old and new settings cross over in a few thousandths of a second.

7.6.1 OSC A

Oscillator A, the first of the two tone sources.

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
A FREQ	band	**−24 ST** to **+24 ST** in semitone steps (**+0 ST**)	Tunes oscillator A up or down, two octaves either way.
A SAW	band	**OFF**, **ON** (**ON**)	A saw wave on oscillator A: bright and buzzy.
A PULSE	band	**OFF**, **ON** (**OFF**)	A pulse wave on oscillator A, hollow at 50%, thinner as it narrows. With A SAW and A PULSE both on, A plays the two added together. With both off, A is silent.
PW *(CORE)*	band	**5%** to **95%** (**50%**)	How narrow oscillator A's pulse is. It changes the sound only while A PULSE is on.
SYNC	SHIFT	**OFF**, **ON** (**OFF**)	Locks oscillator A to B: A starts its wave again every time B starts a new cycle. The note's pitch then follows B, and moving A FREQ changes the tone instead of the pitch, giving the hard, tearing "sync" sound. B drives the sync even when B LEVEL is at 0.



Figure 7.10 OSC A on Sync Arc: a saw an octave up, synced to oscillator B, which is where the lead's tearing tone comes from.

To hear oscillator sync:

01 In MIXER, drag **B LEVEL** to **00**, so you hear oscillator A alone.

02 In OSC A, latch SHIFT and drag **SYNC** to **ON**. Tap SHIFT again.

03 Hold a key and drag **A FREQ** up. The pitch stays put and the tone tears and sweeps.

7.6.2 OSC B

Oscillator B, the second tone source. It also drives SYNC and poly-mod, and it can become a slow modulation source of its own (LO FREQ). The figure in 7.4 shows this group under SHIFT.

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
B FREQ	band	**−24 ST** to **+24 ST** (**+0 ST**)	Tunes oscillator B up or down in semitones. **+7 ST** puts B a fifth above A; **+12 ST** an octave.
B FINE *(CORE)*	band	**−50 CT** to **+50 CT** (**+7 CT**)	Detunes B slightly from A. A few cents make the two beat slowly against each other, which thickens the sound.
B SAW	band	**OFF**, **ON** (**ON**)	A saw wave on oscillator B.
B TRI	band	**OFF**, **ON** (**OFF**)	A triangle wave on oscillator B: soft and round.
B PULSE	SHIFT	**OFF**, **ON** (**OFF**)	A pulse wave on oscillator B. Any mix of B's three waves can be on at once; B plays them added together.
B PW	SHIFT	**5%** to **95%** (**50%**)	How narrow oscillator B's pulse is. Heard only while B PULSE is on.
LO FREQ	SHIFT	**OFF**, **ON** (**OFF**)	Turns oscillator B into a slow wobble for poly-mod (7.6.7). B FREQ then sets its speed instead of its pitch: from 0.3 times a second at **−24 ST**, through 3 at **+0 ST**, to 30 at **+24 ST**. Those speeds are for C4; with B KEYS on, higher keys run it faster and lower keys slower. B is still in the mixer, so turn B LEVEL down if you want it only as a modulator.
B KEYS	SHIFT	**OFF**, **ON** (**ON**)	Whether B follows the keys. Off, B stays at one pitch (C4 moved by B FREQ) whatever key you play, a drone under the melody; with LO FREQ on, its speed stops following the keys too.

7.6.3 MIXER

How much of each source goes into the filter. Three controls; the fourth band lane and the whole SHIFT layer are empty.

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
A LEVEL	band	**0%** to **100%** (**80%**)	How loud oscillator A is.
B LEVEL *(CORE)*	band	**0%** to **100%** (**70%**)	How loud oscillator B is. At 0 you don't hear B, but it still drives SYNC and poly-mod.
NOISE	band	**0%** to **100%** (**0%**)	How much hiss is mixed in. It rises slowly at first and quickly near the top, so the lower half is for a touch of breath.

TIP

> With both oscillators and NOISE all near full, the mix reaches the filter hotter than it takes cleanly, as on the old instruments. The sound thickens and roughens a little instead of getting much louder.

7.6.4 FILTER

A four-pole low-pass filter: it lets the low end through and cuts the highs above the cutoff, steeply.

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
CUTOFF *(CORE)*	band	**20 HZ** to **20.00 KHZ** (**893 HZ**)	How open the filter is. Down is darker.
RESONANCE *(CORE)*	band	**0%** to **100%** (**20%**)	How hard the filter rings at its edge. Near the top it whistles: the filter rings with a steady tone of its own near the cutoff.
ENV AMOUNT *(CORE)*	band	**−100%** to **+100%** (**+40%**)	How far the filter envelope (7.6.5) sweeps the cutoff with each note. At **+100%** it can open the filter eight octaves above CUTOFF; minus values sweep down instead of up; at **+0%** the envelope does nothing to the filter. On the band it reads **−50** to **+50**.
KEY TRACK	band	**OFF**, **HALF**, **FULL** (**HALF**)	How much the filter follows the keys, measured from C4. FULL moves the cutoff an octave for every octave you play, so high notes stay as bright as low ones. HALF moves it half as far. OFF leaves it where CUTOFF puts it.

7.6.5 FILTER ENV

An envelope that moves the filter, starting with each note. It works like the amp envelope (4.6) and has the same ranges, but it shapes the brightness instead of the loudness. ENV AMOUNT sets how far it moves the cutoff, and PM F-ENV lets it bend other things too (7.6.7).

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
F ATTACK	band	**0.5 MS** to **10.00 S** (**2.0 MS**)	How fast the filter opens when a note starts.
F DECAY	band	**1.0 MS** to **10.00 S** (**631 MS**)	How fast it falls back to F SUSTAIN.
F SUSTAIN	band	**0%** to **100%** (**30%**)	Where the filter rests while you hold the key.
F RELEASE	band	**1.0 MS** to **20.00 S** (**381 MS**)	How fast the filter closes after you let go.



Figure 7.11 The filter's own envelope. ENV AMOUNT, in FILTER, decides how far it moves the cutoff.

For a plucked, percussive sound: in FILTER set ENV AMOUNT to about **+25** on the band and CUTOFF low; then in FILTER ENV set F SUSTAIN to **00** and F DECAY short. Each note opens bright and closes quickly.

7.6.6 AMP ENV and VOICE

AMP ENV is the amp envelope every synth has: SHAPE's **ATTACK**, **DECAY**, **SUSTAIN** and **RELEASE** (4.6).

DIVINER's VOICE group is the rest of SHAPE plus three controls of DIVINER's own. It has seven, so the last SHIFT lane is empty.

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
PLAY MODE	band	**POLY**, **MONO**, **LEGATO**, **UNISON** (**POLY**)	As on SHAPE (4.6.1).
GLIDE	band	**OFF**, then **1.0 MS** to **2.00 S** (**OFF**)	Time to slide from one note to the next (4.6.2).
UNI DETUNE	band	**+0 CT** to **+40 CT** (**+10 CT**)	How far apart the voices of a UNISON note spread, on top of the spread UNISON already has. It does nothing unless PLAY MODE is UNISON.
VELOCITY	band	**0%** to **100%** (**30%**)	How much a soft note dulls the filter sweep. At **0%** every note sweeps by the full ENV AMOUNT; turned up, softer notes sweep less and sound darker. Loudness follows how hard you play either way.
DRIFT	SHIFT	**0%** to **100%** (**20%**)	How far each voice wanders out, the way old analog hardware does. At **100%** each oscillator drifts up to 10 cents in pitch, and each note gets its filter up to a semitone and a half off and its filter envelope up to 10% faster or slower. Every note is a little different.
BEND	SHIFT	**+0 ST** to **+24 ST** (**+2 ST**)	How far the pitch bends: a MIDI keyboard's pitch-bend wheel, and the X/Y pad's X (4.6.2).
LEVEL	SHIFT	**−INF DB** to **+6.0 DB** (**+0.0 DB**)	How loud the sound is.

7.6.7

POLY-MOD

Poly-mod lets two sources bend three destinations, separately for each note. The sources are the filter envelope and oscillator B; the destinations are A's pitch, A's pulse width and the filter's cutoff. You need both halves: at least one source above **0%**, and at least one destination **ON**. With either half at nothing, poly-mod does nothing.

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
PM F-ENV	band	**0%** to **100%** (**0%**)	Source: how much the filter envelope bends the destinations. Each note's envelope shape (F ATTACK to F RELEASE) is what moves them.
PM OSC B	band	**0%** to **100%** (**0%**)	Source: how much oscillator B bends the destinations. At audio pitch this makes metallic, bell-like and clangorous tones. With LO FREQ on, B wobbles them slowly instead.
PM FREQ A	band	**OFF**, **ON** (**OFF**)	Destination: oscillator A's pitch. A source at **100%** moves it by up to four octaves. The filter envelope bends it upwards; oscillator B bends it up and down.
PM PW A	band	**OFF**, **ON** (**OFF**)	Destination: oscillator A's pulse width. Heard only while A PULSE is on.
PM FILTER	SHIFT	**OFF**, **ON** (**OFF**)	Destination: the filter's cutoff, by up to four octaves for a source at **100%**.



Figure 7.12 Sync Arc's poly-mod: the filter envelope bends oscillator A's pitch, the sync sweep described below.

Two classic uses:

- **The sync sweep.** SYNC on (OSC A), then PM F-ENV up and PM FREQ A on. Each note starts with a sync sweep that follows the filter envelope. Sync Arc is set up this way, with A an octave up; set B LEVEL to **00** to hear the sweep alone.
- **Bells.** B FREQ to an odd interval such as **+5 ST** or **+19 ST**, PM OSC B up a little, PM FREQ A on. Raise PM OSC B slowly: the tone goes from glassy to clanging.

7.6.8

WHEEL-MOD

One LFO (a slow, repeating wobble) for the whole sound. Every note moves with it together, the way the mod wheel section of an old polysynth works. WHEEL sets how much reaches the four destinations you switch on.

CONTROL	LAYER	VALUES (STARTS AT)	WHAT IT DOES
LFO RATE *(CORE)*	band	**0.05 HZ** to **30 HZ** (**5.00 HZ**)	How fast the LFO moves, from one cycle every twenty seconds to thirty a second.
LFO SHAPE	band	**TRI**, **SAW**, **SQUARE**, **RANDOM** (**TRI**)	The LFO's shape. TRI rises and falls evenly; SAW rises and drops; SQUARE jumps between two values (a trill); RANDOM jumps to a new random value each cycle and holds it (sample and hold).
LFO/NOISE	band	**0%** to **100%** (**0%**)	Blends the LFO into noise. At **0%** it is the LFO alone; at **100%** it is noise alone, a fast random shake.
WHEEL *(CORE)*	band	**0%** to **100%** (**0%**)	How much the LFO moves things. The bottom of the range is fine: **20%** is about half a semitone of vibrato on pitch, **100%** is a full octave either way.
WM FREQ A	SHIFT	**OFF**, **ON** (**ON**)	The LFO moves oscillator A's pitch.
WM FREQ B	SHIFT	**OFF**, **ON** (**ON**)	The LFO moves oscillator B's pitch.
WM PW	SHIFT	**OFF**, **ON** (**OFF**)	The LFO moves both oscillators' pulse widths. Heard only on a pulse wave.
WM FILTER	SHIFT	**OFF**, **ON** (**OFF**)	The LFO moves the filter's cutoff, up to four octaves either way at WHEEL **100%**: a wah or a slow sweep.

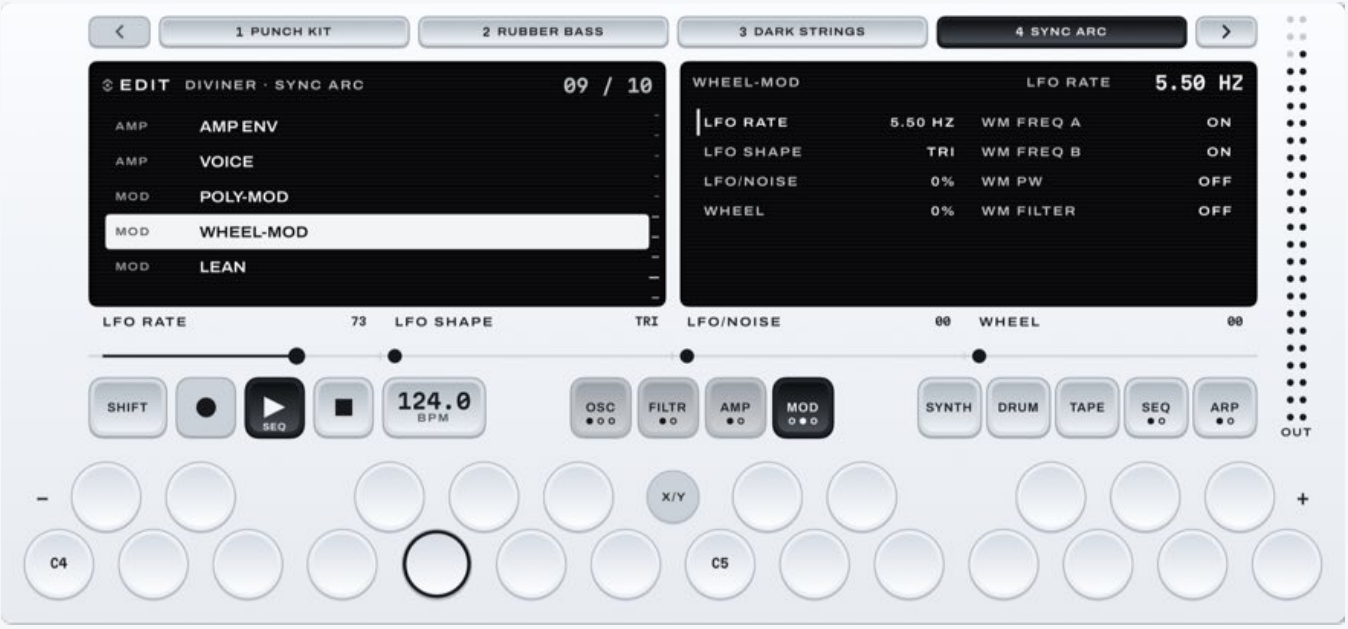


Figure 7.13 WHEEL-MOD on Sync Arc: vibrato is set up on both oscillators, waiting for WHEEL.

Tonaut has no wheel on screen, so WHEEL is a control like any other. Because it is also on CORE, a modulator or LEAN can move it: LEAN DEST **CORE** with LEAN SLOT **8** (3.5.3), or the Expression modulator with SOURCE **WHEEL**, which a MIDI keyboard's mod wheel and the X/Y pad's Y both drive (4.8.8, 15.6). Every factory DIVINER sound, Init and Sync Arc among them, comes set up with both.

7.6.9 A sound from Init, step by step

Init is DIVINER's plain starting point: oscillator A's saw alone, the filter wide open with no resonance and no envelope sweep, a gate-like amp envelope (full sustain, a quarter-second release), and nothing moving. This walk-through visits most groups and is a good first tour of EDIT. Play a key after each step to hear what changed.

01 Load Init: SHIFT + PATCH, tap DIVINER in the engine column with the type column on ALL, then tap Init, the first row (5.2). Tap SHIFT to go back to where you were.

02 If you opened PATCHES from EDIT, EDIT is back already. If not, hold SHIFT and press EDIT.

03 Press OSC until MIXER shows. Drag **B LEVEL** up to about **70**. Oscillator B joins A.

04 Press OSC once more for OSC A, then again for OSC B. Drag **B FREQ** to **+7 ST** and **B FINE** to about **+6**. You hear a fifth, slowly beating.

05 Press FILTR. Drag **CUTOFF** down to about **40**, **RESONANCE** up to about **40**, and **ENV AMOUNT** to about **+25**. Each note now opens with a sweep.

06 Press FILTR again for FILTER ENV. Drag **F DECAY** down and **F SUSTAIN** to **00**. The sweep turns into a pluck.

07 Press AMP. Drag **RELEASE** up so notes ring after you let go.

08 Press MOD for POLY-MOD. Drag **PM F-ENV** to about **20** and **PM FREQ A** to **ON**. Each note starts with a short pitch blip on A.

09 Press MOD again for WHEEL-MOD. Drag **WHEEL** to about **20**. A gentle vibrato comes in at 5 Hz.

10 Drag **WHEEL** back to **00**. Hold a key and tilt the phone: Init's LEAN brings the vibrato in as you lean, up to about a semitone. It works one way only; leaning the other way would push WHEEL below **00**, so nothing happens.

11 To keep the result as a sound of its own, save it in USER (5.11.1) or to a quick slot (3.6.1). The project keeps it on the lane either way.

To bring the vibrato in by hand instead, close EDIT, press X/Y on SYNTH and drag up on the pad (15.6).

NOTE

> Loading another patch onto the lane replaces everything you set here. Save it first if you want to come back to it (5.3.1).

08 SEQ

SEQ is Tonaut's step sequencer. Every lane has its own sixteen patterns, and when you press PLAY every lane plays its pattern together. You can write notes into a pattern one step at a time, or play them in live and let the pattern keep them. Then PATTERN PLAY switches every lane to another set of patterns with one tap, the way a song moves from verse to chorus.

8.1 Patterns and steps

To open SEQ, press SEQ, the fourth mode key. It shows the focused lane's pattern. Tap another lane button to see that lane's pattern; you stay on SEQ (2.2).

A pattern is a loop of steps. A step is one slot in that loop: at normal speed it lasts a sixteenth note, and it holds the notes that play when the loop reaches it. The limits:

WHAT	HOW MANY
Patterns per lane	16, numbered **01** to **16**. An eight-lane project has 128 patterns, a six-lane one 96.
Steps per pattern	Up to 64: four bars of sixteen. LENGTH sets 16, 32, 48 or 64 (8.6.2).
Notes per step	Up to 8, so a step can hold a chord (8.3.1).

Each lane plays one of its sixteen patterns at a time, the one its PATTERN control names, and loops it until you choose another. To move every lane to another pattern at once, use PATTERN PLAY (8.13). To copy, swap or clear whole patterns, use PATTERNS (8.14).

NOTE

> On iPad, SEQ shows up to four bars of a pattern at once (two on iPad mini) and its keys are laid out differently. This chapter describes the iPhone; chapter 17 covers the iPad.

8.1.1 The screen

The grid is the one screen in Tonaut that uses a single wide window instead of two.

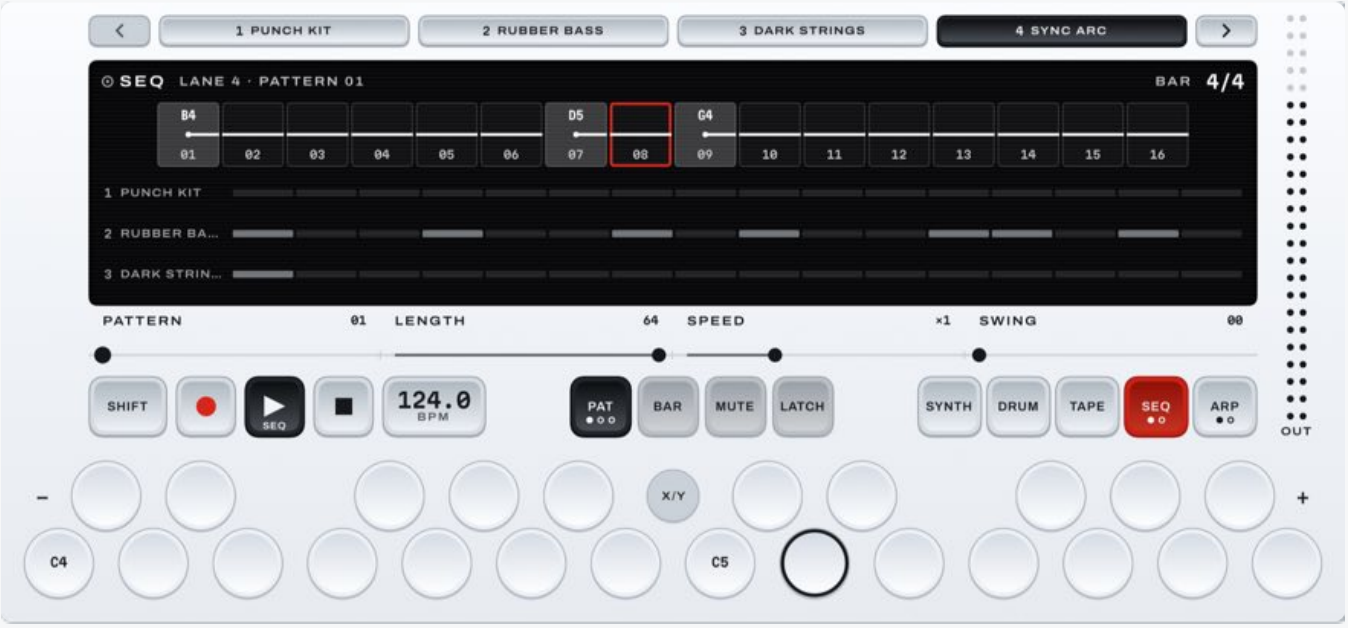


Figure 8.1 One bar of the focused lane's pattern: the bar the playhead is in, which the header's BAR readout counts. The other lanes on the lane row's page are mapped underneath.

- **The header** reads `SEQ`, then the lane and the pattern you are editing, such as `LANE 4 · PATTERN 01`. While the pattern is armed to record live, a red dot follows, and sometimes a red word: `FIRST NOTE STARTS` while it waits for you, or the selected cell during a take (8.8.1). A STEP REC pass puts no dot there: its cursor is the filled cell (8.8.8). On the right is the BAR readout: `BAR` and the bar showing over how many bars the lane's pattern has, such as `BAR` `3/4`, bar 3 of a four-bar pattern. It reads the same on PAT, BAR and MUTE. While your finger is on a band control, and for a second and a half after you lift it, the readout shows that control and its value instead, such as `HOLD` `4`; then it goes back to the bar. A bar past the pattern's LENGTH reads as it is: `BAR` `4/1` is bar 4 of a one-bar pattern (8.7.1).
- **Sixteen cells**: the sixteen steps of the bar showing. The BAR control picks which of the four bars that is, and while the patterns play the grid follows the playhead from bar to bar (8.7.1). The cells are the one part of the window you touch.
- **Thin rows** underneath show the other lanes the lane row is showing: on iPhone, the rest of the lane row's page (the row shows four at a time in an eight-lane project), or the other five in a six-lane one, in columns of three. Each row has the lane's number, its sound's name and a small block for each of the sixteen steps. A brighter block is a step with notes in that lane's pattern, in the same bar. The rows are a map only and take no touches. To edit another lane's pattern, tap its lane button; to see lanes on the other page, use the arrow keys at the ends of the lane row (2.2).

What a cell looks like tells you what is in it:

THE CELL	MEANS
a faint ground and its step number	an empty step
a brighter ground, note names above a dot, the step number below	a step holding notes (8.3.2)
filled solid	the selected cell: the one the keys write into (8.3). During a STEP REC pass, the cursor (8.8.8)
a red outline	the playhead: the step playing right now (8.2)
a line running from the dot to the right, or straight through the cell	a held note: it keeps sounding into the next cells (HOLD, 8.6.3)

A cell can be several of these at once. The playhead runs over the selected cell every time round, so a cell can be filled and outlined in red together.

8.1.2 The page keys and the band

The four page keys are PAT, BAR, MUTE and LATCH. The first three are pages: each puts different controls on the band. LATCH is an on/off switch, not a page. Pressing it leaves you on the page you were on, and the key stays filled while LATCH is on (8.5). PAT wears three dots, because pressing it again on its own page takes you on to PATTERN PLAY and PATTERNS (8.1.6). While a STEP REC pass runs, the four keys read UNDO, REDO, REST and TIE instead, with SHIFT or without (8.8.9).

PAGE	THE BAND	THE BAND UNDER SHIFT
PAT, no step with notes selected	PATTERN, LENGTH, SPEED, SWING	two blank sliders, then the keys PAT OCT- and PAT OCT+ (8.6.5)
PAT, a step with notes selected	HOLD, RATCHET, LOUDNESS, CHANCE	EVERY, SLIDE, PAT OCT-, PAT OCT+
BAR	BAR, QUANTIZE, STRENGTH, REC	COUNT-IN, CLICK, CLK LEVEL, GLIDE
MUTE	a MUTE pill for each lane the lane row shows (8.9)	blank

The sliders work as they do everywhere: drag left or right, hold still for fine adjust (2.4). Stepped controls click from one value to the next. A double-tap does nothing on SEQ's sliders; to take a change back, use UNDO (8.10).

8.1.3 SHIFT on SEQ

You can tap SHIFT to latch it, so it stays on until you tap it again, or hold it down for a single press. On SEQ both work. Latch it when you want to press UNDO several times in a row; a latched SHIFT stays latched after each press.

WHAT	UNDER SHIFT ON SEQ
Page keys	UNDO REDO CLEAR RESET, on every page, with LATCH on or off (8.10). On PATTERNS they are the ALL LANES keys instead (8.14.4)
Band	the page's second four, each with the SH badge (table above). On PAT the last two are keys, PAT OCT- and PAT OCT+, which move every note of the pattern an octave (8.6.5)
Mode keys	the five doors; the SEQ key reads EDIT (2.6)
Keyboard, upper row	quick slots 1 to 7, with 8 in the gap between the upper octave's E and F (3.6), then UNDO, DIE and HELP. DIE and its UNDO are wells on SEQ and say DIE WORKS ON THE SOUND PAGES
Keyboard, lower row	PAT OCT- and PAT OCT+ on the two end keys, which move every note of the focused lane's pattern an octave, as the band's keys of the same names do (8.6.5). The twelve keys between them still play, and still write into the selected cell
REC	SHIFT + REC changes the record mode, LIVE or STEP, and two dots under REC show which (8.8)
PLAY STOP	no change

The iPhone keyboard's top row also has three keys in its gaps, with or without SHIFT: the signs – and + at the two ends, which move the keyboard's octave, never the notes in the pattern (3.2), and X/Y in the middle. The X/Y pad cannot take a window on SEQ, so there X/Y is a well (15.6).

8.1.4 HELP on SEQ

Press SHIFT + HELP to latch HELP (2.9). On SEQ the help window covers the left half of the grid. While HELP is latched, a tap on a slider or a page key shows its one-line description at the top of the help window instead of doing its job; a drag still moves a slider (2.9.2). For example, STRENGTH says HOW FAR PLAYED NOTES MOVE · 100 IS EXACT, and PAT says PATTERN · AGAIN: PATTERN PLAY · PATTERNS. A tap on a step the help window leaves uncovered says TAP A STEP · HOLD IT AND PLAY A KEY, and the step is not chosen. The grid's header carries the tap mark (2.3), and a step you touch shows a white outline while your finger is on it. Press SHIFT + HELP again to put the left half of the grid back.



Figure 8.2 HELP on SEQ covers the left half of the grid. Unlatch it to get those cells back.

8.1.5 What SEQ keeps

Saved with the project, automatically (13.2): every pattern's notes and settings, which pattern each lane plays, every lane's pattern mute, and COUNT-IN, CLICK and CLK LEVEL.

Not saved: LATCH, the selected cell, which bar each lane is showing, which page or place you are on, and the UNDO history. Each lane keeps its bar while the project stays open (8.7.1); opening another project, or a relaunch, starts every lane on bar 1, with LATCH off and nothing to undo. PERFORM's faders are never saved either (15.5).

8.1.6 SEQ's other places: PATTERN PLAY, PATTERNS and PERFORM

Besides the grid, SEQ has three more views. You reach each one by pressing a key you are already on:

PRESS	WHERE IT GOES
PAT on the PAT page	PATTERN PLAY (8.13), then PATTERNS (8.14), then back to the grid. PAT's three dots say which: the filled one is where you are
SEQ on SEQ	PERFORM (15.1), from the grid, PATTERN PLAY or PATTERNS; pressed on PERFORM, back to the grid. On iPhone the SEQ key wears two dots, one for SEQ (the grid, PATTERN PLAY and PATTERNS) and one for PERFORM; the filled one is where you are. Under SHIFT the key is the EDIT door and has no dots
BAR or MUTE on PATTERN PLAY	that page's grid
PAT, BAR or MUTE on PERFORM	that page's grid
another mode key	leaves SEQ; the next time you open it, it shows the grid

The three views use both windows, and none of them has a cell to write into: there the keys play the focused lane, and with the pattern armed they record (8.8). On iPad, which has no PAT key, the SEQ key goes round all four: the grid, PATTERN PLAY, PERFORM and PATTERNS (chapter 17).

8.2 Playing patterns

To hear your patterns:

01 Press PLAY. It fills, and every lane plays its pattern from step 1.

02 Watch the red outline move along the cells. It follows the focused lane's pattern. The keys of the notes playing on the focused lane ring as they sound, or in the TN looks light their LEDs bright (3.4).

03 Press STOP to stop every lane.

PLAY carries the word SEQ under its triangle on SEQ and every other screen where it runs the sequencer; on TAPE and the recorder it reads TAPE (2.10). If the pattern on screen holds no notes, PLAY still starts every lane, and the notice says PATTERN EMPTY. The other lanes play their patterns as usual, and the red outline moves through the empty cells, so you can see the pattern is running. On a screen other than SEQ the same line means no lane's pattern holds a note.

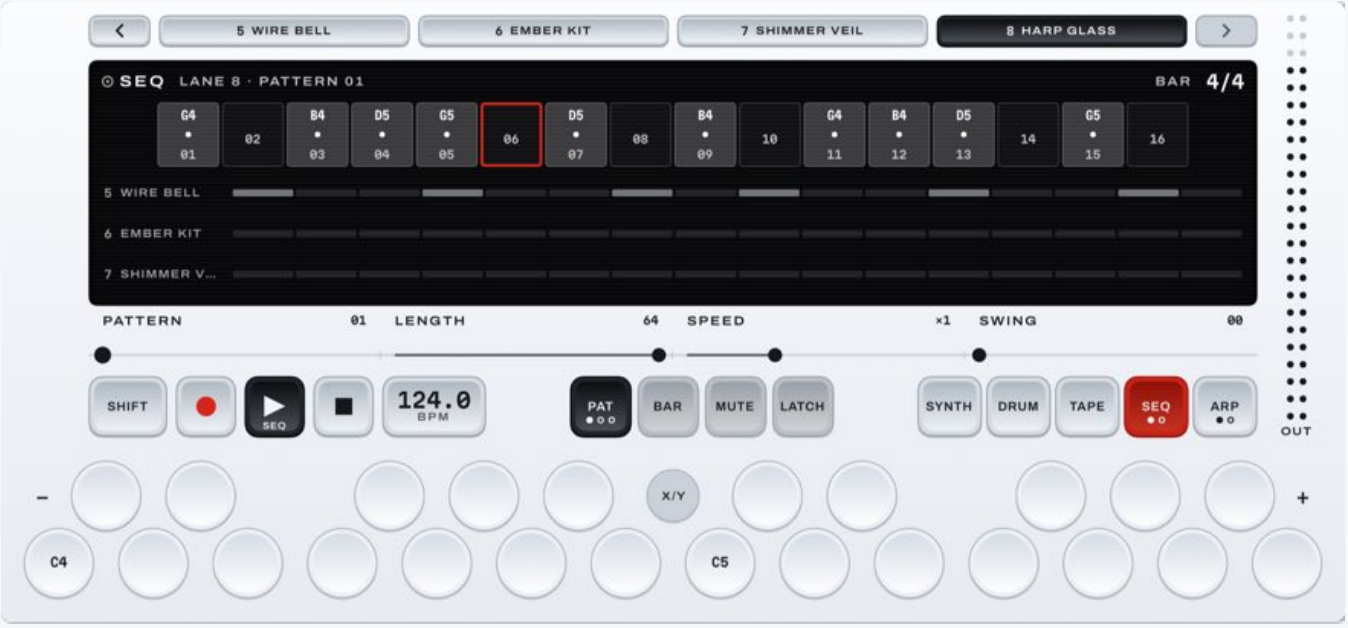


Figure 8.3 While the patterns play, the grid shows the bar the playhead is in, bar 4 of 4 here.

- PLAY plays the patterns on every screen but TAPE (2.10). On SEQ the tape stays where it is.
- With everything stopped, PLAY starts every pattern from step 1. STOP pressed again while everything is stopped rewinds the tape to its start (or to LOOP IN while a loop is on); it changes nothing for the patterns, which start from step 1 anyway. With a lane on EXTERNAL MIDI, that second STOP also turns off every note your gear is holding (16.7).
- If the tape is already rolling (you started it on TAPE), PLAY on SEQ adds the patterns in time without restarting the tape. They come in at whatever step the running clock has reached, not at step 1.
- Each lane loops its own pattern at its own LENGTH and SPEED. A 16-step pattern on lane 1 and a 48-step pattern on lane 2 go round at different rates and line up again every three bars.
- The grid follows the playhead. When the focused lane's playhead moves on to bar 2, the grid turns to bar 2, and the header's readout says so. Move BAR, or touch a cell, while it plays and the grid stays on that bar until the next PLAY (8.7.1). The red outline appears only on the bar you are looking at.
- A lane whose pattern is muted plays nothing from it (8.9).
- A lane on EXTERNAL MIDI plays its pattern on your own gear instead of a sound of Tonaut's (chapter 16).

8.2.1 Changing pattern while you play

To switch one lane, say lane 1, to another pattern:

01 Focus lane 1. On PAT, make sure no step holding notes is selected (with LATCH off, tap the selected cell to let it go). The band reads PATTERN, LENGTH, SPEED, SWING.

02 Move **PATTERN**. The header and the grid show the new pattern at once.

- **Stopped**: the lane switches at once.
- **Playing**: the old pattern plays on to the next bar line, then the new one starts. Bar lines come every sixteen sixteenth notes from when you pressed PLAY, whatever the pattern's LENGTH or SPEED.
- Each lane switches on its own. Lane 1's PATTERN never changes lane 2. To move every lane together, use PATTERN PLAY (8.13). A tile tapped on PATTERNS does what PATTERN does, for the focused lane (8.14).

NOTE

> You always edit the pattern the lane is set to play. There is no way to write into pattern 05 while lane 1 keeps playing pattern 01: switch the lane to 05 first.

8.3 Entering notes: tap a cell, then a key

The usual way to write a pattern is to pick a step, then play the note you want in it.

To put a note on step 5 of lane 1:

01 Tap lane 1's button to focus it, and press SEQ.

02 Tap cell 05. It fills: it is selected. Nothing is written yet, and because the cell is empty the notice line says A KEY PUTS ITS NOTE IN THIS STEP.

03 Press a key, say E3. You hear it, and the cell now reads E3 above a dot.

04 Tap the next cell you want and press its key. Repeat until the pattern is written.

The rules:

- **A tap only selects.** With LATCH off, tapping a cell never writes a note and never erases one. A tap on a cell that holds notes plays them (8.3.5).
- **Tap the selected cell again to let it go.** It stops being filled, and nothing in it is erased.
- **Tapping another cell selects that one instead.** Only one cell is selected at a time.
- **A key already in the cell takes its note out.** You hear the note as you press, and it leaves the cell.
- **The selected cell's notes are lit on the keyboard** (filled), for as long as it stays selected. So a lit key is one a press takes out, and a dark key is one a press adds. A ring on a key is different: it means the note is sounding right now (3.4). A key can be lit and ringed at once.
- In the TN looks (the iPhone's TN-1, TN-1 DARK and TN-XY housings, 14.2.1), the keys don't fill or ring. Each key has a small light, an LED, near the top of its round face: the selected cell's notes light theirs at half glow, and a note sounding lights its LED bright, in place of the ring.
- A note above or below the two octaves on screen has no key, so it lights nothing. Move the octave with − and + at the ends of the keyboard's top row to see it (3.2). Each lane keeps its own octave.
- The key writes the pitch it plays at the keyboard's current octave.
- Changing lane, moving BAR or moving PATTERN lets the selected cell go. So does playback when it turns the grid to another bar (8.7.1): a key never writes into a cell you can't

see. Changing page does not.

NOTE

> A MIDI keyboard writes into the selected cell the same way (8.3.6). While the pattern is armed to record, though, the keys and a MIDI keyboard play and record instead of writing into the cell (8.8), and during a STEP REC pass the keys write into the cursor's step and move on (8.8.8).

A note written this way plays at a fixed velocity of 100 (on a scale of 1 to 127). To make a step louder or softer, use LOUDNESS (8.6.3).

8.3.1 Making a chord

A step can hold a chord. Each key you press adds its note to the selected cell; press C3, E3 and G3 one after another and the cell reads `C3,E3,G3`.

- A step holds up to eight notes. A ninth key is refused with `A STEP HOLDS EIGHT NOTES`, and the cell is unchanged.
- To take a chord apart, press its keys again, one at a time. When the last note goes, the step is empty, and its HOLD, RATCHET and the rest go with it.
- Every note of a step shares that step's HOLD, RATCHET, LOUDNESS, CHANCE, EVERY and SLIDE. A note you add to a step takes the length the step's notes already have.
- With CHORDS on, one key writes its whole chord into the cell (8.3.7).

8.3.2 Note names in the cells

Every cell that holds notes names them, so you can read a pattern without playing it:

THE CELL READS	MEANS
`E3`	one note. Names are scientific pitch: C3 is MIDI note 48, and middle C is C4, the same names the keyboard's C keys carry.
`C#3`	sharps are written with #. There are no flats.
`C3,E3,G3`	a chord of up to three notes, lowest first, with no spaces.
`C3+3`	four notes or more: the lowest, and how many more. C3+3 is four notes in all.
`1,9`	on a kit lane, pad numbers instead of note names (8.11).

The text shrinks only as far as it must to fit inside its cell, so a chord of three sharps is smaller than a single note. Names are scientific pitch throughout Tonaut.

8.3.3 The first note brings up HOLD

The moment the first note goes into an empty cell, the band turns into that step's own controls with **HOLD** first, ready for your finger. If you were on BAR or MUTE, SEQ moves you to PAT to do this. So the next thing to hand is how long the note lasts (8.6.3).



Figure 8.4 A selected step: its note lit on the keys, and the band showing that step's own controls.

8.3.4 Emptying cells

There are four ways to take notes out:

- One cell, note by note: select it and press each lit key (above).
- One cell, all at once: with LATCH on, tap it (8.5).
- The whole pattern on screen: SHIFT + CLEAR (8.10.2).
- Any pattern of the lane, or the same pattern on every lane: CLEAR on PATTERNS (8.14.3).

8.3.5 Tapping a step plays it

Tap a cell that holds notes and it plays them once, as playback would: a chord all its notes, a drum step all its pads, each at the step's loudness and for the step's own length at the pattern's SPEED and the tempo, never longer than a second. The keys ring as the notes sound.

- It plays whether the tap selects the cell or lets it go, stopped or playing.
- It writes nothing and is not an UNDO step.
- An empty cell plays nothing. A held cell (8.4) plays nothing when you lift your finger after writing into it, and a tap with LATCH on (8.5) writes or empties a cell without playing it.
- It plays even when the lane's pattern is muted on SEQ's MUTE page (8.9), and a pad muted on DRUM still sounds. A lane whose channel is muted on MIX stays silent.
- On a lane on EXTERNAL MIDI, the notes go to your gear.

8.3.6 Writing from a MIDI keyboard

A MIDI keyboard, plugged in or paired over Bluetooth (3.8), writes into the selected cell exactly as the keys on screen do. Tap a cell, then play a note on the keyboard, or a chord.

- Each note goes in as you play it: added, or taken out when the cell already has it. A chord struck all at once goes in whole, and you can also build one a key at a time. A cell holds eight notes at most, as from the screen (A STEP HOLDS EIGHT NOTES).
- Each note is one UNDO step, as a key on screen is, so a three-note chord takes three presses of UNDO (8.10.1).
- The cell names its notes, they light on the keys on screen, and the first note into an empty cell brings up HOLD (8.3.3).
- A note goes in at velocity 100, as a key's does. How hard you play shapes only the note you hear as you play it; to make a step louder or softer, use LOUDNESS (8.6.3).
- The cell holds the pitch you played. The octave of the keys on screen never moves a note from a MIDI keyboard.
- On a kit lane the note goes in as the pad it struck, and the cell names that pad (8.11).
- SHIFT and HELP don't change a MIDI keyboard. Its keys are always notes, so they still write, and a latched or held SHIFT stays on.
- Into a held step (8.4) a MIDI note goes in too, but you hear it: it has already sounded by the time it reaches the cell.
- With LATCH on, a MIDI note chooses the latched note, as a key does (8.5). With the pattern armed, it records live instead (8.8), and during a STEP REC pass it writes the step under the cursor (8.8.8).
- Only on the grid. On PATTERN PLAY, PATTERNS and PERFORM, and on every other screen, a MIDI note plays and writes nothing. With no cell selected it writes nothing either.
- Only a note that plays the focused lane writes. A note on a channel the **Channel** row in Settings filters out plays nothing and writes nothing. With the **MIDI in** row set to **BY CHANNEL**, only a note on a channel the focused lane listens to reaches its cell (3.8.8).

8.3.7 LOCK and CHORDS

A key writes what it plays. With LOCK or CHORDS on, set on the KEY page (3.11), that is not always the key's own note:

- **LOCK** moves every note you play to the nearest note of the lane's scale, and the cell gets the note you hear. In D minor, C# writes C. Each lane has its own key, scale and LOCK unless Settings makes every synth lane share one (3.11).
- **CHORDS** makes one key play a chord on the lane, and the key writes the whole chord into the cell, as one UNDO step. Press the same key again and the whole chord comes out. If the cell already holds some of the chord's notes, the key adds the rest. A chord that would take the cell past eight notes is refused with A STEP HOLDS EIGHT NOTES, and nothing is written.
- It works the same from a MIDI keyboard (8.3.6), into a held step (8.4), and with LATCH, whose taps write the latched key's chord or locked note (8.5).
- The lit keys on SEQ are still the selected cell's notes, so a chord written with one key lights all of its notes. The scale's small round lights on the keys (3.11) only show where the scale's notes are.

- Live recording records every note played: each note of a chord, and the locked note, not the key you pressed (8.8.4). STEP REC writes them the same way, a whole chord into one step (8.8.8).
- Notes already in a pattern never change. Setting a scale, or turning LOCK or CHORDS on or off later, leaves what you wrote alone.
- A kit lane is never locked or chorded: its keys are pads.
- **The chord pad** writes the same way (3.12): a chord key puts the chord it plays now, with the stick where it is, into the selected cell, or silently into a step you hold, and pressing it again takes the chord out. A MIDI keyboard's white key writes its chord too. With STRUM on, each note of the chord sits a little later in its step, as it was rolled, never more than half a step, so the pattern plays the strum back.

8.4 Holding a step

You can also keep one finger on a cell and play keys with the other hand. The notes go into that step silently, so you can write while a pattern plays without the extra notes in your ears.

01 Touch a cell and keep your finger on it. After a quarter of a second the notice line says PLAY A KEY TO WRITE IT INTO THIS STEP.

02 With your other hand, press keys. Each one goes into the step without sounding, or comes out if it was already there. The step's notes light on the keyboard as you go.

03 Lift your finger. The cell stays selected, and nothing more happens.

- If you lift without pressing a key, it counts as an ordinary tap (8.3).
- A held step works even while the pattern is armed to record, when the keys otherwise play and record. During a take, holding a cell and a LATCH tap (8.5) are the only ways to change a cell.
- A held step works with LATCH on too: the keys go into the held step instead of changing the latched note.
- A note from a MIDI keyboard goes into the held step as well, but it sounds as you play it (8.3.6).
- Everything you write during one hold is one UNDO step (8.10.1).
- During a STEP REC pass a cell holds nothing: a touch moves the cursor there instead (8.8.9).

8.5 LATCH

LATCH is for writing the same note on many steps: a kick on every beat, a bass note on the off-beats. You choose the note once, then tap each step that should have it.

To put the same note on several steps:

01 Press LATCH. It fills, and the notice says LATCH ON · A KEY, THEN TAP THE STEPS.

02 Press a key. You hear it, it stays lit, and the LATCH key shows its name under the word, such as A4 (on a kit lane, the pad number).

03 Tap each empty cell that should have the note. Each one gets it.

04 To change the note, press another key. The next taps use that one.

05 Press LATCH again when you're done. The notice says LATCH OFF and the note is let go.



Figure 8.5 A lit LATCH names the note it will write.

- **With LATCH on, tapping a cell that holds notes empties it**, whatever notes it holds, along with its step settings. Tapping an empty cell writes the latched note. Be careful: a tap is now a write or an erase.
- That holds before you press a key too. Until a note is latched, a tap on an empty cell only selects it, but a tap on a cell that holds notes still empties it.
- Tapping the selected cell again does not let it go while LATCH is on. It writes or empties like any other tap.
- LATCH cannot add a note to a cell that already has one: the tap empties it instead. To put a hi-hat on a step that already has a kick, switch LATCH off, tap the cell and press the pad (8.3.1).
- With LATCH on, the keys choose the latched note; they do not write into the selected cell. The keyboard lights the latched key, not the selected cell's notes; in the TN looks its LED glows at half strength.
- With CHORDS on, each tap writes the latched key's whole chord; with LOCK on, its locked note (8.3.7). On the chord pad, a chord key latches its whole chord, the stick's change

included, and every cell you tap takes it; the LATCH key names the chord's notes.

- The latched note follows the octave. Press `+` at the right end of the keyboard's top row and the next taps write the same key an octave higher. On a kit lane it is the pad, which has no octave.
- Each lane keeps its own latched note while LATCH stays on, so you can latch a pad on lane 1, focus lane 2, latch a bass note there, and come back. Switching LATCH off lets go of all of them.
- While the pattern is armed to record, the keys play and record, and do not change the latched note. Taps still write and empty cells with the note you latched before you armed.
- Each tap is one UNDO step.
- LATCH is not saved. A reopened project starts with it off.
- Under SHIFT the LATCH key is `RESET` (8.10.3).

8.6 PAT: the pattern, and the selected step

PAT has two sets of controls, and which one the band shows depends on the selected cell:

- **No cell selected, or the selected cell is empty**: the pattern's own settings, PATTERN, LENGTH, SPEED and SWING. Under SHIFT the first two lanes are blank.
- **The selected cell holds notes**: that step's own settings, HOLD, RATCHET, LOUDNESS and CHANCE, and under SHIFT EVERY and SLIDE. Each of these sliders wears a badge naming the step, such as `S05`, so you always know which step you are changing.

Either way, the last two lanes under SHIFT are the keys `PAT OCT-` and `PAT OCT+`, which move the whole pattern an octave (8.6.5).

To get back to the pattern's settings, tap the selected cell to let it go, or select an empty one. With LATCH on a tap writes or empties instead, so switch LATCH off first, or move BAR.

8.6.1 The pattern's settings

CONTROL	VALUES	WHAT IT DOES
PATTERN	01 to 16	Which of the lane's sixteen patterns it plays, and the one the grid shows (8.2.1). Starts at 01.
LENGTH	16, 32, 48, 64	How many steps the pattern plays before it loops: one, two, three or four bars. It reads the number of steps. Starts at 16 (8.6.2).
SPEED	×1/2, ×1, ×2, ×4	How fast the pattern runs against the tempo. At ×1 a step is a sixteenth note and sixteen steps make a bar. At ×1/2 a step is an eighth note (sixteen steps take two bars); at ×2 a thirty-second (half a bar); at ×4 a sixty-fourth (a quarter of a bar). Starts at ×1.
SWING	00 to 99	Pushes every second step (2, 4, 6 and so on) late, for a shuffle. At 99 those steps sit half a step late. Starts at 00, straight.

All four belong to the pattern on screen: each of the sixteen patterns has its own LENGTH, SPEED and SWING. Changing SPEED while the pattern plays keeps it on the bar lines.

8.6.2 LENGTH: growing a pattern copies it

When you make a pattern longer, the new bars start as copies of what you already have. Write one bar of drums, take LENGTH from 16 to 64, and bars 2, 3 and 4 are bar 1 again. Take a two-bar pattern to 64 and it repeats twice.

- **Copying never writes over notes.** A new bar that already holds steps keeps them and is not copied into.
- **Shortening deletes nothing.** Take LENGTH from 32 to 16 and bar 2 stops playing but stays in the pattern. Take it back to 32 and bar 2 is there as you left it, not a copy of bar 1.
- So you can make a variation: write bar 1, grow to 32, change bar 2, and shorten and lengthen as often as you like.
- CLEAR is the exception: it empties the steps past the end too (8.10.2).

8.6.3 The step's settings

Select a cell that holds notes and the band shows that step's settings. They change every note in the step together.

CONTROL	VALUES	WHAT IT DOES
HOLD	**1/2**, then **1** to **16**	How long the step's notes sound, in steps. 1/2 is half a step, a short note and the length every new note starts with. 4 is a quarter note at ×1; 16 is a whole bar. A note longer than one step is drawn as a line running right through the cells it sounds in.
RATCHET	**OFF**, **×2**, **×3**, **×4**, **×6**, **×8**	Plays the step's notes 2 to 8 times inside the one step, evenly spaced: a roll or a stutter.
LOUDNESS	**OFF**, **24**, **48**, **72**, **100**, **127**	How hard the step is played, as a velocity from 1 to 127. OFF plays each note at its own velocity (100 for a note you wrote in, what you played for one you recorded). Any other value plays every note of the step at that velocity.
CHANCE	**OFF**, **10%**, **25%**, **50%**, **75%**, **90%**	How often the step plays at all. Each time the loop reaches it, the step plays or stays silent, with that chance. OFF means it always plays.
EVERY (SHIFT)	**OFF**, **2**, **3**, **4**, **8**	Plays the step only on every 2nd, 3rd, 4th or 8th time round the pattern. OFF plays it every time.
SLIDE (SHIFT)	**OFF**, **25%**, **50%**, **75%**, **100%**	Makes the step's note glide in from the pitch the lane played before it, taking that share of a step to arrive. Synth lanes only.

8.6.4 How the step settings behave

These are the details that decide what you hear. Each one is what the sequencer does, not a fault.

- **RATCHET keeps every hit short.** With RATCHET on, each hit lasts at most half the gap to the next one, whatever HOLD says. A ratcheted step held for 4 steps still sounds as quick hits inside its own step.
- **EVERY counts from PLAY, and does not play on the first pass.** Switching the lane to the pattern starts the count again at that bar line. EVERY 2 plays the step the 2nd, 4th, 6th time round; EVERY 4 the 4th, 8th, 12th. With EVERY 8 on a one-bar pattern at 120 BPM, you first hear the step about 14 seconds in.
- **EVERY comes before CHANCE.** On a pass EVERY lets through, CHANCE then decides whether the step plays.
- **CHANCE rolls the same way each time you press PLAY.** The run of plays and misses varies from one pass to the next, but starting from STOP gives the same run again, so two plays from the top sound alike. Each lane has its own run.
- **Put SLIDE on the step you want to arrive at.** The note on the step carrying SLIDE glides in from whatever the lane played last, including a note you played on the keys yourself. With RATCHET, only the first hit slides. On a kit lane SLIDE does nothing. Its help line reads `HOW FAR IT SLIDES INTO THE NEXT NOTE`; what it does is the slide into this step's own note.
- **SLIDE is not the sound's GLIDE.** GLIDE on SHAPE (4.6.2) glides every note in MONO, LEGATO and UNISON. SLIDE glides only the step that carries it, in any play mode.
- **HOLD on a kit lane** changes only SLICER pads whose PLAY MODE is GATE or LOOP (7.5.6). KNOCK pads and one-shot SLICER pads play to their end whatever HOLD says.
- **HOLD shows the first note's length.** In a step recorded live, each note keeps the length you played. HOLD reads the first note's length, rounded; moving it gives every note of the step the new length.
- **On a lane on EXTERNAL MIDI, SLIDE and GLIDE are drawn off**: both shape a sound of Tonaut's, and the lane sends notes to your gear. A tap on either says `A MIDI LANE HAS NO SOUND OF ITS OWN`.

8.6.5 PAT OCT- and PAT OCT+: the whole pattern an octave

Gave a melody a new sound and it now sits too high or too low? Move the whole pattern an octave, as many times as you need.

To move a pattern down an octave:

01 On SEQ, focus the lane and go to PAT. The header names the pattern.

02 Hold SHIFT, or tap it to latch it. The band's last two lanes read PAT OCT- and PAT OCT+, and so do the keyboard's two end keys, its lowest and highest white keys.

03 Press PAT OCT-, on the band or the keyboard. Every note of the pattern moves down twelve semitones, the cells name the new notes, and the notice says PATTERN 03 DOWN AN OCTAVE.

04 Press it again to go down another octave.

- It moves every note of the pattern the header names, the steps past LENGTH included (8.6.2), whether or not a cell is selected.
- The keyboard's pair works on every page of SEQ and on PATTERN PLAY, PATTERNS and PERFORM too, wherever SHIFT is on. On every other screen those two end keys are blank under SHIFT.
- While your finger is on either of the band's keys, the header's readout shows the key and the pattern's lowest note, such as PAT OCT+ C4, so you can see where the notes went.
- Each press is one UNDO step, so SHIFT + UNDO, right beside it, takes a press back (8.10.1).
- **A press moves every note or none.** The notes stay inside the range Tonaut plays, MIDI notes 0 to 127. If one note would leave it, the press moves nothing and says A NOTE WOULD GO ABOVE THE TOP or A NOTE WOULD GO BELOW THE BOTTOM, so a melody's shape is never squashed against the end. That key stays a well until the other one has brought the notes back in.
- All four keys are wells, and a press says why, on a kit lane (DRUM LANES PLAY PADS · NO OCTAVES), on an empty pattern (NO NOTES IN THIS PATTERN TO MOVE) and while a take is recording (STOP THE TAKE FIRST).
- They rewrite the notes in the pattern. The keyboard's own octave keys, – and + at the ends of its top row, only move the keys you play (3.2).
- With HELP latched, they say THE WHOLE PATTERN DOWN AN OCTAVE and THE WHOLE PATTERN UP AN OCTAVE.
- On iPad they are the first two page keys under SHIFT (chapter 17).

8.7 BAR: the bar showing, and recording

BAR holds which part of the pattern you see, and everything live recording needs, on one page.

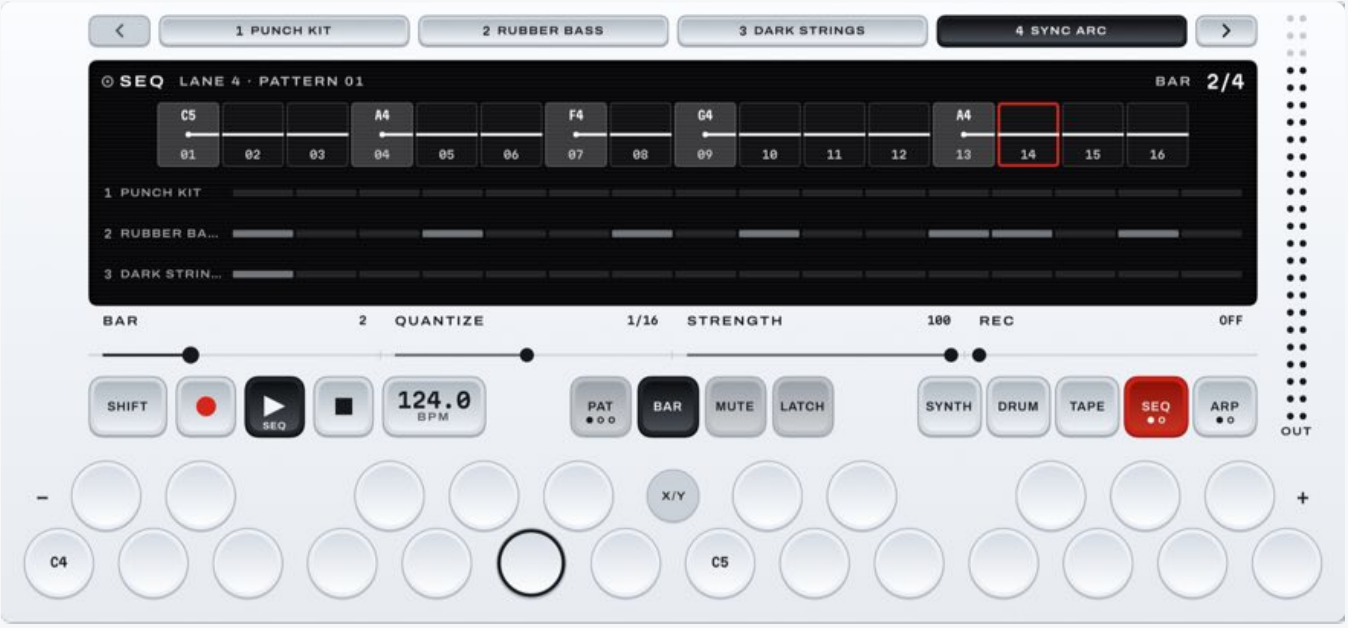


Figure 8.6 BAR: the bar you are looking at, then the three record controls. The header counts the bar too.

CONTROL	VALUES	WHAT IT DOES
BAR	**1** to **4**	Which sixteen steps the grid shows: steps 1–16, 17–32, 33–48 or 49–64. Each lane keeps its own, and it follows the playhead while the patterns play (8.7.1).
QUANTIZE	**OFF**, **1/32**, **1/16**, **1/8**, **1/4**	The note value that notes you record live are moved onto. Starts at 1/16 (8.8.5).
STRENGTH	**0** to **100**	How far they are moved: 100 puts them exactly on QUANTIZE's grid, 50 halfway, 0 leaves them where you played them. Starts at 100.
REC	**OFF**, **ON**	The pattern's live record arm: the switch the **REC** key works in LIVE (8.8.1). It arms live recording whatever the record mode, and never starts a STEP REC pass.
COUNT-IN (SHIFT)	**OFF**, **1 BAR**, **2 BARS**, **3 BARS**, **4 BARS**	Bars of clicks before a take started with PLAY, with CLICK on (8.8.3). Starts at 1 BAR.
CLICK (SHIFT)	**OFF**, **ON**	A click on every beat while anything plays. Starts at OFF. A tap on the tempo key turns it on or off too.
CLK LEVEL (SHIFT)	**00** to **99**	How loud the click and the count-in are. Starts at 80.
GLIDE (SHIFT)	**00** to **99**	Has nothing to act on yet (8.7.3).

QUANTIZE, STRENGTH and GLIDE belong to the pattern on screen, like LENGTH. COUNT-IN, CLICK and CLK LEVEL belong to the project.



Figure 8.7 BAR under SHIFT: the count-in and the click, and the four pattern tools on the page keys.

8.7.1 BAR: looking at bars 2 to 4

The grid shows sixteen steps at a time. To work on bar 2 of a two-bar pattern, go to BAR and move **BAR** to **2**. The cells are now steps 17 to 32, though each cell still shows its number within the bar, 01 to 16, and the header's readout reads BAR 2/2. The step badge on the band counts from the start of the pattern, so step 5 of bar 2 reads S21. The lane rows below show the same bar of the other lanes.

- BAR always has four positions, even when LENGTH is 16. Steps past LENGTH don't play, but you can see and edit them, and they are kept: a later LENGTH change brings them in (8.6.2). The readout then reads past the end, such as BAR 3/1.
- Moving BAR lets the selected cell go.
- Each lane keeps its own bar. Look at bar 3 of lane 2, focus lane 1, and lane 1 shows the bar you last left it on; come back to lane 2 and it is on bar 3 again.
- A lane is never shown past its own pattern when you arrive at it. When you focus a lane, switch its pattern (PAT, a PATTERNS tile or PATTERN PLAY), or make its pattern shorter, a bar past its LENGTH comes back to the pattern's last bar. So a one-bar pattern never opens on an empty bar 3. Only BAR moved by hand takes the grid past LENGTH.
- While the patterns play, every lane's bar follows its playhead. As lane 2's pattern moves on from bar 1 to bar 2, its grid turns to bar 2 on every page, and the readout counts along. The same happens while you record live.
- **A bar you pick by hand holds.** Move BAR, or touch a cell, while the patterns play, and that lane's grid stays on that bar so an edit is never pulled away. It follows again at the next PLAY, or when live recording starts. STOP leaves the grid where it is.
- When playback turns the grid to another bar, a selected cell in the bar it left is let go, so a key never writes into a cell you can't see.
- The bars are not saved. Opening another project, or a relaunch, starts every lane on bar 1.

8.7.2 COUNT-IN, CLICK and CLK LEVEL

These three are the tempo page's Count-in, Metronome and Level under SEQ's names (3.9). Change one place and the other follows.

- A count-in is 4 beats a bar, with a higher click on the first beat of each bar. It plays only when PLAY starts a take: the pattern armed with REC (8.8), or a tape track armed on TAPE. A plain PLAY starts at once.
- The count-in belongs to the click: with CLICK OFF nothing counts in, whatever COUNT-IN says. A new project's COUNT-IN is 1 BAR, so with CLICK on every take starts after four clicks. Set COUNT-IN to OFF to record with the click and no count-in.
- CLICK ON clicks on every beat whenever the transport runs, on every screen, the tape included, when you play and when you record alike. The first beat of every four is higher. A tap on the tempo key turns CLICK on or off from any screen, and the key is filled while it is on (3.9).
- The click is mixed in after everything else, so it never reaches the tape or a capture of Tonaut's own sound. A microphone can still pick it up from the speaker: use headphones when you record the mic.

8.7.3 GLIDE

GLIDE sets how smoothly a pattern moves between values that its steps lock a sound's controls to. Nothing puts such a value on a step yet, so GLIDE has nothing to act on, and you will not hear it change anything. Its help line reads `TIME TO SLIDE BETWEEN NOTES`. For a note that slides, use SLIDE on the step (8.6.3), or GLIDE on the sound's SHAPE page (4.6.2).

8.8 Recording live, and STEP REC

Instead of writing notes into cells, you can play them and let the pattern record them. Recording goes into the focused lane's pattern. Live, every pass round the loop adds to it (8.8.1 to 8.8.7); with STEP REC the transport stays still and each note or chord you play fills the next step (8.8.8).

REC on SEQ records in the **record mode**, `LIVE` or `STEP`. A new install starts on LIVE. To change it, hold `SHIFT` (or tap it to latch) and press `REC`: the notice says `REC MODE · STEP` or `REC MODE · LIVE`.

- While SHIFT is on, two dots sit under REC, LIVE's first, and the filled one is the mode. Without SHIFT REC has no dots.
- Tonaut keeps the mode for every project, and after a relaunch, until you change it.
- While the patterns are playing, REC records live whatever the mode: STEP REC works only with the transport stopped.
- Changing the mode ends a STEP REC pass, and changing it to STEP while the pattern is armed and stopped disarms it.
- With HELP latched, REC says the mode and how to change it: `REC MODE · LIVE · SHIFT + REC: STEP`.

8.8.1 Arming the pattern

On SEQ, press `REC`: with the record mode on LIVE, or in either mode while the patterns play. It turns red, a red dot appears in the header after the pattern number, and the notice says what happened:

- `PATTERN REC ON · FIRST NOTE STARTS` with the transport stopped (8.8.2);
- `PATTERN REC ON` while the patterns are playing: from now on, what you play is recorded;
- `PATTERN REC OFF` when you press REC again.

Steady red means armed: waiting for the first note, or counting in. REC **blinks** while a take is really being written: armed with the patterns playing, past any count-in. At `STOP` it goes back to steady red.

REC on SEQ arms the pattern, never the tape. The tape has its own REC on TAPE (11.3). The REC slider on the BAR page is this live switch, whatever the record mode, and REC works the same on PATTERN PLAY, PATTERNS and PERFORM, whose left header carries the same red

dot. With the mode on STEP, REC pressed there takes you to the grid and starts a STEP REC pass (8.8.8).

While a take runs with a cell selected, the red word after the dot names that cell's step, such as STEP 05. It only tells you which cell is selected: what you play still lands where you play it (8.8.4).

8.8.2 FIRST NOTE STARTS

Armed and stopped on SEQ, the header reads FIRST NOTE STARTS in red beside the dot. The pattern is waiting for you.



Figure 8.8 Armed and stopped: the first note you play starts the take.

To record starting on your first note:

01 On SEQ, with nothing playing and the record mode on LIVE, press REC. The header reads FIRST NOTE STARTS.

02 Play. The first key, pad or MIDI note you play starts every lane's pattern at that exact moment, and lands on step 1, exactly. REC starts to blink.

03 Keep playing along with the pattern. Each note is recorded where you played it.

04 Press STOP when you're done.

- There is no count-in for a take started this way.
- It works only on SEQ. Leave SEQ and the pattern waits for PLAY instead, so trying a sound on SYNTH never starts a take.
- On a kit lane with GROOVE on, the pad you hold starts the groove and the take together, the groove's first beat on step 1 (9.5).
- Holding a cell and writing into it (8.4) plays no note, so it does not start the take.

8.8.3 Starting with PLAY and a count-in

To get a count-in first:

01 Turn the click on: tap the tempo key, or on BAR hold SHIFT and set CLICK to ON. The click carries on through the take. A new project counts in one bar; to change it, set COUNT-IN on the same page to 1 to 4 bars.

02 Press REC, then PLAY. PLAY fills, the count-in clicks with REC steady red, and the patterns start from step 1 when it ends, REC blinking.

03 Play, then press STOP.

8.8.4 What a take records

- **Into the focused lane's pattern**, the one it is playing. The keys and a MIDI keyboard both play the focused lane, so both record: live recording is one way MIDI notes get into a pattern, and writing into a cell is the other (8.3.6).
- **Chords and locked notes record as you hear them.** With CHORDS on, one key records every note of its chord; with LOCK on, the note it was moved to, not the key you pressed (8.3.7). The chord pad records its chord's notes, a stick move records the notes that changed, and with STRUM on each note lands where it sounded (3.12.6).
- **Every pass adds.** A take never erases what is already in the pattern. Play the same note at the same moment again (within half a step) and it replaces the earlier one; everything else is kept. To start over, CLEAR the pattern (8.10.2).
- **Each note keeps its velocity and its length.** The on-screen keys all play at the same velocity; a MIDI keyboard records your touch. The length is how long you held the key.
- **Arpeggios and grooves record too**, as the notes they played (9.7), each into its own lane's pattern. A groove left running with HOLD on lane 1 records into lane 1's pattern while you play lane 2. On playback those notes are not arpeggiated again and do not restart the groove.
- **Each note is placed by the time you played it**, measured against what you were hearing, then moved onto the grid by QUANTIZE and STRENGTH (8.8.5).
- **A step holds eight notes.** A note that QUANTIZE would put in a full step goes into the step nearest to where you played it instead; if that step is full too, the note is not recorded.
- **The grid fills in as you play.** Recorded notes show in their cells straight away.
- While a take records, the keys play and record and never write into the selected cell. A held cell still takes notes (8.4), and with LATCH on a tap still writes or empties a cell (8.5).

8.8.5 QUANTIZE and STRENGTH, before and after

Every note you record keeps the exact time you played it, as well as where it sits now. So QUANTIZE and STRENGTH can be changed after the take, as often as you like, and nothing is lost.

- **QUANTIZE** is a note value, not a number of steps. At SPEED ×1 a step is a 1/16, so 1/8 is every second step and 1/4 every fourth. At ×2 a step is a 1/32, and 1/8 is every fourth step.
- **STRENGTH 100** puts every note exactly on QUANTIZE's grid. Lower values pull each note only part of the way, keeping some of your feel.
- **QUANTIZE OFF** leaves every note where you played it, and STRENGTH then does nothing.
- **Change them after recording** and every recorded note moves again from where you played it. Choose 1/4 by accident and the notes bunch onto quarter notes; choose 1/16 again and each goes back to where 1/16 puts it.
- Changing SWING or SPEED re-places recorded notes the same way.
- **Notes you wrote by hand never move.** QUANTIZE and STRENGTH only touch notes recorded live.

TIP

> If a take sounds stiff, try STRENGTH around 70 before you re-record. If it sounds loose, raise STRENGTH to 100, or try a coarser QUANTIZE.

8.8.6 Ending a take, and disarming

- STOP ends the take but **does not disarm**. REC stops blinking and stays steady red. Press PLAY again and you are recording again, even if you only meant to listen.
- To listen back without recording, press REC to disarm first (PATTERN REC OFF), then PLAY.
- While a take runs (REC on and the transport playing), UNDO, REDO and CLEAR are wells. Each take becomes one UNDO step when it ends (8.10.1).
- RESET is a well while the pattern is armed, playing or not (8.10.3).

NOTE

> The pattern stays armed when you leave SEQ, and nothing else on the panel says so: the red dot is only on SEQ's own windows, and REC on other screens is a well or arms something else. Press PLAY on SYNTH, DRUM or ARP while it is armed, and what you play there is recorded into the focused lane's pattern. Go back to SEQ and press REC to disarm.

8.8.7 Recorded steps are saved straight away

Notes you record live are saved with the project within about a second of the last one, like every other change (13.2).

8.8.8 STEP REC: a step at a time

STEP REC writes a pattern one step at a time, with the transport stopped. Play a note or a chord and it goes into the step under the cursor, and the cursor moves on to the next step. Nothing runs, so you can take as long as you like over each one.

To step-record a bass line:

01 Focus the lane, press SEQ, and make sure nothing is playing. With no cell selected the pass starts on step 1; to start somewhere else, tap that cell first.

02 If the record mode is LIVE, hold SHIFT and press REC. The notice says REC MODE · STEP. Let go of SHIFT.

03 Press REC. It turns steady red, the cell you start on fills (that is the cursor), the page keys read UNDO, REDO, REST and TIE, and the notice says STEP REC · PLAY STEP 1 · REST AND TIE ON THE KEYS.

04 Play a note. You hear it and the cell names it. Let go, and the cursor moves to the next cell.

05 Play the next note, and the next. For a step with nothing in it, press REST; to make the last note longer, press TIE (8.8.9).

06 When you have played the pattern's last step, the pass ends by itself and the notice says STEP REC · DONE AT 16 (the number is the pattern's LENGTH). REC is no longer red, and PAT, BAR, MUTE and LATCH come back.

What goes into a step:

- **The step's notes are replaced.** Whatever the step held before is gone, but its RATCHET, LOUDNESS, CHANCE, EVERY and SLIDE stay as they were (8.6.3).
- **Keys pressed together are one chord**, in one step, up to eight notes. The cursor moves on when you let go of the last of them, so you can also put a chord down a finger at a time, as long as one key stays down.
- **Each note lasts one step** (HOLD 1). For a longer note, press TIE after it (8.8.9), or change HOLD afterwards.
- **Each note is written at the velocity it was played with.** From the keys on screen that is always the same, about 102 (3.1.4); a note written into a selected cell goes in at 100 instead (8.3).
- **A key writes what it plays.** With LOCK on, the note it was moved to; with CHORDS on, its whole chord, in one step (8.3.7).
- **On the chord pad, one chord key is one step**, the stick's change included. The step takes the chord as it sounds when you let go of the key, so moving the stick while you hold it counts (3.12). STRUM's roll is not kept: the chord's notes go in together.
- **A MIDI keyboard step-records as the keys on screen do**: each note writes its step and the pass moves on when the key comes up; hold several keys and they go into one step as a chord, the pass moving on at the last release. On a chord pad lane its white keys are the chord keys and a black key moves the stick (3.12.7).
- **On a kit lane the pads go in**: one pad, or several struck together, a step at a time (8.11).
- The keys sound as you play them, through the arpeggiator if the lane's ARP is on, but the step takes the keys you pressed, not the arpeggio (9.7.1).

While the pass runs:

- The cursor is the filled cell. When it moves on past a bar's sixteenth step, the grid turns to the next bar with it.
- REC stays steady red: nothing moves until you press a key. The header shows no red dot, because nothing is recording live.
- The pass starts on the selected cell, or on step 1 when no cell is selected or the selected one is past the pattern's LENGTH.
- It never goes round: it ends at the pattern's LENGTH, 16, 32, 48 or 64 steps.
- On iPad the page keys read the same during a pass (chapter 17).



Figure 8.9 Three notes, a REST, a note and a TIE: the cursor waits on step 7 for the next note.

8.8.9 REST, TIE and moving the cursor

During a pass the four page keys are STEP REC's own, with SHIFT or without:

KEY	DOES
UNDO	Ends the pass and takes back everything it wrote, in one press (8.8.10)
REDO	Ends the pass, then does REDO's job (8.10.1)
REST	Leaves the step under the cursor empty, clearing whatever it held, settings and all, and moves on
TIE	Makes the last step you played one step longer, empties the step it now reaches into, and moves on. Press it again for a longer note: three TIEs after a note make it four steps long

- TIE is a well until there is a note to lengthen: at the start of a pass, after a REST, and after you move the cursor. A press says NOTHING TO TIE · PLAY A NOTE FIRST.
- Neither REST nor TIE does anything while you are holding a key.
- With HELP latched, REST says LEAVE THIS STEP EMPTY · MOVE ON and TIE LAST NOTE ONE STEP LONGER · MOVE ON.

To skip steps, or go back and play a step again, tap its cell. The cursor moves there, forward or back, and the notice says which step, such as STEP REC · STEP 9. The tap writes nothing and plays nothing, and the steps you skipped keep what they hold, so this is the way to rest without emptying a step. Not while a key is held.

8.8.10 Ending a pass

A pass ends by itself at the pattern's end, with STEP REC · DONE AT 16. It also ends, keeping everything it wrote, when you:

- press REC again;
- press PLAY: the pass ends and the patterns play from step 1, so you hear what you wrote;
- change the record mode with SHIFT + REC;
- press a mode key, SEQ's own included, or focus another lane;
- switch the lane to another pattern: the next key you press then writes nothing, and the pass ends.

Ended any of those ways, the notice counts the steps the cursor moved through, written, rested or tied: STEP REC OFF · 5 STEPS.

- The whole pass is one UNDO step. UNDO, during the pass or after it, takes back everything it wrote at once (8.10.1).
- Steps you write are saved with the project as you go, like every other change (13.2).
- The record mode stays on STEP after the pass. The next REC with the patterns stopped starts another pass; with them playing, REC still records live (8.8).

8.9 MUTE: pattern mutes

The MUTE page stops a lane's pattern from playing while the others carry on. Each lane has one pill, and a lit pill is a muted pattern.

To mute lane 2's pattern:

01 On SEQ, press MUTE. The band holds a pill for each lane the lane row shows: LANE 1 MUTE to LANE 4 MUTE on the first page of an eight-lane project on iPhone, all six in a six-lane one.

02 Tap LANE 2 MUTE. It lights the moment your finger lands, lane 2's pattern goes silent at once, mid-note if it has to, and for a moment the header reads LANE 2 MUTE.

03 Tap it again to bring the pattern back. It goes dark, the header reads PLAY for a moment, and the pattern comes back in time, because a muted pattern keeps counting its steps silently.

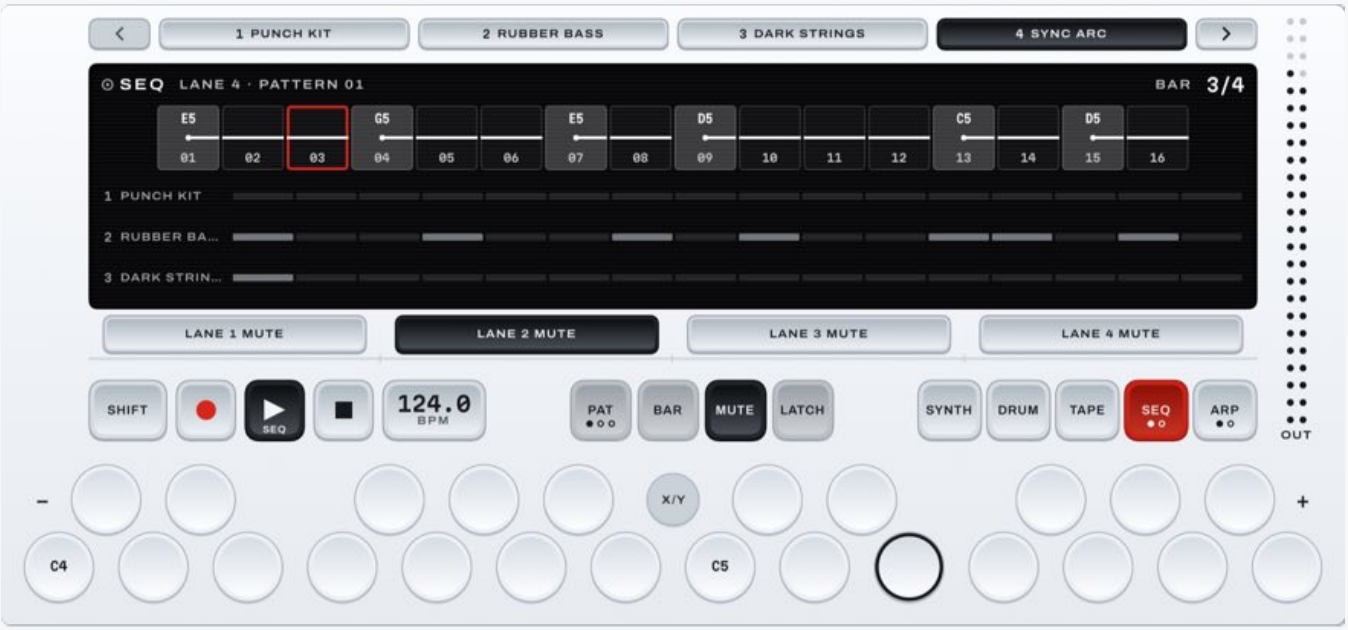


Figure 8.10 Lane 2's pattern muted. A lit pill is a muted pattern; the other lanes play on.

- You can mute any lane from here, whichever lane is focused. On iPhone the pills follow the lane row's page: use the arrows at its ends to reach lanes 5 to 8 (2.2).
- Where a column is too narrow for the words, every pill reads the lane number and MUTE, such as 2 MUTE.
- A pattern mute stops only the pattern. You can still play the lane on the keys or from a MIDI keyboard, and MIX still passes its sound.
- A mute does not stop live recording. Arm and play on a muted lane and the take still goes into its pattern; you hear those notes from the pattern once you unmute it.
- With REC SEQ on TAPE, a lane whose pattern is muted is left out of the take (11.7).
- Pattern mutes are saved with the project. RESET does not change them, and neither does PATTERN PLAY.
- Under SHIFT the MUTE page's band is blank.

Tonaut has four mutes, and they are different acts:

MUTE	WHERE	SILENCES	STILL SOUNDS
pattern mute	SEQ's MUTE page	the lane's whole pattern	your fingers, MIDI, the lane's tape track
pad mute	DRUM, a tap on the pad map (6.7)	one pad's hits from the pattern and the groove	your fingers, MIDI, the tape
channel mute	MIX (10.4)	the lane's live sound, played any way	the lane's tape track
track mute	TAPE, SHIFT + a track key (11.2), or TAPE MIX (10.10)	that tape track's playback	the lane itself

TIP

> To hear a lane on the tape without its pattern doubling it, mute the pattern here. To silence the lane however it is played, mute its channel on MIX; to silence its tape track as well, mute the track.

8.10 UNDO, REDO, CLEAR and RESET

Under SHIFT the four page keys become SEQ's pattern tools, on the same keys on PAT, BAR and MUTE, with LATCH on or off, and on PATTERN PLAY and PERFORM too. On PATTERNS, SHIFT gives that view's own keys instead (8.14.4): press PAT to leave it first. During a STEP REC pass the four are UNDO, REDO, REST and TIE, with SHIFT or without (8.8.9).



Figure 8.11 Right after the app opens there is nothing to undo or redo, so UNDO and REDO are wells. CLEAR is live because the pattern has notes, and so are PAT OCT- and PAT OCT+, on the band and at the ends of the keyboard.

KEY	UNDER SHIFT	DOES	A WELL, AND SAYS WHY, WHEN
PAT	UNDO	Takes back the last change to this pattern: UNDONE · PATTERN 03	nothing to undo, a take is recording, no project is open
BAR	REDO	Puts back what UNDO took: REDONE · PATTERN 03	nothing to redo, a take is recording, no project is open
MUTE	CLEAR	Empties this pattern in one press: PATTERN 03 CLEARED · UNDO PUTS IT BACK	the pattern is empty, a take is recording, no project is open
LATCH	RESET	Arms, then erases every pattern on every lane on a second press	the pattern is armed to record, playing or not (8.10.3)

A key that can act right now has a thin frame round its edge; a well has none. Right after the app opens, CLEAR and RESET are framed and UNDO and REDO are not; after your first change UNDO is framed too. An armed RESET is filled, and the fill is what tells you it is armed.

UNDO, REDO and CLEAR act on one pattern: the one the header names, which is the focused lane's selected pattern. Each pattern has its own history, so UNDO never changes a pattern you can't see. The one exception is an act made on PATTERNS, which UNDO takes back first (8.10.1).

A well still answers a press with its reason:

- NOTHING TO UNDO ON THIS PATTERN
- NOTHING TO REDO ON THIS PATTERN
- THIS PATTERN IS ALREADY EMPTY
- STOP FIRST · A TAKE IS RECORDING: REC is on and the transport is playing. This includes listening back with REC still on.
- NO PROJECT IS OPEN YET: in the first second after launch, and while a project is opening.
- COULD NOT CHANGE THE PATTERN: the sequencer refused the change. This should not happen; if you see it, please tell us what you were doing (14.10).

8.10.1 UNDO and REDO

One UNDO takes back one of these:

ONE UNDO STEP	COVERS
a key into the selected cell, or a note from a MIDI keyboard	one note added or taken out; with CHORDS on, the key's whole chord (8.3.7)

a held cell	everything written while your finger was on it, a whole chord
a LATCH tap	one cell written or emptied
a slider touch	HOLD, RATCHET, LOUDNESS, CHANCE, EVERY, SLIDE, LENGTH, SPEED, SWING, QUANTIZE, STRENGTH or GLIDE, from touching it to letting go, however far you dragged
CLEAR	the whole pattern's notes
a press of PAT OCT- or PAT OCT+	every note of the pattern moved one octave (8.6.5)
a take	everything recorded from REC on with the transport playing until STOP or REC off, one step for each pattern the take changed. A cell you held and wrote into during the take is part of it
a STEP REC pass	every step it wrote, rested or tied, from REC to the pass's end (8.8.10)
a COPY, SWAP or CLEAR on PATTERNS	every pattern it changed, on one lane or on all of them (8.14)

- **Not UNDO steps**: PATTERN, BAR, the MUTE page, REC and the record mode, COUNT-IN, CLICK and CLK LEVEL, a switch made with PATTERN PLAY, and a tap that plays a step. They change which pattern plays or how, not what is in it.
- A drag that ends where it began, or a change that changes nothing, leaves no step.
- **Strictly last change first.** UNDO after a SWING move takes back the SWING, not the note you wrote before it.
- **An act on PATTERNS comes back first.** Until you change any pattern again, UNDO takes back the last COPY, SWAP or CLEAR made on PATTERNS, on every pattern it touched, whichever pattern the header names: UNDONE · COPY 01 TO 05. REDO puts it back the same way.
- **REDO is lost as soon as you change the pattern**, a take included.
- **32 UNDO steps per pattern.** The 33rd change drops the oldest.
- The history is not saved. It starts empty after a relaunch, after opening a project (the same one included), after RESET, after you save a new version with SAVE AS on PROJECTS (13.5.1), and after REVERT (13.6). A project made with NEW starts empty. Renaming leaves the history alone.

8.10.2 CLEAR

SHIFT + CLEAR empties the pattern on screen in one press. Nothing arms and nothing asks: one UNDO puts every note back, and the notice says so.

- It empties every step, including the ones past LENGTH that you can't hear (8.6.2).
- It keeps the pattern's settings: LENGTH, SPEED, SWING, QUANTIZE, STRENGTH and GLIDE.
- It touches only this pattern of this lane. To clear another pattern without switching to it, or the same pattern on every lane, use CLEAR on PATTERNS (8.14.3).
- A selected cell stays selected, now empty.

8.10.3 RESET

RESET erases every pattern on every lane and puts each one's settings back to their starting values (LENGTH 16, SPEED ×1, SWING 00, QUANTIZE 1/16, STRENGTH 100, GLIDE 00). It cannot be undone, so it asks first.

01 Press SHIFT + RESET. The key fills (armed), and a two-line warning stays up for eight seconds: **ERASE ALL 128 PATTERNS? PRESS AGAIN** / **THIS CANNOT BE UNDONE**.

02 Press SHIFT + RESET again within those eight seconds. The notice says how many patterns had notes, such as **SEQUENCER RESET · 5 PATTERNS ERASED**, or **THE SEQUENCER IS ALREADY EMPTY**.

- The warning counts eight lanes of sixteen patterns, in a six-lane project too.
- To cancel, wait eight seconds, press PAT, BAR or MUTE, or change lane or screen. The key stops being filled and the notice says **RESET CANCELLED**. UNDO, REDO and CLEAR cancel it too, and then do their own job. LATCH does not cancel it.
- With the pattern armed to record, playing or not, RESET is a well: it has no frame, a press neither arms nor warns, and the line says **TURN PATTERN REC OFF FIRST**. Press REC to disarm, and RESET is framed again.
- RESET also empties every pattern's UNDO history, so nothing can bring a pattern back.
- It leaves alone which pattern each lane plays, the pattern mutes, COUNT-IN and CLICK, every sound, the mix, the tempo and the tape. DRUM's pad mutes stay too.

> NOTE
>
> RESET is on the same key as LATCH. If you latched SHIFT for a run of UNDO presses, the fourth key is RESET, not LATCH, until you tap SHIFT off. One press only arms it, so a stray press costs nothing if you wait.

8.11 Drum lanes in SEQ

A kit lane works in SEQ the way a synth lane does, with pads instead of pitches.



Figure 8.12 On a kit lane the cells name pads, and the keys are the 24 pads. The ringed pads, 2, 3 and 8, are the step under the red outline.

- The keys read `1` to `24`; each is a pad. Tap a cell and press a pad to put that pad in the step.
- Cells show pad numbers, lowest first: **`1`**, **`1,3`**, and for four pads or more the lowest and how many more, such as **`1+3`**.
- Several pads in one step play together, up to eight. A tap on a cell plays its pads (8.3.5).
- LATCH latches a pad. The octave keys `–` and `+` are wells on a kit lane (**A KIT HAS 24 SOUNDS, NOT 24 PITCHES**), so the latched pad never moves. So are `PAT OCT-` and `PAT OCT+`, on the band and the keyboard (**DRUM LANES PLAY PADS · NO OCTAVES**), and LOCK and CHORDS leave a kit lane alone.
- A MIDI keyboard writes the pad its note strikes (8.3.6).
- STEP REC writes a beat a step at a time: strike the pads for a step together, let go, and the cursor moves on; REST leaves a step empty (8.8.8).
- HOLD matters only for SLICER pads set to GATE or LOOP; SLIDE does nothing on a kit lane (8.6.4). RATCHET, LOUDNESS, CHANCE and EVERY work as on any lane, and they are the main tools for a drum part: RATCHET for rolls, LOUDNESS for accents, CHANCE and EVERY for variation.
- A pad muted on DRUM stays silent in the pattern, but its notes are still in the cells (6.7).
- Live recording on a kit lane records the pads you hit, and with GROOVE on, the groove's hits (9.7).

TIP For a basic beat: LATCH on, press pad 1 and tap cells 01, 05, 09 and 13; press another pad and tap the off-beats; LATCH off. Then grow LENGTH to 64 and change the fourth bar for a fill.

8.12 Recording patterns to tape

SEQ itself never records audio. To put your patterns on the tape, use REC SEQ, a slider under SHIFT on TAPE (11.7). Set to **EACH**, it records every lane onto its own track, lane 1 onto track 1 and so on. Set to **ONE**, it mixes the lanes you hear, at their MIX levels, onto the selected track (11.7.4). Either way the patterns start from step 1 on a bar line of the tape (11.7.3).

- A lane whose pattern is muted on SEQ's MUTE page is left out (8.9).
- A lane on EXTERNAL MIDI is left out too: it plays your gear, and Tonaut doesn't hear it (chapter 16).
- Everything that plays goes into the take: switches you make with PATTERN PLAY (8.13), and PERFORM's faders and the X/Y pad as you move them (chapter 15). So you can play an arrangement onto the tape live.

8.13 PATTERN PLAY: switching every lane together

PATTERN PLAY moves every lane to the same pattern number at once, the way a song moves from verse to chorus. Put the verse in pattern 01 of each lane, the chorus in 02, a break in 03, and play your way through them.

To open it, press PAT while you are on the PAT page. PAT's second dot fills, and both windows hold sixteen numbered boxes, eight in each.
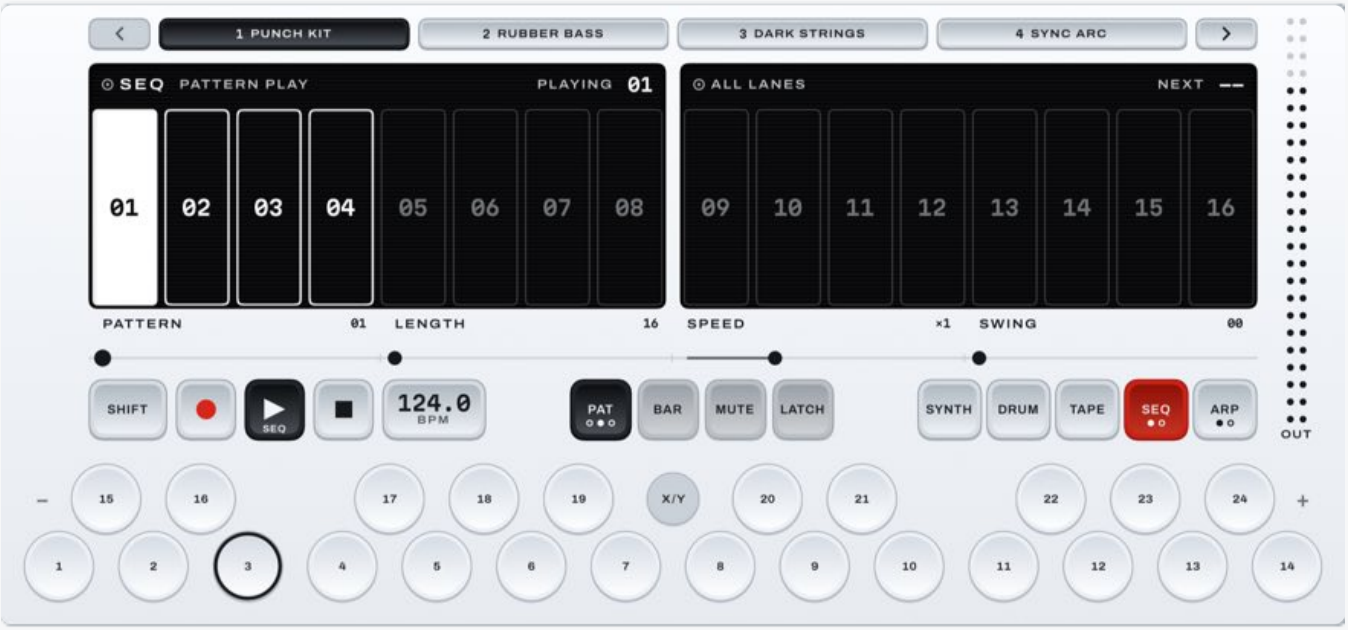


Figure 8.13 Every lane is playing pattern 01. Patterns 02 to 04 hold notes on at least one lane; the grey boxes are empty everywhere.

THE BOX	MEANS
outlined	at least one lane has notes in that pattern. Tap it to go there
grey	no lane has a note in it. It takes no tap
solid	every lane is playing this number now
flashing, with NEXT under the number	queued: every lane goes here at the next switch

The left header reads PLAYING and the number every lane is on; the right reads ALL LANES and NEXT with the number queued, or -- while nothing is. If the lanes are playing different numbers (each chosen with PAT's PATTERN), no box is solid and PLAYING reads --; a tap on any outlined box brings them together.

8.13.1 Switching while stopped

Tap a box. Every lane goes to that pattern at once and the box turns solid. Press PLAY and they all start it from step 1.

8.13.2 Switching while the patterns play

To move the song on to pattern 02:

01 Tap box 02. It flashes and reads NEXT, and the right header reads NEXT 02. Nothing changes yet.

02 Keep playing. At the end of the longest pattern playing, every lane switches together and starts pattern 02 on step 1. Box 02 turns solid.

- **When the switch comes.** The longest pattern among the lanes that are playing notes decides: the switch lands where it ends, counted from when the lanes last started together (PLAY, or the last switch), so every lane stays in step. With four-bar patterns playing, the switch can be up to four bars away. With no lane playing a note, it comes at the next bar line.
- **Change your mind** before the switch: tap another box, and it is queued instead. Tap the solid box to cancel the queue.
- **Now, not later**: press PLAY while a box flashes and the switch happens at once.
- STOP clears the queue. The lanes keep the pattern they were playing.

8.13.3 What a switch does

- A lane with nothing in the new pattern goes quiet until the next switch. Its pattern mute is not touched.
- A lane whose new pattern is shorter than the longest loops it as usual.
- Each lane's PATTERN follows the switch, so SEQ's header and grid name the new pattern, and the project keeps it.
- A switch writes no notes and is not an UNDO step.
- REC SEQ on TAPE records the switches with everything else, so a take holds your arrangement as you played it (11.7).

While PATTERN PLAY shows, the band holds the focused lane's PATTERN, LENGTH, SPEED and SWING, and the keys play the focused lane. Press PAT again for PATTERNS (8.14), or BAR or MUTE for those pages. With HELP latched, a touch on a box says TAP TO TAKE EVERY LANE TO THIS PATTERN and switches nothing.

> **TIP** Make each section across the lanes under one number first: write the verse on every lane's pattern 01, then use COPY ALL on PATTERNS (8.14.4) to start the chorus as a copy in 02, and change what should change.

8.14 PATTERNS: copy, swap and clear patterns

PATTERNS shows the focused lane's sixteen patterns as tiles, so you can see them all at once, play one, and copy, swap or clear them, on one lane or on every lane together.

To open it, press PAT on PATTERN PLAY: that is the third press of PAT from the PAT page, and PAT's third dot fills.



Figure 8.14 One lane's sixteen patterns at a glance: the solid tile is the one playing.

- **A tile** shows the pattern's number, a small picture of its notes (one dot a note, left to right across the pattern's length, low notes at the bottom), and at its foot its length, `1 BAR` to `4 BARS`, or `EMPTY`.
- The pattern the lane is playing is solid. One it is about to switch to has a heavier outline, and the right header reads `NEXT` and its number.
- The left header reads `SEQ`, the lane and `PATTERNS`, such as `LANE 1 · PATTERNS`, and `PLAYING` with the lane's pattern. The right header names the key at work and the tile it has, such as `COPY 01`.
- The page keys are `PAT` (lit), `COPY`, `SWAP` and `CLEAR`. Press `PAT` to go back to the PAT page's grid. The key at work is lit beside it.
- To see another lane's patterns, tap its lane button. While COPY waits for a target, that lane's tiles become the places it can go (8.14.2); a waiting SWAP or CLEAR lets go.
- The band holds the focused lane's PATTERN, LENGTH, SPEED and SWING, and the keys play the focused lane.

8.14.1 Playing a pattern from its tile

With no key at work, tap a tile and the lane plays that pattern, as PATTERN on the PAT page would: at once when stopped, at the next bar line while playing (8.2.1). Only the focused lane changes. With HELP latched, a tile says `TAP A PATTERN TO PLAY IT ON THIS LANE` instead.

8.14.2 COPY and SWAP

COPY writes one pattern over another: its notes and all its settings, LENGTH, SPEED and SWING included.

To copy a pattern:

01 Press `COPY`. It lights, and the pattern the lane is playing is the one to copy: its tile reads `FROM`, and the notice says `COPY 01 · TAP WHERE IT GOES`.

02 To copy a different pattern, tap its tile first. It reads `AGAIN`, as a target would; your next tap, on another tile, makes it the one to copy.

03 Tap the tile it should go to. If that tile is empty, the copy is made at once: `COPIED 01 TO 05`.

04 If the tile already holds something, it reads `AGAIN` and the notice says `TAP AGAIN TO REPLACE 05`. Tap it a second time to replace it.

COPY also takes a pattern to another lane, so a melody you like can move to a new sound while the original stays where it is. To copy lane 3's pattern 02 to lane 4:

01 On lane 3's PATTERNS, press COPY. If lane 3 isn't playing pattern 02, tap tile 02.

02 Tap lane 4's button. PATTERNS shows lane 4's tiles, the right header reads COPY LANE 3 · 02, and the notice says COPY LANE 3 · 02 · TAP WHERE IT GOES.

03 Tap the tile it should go to on lane 4, any of the sixteen. An empty one takes the copy at once: COPIED LANE 3 · 02 TO LANE 4 · 05.

04 If the tile already holds something, the notice says TAP AGAIN TO REPLACE 05. Tap it a second time to replace it.

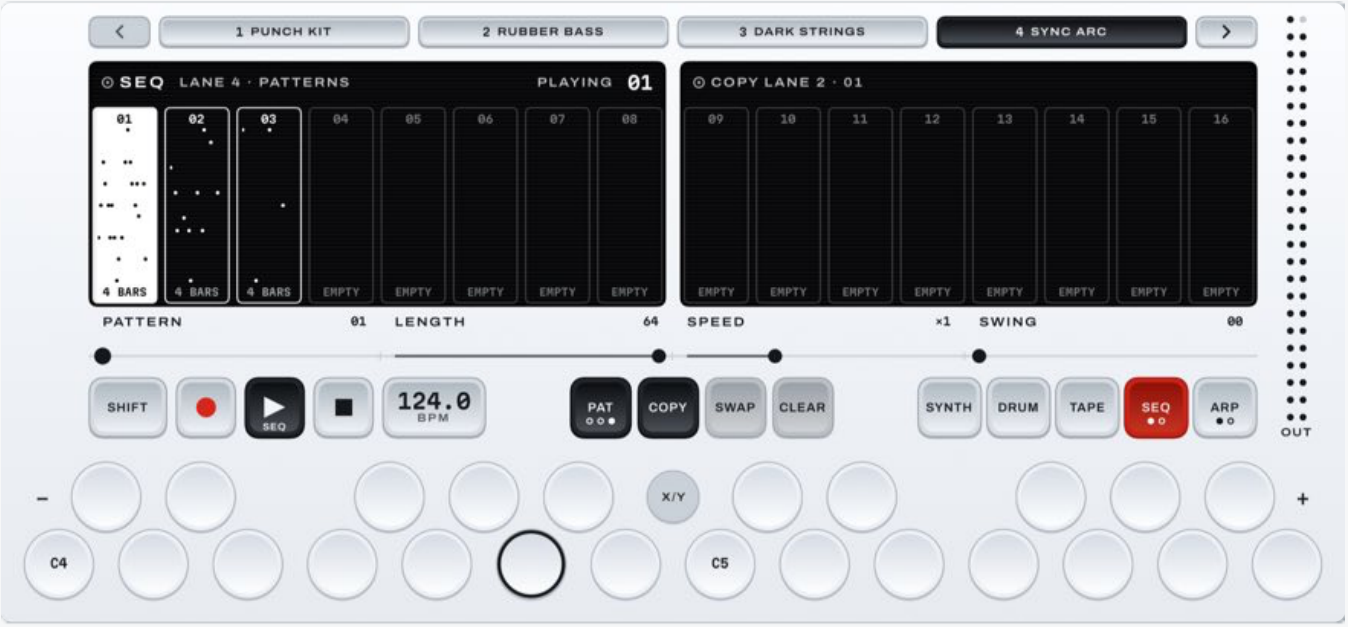


Figure 8.15 COPY taken to another lane. The right header keeps the source, lane 2's pattern 01, while lane 4's tiles show.

- The copy takes the pattern's notes and its LENGTH, SPEED and SWING, as a copy on one lane does. One UNDO takes it back: UNDONE · COPY LANE 3 · 02 TO LANE 4 · 05 (8.14.5).
- Synth and drum patterns don't mix. On a lane of the other kind the notice says A SYNTH PATTERN CAN'T GO ON A DRUM LANE or A DRUM PATTERN CAN'T GO ON A SYNTH LANE, a tile tapped there copies nothing, and the copy waits for a lane of its kind. A lane on EXTERNAL MIDI counts as the kind of sound it keeps.
- Tap a third lane's button before you choose a tile and the copy still comes from lane 3. Go back to lane 3 and it is a copy on lane 3 again.

SWAP exchanges two patterns, notes and settings.

01 Press SWAP. The notice says SWAP · TAP TWO PATTERNS.

02 Tap the first tile. It reads SWAP and the notice says SWAP 03 · TAP THE OTHER. Tap it again to let it go.

03 Tap the other tile. The two change places: SWAPPED 03 AND 07.

- When the copy or swap is done, the key lets go. Press it again to do another.
- Press the lit key again to let it go without doing anything; press another key to start that one instead.
- Two patterns that are already the same are left alone: THEY ARE ALREADY THE SAME.

8.14.3 CLEAR

CLEAR on PATTERNS empties any pattern of the lane, without switching to it. It asks first.

01 Press CLEAR. It arms on the pattern the lane is playing: its tile reads CLEAR and the notice says CLEAR 01? PRESS CLEAR AGAIN.

02 To clear another pattern, tap its tile. CLEAR moves there: CLEAR 05? PRESS CLEAR AGAIN.

03 Press CLEAR again within eight seconds: CLEARED 05.

- Like SEQ's own CLEAR (8.10.2), it takes the notes and keeps the pattern's settings.
- An empty pattern is left alone: NOTHING TO CLEAR.
- Wait eight seconds and CLEAR lets go; the notice says RESET CANCELLED. COPY, SWAP or PAT let go of it too.

8.14.4 ALL LANES: COPY, SWAP and CLEAR on every lane

Under SHIFT, the three keys read COPY ALL, SWAP ALL and CLEAR ALL, PAT is blank, and the header reads ALL LANES · PATTERNS. Press one with SHIFT held or latched, and it works as above on every lane of the project at once, at the numbers you tap.



Figure 8.16 Under SHIFT the three keys act on every lane's pattern at those numbers.

- COPY ALL from 01 to 05 copies each lane's pattern 01 onto its own pattern 05, each keeping its own length, speed and swing. A section of the song is copied in one move.
- SWAP ALL swaps two numbers on every lane: a way to reorder the song's sections.
- CLEAR ALL empties one number on every lane, after the second press.
- The tiles still show the focused lane. A target counts as holding something if any lane's pattern there does, so COPY ALL asks for the second tap then.
- The notices carry ALL: COPY ALL 01 · TAP WHERE IT GOES, COPIED 01 TO 05 ALL, CLEAR ALL 05? PRESS CLEAR AGAIN.

8.14.5 Taking an act back

Each COPY, SWAP or CLEAR is one UNDO step, however many patterns it changed. To take it back, press PAT to leave PATTERNS, then SHIFT + UNDO: UNDONE · COPY 01 TO 05. Until you change a pattern again, UNDO takes this act back first, on every pattern it touched (8.10.1). While a take is recording, a COPY, SWAP or CLEAR is refused with STOP THE TAKE FIRST and changes nothing.

With HELP latched, the keys say what they do: COPY COPY A PATTERN · TAP FROM, THEN TO, SWAP SWAP TWO PATTERNS · TAP BOTH, CLEAR EMPTY A PATTERN · PRESS TWICE, and PAT BACK TO THE PATTERN PAGE.

09 ARP, GROOVE and the clock

The ARP key sets up a lane's note generator. On a synth lane it is the arpeggiator, which turns the keys you hold into a run of notes. On a kit lane it is GROOVE, which turns one held pad into a whole drum beat. Every lane has one or the other, up to eight at once. Grooves, and arpeggios set to LOCK, keep time on one shared clock, so what you start lands on the same beat.

9.1 The arpeggiator belongs to the lane

An arpeggiator plays the notes of a chord one after another, in time with the tempo, for as long as you hold the chord. Hold C, E and G and it plays C, E, G, C, E, G until you let go.

In Tonaut the arpeggiator is part of a **lane**, not of a screen. Each synth lane has its own, with its own eight settings. Switch it on for lane 2 and lane 2 arpeggiates on every screen: SYNTH, SEQ, PERFORM, TAPE, MIX, EDIT and the browsers. You set it up on the ARP screen and then go and play wherever you like.

What that means in practice:

- It hears your hands. The on-screen keys and a MIDI keyboard (3.8) both feed it. Notes from a MIDI keyboard keep their velocity, so each note of the run is as loud as you pressed its key. It hears them after the KEY page's rules: with LOCK on it gets the notes moved into the lane's scale, and with CHORDS on one key gives it a whole chord (3.11, 9.9).
- It doesn't hear the lane's pattern. Notes SEQ plays go straight to the sound, arpeggiator on or off.
- The keys you hold don't sound on their own. You hear only the notes the arpeggiator plays from them.
- Its settings are saved with the project, lane by lane. Loading another patch onto the lane keeps them, so you can audition patches through a running arpeggio (5.3.1). A quick slot holds the sound only, not the arpeggiator (3.6).
- Every synth lane can arpeggiate at the same time, each at its own settings.
- A kit lane has no arpeggiator. It has GROOVE instead (9.4). Load a kit onto a synth lane and its arpeggiator stops, but its settings are kept for when the lane holds a synth sound again.
- The keys the arpeggiator is playing wear a ring on every screen, while that lane is focused; in the iPhone's TN looks their LEDs light bright instead (3.4).
- On a lane set to EXTERNAL MIDI, the arpeggiator plays your own synth instead of a Tonaut sound (9.8).

9.1.1 The ARP key

Press ARP, the fifth mode key. What opens depends on the focused lane:

- a synth lane opens the **ARP screen** for that lane;
- a kit lane opens **GROOVE** for that kit (9.4).

Press ARP again and it opens its second place, KEY, where you set the lane's key, scale and chord mode (3.11). The key wears two dots under its name, one for each place, the filled one where you are; press it once more to go back. On a kit lane it goes from GROOVE to KEY and back the same way.

Unlike SYNTH and DRUM, the ARP key never moves you to another lane and never refuses. It stays on the lane you pressed it from. Tapping a lane button while you're on ARP stays on ARP too: it shows that lane's arpeggiator or groove. SHIFT + ARP reads MIX and opens the mixer (10.1).

9.1.2 The ARP mark

The arpeggiator keeps running when you leave the ARP screen, so SYNTH tells you it's on. While the focused lane's ARP is switched on, the word ARP appears in SYNTH's header, after the sound's name and the MIDI mark. It shows whenever ARP is ON, whether or not you're holding keys, and goes the moment you switch it off. It is never lit in red and never dimmed: it's there or it isn't.

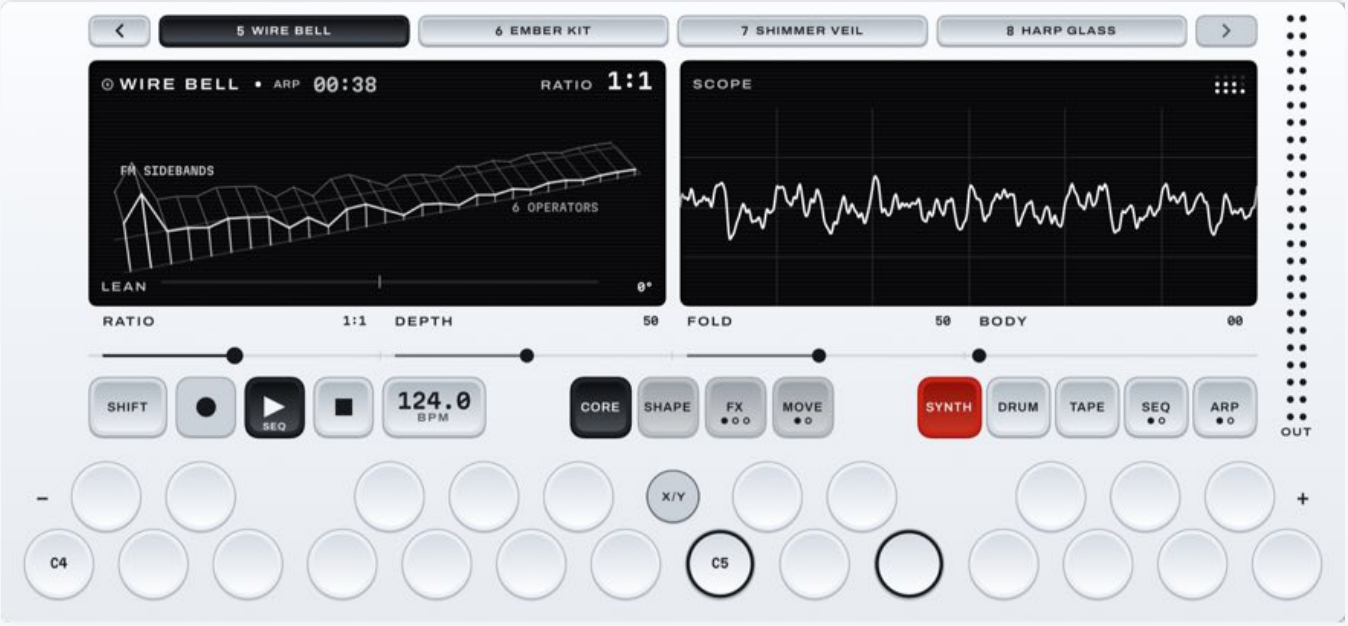


Figure 9.1 The ARP mark on SYNTH: this lane is arpeggiating, though you're not on ARP.

The mark only speaks for the focused lane. To see every lane at once, look at the LANES window on ARP (9.2.3). While the mark shows, a long patch name may be shortened to make room for it.

9.1.3 Your first arpeggio

To hear an arpeggio on a new project:

01 Tap lane 4's button. A new project has a synth sound there, Bottle Glass. (Lanes 1 and 2 hold kits, and lane 3's bass sits two octaves down.)

02 Press ARP. The left window reads ARP and LANE 4.

03 Drag the band's first slider, ARP, to ON. Row 1 of the right window now reads 1/16 UP.

04 Hold C3, E3 and G3. You hear C, E, G repeating, one sixteenth note each, at the project's tempo. The left window draws three rising bars, and the one sounding is filled.

05 Let go. The note that is sounding finishes, and the arpeggio stops.

9.2 The ARP screen

The ARP screen is where you set up a synth lane's arpeggiator while you play it. The left window draws the pattern the settings make; the right window, LANES, shows what the lanes are doing. Below them, the band holds the eight controls (9.3).



Figure 9.2 ARP with nothing held. The faint bars are a demonstration of the mode, not notes you played. Every row in LANES reads two dashes: no lane on this page has ARP or GROOVE on.

Nothing in ARP's windows or on its band is ever red, because nothing here records or arms anything. The lit ARP key, red in LIGHT and DARK, only tells you which screen you're on. On iPad, ARP and GROOVE lay out the same controls differently (chapter 17).

9.2.1 The page keys are the lanes

On ARP the page keys are the lanes, and on iPhone each reads LANE over its lane's number. Each one focuses its lane, exactly as the lane button does, and the filled key is always the focused lane. Press `LANE 3` and lane 3's button fills too; tap lane 2's button and `LANE 2` fills.

- In an eight-lane project on iPhone there are four keys, and they show the lanes the lane row shows: `LANE 1` to `LANE 4`, or `LANE 5` to `LANE 8` after the lane row's arrow (2.2). The LANES window pages with them.
- In a six-lane project there are six keys, narrower, each still reading LANE over its number.
- Pressing the key of a kit lane shows that lane's GROOVE (9.4). Pressing a synth lane's key from GROOVE brings the ARP screen back.
- Focusing another lane lets go of any keys you're holding, so an arpeggio without HOLD stops. With HOLD on it keeps playing.
- Under SHIFT the page keys are blank and take no touch.
- On KEY, ARP's second place, the page keys are the lanes too: pressing one stays on KEY and shows that lane's key, scale and CHORDS (3.11.1).

9.2.2 The left window: the pattern

The header reads `ARP` and the lane, such as `LANE 2`. On the right is the control you touched last and its value, such as `RATE` `1/16`.

Below it the window draws one full cycle of the arpeggio, left to right: every note it plays before the order repeats. The drawing is made from the notes the arpeggiator is really playing, in the order it will play them, so it can't disagree with what you hear.

- **Each note is a short bar**, placed high or low by its pitch. Five modes draw one bar per step; CHORD draws a column of bars per step, one for each note of the chord.
- **The bar's length is GATE**: a short bar for a short note.
- **SWING** shifts every second bar to the right. A LOCKed arpeggio under a swung groove plays swung (9.6.4), and the picture shows it: with SWING at **00** the bars already sit long-short, and SWING moves every second one further.
- **Thin horizontal lines** mark each octave above the lowest note, so **OCTAVES 3** reads as three bands.
- **The filled bar** is the note sounding now. It is the only thing that moves, and only while notes are sounding.
- **The window draws up to 32 steps.** Only UP-DN over more than seventeen notes in all (the held notes times OCTAVES, such as six notes at OCTAVES **3**) runs longer. Then you see its first 32 steps, and the filled bar and the LANES marker drop out of sight while the run is past them.



Figure 9.3 UP over four held notes. The filled bar moves along the climb as each note plays.

With nothing held, the window draws a demonstration: the shape the current MODE, OCTAVES, GATE and SWING would make from a plain major chord. The chord is built on the last note you played on this lane with the screen keys, or on the keyboard's lowest key if you haven't played one. It is drawn in a fainter grey with no filled bar, so you can tell it from the real thing. Change MODE with nothing held and the shape changes, so you can learn the six modes by looking. Hold keys and the drawing becomes your notes at full strength.



Figure 9.4 CHORD draws a column: every held note together, on every step. Each bar's length is GATE, here 50%.

9.2.3 The right window: LANES

The LANES window has one row per lane, so you can see what every lane's generator is doing without changing lanes. It shows the lanes the lane row shows: on iPhone, four at a time in an eight-lane project and all six in a six-lane one. Each row shows the lane number, the lane's sound name (shortened if it's long), its state, and a thin line with a marker.

THE ROW READS	MEANS
`1/16 UP`	A synth lane with ARP on: its RATE and MODE.
`FUNK 70%`	A kit lane with GROOVE on: its STYLE and COMPLEXITY.
`--`	ARP or GROOVE is off on that lane.

The thin line is drawn only while the lane's ARP or GROOVE is on. A small square runs along it as the lane plays, from the first step of the cycle at the left to the last at the right. It disappears when nothing is sounding. The focused lane's row is drawn at full strength and the others paler. The window takes no touch: use the page keys or the lane buttons to change lanes.

The state column is twelve characters wide. `1/16T RANDOM` fits, but a long style with its percentage, such as `DRUM & BASS 30%` or `BREAKBEAT 30%`, can be cut short.

9.2.4 The keyboard, SHIFT and the transport on ARP

The keyboard plays the focused lane, through its arpeggiator when ARP is on. On a kit lane the keys are pads 1 to 24 (3.3).

You can tap `SHIFT` to latch it or hold it while you use a shifted control (2.7). Under SHIFT on ARP and GROOVE:

- the band shows the second four controls, each with the **SH** badge;
- the page keys are blank;
- the keyboard's upper row becomes the quick slots `1` to `7`, with `8` in the gap between the upper octave's E and F, then `UNDO`, `DIE` and `HELP`; the lower row's two end keys are blank, and the twelve keys between them keep playing (2.8.1). The `-` and `+` at the ends of the top row still move the octave; on a kit lane they are drawn off and say `A KIT HAS 24 SOUNDS, NOT 24 PITCHES` (3.3.1);
- the tempo key reads `TAP TEMPO`, so you can tap the tempo in while you set up the arpeggio (3.9);
- the mode keys become their doors, and `ARP` reads `MIX` (2.6);
- `REC`, `PLAY` and `STOP` don't change.

`DIE` does not scramble the arpeggiator or the groove. On ARP and GROOVE it scrambles eight controls of the focused lane's sound, on one of its pages (usually the one SYNTH or DRUM showed last), which you can't see from here. Each press rolls a new set; `UNDO`, on DIE's left, takes the rolls back one at a time, up to eight (3.7).

PLAY plays the patterns here, as on every screen but TAPE and the recorder, and reads **SEQ** under its triangle to say so. PLAY pressed while the patterns are stopped, with no arpeggio running on the lane, says **HOLD KEYS**: the patterns start, but the arpeggiator plays only while keys are held, or latched with HOLD. REC is a well: it arms nothing on ARP (2.10). STOP stops the patterns but not an arpeggio or a groove (9.6).

The X/Y key in the keyboard's middle gap works here: the X/Y pad takes the LANES window's place until you press it again (15.6).

With HELP latched (SHIFT + HELP, 2.9), a quick tap on any of the eight sliders shows its line, and a drag still moves it (2.9.2). ARP and GROOVE each have their own lines: ARP's HOLD reads **KEEP PLAYING AFTER YOU LET GO**, GROOVE's **KEEP THE GROOVE GOING AFTER YOU LET GO**.

9.3 ARP controls

The arpeggiator has eight controls: four on the band and four under SHIFT. Each column of the band is one idea on two layers: switching (ARP and HOLD), timing (RATE and SWING), order and clock (MODE and SYNC), size (GATE and OCTAVES). Every control works whether ARP is on or off, so you can set it up before you switch it on.

CONTROL	LAYER	VALUES	A NEW LANE STARTS AT
ARP	band	`OFF`, `ON`	`OFF`
RATE	band	`1/4`, `1/8`, `1/8T`, `1/16`, `1/16T`, `1/32`	`1/16`
MODE	band	`UP`, `DOWN`, `UP–DN`, `PLAYED`, `RANDOM`, `CHORD`	`UP`
GATE	band	`5%` to `95%`	`50%`
HOLD	SHIFT	`OFF`, `ON`	`OFF`
SWING	SHIFT	`00` to `99`	`00`
SYNC	SHIFT	`FREE`, `LOCK`	`LOCK`
OCTAVES	SHIFT	`1`, `2`, `3`, `4`	`1`

GATE and SWING are smooth controls; the other six step. Double-tap GATE to put it back to `50%`, or SWING to put it back to `00`. A double-tap on a stepped control does nothing. SHIFT + double-tap puts back any control's last change, stepped ones too (2.4.4).

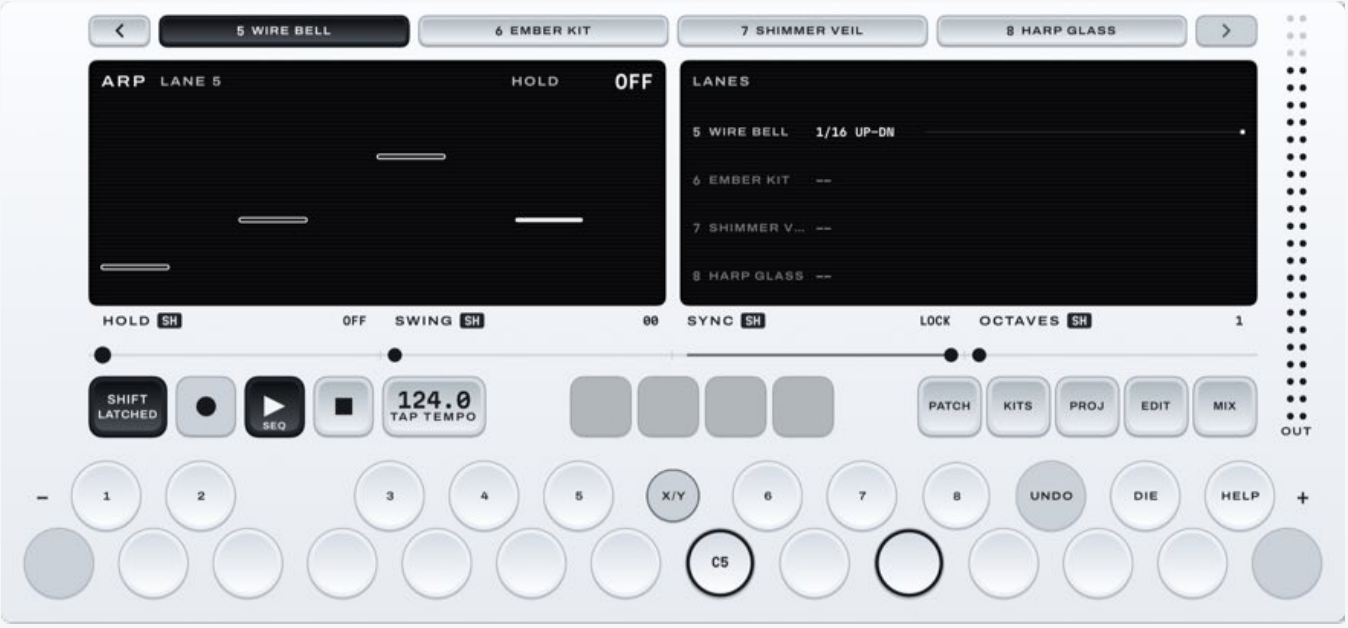


Figure 9.5 The second four, under SHIFT: HOLD, SWING, SYNC and OCTAVES.

9.3.1 ARP: on and off

ARP switches the lane's arpeggiator on and off. Its help line says it plays held notes one after another.

- Switched on while you're already holding keys, it doesn't take them over. The notes you're holding keep sounding as plain notes, and the arpeggio starts with the next key you press. Lift your hand and play the chord again.
- Switched off while it plays, the note sounding finishes its GATE, and the run stops. Keys you're still holding don't start sounding on their own; play them again.
- With HOLD on, the latched chord starts as soon as you switch ARP on (9.3.5).

9.3.2 RATE: how often the next note comes

RATE is the length of one step of the arpeggio as a note value at the project's tempo: **1/4** is one note a beat, **1/16** four a beat, **1/32** eight a beat. The two triplet rates, **1/8T** and **1/16T**, fit three notes where two would go. Change the tempo and the arpeggio follows it smoothly, mid-note, with nothing skipped or repeated (3.9).

9.3.3 MODE: which order the notes run in

MODE chooses the order. In the table, you hold C, E and G, pressing them in the order G, C, E:

MODE	PLAYS	HOW IT WORKS
UP	C E G C E G	Lowest to highest, then again.
DOWN	G E C G E C	Highest to lowest.
UP–DN	C E G E C E G E	Up, then back down. The top and bottom notes are not played twice at the turn, so three notes make a four-step cycle that stays in step with the bar.
PLAYED	G C E G C E	The order you pressed the keys. A key you add while it runs goes to the end.
RANDOM	for example E G C G C E	A shuffled order. Every held note plays once before any plays twice, and a new round never starts on the note the last round ended on. Each lane shuffles differently.
CHORD	CEG CEG CEG	Every held note together, on every step: a chord repeated in rhythm, chopped by GATE.

UP, DOWN and UP-DN go by pitch, not by when you pressed the keys. In RANDOM the picture shows the notes that really are coming next, because each round is shuffled before it starts.

Fingers on a chord rarely land together. When the arpeggio's first note sounds at the press (9.6.1) before your other fingers arrive, it carries on in the mode's order from that note, so the chord in the table, pressed G, C, E in UP, plays G C E G C E: never the same note twice in a row. In RANDOM that first note counts as played for the round. In CHORD the keys that land late sound with the first step as they arrive, so the first step is the whole chord.

Changing the chord while it runs. Add a key and its note joins the run in its place; lift a key and its note drops out. The arpeggio doesn't restart either way: it keeps counting and walks into the new note when it gets there. It starts again from the first note only when you have let go of every key and press a new chord.

- It takes up to eight held notes, the lane's eight voices. A ninth key drops the oldest one held.
- Hold one key and every mode repeats that note at RATE, climbing octaves if OCTAVES is above 1. That's a repeater, not a fault.

9.3.4 GATE: how long each note is held

GATE is how long each note sounds, as a share of its step: **5%** is a short blip, **95%** almost reaches the next note. The band and the header read it as a percentage. It stops at 95% on purpose: an arpeggio never overlaps its own notes, so it can't tie one note into the next. With SWING up, a swung note has less room before the next one, and if its GATE would run past the next note's start, it is cut there.

The sound's own envelope still applies. A long RELEASE on SHAPE (4.6) lets each note ring past its gate.

9.3.5 HOLD: keep playing after you let go

HOLD latches the chord, so the arpeggio carries on after your fingers come up.

- Switch HOLD on while you hold keys and those notes are latched at once. Switch it on with nothing held and it waits for the next chord.
- With HOLD on, play a new chord after letting go of everything and it **replaces** the latched one, starting from its first note.
- Press more keys while you're still holding some and they are **added** to the latch.
- Lifting keys never takes notes out of the latch.
- To stop a held arpeggio, switch HOLD off (the run stops unless you're holding keys) or switch ARP off. STOP doesn't stop it.
- Switch ARP off and on again with HOLD still on and the latched chord starts again.

A sustain pedal does the same job from a MIDI keyboard: keys you let go of under the pedal stay in the run until the pedal comes up.

NOTE

> LEAN only works while you're holding a key (3.5). Under HOLD, once your hands come off the keys the tilt springs back, though the arpeggio carries on.

9.3.6 SWING: how late the off-beats sit

SWING delays every second step of the arpeggio. At **00** the notes are evenly spaced; at **99** every second note lands about half a step late, a heavy shuffle. It swings the arpeggio's own steps, so at RATE **1/8** it swings eighths. In the picture, every second bar moves right as you turn it up.

At LOCK under a swung groove, the arpeggio already swings with the groove at SWING **00** (9.6.4), and SWING is extra swing on top of the groove's. It still moves the off-beats later at every setting, even on SHUFFLE.

9.3.7 SYNC: run free, or lock to the beat and swing

SYNC decides whose beat the arpeggio keeps.

- **LOCK** (the starting value) puts it on the one beat that every groove and every LOCKed arpeggio share, and on the patterns' beat while they play. Start it while something else is playing and its first note sounds the moment you press; every note after it is on the beat. Under a swung groove it swings with the groove.
- **FREE** starts a beat of its own the moment you press the first key of a chord, and keeps it while that chord plays. PLAY and STOP don't move it, and nothing else follows it.

The full rules are in 9.6. You can change SYNC at any time, playing or not.

9.3.8 OCTAVES: how far it climbs

OCTAVES spreads the run over one to four octaves.

- In UP, DOWN, UP-DN, PLAYED and RANDOM, the held notes are repeated an octave up for each extra octave, and the mode runs through all of them. C E G at OCTAVES **2** in UP plays C E G, then the C, E and G an octave higher.
- In CHORD, the whole chord moves up an octave each step instead: the chord, then the chord an octave up, and so on, then back to the start. The chord is never stacked across octaves, so it never needs more than the lane's eight voices.

How many steps one cycle takes, before the order repeats:

MODE	STEPS IN ONE CYCLE	C E G AT OCTAVES 2
UP, DOWN, PLAYED, RANDOM	notes held × OCTAVES	6
UP-DN	2 × (notes held × OCTAVES – 1)	10
CHORD	OCTAVES	2

A note pushed above the top of MIDI's range (G9) by OCTAVES plays at the top note instead.

9.4 GROOVE: the drum groove player

GROOVE is the kit lane's answer to the arpeggiator. Choose one of sixteen drum grooves, hold any pad, and the whole kit plays that groove in time: kick, snare, hats and the rest, on the kit's own sounds, through the kit's effects. Let go and it stops.

Press ARP with a kit lane focused to open it. On a new project, lanes 1 and 2 hold kits and lane 1 is focused, so ARP opens GROOVE straight away; from the ARP screen, LANE 1 or LANE 2 gets you there too. GROOVE has the same layout as ARP: the same page keys (the lanes), the same LANES window on the right, and eight controls, four under SHIFT. Like the arpeggiator, the groove belongs to the lane. Its settings are saved with the project and stay when you load another kit, and it plays from any screen.

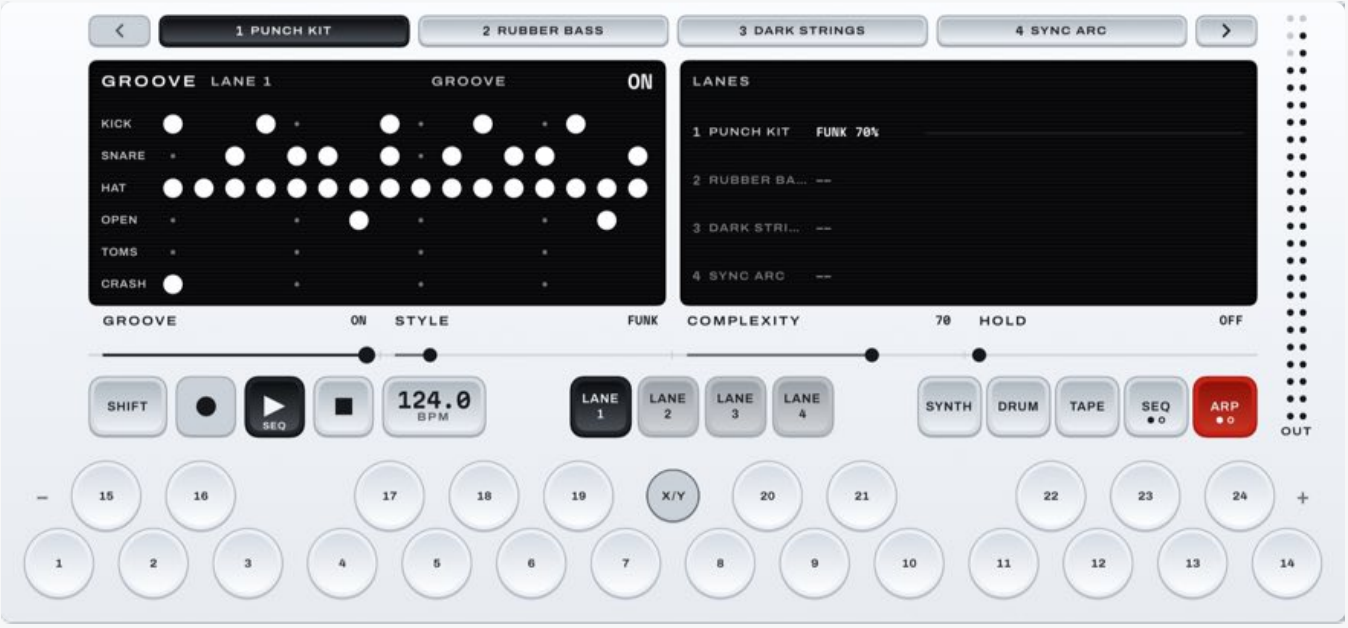


Figure 9.6 GROOVE draws the beat as rows of dots, one column per sixteenth. At COMPLEXITY 70 every hit in this bar plays, so every dot is filled; a hit that joins further up would be hollow.

9.4.1 The GROOVE screen

The left window's header reads **GROOVE** and the lane, such as **LANE 3**, with the control you touched last and its value on the right, such as **STYLE** **FUNK**.

Below it the groove is drawn as a grid: one row per part, one column per sixteenth note, one bar across (two bars for the four two-bar styles). The rows are labelled **KICK**, **SNARE**, **HAT** (the closed hi-hat), **OPEN** (the open hi-hat), **CLAP**, **RIM**, **TOMS** (all three toms share a row), **RIDE** and **CRASH**. A style shows only the rows it ever uses.

- A **filled dot** is a hit that plays at the current COMPLEXITY.
- A **hollow dot** is a hit that joins further up the COMPLEXITY slider. Turn COMPLEXITY up and you watch hollow dots fill in.
- A **tiny dot** marks each beat where a row has no hit, so you can count the beats.
- While the groove plays, the **column playing** is shaded and moves across.
- The grid shows the bar of the four-bar phrase now playing, so fills and crashes appear in the bars that have them (9.4.4). Stopped, it shows the first bar.
- A row's label turns **red** when every pad that row plays is muted on DRUM (9.4.6). This is the only red in GROOVE's windows.

The picture takes no touch. The right window is LANES, the same as on ARP (9.2.3): a kit lane's row reads its STYLE and COMPLEXITY, such as **FUNK 70%**, while GROOVE is on.

9.4.2

GROOVE controls

CONTROL	LAYER	VALUES	A NEW LANE STARTS AT	WHAT IT DOES
GROOVE	band	**OFF**, **ON**	**OFF**	Lets a held pad play the groove.
STYLE	band	sixteen styles (9.4.3)	**ROCK**	Which groove plays.
COMPLEXITY	band	**00** to **99**	**30**	From a plain beat to fills (9.4.4).
HOLD	band	**OFF**, **ON**	**OFF**	Keeps the groove going with no pad held (9.5).
SWING	SHIFT	**00** to **99**	**00**	How late every second sixteenth lands, up to half a sixteenth, added to the style's own swing.
KICK	SHIFT	**PAD 01** to **PAD 24**	**PAD 01**	Which pad the groove's kick plays.
SNARE	SHIFT	**PAD 01** to **PAD 24**	**PAD 02**	Which pad the groove's snare plays.
HAT	SHIFT	**PAD 01** to **PAD 24**	**PAD 03**	Which pad the groove's closed hi-hat plays.

Every control works whether GROOVE is on or off, and the picture follows each change at once. COMPLEXITY and SWING are smooth; double-tap COMPLEXITY to put it back to **30**, or SWING to **00**. The other six step. SHIFT + double-tap puts back any control's last change (2.4.4).

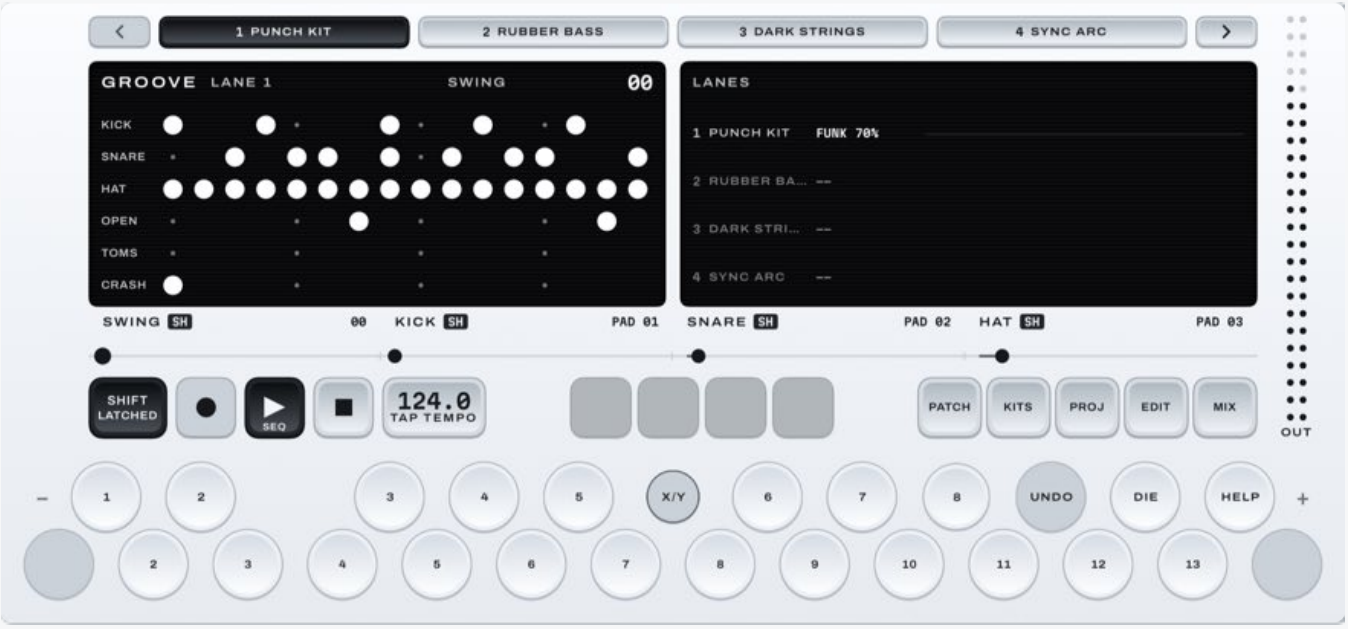


Figure 9.7 Under SHIFT: SWING, and the three pads the kick, snare and hat play.

9.4.3

The sixteen styles

STYLE steps through these sixteen, in this order. Each was written for Tonaut, and each has its own plain beat at COMPLEXITY **00**. Counting a bar as *1 e & a 2 e & a 3 e & a 4 e & a*:

STYLE	LENGTH	OWN SWING	THE PLAIN BEAT, AT COMPLEXITY 00
ROCK	1 bar	none	Kick on 1 and 3, snare on 2 and 4, eighth-note hats.
POP	1 bar	none	Kick on 1, the & of 2 and 3; snare on 2 and 4; eighth hats.
FUNK	1 bar	none	Kick on 1, the a of 1 and the & of 3; snare on 2 and 4; eighth hats.
DISCO	1 bar	none	Kick on every beat, snare on 2 and 4, eighth hats leaning on the off-beat.
HOUSE	1 bar	12	Kick on every beat, a lighter snare on 2 and 4, a closed hat on every off-beat.
TECHNO	1 bar	none	Kick on every beat, a soft snare on 2 and 4, hats on the & and the a of every beat.
BOOM BAP	1 bar	30	A heavy kick on 1, the a of 2 and the & of 3 under a hard snare on 2 and 4; eighth hats.
TRAP	1 bar	none	Half time: kick on 1 and the & of 3, snare on 3 only, eighth hats.
BREAKBEAT	2 bars	8	Kick on 1 and the & of 3, then on 1, the & of 1 and the & of 3; snare on 2 and 4; eighth hats.

DRUM & BASS	2 bars	none	Kick on 1 and the & of 3, doubled onto the a of 3 in the second bar; snare on 2 and 4; eighth hats.
ONE DROP	1 bar	34	Nothing on 1: kick and snare together on 3, hats leaning on the off-beat.
BOSSA	2 bars	none	Kick on 1 and 3, a soft clave figure on the snare across the two bars, steady eighth hats.
SHUFFLE	1 bar	67	Kick on 1 and 3, snare on 2 and 4, hats on every sixteenth, swung long-short.
AFROBEAT	2 bars	12	A kick that falls differently in each bar, snare on 2 and 4, eighth hats.
2-STEP	1 bar	42	No kick on 3: kick on 1 and the a of 3, snare on 2 and 4, hats on the off-beat.
ELECTRO	1 bar	none	Straight and mechanical: kick on 1, the & of 2 and the a of 3; snare on 2 and 4; eighth hats.

Own swing is swing written into the style, in the same units as the SWING control. Those seven styles swing even with SWING at **00**. SWING adds to it, up to the maximum, so SHUFFLE reaches the heaviest swing at about SWING **33** and goes no further.

9.4.4

COMPLEXITY: from a plain beat to fills

Every style is written in layers, and each hit joins at a COMPLEXITY value. The groove plays every hit at or below the slider. So raising COMPLEXITY only ever adds hits, it never takes one away, and one value always plays the same beat. You can ride the slider while the groove plays.

COMPLEXITY	WHAT JOINS
00	The style's plain beat: kick, snare and closed hat only.
01 to **24**	Still only kick, snare and closed hat. In most styles the hats go to sixteenths or an extra kick comes in.
25 and up	Ghost notes on the snare, claps, rim clicks, syncopated kicks.
40 and up	Open hats (never below 40), ride, toms.
58	A crash on beat 1 of every four-bar phrase (**60** on BOSSA).
65	Fills in the last bar of every four-bar phrase. Every style adds more to its fill between 72 and 82.
85	Fills in the second bar of the phrase as well. Each fill layer reaches bar 2 twenty points after it reaches bar 4.
88	The crash on the third bar of the phrase as well (**90** on BOSSA).

Fills and crashes count bars in a **four-bar phrase**. While the patterns play, bar 1 of the phrase is the bar PLAY started, so fills land in bars 4, 8, 12 and so on of your song. With the transport stopped, the phrase counts from when the shared beat started (9.6). A two-bar style plays twice per phrase.

The band reads COMPLEXITY from **00** to **99**; the LANES window shows the same value as a percentage, with the top of the slider reading **100%**.

9.4.5 Which pads a groove plays

A groove plays *parts*, and each part plays one pad. You choose the pads for the three parts that matter most; the rest use a fixed map.

PART	ROW IN THE PICTURE	PAD
kick	**KICK**	the **KICK** control (pad 1 to start)
snare	**SNARE**	the **SNARE** control (pad 2 to start)
closed hi-hat	**HAT**	the **HAT** control (pad 3 to start)
open hi-hat	**OPEN**	pad 4
low, mid and high tom	**TOMS**	pads 5, 6 and 7
clap	**CLAP**	pad 8
rim	**RIM**	pad 9
ride	**RIDE**	pad 11
crash	**CRASH**	pad 12

The KNOCK kits, the CINDER kits and the seven sample kits are laid out on this map (5.5), so every style plays the right sounds on any of them. Each of them has a second kick on pad 13 and a second snare on pad 14, and the sample kits keep more kicks, snares and hats on their spare pads. KICK, SNARE and HAT let you pick the one that suits the groove.

The five SLICER rows that play a recording (Back Slices, Floor Slices, Gate Slices, Slice 24 and Wide Slices) don't follow the map: their pads are slices of one recording, in order. Neither does a kit you made from your own recordings or audio files (6.8). A groove on one of these plays whatever slice sits on each pad, so point KICK, SNARE and HAT at the slices you want. The other parts stay on their fixed pads from the table above.

To choose the kick by ear:

01 On GROOVE, hold **SHIFT** (or tap it to latch).

02 Drag **KICK**. Each time it lands on a new pad, that pad plays once, so you hear each candidate. The header reads **KICK** and the pad, such as **PAD 13**.

03 Stop on the one you like.

SNARE and HAT work the same way. If two parts land on the same pad, a hit where both play sounds once, at the louder of the two.

NOTE

> The pad KICK, SNARE or HAT plays as you drag counts as a pad you're holding. With GROOVE on and HOLD off, the groove plays a step or two along with it.

9.4.6 Grooves and pad mutes

A pad muted on DRUM's pad map (6.7.2) is silent to the groove. The groove leaves that part out of every step and plays the rest on, in time. A muted part is not recorded either (9.7). To keep only the kick of a groove, mute the other pads on DRUM.

On GROOVE, a row whose every pad is muted shows its label in red. The dots stay drawn, because they are still the groove; the red label says you've silenced that part.

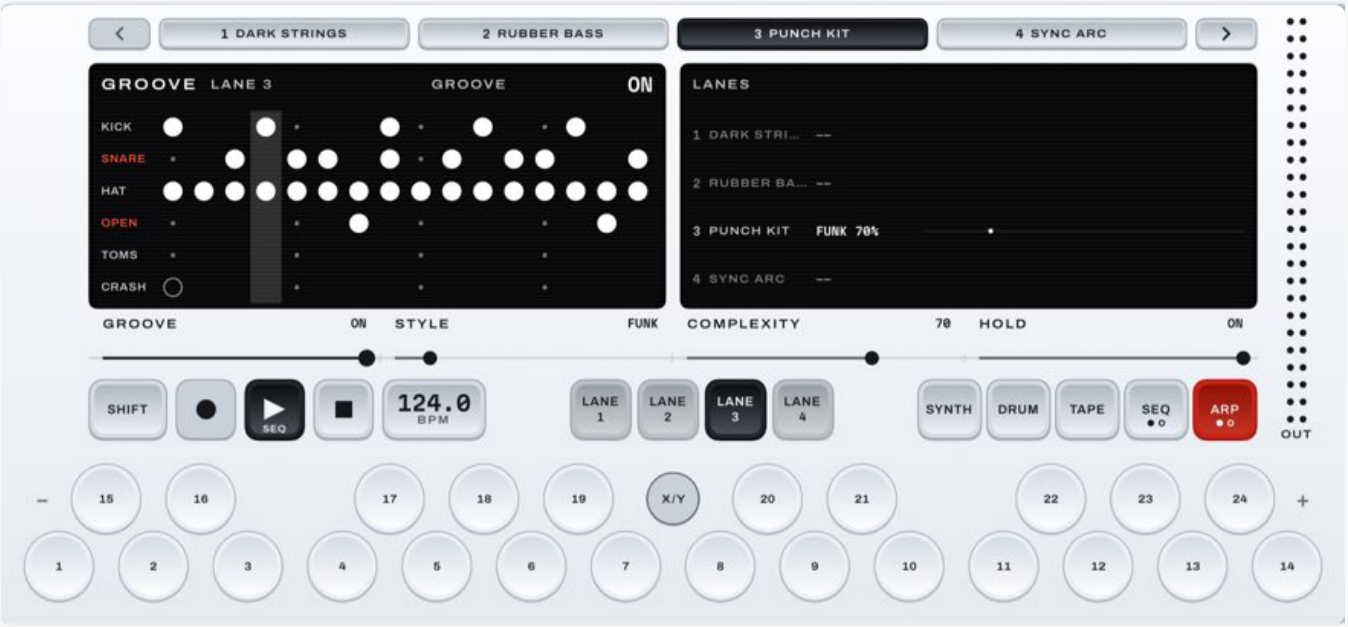


Figure 9.8 Pads 2 and 4 muted on DRUM: the snare and the open hat are out of the groove, though their dots stay drawn.

Mutes don't touch your own fingers: a muted pad still plays when you press it. The kit browser's preview beat ignores mutes and plays the whole kit (5.5.1).

9.5 Playing a groove

To play a groove:

01 Focus a kit lane and press ARP. The window reads GROOVE.

02 Set GROOVE to ON and choose a STYLE.

03 Hold any pad. The groove starts and the pad you pressed sounds too. The shaded column moves across the picture, and the LANES row's marker runs along its line.

04 Let go. The groove plays to the end of the step it's on and stops.

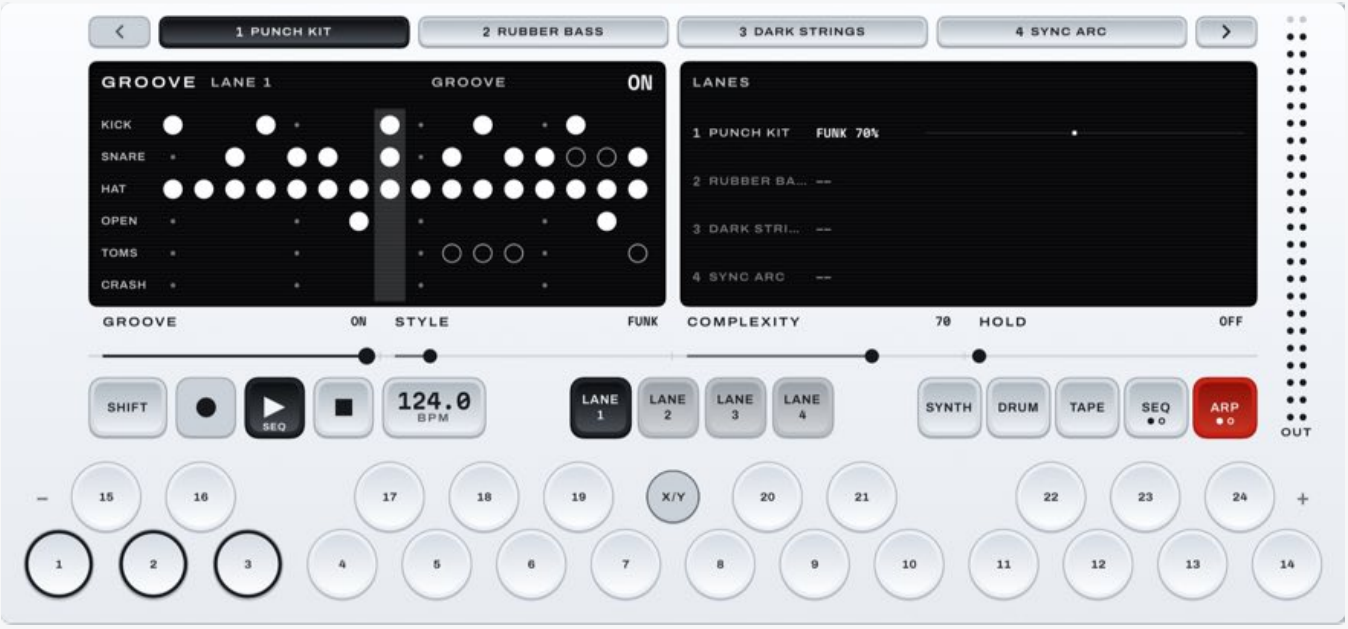


Figure 9.9 A groove running, in the fill bar. The shaded column is the sixteenth playing now; the hollow tom dots join higher up COMPLEXITY.

- Any pad starts it, and keeps it going for as long as any pad of the lane is held. The groove doesn't take over the keys: every pad you press sounds as usual, so you can play fills or extra hits over the top.
- It doesn't matter which screen you're on. Hold a pad of a kit lane with GROOVE on from DRUM, SEQ or TAPE and the groove plays.
- A MIDI keyboard's notes hold it too, and so does the sustain pedal: a pad let go under the pedal keeps the groove running until the pedal comes up.
- When it starts depends on what else is playing (9.6). With nothing else playing it starts at once, on its first step.
- The hits play at the groove's own loudness, with accents and ghost notes written in. How hard you press the pad doesn't change them.

9.5.1 HOLD: a groove that keeps going

With **HOLD ON** the groove plays all the time while GROOVE is on, whether or not a pad is held. So:

- switching HOLD on while GROOVE is on starts the groove straight away, with no pad pressed;
- switching GROOVE on while HOLD is on does the same;
- it keeps playing when you change screens or focus another lane.

To stop a groove:

IF	DO THIS
HOLD is off	Let go of every pad. It stops at the end of its step.
HOLD is on	Set GROOVE to **OFF**, or HOLD to **OFF** with no pad held. It stops at the end of its step.

STOP doesn't stop a groove. It stops the patterns and the tape, and the groove carries on in time on its own.

TIP

> Focusing another lane lets go of the pads you're holding. Turn HOLD on before you go to play another lane, and the drums keep going under it.

9.5.2 Hearing a groove from the kit browser

In the KITS browser, tapping the kit the lane already holds plays two bars of the lane's groove, with its STYLE, COMPLEXITY, SWING and pads, whether GROOVE is on or not. It's the quickest way to hear a kit play a beat (5.5.1).

9.6 One clock

Every groove and every arpeggio set to LOCK share one beat. Start a groove on a kit lane, go to a synth lane and play an arpeggio, and the arpeggio lands on the groove's beat even if your finger is a little early or late. Start the patterns and both move onto the patterns' beat. You never have to line them up by hand.

9.6.1 When a groove or an arpeggio starts

WHAT IS ALREADY PLAYING	A GROOVE, OR AN ARPEGGIO AT LOCK, STARTS
Nothing: the patterns are stopped and no other groove or LOCKed arpeggio is playing	At once, on its own first step. That moment becomes the shared beat.
Another groove or LOCKed arpeggio, with the patterns stopped	A groove: on the shared beat's next step, at that point of the beat's bar, so it may open mid-bar or even in a fill. An arpeggio: its first note at once, the rest on the shared beat.
The patterns, or the tape on TAPE (PLAY is lit)	A groove: on the next step of the beat PLAY started, at that point of the bar, not from its own beginning. An arpeggio: its first note at once, the rest on that beat.

- An arpeggio's first note sounds the moment you press, even when something else is playing. It counts as whichever step of the beat is nearer, the one before or the one coming, and the second note lands on the step after that. From the second note on, every note is on the beat.
- A groove that joins waits for "the next step", the groove's next sixteenth. The wait is never longer than one step (plus the swing, if that step is a swung one).
- A quick tap still plays. A tap on a LOCKed arpeggio plays one note, at the press. A groove that has to wait for its step plays nothing if you let go first; with nothing else playing it starts at once, so even a tap plays its first step.

NOTE

> The first note is as late as your touch. A touch reaches the app a few hundredths of a second after your finger lands, so pressing exactly on a beat you hear brings the first note in that much after the beat, once; every note after it is in time. If you press nearer the next step than the last, the first note counts as that next step, so it can sound a little ahead of it. Recorded into a pattern, the first note goes on the step it counts as.

9.6.2 PLAY, STOP and the tempo

- **PLAY** while a groove or a LOCKed arpeggio is running: it moves onto the patterns' beat with one step a little shorter or longer than the rest. A groove jumps to its own first step, together with the patterns' step 1. An arpeggio keeps its place in its order and nothing is played twice.
- **STOP**: grooves and LOCKed arpeggios carry on from where the patterns were, in step with each other, with no jump.
- The tempo drives all of them. Change it while they play and they speed up or slow down together.

On TAPE, PLAY rolls the tape on the same clock, so a LOCKed arpeggio moves onto the beat PLAY started there too.

The clock is Tonaut's own. With **Transport** on the tempo page at **IN** or **BOTH**, your MIDI gear's Start and Stop press PLAY and STOP for you, with the same results as above, but the tempo stays Tonaut's (3.9.4).

9.6.3 LOCK or FREE

Grooves are always on the shared beat. The arpeggiator has a choice, its **SYNC** control:

	LOCK	FREE
Starts	at once; with nothing else playing it becomes the shared beat, otherwise every note after the first is on it	at once, always, on a beat of its own that starts with your first key
A swung groove	swings with it, at RATE **1/4**, **1/8**, **1/16** and **1/32**	stays straight
PLAY and STOP	move it onto the patterns' beat and back, in step	don't affect it
Other lanes	can join its beat	never follow it

Use LOCK for anything that should sit with the drums and the patterns. Use FREE when you want the arpeggio to start exactly when you press and float against what's playing, for example over a take rolling on TAPE that was recorded at another feel. A FREE arpeggio follows the tempo but keeps its own downbeat.

Switching SYNC while an arpeggio plays keeps it going. From FREE to LOCK it joins the shared beat on its next step, or becomes the shared beat if nothing else is playing; from LOCK to FREE it carries on from the beat it was on.

9.6.4 Swung grooves

A LOCKed arpeggio swings with the groove. Seven styles carry their own swing (9.4.3), and the groove's SWING adds to it. With the arpeggio's SWING at **00**, its sixteenths land on the groove's own swung sixteenths, long-short with the hats. Nothing to set.

- **The arpeggio's SWING adds on top.** Turn it up for an arpeggio that lays back further than the drums.
- **Eighths and quarters** at SWING **00** don't move: a groove's swing moves only every second sixteenth. At **1/32** the notes between the sixteenths move with them.
- **Triplets** (**1/8T**, **1/16T**) and **FREE** never follow: a triplet already swings, and FREE keeps its own beat.
- **Two grooves at once:** the arpeggio follows the one that has been playing longest.
- **When the drums stop**, a held arpeggio keeps their swing until you play a new chord, change a groove, or press PLAY or STOP: each of those makes it look again, and with no groove playing it goes straight. Playing other lanes on the keys never changes it.
- **Recorded into a pattern** at STRENGTH **100**, the notes go on the pattern's straight steps, as a groove's do. Each note keeps where it was played, so a lower STRENGTH or the pattern's own SWING brings the swing back (8.8).



Figure 9.10 UP at SWING 00 over SHUFFLE: the bars sit long-short, as the notes do.

9.6.5 PATTERN PLAY, the click and the count-in

- **PATTERN PLAY** (8.13) switches every lane to another pattern at the end of the longest one. The clock doesn't stop or restart for the switch, so grooves and LOCKed arpeggios carry on through it on the same beat.
- **The click** (3.9.2) sounds on the patterns' beat, and only while PLAY is lit. A groove or an arpeggio running with the patterns stopped gets no click.
- **A count-in** comes before the patterns start. Their beat begins when the count-in ends, and that is when a running groove or LOCKed arpeggio moves onto it, as at any PLAY.

9.7 Recording arps and grooves

What an arpeggio or a groove plays can be recorded two ways: as notes into a pattern on SEQ, or as sound onto the tape.

9.7.1 Into a pattern

This is SEQ's live recording (8.8) with the arpeggiator doing the playing. To record an arpeggio into a pattern:

01 On ARP, set up the lane's arpeggiator and switch it on.

02 Press SEQ, with the same lane focused, and choose the pattern to record into (8.6). Make sure no cell is selected.

03 Press REC, with the record mode on LIVE (8.8). REC turns steady red and the notice line reads PATTERN REC ON · FIRST NOTE STARTS.

04 Hold your chord. The first key starts the pattern, the arpeggio's first note lands on step 1, and REC blinks while the take records.

05 Press STOP when you're done. The take is one UNDO step (8.10).

What goes into the pattern is the notes the arpeggiator played, not the chord you held, so the pattern plays back what you heard and you can edit each note. The pattern's own notes are never arpeggiated, so playback stays as recorded whether ARP is on or off.

STEP REC is the other way round (8.8.8): it writes the keys you press, not the arpeggio, so a chord held with ARP on goes into one step as a chord, and a groove's hits are not written. Use live recording to keep what the arpeggiator or the groove plays.

A groove records the same way: switch GROOVE on, then on SEQ with that kit lane focused, press REC and hold a pad. The groove's first step lands on step 1 with the pattern. Two differences:

- The pad you hold also sounds, so it is recorded too. To take it out, select its cell on SEQ and press that pad's key (8.3).
- Parts on pads muted on DRUM are not played, so they are not recorded.

Every lane records at once, each into its own pattern. A groove left running with HOLD on lane 3 records into lane 3's pattern while you play lane 1, and an arpeggio held on lane 2 records into lane 2's.

You can also arm on SEQ, go back to ARP or GROOVE, and press PLAY. The patterns start (after a count-in, if the click is on and COUNT-IN is set, 8.7.2) and everything the lanes play from then on is recorded. ARP and GROOVE don't show that SEQ is armed: the red dot is on SEQ's header only.

NOTE

> HOLD keeps an arpeggio or a groove playing after the take. Played back, the pattern then doubles up with the live run. Switch HOLD off, or ARP or GROOVE off, to hear the take on its own.

Matching RATE to the pattern. A pattern step is a **1/16** at SPEED **×1**, an **1/8** at **×1/2**, a **1/32** at **×2** and a **1/64** at **×4** (8.6). An arpeggio at the pattern's step size or slower, with its SWING at **00**, puts each note on a step of its own. Faster rates and the two triplet rates put notes between steps, and the pattern's QUANTIZE and STRENGTH decide where they play back (8.7):

- At the starting QUANTIZE **1/16** and STRENGTH **100**, a **1/32** arpeggio at SPEED **×1** is pulled onto sixteenths, so pairs of its notes land together. Set QUANTIZE to **1/32** or **OFF** to hear it as you played it.
- Swing is pulled straight the same way. With the pattern's own SWING at **00**, a groove style that swings, or an arpeggio with SWING above **00**, plays back straight at STRENGTH **100**. Lower STRENGTH, or set QUANTIZE to **OFF**, to keep the swing as you heard it.
- Each note remembers where it was played, so you can change QUANTIZE and STRENGTH after the take (8.8.5).
- A step holds at most eight notes.

9.7.2 Onto tape

An arpeggio or a groove is sound on its lane like any other, so a tape take records it with no special setting:

01 Start the arpeggio or groove with HOLD on, or be ready to hold its keys.

02 Press TAPE, choose a track with its TRK key, and press REC, then PLAY (11.3).

03 Play, then press STOP.

You can keep playing on any screen while the tape rolls: go back to ARP and change MODE mid-take, or to GROOVE and ride COMPLEXITY, and the take catches every change.

REC SEQ records the lanes onto tape in one pass, each lane onto its own track or all of them mixed onto one (11.7). It leaves out a lane whose pattern has nothing to play, but not one whose groove or arpeggio is running with HOLD on: that lane plays, so it is recorded.

TIP

> Played something good and weren't recording? CATCH, on TAPE under SHIFT, puts the last thirty seconds the instrument played onto the selected track, arpeggios and grooves included (11.14).

9.8 ARP and GROOVE on a lane that plays your own gear

A lane set to EXTERNAL MIDI (5.13) keeps its arpeggiator or its groove, and what they play goes out to your gear on the lane's MIDI channel instead of to a Tonaut sound.

- **A lane from PATCHES** (a synth) has the arpeggiator, and you set it up on ARP as on any synth lane. The keys and a MIDI keyboard feed it, and the notes it plays go to the synth.
- **A lane from KITS** (a drum machine) has GROOVE. Its pads send drum notes, so a groove's kick, snare and hat on pads 1, 2 and 3 reach a General MIDI drum machine as its kick, snare and closed hat. Pad mutes and the KICK, SNARE and HAT choices work as on a kit.
- The clock is the same one: a LOCKed arpeggio or a groove on a MIDI lane stays in time with the rest of Tonaut, and **MIDI delay** on the tempo page moves the gear's notes earlier or later to line it up by ear (16.8).
- A MIDI lane isn't recorded to tape, because its sound comes from your gear and not from the phone. To get it onto tape, record the gear's audio through the recorder with a USB audio interface (12.5).

9.9 CHORDS with the arpeggiator

CHORDS, on the KEY page, makes one key play a whole chord (3.11.4). The arpeggiator hears that chord exactly as if you held every note of it, so with CHORDS and ARP both on, one key is an arpeggio of its chord.

To arpeggiate chords from single keys:

01 On ARP, set **ARP** to **ON** and choose a **MODE**.

02 Press ARP again to open KEY. Set **KEY** and **SCALE** and switch **CHORDS** on, or leave SCALE **OFF** and choose a chord with **TYPE** under SHIFT.

03 Hold one key. The arpeggiator runs through its chord: in A minor at MODE **UP**, A4 plays A4, C5, E5, A4, C5, E5.

04 Play another key and the run takes that key's chord.



Figure 9.11 One key held, three notes in the run: the arpeggiator plays the chord that CHORDS built on A4.

- **Every MODE works.** UP, DOWN, UP-DN, PLAYED and RANDOM run through the chord's notes; **CHORD** repeats the whole chord in rhythm, chopped by GATE (9.3.3).
- **The other controls work as usual.** RATE, GATE, SWING and SYNC time the run, OCTAVES climbs the chord through more octaves, and HOLD latches it when you let go.
- **Two keys give it both chords**, a note the chords share counted once, up to the eight notes the arpeggiator takes (9.3.3).
- **The picture and the rings show every note** of the chord as it plays; only the key you hold is filled.
- **A MIDI keyboard works the same way**, and with LOCK on the arpeggiator holds the notes moved into the scale (3.11.3).
- **The chord pad works too** (3.12): one chord key with ARP on arpeggiates its chord, and moving the stick changes the notes the run plays from its next note. STRUM doesn't apply: the arpeggiator takes the chord as one held set.
- A take on SEQ records the notes the arpeggiator played (9.7), and on a lane that plays your own synth the run goes out to it (9.8).

10 MIX

MIX is Tonaut's mixer for the lanes. It sets how loud each lane is and where it sits left to right, mutes lanes, gives every lane an EQ of its own, and shapes the whole mix on its way out with a master EQ, one master effect, a drive stage and a limiter. The tape has a mixer of its own, TAPE MIX, on the same screen (10.10).

10.1 Opening MIX

On the iPhone, MIX has no mode key of its own. It is the SHIFT job of the fifth mode key, the one that reads ARP.

To open MIX:

01 Hold SHIFT, or tap it to latch it. The fifth mode key reads MIX. In a browser, hold SHIFT: a tap there means BACK (2.7.3).

02 Press MIX. The mixer fills both windows, the band and the page keys.

This works from SYNTH, DRUM, SEQ, ARP and GROOVE, EDIT, the browsers, the effect and modulator lists, Settings and the tempo page. **On TAPE the same press opens TAPE MIX**, the tape tracks' mixer (10.10). To reach MIX while you're working on the tape, go to another screen first, SEQ for example, and press SHIFT + MIX there. On the iPad, MIX has a key of its own (chapter 17).

- **MIX always opens on LEVEL**, whatever page you were on before.
- **No mode key is red** while MIX is showing. It is a view of all the lanes, not of one mode. Bring SHIFT on and the MIX key is drawn filled: that is how the panel says MIX is open.
- **A latched SHIFT stays latched.** If you tapped SHIFT to get here, MIX arrives with its page keys reading MUTE 1 and up (10.4). Tap SHIFT once to see LEVEL EQ FX OUT. If you held SHIFT, it drops when you let go.
- **Opening MIX turns HELP off** if it was latched (10.9.2).

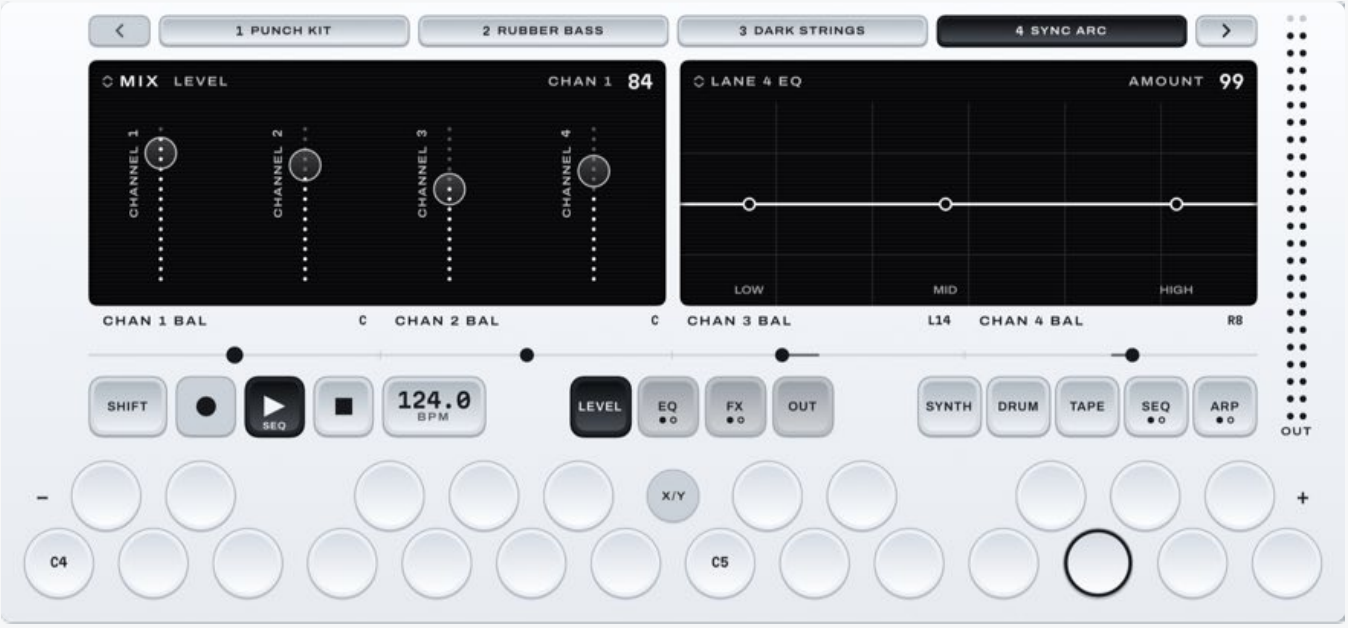


Figure 10.1 MIX on a playing song. The faders are the lanes' levels and the band under them their balances; the lane row's arrows turn to lanes 5 to 8.

10.1.1

What the screen shows

MIX looks the same on all four of its pages, except for the band and, on FX, the right window:

PART	WHAT IT SHOWS	WHERE TO READ MORE
Left window	The header MIX and the page you're on, then on the right one lane's level or balance, such as CHAN 1 and its level (10.3.1). Below it, a fader for each lane the lane row shows, with its meter.	10.3
Right window	An EQ: the focused lane's, headed LANE 4 EQ (for lane 4) with its AMOUNT on the right, or the master's, headed MASTER EQ with DRIVE and its value. It is whichever the EQ page last showed. Below the header, the EQ curve with three white ring handles, which fill while you drag one. On FX, the master effect's eight controls and their values instead (10.6.2).	10.5, 10.7
The band	The controls of the page you're on.	each page's section
Page keys	LEVEL EQ FX OUT. Under SHIFT, one MUTE key for each lane showing.	10.4
Lane row	The lane buttons, and in an eight-lane project on the iPhone, an arrow key at each end.	below
Keyboard	It keeps playing the focused lane, so you can play while you mix.	10.9

Four lanes at a time on the iPhone. In an eight-lane project the iPhone's lane row shows lanes 1 to 4 or lanes 5 to 8, with an arrow key at each end, ‹ and ›. MIX follows the same page: four faders, four balances and four MUTE keys, for the four lanes the row shows. Press an arrow to turn to the other four (2.2). Focusing a lane on the other page turns it too. A six-lane project shows all six lanes, so MIX shows six faders and six balances. The 11- and 13-inch iPads show all eight (chapter 17).

The faders take your finger on every page, and the EQ curve on every page that shows it (all but FX), so you can move a level, or a band of the EQ showing, from LEVEL, EQ or OUT. Both windows carry the drag mark (2.3). With HELP latched, a tap on the EQ says DRAG UP OR DOWN TO BOOST OR CUT and changes nothing; a drag still moves the band.



Figure 10.2 MIX in the dark housing. The windows are black in both housings, so the faders and the curve look the same.

10.1.2 The four pages

KEY	PAGE	THE BAND	UNDER SHIFT	PRESSED AGAIN
LEVEL	Each lane's level and balance	a balance for each lane showing, **CHAN 1 BAL** and up	the same balances	nothing
EQ	The focused lane's EQ, or the master EQ	**LOW MID HIGH AMOUNT**	**LOW HZ MID HZ HIGH HZ**, and a fourth lane (10.5.2)	the other EQ: from the lane's to the master's, and back (10.5)
FX	The master effect	the effect's first four controls	its other four	opens the master effect list (10.6.1)
OUT	What leaves the instrument	**OUT L OUT R DRIVE RELEASE**	nothing: four lanes drawn off	nothing

The page keys are MIX's own while MIX is open. They never change a page of the sound underneath. FX wears two dots: the first is filled on every MIX page, and the second takes over while the master effect list is open (2.5.1). EQ wears two as well: the first is filled while the lane's EQ is the one showing, the second while the master EQ is.

10.1.3 Closing MIX

There are two ways out:

- SHIFT + MIX **again.** MIX closes and you're back on the mode and page you opened it from. A trip to the mixer from SYNTH's FX page lands you on SYNTH's FX page. A browser, an effect or modulator list, Settings or the tempo page closes when MIX opens, so if you opened MIX from one of those you land on the mode that was under it.
- **Any mode key.** MIX closes and you go to that mode. Pressing the mode you came from is the same as closing MIX.

TAPE MIX closes the same two ways.

10.1.4 Going to a browser and back

You can open PATCHES, KITS or PROJECTS from MIX and come back to it.

01 On MIX, hold SHIFT and press PATCH, KITS or PROJ. The browser opens in place of MIX.

02 Do what you came to do, for example load a different sound onto the focused lane.

03 Tap SHIFT (it reads **BACK**), or hold SHIFT and press the same browser key again. MIX opens again, on LEVEL.

04 Close MIX (SHIFT + MIX). You land on the mode and page you were on before you first opened MIX.

You can switch from one browser to another on the way, with the browser's page keys or another SHIFT + browser key; the way back still leads to MIX. A mode key takes you to that mode instead, and MIX stays closed. From TAPE MIX the way back opens MIX, the lanes' mixer, with TAPE under it; press SHIFT + MIX once to switch to TAPE MIX.

Other screens and MIX:

- **Settings and the tempo page** open over MIX and return to it when you close them. Settings opens from the help panel's SETTINGS cell (10.9.2), the tempo page by holding the tempo key (3.9.1). While either is over MIX, SHIFT + MIX closes MIX underneath, not the page you're looking at. Close Settings or the tempo page first.
- **The recorder and the sample editor** close MIX. When you leave them you're on TAPE or DRUM, not MIX.
- **EDIT** (SHIFT + EDIT) replaces MIX. Closing EDIT takes you to the mode, not back to MIX.

10.2 MIX sets the lanes, TAPE MIX sets the tape

Each lane has a strip on MIX: a fader, a balance and a mute. Everything the lane plays goes through it, whether you play it with your fingers or MIDI, or its pattern, arpeggio or groove plays it. Each tape track has a strip of its own on TAPE MIX, with the same three controls (10.10). The two mixers never touch each other: a lane's fader doesn't change how the tape plays back, and a track's fader doesn't change how a lane sounds.

Here is the whole path, in order:

01 **Lane n**, live: keys, MIDI, the pattern, the arpeggiator or groove, through its strip on MIX: its own EQ (**LANE n EQ**, 10.5.3), then the fader, the balance (**CHAN n BAL**) and the mute (MUTE N).

02 **Tape track n**, playing back, through its strip on TAPE MIX: the fader, the balance (**TRK n BAL**) and the mute, which is the same mute as SHIFT + the track key on TAPE (11.2.1).

03 All the strips add together. The input you monitor in the recorder joins here too, with no strip of its own (chapter 12).

04 **MASTER EQ** (10.5).

05 **The master effect** (10.6).

06 **DRIVE**, with its **RELEASE** (10.7).

07 **OUT L and OUT R**.

08 **The limiter**, which you can't adjust.

09 The metronome click, added after everything else. Nothing on MIX changes it; its level is on the tempo page (3.9.1).

The master section, steps 4 to 8, is shared: TAPE MIX's EQ, FX and OUT pages are these same controls.

10.2.1 What the tape records: before or after the strips

An ordinary take is recorded from the lanes *before* their strips. Nothing on MIX is written onto it: not the lane EQs, the faders, the balances, the lane mutes, the master EQ, the master effect, DRIVE or OUT. That has three results:

- **A muted lane still records.** Muting lane 1 on MIX silences it in your ears, but an ordinary take started on TAPE still captures it.
- **How hot a take is written is set on TAPE**, with REC LEVEL and REC PAN (11.5), not here.
- **You rebalance a finished take on TAPE MIX.** A take recorded with a lane's fader all the way down is on the tape at full level, and TAPE MIX decides how loud it plays back.

A REC SEQ take hears the lane strips: it records each lane as you hear it, through its lane EQ and at its MIX level, balance and mute (11.7). Set to **EACH**, each lane goes onto its own track that way, so with TAPE MIX at its defaults the tape plays back the balance you heard, and a lane muted on MIX records silence onto its track. Set to **ONE**, the lanes are mixed onto one track. Even then the master EQ, the master effect, DRIVE and OUT stay off the tape.

A take plays back through the TAPE MIX strip of the track it is on, whichever lane played it. Record lanes 1 and 3 onto track 2 and that take is under TAPE MIX's TRACK 2 fader.

10.2.2 What the mix belongs to

- The mix is part of the project. Every fader, balance and mute on MIX and on TAPE MIX, every lane's EQ and the master EQ, the master effect and its eight values, and the OUT page are saved as you change them, and come back when you open the project again. SAVE AS carries them into the new project, and REVERT puts them back as they were at the last SAVE (13.6).
- A new project starts with a plain mix: every fader on MIX and TAPE MIX at **80**, every balance at **C**, nothing muted, every EQ flat, no master effect, OUT L and OUT R at **80**, DRIVE at **00** and RELEASE at **40**.
- The fader belongs to the lane, not to the sound. Load a different patch or kit onto a lane and its fader, balance, mute and EQ stay where they were. Sounds are not all equally loud, so a new sound can come in louder or quieter at the same fader setting.
- Swapping two lanes (2.12) moves each lane's MIX strip with it, its EQ included, and its tape track's TAPE MIX strip too.
- Exports are made from the tape, through TAPE MIX, so MIX's lane EQs, lane faders and lane mutes don't change them (10.10.4).

10.3 LEVEL: faders and balance

The LEVEL page is where you balance the lanes against each other: their levels with the faders in the left window, their places left to right with the band.

10.3.1 The faders

The left window holds a fader for each lane the lane row shows, left to right: four on the iPhone in an eight-lane project, six in a six-lane one. Each has its name written up its left side, `CHANNEL 1` for lane 1 and so on. Where the full word doesn't fit beside the fader it reads `CHAN 1` instead.

To set a lane's level:

01 Put a finger anywhere in that fader's column of the left window.

02 Drag up for louder, down for quieter. The knob doesn't jump to your finger. It moves as far as your finger moves, so a drag the full height of the line takes it from bottom to top.

03 Watch the left window's header. It names the lane, `CHAN 2`, and its value, **00** to **99**.

You can move two or more faders at once with different fingers.

FADER READS	GAIN
99	about +6 dB, the most it gives
90	about +3 dB
80	0 dB: the lane as it is. This is where every fader starts.
70	about –4 dB
60	about –8 dB
50	about –13 dB
40	about –19 dB
20	about –37 dB
00	silent

A small solid dot in the middle of a knob means that fader is exactly at **80**. Move it and the dot goes.

NOTE

> The faders have no double-tap reset and no fine adjust. To get back to exactly **80**, drag slowly and watch for the dot in the knob; the header reading **80** alone can be a hair off.

The header always shows one lane's setting. On LEVEL, after you touch a band slider, it shows that lane's balance: `CHAN 2 BAL` and its value. After anything else, and on every other page, it shows a fader's level. It never shows an EQ, effect or OUT value; read those on their sliders.

10.3.2 The meters inside the faders

The line each knob rides on is the lane's meter: a column of 16 dots, lit from the bottom by what the lane is sending. At rest they are the faint line you see behind the knob.

- **The scale is in decibels, 3 dB a dot.** The bottom dot lights at –48 dBFS (very quiet); the top dot at full scale. It is the same scale as the OUT meter in the right margin (2.1), so a level fills the same share of both.
- **It reads after the lane's EQ, the fader, the balance and the mute.** A lane pulled down reads low, and a muted lane reads dark, even while it is playing. It shows what the lane sends, not what it makes.
- **It reads the lane alone.** The tape track with the same number has its own meter, on TAPE MIX.
- **It follows peaks**, the loudest moment of the last tenth of a second.
- When a lane reaches full scale, its top dot turns red (in TN-1 and TN-1 DARK, orange). That is a warning, not damage: the limiter at the end of the chain (10.7.3) keeps the output itself from going over. Pull the fader down until the red stops if you want the lane clean.

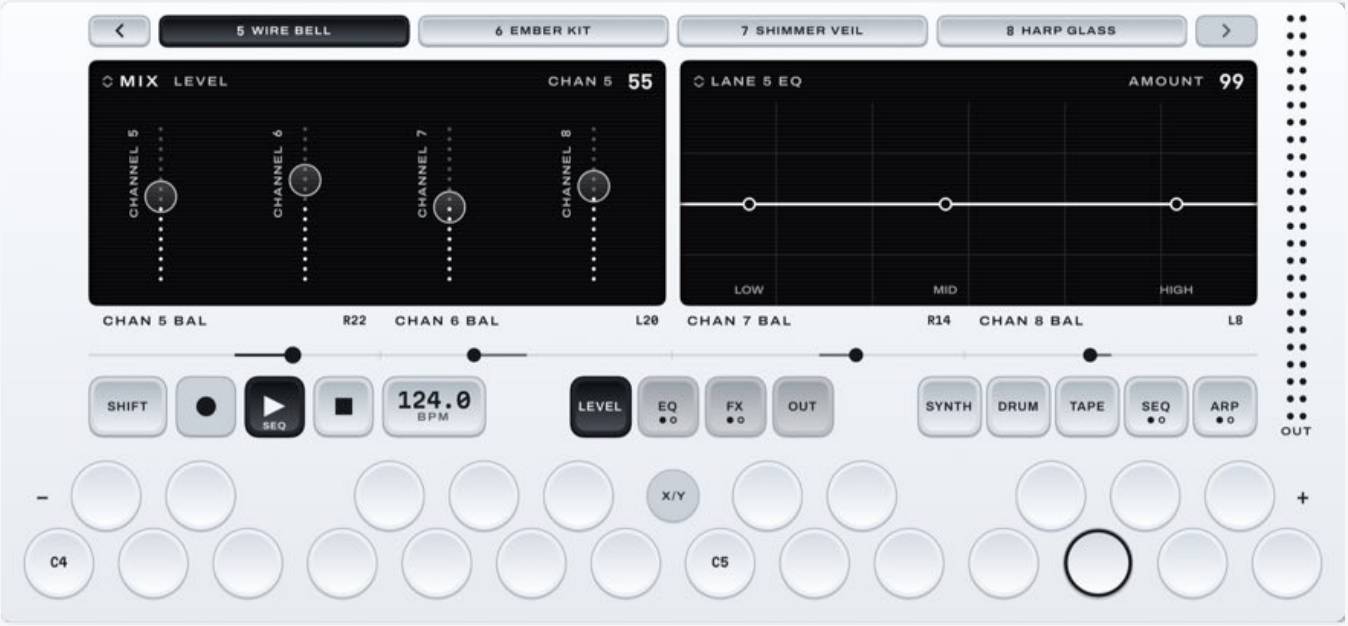


Figure 10.3 Lanes 5 to 8, one arrow press away. Each meter lights only as high as its lane is loud after its fader.

10.3.3 CHAN BAL: each lane's balance

On LEVEL the band holds one balance for each lane showing, **CHAN 1 BAL** to **CHAN 4 BAL**, or **CHAN 5 BAL** to **CHAN 8 BAL** on the second page (**CHAN 1 BAL** to **CHAN 6 BAL** in a six-lane project), in the same order as the faders above them.

To move a lane left or right:

01 Touch that lane's slider on the band and drag. Left moves the lane left, right moves it right. A slow drag moves finely and a quick one far; hold still for a moment first for the finest steps (2.4.1).

02 Read the value on the slider and in the header: **L50** (hard left) through **L1**, **C** (center), **R1** through **R50** (hard right).

03 To put it back in the middle, double-tap the slider. It reads **C**. SHIFT + double-tap puts back the slider's last change instead (2.4.4).

It is a *balance*, not a pan. Most of Tonaut's sounds are stereo, and a balance keeps the stereo picture you hear: at **C** both sides play at full level; turning toward one side fades the other side down. At **L50** you hear only the lane's left side, and anything that was only on its right is gone. It places the lane only; a tape track's place is its **TRK n BAL** on TAPE MIX.

The LEVEL band has no second layer. With SHIFT on it shows the same balances, without the **SH** badge, because nothing on it changes.

10.3.4 A lane that plays your own gear

A lane set to EXTERNAL plays a synth or drum machine over MIDI instead of a Tonaut sound (5.13). Its strip on MIX still works, on the gear:

- **The fader** also sends MIDI volume (controller 7) on the lane's channel, and **its balance** sends MIDI pan (controller 10). They send only when you move them, never when a project opens.
- **The mute** stops the lane's notes, whatever plays them: the keys, a MIDI keyboard, the pattern, the arpeggiator or a groove.
- The lane makes no sound inside Tonaut, so its meter stays dark, nothing of it reaches the tape, and its EQ has nothing to shape (10.5.3).

The rest is in chapter 16: channels, all notes off, MIDI delay and the clock Tonaut sends.

10.4 Mutes

A lane mute silences one lane's live sound. The mutes are the page keys under SHIFT, on every MIX page: one MUTE key for each lane the row shows, MUTE 1 to MUTE 4, or MUTE 5 to MUTE 8 on the second page. A six-lane project has six narrower keys, MUTE 1 to MUTE 6; on smaller iPhones the word sits over the number.

To mute a lane:

01 On MIX, tap SHIFT to latch it. The page keys read MUTE 1 to MUTE 4.

02 Press MUTE 2. Lane 2 goes silent. The key is drawn filled, its fader's name turns red, and its meter goes dark.

03 Press MUTE 2 again to unmute it.

04 Tap SHIFT again when you're done. The page keys read LEVEL EQ FX OUT again.

A latched SHIFT stays on while you press mutes, so you can mute or unmute several in a row; the lane row's arrows still turn the page. If you'd rather not latch, hold SHIFT and press the mute; SHIFT drops when you let go. The MUTE keys work the same in the master effect list.

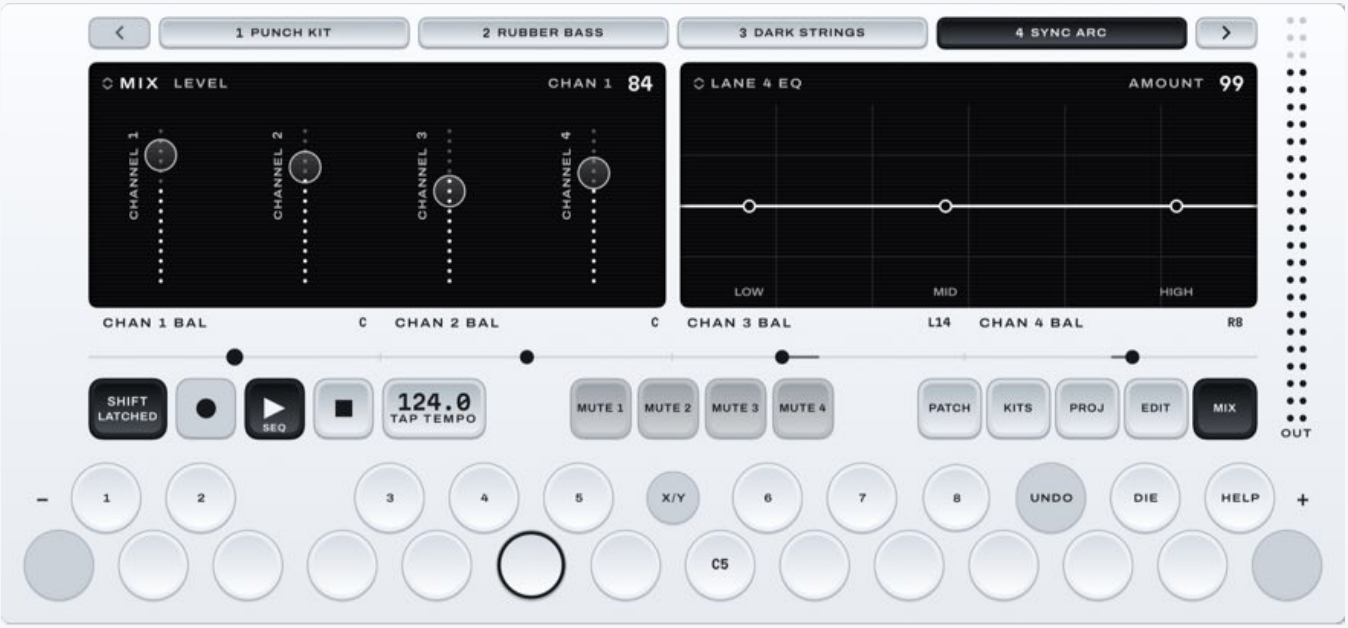


Figure 10.4 MIX under SHIFT. The page keys become the mutes of the four lanes showing; MIX is filled because MIX is the screen that's open.

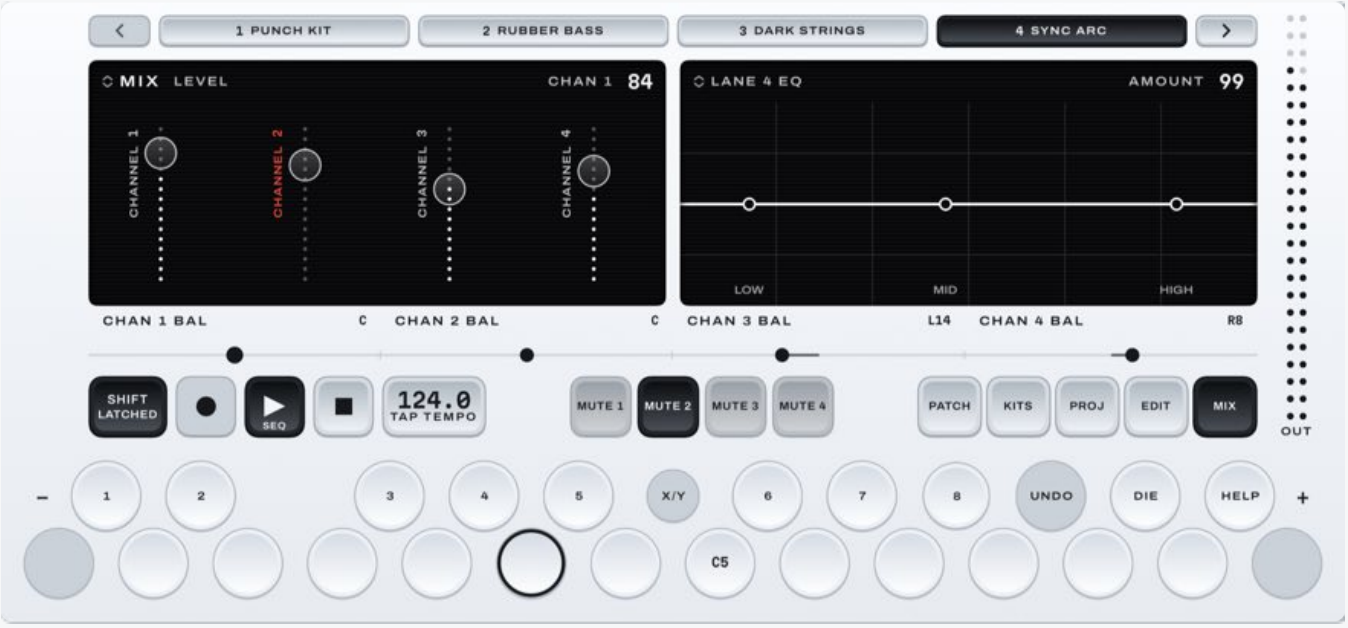


Figure 10.5 Lane 2 muted: MUTE 2 filled and CHANNEL 2 in red. The red stays on the fader after you let SHIFT go.

What a lane mute does and doesn't do:

- **It silences everything the lane plays**: your fingers, MIDI, the lane's pattern, arpeggio or groove. It fades in and out over a few thousandths of a second, so muting never clicks.
- **The tape plays on.** The tape track with the same number, and every take on it, still sounds. To silence a tape track, mute it on TAPE MIX or on TAPE (10.10, 11.2.1).
- **The lane keeps running underneath.** Its pattern, arpeggio or groove keeps its place, so when you unmute it comes back in time.
- **It does not stop an ordinary take.** An ordinary take still captures a muted lane (10.2.1). A REC SEQ take records what you hear: set to EACH, a muted lane records silence onto its track; set to ONE, it leaves a muted lane out.
- **On a lane that plays your own gear**, it stops the lane's notes (10.3.4).
- **It is saved with the project.**
- **It shows only on MIX**: on its key under SHIFT and as the red fader name. Nothing on SYNTH, DRUM or SEQ says a lane is muted, so if a lane plays nothing anywhere, look here.

10.4.1 The mutes compared

Tonaut has three mutes that act on a whole lane or track, and a fourth for single drum pads. They are different acts, and they add up: a sound must get past every one that applies to it.

MUTE	WHERE	SILENCES	STILL SOUNDS	IN A TAKE
Pattern mute	SEQ's MUTE page: a **LANE 2 MUTE** key for each lane, lit while muted (8.9)	the lane's pattern	your fingers and MIDI on that lane; its tape track	A REC SEQ take leaves the lane out.
Lane mute	MIX: SHIFT + MUTE 2	everything lane 2 plays, any way	tape track 2	Still recorded in an ordinary take. A REC SEQ take hears it: silence on its EACH track, left out of ONE.
Tape track mute	TAPE: SHIFT + a track key, which reads MUTE (11.2.1). TAPE MIX: SHIFT + MUTE 2. One mute, two keys.	tape track 2's playback	every lane, live	You can still record onto the track.
Pad mute	DRUM, a tap on the pad map (6.7.2)	one pad's hits from the pattern and groove	that pad by hand or MIDI; the tape	The pad's pattern hits aren't played, so they aren't recorded.

On screen they are told apart by where they are drawn. SEQ's pattern mute is a lit **LANE 2 MUTE** key on SEQ's MUTE page. MIX's lane mute is a filled MUTE 2 under SHIFT and a red channel name. A muted tape track has a filled MUTE on its track key under SHIFT, a filled MUTE 2 and a red track name on TAPE MIX, and its takes drawn as outlines on TAPE. A muted pad shows in DRUM's header as a red count, such as 3 MUTED.

TIP

> When something you expect to hear is silent, check in this order: MIX's mutes and faders, then TAPE MIX's, then SEQ's MUTE page, then the red count in DRUM's header. With PATTERN PLAY, a lane that has nothing in the pattern number you switched to goes quiet too (8.13).

10.5 EQ: each lane's EQ and the master EQ

An EQ lifts or cuts the bass, the middle and the top of a sound. MIX has two kinds:

- **Each lane's own EQ**, such as LANE 3 EQ, shapes that lane alone, on its strip before its fader (10.5.3). Use it to give each part its room: take some bass out of a pad so the bass line comes through, or brighten a lead.
- **The master EQ**, MASTER EQ, shapes the whole mix: every lane and every tape track together, after they are added up.

Both have the same three bands, AMOUNT and three frequencies, and work the same way. The EQ page shows one of them at a time, and the right window shows the same one on LEVEL and OUT.

To shape lane 3's sound:

01 On MIX, tap lane 3's button to focus it.

02 Press EQ. The right window reads LANE 3 EQ, with that EQ's AMOUNT on the right, and the band holds lane 3's **LOW**, **MID**, **HIGH** and **AMOUNT**. If the window reads MASTER EQ instead, press EQ again.

03 Drag a handle in the window, or a slider on the band (10.5.1, 10.5.2). Only lane 3 changes.

04 To shape another lane, tap its button. The window's name, the curve and the band follow at once.

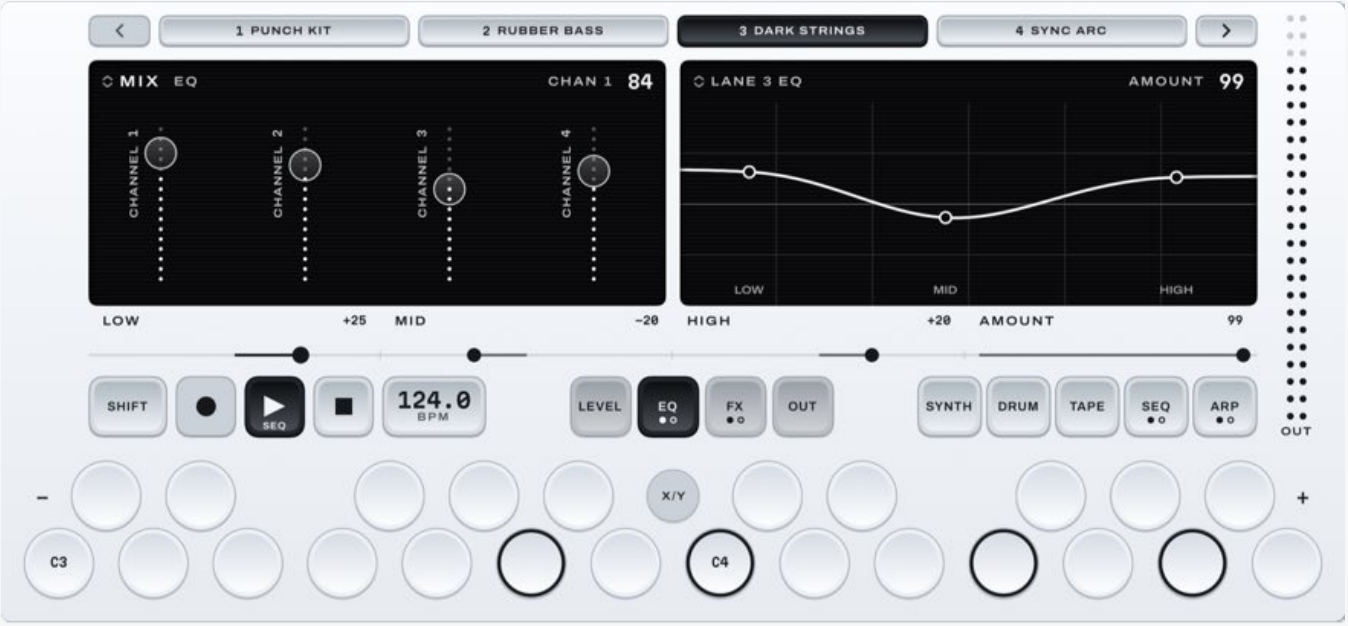


Figure 10.6 Lane 3's own EQ. The window names the lane, and the curve and the band change lane 3 alone.

To reach the master EQ, press EQ again. The window reads MASTER EQ, with DRIVE and its value on the right (10.7), and the band holds the master's controls. Press EQ once more to go back to the focused lane's EQ.

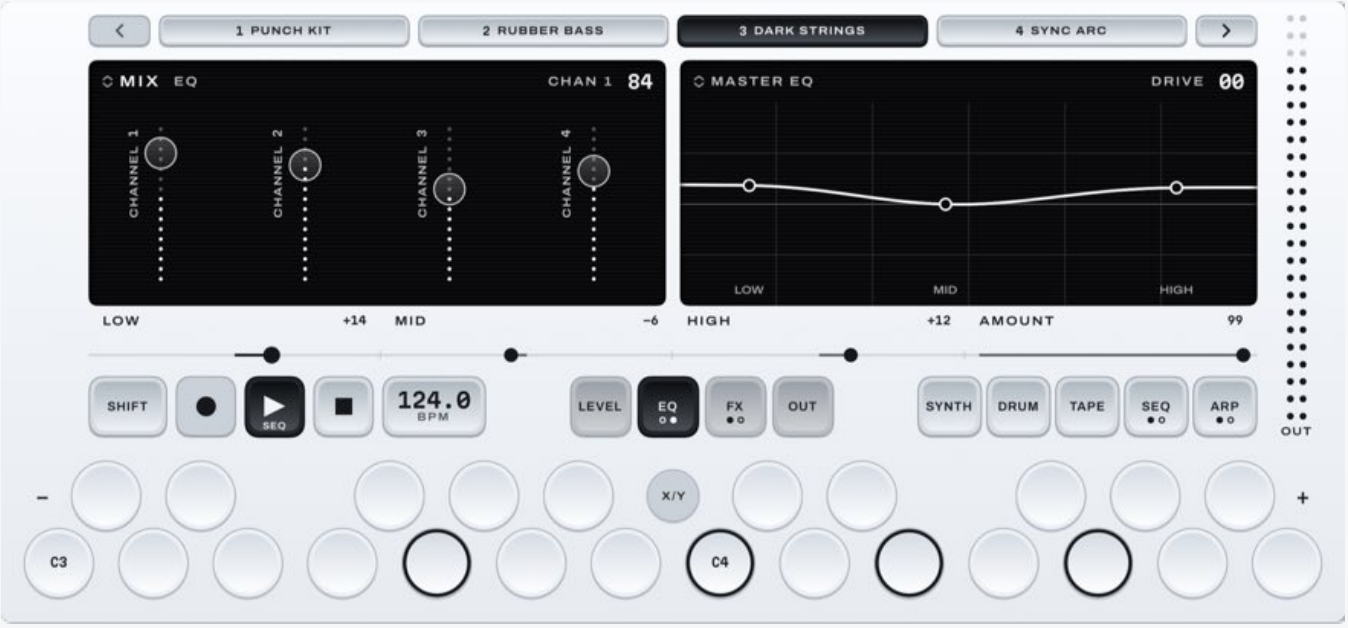


Figure 10.7 EQ pressed again: the master EQ, which shapes everything you hear together.

- EQ wears two dots: the first is filled on a lane's EQ, the second on the master EQ.
- MIX keeps your choice while Tonaut runs: leave MIX on the master EQ and the EQ page opens on it next time, whichever lane is focused. After a relaunch it starts on the lane's EQ.
- On TAPE MIX the EQ page is always the master EQ. A tape track has no EQ of its own, so there EQ has no dots and a second press changes nothing (10.10.2).
- With HELP latched, EQ reads **THIS LANE'S EQ · AGAIN: THE MASTER EQ** on MIX, and **THE MASTER TONE CONTROLS** on TAPE MIX.

10.5.1 The curve and its three handles

The white line in the EQ window is the shape of the EQ showing, the one its header names: bass on the left, treble on the right. Flat means the EQ changes nothing. The three handles, white rings, **LOW**, **MID** and **HIGH**, are the three bands.

To change a band by touch:

01 Put a finger anywhere in that band's third of the window: left third for LOW, middle for MID, right for HIGH.

02 Drag up to boost, down to cut. The curve bends as you go, and the matching band slider on the EQ page follows.

The curve shows how much each band boosts or cuts, scaled by **AMOUNT**. It does not move sideways when you change the frequencies under SHIFT: the three handles stay where they are drawn.

10.5.2

The EQ page's band

A lane's EQ and the master EQ have the same controls, with the same values and the same starting points:

CONTROL	LAYER	VALUES	WHAT IT DOES
LOW	band	**−50** to **+50**, **0** flat	Lifts or cuts the bottom end: a low shelf, which moves everything below its corner by the same amount. **+50** is +12 dB, **−50** is −12 dB.
MID	band	**−50** to **+50**, **0** flat	Lifts or cuts the middle: a broad bell around its frequency. ±12 dB at the ends.
HIGH	band	**−50** to **+50**, **0** flat	Lifts or cuts the top end: a high shelf. ±12 dB at the ends.
AMOUNT	band	**00** to **99**	How much of the EQ you get. It scales all three bands at once: **99** is the full setting, **00** is exactly flat however the bands are set. Good for comparing with and without. It starts at **99**, so the first drag is heard.
LOW HZ	SHIFT	**00** to **99**	Where the bottom end starts: 50 Hz at **00** to about 500 Hz at the top. It starts at **35**, about 110 Hz.
MID HZ	SHIFT	**00** to **99**	Where the middle band sits: 250 Hz to about 5 kHz. It starts at **50**, about 1.1 kHz.
HIGH HZ	SHIFT	**00** to **99**	Where the top end starts: 2 kHz to about 16 kHz. It starts at **60**, about 7 kHz.
fourth lane	SHIFT		On a lane's EQ, drawn off: there is nothing more. On the MASTER EQ it is not an EQ control but the master effect's eighth control, the same one as the last slider of the FX page under SHIFT (10.6.2). With no master effect it is drawn off there too, reading `-` and `--`.

A double-tap puts any of the seven EQ controls back where a new project has it: the three bands to **0**, AMOUNT to **99**, the three frequencies to **35**, **50** and **60**. SHIFT + double-tap puts back a slider's last change, and each lane's EQ remembers its own (2.4.4).

With HELP latched, a lane's EQ says that it is the lane's: its LOW reads LIFT OR CUT THIS LANE'S BOTTOM END where the master's reads LIFT OR CUT THE BOTTOM END, and its AMOUNT HOW MUCH OF THIS LANE'S EQ · 0 IS OFF.



Figure 10.8 The master EQ under SHIFT: the three frequencies, then the master effect's eighth control, WIDTH here. On a lane's EQ that fourth lane is off.

10.5.3

Where a lane's EQ sits, and what keeps it

A lane's EQ is the first thing on its strip, before the fader, the balance and the mute, as on a mixing desk (10.2).

- **A fader move never changes what the EQ hears**, and the lane's meter on LEVEL reads the lane after its EQ (10.3.2).
- **It stays off an ordinary take.** An ordinary take records the lane before its EQ, so a lane recorded that way plays back without it, and a tape track has no EQ to put it back. Shape what is on the tape with the master EQ, which every track plays through. A REC SEQ take, set to **EACH** or **ONE**, records each lane through its EQ, as you hear it (10.2.1).
- **Exports don't hear it** either, since MIX DOWN and STEMS are made from the tape (10.10.4), except through a REC SEQ take.
- **A flat EQ costs nothing.** An EQ whose three bands are at **0**, or whose AMOUNT is **00**, is skipped, so EQs you leave alone take nothing from the phone's processor.
- **It belongs to the lane, not to the sound**, like the fader. Load another patch or kit and the EQ stays. A lane swap (2.12) carries it with the lane, and switching a project to six lanes clears lanes 7 and 8's EQs along with their faders.
- **It is saved with the project**, with the rest of the mix (10.2.2). SAVE AS carries it, and REVERT puts back the EQs of the last SAVE.
- **On a lane on EXTERNAL MIDI** there is no sound for the EQ to shape. Its band is drawn off, the curve is flat, the handles move nothing, and the header reads **MIDI** where AMOUNT would be. The values are kept for when the lane plays a sound of Tonaut's again.
- **A song you send carries every lane's EQ** (13.13). If one of them changes the sound, an older version of Tonaut that has no lane EQs says **UPDATE TONAUT TO OPEN IT** and doesn't open the song (13.14). A song whose lane EQs are all flat opens there as before.

NOTE

Tonaut 1.0 has no lane EQs. If your other device still runs it and opens one of your projects through iCloud, it plays the project without them, and a save made there drops them. Update Tonaut on every device you use.

10.6 FX: the master effect

The master effect is one effect on the whole mix, after the master EQ and before DRIVE. It is separate from the four effects every sound has (4.7): those are on one lane each, this one is on everything, the tape included. A new project has none.

With no master effect, the FX page's four sliders are drawn off, reading `-` and `--`, and take no touch. The right window reads `NO EFFECT ON THE MASTER` and `PRESS FX AGAIN TO CHOOSE ONE`.



Figure 10.9 The FX page with no master effect: four lanes off. Press `FX` again to choose one.

10.6.1 Choosing the master effect

To choose a master effect:

01 On MIX, press `FX`. The FX page shows.

02 Press `FX` again. The master effect list opens: the left window reads `EFFECT` and `MASTER`, with a counter such as `01 / 17`.

03 Move the cursor: drag the band's **CURSOR** slider, drag the list, or tap a row. **Each effect goes on the moment the cursor reaches it**, so play the keys or start the patterns and listen.

04 Leave the list on the one you want. Press `FX` again to close the list and land on the FX page with its controls, or press `LEVEL`, `EQ` or `OUT` to close it and go to that page.

The list has seventeen rows, in this order: **None**, **Spring**, **Delay**, **Crush**, **Fold**, **Comb**, **Reverb**, **Chorus**, **Drive**, **Echo**, **Space**, **Dist**, **Filter**, **Pump**, **Swirl**, **Lo-Fi**, **Tremolo**. They are the same sixteen effects a sound's FX slots use (4.7.2, 4.7.4, 4.7.5). There is only one master effect, so the rows carry no lane marks. The right window, **CONTROLS**, names the effect at the cursor and lists its eight controls, the first four on the left and the four under SHIFT on the right. The band has only **CURSOR**.



Figure 10.10 The master effect list. Moving the cursor puts the effect on at once; the page keys take you back to MIX.

- Changing the effect resets its eight controls to the new effect's starting values. The list remembers the effect that was on when you opened it: come back to it and your settings come back too. Any other effect comes in at its starting values.
- Choose **None** to take the master effect off. The FX page's lanes go back to off.
- Swapping effects while music plays crossfades from the old one to the new one, so it does not click.
- The keyboard keeps playing the focused lane while the list is open, and **SHIFT** + the **MUTE** keys still work. While SHIFT is on, the band's **CURSOR** is drawn off; drag the list or tap a row instead.
- Opening the list doesn't light a mode key; MIX lights none.

10.6.2

The master effect's eight controls

Once an effect is on, the FX page's band shows its first four controls, and SHIFT shows the other four. The right window lists all eight with their values, the band's four on the left and SHIFT's four on the right, with a bar beside the one you touched last, whose value the window's header also shows; it is the master effect's own CONTROLS. A sound's four effects have theirs on FX 's third press (4.7.3). What each control does is in 4.7.2, and the ranges and starting values of Echo, Space and Dist are in 4.7.4, and those of Filter, Pump, Swirl, Lo-Fi and Tremolo in 4.7.5.

EFFECT	BAND	UNDER SHIFT	MIX STARTS AT
Spring	TONE SIZE DAMP MIX	DRIP DRIVE WIDTH PRE-DELAY	30
Delay	TIME FEEDBACK TONE MIX	SYNC PING-PONG WOW DIP	30
Crush	BITS RATE FLAVOR MIX	DITHER HISS TONE DRIVE	99
Fold	FOLD BIAS TONE MIX	DRIVE STAGES SMOOTH LEVEL	99
Comb	FREQ FEEDBACK SPREAD MIX	DAMP MOD RATE MOD DEPTH SYNC	50
Reverb	SIZE GATE COLOR MIX	PRE-DELAY DAMP MOTION WIDTH	25
Chorus	RATE DEPTH WIDTH MIX	VOICES DELAY HAAS LOW CUT	50
Drive	DRIVE PUNCH TONE MIX	ATTACK RELEASE CHARACTER LEVEL	99
Echo	TIME FEEDBACK WEAR MIX	SYNC WOW SATURATE SPREAD	30
Space	DECAY SHIMMER DAMP MIX	PRE-DELAY MOTION LOW CUT WIDTH	35
Dist	GAIN TONE FUZZ MIX	LOW CUT BIAS BITE LEVEL	99
Filter	CUTOFF RESONANCE DEPTH MIX	MODE MOVE DRIVE SPREAD	99
Pump	DEPTH RATE RELEASE MIX	CURVE ATTACK HOLD OFFSET	99
Swirl	RATE DEPTH FEEDBACK MIX	MODE SYNC CENTER SPREAD	50
Lo-Fi	TONE WOBBLE CRACKLE	NOISE GRIT WIDTH DRIVE	99

	MIX		
Tremolo	**DEPTH RATE SHAPE MIX**	**MODE OFFSET LOW CUT LEVEL**	**99**

The fourth slider, **MIX**, is how much of the effect you hear against the dry mix. Crush, Fold, Drive, Dist, Filter, Pump, Lo-Fi and Tremolo arrive with it at **99**, which puts the *whole* mix through the effect at once. Bring it down if that's more than you wanted.

- The **SYNC** of Delay, Comb, Echo and Swirl follows the project's tempo, and so do Filter's **MOVE** on a note value and the **RATE** of Pump and Tremolo.
- These sliders have no double-tap reset. To get an effect's starting values back, choose another effect and then this one again. SHIFT + double-tap still puts back a slider's last change (2.4.4).
- With HELP latched, a tap on one of them reads the effect's own line for that control.
- The eighth control, the last slider under SHIFT, also appears as the fourth lane of the MASTER EQ under SHIFT (10.5.2). Both move the same value.

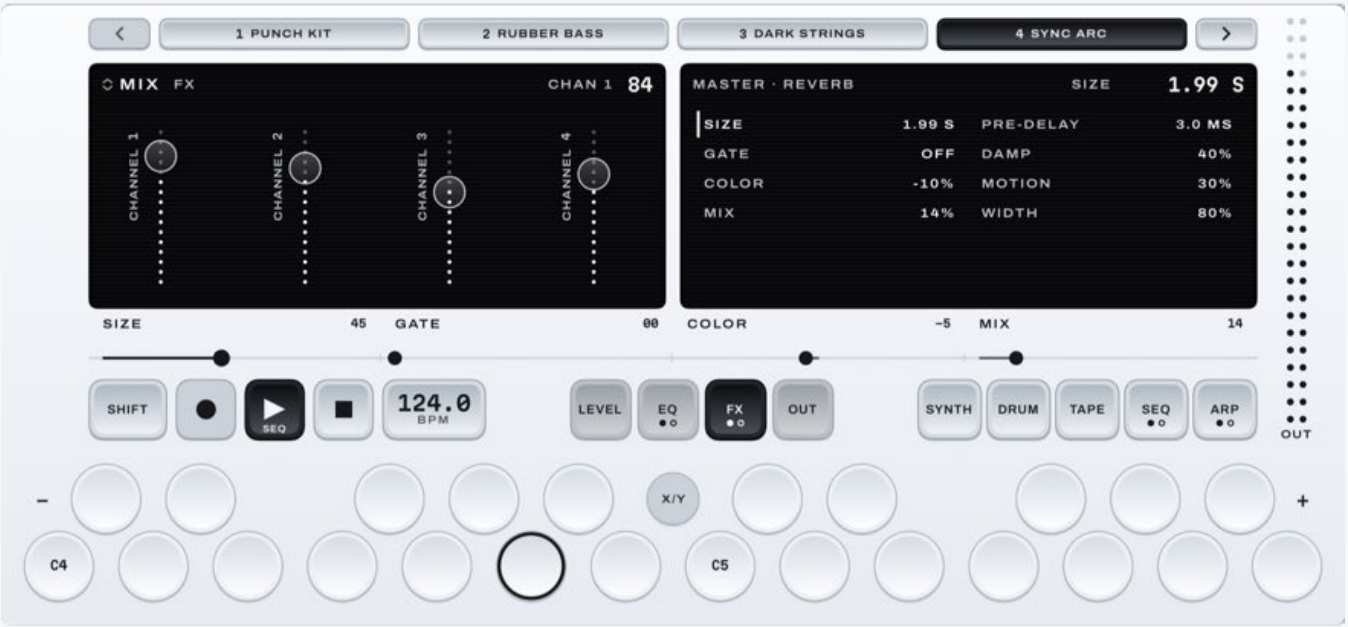


Figure 10.11 A touch of Reverb on the whole mix. Its first four controls are on the band; SHIFT shows PRE-DELAY, DAMP, MOTION and WIDTH.

10.7 OUT: what leaves the instrument

The OUT page holds the last controls before the sound leaves Tonaut: the level of each side and the drive stage.

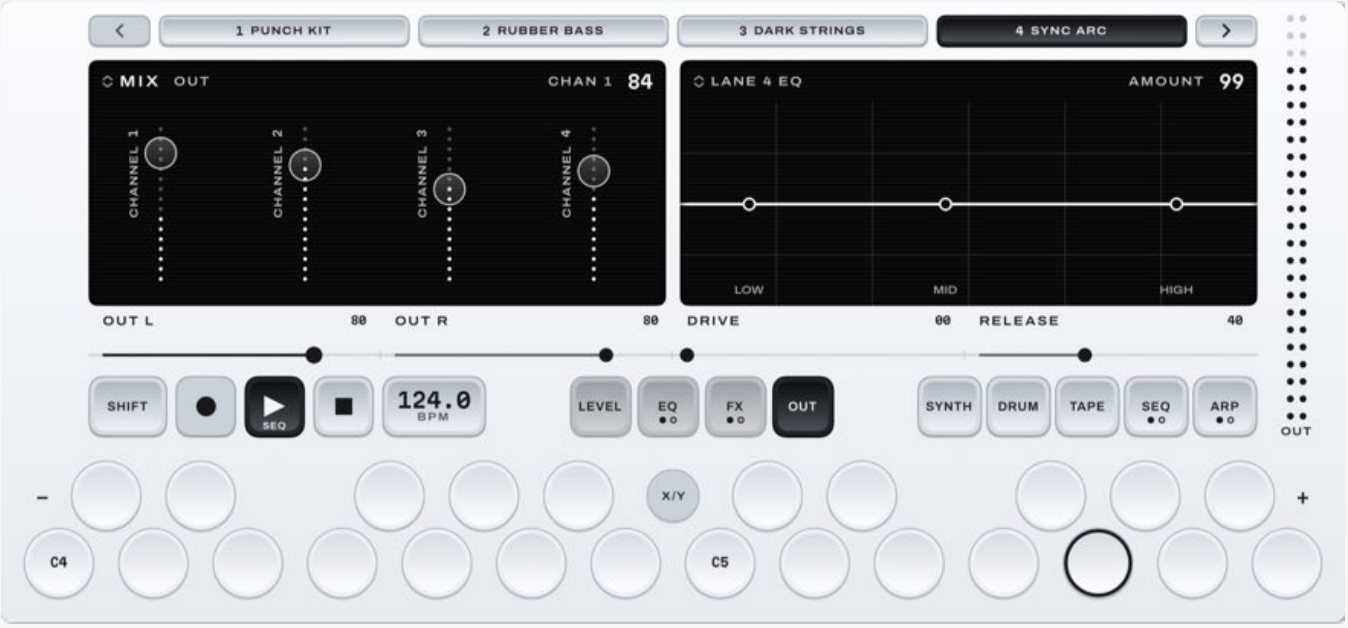


Figure 10.12 The OUT page. DRIVE at **00** is off; the right window shows DRIVE's value in its header whenever it shows the master EQ.

CONTROL	VALUES	WHAT IT DOES
OUT L	**00** to **99**, starts at **80**	How loud the left side goes out. **80** leaves it as it is, **99** is about +6 dB, **00** silences the left side. It acts before the limiter.
OUT R	**00** to **99**, starts at **80**	The same for the right side.
DRIVE	**00** to **99**, starts at **00**	How hard the whole mix is pushed. At **00** it is off and changes nothing. Turned up, it squeezes the loud parts (a compressor: it turns down peaks so the quieter parts sit closer to them), adds warm saturation, and raises the level into the limiter. The more you turn it, the harder all three get.
RELEASE	**00** to **99**, starts at **40**	How fast the squeeze lets go after a loud moment: about 30 ms at **00** to 1.5 seconds at the top; **40** is about 140 ms. Short makes the mix pump and breathe; long holds it down evenly. **It does nothing while DRIVE is at 00.**

A double-tap puts each one back to its starting value. Under SHIFT the OUT page's four lanes are drawn off: there is nothing more here.

10.7.1 Using DRIVE

To make the whole mix louder and denser:

01 Start the patterns, or play back the tape.

02 On OUT, raise **DRIVE** slowly from **00**. Watch the OUT meter in the right margin climb.

03 Set **RELEASE** by ear: lower for a pumping, breathing sound, higher for a steady one.

04 If the mix starts to sound flat or distorted, back DRIVE off.

10.7.2 OUT L and OUT R

The two are separate, so you can trim one side against the other at the very end of the chain, for example if your speakers or headphones are unbalanced. To turn the whole mix down, move both together. For one lane, use its fader instead, and for one tape track, its fader on TAPE MIX.

10.7.3 The limiter

The last stage is a limiter. It is always on and has no controls. It holds the output 1 dB under full scale, so however hard you push the faders, OUT and DRIVE, what leaves Tonaut does not clip. Pushed hard, it audibly flattens the loudest moments; that is the sign to back something off.

The OUT meter in the right margin (2.1) reads after the limiter. It can fill to the top, but because the limiter stops 1 dB short of full scale, its red top dot should stay dark. A lane's meter on MIX, or a track's on TAPE MIX, can still turn red (10.3.2): they read before the master section.

In the TN looks on the iPhone (2.1.1) the OUT meter lights in the look's own colors: graphite dots in TN-1 and white ones in TN-1 DARK, each with the top four rows of a column lit orange as the mix nears the top, and white all the way up in TN-XY. A loud mix that lights the orange rows is still under the limiter's ceiling.

10.8 Transport from MIX

MIX and TAPE MIX count as screens of their own for the transport keys, not the mode underneath. REC, PLAY and STOP do the same with SHIFT latched as without, so you can sit on the mutes and still start and stop (2.10).

KEY	ON MIX AND TAPE MIX
PLAY	Plays the patterns, even on TAPE MIX, so the word under its triangle reads **SEQ** here. If no lane's pattern holds a note, the screen says PATTERN EMPTY. The tape stays where it is. If the tape is already rolling (you started it on TAPE), PLAY adds the patterns without restarting anything. PLAY is lit while anything runs.
REC	Nothing. It is a well and takes no press. Recording is armed on SEQ or TAPE. A take you started on TAPE keeps recording while you're on MIX.
STOP	Stops the patterns, the tape and a take in progress. Grooves and arpeggios carry on (9.6.2). Pressed again while stopped, it sends the tape back to the start, or to LOOP IN while a loop is on. With a lane playing your own gear, that second press also sends all notes off (chapter 16).

To mix a song you've recorded on tape:

01 On TAPE, press PLAY. The tape rolls.

02 Press SHIFT + MIX. TAPE MIX opens and the tape keeps rolling.

03 Set each track's fader and balance while it plays (10.10), then the master EQ, the master effect and OUT on the other pages.

04 Press STOP when you're done, and again to go back to the start.

TIP

> Set a loop on TAPE first (11.9). The tape then plays the same section over and over while you work on the mix.

10.9 Playing, slots, DIE and HELP on MIX

10.9.1 The keyboard and the lanes

The keyboard keeps playing the focused lane on MIX, with a kit lane's keys reading 1 to 24 as everywhere else. Tap a lane button to play another lane; MIX stays open. MIDI plays the focused lane as usual.

The mode under MIX follows the lane, as it does everywhere (2.2.1). If you opened MIX from SYNTH and tap a kit lane, closing MIX lands on DRUM; from DRUM, a synth lane sends you to SYNTH.

Under SHIFT the keyboard is the same as on SYNTH: the upper row is quick slots 1 to 8, UNDO, DIE and HELP, the end keys are blank, and the naturals between keep playing (2.8.1). A quick slot loads onto the focused lane from MIX as it does anywhere (3.6), and leaves that lane's fader where it is. On the iPhone, the – and + keys in the keyboard's end gaps move the octave here too, with SHIFT or without (3.2). The X/Y key in the middle gap does not open the pad on MIX, whose right window is the EQ: it says X/Y PAD: SYNTH, DRUM, TAPE OR ARP.

NOTE

> DIE takes the press on MIX, but it has no MIX job. It scrambles a page of the focused lane's sound that MIX doesn't show, so you can't see what it changed or what UNDO puts back (3.7). Use it on SYNTH, DRUM or EDIT only.

10.9.2 HELP on MIX

Opening MIX turns HELP off. To read what MIX's controls do:

01 Go to the MIX page you want to read about first.

02 Hold SHIFT and press HELP. The help panel takes the left window, so the faders are hidden. The EQ window stays.

03 Tap a band slider, or press a page key, or under SHIFT one of the MUTE keys. Its line appears in the left window's header. A drag on a slider still moves it, but a page key or a mute key only answers: it doesn't change the page or mute anything.

04 Press SHIFT + HELP again. The faders come back.

To read another page's sliders, turn HELP off, go to that page, and latch HELP again.

The faders and the EQ handles have no lines of their own while the help panel covers them. Their sliders do: **LOW**, for example, reads LIFT OR CUT THE BOTTOM END, and a MUTE key on MIX reads SILENCE THIS LANE · THE TAPE PLAYS ON. The SETTINGS cell in the help panel opens Settings over MIX, and closing Settings brings MIX back. The SAMPLE and RECORD cells close MIX (10.1.4).

10.10 TAPE MIX: the tape's own mixer

TAPE MIX sets how each tape track plays back: its level, its balance and its mute. It is MIX's screen with the tape tracks' strips in place of the lanes', so everything in this chapter about faders, meters, balances and mute keys works the same way here. Use it to balance the parts you've recorded without touching how the lanes sound live.

10.10.1 Opening TAPE MIX

To open TAPE MIX:

01 Press TAPE.

02 Hold or latch SHIFT and press MIX. The screen opens on LEVEL and its header reads TAPE MIX.

Close it the way you close MIX: SHIFT + MIX again, or any mode key (10.1.3). On the iPhone, SHIFT + MIX on TAPE always means TAPE MIX; from every other screen it means MIX. On the iPad, MIX's own key still opens MIX on TAPE, SHIFT + MIX opens TAPE MIX, and either key switches to its mixer while the other is open (chapter 17).

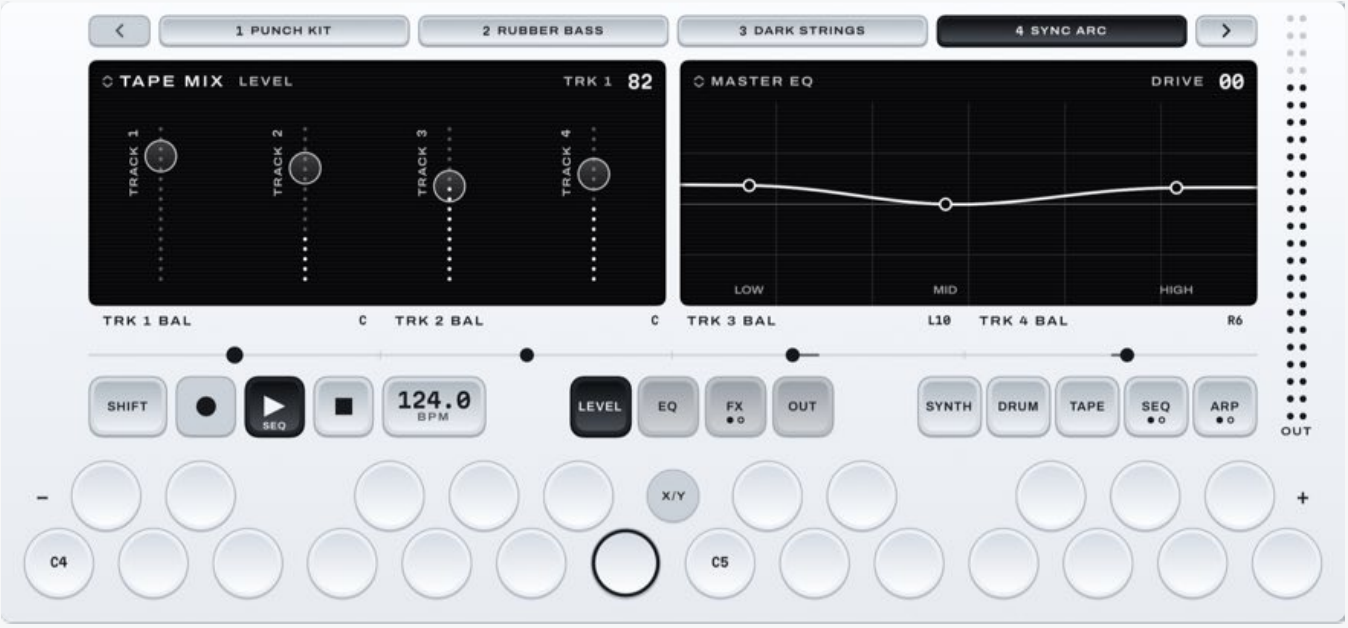


Figure 10.13 TAPE MIX: the faders and balances are the tape tracks', and the meters show what each track plays back. EQ, FX and OUT are the same master pages as on MIX.

10.10.2

What it shows

- **The faders** are the tape tracks' playback levels, named TRACK 1 and up (TRK 1 where the full word doesn't fit), with the same values and the same 0 dB at **80** as MIX's (10.3.1). The header names the track you touched last, such as TRK 2, and its level.
- **The band on LEVEL** is each track's balance, TRK 1 BAL and up, reading **L50** to **C** to **R50**. A double-tap centers it, as on MIX.
- **Under SHIFT** the page keys are MUTE 1 and up, the tape tracks' mutes. They are the same mutes as SHIFT + a track key on TAPE (11.2.1): mute track 2 here and its key on TAPE is filled too. A muted track's name turns red and its meter goes dark.
- **The meters** show each track's playback alone, after its fader, balance and mute.
- **The lane row's page** applies here as on MIX: tracks 1 to 4 or 5 to 8 on the iPhone in an eight-track project, all six in a six-track one.
- **EQ, FX and OUT** are the master section, the same controls MIX shows (10.5 to 10.7). TAPE MIX's EQ is always the MASTER EQ: a tape track has no EQ of its own, so EQ has no dots here and a second press changes nothing.

With HELP latched, a MUTE key here reads SILENCE THIS TAPE TRACK'S PLAYBACK and a balance PLACE THIS TAPE TRACK LEFT TO RIGHT, so the lines always say which mixer is open.

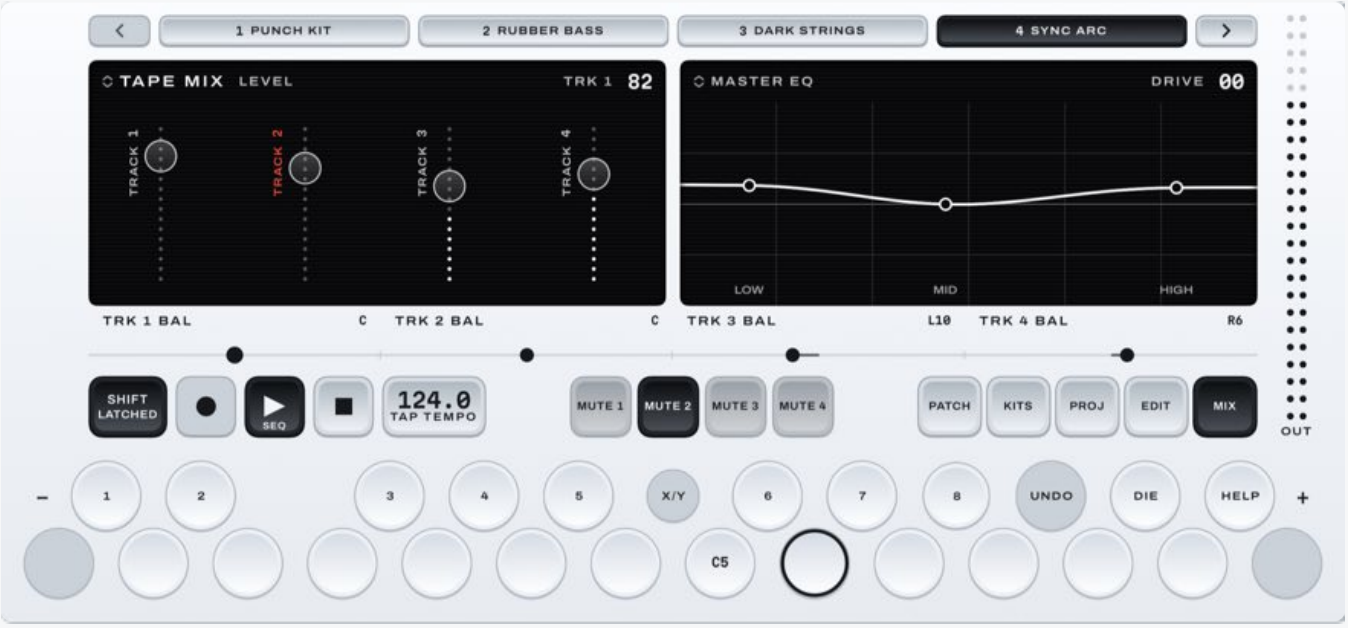


Figure 10.14 Tape track 2 muted on TAPE MIX. The same mute shows on TAPE as a filled MUTE key and outlined takes.

10.10.3 Takes are recorded at full level

Nothing on TAPE MIX reaches what is recorded. A take is written at the level **REC LEVEL** and **REC PAN** on TAPE set (11.5), and TAPE MIX decides only how loud and where it plays back. Pull a track's fader down, record onto it, and the new take is on the tape at full level: raise the fader and you hear it.

A muted track can still be recorded onto. You hear what you play, but not the takes already on the track.

10.10.4 Exports go through TAPE MIX

Both of a project's audio exports are made from the tape (14.8.1):

- **MIX DOWN** is the tape through TAPE MIX and the whole master section: each track at its fader and balance, muted tracks left out, then the master EQ, the master effect, DRIVE, OUT and the limiter. What you hear on TAPE MIX is what the file sounds like.
- **STEMS** writes one file per track that holds a take, each at its TAPE MIX level and balance, without the master EQ, the master effect, DRIVE or the limiter, which belong to the whole mix. A muted track writes no file. With every recorded track muted, STEMS writes nothing and says every track is muted.

MIX's lane EQs, lane faders and lane mutes play no part in either: an export has no live lanes, only the tape. Sharing the tape as a video or audio file from TAPE makes its sound the way MIX DOWN does (11.19).

11 TAPE

TAPE is Tonaut's multitrack tape recorder, with up to 30 minutes of tape per project. Everything the instrument plays can go onto it: your keys, the patterns, the arpeggiator, a groove. You make a piece in layers, loop part of it, cut and move takes, and play it all back through TAPE MIX.

11.1 The tape

Every project has its own tape. A new project's tape has eight stereo tracks of 20 minutes each at normal speed. SHAPE on PROJECTS turns it into six tracks of 30 minutes instead (13.15), so a project holds up to 30 minutes of tape. You never load or save a tape. It is part of the project, and a take is written to the phone while you record it, at least every two seconds, and again the moment you stop (13.2).

To open TAPE, press the TAPE mode key. It turns red. The left window is the deck and the right window is TRACKS. The band holds the tape's own controls (11.5), and the page keys choose a track (11.2). Without SHIFT the keyboard plays the focused lane as it does on every screen, kit pads included, so you can play and record without leaving TAPE. Under SHIFT the TAPE key reads PROJ and opens PROJECTS (chapter 13), and the keyboard becomes the tape's tools (11.8).



Figure 11.1 A song on tape: four of its eight tracks on this page. Track 1 is the chosen track, so it is drawn red.

11.1.1 The deck

The deck fills the left window. Down its left side, top to bottom:

- **TAPE**, the screen's name, with the wind mark before it: two chevrons side by side, saying the window takes a drag (2.3, 11.6).
- The counter, in two rows. The bar, four digits with the leading zeros dimmed, then the beat: **0002 3** is bar 2, beat 3. Under them the captions **BAR** and **BEAT**. The counter turns red while **REC** is armed. The clock is on the TRACKS title line (11.1.2).
- The armed line: a red dot and **REC TRK 2**, the track the next take goes onto. On TAPE, choosing a track is arming it, so this line is always there and always red, whether or not REC is pressed. With REC SEQ on and REC armed it names every track the take will write: up to three by number, such as **REC TRK 1 3**; more than that counted, such as **REC 5 TRACKS**; and **REC TRK ALL** for every track (11.7).
- The SEQ line, only while REC SEQ is on: the lanes whose patterns will play into the next take. Up to five by number, such as **SEQ 1 3**; more than that counted, such as **SEQ 6 LANES**; and **SEQ ALL** for every lane (11.7).
- Tape left, at the foot, level with the bottom of the spools: **20:00 LEFT** on an empty eight-track tape, **30:00 LEFT** on a six-track one. It turns red for the last 30 seconds (**0:24 LEFT**) and reads **TAPE FULL** at the end (11.16). If the phone has room for less than that on the tracks you're recording, it counts the room instead (11.3).

The two spools fill the rest of the window. They turn only while the tape moves, at its real speed and in its real direction: backwards when the tape runs backwards, faster when it winds, and not at all when it is stopped or at the end. The left spool speeds up as it empties and the right one slows as it fills, as on a real machine. The iPad draws its deck differently (chapter 17).

NOTE

> In the TN-1 and TN-1 DARK housings, which only the iPhone offers (14.2.1), everything this chapter calls red is orange: the TAPE key, REC, the armed line, the counter and clock while armed, and the take being written. Those two housings also draw the spools their own way, with thin rims, fine rings for the wound tape and three rounded openings. In TN-XY the lit TAPE key is silver and recording stays red.

The counter's bars and beats are counted in the song's tempo, the tempo the patterns record at. With the tempo page's **Tape speed** on **FOLLOWS** they are counted in the tempo of this project's first recording instead: the tape follows a tempo change, so the bar lines stay with what is already on tape (11.15).

NOTE

> On the smallest screens, such as the iPhone 13 mini, the deck has room for only one of the bottom two lines. While REC SEQ is on, the SEQ line takes the place of the tape left.

11.1.2 TRACKS

The right window draws the tracks as numbered rows, one for each track the lane row shows. On the iPhone in an eight-track project that is four at a time, tracks 1 to 4 or 5 to 8: the arrow keys at the ends of the lane row turn the page (2.2). A six-track project shows all six.

The title line reads **TRACKS · 8 BARS**: how much of the tape the window shows, which a pinch changes (11.18). The clock sits at the right end of the same line, in the same size: minutes, seconds and hundredths of a second, such as **0:05.32**. The hundredths run while the tape moves and stop when it stops. It turns red with the counter while **REC** is armed, and it always reads the same place as the counter: **0009 1** at 120 BPM is **0:16.00**.

- Thin vertical lines mark each bar. At its usual 8 bars the window shows eight bars at a time, and when the playhead passes the right edge it turns to the next eight. At 120 BPM, eight bars is 16 seconds of tape.
- A take is a tinted block with its waveform drawn inside it. A take is one stretch of recorded audio on one track.
- The armed track is drawn red: its number, its blocks and their waveforms. Ordinarily that is the track you chose with its **TRK** key.
- A muted track's takes lose their fill and keep only their outline (11.2.1).
- The playhead is a vertical line with a small triangle at the top. It turns red while REC is armed.
- While a take records, the new take grows in red behind the playhead.
- The loop markers are two thin lines at LOOP START and LOOP END, each with a short flag along the top pointing into the loop. The flags are solid while LOOP is on and faint while it is off. There are no markers until LOOP END is later than LOOP START (11.9).

A pinch on TRACKS zooms it and a double-tap brings it back to 8 bars (11.18). Nothing else you do there changes the tape: one finger dragging does nothing, because winding is the deck's job. While the X/Y pad is on, it takes TRACKS' place; press **X/Y** again to bring TRACKS back (15.6).

TRACKS draws every take with its waveform as soon as a project opens.

11.1.3 What the project keeps

The project keeps, and gives back when you open it again: every take, the chosen track, the track mutes, where the playhead was, the loop markers and whether LOOP was on, SPEED, REC LEVEL, REC PAN, REC SEQ, the clipboard (11.11.2), the last eight undo steps (11.12), the tempo page's Tape speed setting (11.15), and after a lane swap, which track belongs to which lane (11.2). TAPE MIX's levels, balances and mutes are kept too (10.10).

Two things are not kept. REC is never armed when a project opens, and TRACKS opens at 8 bars every time Tonaut starts.

The tape plays through a flavour, which the first-launch screen shows as **FLAVOUR** `Clean`. No control changes it yet.

11.2 Choosing a track

On TAPE the page keys are the tracks: one TRK key for each track the lane row shows. On the iPhone in an eight-track project that is TRK 1 to TRK 4, or TRK 5 to TRK 8 after the lane row's › arrow; a six-track project shows six narrower keys, TRK 1 to TRK 6, which on smaller iPhones set the word over the number, TRK above 1. Press one to choose the track the next take records onto. Its key fills, its row in TRACKS turns red, and the deck reads REC TRK 3 (for track 3).

The chosen track is also the one these act on:

- the edit tools LIFT, DROP, SPLIT, JOIN, ONE, ERASE and TRACK (11.11);
- CATCH (11.14.2);
- a REC SEQ take set to ONE, and an EACH take with one lane playing (11.7);
- IMP on the kit browser, which turns the chosen track into a kit (5.7.1);
- the recorder, when its DEST is TAPE (12.5). The recorder shows the same track keys.

Choosing a track during a take moves the recording to the new track from that moment. What was recorded so far stays on the old track. The two halves are two takes and two undo steps.

The track keys are on TAPE and the recorder only. On other screens the page keys have no track job, under SHIFT or not.

Swapping two lanes swaps their tracks too (2.12). Swap lanes 1 and 3 and lane 3's takes, its TAPE MIX strip and its mute move to track 1 with the lane's sound. The chosen track follows what it was on: with track 1 chosen before the swap, track 3 is chosen after it, so an edit still lands on the same takes.

11.2.1 Muting a track: SHIFT + TRK

Under SHIFT each track key reads MUTE and its number, such as MUTE 2 for track 2; on the narrower keys of smaller iPhones the word sits over the number. A tape track mute silences that track's playback and nothing else. It is the same mute as the MUTE keys on TAPE MIX (10.10.2): set it on either and both show it.

To mute track 2:

01 On TAPE, hold SHIFT, or tap it to latch it. The page keys read MUTE 1, MUTE 2 and so on.

02 Press MUTE 2 (the key that reads TRK 2 without SHIFT). It fills.

03 Track 2's takes in TRACKS lose their fill and keep their outlines. Track 2 no longer sounds when the tape plays.

Press the same key again to unmute. With SHIFT latched you can mute several tracks one after another. The mutes are saved with the project.

A tape mute is the tape's half only. Lane 2 still sounds when you play it, and you can still record onto track 2 while it is muted. You hear what you play, but not the takes already on the track.



Figure 11.2 Track 2 muted. The filled MUTE key and the outlined take both say so.

Three of Tonaut's mutes act on a lane or a track, and they silence different things. The full comparison, pad mutes included, is in 10.4.1.

MUTE	WHERE	WHAT GOES QUIET	STILL RECORDED?
Tape track mute	TAPE: SHIFT + MUTE 2; TAPE MIX: SHIFT + MUTE 2	That track's playback only	Yes. You can record onto a muted track.
Lane mute	MIX: SHIFT + MUTE 2 (10.4)	Everything lane 2 plays; not its tape track	Yes, except in a REC SEQ take set to ONE.
Pattern mute	SEQ's MUTE page (8.9)	The lane's pattern stops playing	The pattern doesn't play, so it isn't in the take. A REC SEQ take leaves the lane out.

11.3 Recording a take

To record a take onto track 2:

01 On TAPE, press TRK 2.

02 Put the playhead where the take should start. Press STOP twice to go to the start, or see 11.5 and 11.6.

03 Press REC. It turns a steady red, and so do the counter, the clock and the playhead. Nothing is recorded yet: the tape is armed.

04 Press PLAY. The tape rolls and everything the instrument plays is written to track 2. REC blinks, and a red block grows behind the playhead.

05 Play.

06 Press STOP. The take ends and is saved. REC stops blinking and stays a steady red.

07 Press REC to disarm it before you listen back.

REC tells you which state the tape is in, as on a hardware recorder: a steady red means armed, so the next PLAY records; blinking means a take is being written right now.

NOTE

> STOP does not turn REC off. If REC is still red when you press PLAY to listen back, the tape records again, adding whatever you play on top of the take (11.3.2). Even if you play nothing, the pass is written to the tape and counts as an undo step. Disarm REC first, or UNDO the extra pass.

With the metronome on, PLAY with REC armed clicks the count-in first (3.9.2): one bar, four clicks, in a new project. The count-in belongs to the metronome, so with it off REC and PLAY record at once; tap the tempo key to turn the metronome on or off. The tape and the counter stand still during the count, REC stays steady, and recording starts on the first beat after it, when REC starts to blink. A PLAY with REC off starts at once, metronome or not.

The phone's room. Tape takes space: about 23 MB a minute for each track you record. When you arm REC, Tonaut works out how much tape the phone has room for on the tracks being armed, keeping 512 MB free for the phone itself. If that is less than the tape left, the screen says so, such as ROOM FOR 4:10 ON THIS PHONE, and the deck's LEFT counts down that room instead of the tape. If the phone fills during a take, the take stops with everything before it kept, and the screen says PHONE FULL - RECORDING STOPPED.

Once a take is rolling you can move to any other screen. The take goes on: PLAY stays filled, SYNTH's header shows the red record dot, and every key you play on any screen is recorded. Off TAPE, REC no longer reaches the tape: on most screens it is a well, on SEQ it arms pattern recording instead (8.8.1), and in a browser it starts an export (14.8). Come back to TAPE to punch out. STOP works on every screen.

11.3.1 What a take records

A take records everything the lanes play, each lane after its own effects and before MIX:

- keys you play on the screen, on any screen, and notes from a MIDI keyboard;
- the arpeggiator and the groove player (9.7);
- patterns that are playing;
- the recorder's input, while it is being monitored (12.5).

It goes onto the tape through REC LEVEL and REC PAN (11.5).

A take does not record:

- MIX's lane EQs, faders, balances, mutes, master EQ or master effect, or anything on TAPE MIX. MIX acts on what you hear, after the tape, so a take keeps its own level and you rebalance it later on TAPE MIX (10.2.1). The one exception is a REC SEQ take set to ONE (11.7.4).
- a lane that plays your own gear: its sound is in the gear, not in Tonaut (chapter 16);
- the metronome or the count-in clicks;
- the tape's own playback. To combine tracks, use ALL and ONE (11.11.5).

PLAY on TAPE does not start the patterns. There are two ways to get them into a take:

- With REC SEQ, the patterns start on a bar line of the tape: each lane onto its own track, or all of them mixed onto one (11.7).
- Start the patterns on SEQ with PLAY, then go to TAPE and press REC and PLAY. The tape joins without restarting the patterns, and all the lanes are recorded together onto the chosen track, at full level, as they are before MIX.

11.3.2 Recording over a take adds to it

Recording onto part of a track that already holds a take does not erase it. The new sound is added to what is there, and you hear both. Where the new take overlaps or touches the old one, the two become one block.

To replace part of a track instead, clear that part first. ERASE wipes the whole take under the playhead, so to clear only part of one, cut it out with SPLIT and ERASE (11.11.4), or put a loop around it and LIFT (11.11.3). To take back the take you recorded last, press SHIFT + UNDO (11.12).

11.3.3 Punching in and out

Pressing REC while the tape plays starts and stops recording on the spot, without stopping the tape.

To record a few bars in the middle of a track:

01 Make sure REC is off. Put the playhead a few bars before the part, and press PLAY.

02 When the tape reaches the part, press REC and play. REC blinks while it records. That is the punch in.

03 When the part is done, press REC again. REC goes out, recording stops and the tape keeps playing. That is the punch out.

Each punch is its own take and its own undo step. There is no count-in on a punch. Recording fades in and out over 5 milliseconds at each punch, so the edges don't click.

NOTE

> A punch adds to what is already on the track, as any take does. It does not replace a mistake. To redo a few bars, clear them first (11.3.2), then punch in.

11.3.4 What pauses or ends a take

- STOP, on any screen. The take is saved; REC stays armed.
- REC pressed again on TAPE: the punch out.
- The end of the tape (11.16).
- The phone running out of room: PHONE FULL - RECORDING STOPPED (11.3). The take is kept.
- Opening another project in PROJECTS. The take is finished and saved first, and the screen says so with the project's name, such as OPENED GLASS HARBOR / YOUR TAKE WAS SAVED FIRST.
- Holding BRAKE, REV or STUT, or winding the tape by hand, pauses the recording while you hold. It carries on when you let go, and what follows is a separate undo step.
- A phone call, an alarm, or anything else that takes the sound away from Tonaut. The take is saved and REC is turned off.

The tape records only while it moves forward. Running it backwards records nothing.

Limits: each track is as long as the project's tape at 1.00× SPEED, 20 minutes in an eight-track project and 30 in a six-track one, and holds up to 256 takes. A track that would go past 256 joins its two closest takes into one to make room, rather than refusing to record.

11.4 Playing the tape

PLAY on TAPE rolls the tape, and the small word under its triangle says so: **TAPE**, where every screen but TAPE and the recorder reads **SEQ** (2.10). PLAY fills, the spools turn, the counter runs, and every track that isn't muted plays. The patterns stay stopped. The one exception is a REC SEQ take, where PLAY starts the patterns too, on the tape's next bar line (11.7).



Figure 11.3 The tape rolling. No line on the screen says so: the filled PLAY key, the turning spools and the running counter do.

- PLAY on any other screen plays the patterns and leaves the tape where it is (2.10). Only TAPE and the recorder roll the tape, and only their PLAY key reads TAPE.
- To hear the patterns over the tape, press PLAY on SEQ, then PLAY on TAPE, or the other way round. The second press adds to what is running; nothing restarts.
- STOP stops everything. Pressed again while stopped, it sends the tape back to the start, **00:00**, or to LOOP IN while LOOP is on. To reach **00:00** while a loop is on, use TOP (11.14.1).

Each track plays back through its own strip on TAPE MIX (10.10): its fader sets how loud the track plays, its balance where it sits, and the master EQ and effect color it. MIX's lane faders don't touch the tape.

11.5 The band

TAPE's band reads in the tape's own units: minutes and seconds, bars and beats, a speed, decibels. Four controls show without SHIFT and four more under it. **POSITION** is in both.

CONTROL	LAYER	READS	WHAT IT DOES
POSITION	band and SHIFT	**00:00** to the end of the tape, **20:00** or **30:00**	Moves the playhead by bars, more the faster you drag (11.5.1). With the tape stopped it stops on the start of a bar.
LOOP END	band	bar and beat, such as **025 1**	Where the loop turns back (11.9).

SPEED	band	**0.50×** to **2.00×**, **1.00×** in the middle	How fast the tape runs. Pitch and time change together, like a real tape (11.15).
REC LEVEL	band	**−INF** to **6 dB**; new projects **0 dB**	How loud a take is written. You hear no change while you play; only the take is louder or quieter. Takes already on tape don't change.
LOOP START	SHIFT	bar and beat, such as **017 1**	Where the loop starts again from (11.9).
REC SEQ	SHIFT	**OFF**, **EACH**, **ONE**	Whether the next take carries the patterns, and onto which tracks (11.7). Three positions: the one nearest your finger wins, and it takes effect as you drag.
REC PAN	SHIFT	**−50** to **+50**, **0** in the middle	Balances the take between left and right. At **0** both sides go on as they are. Toward **−50** the right side fades out, and at **−50** only the left side is written. **+50** is the mirror image.

- A slow drag moves finely and a quick one far; touch and hold still first for the finest steps, as on every screen (2.4.1). A double-tap does nothing on TAPE's band, and neither does SHIFT + double-tap.
- LOOP START and LOOP END move one beat at a time, on the same beat grid the counter reads, and read the bar and beat they stand on. A slow drag stops on each beat in turn, with a tick for each when haptics are on, so you can land the loop on the bar line you want; a quick sweep still crosses the whole tape. The IN and OUT keys (11.9) still set either end at the playhead, wherever it is.
- Drag LOOP END earlier than LOOP START and the two swap: the loop is always the stretch between them.
- REC LEVEL and REC PAN also set what CATCH holds (11.14.2).

11.5.1 Moving the playhead with POSITION

POSITION is a jog. You drag it to move the playhead, and how far the playhead goes depends on how fast you drag, not on where your finger is along the slider. It works the same on a tape of any length.

- A slow drag moves one bar for about each key's width your finger travels. The bar changes halfway across, like a notch.
- A faster drag moves more bars for the same distance. A quick flick jumps a long way, up to 64 bars for a key's width.
- With the tape stopped, every step lands on the start of a bar, so the counter reads beat 1, such as `0009 1`, and the clock the matching time. The first step back goes to the start of the bar you are in.
- While the tape plays, POSITION moves it by whole bars from where it is, so the music stays on the beat.
- Touch and hold still first for fine adjust: the slider shows ×8, and the playhead moves freely and slowly, without stopping on bars. Use it to land between bar lines.
- The slider's line still shows where the playhead is on the whole tape, and its readout the time, such as **`02:14`**.
- With VoiceOver, swipe up or down on POSITION to move one bar.

11.6 Winding the tape

You can wind the tape by hand, like rocking the spools of a real machine. You hear the tape as it moves, whether it was stopped or playing.

To wind the tape:

01 Put a finger anywhere on the deck, the left window.

02 Slide it to the right to wind forward, or to the left to wind back. The spools turn and the counter follows.

03 Lift your finger. The tape goes back to what it was doing: stopped where you left it, or playing on from there.

How far your finger is from where it landed sets how fast the tape winds, not where it goes. Hold still at a distance and it keeps winding at that speed. A short slide is a slow crawl. About a centimeter is roughly normal speed. About two centimeters (140 points) is the fastest, four times normal speed. Bring your finger back toward where it started to slow down.

- A tap does nothing. The first few points of movement don't count, so touching the deck never moves the tape.
- Winding during a take pauses the recording until you let go.
- Where the wind leaves the playhead is saved with the project.
- The deck is not there while HELP is latched (the help panel covers it), so you can't wind then.

11.7 REC SEQ: recording the sequencer

REC SEQ puts the sequencer in the next take. It is on the band under SHIFT, and it has three positions:

REC SEQ	WHAT THE NEXT TAKE RECORDS
OFF	The sequencer stays out. A take records onto the chosen track whatever you play, and PLAY on TAPE rolls only the tape. Every new project starts here.
EACH	Each lane's pattern onto its own track: lane 1 onto track 1, lane 2 onto track 2, and so on, each as you hear it, at its MIX level. One lane playing alone goes onto the chosen track (11.7.1).
ONE	All the lanes you hear, mixed at their MIX levels, onto the chosen track (11.7.4).

EACH is how you put a whole arrangement on tape in one pass, balanced as you hear it, and still mix the parts separately on TAPE MIX; ONE is how you put a section on one track as you've balanced it. Either way the patterns start on a bar line of the tape (11.7.3).

To record the patterns of lanes 1 and 3 onto tracks 1 and 3:

01 Make the patterns (chapter 8). On SEQ's MUTE page, light the **LANE n MUTE** key of every lane you want to leave out, here every lane but 1 and 3 (8.9).

02 Go to TAPE. Hold or latch SHIFT and drag **REC SEQ** to **EACH**. The deck shows **SEQ 1 3**: the lanes whose patterns will play into the take.

03 Press STOP twice to go to the start.

04 Press REC. The armed line changes to **REC TRK 1 3**, and rows 1 and 3 in TRACKS turn red.

05 Press PLAY. After any count-in, the patterns and the tape start together, and each lane records onto its own track. The start of the tape is a bar line; from anywhere else the tape rolls and the patterns wait for the next one (11.7.3).

06 Press STOP when you have enough. Press REC to disarm.



Figure 11.4 REC SEQ armed with six lanes muted on SEQ: two tracks will be written, and both are red.

- The whole pass, across every track it writes, is one take per track and one undo step. One UNDO takes the whole pass back.
- REC SEQ on its own changes nothing. PLAY on TAPE still rolls only the tape until REC is armed as well.
- REC SEQ is saved with the project, so it is where you left it the next time you open it.
- A PATTERN PLAY switch during the take is recorded like anything else the lanes play (8.13), so you can record a song's sections in one pass.
- A lane that plays your own gear isn't recorded: its sound is in the gear. When you turn REC SEQ on, or arm REC with it on, the screen names such lanes, such as **LANE 4 IS MIDI · NOT RECORDED TO TAPE**. Their patterns still play and their notes still go out (chapter 16).

11.7.1 Which lanes go to which tracks

With REC SEQ at **EACH**:

- With two or more lanes playing, the mapping is fixed: lane n goes to track n. To move a part afterwards, LIFT it and DROP it on another track (11.11.3).
- With one lane playing, it goes onto the chosen track, whatever its number. Lane 2 alone with **TRK 1** lit records onto track 1, and the armed line reads **REC TRK 1** before you press PLAY. Nothing reaches the other tracks. To record lane 2 onto track 2, choose **TRK 2** first.
- SEQ's pattern mutes choose the lanes. A muted lane's track is not armed.
- A lane whose pattern holds no notes stays out too, unless it is the lane the keyboard plays, or its arpeggiator or groove is on with HOLD. So an empty lane never arms a track for nothing.

- With no lane left to map, the deck shows no SEQ line, and the take goes onto the chosen track like an ordinary take.
- Which lanes are in is decided as the pass begins and held for it. Moving the focus, writing a note or switching a pattern during the take doesn't move a lane onto another track; switching a lane on or off on SEQ's MUTE page does.
- Each track gets everything its lane plays during the pass: the pattern, plus any keys you play on that lane, its arpeggiator or its groove.
- **Each lane is recorded as you hear it**: through its lane EQ, at its MIX fader and balance (10.2.1). TAPE MIX starts every track at its default, so the tape plays back the balance you heard. A lane muted on MIX records silence onto its track. The master EQ, the master effect, DRIVE and OUT stay off the tape.
- The recorder's input goes onto the chosen track only, and only if that track is one being written. To record a microphone, use an ordinary take (12.5).
- Tracks that already hold takes have the new sound added to them (11.3.2). For a clean pass, clear them first with TRACK or RESET.
- A pad muted on DRUM's pad map is left out of the pattern and the groove, so it isn't in the take either (6.7.2).
- After a lane swap, each lane still records onto its own track, the one that moved with it (11.2).

11.7.2 Changing REC SEQ during a take

- Turn REC SEQ to **OFF** during a take and the patterns stop at once. The tape keeps rolling, and recording carries on onto the chosen track only.
- Turn it to **EACH** or **ONE** while a take is recording and the patterns start on the tape's next bar line, from step 1.
- Moving between EACH and ONE during a take takes effect at once.
- Punching in with REC SEQ on (REC while the tape plays) brings the patterns in on the next bar line, from step 1. Punching out with REC stops them, and the tape plays on.
- If the patterns are already playing when a REC SEQ take begins, for example started on SEQ before you pressed REC and PLAY on TAPE, they stop and start again from step 1 on the next bar line.

11.7.3 The patterns start on a bar line

A REC SEQ take always starts the patterns on a bar line of the tape, the bar lines TRACKS draws and the counter counts. If the playhead is on a bar line when you press PLAY, as it is at the start of the tape or after POSITION has stopped on a bar, the patterns start at once (after any count-in). Anywhere else, the tape rolls and records straight away, and the patterns wait for the next bar line, then start on it from step 1. The metronome waits with them. With the metronome on, the count-in comes first: the tape stands still for the count, then rolls, and the patterns still start on the next bar line. To have the count lead straight into bar 1 of the take, start from a bar line.

So parts recorded in separate passes line up exactly. Record a bass from the start of the tape, then come back and record a pad from a few beats before bar 9: the pad's pattern starts exactly on bar 9's line, in time with the bass.

NOTE

> The bar lines are counted in the tape's own tempo, the one the counter uses (11.1.1). If a loop is shorter than a bar and holds no bar line, a REC SEQ take inside it never reaches a line, so the patterns never start. Make the loop at least a bar long, from a bar line.

11.7.4 ONE: every lane onto one track

With REC SEQ at **ONE**, the take is the mix of the lanes you hear, recorded onto the chosen track.

To record the lanes onto one track:

01 Balance the lanes on MIX the way you want them on tape (10.3).

02 On TAPE, press the track's TRK key.

03 Hold or latch SHIFT and drag **REC SEQ** to **ONE**. The deck's SEQ line names the lanes that will go in.

04 Press REC. The armed line names the one track, such as **REC TRK 2**, and only that row turns red.

05 Press PLAY, and STOP when you have enough.

- **The same lanes as EACH go in** (11.7.1), each through its own lane EQ and at its MIX fader, balance and mute (10.2.1, 10.5.3). A lane muted on MIX is left out.
- **The master section stays out**: no master EQ, master effect, DRIVE or OUT. REC LEVEL and REC PAN apply on top, as on every take, and the recorder's input rides the chosen track as it always does.
- Lanes that play your own gear and lanes with nothing to play stay out, as in EACH.
- It is one take and one undo step. TAPE MIX sets how the new track plays back (10.10).

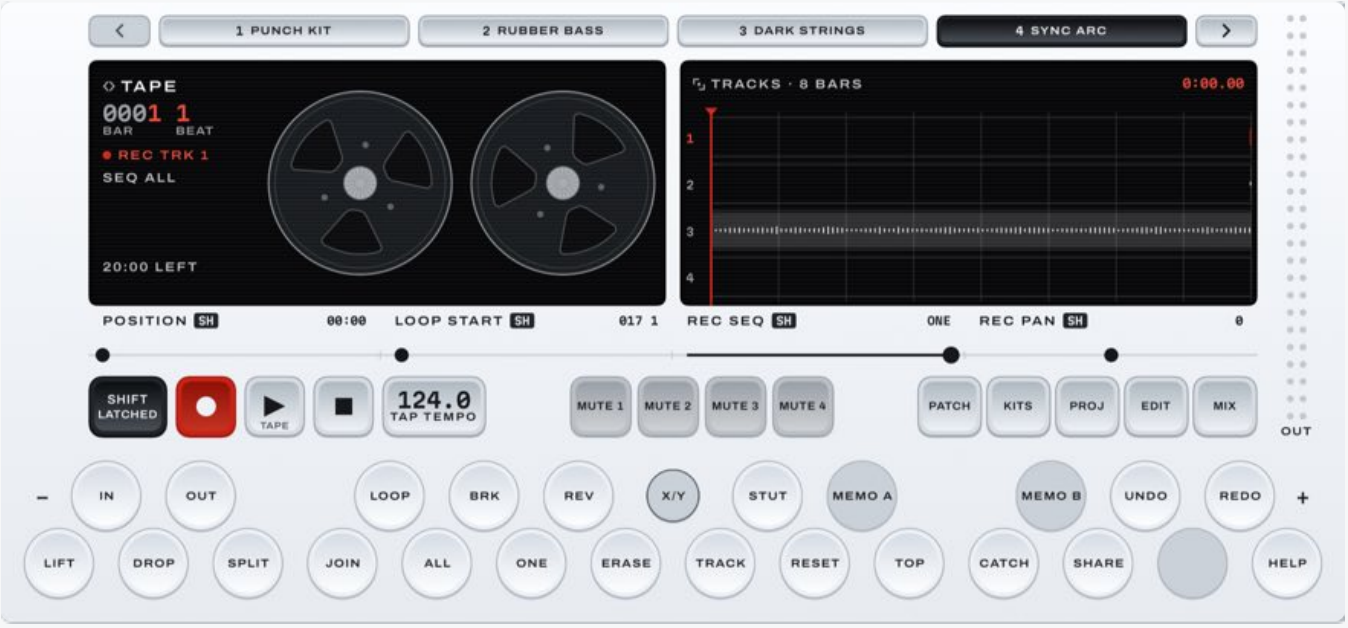


Figure 11.5 REC SEQ at ONE: every lane is going in, and all of it lands on track 1.

11.8 The tool row: TAPE + SHIFT

On TAPE, SHIFT turns the keyboard into the tape's 22 tools: three loop keys, three performance tools, two MEMO keys that do nothing yet, UNDO and REDO, eight edit tools, RESET, TOP, CATCH and SHARE. The lower row's last key is HELP (2.9.3), and the one before it is blank. The page keys read MUTE 1, MUTE 2 and so on (11.2.1) and the band shows its second four.

Hold SHIFT and press a tool for a single job; SHIFT drops when you let go. Tap SHIFT to latch it and use several tools in a row; it stays latched until you tap it again (2.7). REC, PLAY and STOP keep their jobs with SHIFT latched.

- A tool acts the moment you touch it. BRAKE, REV and STUT act for as long as you hold them; every other tool acts once per press.
- Sliding a finger from one tool onto the next does nothing. Lift and press again.
- LOOP is filled while the tape loops, and RESET is filled while it is armed. In the TN-1, TN-1 DARK and TN-XY housings the keys don't fill: the LED near the top of the key lights bright instead, for LOOP while the tape loops, RESET while it is armed and HELP while it is latched (3.4.2).
- The screen answers each edit in a line at the foot of the left window, or says why it could not (11.8.1).
- There are no notes, quick slots or DIE under SHIFT on TAPE. HELP is the lower row's last key: press it to latch HELP, then tap a tool to read its line (2.9.3). On the iPhone the – and + keys in the keyboard's end gaps and X/Y in its middle gap stay as they are; they belong to no layer (3.2).



Figure 11.6 The tool row. Upper row: the loop, the performance tools, UNDO and REDO. Lower row: the edits, then RESET, TOP, CATCH and SHARE, and HELP in the corner.

KEY	TOOL	WHAT IT DOES	SEE
Upper row			
IN	LOOP IN	Sets the loop's start at the playhead.	11.9
OUT	LOOP OUT	Sets the loop's end at the playhead.	11.9
LOOP	LOOP	Turns the loop on or off. Filled while on (in the TN looks, its LED lights instead).	11.9
BRK	BRAKE	While held, slows the tape to a stop.	11.10
REV	REVERSE	While held, runs the tape backwards.	11.10
STUT	STUTTER	While held, repeats the last sixteenth note in time.	11.10
MEMO A	MEMO A	Nothing yet. Drawn as a well.	
MEMO B	MEMO B	Nothing yet. Drawn as a well.	
UNDO	UNDO	Takes back the last take, edit or CATCH.	11.12
REDO	REDO	Puts back what UNDO took.	11.12
Lower row			
LIFT	LIFT	Cuts the take under the playhead, or the loop while LOOP is on, to the clipboard.	11.11.3
DROP	DROP	Puts the clipboard down at the playhead, replacing what	11.11.3

		is there.	
SPLIT	SPLIT	Cuts the take under the playhead in two.	11.11.4
JOIN	JOIN	Joins the take under the playhead to the next one.	11.11.4
ALL	LIFT ALL	Cuts the loop from every track to the clipboard.	11.11.5
ONE	MERGE DROP	Puts an every-track clipboard down mixed onto one track.	11.11.5
ERASE	ERASE	Wipes the take under the playhead.	11.11.6
TRACK	ERASE TRACK	Wipes the whole chosen track.	11.11.6
RESET	RESET TAPE	Wipes every track. Press twice. Filled while armed (in the TN looks, its LED lights instead).	11.13
TOP	TO TOP	Sends the tape to **00:00**.	11.14.1
CATCH	CATCH	Puts the last 30 seconds you played onto the chosen track.	11.14.2
SHARE	SHARE	Makes a video or an audio file of what PLAY plays, for the share sheet.	11.19
(one blank key)		No job. Drawn empty.	
HELP	HELP	Latches HELP, or turns it off. Filled while latched (in the TN looks, its LED lights instead).	2.9.3

The tool row, left to right

MEMO A and MEMO B are drawn as wells and take no touch. They do nothing yet.

11.8.1 When a tool says no

A tool that can't act changes nothing and says why, in the tape's own words:

THE SCREEN SAYS	WHEN
RECORDING	An edit, UNDO or REDO while a take is being written. Stop or punch out first. With REC armed and the tape stopped, edits work.
NO TAKE	LIFT (with LOOP off), SPLIT, JOIN or ERASE with no take under the playhead on the chosen track. Also SPLIT at the very first moment of a take, and JOIN on the last take of a track.
NOTHING TO DROP	DROP or ONE with an empty clipboard, or with the playhead at the very end of the tape.
EMPTY TRACK	TRACK on a track with nothing on it.

LOOP OFF	ALL while LOOP is off. Turn LOOP on first.
NOTHING TO UNDO, NOTHING TO REDO	UNDO or REDO with nothing left to take back or put back.
SET LOOP IN AND LOOP OUT FIRST	LOOP with no loop marked.
NOT WHILE RECORDING, NOTHING HELD TO CATCH, PLAYED WHERE THE TAPE CANNOT TAKE IT	CATCH (11.14.2).
NOTHING RECORDED ON THE TAPE, ALREADY MAKING ONE · STOP CANCELS and others	SHARE (11.19.3).
COULD NOT RESET IT · RECORDING	RESET confirmed while REC is armed (11.13).
NOT ENOUGH ROOM TO UNDO A RESET	RESET confirmed when the phone has no room to keep what it would erase for UNDO (11.13).
NO PROJECT OPEN	Any edit, UNDO or REDO at a moment when no project is open, such as while one is opening.

11.9 Looping

A loop plays one stretch of the tape over and over. You mark it with LOOP IN and LOOP OUT, then turn it on with LOOP.

To loop bars 3 and 4:

01 Put the playhead at the start of bar 3: the counter reads **0003 1**. Play, wind or use POSITION.

02 Press SHIFT + IN. LOOP IN is now at the playhead. On a new project LOOP OUT moves there with it, so TRACKS shows no markers yet.

03 Move the playhead to the start of bar 5 (**0005 1**).

04 Press SHIFT + OUT. LOOP OUT is now at the playhead, and the two loop markers stand in TRACKS with faint flags.

05 Press SHIFT + LOOP. The key fills (in the TN looks, its LED lights), the markers' flags turn solid, and the screen says **LOOP ON**.

06 Press PLAY. The tape plays to LOOP OUT and goes back to LOOP IN, again and again.

You can also set the two ends with the sliders: **LOOP END** on the band and **LOOP START** under SHIFT, which move a beat at a time and read the bar and beat, such as **005 1** (11.5). IN and OUT post no line; watch the markers, or the sliders.



Figure 11.7 LOOP on: the key is filled and the flags on the markers are solid. With LOOP off they are faint.

- Press SHIFT + LOOP again to turn the loop off: **LOOP OFF**. The markers stay where they are.
- With no loop marked, LOOP refuses: **SET LOOP IN AND LOOP OUT FIRST**. A new project has both at the start of the tape. The shortest loop is 10 milliseconds.
- Pressing IN at a point after LOOP OUT moves LOOP OUT there too, and pressing OUT before LOOP IN brings LOOP IN along. Either way the loop has no length, so LOOP turns off, or refuses to turn on. Set the other end again.
- With LOOP on, the tape plays into the loop from anywhere before LOOP IN. If the playhead is past LOOP OUT, the tape jumps back into the loop as soon as it moves.
- The jump back is smoothed over 3 milliseconds, so the loop doesn't click.
- With LOOP on, STOP pressed twice goes to LOOP IN. TOP goes to **00:00**, and the tape then plays on into the loop.
- REV and winding work inside the loop: running backwards, the tape jumps from LOOP IN to LOOP OUT.
- A loop never reaches the end of the tape.
- LIFT uses the loop while LOOP is on, and ALL needs it (11.11).

11.9.1 Recording in a loop

Record with LOOP on and each pass is added on top of the last, so a part grows in layers while the tape goes round. Stop when you have enough. The whole looped recording is one take and one undo step: one UNDO takes away every pass.

11.10 BRAKE, REV and STUT

Three tools for playing the tape like an instrument. Each acts while you hold it and stops when you let go. Use them while the tape plays: on a stopped tape there is nothing for them to change.

- `BRK` (BRAKE) slows the tape to a stop over about 0.6 seconds, and the pitch falls with it, like a tape machine switched off. Let go and it comes back up to speed in about 0.3 seconds. Let go early for a dip instead of a full stop.
- `REV` (REVERSE) runs the tape backwards at its current speed. The spools turn the other way and the counter runs down. Let go and it runs forwards again from where it got to.
- `STUT` (STUTTER) repeats the last sixteenth note of what the tape played, in time with the tempo: 125 milliseconds at 120 BPM. The tape keeps moving underneath, so when you let go you hear the tape where it has got to, not where it was.

They act on the tape's playback only. Lanes you play and patterns that are running carry on as they were. You can hold two at once, such as BRAKE and REV together.

During a take, holding any of the three pauses the recording. It carries on when you let go (11.3.4).

11.11 Editing takes

The edit tools cut, move, split, join and erase takes. They work on the chosen track, at the playhead. ALL works on every track, and DROP on every track when the clipboard holds them all.

- Each edit is one undo step (11.12).
- Edits are refused with `RECORDING` while a take is being written.
- Every cut is faded over 2 milliseconds at its edges, so an edit never leaves a click.
- The tape keeps playing while you edit. The tracks being changed go quiet for a moment.

KEY	ACTS ON	CLIPBOARD	THE SCREEN SAYS
LIFT	The take under the playhead; the loop while LOOP is on	Fills it (one track)	LIFTED
DROP	The playhead onward, on the chosen track (or every track)	Uses it, keeps it	DROPPED
SPLIT	The take under the playhead	Untouched	SPLIT
JOIN	The take under the playhead and the next one	Untouched	JOINED
ALL	The loop, on every track	Fills it (every track)	LIFTED ALL TRACKS
ONE	The playhead onward, on the chosen track	Uses it, mixed to one	DROPPED MERGED
ERASE	The take under the playhead	Untouched	ERASED
TRACK	Every take on the chosen track	Untouched	TRACK CLEARED

NOTE

> The help lines for LIFT and ERASE talk about "the loop". LIFT uses the loop only while LOOP is on, and ERASE never does: it always wipes the take under the playhead. This section describes what the keys do.

11.11.1

The take under the playhead

Most edits act on the take the playhead is standing in, on the chosen track. The playhead is in a take from the take's first moment up to, but not including, its end. Choose the track first, then put the playhead inside the block you mean.

TIP

> When you stop a take, the playhead comes to rest a hair past the end of it, outside the block. ERASE, SPLIT or LIFT pressed straight after STOP says NO TAKE. Wind back a little into the block, or press STOP again to go to the start.



Figure 11.8 The playhead standing inside track 1's take: ERASE, SPLIT or LIFT now act on that block.

11.11.2 The clipboard

The clipboard holds what LIFT or ALL last cut, ready for DROP or ONE to put down.

- It holds one thing at a time: one track's worth from LIFT, or every track from ALL. The next LIFT or ALL replaces it.
- DROP and ONE leave it full, so you can put the same audio down as many times as you like.
- Each project has its own clipboard, kept with the project. It is still there after you quit and reopen, and it does not carry over to another project.
- UNDO does not empty it. LIFT followed by UNDO puts the take back where it was and leaves a copy on the clipboard. That is how you copy a take.
- REVERT on PROJECTS does not empty it either (13.6).

11.11.3 LIFT and DROP

LIFT cuts audio from the chosen track to the clipboard and leaves silence where it was:

- With LOOP off, it lifts the whole take under the playhead. NO TAKE if there is none.
- With LOOP on, it lifts exactly the loop, whatever is in it, even silence. A take that crosses an edge of the loop is cut there, and what lies outside the loop stays on the track.

DROP puts the clipboard down at the playhead on the chosen track. It replaces what was on the track for the clipboard's length; it does not add to it. If what you drop overlaps or touches a take, they become one block. A drop that would run past the end of the tape is cut off there. If the clipboard holds every track (from ALL), DROP puts them all down at the playhead, each on its own track, whichever track is chosen. A track that was empty inside the loop comes back as a silent block.

To move a take from track 1 to track 3, starting at 0:20:

01 Press TRK 1 and put the playhead inside the take.

02 Make sure LOOP is off, then press SHIFT + LIFT. The screen says LIFTED and the block disappears.

03 Press TRK 3. Drag POSITION until it reads 00:20. At 120 BPM that is the start of bar 11, where a slow drag stops; at another tempo, hold still first for fine adjust (11.5.1).

04 Press SHIFT + DROP. The screen says DROPPED and the take appears on track 3.

To copy instead, press SHIFT + UNDO straight after LIFT, then carry on from step 3.

11.11.4 SPLIT and JOIN

SPLIT cuts the take under the playhead into two takes at the playhead. No audio changes: you get two blocks where there was one, so that LIFT or ERASE can take one of them. NO TAKE if the playhead isn't inside a take, or sits on its very first moment.

JOIN joins the take under the playhead to the next take to its right on the same track. They become one take, with the gap between them, which stays silent, inside it. NO TAKE if there is no take under the playhead, or no take after it.

To erase the second half of a take:

01 Choose its track and put the playhead where the part to remove begins.

02 Press SHIFT + SPLIT. The playhead is now at the start of the second take.

03 Press SHIFT + ERASE. The second half goes.

11.11.5 ALL and ONE: every track at once

ALL (LIFT ALL) cuts the loop from every track onto the clipboard, each track kept apart, and leaves the loop silent on every track. It needs LOOP on, and says LOOP OFF otherwise.

ONE (MERGE DROP) mixes that clipboard down and puts it down as one, at the playhead on the chosen track, replacing what was there. It mixes the tracks as they were recorded: tape mutes and TAPE MIX's faders don't apply. With a one-track clipboard, ONE does what DROP does.

To bounce bars 1 to 8 of every track onto track 1:

01 Set LOOP IN at 0001 1 and LOOP OUT at 0009 1, and turn LOOP on (11.9).

02 Press SHIFT + ALL. The screen says LIFTED ALL TRACKS, and the loop is now empty on every track.

03 Press TRK 1. Press STOP twice to put the playhead at LOOP IN.

04 Press SHIFT + ONE. The screen says DROPPED MERGED, and the mix is on track 1.

The other tracks are now free for new parts in those bars. To put every track back as it was instead, press SHIFT + DROP at LOOP IN: an every-track clipboard drops onto every track.

11.11.6 ERASE and TRACK

ERASE wipes the take under the playhead on the chosen track, and nothing else. The loop has no effect on it and nothing goes to the clipboard. NO TAKE if the playhead isn't in a take.

TRACK (ERASE TRACK) wipes every take on the chosen track, wherever the playhead is, as one undo step. The screen says TRACK CLEARED, or EMPTY TRACK if there was nothing on it.

Neither asks first. One UNDO brings back what either wiped.

11.12 UNDO and REDO on tape

UNDO takes back the last change to the tape and REDO puts it back. They are on the upper row of the tool row. The screen says UNDONE or REDONE, or NOTHING TO UNDO and NOTHING TO REDO when there is nothing left.

Each of these is one step:

- a take: each punch, and each part of a take that a BRAKE, REV, STUT, wind or track change split off;
- a REC SEQ pass, across all the tracks it wrote;
- a whole looped recording, however many passes (11.9.1);
- each edit: LIFT, DROP, SPLIT, JOIN, ALL, ONE, ERASE, TRACK;
- each CATCH;
- RESET TAPE counts one step for each track it erased (11.13).

Not steps: the loop markers and LOOP, SPEED, REC LEVEL, REC PAN, REC SEQ, mutes, TAPE MIX, the playhead and the clipboard. UNDO doesn't change those.

- The tape keeps the last eight steps. A ninth change drops the oldest.
- A new change after UNDO clears what REDO could have put back.
- The history is kept with the project, so UNDO still works after you quit and reopen.
- UNDO and REDO are refused with RECORDING while a take is being written.
- If the phone has no room to keep what REDO would need, UNDO still works and says UNDONE - NO ROOM TO REDO.
- The tape's UNDO is its own. SEQ has a separate UNDO for patterns (8.10), and DIE has its own (3.7).
- REVERT on PROJECTS takes the tape back to the last SAVE, with the rest of the project: takes recorded since go, and takes erased since come back. The history is emptied, because it describes a tape that is gone, so UNDO then says NOTHING TO UNDO; the clipboard stays (13.6). If the tape hasn't changed since the SAVE, REVERT leaves it and its history alone.

11.13 RESET TAPE

RESET (RESET TAPE) wipes every track. It asks first.

To erase the whole tape:

01 Make sure REC is off.

02 Press SHIFT + RESET. The key fills (in the TN looks, its LED lights) and the screen says ERASE ALL 8 TAPE TRACKS? PRESS AGAIN UNDO PUTS THEM BACK ONE AT A TIME (ERASE ALL 6 TAPE TRACKS? on a six-track project).

03 Within eight seconds, press SHIFT + RESET again. The screen says how many tracks it erased, such as TAPE RESET · 3 TRACKS ERASED. Empty tracks aren't counted.

- To cancel, wait eight seconds, or press a mode key. The key empties (or its LED goes out) and the screen says RESET CANCELLED.
- On a tape with nothing on it, the second press says THE TAPE IS ALREADY EMPTY.
- With REC armed, the second press says COULD NOT RESET IT · RECORDING and erases nothing, even with the tape stopped. Press REC to disarm, then start again.
- If the phone has no room to keep the erased audio for UNDO, the second press says NOT ENOUGH ROOM TO UNDO A RESET and erases nothing.
- Each erased track is its own undo step. UNDO brings them back one per press, the last one erased first. Since the tape keeps eight steps, every track comes back if you undo straight away.
- RESET erases audio only. The loop markers, SPEED, levels, mutes, TAPE MIX, the clipboard and the chosen track stay as they were.

11.14 TOP and CATCH

11.14.1 TOP

TOP (TO TOP) sends the tape to **00:00**. If the tape is playing, it keeps playing from the start. If it is stopped, it stays stopped at the start. TOP does not touch REC.

STOP pressed twice goes to LOOP IN while LOOP is on, so TOP is the way to the very start with a loop on. From there the tape plays on into the loop.

11.14.2 CATCH

Tonaut always keeps the last 30 seconds of what the instrument played, whether or not REC was armed: everything a take would have recorded (11.3.1), through REC LEVEL and REC PAN. CATCH puts it on tape.

To keep something you played without recording:

01 Play. If you like it, stop playing.

02 Go to TAPE and choose the track with its TRK key. If you played with the tape stopped, put the playhead where the audio should start.

03 Press SHIFT + CATCH. The screen says CAUGHT TO TRACK 2 (for track 2), and a take appears.

- **Where it lands.** If the tape was rolling all the while you played, and still is when you press CATCH, the audio lands on the tape exactly where you played it, in time with the takes you played along to. You don't need to stop the tape first. If the tape was stopped for any of it, pressing STOP before CATCH included, all of it lands at the playhead, starting there.
- It starts with your first sound: silence before it is left out. It runs up to the moment you press CATCH, silence after your last note included.
- Don't wait too long. Once 30 seconds have passed since your last note, what you played has gone and CATCH says NOTHING HELD TO CATCH.
- It adds to what is on the track, like any take (11.3.2), and it is one undo step.
- It always goes onto the one chosen track, whatever REC SEQ is set to.
- CATCH works with REC armed and the tape stopped. While a take is being written it says NOT WHILE RECORDING.
- If everything you played was while BRAKE, REV or STUT was held, while you wound the tape, or past its end, there is no place on the tape for it, and CATCH says PLAYED WHERE THE TAPE CANNOT TAKE IT.

What CATCH holds empties when you use it, so a second CATCH says NOTHING HELD TO CATCH until you play again. It also empties at every punch out, so audio already on tape is never caught twice, and when a project opens.

TIP

> Played a good part along with the tape? Press SHIFT + CATCH before you stop it, and the part lands in time with the takes. Caught after STOP, it lands at the playhead instead: move it to where it belongs with LIFT and DROP (11.11.3).

11.15 Speed and tempo

SPEED works like the speed of a real tape: pitch and time change together. At **2.00×** the tape plays an octave higher and twice as fast; at **0.50×** an octave lower and at half speed. A change glides over a few hundredths of a second rather than jumping.

- **Recording at another speed.** A take is written at the speed the tape is running. Record a phrase at **0.50×**, set SPEED back to **1.00×**, and it plays back an octave higher and twice as fast. Record at **2.00×** for the opposite.
- **Tape time.** The counter, the clock on the TRACKS line, POSITION and the time left count tape, not the clock on the wall. At **0.50×** the tape lasts twice as long as its length says; at **2.00×**, half as long.
- **Patterns don't follow SPEED.** The patterns, the arpeggiator, grooves and the metronome follow the tempo. At any SPEED but **1.00×**, the tape drifts away from them.

The tempo page's **Tape speed** row decides what a tempo change does to the tape (3.9.3):

- **FREE** (new projects): the tempo and the tape are independent.
- **FOLLOWS**: the tape's speed follows the tempo, measured against the tempo you first recorded at on this project. Raise the tempo by 10 % and the tape plays 10 % faster and higher, so it stays in time with the patterns. SPEED still reads what you set; the tempo change goes on top of it. Before the first take there is nothing to measure against, and FOLLOWS changes nothing.

The choice is saved with the project. On **FREE** the counter's bars and beats are counted in the song's tempo; on **FOLLOWS**, once you have recorded, in the tempo of that first recording, which the tape follows (11.1.1). Either way they are the bars the patterns record on, so parts recorded with REC SEQ in separate passes line up.

11.16 When the tape runs out

Each track is as long as the project's tape: 20 minutes in an eight-track project, 30 in a six-track one. The deck warns you, and says so when it ends.

- In the last 30 seconds the time left turns red: **0:24 LEFT**.
- At the end, **20:00** or **30:00**, the line reads **TAPE FULL** in red. The counter stops and the spools stop turning.
- If a take was recording, it ends cleanly at the end of the tape, the transport stops (patterns too), and the screen says **TAPE FULL - RECORDING STOPPED**, on whatever screen you're on. The take is saved. REC stays armed.
- If the tape was only playing back, it stops at the end but the transport keeps running: PLAY stays filled, any patterns that were playing carry on, and the deck says **TAPE FULL**. Press STOP when you're done.
- PLAY on TAPE with REC armed and the tape at the end does nothing but say **TAPE FULL - NOTHING TO RECORD**.

To carry on, move the tape back: STOP twice, TOP, POSITION, or wind it. A loop never reaches the end of the tape.



Figure 11.9 The end of the tape. The line that counted down now says TAPE FULL, and stays until you move the tape back.

11.17 iCloud lines on TAPE

With iCloud sync on (14.9), a project's tape audio can be on one of your devices and not yet on the other. Tonaut sends a tape in pieces, a minute of one track at a time, and only the minutes that changed, so after a small edit to a long tape only a little crosses, and a send that is cut off carries on where it stopped. A line at the foot of the deck says where the tape is:

THE DECK SAYS	WHAT IT MEANS
TAPE STILL IN ICLOUD	This project's tape audio is in iCloud and hasn't come to this phone yet. TRACKS shows no takes, because there are none here to play.
TAPE IS ON YOUR OTHER PHONE	This project's tape audio is only on your other phone; it isn't in iCloud, so it won't come down until that phone sends it (Tape audio, 14.6.2). TRACKS shows no takes. On an iPad the line says DEVICE.
TAPE ARRIVING 1:10 / 3:42	It is on its way: 1 minute 10 of a 3 minute 42 tape has arrived so far.
TAPE ARRIVED · PRESS OPEN TO LOAD IT	It is all here and waiting. Open PROJECTS (SHIFT + PROJ) and press OPEN on this project, the one already open. The tape loads (13.12).

PLAY works while any of these lines shows, and you can still wind the tape under it. REC works too, but wait for the tape before you record on this project: when OPEN loads the tape that arrived, it takes the place of the tape on this phone, so a take recorded here in the meantime is

not on the tape afterwards.

11.18 Zooming the tracks

Pinch TRACKS to see more or less of the tape. It steps through five views: 8, 16, 32 and 64 bars, and the whole tape. Close two fingers to see more bars, spread them to see fewer. Each step needs the fingers to close or spread by about a third; a pinch held still steps nothing, and with haptics on each step ticks.

The title line says which view is showing: `TRACKS · 8 BARS`, `TRACKS · 32 BARS`, `TRACKS · WHOLE TAPE`.



Figure 11.10 Thirty-two bars at once: the whole song's shape on four tracks, each part starting where it comes in.

- **The playhead stays in view.** A step keeps it at about the same place across the window, and while the tape rolls the window turns a page at a time, as it does at 8 bars.
- **Bar lines thin out as you zoom.** At 8 and 16 bars a line stands at every bar; at 32 and 64, one every four bars; over the whole tape, one every 64 bars or more.
- **Zoomed out, a waveform** shows the loudest moment each stroke covers, so short loud hits still show.
- **Double-tap TRACKS to go back to 8 bars.** A single tap does nothing; with HELP latched it says `PINCH TO ZOOM · DOUBLE-TAP FOR 8 BARS`.
- **One finger winds on the deck, as always** (11.6). One finger dragging on TRACKS does nothing.
- **The zoom isn't saved.** Tonaut opens at 8 bars every time it starts; opening another project keeps the view you had.
- With VoiceOver, swipe up on TRACKS for fewer bars and down for more.

11.19 Sharing the tape: SHARE

SHARE turns what the tape plays into a file you can post or send: a tall video with your music moving on screen, ready for Instagram, TikTok or Messages, or the sound on its own. It is in the tool row, the key after CATCH (11.8). On iPad it is a key of its own in the TAPE row, with no SHIFT (chapter 17).

To share a loop as a video:

01 On TAPE, mark a loop around the part you want and turn LOOP on (11.9).

02 Hold SHIFT, or tap it to latch it, and press SHARE. A pop-up asks how to share. Its title says which part of the tape goes, such as SHARE THE LOOP, and the line under it how long the file will be, such as 0:16.

03 Choose VIDEO, or AUDIO ONLY for the sound alone. CANCEL closes the pop-up and makes nothing.

04 Tonaut makes the file, and a line counts it on every screen: MIXING DOWN 0:12 / 0:16 · STOP CANCELS, then VIDEO 0:07 / 0:16 · STOP CANCELS (or AUDIO). The music keeps playing and you can go on working.

05 When the file is ready, the share sheet opens over the panel. Choose Instagram, TikTok, Messages, Mail, AirDrop, Save Video, Save to Files or another app. Which apps it offers depends on the phone.

06 When the sheet closes, the line says SENT · NIGHT DRIVE, or NOTHING SENT if you closed it without sending.

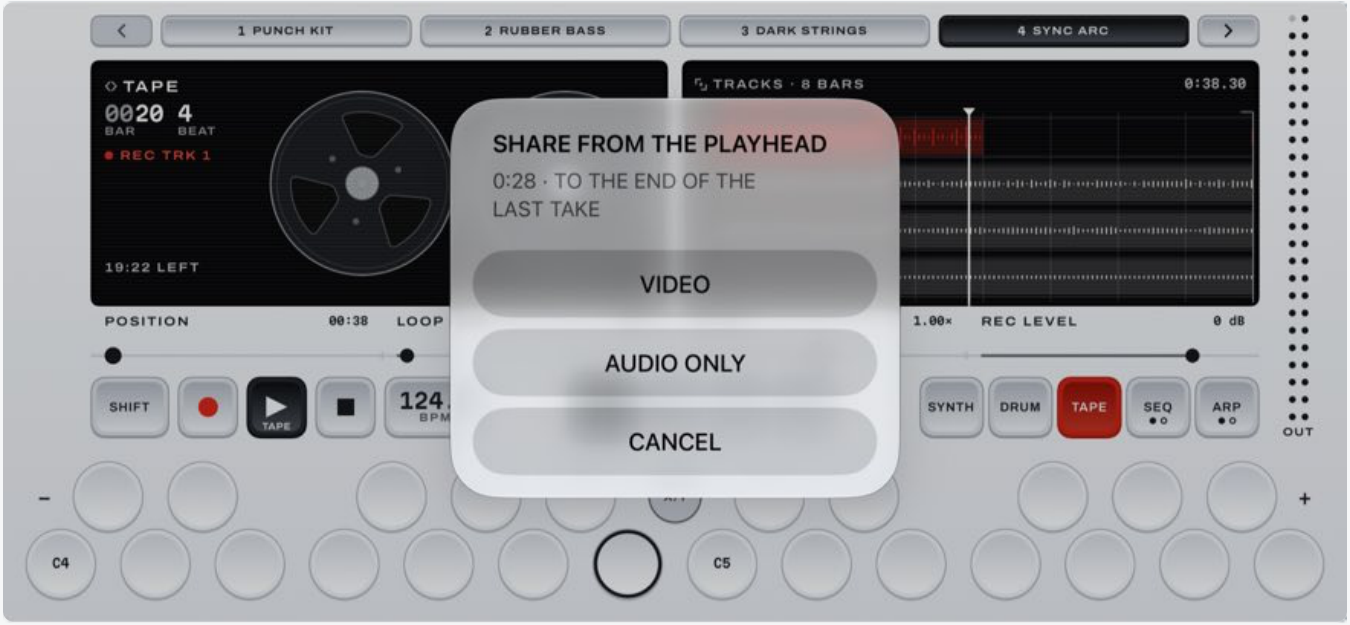


Figure 11.11 With LOOP off, SHARE takes the tape from the playhead to the end of the last take, 28 seconds here, and says so before anything is made.

With HELP latched, SHARE reads SHARE WHAT PLAY PLAYS · VIDEO OR AUDIO.

11.19.1

Which part of the tape goes

SHARE sends what PLAY would play from where the tape stands, and the pop-up's title says which:

THE TITLE	WHEN	WHAT GOES
SHARE THE LOOP	LOOP is on	The loop, LOOP IN to LOOP OUT. A loop shorter than five seconds goes round whole times until the file lasts at least five, and the line says so: 0:06 · THE LOOP 3 TIMES ROUND.
SHARE FROM THE PLAYHEAD	LOOP is off	The tape from the playhead to the end of the last take on any track, and the master effect's tail ringing on after it, up to ten seconds. The line reads such as 0:48 · TO THE END OF THE LAST TAKE.
SHARE FROM THE START	LOOP is off, and less than a second of takes is left after the playhead, as when you have just stopped a take	The tape from 00:00 to the end of the last take, with the tail.

- **At most 90 seconds**, the longest Instagram takes as a Reel. Anything longer is cut at 1:30 and fades out over its last second: the line reads 1:30 · CUT AT 1:30 FOR INSTAGRAM, and the counting line adds CUT AT 1:30 FOR INSTAGRAM under it. A loop that fits is never cut or faded, so it loops without a seam when the app plays it round again.
- Loop markers with LOOP off don't count: the tape goes from the playhead. Turn LOOP on to share the loop.
- The part is chosen when you press SHARE. The pop-up names it, and that is what is made, even if the tape moves on while the pop-up is up.
- **The sound is the tape's mix.** Every track plays through TAPE MIX and the master section, as a MIX DOWN does (10.10.4), with the master effect already ringing as the file starts and a loop's end running into its start. Only what is on the tape goes: lanes you play live, patterns not recorded, and the click are not in it. Put your patterns on the tape first with REC SEQ (11.7).

11.19.2 The video and the audio file

- **VIDEO** is a tall MP4 film, 1080 by 1920 pixels at 30 frames a second: the shape a phone holds upright, which Instagram, TikTok and Messages show without cropping. On a graphite ground like Tonaut's panel it shows the project's name, a line such as “LOOP · 0:16 · 124 BPM” (“TAPE” instead of LOOP for a stretch of tape), and a black window like Tonaut's screens. In the window the clock runs, a scope is drawn from the music itself, and the tape's waveform scrolls past a red playhead with its bar lines. Under it is a card with Tonaut's icon, “Created with Tonaut” and “tonaut.app”. The picture moves only with the sound: silence draws a flat line.
- **AUDIO ONLY** is an M4A file, the AAC format Apple's own apps use, in stereo.
- Both are named after the project, such as Night Drive.mp4 or Night Drive.m4a, and carry its name as their title and “Created with Tonaut · tonaut.app” as their description.
- **The file is made for this share only.** When the sheet closes, Tonaut throws its copy away. To keep one, choose Save Video, which puts the video in Photos, or Save to Files.
- The first time you choose Save Video, iOS asks whether Tonaut may add to your photos. Tonaut only adds the video you chose to save; it never reads your library.

NOTE

> To send the whole project, so someone can open it in Tonaut and carry on working, use SHARE on PROJECTS instead (13.13). To keep the whole tape as audio files, export a MIX DOWN or STEMS (14.8).

11.19.3 Stopping, and when SHARE says no

- STOP on TAPE while the file is being made stops it and keeps nothing: `SHARE STOPPED · NOTHING KEPT`. On other screens STOP does its usual job and the file carries on.
- A video stops if Tonaut leaves the screen, because iOS takes the video maker away from an app in the background. When you come back the line says `SHARE STOPPED · KEEP TONAUT OPEN`. An audio file carries on.
- If the file can't be made, the line says `SHARE FAILED` and the reason.
- **Room first.** Before it makes anything, Tonaut checks the phone has room for the file and still keeps 512 MB free, as for an export (14.8.1). If not, nothing is made and the line says how much free space it needs, such as `NOT ENOUGH SPACE · NEEDS 607 MB FREE`. A 90-second video takes about 100 MB while it is made.

SHARE is a well, and says why when you press it, while it can't make a file:

THE SCREEN SAYS	WHEN
NO PROJECT OPEN	at a moment when no project is open, such as while one is opening
ALREADY MAKING ONE · STOP CANCELS	a share is already being made
NOT WHILE RECORDING	a take is being written. REC armed with the tape stopped is fine
NOTHING RECORDED ON THE TAPE	the tape is empty, or its audio isn't on this phone yet (11.17)
AN EXPORT IS ALREADY RUNNING	an export is being made (14.8)
A FILE IS STILL BEING PACKED	a song or a file of sounds is being packed to send (13.13)
ALREADY LOADING · ONE MOMENT	an audio file is being loaded

12 Sampling: the recorder and the sample editor

Two screens bring sound from outside into Tonaut and shape it. The recorder captures the microphone, a USB input or Tonaut's own output, either onto a lane, where you play it from the keys, or onto a tape track. The sample editor trims the 24 slices of a SLICER kit with a zoomed view of the recording, and puts an audio file of your own on the pad you are editing.

12.1 Opening the recorder

The recorder has no mode key of its own. You reach it from HELP, the same way you reach Settings.

To open the recorder:

01 Latch HELP: tap SHIFT, then press HELP, the last key of the keyboard's upper row. In a browser, hold SHIFT instead, because a tap there is BACK. On TAPE, HELP is the last key of the lower row under SHIFT, at the end of the tool row (11.8). The left window shows the help panel with its cells: LEAN, SAMPLE, RECORD and SETTINGS, less any that can't act right now (2.9.1).

02 Press RECORD (it reads OPEN). The recorder opens and HELP turns off.

On iPad, HELP is a key of its own in the strip above the keyboard (chapter 17).



Figure 12.1 The recorder and the sample editor are behind the middle two cells. On a sampled kit like Punch Kit both show.

The RECORD cell is hidden while no project is open: a recording has to land in a project. That is the case for about a second after launch, while a project is opening, and when one fails to open. If the recorder is asked to open with no project, the notice line says OPEN A PROJECT FIRST.

As it opens, the recorder closes MIX, EDIT, Settings or a browser if one was showing, drops a latched SHIFT, and lights the TAPE mode key. The recorder is drawn over TAPE, because it is the tape machine seen from the input side: its deck, its track keys and its REC LEVEL are TAPE's own.

12.1.1 Leaving the recorder

Any of these closes the recorder:

- SHIFT + HELP. The recorder closes and HELP stays off. You land on TAPE, whichever screen you opened the recorder from.
- A mode key. TAPE leaves you on TAPE; any other mode key takes you to its screen.
- A SHIFT door (PATCH, KITS, PROJ, EDIT, MIX), or the tempo page (hold the tempo key, 3.9.1).

Leaving drops a lane arm (12.4) and a punch-in that is waiting, so no key is left capturing on another screen. A tape take that is recording keeps going, and TAPE shows it.

NOTE

> MONITOR stays on after you leave the recorder. You keep hearing the input on every screen, and a take you record on TAPE includes it. Turn MONITOR off before you leave if you don't want that. Quitting Tonaut also turns it off.

HELP's one-line explanations can't be read inside the recorder or the sample editor, because SHIFT + HELP closes them. This chapter gives each control's meaning instead.

12.2 The recorder screen

The left window is the tape deck with six lines of type beside it: where the tape is and where the next recording will land. The right window, INPUT, shows the signal you are about to capture: a level meter, the input's level over the last few seconds, and a ruler of bars.



Figure 12.2 The recorder ready to capture onto lane 4, the focused lane, while the song plays. MONITOR is off, so the input isn't open yet: the meter is dark and the level line lies flat.

12.2.1 The left window: the deck and six lines

LINE	EXAMPLE	WHAT IT TELLS YOU
Title	`RECORD`	The screen's name.
Counter	`2:14.07`	The tape's position in minutes, seconds and hundredths, the same clock TAPE shows. It turns red while the tape is armed to record.
Bar	`BAR 005.3`	The bar and beat you're on: bar 5, beat 3. Read it before a punch-in. It reads `--` when there is no tempo to count bars by.
Armed line	`REC LANE 3` `REC TRK 2`	Where the next recording will land, in red with a red dot. With DEST on LANE it names the focused lane; with DEST on TAPE it names the track. With TAPE's REC SEQ on EACH and several lanes' patterns playing, it names the tracks they go onto: up to three by number (`REC TRK 1 3 5`), more as a count (`REC 5 TRACKS`), and every track as `REC TRK ALL` (11.7).
Peak, or the SEQ line	`PEAK -6.2 dB` `SEQ 1 3`	PEAK is the loudest the signal has been since you last armed with REC, moved LEVEL or switched SOURCE between the input and APP. It holds, so you can read it after playing. `-INF` means nothing yet. With DEST on TAPE this line becomes the SEQ line whenever patterns will be recorded: the lanes whose patterns play onto the take when you press PLAY

		(12.5.3). Up to five are named (SEQ 1 2 3 4 5), more are counted (SEQ 7 LANES), and every lane reads SEQ ALL. Lanes muted on SEQ's MUTE page, lanes with nothing to play and lanes on EXTERNAL MIDI are left out (11.7).
Foot	3:46 LEFT HOLD A KEY 18.4 S LEFT	The tape left between the playhead and the end of the tape, or the time the phone has room to record, if that is less; TAPE FULL at the end. While a lane is armed it reads HOLD A KEY, and while a capture runs it counts down what is left of the 20 seconds.

The spools turn while the tape moves and stand still otherwise. They don't turn during a capture onto a lane, because the tape isn't moving then. The deck doesn't take a touch: to wind the tape by hand, use TAPE (11.6).

On a smaller iPhone the window is shorter. The foot line is left out first, then PEAK. The title, counter, bar and armed line always stay.

12.2.2 The right window: INPUT

The header reads INPUT and the name of what you're recording from: the input's own name as iOS reports it (for example the phone's microphone, or your interface's name), or `MIC`, `USB` or `APP`. When the input can't be used, the reason takes the name's place (12.7). On the right of the header, in large type, is the band control you touched last and its value.

Below the header, from back to front:

- **The bar ruler.** A thin line at every bar line, with a number on every fourth bar (1, 5, 9 and so on). Eight bars fit across the window, and the newest moment is at the right edge. Nothing is drawn before bar 1, so near the start of the tape the window is mostly empty, and it fills as the tape rolls. With no tempo there is no ruler.
- **The envelope.** The level of the signal over the last few seconds, newest at the right. It is a level, not a waveform, and it runs on its own clock: it doesn't line up with the bar ruler behind it. When nothing arrives and the tape is stopped, it lies flat and stops moving.
- **Red outline.** A tape take being written is outlined in red over the envelope, from where it started to the right edge. A waiting punch-in has no mark in the window, because the window shows only what has already happened; the steady red REC key and the notice line say a punch-in is waiting (12.5.1).
- **The input meter.** Two columns of 24 dots at the right edge. Set your level by it: the louder, the higher. With MIC or USB both columns show the same level. With SOURCE on APP they are Tonaut's own output, left and right. The top dot of each column turns red when the signal reaches full scale (a clip), and stays red until you move LEVEL, switch SOURCE between the input and APP, or arm again with REC, so you see a clip you missed.

> NOTE
>
> Tonaut opens the microphone or USB input only when something needs it: when MONITOR is on, or when you press REC with DEST on LANE. Until then the meter and the envelope stay at the bottom, whatever you play into the phone. To set a level for a capture without monitoring, press REC first and watch the meter before you hold a key.

12.2.3 The keys on the recorder

KEY	WHAT IT DOES HERE
The track keys, `TRK 1` and on	Choose the tape track a tape take lands on, as on TAPE (11.2). The armed line follows when DEST is TAPE. Every track of the project can be reached. In an eight-track project the iPhone shows four track keys at a time, the same four the lane row shows: `TRK 1` to `TRK 4`, and after the lane row's `›` arrow `TRK 5` to `TRK 8` (2.2). A six-track project

	shows all six at once, on narrower keys, which on smaller iPhones set the word over the number (11.2).
SHIFT + a track key (it reads MUTE and the track's number, such as MUTE 2)	Mutes or unmutes that tape track, as on TAPE (11.2.1).
REC	Arms whatever DEST names: the focused lane for a capture, or the tape. Pressed again, it disarms, cancels a punch-in that is waiting, or punches out of a take. A steady red while armed, or while a punch-in is waiting; it blinks while a recording is being written: while you

	hold a key for a capture, and while a tape take rolls. In the TN-1 and TN-1 DARK housings the red is orange (11.1.1).
PLAY	Rolls the tape and plays the patterns together (2.10). As on TAPE, the word under its triangle reads **TAPE**.
STOP	Stops the tape and the patterns. Pressed again while stopped, it rewinds. It doesn't disarm.
The keyboard	Plays the focused lane. While a lane is armed, a held key on the focused lane captures instead (12.4).

SHIFT + the keyboard	The upper row: quick slots 1 to 8 (3.6), UNDO, DIE and HELP (which closes the recorder). The lower row keeps playing, and the – and + beside the keyboard move its octave (3.2). DIE works, but it scrambles a page of the focused lane's sound that the recorder doesn't show; press UNDO, the key to its left, to put it back (3.7).
Lane buttons	Focus a lane. With DEST on LANE, the armed line follows: REC LANE 2.

12.3 The band

The recorder's band has four controls on its first layer, about the input, and four under SHIFT, about where and when the recording happens. Each control reads its value in its own units.

CONTROL	VALUES	WHAT IT DOES
LEVEL	**+0 dB** to **+30 dB**	How much the microphone or USB input is turned up before it is captured, monitored or recorded. Off, reading **--**, while SOURCE is APP: Tonaut's own output doesn't pass through it. The value comes back when you choose MIC or USB again.
TRIG	**−60 dB** to **0 dB**	How loud a sound has to be to start a capture onto a lane. The capture waits, with the key held, until the signal goes above it (12.4.2). It has no effect on tape takes.
SOURCE	**MIC**, **USB**, **APP**	What you record from (12.3.1).
MONITOR	**OFF**, **ON**	Lets you hear the input through Tonaut while you record. It is also the input's only way onto tape (12.3.2). Reads **--** and can't be moved while the phone plays through its own speaker and listens through its own microphone. With SOURCE on APP there is no input to hear, and MONITOR does nothing until you go back to MIC or USB.
DEST (SHIFT)	**LANE**, **TAPE**	Whether REC arms a capture onto the focused lane (12.4) or a take onto the selected tape track (12.5). Changing it drops a lane arm and a punch-in that is waiting. A tape that is already armed stays armed: set DEST back to TAPE and press REC to disarm it.
QUANT (SHIFT)	**OFF**, **BAR**, **1/4**, **1/8**, **1/16**, **1/32**	When REC is pressed while the transport runs, waits for the next bar line, beat or fraction of a beat before it acts (12.5.1). A bar is four beats.
COUNT (SHIFT)	**0** to **4** bars	Bars of click before a tape take starts, with the metronome on (12.5.2). It is the project's count-in, the same setting as SEQ's COUNT-IN and the tempo page's Count-in: 1 in a new project.
REC LEVEL (SHIFT)	**−INF** to **6 dB**, starting at **0 dB**	How loud a tape take is written. It is TAPE's own REC LEVEL (11.5); a change here is a change there. TAPE's REC PAN applies to takes made here too, but it is set only on TAPE.

Hold **SHIFT**, or tap it to latch it, to reach the second four. Each shows an **SH** badge. The touch-and-hold fine adjust works here as on every band (2.4).



Figure 12.3 Under SHIFT: where the recording goes, when it starts, and how hot a tape take is written.

12.3.1 SOURCE: MIC, USB or APP

- **MIC** is the iPhone's own microphone.
- **USB** is any other input iOS is using: a USB audio interface, a USB microphone or a headset microphone.
- **APP** is Tonaut's own output, for resampling (12.6). It needs no microphone permission and no headphones, and it always works.

MIC and USB are not a choice you make. Both record from whichever input iOS is using, and SOURCE only names it. It looks when the recorder opens and when you move SOURCE, and it can see an interface only once the input is open (MONITOR on, or REC pressed with DEST on LANE). So with an interface plugged in, SOURCE can read MIC at first; move it and it reads USB. Either way the recording comes from the interface. The INPUT header names the input itself once it is open, and follows a plug or an unplug straight away. Moving SOURCE to the one that isn't connected leaves it where it was. What you can choose is between the input and APP.

If no input can be used, for example because microphone access is off, SOURCE moves to APP when the recorder opens, and moving it back to MIC or USB shows the reason on the notice line (12.7).

Changing SOURCE drops an arm, and clears the meter's peak and clip.

12.3.2 MONITOR, headphones and the speaker guard

With MONITOR on, the input plays through Tonaut so you hear what you're recording. It isn't a lane, so the lane effects don't touch it and MIX's faders don't change it. It does join the main output before the master EQ and the master effect, so you hear it through those. A tape take records the input without them, the same way it records the lanes.

Tonaut refuses to monitor while the phone plays through its own speaker and listens through its own microphone. The two are a couple of inches apart, so the speaker would feed the microphone and the sound would howl. While that is the case, MONITOR reads `--` and can't be moved. Plug in headphones, or use an interface, and MONITOR comes back.

Tonaut can only see the route once the input is open. So on a bare phone MONITOR first reads `OFF` and can be switched on; a moment later it turns to `--`. It then stays that way, switched on but refused, until you plug in headphones, and monitoring starts the moment you do.

This matters for tape: the input reaches the tape only through the monitor. So recording the iPhone's microphone onto a tape track needs headphones (12.5). Capturing onto a lane does not: it works with the phone on its own speaker and microphone.

TIP

> Wired headphones are the best choice for monitoring. Bluetooth headphones also lift the guard, but what you hear through them arrives late.

12.3.3 What the recorder remembers

CONTROLS	KEPT
LEVEL, TRIG, SOURCE, MONITOR, DEST, QUANT	While Tonaut is open, across visits to the recorder. They start again at `+0 dB`, `−60 dB`, `MIC` (or `APP` if no input can be used), `OFF`, `LANE` and `OFF` each time you launch the app. They are not part of a project.
COUNT, REC LEVEL	Saved with the project, because they belong to the project's count-in and its tape.
A lane arm or a waiting punch-in	Never kept: leaving the recorder, or changing SOURCE or DEST, drops it. A tape arm is TAPE's, and none of these drops it.

12.4 Sampling into a lane

Sampling onto a lane records up to 20 seconds while you hold a key, and turns the recording into the lane's sound. On a synth lane you then play it across the keyboard; on a kit lane it is cut into 24 pads.

To sample onto a lane:

01 Tap the button of the lane you want to fill, so it is focused. You can do this on the recorder too.

02 Open the recorder (12.1). The armed line reads **REC LANE 1**, with your lane's number.

03 Choose the **SOURCE**. For MIC or USB, set **LEVEL** by the meter (see the note in 12.2.2).

04 Under SHIFT, check that **DEST** reads **LANE**. It does unless you changed it.

05 If you want the capture to wait for a sound, raise **TRIG** (12.4.2).

06 Press **REC**. It turns a steady red and the notice line says **HOLD A KEY TO CAPTURE**. The foot of the left window reads **HOLD A KEY**. The first time you use the microphone, iOS asks for permission (12.7.1).

07 Hold any key and make the sound. The key records instead of playing, and REC blinks while you hold it. The envelope in the INPUT window shows the sound arriving, and the foot counts down from **20.0 S LEFT**.

08 Let go. The notice says **CAPTURED 2.4 S**, with the length you recorded, and the lane now holds your recording.

09 Press **REC** to disarm. Now the keys play your sample.

NOTE

> The lane stays armed after a capture. Until you press REC again, the next key you hold on the focused lane records a new capture, which replaces the one you made. While the lane is armed, none of its keys play a note.

Any key captures, and a note from a MIDI keyboard on the focused lane does too. Only the focused lane is armed: the other lanes' patterns and the tape carry on playing. The focused lane's own pattern keeps playing as well, through its old sound until the capture lands.

With QUANT set and the transport running, REC waits for the next grid line before it arms the lane, and says where (**PUNCH IN AT 005.1**). The capture itself still starts when you hold a key.

12.4.1 What the lane becomes

The capture replaces the lane's sound, with its effects and modulator, by a new sound made from the engine's starting values. What it becomes depends on the lane:

LANE	BECOMES	HOW IT PLAYS	WHERE TO SHAPE IT
Synth lane	SAMPLER	One sound played across the keyboard. The key **C4** plays it at the pitch you recorded; other keys play it higher or lower.	SYNTH's CORE page (START, LOOP, END, PITCH, 4.4.3) and EDIT's LOOP group (7.5.3). The sample editor does not open for a SAMPLER.
Kit lane	A SLICER kit	The recording cut into 24 equal slices, one per pad: pad 1 plays the first twenty-fourth, pad 2 the next, and so on.	DRUM's KIT page (6.4.2) and the sample editor (12.8).

The lane's button reads SAMPLER or SLICER, because the new sound has no name of its own. A kit lane stays a kit lane and a synth lane stays a synth lane; to sample into a kit, focus a kit lane first.

The new sound starts with NORMALIZE on, which matches the recording's loudness to the other sounds, so a quiet capture plays back about as loud as a hot one. To hear it at the level you recorded, switch NORMALIZE off in EDIT: the LOOP group on a SAMPLER (7.5.3), the SAMPLE group on a SLICER kit (7.5.6).

The recording is saved inside the project, so it is there the next time you open the project, and SAVE AS takes it along (chapter 13). To get it back out as an audio file, use the EXPORT lane in a browser (14.8.2). To keep the sound for other projects, save it in USER (5.11.1).

TIP

> To keep the sound the lane had before, save it first, in a quick slot (SHIFT + hold a slot key, 3.6) or in USER. A capture has no undo of its own; REVERT on PROJECTS takes the whole project back to your last SAVE (13.6).

NOTE

> If the phone can't store the recording, for example because it is out of space, the lane still plays it until you quit, and it is missing the next time you open the project. Tonaut doesn't warn you when that happens.

12.4.2 TRIG: waiting for the sound

With the key held, the capture doesn't write anything until the signal goes above TRIG. Then it starts, and keeps the hundredth of a second before that moment, so the start of a drum hit or a plucked note isn't cut off. The 20 seconds count from that moment, not from the key.

- At **`−60 dB`**, the lowest setting, any real microphone signal starts the capture at once. Complete digital silence never does, which matters with SOURCE on APP: the capture waits for Tonaut to make a sound.
- Raise TRIG to hold a key, get ready, and let the first loud sound start the recording.

If you let go before anything crosses TRIG, nothing is recorded, the lane keeps its sound, and no message appears.

12.4.3 The 20-second limit

A capture is 20 seconds at most. At 20 seconds it ends by itself, even with the key still held, and the notice says CAPTURED 20.0 S. The foot of the left window counts down to it.

12.5 Recording the input to tape

With DEST on TAPE, the recorder records the microphone or USB input onto a tape track, with a count-in and an optional punch-in on the grid. The take is an ordinary tape take: TAPE plays it and edits it (chapter 11), and an export from PROJECTS takes it along with the rest of the tape (14.8.1).

NOTE

> Recording the iPhone's microphone to tape needs headphones. The input reaches the tape only through the monitor, and the phone won't monitor while it plays through its own speaker and listens through its own microphone (12.3.2). With a USB interface for input and output, headphones aren't required. Headphones with a microphone of their own, such as wired EarPods, take over the input: SOURCE reads USB, and the take records their microphone, not the phone's.

To record the input onto a tape track:

01 Plug in headphones (or connect your interface).

02 Open the recorder (12.1). SOURCE should read MIC or USB.

03 Turn **MONITOR** on. The first time, iOS asks for permission to use the microphone. You now hear the input.

04 Play or sing at the level you'll record at, and set **LEVEL** so the meter stays clear of the red top dot.

05 Under SHIFT, set **DEST** to **TAPE**. The armed line names the selected track: **REC TRK 1**.

06 Press a track key to choose the track. The armed line follows.

07 If you want a count-in, turn the metronome on with a tap on the tempo key. **COUNT** sets how many bars.

08 Press **REC**. It turns a steady red and the counter turns red: the tape is armed.

09 Press **PLAY**. After any count-in, the tape rolls and records, and REC blinks. The take is outlined in red in the INPUT window.

10 Press **REC** to stop recording while the tape keeps rolling, or **STOP** to stop everything.

After STOP the tape is still armed and REC stays a steady red: the next PLAY records again from where the tape is. Press REC to disarm.

NOTE

> If you unplug the headphones during a take, the speaker guard comes back up and monitoring stops. The take carries on, but from that moment the input no longer reaches it.

If REC can't record the input, it doesn't light, and the notice line says what to fix:

- **TURN MONITOR ON TO RECORD INPUT**: MONITOR is off. Turn it on.
- **PLUG IN HEADPHONES TO RECORD INPUT**: the phone is on its own speaker and microphone. Plug in headphones.

12.5.1 Punching in on the grid: QUANT

A punch-in starts recording while the tape is already rolling. QUANT makes it start exactly on a bar line, a beat or a fraction of a beat.

To punch in on a bar line:

01 Set DEST to TAPE, MONITOR on, and **QUANT** to **BAR**.

02 Press PLAY. The tape rolls without recording.

03 Press REC during the bar before the one you want. REC turns a steady red and the notice says **PUNCH IN AT 005.1** (bar 5, beat 1). Watch the BAR line in the left window count up to it.

04 When the tape reaches that bar, recording starts: REC blinks, and the take's red outline appears in the INPUT window.

05 Press REC again to punch out. With QUANT set, the take ends on the next grid line, and the notice names it.

- A take is never shorter than one grid unit: a punch-out pressed inside the unit you punched into ends at the following line.
- Pressing REC while a punch-in is waiting cancels it.
- QUANT acts only while the transport runs. Pressed with everything stopped, REC arms at once and the take starts with PLAY.
- With QUANT on **OFF**, REC punches in and out the moment you press it.
- Changing DEST or SOURCE while a punch-in is waiting cancels it.

NOTE

> The punch-out notice also reads **PUNCH IN AT**, followed by the bar where recording will stop. The take does stop there.

12.5.2 COUNT: a count-in

With the metronome on and COUNT at 1 to 4, PLAY on an armed tape first clicks that many bars at the project's tempo, accented on each bar's first beat, and then rolls and records. With the metronome off nothing counts in, whatever COUNT says. COUNT is the project's one count-in setting, shared with SEQ's COUNT-IN (8.7.2) and the tempo page (3.9.2). It counts in only when PLAY starts an armed tape: a punch-in on a tape that is already rolling has no count-in, and neither does a capture onto a lane.

12.5.3 What else goes onto the take

PLAY on the recorder rolls the tape and plays the patterns together. Whatever the lanes play while the tape records goes onto the take with your input: patterns, grooves and arpeggios, and the keys you play by hand. Where each part lands follows TAPE's **REC SEQ** (11.7):

REC SEQ	THE LANES	YOUR INPUT
OFF	Everything on the selected track.	On the selected track.
EACH	Each lane whose pattern plays onto its own track, lane 1 onto track 1 and so on. With one lane's pattern playing, it goes onto the selected track instead.	On the selected track, but only if that track is one of the armed ones. With one lane playing it always is.
ONE	Every lane that plays, mixed onto the selected track.	On the selected track, with them.

- The SEQ line in the left window (**SEQ 1 3**) names the lanes whose patterns will be recorded. To record the input alone, mute those lanes' patterns on SEQ's MUTE page first (8.9).
- A lane on EXTERNAL MIDI plays your own gear, and its sound never reaches the tape (chapter 16). Its patterns still play.
- With REC SEQ on EACH or ONE, the patterns start on a bar line of the tape: from anywhere else the tape rolls and records, and they come in on the next one (11.7.3).

With SOURCE on APP and DEST on TAPE, REC makes an ordinary tape take of the lanes, the same as REC on TAPE. To record Tonaut's finished output, after MIX and the master effect, capture onto a lane instead (12.6).

When the tape reaches its end (20:00 on an eight-track project, 30:00 on a six-track one, 13.15), the take stops and the notice says **TAPE FULL - RECORDING STOPPED**. PLAY pressed with an armed tape already at its end says **TAPE FULL - NOTHING TO RECORD** (11.16).

12.6 Resampling Tonaut itself

Resampling captures Tonaut's own output onto a lane: a pattern, a chord through the master effect, a passage of the tape. It is everything you hear, after MIX, the master EQ and the master effect, except the metronome click and the count-in. It needs no microphone, no permission and no headphones.

To resample onto a lane:

01 Set up what you want to capture: patterns on other lanes, takes on the tape, or both.

02 Focus the lane that will receive the sample.

03 Open the recorder and set **SOURCE** to **APP**. LEVEL reads **--**, and the meter now shows Tonaut's output.

04 Under SHIFT, check that **DEST** reads **LANE**.

05 Press **REC**. The notice says **HOLD A KEY TO CAPTURE**.

06 Press **PLAY**. The tape rolls and the patterns play.

07 Hold any key when you want to start, and let go when you want to stop (20 seconds at most).

08 Press **REC** to disarm, and play your new sample.

NOTE

> While the lane is armed, its keys capture instead of playing, so the sound you resample has to come from somewhere else: patterns, grooves, the tape. The focused lane's own pattern does play, and is captured with the rest. With TRIG at **−60 dB** the capture starts at the first sound, so a silent moment at the start isn't recorded.

Resampling is also a way to bounce several lanes into one sound, freeing the other lanes: focus a lane whose sound you can spare, play the parts as patterns, and capture two bars of them. On a synth lane the result is a SAMPLER that plays the whole passage from **C4**. On a

kit lane it is cut into 24 equal slices, so each pad plays only a twenty-fourth of it; to play the whole passage from one pad, set that pad's IN to **00** and OUT to **99** (6.4.2).

12.7 What the recorder tells you

Most messages appear on the notice line at the bottom left of the screen. The reasons an input can't be used also appear in the INPUT window's header, in place of the input's name.

MESSAGE	WHAT IT MEANS	WHAT TO DO
HOLD A KEY TO CAPTURE	The focused lane is armed. Nothing has been recorded yet.	Hold a key to capture (12.4).
CAPTURED 2.4 S	The capture landed on the lane, with its length.	Press REC to disarm, then play it.
NOTHING WAS CAPTURED	A capture ended but nothing reached the lane.	Try again. If it keeps happening, please tell us what you were doing (14.10).
PUNCH IN AT 005.1	REC is waiting for that bar and beat (12.5.1).	Wait, or press REC to cancel.
TURN MONITOR ON TO RECORD INPUT	DEST is TAPE, SOURCE is MIC or USB, and MONITOR is off.	Turn MONITOR on.
PLUG IN HEADPHONES TO RECORD INPUT	DEST is TAPE and the phone is on its own speaker and microphone.	Plug in headphones.
PLUG IN HEADPHONES TO MONITOR	MONITOR was switched on while the phone was on its own speaker and microphone. You will rarely see it: usually MONITOR turns to `--` a moment after you switch it on instead (12.3.2).	Plug in headphones.
INPUT LOST - 1.2 S KEPT	The input stopped being usable during a capture (12.7.2). What arrived before is kept on the lane.	Reconnect, and capture again if you need more.
INPUT LOST - RECORDING STOPPED	The input stopped being usable while the tape was armed. The tape was disarmed and what was recorded is kept.	Reconnect, and arm again.
MICROPHONE ACCESS IS OFF	Tonaut isn't allowed to use the microphone.	Allow it in the Settings app (12.7.1). APP still works.
NO INPUT	The phone offers nothing to record from.	Check the connection;

		use APP meanwhile.
INPUT 44.1 kHz, SESSION 48.0 kHz	Your interface runs at a different sample rate from Tonaut, so its input can't be used. The numbers are the two rates.	Set the interface to the session's rate (the second number), then reconnect it.
TAPE FULL - RECORDING STOPPED	The tape ran out mid-take.	See 11.16.
TAPE FULL - NOTHING TO RECORD	PLAY was pressed with the tape armed and already at its end.	Move the tape back: STOP twice, or wind it on TAPE (11.16).
OPEN A PROJECT FIRST	The recorder was asked to open with no project open.	Wait for the project to open, or open one (chapter 13).

12.7.1 The microphone permission

iOS asks once whether Tonaut may use the microphone, the first time the recorder opens the input: when you turn MONITOR on, or press REC with DEST on LANE and SOURCE on MIC or USB. The question reads: "Tonaut uses the microphone so you can sample sounds, play them on the keys, and record them to tape."

- Allow, and the input opens.
- Don't Allow, and the INPUT header reads MICROPHONE ACCESS IS OFF. Nothing reaches a capture or the tape from the input; APP still works.

To allow it later, open the Settings app, go to **Privacy & Security** › **Microphone** and switch Tonaut on. Then quit and reopen Tonaut (14.10).

NOTE

> If you refuse the permission while a lane is armed, the armed lane's keys stay silent and capture nothing. Press REC to disarm.

12.7.2 When the input goes away

If the input stops being usable during a capture, the capture ends and keeps what it had (INPUT LOST - 1.2 S KEPT). If it happens while the tape is armed, the tape is disarmed (INPUT LOST - RECORDING STOPPED).

Unplugging something doesn't always count. When you pull out an interface or a headset, the phone usually switches straight to its own microphone. The input is still usable, so no INPUT LOST line appears, and the recording can carry on from the phone's microphone. Unplugging headphones doesn't end a recording either, but on a bare phone it brings the speaker guard back, and monitoring stops (12.3.2).

12.8 The sample editor

The sample editor shows a SLICER kit's whole recording with one slice marked on it, and a magnified view of the part you're trimming. It edits one slice, one pad, at a time: where it starts and ends, how it plays, its fade, level, pitch and pan. It changes the same values as DRUM's KIT page and EDIT's PLAY group, so whichever you use, the others show the result. Trimming never changes the recording itself. The one thing here that does is SHIFT + LOAD, which puts an audio file of your own on the pad you are editing (12.8.7). Chapter 6 has the whole route from your own sound to a playable kit (6.8); this section is the editor itself.

12.8.1 Opening and closing the sample editor

To open the sample editor:

01 Focus a kit lane that holds a SLICER kit with a recording: a factory sample kit such as Punch Kit, one you captured (12.4), or one you made from a tape track or from audio files (6.8).

02 Latch HELP (SHIFT + HELP).

03 Press SAMPLE (it reads OPEN). The sample editor opens on its TRIM page, HELP turns off, and the DRUM mode key lights.

The SAMPLE cell is shown only when the focused lane is a SLICER kit holding a recording. It is hidden on a KNOCK or CINDER kit, on a synth lane (a SAMPLER included), on a SLICER kit with no recording and on a lane on EXTERNAL MIDI, and the other cells widen to fill its place.

To close it, press SHIFT + HELP (you land on DRUM, with HELP off), a mode key or a SHIFT door, or open the tempo page.

12.8.2 The screen



Figure 12.4 Only slice 01, at the far left, is at full brightness: that is what pad 1 plays. At ×1 the bracket frames the whole left window, so the right window shows the whole recording too.

- **The left window** reads `SAMPLE` and the slice you're editing, `SLICE 08`. Below is the whole recording as a waveform. Everything outside the slice is darkened, and a white line marks each end. Thin lines along the top and bottom, with short legs at their corners, bracket the part of the recording the right window shows: the zoom bracket. At ×1 it frames the whole window. On the right of the header, in large type, is the band control you touched last and its value, in its own units: IN and OUT as a percentage of the recording, PITCH in semitones, FADE in milliseconds or seconds, GAIN in decibels.
- **The right window**, ZOOM, reads the magnification (`×8`) and LENGTH, how much time the window spans (`0.69 s` at ×8 on Punch Kit). At ×1 that is the whole recording's length. Below is the bracketed part, magnified. The IN line carries a small tab at its top, so you can tell IN from OUT when only one is in view.

Neither window takes a touch. You move the slice with the band.

The editor stays open if you tap another lane's button. If that lane has no recording to edit, the left window says `NO RECORDING ON THIS KIT` and every band lane is off.



Figure 12.5 A kit with no recording has nothing to trim: every band lane reads -- and takes no touch.

12.8.3 Choosing the slice

Play a key. The keys are the kit's 24 pads, as on DRUM; the one you play last is the slice the editor shows, and the header number follows it. Only the on-screen keys choose it: a pad played by a pattern, the groove or a MIDI keyboard sounds, but the editor stays on its slice (6.3). It is the same pad DRUM edits, so leaving the editor for DRUM keeps your place.

12.8.4 The four pages: TRIM, LOOP, FADE, PITCH

The page keys choose which two of the slice's controls are on band lanes 1 and 2. Lanes 3 and 4 are ZOOM and PLAY on every page.

PAGE KEY	LANE 1	LANE 2
TRIM	**IN**: where the slice starts	**OUT**: where it ends
LOOP	**PLAY MODE**: `ONE-SHOT`, `GATE`, `LOOP`	**DIRECTION**: `FORWARD`, `REVERSE`
FADE	**FADE**: 1 ms to 2 seconds	**GAIN**: `-INF` to +6 dB, 0 dB to start
PITCH	**PITCH**: 24 semitones down to 24 up	**PAN**: left to right

- **IN and OUT** read **00** to **99** on the band: how far into the recording, in hundredths of its length. Hold your finger still for fine adjust and they show a decimal. If IN is later than OUT, the slice still plays the part between them, and DRUM still counts the pad as filled, but the editor darkens the whole recording.
- **PLAY MODE.** ONE-SHOT plays the whole slice however briefly you touch the key. GATE plays while the key is held, then fades out by FADE. LOOP repeats the slice from IN to OUT while the key is held, then fades out by FADE.
- **DIRECTION** plays the slice forwards or backwards.
- **FADE** is how gently the slice ends: the fade before OUT, and the fade after you let go in GATE and LOOP. Lengthen it if a slice clicks at its end.
- **GAIN** is the slice's own level. **PITCH** retunes the slice without changing the others. **PAN** places it between left and right; the band reads **–50** to **+50**.

Every change is the selected slice's alone, and it is saved with the project as you make it.



Figure 12.6 The LOOP page: how the slice plays when you hold its key, and which way. Slice 01 is a ONE-SHOT played FORWARD.

To trim a slice in the sample editor:

01 Play the pad you want to trim. The header reads its slice number.

02 On TRIM, drag **IN** until the white line on the left sits a little before the sound you want. The ZOOM window follows the line.

03 Raise **ZOOM** to place IN exactly. Play the pad to hear where it starts.

04 Drag **OUT** to where the sound should stop. The ZOOM window now follows OUT.

05 If the end clicks, press FADE and lengthen **FADE**.

12.8.5 ZOOM

ZOOM sets how far the right window magnifies the recording: **×1**, **×2**, **×4**, **×8**, **×16**, **×32**, **×64**. At ×8 the window shows an eighth of the recording, and LENGTH says how long that is. The bracket on the left window shows where that eighth is.

The magnified view follows the end you moved last, IN or OUT, and keeps it a quarter of the way in from the left. Moving IN makes it follow IN; moving OUT makes it follow OUT. Until you move either, it follows IN. The view never runs past either end of the recording. ZOOM is a magnifying glass only: it doesn't change the sound.



Figure 12.7 At ×8 the right window spans an eighth of the recording, 0.69 seconds of it, with IN, the end it follows, a quarter of the way in.

12.8.6 PLAY

Band lane 4, PLAY, is drawn off and reads **--**. It is for dragging through the sample to hear it under your finger, which isn't in Tonaut yet (1.4). To hear a slice, play its key.

12.8.7 Keys and SHIFT in the sample editor

- The keyboard plays the kit, and the key you play chooses the slice.
- Under SHIFT the first page key reads LOAD and the other three are blank, and the keyboard's upper row is the quick slots, UNDO, DIE and HELP. The – and + beside the keyboard are drawn off, because a kit has 24 sounds rather than 24 pitches.
- SHIFT + LOAD opens the Files picker and puts an audio file on the pad you are editing, or several files, in name order, on that pad and the ones after it. Every other pad keeps its sound, and the loaded pad starts from SLICER's starting values so the file plays as it is. For a file called Snare on pad 8 the screen says PAD 08 · SNARE / KIT NOW 12.4 S OF 20 S; for several, PADS 08-12 · 5 FILES. The kit keeps its name and nothing goes into USER. The steps, and what happens when a kit is full, are in 6.8.2. LOAD is drawn flat on a kit that isn't a sample kit (NOT A SAMPLE KIT · USE IMP IN KITS) and on one whose recording is missing (THE KIT'S RECORDING IS MISSING).
- SHIFT + DIE scrambles the selected slice's eight KIT-page controls, IN and OUT among them, as DIE does on DRUM's KIT page (6.4.4). Press SHIFT + UNDO, the key to its left, to put all eight back. Playing a different pad first drops the UNDO.
- PLAY plays the patterns and STOP stops them. REC is off here.

12.9 Lifting a tape track into a kit

The other way to get a recording into a kit is IMP, the fourth page key of the KITS browser. With its FROM lane on TAPE, it copies the selected tape track into the focused lane as a new SLICER kit, cut into 24 equal slices, and the notice says TRACK 2 IS NOW THE KIT. An empty track says NOTHING ON TRACK 2. The full steps are in 5.7.1 and 6.8.

NOTE

> IMP copies from the very start of the tape to the end of the track's last take, and a kit holds 20 seconds at most. A track whose audio ends after 0:20 is refused with NOTHING ON TRACK 2, even though it isn't empty.

IMP and the recorder work together. To sample on the grid with a count-in, record the input onto a track at the start of the tape (12.5), then lift that track into a kit with IMP, and trim the slices in the sample editor (12.8).

Audio files come in from the Files app too: into the SAMPLER with IMP on PATCHES (5.7.2), as a new kit with IMP on KITS with FROM on FILES (5.7.3), and onto a pad of the kit you are editing with LOAD (12.8.7).

13 PROJECTS

A project is everything you are working on: the lanes' sounds, their patterns, the mix and the tape. PROJECTS is the screen where you open one, mark the version to go back to and go back to it, keep a version under a new name, rename it, start a new one, delete one you no longer want, send one to someone as a song, and choose whether it has eight tracks or six.

13.1 What a project is

A project holds the whole session. When you open it again, everything in this list comes back as you left it:

- **Its shape**: eight lanes and eight tape tracks of 20 minutes, or six lanes and six tracks of 30 minutes (13.15).
- **Each lane's sound**, with every control on every page: the engine, its effects and their settings, its modulator, and on a kit lane every pad's settings (chapters 4, 6 and 7). A lane on EXTERNAL MIDI keeps its channel, and the sound it had (chapter 16).
- **Each lane's recording**: audio you recorded onto the lane, lifted from the tape or loaded from a file (chapter 12). It stays with the lane even while the lane plays another sound. Your samples live inside the project.
- **Pad mutes** on DRUM's pad map (6.7.3).
- **The sequencer**: sixteen patterns for each lane, every note and step setting in them, which pattern each lane is playing, and SEQ's pattern mutes (chapter 8).
- **ARP and GROOVE settings** for each lane (chapter 9).
- **The mix**: MIX's levels, balances and mutes, the master EQ, the master effect and OUT (chapter 10), and TAPE MIX's level, balance and mute for each tape track (10.10).
- **The tempo**, the count-in and the metronome.
- **Each lane's keyboard octave** (3.2) and which lane is focused.
- **Each lane's key and chords**: its KEY, SCALE and LOCK, so two lanes can play in different keys, and its CHORDS, CHORD PAD, STRUM and BASS settings (3.11, 3.12).
- **The tape**: every take on every track, the chosen track, where the playhead was, the loop markers and LOOP, SPEED, REC LEVEL and REC PAN, REC SEQ's position, the order of the tracks after a lane swap (2.12), the tempo page's Tape speed setting, plus the tape's UNDO history and its clipboard (11.1.3).

Patterns, the mix and takes have no files of their own: each belongs to the project it was made in. To carry a sound from one project to another, save it in USER (5.11) or keep it in a quick slot (3.6).

13.1.1 What a project does not keep

Some things belong to the phone or to the moment, not to a project. These are not saved with it:

- SHIFT's latch, HELP's latch and SEQ's LATCH.
- REC armed. Opening a project turns REC off.
- Which screen and page you are on.
- The recorder's settings, apart from COUNT and REC LEVEL (12.3.3), and which pad you are editing on DRUM.
- SEQ's UNDO history. It starts empty every time a project opens (8.10.1).
- PERFORM's faders and the X/Y pad (chapter 15).
- Everything in Settings: the theme, scan lines, haptics, MIDI, the chord pad's settings and sync (chapter 14), and the tempo page's MIDI settings (chapter 16).
- The quick slots, your USER sounds and your favorites. They belong to the phone, and every project on it shares them.

13.1.2 Your first project

A new install starts with one project, **`Project 1`**, with eight lanes and eight tape tracks of 20 minutes. NEW numbers its projects **`Project 2`**, **`Project 3`** and so on (13.8). Use RENAME to give a project a real name (13.7).

13.2 Saving is automatic

You never have to save to keep your work, and nothing asks about unsaved changes. Tonaut saves the open project about a second after your last change. If you keep changing things without a pause, it still saves at least every three seconds. It also saves when you leave the app, and when iOS closes it.

- **Notes recorded live are saved too.** A step recorded on SEQ, or written by the arpeggiator or GROOVE while SEQ records, is saved about a second after it lands, and at least every three seconds while steps keep coming, even with the transport still running (8.8.7).
- **The tape is written while you record**, not saved afterwards (11.1).
- **Tonaut opens where you left off.** The next launch opens the project that was open last.

Saving always writes over the open project. SAVE on PROJECTS is the other kind of save: it marks the project as it is now as **the version to go back to**, and REVERT takes you back there, takes included (13.6). To keep a version under its own name and carry on in a new one, use SAVE AS (13.5).

TIP

Before you try something drastic (RESET on SEQ, a big tape edit), press SAVE on PROJECTS. If the experiment goes wrong, hold SHIFT and press REVERT twice: you are back where you saved.

13.3 The PROJECTS screen

PROJECTS lists every project on the phone. You can open it from any screen.

To open PROJECTS:

01 Hold SHIFT, or tap it to latch it. The third mode key, the one that reads TAPE, now reads PROJ.

02 Press PROJ. PROJECTS opens with the cursor on the project that is open.

From PATCHES or KITS, press the PROJ page key instead; no SHIFT is needed (5.7). On iPad, PROJ is a key of its own and PROJECTS is laid out for the bigger screen (chapter 17).

Three things tell you PROJECTS is up. **No mode key is red**: a project is every lane and the tape, not one mode. SHIFT **is filled and reads BACK under the word**; if you latched SHIFT to get here, the latch is dropped. **Hold SHIFT and** PROJ **is drawn filled**, the way MIX and EDIT show they are open.

If HELP is latched when you get here, the help panel takes the list's place and the page keys answer with their help lines instead of acting. Hold SHIFT and press HELP to turn it off, and the list comes back (2.9).



Figure 13.1 The header names the open project (Night Drive) even while the cursor is on another one. Moving the cursor opens nothing.

13.3.1 What the screen shows

The screen has the usual two windows, the band and four page keys.

PART	WHAT IT SHOWS
Left window header	**PROJECTS**, then the name of the open project in capitals, then on the right the cursor's place in the list, such as **03 / 07**. The header names the open project wherever the cursor is, so you always know which project you are in. If the name is too long for the header, its end is cut off with "..."; the counter is never cut. With no project open it reads **NO PROJECT OPEN**.
Left window list	Every project, sorted A to Z. Each row is the name as you typed it, upper and lower case kept, and on the right the tape column. The open project's row has a thin outline; when the cursor is on it, it is the filled cursor row instead.
Right window	**LANES** and, on the right, the cursor project's tape column again. Below, the cursor project's lanes, each with its lane chip: four to a row for an eight-lane project (**L1** to **L4** over **L5** to **L8**), three to a row for a six-lane one. A long name is cut off with "...". At the foot, on the left, one or two lines about where the project is kept (13.12) or, while you hold SHIFT, what SHARE would send (13.13). On the right, the **RENAME** and **DELETE** buttons (13.7, 13.9). While they are there, the window's header carries the small mark that says the window takes a tap (2.3).
The band	**CURSOR**, **SHAPE**, **TAPE** and **EXPORT**. CURSOR moves through the list (13.3.3); SHAPE reads the open project's shape and switches it, and is drawn off on any other row (13.15); TAPE picks whether SHARE sends the cursor's project with its tape or without (13.13); EXPORT picks what **REC** writes out (13.11).
Page keys	**SAVE** **SAVE AS** **NEW** **OPEN**. Under SHIFT the second reads **REVERT** and the fourth **SHARE**; the first and third are blank (13.3.4).
Keyboard	It keeps playing the focused lane (13.3.6).

The list is sorted by name, ignoring upper and lower case. Numbers sort as text, so **`Project 10`** comes before **`Project 2`**. A project's place in the list changes when you rename it. The list shows **NO PROJECTS** only if there is none at all.

A project Tonaut cannot read at all is left out of the list rather than shown broken. If one of yours goes missing, please tell us (14.10).



Figure 13.2 PROJECTS in the dark housing.

13.3.2

The tape column

The right-hand column says how much is recorded on each project's tape and where that tape is.

IT READS	MEANING
`--`	Nothing has been recorded on this project's tape.
`3:42`	The tape is on this phone, and the furthest take on any track ends 3 minutes 42 seconds into the tape.
`3:42 CLOUD`	The tape exists but is in iCloud, not on this phone. OPEN fetches it (13.12).
`3:42 PHONE`	The tape exists but is only on your other iPhone or iPad: it isn't here and it isn't in iCloud, usually because Tape audio is off on that device (14.6.2). OPEN can't fetch it. Turn Tape audio on there and open the project there once. On an iPad the column reads `DEVICE` instead of PHONE.
`1:10 / 3:42`	The tape is moving: coming down from iCloud or going up to it, 1:10 of 3:42 so far. A tape that has come down in full and waits for `OPEN` reads its length twice, such as `3:42 / 3:42` (13.4.1).
`NEWER`	A newer version of Tonaut wrote this project, on another device. This version cannot read it: its lanes are not listed, and OPEN and RENAME refuse with `WRITTEN BY A NEWER TONAUT`. The same goes for a project that uses a sound this version doesn't have, such as a new engine, effect or modulator. It is never opened or changed here, so it can't be damaged. Update Tonaut to open it.

The time is how far into the tape the recording reaches, not the total of the takes. A tape with one short take near its end still reads close to its full length.

13.3.3 Moving the cursor

The cursor picks which project OPEN, RENAME, DELETE and SHARE act on. SHAPE is live only while the cursor is on the open project. SAVE, SAVE AS, REVERT and EXPORT act on the open project wherever the cursor is. Move it any of three ways:

- Drag the list up or down. It moves row by row, and a flick goes further.
- Tap a row. The cursor jumps to it.
- Drag the **CURSOR** lane on the band. Its readout says where you are, such as **2/3**. With one project in the list it is drawn off.

Moving the cursor opens nothing. In PATCHES the cursor loads a sound as it lands; here it only points. OPEN is the only way to open a project. The CURSOR lane's help line says MOVE THROUGH THE LIST AND LOAD ONE, because it is shared with the sound browsers; on PROJECTS nothing loads.

Moving the cursor also cancels a DELETE or a REVERT you have armed (13.9, 13.6).

13.3.4 The keys

PROJECTS has its own four page keys. SAVE and SAVE AS always act on the open project, wherever the cursor is; OPEN acts on the project at the cursor; and NEW makes a new one. In a browser SHIFT never latches, so **hold SHIFT** to reach REVERT and SHARE (2.7.3). REVERT acts on the open project, SHARE on the project at the cursor. SAVE AS and REVERT are each set on two lines, **SAVE** over **AS** and **RE** over **VERT**.

KEY	WHAT IT DOES	UNDER SHIFT	ITS HELP LINE
SAVE	Marks the open project, as it is now, as the version to go back to (13.6). Lit only when something has changed since the last SAVE	Blank	MARK THIS AS THE VERSION TO GO BACK TO

SAVE AS	Save As, on the open project: keeps it as it is and carries you on under a new name (13.5)	REVERT: takes the open project back to its last SAVE, after a second press (13.6). Line: GO BACK TO YOUR LAST SAVE · PRESS TWICE	KEEP THIS ONE · GO ON UNDER A NEW NAME
NEW	Makes a new project and opens it (13.8)	Blank	START A FRESH PROJECT AND OPEN IT
OPEN	Opens the cursor's project (13.4)	SHARE: sends the cursor's project to another iPhone or iPad as a song (13.13). Line: SEND THIS PROJECT TO ANOTHER IPHONE	OPEN THE PROJECT AT THE CURSOR

RENAME and DELETE are not page keys. They are two buttons at the foot of the right window, under the project they act on, and they take a plain tap with no SHIFT (13.7, 13.9). With no project under the cursor, neither is drawn.

A key or button that cannot act right now is drawn flat, as a well. Press it anyway: it says why in the notice line (13.10). To read a help line, hold SHIFT, press HELP on the keyboard and let go of SHIFT. The help panel takes the list's place. Press the key or button: its line shows in the header, and it does nothing else. For REVERT or SHARE, hold SHIFT while you press it. RENAME's line is RENAME THE PROJECT AT THE CURSOR, DELETE's THROW THIS PROJECT AWAY · PRESS TWICE. Hold SHIFT and press HELP again to turn HELP off.

To get to PATCHES or KITS from here, hold SHIFT and press PATCH or KITS.

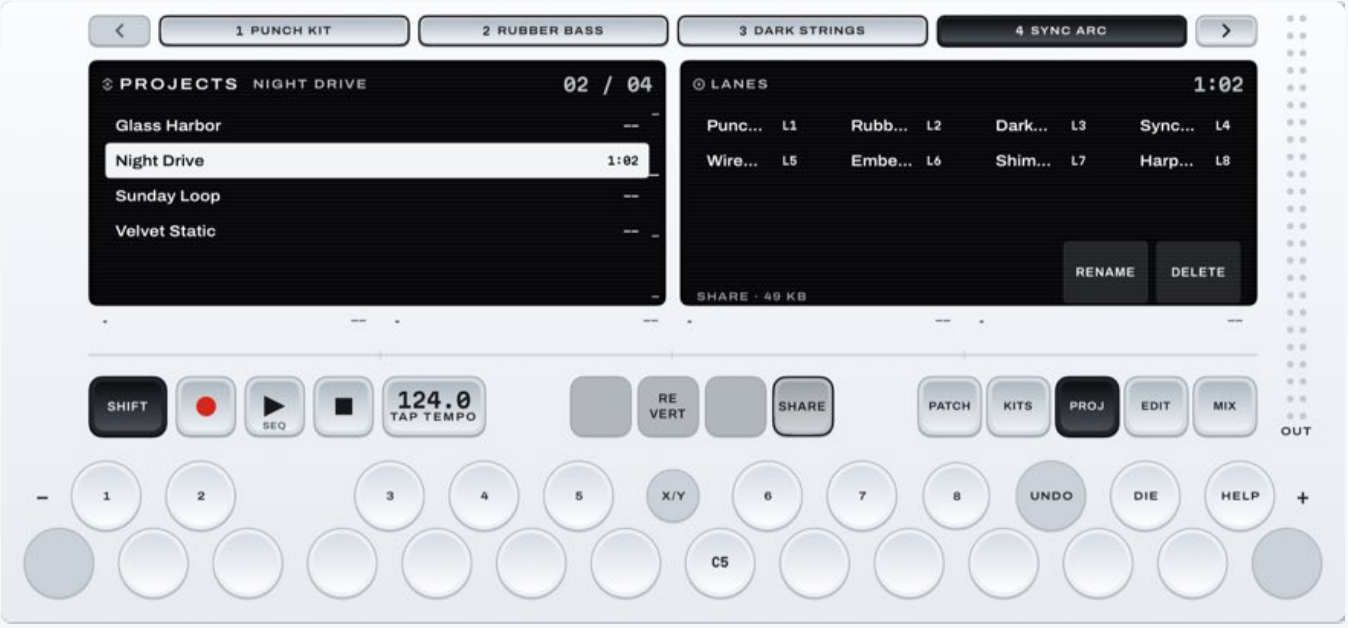


Figure 13.3 Under SHIFT: REVERT and SHARE. REVERT is flat because nothing has changed since the last SAVE, and the foot line says how big the song would be. Hold SHIFT; a tap goes BACK.

13.3.5 Leaving PROJECTS

Use any of these:

PRESS	WHERE YOU LAND
SHIFT (tap; it reads BACK)	Where you opened PROJECTS from: the same screen and page, with MIX or EDIT open again if one of them was.
Hold SHIFT, press PROJ	The same as BACK.
A mode key	That screen.
Hold SHIFT, press PATCH or KITS	That browser. BACK from there still goes where you started.
Hold SHIFT, press EDIT or MIX	EDIT or MIX.

Leaving cancels an armed DELETE or REVERT. If you opened another project while you were here, you land on the screen you came from, now showing the project you opened.

13.3.6 Playing while PROJECTS is open

The keyboard keeps playing the focused lane, so you can play while you look through your projects. Under SHIFT it is its usual shift layer: quick slots, DIE, HELP and the octave keys (2.8.1).

- PLAY plays the patterns. The tape stays put, as on every screen but TAPE and the recorder (2.10).
- STOP stops everything. While an export runs or a song is being packed, it cancels that instead and the music plays on; press it again to stop the music.
- REC exports the open project to a file (13.11). It does not arm anything.

A take you started on TAPE keeps recording while you are here. While it does, SAVE, SAVE AS, REVERT and NEW refuse (13.10).

13.4 Opening a project: OPEN

OPEN opens the project at the cursor.

To open a project:

01 Open PROJECTS (SHIFT + PROJ).

02 Move the cursor to the project.

03 Press OPEN. The line says OPENED SUNDAY LOOP (with the project's name), the header names it, and its row takes the outline.

What happens when you press it:

- **The transport stops.** Whatever was playing stops; the project you leave is saved first, as it always is.
- **A take is finished, never thrown away.** If the tape is armed to record, Tonaut ends the take the way STOP would, turns the arm off, and the line has a second row: OPENED SUNDAY LOOP / YOUR TAKE WAS SAVED FIRST. The second row appears whenever the tape was armed, even if it was not rolling and nothing was recorded.
- **Everything in the project comes back** (13.1): its shape, its lanes' sounds and patterns, the mix, the tempo, the tape and its UNDO history.
- **SEQ's UNDO starts empty.** The tape's UNDO is the opened project's own, so it can still take back that project's recent tape edits (11.12).
- You stay on PROJECTS, with the cursor on the project you opened. Tap BACK to go to work in it.

OPEN is refused on a project from a newer Tonaut (WRITTEN BY A NEWER TONAUT), and for a moment while SAVE, SAVE AS, RENAME or REVERT finishes (STILL COPYING · ONE MOMENT). If a project cannot be read, nothing changes: the project you were in stays open, and the line reads COULD NOT OPEN IT, followed by the reason. In the rare case that the project you were in cannot be put back either, the line's first row reads COULD NOT OPEN IT · NO PROJECT OPEN and the reason goes on a second row: open any project from the list to carry on.

A project can use a factory recording, such as a sample kit, that a newer Tonaut has and this one doesn't, when it comes from your other device. It still opens. That lane plays without the recording, and the line reads OPENED SUNDAY LOOP / A FACTORY SOUND IS MISSING. The project keeps its choice of recording, so once you update Tonaut the lane plays it again.

13.4.1 OPEN on the project that is already open

On the open project's row OPEN is drawn flat. Press it and the line says THIS PROJECT IS ALREADY OPEN.

There is one exception. When this project's tape has come down from iCloud, it waits beside the project until you load it, and TAPE says TAPE ARRIVED · PRESS OPEN TO LOAD IT. Then OPEN is live on the open project's row. Press it: the project opens again with the new tape, and the transport stops as with any OPEN (13.12).

The same goes for a newer version of the open project that your other device sent while you were using it here: the foot line says NEWER VERSION ARRIVED · PRESS OPEN, OPEN is live on its row, and pressing it loads that version (13.12.1).

13.5 Save As: SAVE AS

SAVE AS keeps the open project exactly as it is now, under the name it has, and carries you on under a new name. It acts on the open project wherever the cursor is. It is the second key, written on two lines, **SAVE** over **AS**.

To save the open project as a new one:

01 Open PROJECTS (SHIFT + PROJ).

02 Press SAVE AS. A pop-up appears with the iPhone keyboard. It reads SAVE AS over THIS ONE STAYS AS IT IS NOW, and the field already holds a suggested name: the open project's name with a version number in brackets, so **Night Drive** offers **Night Drive (2)**, and SAVE AS again in **Night Drive (2)** offers **Night Drive (3)**. The project's own name never changes: **Project 6** offers **Project 6 (2)**, not Project 7.

03 Keep the suggestion, or delete it and type a name of your own (13.7.1).

04 Press SAVE in the pop-up. The line says SAVED AS NIGHT DRIVE (2).



Figure 13.4 SAVE AS suggests the name with (2) after it. The project you are in stays as it is under its old name.

After SAVE AS there are two projects where there was one:

NAME	WHAT IT IS
The old name (**Night Drive**)	The project exactly as it was the moment you pressed SAVE in the pop-up. It is closed, in the list, untouched, and saved: its save point is that moment (13.6).
The new name (**Night Drive (2)**)	The project you are in now. It is open, its row has the outline and the header names it. Everything you change from here goes into it. It is saved too, at the same moment, so REVERT on it goes back to where you pressed SAVE AS.

The rest of what SAVE AS does:

- **The music keeps playing.** Nothing stops and nothing reloads, during the pop-up or after it.
- **A key you were holding is let go** as the pop-up appears, so no note hangs.
- **The panel does not move** when the iPhone keyboard comes up.
- CANCEL **changes nothing.** Nothing is written until you press SAVE in the pop-up.
- **An empty field takes the suggested name.**
- **A name that is taken gets a number** rather than a refusal (13.7.1). Typing the open project's own name back gives `Night Drive (2)`, because `Night Drive` is the name the kept version keeps.
- The cursor lands on the project you are in, under its new name.
- If a take started while the pop-up was up, SAVE AS refuses with NOT WHILE RECORDING and nothing is saved.
- Live recording on SEQ does not stop SAVE AS. The kept version has every step recorded up to that moment.
- SAVE AS refuses while the open project's tape is still in iCloud, on its way, or arrived and waiting for OPEN, so the kept version is never a project without its takes (13.12).

NOTE

> You never need SAVE AS to keep your work: that happens on its own (13.2). Every SAVE AS you confirm in the pop-up leaves one more project in the list, so use it when you want a version to keep under its own name. To go back to a version without making another project, use SAVE and REVERT (13.6). To copy a project that isn't open, OPEN it first, then SAVE AS.

13.5.1 What each one keeps of the undo histories

The two projects share everything you made, but not the histories:

- **The project you carry on in** keeps the tape's UNDO history and the tape clipboard (11.11.2, 11.12). SEQ's UNDO starts empty, so you cannot take back a pattern change made before SAVE AS.
- **The kept version** has no tape UNDO history and an empty tape clipboard. SEQ's UNDO is empty whenever a project opens, so that is empty too.

13.5.2 The pop-up on a small iPhone

On the iPhone 13 mini and other phones that small, the keyboard leaves too little room for the two lines of words. There the pop-up is the field and two buttons, and the confirming button says what it does: CANCEL and SAVE AS. The header behind it still names the open project. RENAME's pop-up shrinks the same way, with CANCEL and RENAME.

13.6 SAVE and REVERT: a version to go back to

SAVE marks the open project, as it is now, as **the version to go back to**: its sounds, patterns, mix, tempo and tape, takes and all. REVERT takes the open project back there. Both act on the open project, wherever the cursor is. Saving still happens on its own all the time (13.2): SAVE doesn't keep your work, it says which version of it you want to be able to come back to.

To mark a save point and go back to it:

01 On PROJECTS, press SAVE. The line says SAVED · NIGHT DRIVE, and SAVE goes dark.

02 Play, record and change things.

03 To go back, hold SHIFT and press REVERT (SAVE AS's key). It is drawn filled and the line asks REVERT TO YOUR LAST SAVE? PRESS AGAIN, over ALL CHANGES SINCE THEN GO, or CHANGES AND TAKES SINCE THEN GO when the tape has changed too.

04 Press REVERT again within eight seconds. The music stops, as it does for OPEN, and the line says REVERTED TO YOUR LAST SAVE.

Anything else in between cancels it: moving the cursor, leaving the screen, another key, or waiting eight seconds. The line says REVERT CANCELLED.

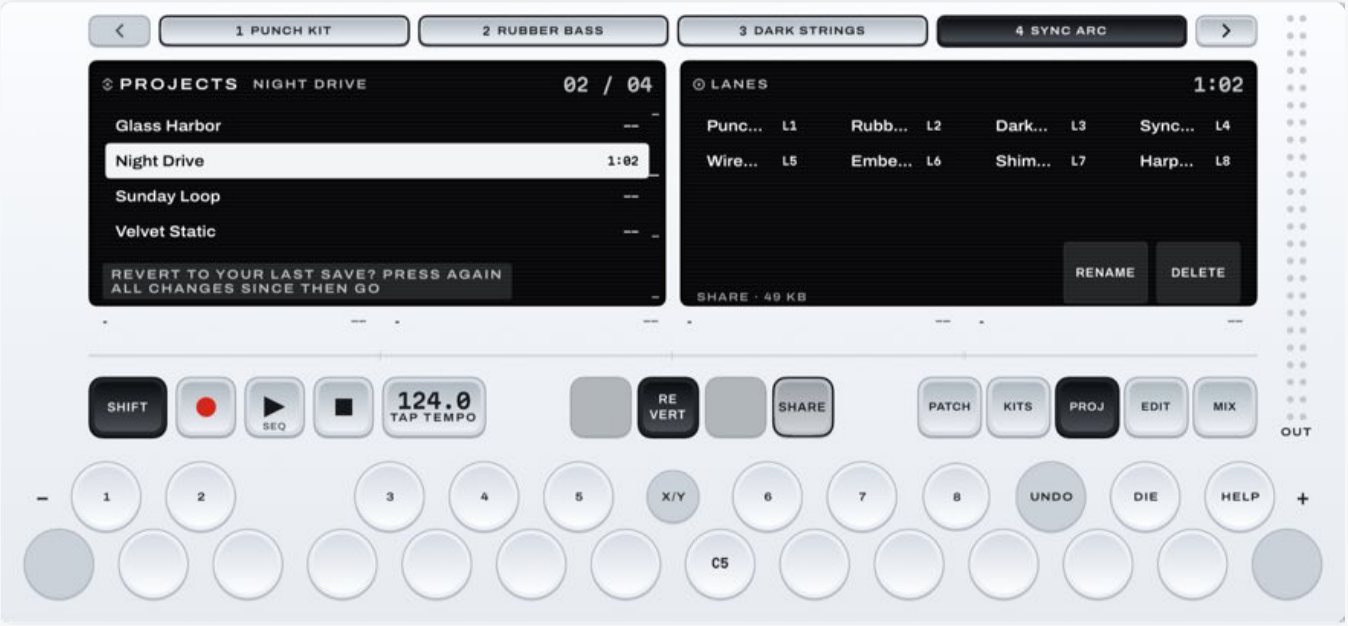


Figure 13.5 REVERT pressed once: armed, and the line says what goes. A second press takes the project back.

A dark SAVE means "all saved". SAVE is lit only when something has changed since the last SAVE; pressed while dark it says NOTHING NEW TO SAVE. A project with no save point yet has SAVE lit. REVERT is lit at the same times as SAVE, once the project has a save point. What counts is your work: a sound, a pattern, a level, the tempo, a lane's octave, the loop, the

project's shape, a take, an erase, a tape UNDO, CATCH. Playing, moving the playhead, choosing a lane, a tape track or the pattern you are looking at, and renaming the project do not light SAVE.

What REVERT takes back, and what it keeps:

- **Everything since the save point goes**, the tape included: takes recorded since are gone, and a take you erased since is back. So is the project's shape, if you switched it since (13.15).
- **The name stays** as it is now. REVERT goes back to the work, not to the name.
- **The tape clipboard stays**, so DROP still drops what you lifted. When the tape goes back, its UNDO history is emptied: it describes a tape that is gone (11.12). A tape that hasn't changed since the SAVE is left exactly as it is, UNDO history included. SEQ's UNDO starts again, as it does whenever a project opens.
- **The save point stays.** You can REVERT to it again later, as many times as you like, until you press SAVE again.

When a project has a save point. A new project is saved the moment NEW makes it, so REVERT on it goes back to the fresh project. SAVE AS leaves both projects saved (13.5). A song someone sent you is saved as it arrived (13.14). OPEN never sets a save point: it stays where you put it, through quitting and reopening, so REVERT a week later goes back to the SAVE you pressed a week ago. Until a project has one, REVERT says NO SAVE POINT YET · PRESS SAVE.

With two devices. Save points stay on the device that made them. When your other device's changes are loaded into a project here, its save point is cleared, so REVERT can never take the project back across work you did on the other device. The line that says the changes arrived gains a second row, YOUR SAVE POINT WAS CLEARED, and REVERT says OTHER PHONE CHANGED IT · SAVE AGAIN until you press SAVE. Pressing SAVE sends nothing to iCloud; a REVERT goes up as a change, with its tape (13.12).

Space. A save point keeps the tape as it was when you pressed SAVE. That costs nothing at first; recording over or erasing tape after a SAVE uses new space for what changed, up to one tape's worth. SAVE refuses with COULD NOT SAVE IT · NOT ENOUGH SPACE when the phone has less than 512 MB free. If a save point's files are ever damaged, REVERT refuses it whole with SAVE POINT DAMAGED · PRESS SAVE rather than taking you back to part of it.

SAVE and REVERT wait for a take to end (NOT WHILE RECORDING) and for the open project's tape to be here (13.12). REVERT also waits for your other device's version when one has arrived: press OPEN to load it first (NEWER VERSION ARRIVED · PRESS OPEN). The rest of the refusals are in 13.10.

13.7 Renaming: RENAME

RENAME renames the project at the cursor. It works on any project, the open one included, except one written by a newer Tonaut.

To rename a project:

01 On PROJECTS, move the cursor to the project.

02 Press RENAME, the first of the two buttons at the foot of the right window. A pop-up appears with the iPhone keyboard. It reads **RENAME** over **24 CHARACTERS AT MOST**, and the field holds the project's name.

03 Change the name.

04 Press RENAME in the pop-up. The line says **RENAMED MIDNIGHT DRIVE** (with the new name), the row moves to its new place in the A to Z list, and the cursor follows it.

CANCEL changes nothing. If you clear the field or leave the name as it was, the line says **NAME UNCHANGED** and nothing is written. Renaming the open project changes the header at once. The music keeps playing, and a held key is let go as the pop-up appears, as with SAVE AS. RENAME works during a take.

If you clear the field, it shows **PROJECT NAME** until you type.



Figure 13.6 RENAME starts with the name the project has.

13.7.1 Name rules

The same rules apply to every project name you type, in SAVE AS's pop-up and RENAME's (a sound's name in USER may be 32 characters, chapter 5):

- **24 characters at most.** The field stops taking characters at 24: the 25th never appears, and a longer name pasted in is cut to 24.
- **Each word starts with a capital** as you type, the iPhone keyboard's own setting. You can turn the capital off with the keyboard's shift key.
- **No autocorrect.**
- **Spaces at the start and end are dropped**, and so are line breaks and invisible characters.
- **The list keeps your upper and lower case.** The header and the notice line show the name in capitals.
- **A name that is taken gets a number, never a refusal.** Upper and lower case don't count, so `night drive` is taken if `Night Drive` exists. `Night Drive` becomes `Night Drive (2)`, or the lowest free number in brackets. The number never changes the name's own number: `Take 5` becomes `Take 5 (2)`, and a name that already ends in a bracketed number is counted from its base, so `Night Drive (2)` becomes `Night Drive (3)`, never `Night Drive (2) (2)`. A long name is cut short to make room for the number. The line always says the final name.
- **A project can keep its own name in different case.** Renaming `night drive` to `Night Drive` is allowed and does not add a number.

Two projects can still end up with the same name, if they were made on two devices that share iCloud (13.12). The list shows both.

13.8 A new project: NEW

NEW makes a new project and opens it.

To start a new project, press NEW, the third page key, on PROJECTS. The new project opens at once, and the cursor is on it. The line says NEW PROJECT · PROJECT 1 (with its name) over 8 × 20 MIN · SHAPE SWITCHES IT.

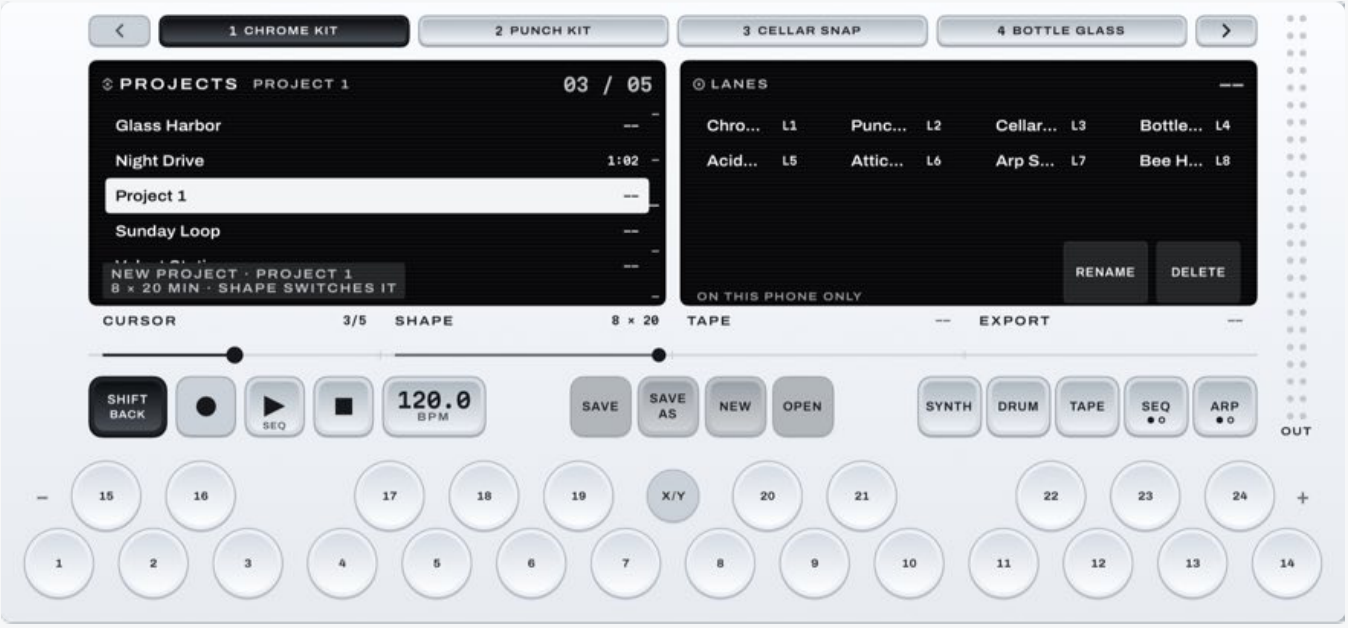


Figure 13.7 NEW opens the project it makes. The second line says its shape, and which control changes it.

A new project is the same as Tonaut's first launch: eight lanes and eight tape tracks of 20 minutes, with a sound ready on every lane; 120 BPM, lane 1 focused, every pattern empty and nothing on the tape. For six tracks of 30 minutes, switch it with SHAPE straight away: the six lanes keep the first six sounds (13.15).

LANE	SOUND	WHAT IT IS
1	**Chrome Kit**	A SLICER drum kit
2	**Punch Kit**	A SLICER drum kit
3	**Cellar Snap**	A DIVINER bass. Its keyboard starts two octaves down, where a bass belongs (3.2)
4	**Bottle Glass**	SLOPE keys
5	**Acid Line**	A SLOPE lead
6	**Attic Strings**	A DIVINER pad
7	**Arp Shards**	A SAMPLER pluck
8	**Bee Hive**	A SWARM texture

- **Its name is `Project` and the lowest free number.** With Project 1, 2 and 3 on the phone you get Project 4. Delete Project 2 and the next NEW is Project 2 again. Use RENAME to give it a real name (13.7).
- **The transport stops**, as with OPEN, and the project you leave is saved first.
- **Not while a take is recording.** NEW is drawn flat while the tape records, and pressing it says NOT WHILE RECORDING: press STOP first. It is one tap on the front row, so a stray tap must not end a take. OPEN still finishes a take and says YOUR TAKE WAS SAVED FIRST (13.4).
- **NEW does not ask twice.** It makes something and destroys nothing.

13.9 Deleting: DELETE

DELETE deletes the project at the cursor, with its tape, its samples and its undo history. Nothing brings it back, so it takes two presses.

To delete a project:

01 On PROJECTS, move the cursor to the project. It cannot be the open one.

02 Press DELETE, the second of the two buttons at the foot of the right window. The button lights, and the notice line shows two lines for eight seconds:
DELETE GLASS HARBOR?
PRESS DELETE AGAIN · CANNOT BE UNDONE.

03 Within those eight seconds, press DELETE again. The row goes and the line says DELETED GLASS HARBOR.

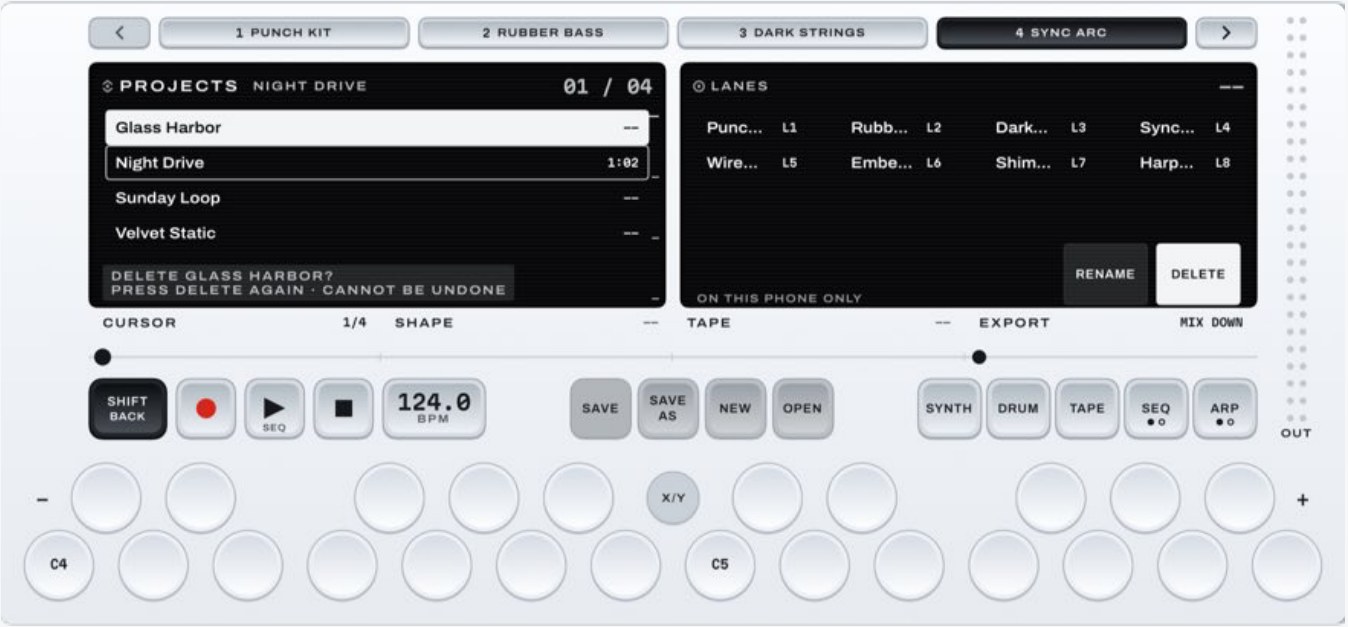


Figure 13.8 DELETE armed. It names the project it is about to delete. Press DELETE again within eight seconds, or let it go.

To change your mind, do nothing. Any of these cancels the delete, and the line says DELETE CANCELLED:

- waiting eight seconds;
- moving the cursor;
- pressing a PROJECTS key or RENAME;
- leaving PROJECTS.

The open project cannot be deleted. On its row DELETE does nothing but say why: CANNOT DELETE THE OPEN PROJECT OPEN ANOTHER PROJECT FIRST. To delete the project you are in, OPEN another one (or make one with NEW), then delete it.



Figure 13.9 DELETE on the open project: refused, with the way through.

NOTE

> A deleted project is gone from the phone for good: its takes, its samples and its undo history go with it. With iCloud sync on, the delete reaches iCloud and your other device too, unless the project is open there (13.12). Export anything you want to keep first (13.11).

13.10 When a key is drawn off

A PROJECTS key or button that cannot act right now is drawn flat. It still takes the press, does nothing, and says why in the notice line. When there are several reasons, it gives the first one in this table.

KEY	IT SAYS	WHEN
SAVE	NO PROJECT OPEN	No project is open: the moment of a switch, or after a

		project failed to open.
	STILL COPYING · ONE MOMENT	Another SAVE, SAVE AS, RENAME or REVERT is still finishing.
	NOT WHILE RECORDING	A take is running (below).
	TAPE ARRIVED · PRESS OPEN FIRST	The open project's tape has come down from iCloud and waits for OPEN to load it (13.4.1).
	WAIT FOR THE TAPE TO ARRIVE	The open project's tape is coming down from iCloud.
	ITS TAPE IS STILL IN ICLOUD	The open project's tape was in iCloud when you opened it and has not started to come down (13.12).
	ITS TAPE IS STILL ON YOUR OTHER PHONE	The open project's tape is only on your other device, not in iCloud (13.3.2). On an iPad it says DEVICE.
	AN EXPORT IS ALREADY RUNNING	An export is running (13.11).
	NOTHING NEW TO SAVE	Nothing has changed since the last SAVE (13.6).
SAVE AS	The same as SAVE, in the same order, except NOTHING NEW TO SAVE: SAVE AS always has something to keep.	
REVERT (SHIFT)	NO PROJECT OPEN	No project is open.
	STILL COPYING · ONE MOMENT	Another act is still finishing.
	NO SAVE POINT YET · PRESS SAVE	Nobody has pressed SAVE on this project (13.6).

	OTHER PHONE CHANGED IT · SAVE AGAIN	Your other device's changes were loaded since the last SAVE, and cleared its save point.
	NOTHING CHANGED SINCE YOUR SAVE	There is nothing to go back from.
	NOT WHILE RECORDING	A take is running.
	TAPE ARRIVED · PRESS OPEN FIRST	The open project's tape has come down and waits for OPEN.
	WAIT FOR THE TAPE TO ARRIVE	The open project's tape is coming down.
	ITS TAPE IS STILL IN ICLOUD or ITS TAPE IS STILL ON YOUR OTHER PHONE	The open project's tape is not here.
	NEWER VERSION ARRIVED · PRESS OPEN	Your other device's version waits for OPEN: load it first, then decide.
	AN EXPORT IS ALREADY RUNNING	An export is running.
	SAVE POINT DAMAGED · PRESS SAVE	The save point's files failed their check. It is never half used.
NEW	STILL COPYING · ONE MOMENT	Another act is still finishing.
	NOT WHILE RECORDING	A take is running (below).
OPEN	STILL COPYING · ONE MOMENT	Another act is still finishing.
	WRITTEN BY A NEWER TONAUT	The row reads NEWER.
	THIS PROJECT IS ALREADY OPEN	The cursor is on the open project, and no tape or newer version is waiting for it (13.4.1).
RENAME	STILL COPYING · ONE MOMENT	Another act is still finishing.

	WRITTEN BY A NEWER TONAUT	The row reads NEWER.
DELETE	STILL COPYING · ONE MOMENT	Another act is still finishing.
	CANNOT DELETE THE OPEN PROJECT OPEN ANOTHER PROJECT FIRST	The cursor is on the open project.
SHARE (SHIFT)	NO PROJECT OPEN	The cursor is on the open project's row while no project is open.
	STILL COPYING · ONE MOMENT	Another act is still finishing.
	WRITTEN BY A NEWER TONAUT	The row reads NEWER.
	NOT WHILE RECORDING	A take is running on the open project, and the cursor is on it. Another project can be sent during a take.
	AN EXPORT IS ALREADY RUNNING	An export is running (13.11).
	A FILE IS STILL BEING PACKED	The song or the sounds you sent before are still being packed (5.11).
	The tape words above, such as ITS TAPE IS IN ICLOUD · OPEN IT FIRST	Only with TAPE on WITH, when the project's tape has stopped being on this phone since the list was read (13.13).

SHAPE's refusals are in 13.15.

"A take is running" means the tape is really recording: REC on with the tape rolling, or REC on and the count-in counting. REC armed on a stopped tape is not a take, so SAVE, SAVE AS and NEW work then. Recording notes live on SEQ is not a take either.

SAVE, SAVE AS and RENAME usually finish in a fraction of a second, and REVERT in about the time OPEN takes, so you will rarely see STILL COPYING. The exception is RENAME on the open project while an export runs: the new name lands when the export ends, and until then the other keys say STILL COPYING.

When the phone says no. If the phone's storage refuses a write, the line names what failed and why. The reason is usually **NOT ENOUGH SPACE**, otherwise **DISK ERROR**.

- **COULD NOT SAVE IT · NOT ENOUGH SPACE**: SAVE AS could not save the open project before making the kept version. Nothing was made, and you are still in the project under its old name. From SAVE, it means the phone has less than 512 MB free: the save point you had stays.
- **NAME NOT WRITTEN · NOT ENOUGH SPACE**: SAVE AS got further. The kept version is made and in the list, and you carry on under the new name, but the phone would not yet write that name into the project you are in. Tonaut writes it again a few seconds later; free some space so that it can.
- **COULD NOT RENAME IT**, with the reason after it, for RENAME. A failed RENAME leaves the old name.
- **COULD NOT REVERT**, with the reason on a second row. Nothing changed: you are where you were.
- **REVERT DID NOT FINISH RESTART TONAUT TO FINISH IT**: in the rare case a REVERT stops part way, quit Tonaut from the app switcher and open it again, and it finishes. Until then OPEN, RENAME and SHARE on that project say **REVERT UNFINISHED · RESTART TONAUT**.
- **COULD NOT DELETE IT** and **COULD NOT OPEN IT**, with the reason after them, for DELETE and OPEN.

Free some space in iOS Settings and try again.

13.11 Exporting a project

PROJECTS is where you write the open project out for use outside Tonaut: its tape as WAV files, or its patterns as MIDI files. Chapter 14 has the details: what is in each format and where the files go (14.8.1, 14.8.4, 14.8.7).

To export the open project:

01 On PROJECTS, drag the **EXPORT** lane to **MIX DOWN** (the tape through the whole mix, as you hear it), **STEMS** (one file for each tape track that holds a recording) or **MIDI** (one MIDI file for each lane, its pattern as it plays). It starts on MIX DOWN.

02 Press **REC**. The line says **EXPORTING MIX DOWN**, **EXPORTING STEMS** or **EXPORTING MIDI**, REC blinks while the files are written, and the header's counter shows the progress.

03 When it is done, the line says **SAVED IN FILES · TONAUT / EXPORTS**, or for stems the number of files, such as **8 FILES IN FILES · TONAUT / EXPORTS**. MIDI files open the share sheet first, so you can send them straight to a computer.

STOP cancels it: **EXPORT STOPPED · NOTHING KEPT**.

- **EXPORT always writes the open project**, wherever the cursor is. To export another project, OPEN it first.
- EXPORT offers MIX DOWN and STEMS only when the tape holds a take, and MIDI only when a pattern holds a note. With one format on offer it is drawn off and reads `--`, and `REC` writes that format. With neither, `REC` says `NOTHING ON THE TAPE OR IN THE PATTERNS`.
- While an export runs, SAVE, SAVE AS and REVERT refuse with `AN EXPORT IS ALREADY RUNNING` (13.10). A second press of `REC` says the same.

13.12 Projects and iCloud

With iCloud sync turned on in Settings (14.6, 14.9), your projects reach your other iPhone or iPad signed in to the same Apple Account. With it off, everything stays on this phone, and the foot of the right window says `ON THIS PHONE ONLY`. On an iPad, the lines in this section say DEVICE and IPAD where an iPhone says PHONE.

What crosses:

- **A project's sounds, patterns, mix and name.** They go up each time the open project saves, and after SAVE AS, RENAME and REVERT. SAVE itself sends nothing: a save point stays on this phone (13.6). Your other device looks for them when Tonaut starts, when you come back to Tonaut there, and each time you OPEN a project there. A project you never open or rename while sync is on stays on this phone.
- **The open project's tape**, when the `Tape audio` row in Settings' SYNC section is on `OPEN PROJECT` (14.6.2). A tape goes up only for a project you open on this phone. It goes in pieces of about a minute, and stretches of silence aren't sent at all: after a change, only the minutes that changed go up again, and an upload that gets cut off carries on where it stopped.
- **Renames.** A project renamed on one device is renamed on the other.
- **Deletes.** A project deleted on one device is deleted on the other, unless it is the project open there: that one stays while it is open. Change it there and it goes back up with its next save, and comes back on the device that deleted it; leave it as it is and it goes from that device too, the next time Tonaut looks in iCloud after you have moved to another project. If the other device had changed that project and not yet sent the change, its change wins and the project comes back; delete it again.
- **Copies.** The version SAVE AS keeps is a new project in iCloud. Open a copy of a recorded project and its tape goes up in full, so copies of recorded projects use that much more of your iCloud storage.

A project whose tape is in iCloud reads `3:42 CLOUD` in the tape column, and the foot of the right window says how big it is, such as `TAPE NOT ON THIS PHONE · 46 MB · PRESS OPEN TO FETCH`. To bring the tape down:

01 Press `OPEN` on that project. It opens straight away with its sounds, patterns and mix, and you can play it. Until its tape starts to move, its row still reads CLOUD and the foot line says `TAPE STILL IN ICLOUD · 46 MB`.

02 The tape comes down behind it. The tape column counts (`1:10 / 3:42`) and TAPE shows `TAPE ARRIVING 1:10 / 3:42` (11.17).

03 When it has all arrived, TAPE says `TAPE ARRIVED · PRESS OPEN TO LOAD IT`. Go to PROJECTS and press `OPEN` on the same project, the open one. The transport stops and the tape loads.

NOTE

> Wait for the tape before you record on that project. When `OPEN` loads the tape that arrived, it takes the place of the tape on this phone, so a take you recorded here in the meantime is not on the tape afterwards.

A row that reads `3:42 PHONE` has its tape only on your other device, and the foot line says `TAPE ON YOUR OTHER PHONE · NOT IN ICLOUD`. OPEN works, but no tape comes: turn Tape audio on there (14.6.2) and the row changes to CLOUD the next time Tonaut looks.

Until the tape is loaded, `SAVE`, `SAVE AS` and `REVERT` on that project say which step you are at: `ITS TAPE IS STILL IN ICLOUD` before it starts to move, `WAIT FOR THE TAPE TO ARRIVE` while it comes down, and `TAPE ARRIVED · PRESS OPEN FIRST` once it waits for OPEN, when the foot line of the open project's row says `TAPE ARRIVED · PRESS OPEN TO LOAD IT`.

13.12.1 Two devices, one project

When you change a project on one device and then pick up the other, what happens depends on whether you changed it on both.

- **Changed on one device only.** That version wins on both. If the project is open on the other device and you haven't touched it there (`PLAY` isn't lit, nothing is recording and nothing is waiting to save), it loads at once and the line says `LOADED YOUR OTHER PHONE'S CHANGES`. A groove or an arpeggio left playing on HOLD with `PLAY` off doesn't count as using it: the new version loads under it. If you are using it there, it waits: the line says `NEWER VERSION ARRIVED · PRESS OPEN`, and `OPEN` on the open project's row loads it (13.4.1). The version it replaces is kept on the device as the version before it, as with any save.
- **Changed on both.** Nothing is overwritten, and both devices end up with the same two projects. The device that sends its change second finds the two versions. It keeps its own under the project's name, makes the other device's into a project of its own, named with `(other)` after it, such as `Night Drive (other)`, and says `BOTH PHONES CHANGED IT · KEPT BOTH` over that name. When the first device next syncs, the project's name there takes the second device's version (at once, or at OPEN, as above), and the first device's own version comes back to it as `Night Drive`

`(other)`, with YOUR VERSION IS NOW over that name. So on the first device, your own work is in the `(other)` project. Listen to both and DELETE the one you don't want (13.9); the delete reaches both devices.

- Changing it while a newer version waits for OPEN counts as changing it on this device, so both are kept. So does a take you recorded in the meantime.
- If the newer version can't be loaded because the phone is out of space, nothing says it loaded: the line says NEWER VERSION ARRIVED · PRESS OPEN once, and it waits for OPEN. A change you make while it loads, such as turning a knob, stays.
- Playing a project, moving the playhead, changing the lane in focus or which pattern you are looking at doesn't count as changing it.
- A name has room for 16 characters before `(other)`; a longer one is cut to fit the 24. If the other device keeps working on its version before yours reaches it, its newer work goes into the same `(other)` project rather than a second one, as long as you haven't changed that project here. Once both devices have each other's versions, the next time both change the project a new one is kept, `(other 2)`; the first `(other)` is never written over.
- The `(other)` project's tape comes down when you open it, like any project's. Until then its row may read CLOUD, or PHONE if it is only on the other device.
- If a full phone stops the second version being kept, nothing is overwritten and the line says COULD NOT KEEP BOTH · NOT ENOUGH SPACE; the project waits until there is room.

NOTE

> Keep Tonaut up to date on both devices. A project that uses an engine or effect an older version doesn't have reads NEWER there and can't be opened (13.3.2). Anything else opens on the older version with what it knows: without a lane EQ, LOCK, CHORDS or a SAMPLER filter, and without the recordings of factory sounds newer than it. If you change the project there, those settings are gone on both devices.

The foot line also shows the sync status: SYNCED 2 MIN AGO (or SYNCED JUST NOW), WAITING FOR WI-FI, NO ICLOUD ACCOUNT, ICLOUD IS FULL · NOTHING WAS LOST, or a transfer in progress such as SENDING 84 MB OF 462 MB or FETCHING 12 MB OF 46 MB. A NEWER project's foot line reads WRITTEN BY A NEWER TONAUT. Chapter 14 explains each one (14.9).

Two devices can make projects with the same name, such as two `Project 2`s. Both are listed. Rename one with RENAME.

13.13

Sending a song: SHARE

SHARE sends a whole project to another iPhone or iPad as one file, a song, so the person who gets it hears exactly what you hear and can carry on working on it in Tonaut. The file holds every lane's sound with every edit, the patterns, the arpeggiator and groove, the mix, the master effect, the tempo, the project's shape and the recordings your lanes hold. A factory sound travels whole, settings and all, so it plays the same even if a later Tonaut changes that sound. Factory recordings, such as a sample kit's drums or a factory SAMPLER sound's recording, go by name, because every Tonaut of the same version or later has them. With the tape, it holds the tape exactly as it is, silence left out. A song never holds your save point (13.6) or the tape's UNDO history.

To send a song:

01 On PROJECTS, put the cursor on the project to send. It can be the open project or any other.

02 To send the tape too, drag the **TAPE** lane to **WITH**. It starts on **WITHOUT**, the small file. TAPE is drawn off and reads **––**, and the song goes without its tape, when the project has nothing recorded on its tape, or its tape is not on this phone.

03 Hold SHIFT. The foot of the right window says what SHARE will send, such as **SHARE · 732 KB** or **SHARE WITH TAPE · 212 MB**. It also says so after you touch the TAPE lane.

04 Still holding SHIFT, press SHARE, the fourth key. The header's counter reads **PACKING 03 / 09** while the song is put together. STOP stops it: **PACKING STOPPED · NOTHING SENT**.

05 The share sheet opens over the panel. Choose AirDrop, Messages, Mail, Files or another app. The music keeps playing.

06 When the sheet closes, the line says **SENT · NIGHT DRIVE**, or **NOTHING SENT** if you closed it without sending.

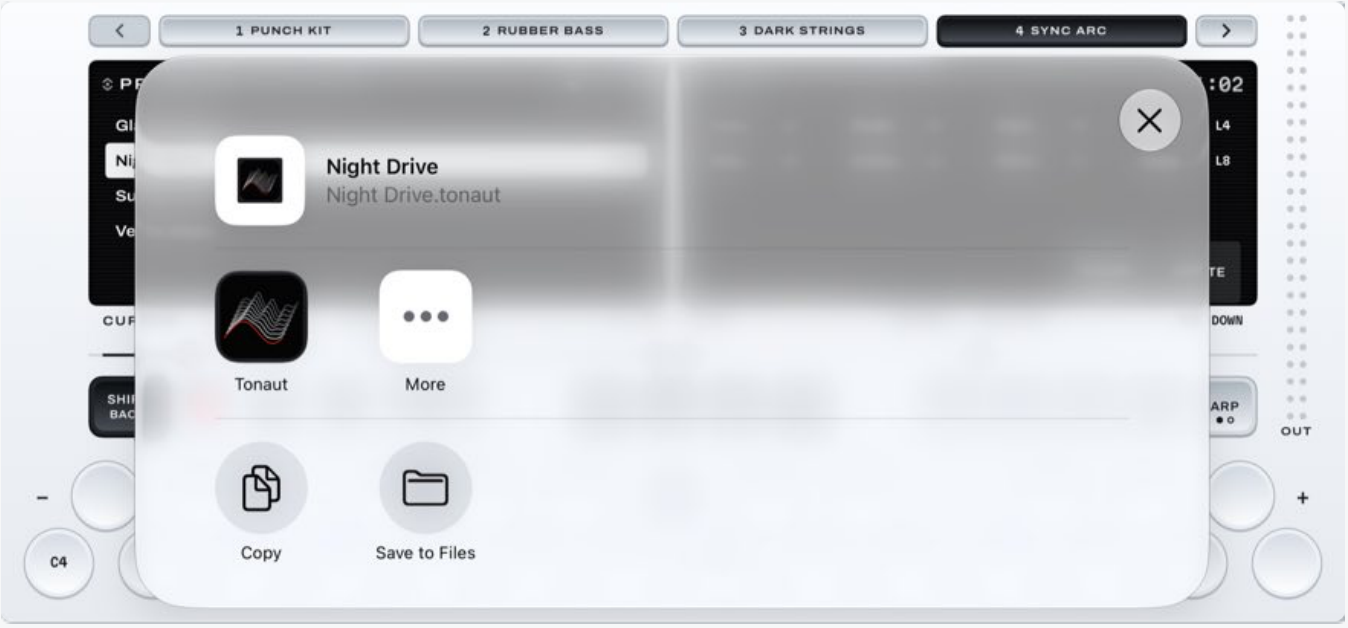


Figure 13.10 The share sheet over the panel, with the song's file, Night Drive.tonaut, at its head. Which apps it offers depends on the phone.

- **The open project is sent as it is now**: Tonaut saves it first. Sending it doesn't change it, and doesn't count as a SAVE.
- The file is named after the project, such as **Night Drive.tonaut**, and shows Tonaut's icon.
- **A song with its tape can be big**: a full track is several hundred megabytes, and a full tape several gigabytes. AirDrop and Files take it; Mail and Messages may not. The tape is sent exactly, so it sounds exactly the same: Tonaut's tape doesn't compress without changing it.
- Only the recordings the project's lanes hold go. A recording you replaced, which no lane holds any more, stays on your phone.
- If the line says `THIS SONG IS TOO BIG TO SEND`, the project uses more recordings than a song holds (64). `COULD NOT PACK IT · NOT ENOUGH SPACE` means your phone has no room to put the file together: free some space and try again.
- **Sending to someone with an older version of Tonaut.** A song that uses a lane EQ (10.5), a SAMPLER filter that isn't fully open (4.4.3), LOCK with a scale (3.11.3), CHORDS on a synth lane (3.11.4), lanes set to different keys (3.11.2), or one of the effects Echo, Space, Dist, Filter, Pump, Swirl, Lo-Fi and Tremolo, in a sound's effect slot or as the master effect (4.7), asks an older Tonaut to update before it opens, because that version would play it without them. So does a song with one of the newer factory sounds whose recording that version doesn't have. A song that uses none of these still opens there.

13.14 A song someone sent you

Tap a **.tonaut** file in Messages, Mail, AirDrop or Files, or choose Tonaut when you share one. Tonaut comes forward and adds the song as a **new project**, named after the song with `(shared)` after it, such as `Night Drive (shared)`. PROJECTS comes up with the cursor on it and the line says SONG ADDED · NIGHT DRIVE (SHARED) over PRESS OPEN TO PLAY IT.

- **It never opens by itself**, and never touches the project you have open: the music doesn't stop. Press OPEN when you want to hear it.
- A second copy of the same song arrives as `(shared 2)`, and so on. A song that was itself sent to you, sent back, doesn't pile up the word: `Night Drive (shared)` arrives as `Night Drive (shared 2)`.
- It keeps the shape it was sent with, eight tracks or six (13.15).
- If a file arrives while you are recording, nothing changes until the take ends. Then the song is added.
- Its first save point is its arrival, so REVERT takes it back to the song as it came (13.6).
- With iCloud on, it goes to your other device like any project, and its tape the day you open it.

A file Tonaut can't use is refused, nothing is added, and the line says CAN'T OPEN THIS FILE over the reason:

IT SAYS	WHY
IT IS DAMAGED OR NOT A TONAUT FILE	The file was changed or cut short on the way, or isn't a Tonaut song. Ask for it again.
UPDATE TONAUT TO OPEN IT	It was made by a newer Tonaut and uses something this one doesn't have, such as a new engine or effect.
NOT ENOUGH SPACE ON THIS IPHONE	There isn't room for it and a take after it. Free some space and tap it again. On an iPad it says IPAD.
THIS FILE IS TOO BIG	It is bigger than any song Tonaut makes.
COULD NOT READ IT	The iPhone wouldn't hand the file over, for example one still downloading from iCloud Drive. Try again.

A **.tonautsounds** file is a set of sounds, not a song: tapping one adds its sounds to USER in PATCHES and KITS (5.11).

13.15

SHAPE: eight tracks or six

Every project has up to 30 minutes of tape, in one of two shapes, chosen per project:

SHAPE READS	LANES	TAPE TRACKS	EACH TRACK
8 × 20	8	8	20 minutes
6 × 30	6	6	30 minutes

Lane *n* and tape track *n* go together, so the shape sets both. Every new project, the first one included, is **8 × 20**, and NEW's notice says so on its second line (13.8).

SHAPE is the second lane of PROJECTS' band, with **6 × 30** at its left end and **8 × 20** at its right. It works only on the open project's row, where it reads that project's shape. On any other row it is drawn off and reads **––**; the right window still shows that project's shape, eight lanes four to a row or six lanes three to a row. To change a project's shape, open it first.

To switch the open project between eight tracks and six:

01 Press **STOP**. A project switches only while the transport is stopped.

02 Open PROJECTS. The cursor is on the open project, and SHAPE is live.

03 Drag **SHAPE** to the other position. The project opens again in its new shape, and the line says **NOW 6 LANES · 30 MIN TAPE** or **NOW 8 LANES · 20 MIN TAPE**.



Figure 13.11 On the open project's row SHAPE is live. Night Drive is eight lanes and eight tracks of 20 minutes.

A switch never throws anything away. When it would, it is refused, nothing changes, and the line says why:

IT SAYS	WHY
STOP FIRST	The transport is running.
NOT NOW · THE PROJECT IS BUSY	Another act is on its way: an OPEN, SAVE AS, REVERT or a file being loaded.
LANE 7 ISN'T EMPTY	Switching to six, with something on lane 7 or 8 (the line names the first): a sound other than the empty lane's SLOPE or the one a new project put there (13.8), a moved control, a note in any pattern, arpeggiator or groove settings, a muted pad, a recording, or EXTERNAL MIDI. Which pattern a lane shows, its SEQ mute, its octave and its faders on MIX and TAPE MIX don't count. Clear the lane, or move what you want to keep to lanes 1 to 6.
TRACK 7 ISN'T EMPTY	Switching to six, with a take on tape track 7 or 8.
LANES SWAPPED WITH 7 OR 8 SWAP THEM BACK FIRST	Switching to six after a lane was swapped with lane 7 or 8 (2.12). Swap them back, then switch.
TAPE RUNS PAST 20:00 CAN'T SWITCH TO 8	Switching to eight, with a take that ends after 20 minutes.
UNDO HISTORY RUNS PAST 20:00 CAN'T SWITCH TO 8	Switching to eight: no take runs past 20 minutes now, but tape UNDO or REDO could put back one that does, such as a long take you erased. The tape keeps its last eight edits, so the step leaves the history as you make newer tape edits (11.12).

- **A switch to six** takes lanes 7 and 8 and tracks 7 and 8 away, and gives each of the six tracks 30 minutes.
- **A switch to eight** adds two empty lanes and two empty tracks, and each track holds 20 minutes. The playhead and the loop markers come back inside 20:00 if they were past it.
- A switch has no UNDO of its own: switch back with SHAPE, which works whenever nothing would be lost. REVERT takes the shape back to the one the save point has (13.6).

TIP

Choose six tracks when you want long recordings, such as a whole set or a jam, and eight when you want more parts. You can switch a fresh project at once: the sounds a new project starts with don't count as yours, so nothing refuses.

14 Settings, export, sync and troubleshooting

Settings holds what belongs to your iPhone or iPad rather than to a project: how the panel looks and feels, the MIDI devices Tonaut can hear and send to and which lanes they play, how the chord pad behaves, the audio buffer and what the audio hardware is doing, where exports go, iCloud sync, and which version you have. This chapter also covers writing your music out as audio and MIDI files, how sync behaves, and what to try when something doesn't work.

14.1 Opening Settings

Settings has no mode key. Its door is the `SETTINGS` cell on the help panel (2.9.1).

To open Settings on iPhone:

01 Tap `SHIFT` to latch it, or hold it. The keyboard's upper row turns into the eight quick slots, `UNDO`, `DIE` and `HELP`. On TAPE, SHIFT turns the keys into the tool row instead, and `HELP` is its last key (2.8.2).

02 Press `HELP`. It fills (in the TN looks its LED lights instead, 14.2.1), and the help panel takes the picture's place with its cells, `SETTINGS` always the last (2.9.1).

03 Press the `SETTINGS` cell. It reads **`OPEN`**.

Settings opens over the screen you were on. HELP turns off, a latched SHIFT drops, and no mode key is lit. The cursor always starts on the first row, **Housing**.

- **In a browser**, hold SHIFT for steps 1 and 2. A tap on SHIFT there means **`BACK`** (2.7.3).
- **On iPad**, `HELP` is on the strip above the keys, with no SHIFT to press, and Settings shows every row at once (chapter 17).

The screen works like a browser: a list on the left and, on the right, the part of the list the cursor is in, drawn as controls.

PART	WHAT IT SHOWS
Left window	The header **TONAUT** and **SETTINGS**, with the version you have on the right. Below it, all twenty-eight settings, each with its value on the right. The row under the cursor is filled.
Right window	The section the cursor is in, by name, with a word on the right saying what that section is doing. Below it, the section's rows, their names in capitals: a choice is drawn as two or three cells with the chosen one filled (Housing, on an iPhone, as six), and a readout, or a row with more choices than that (Channel and the eight Lane rows), as its value. A section with more rows than the window holds, such as MIDI, shows the ones around the cursor, and the rest come into view as the cursor reaches them. CHORD PAD is one row in the list, and its window lists its five settings (14.11). On ABOUT, the font license line is at the foot.
The band	**CURSOR**, **VALUE**, **SECTION**, and a fourth place that is **SCREEN**, drawn off, or on MIDI the **BLUETOOTH** key, or on Chord pad **SETTING** (14.1.1).
Page keys	**THEME** **MIDI** **AUDIO** **INFO** (14.1.2).
Keyboard	Keeps playing the focused lane (14.1.4).



Figure 14.1 Settings opens on THEME, with the cursor on Housing. The left list is every setting; the right window is the section the cursor is in. THEME has three rows: the engine pictures are switched on SYNTH, not here.

The twenty-eight rows, in list order:

SECTION	ROW	READS	CAN YOU CHANGE IT?
THEME (14.2)	**Housing**	**AUTO**, **LIGHT** or **DARK**, and on an iPhone **TN-1**, **TN-1 DARK** or **TN-XY**	Yes

	Scan lines	**ON** or **OFF**; **NONE IN TN-1** in TN-1 and TN-1 DARK	Yes, except in TN-1 and TN-1 DARK
	Haptics	**ON** or **OFF**	Yes
MIDI (14.3)	**Bluetooth**	**PRESS MIDI**, **NOT ALLOWED** or **BLOCKED**	No, a readout. Pair with the **BLUETOOTH** key (14.3.1)
	Input	a device name, or **NONE**	No, a readout
	MIDI in	**LANE** or **BY CHANNEL**	Yes
	Channel	**OMNI**, or **CH 01** to **CH 16**	Yes, while MIDI in is LANE
	Lane 1 to **Lane 8**	**CH 01** to **CH 16**	Yes, while MIDI in is BY CHANNEL
	Output	a device name, or **NONE**	No, a readout
CHORD PAD (14.11)	**Chord pad**	a summary of its five settings, such as **FIXED · PER LANE**	Yes: VALUE changes the one **SETTING** picks
AUDIO (14.4)	**Rate**	such as **48.0 K**	No, a readout
	Buffer	**256 · 5.3 MS** or **128 · 2.7 MS FAST**	Yes
	Latency	such as **5.8 MS · 256 · 0 LATE**	No, a readout
EXPORT (14.5)	**Folder**	**EXPORTS**	No, a readout
SYNC (14.6)	**iCloud**	**ON** or **OFF**	Yes
	Tape audio	**OFF** or **OPEN PROJECT**	Yes, while iCloud is on
	Over cellular	**ON** or **OFF**	Yes, while iCloud is on
	Status	a sync word, such as **SYNCED 2 MIN AGO**	No, a readout
	In iCloud	such as **46 MB OF YOUR WORK**	No, a readout
ABOUT (14.7)	**Version**	the version you have	No, a readout
	Render load	such as **4.7 / 2.1% · 34% MAX**	No, a readout

14.1.1 Moving the cursor and changing a setting

CONTROL	WHAT IT DOES
CURSOR	Moves the cursor through all twenty-eight rows, one row per step. It reads your place, **1/28** to **28/28**.
VALUE	Changes the setting at the cursor. Its positions run in the same order as the cells, left to right, and it reads the choice you are on. On a readout, such as Rate or Version, it is drawn off, reads **––** and takes no touch: the row's value is in the list. It is drawn off the same way on a row that is switched off: Scan lines in TN-1 and TN-1 DARK (14.2.2), Channel while MIDI in is BY CHANNEL, the Lane rows while it is LANE (14.3), Tape audio and Over cellular while iCloud is off, and the iCloud row when iCloud isn't available to Tonaut (14.6.1). On Chord pad it changes the setting SETTING picks (14.11).
SECTION	Jumps the cursor to the first row of a section. It has seven positions, **THEME**, **MIDI**, **CHORD PAD**, **AUDIO**, **EXPORT**, **SYNC** and **ABOUT**, and reads the section you are in.
SCREEN	Drawn off. It has no job and reads **––**. While the cursor is in MIDI, the **BLUETOOTH** key stands in its place (14.3.1), and on Chord pad **SETTING** does (14.11).

The list takes your finger too. Tap a row to put the cursor on it, or drag the list up and down. A tap only moves the cursor: it never changes a value. The cells in the right window are not buttons; VALUE is what moves them.

To change a setting:

01 Put the cursor on its row: tap it, drag **CURSOR**, or use a page key or **SECTION** to get near it.

02 Drag **VALUE** toward the choice you want. The filled cell follows your finger and the change takes effect as you drag.

Every setting you change is kept when you leave Tonaut, except Channel, which starts on OMNI each time (14.3). Settings belong to the device, not to a project: opening another project doesn't change them, and sync doesn't carry them to your other iPhone or iPad. The same goes for the three MIDI rows on the tempo page, Clock out, Transport and MIDI delay (16.8, 16.9).

Under SHIFT the band has no controls on this screen: each of its four places is labeled **–** and reads **––**.

14.1.2 The page keys

Each page key jumps the cursor to the first row of its section. Two of them have a second job when pressed again:

KEY	JUMPS TO
THEME	Housing, the first row of THEME
MIDI	Bluetooth, the first row of MIDI. Pressed again while MIDI is lit, it opens Apple's Bluetooth MIDI list, as the BLUETOOTH key does (14.3.1).
AUDIO	Rate, the first row of AUDIO
INFO	Version, the first row of ABOUT. The key reads INFO because ABOUT doesn't fit on it. Pressed again while ABOUT is showing, it opens the speed test (14.7.1). Its two dots (2.5.1) say which of the two is showing: the first for ABOUT, the second for the speed test.

THEME and AUDIO pressed again put the cursor back on their first row. CHORD PAD, EXPORT and SYNC have no key. Reach them with **SECTION**, **CURSOR** or a tap on the list. The lit key follows the cursor's section however you got there; while the cursor is in CHORD PAD, EXPORT or SYNC, no page key is lit. Under SHIFT the page keys are blank.

14.1.3 Leaving Settings

Any of these closes Settings:

- SHIFT + HELP: back to the page you were on, with HELP off.
- **A mode key**: that mode's screen. Press the key of the screen you came from to go back to it.
- SHIFT + PATCH, KITS **or** PROJ: that browser. SHIFT + EDIT **or** MIX: EDIT or MIX. **A hold on the tempo key**: the tempo page (3.9.1).

NOTE

> **If you opened Settings from a browser**, the browser is still underneath and SHIFT still reads BACK. Hold SHIFT while you press HELP. A tap on SHIFT goes back from the browser underneath, so when you leave Settings you land on the screen you opened the browser from.

NOTE

> HELP can't be latched while Settings is showing: SHIFT + HELP closes the screen instead. This chapter is where Settings' own controls are explained.

14.1.4 Playing while Settings is open

- The keyboard plays the focused lane, as notes on a synth lane and as pads on a kit lane.
- Under SHIFT the keyboard is the same as on SYNTH: the quick slots, UNDO, DIE and HELP (2.8.1).
- PLAY plays the patterns, STOP stops, and REC is a well (2.10).

NOTE

> DIE works here, and it scrambles the page you last had showing on the focused lane's sound, which you can't see from Settings. If you press it by mistake, press UNDO, the key to its left, straight away to put the values back (3.7).

14.2 THEME

THEME is how the panel looks and feels: the housing, the texture of the screens, and the small taps you feel under your finger. The word at the right of the section's header is your Housing choice: FOLLOWS SYSTEM on AUTO, otherwise the housing's name, such as LIGHT or TN-1 DARK.

Which picture SYNTH draws on the CORE page, NEW or CLASSIC, is not a setting. A tap on SYNTH's left window switches it for the lane you are on, and every lane is back on NEW when you move to another lane or open Tonaut again (4.5).

14.2.1 Housing

Housing is the look of the whole instrument. An iPhone offers six: **AUTO**, **LIGHT**, **DARK**, **TN-1**, **TN-1 DARK** and **TN-XY**. An iPad offers the first three.

CHOICE	WHAT YOU GET
AUTO	Your device's own appearance: light in Light mode, dark in Dark mode, within the family of the housing you chose last. After TN-1 or TN-1 DARK, AUTO switches between those two; after LIGHT, DARK or TN-XY, which has no dark-and-light pair, between LIGHT and DARK. If the device switches by itself at sunset (**Settings › Display & Brightness › Automatic**), Tonaut switches with it. The header reads FOLLOWS SYSTEM. This is how Tonaut comes, following LIGHT and DARK.
LIGHT	The light housing.
DARK	The dark housing: graphite panel and darker keys.
TN-1	An ivory housing with raised buttons, round keys under a row of small black caps, and orange for the lit mode key and for recording. On SYNTH and DRUM each of the four sliders has a color of its own, and the part of the picture it moves wears the same color. Its screens have no scan lines, and TAPE's spools have three openings. iPhone only.
TN-1 DARK	TN-1 in charcoal, with TN-1's orange for everything that lights, recording included: there is no red in it. Its screens are TN-1's. iPhone only.
TN-XY	A monochrome housing in black and greys: the lit mode key is silver, the white keys run from dark grey at the left to near-white at the right, and REC and the recording marks are red. Its screens are the classic ones that LIGHT and DARK use. iPhone only.

To change it, put the cursor on Housing and drag **VALUE**. The whole panel repaints as you drag, and the music doesn't stop. The choice is kept on this device; a project doesn't carry it. The black screen windows look the same in LIGHT, DARK and TN-XY; TN-1 and TN-1 DARK draw their own. What each housing looks like is in 2.1.1.

In the three TN looks every key of the keyboard carries a small LED near the top of its round raised area. It lights bright while the key's note sounds, glows at half strength for a note of the selected or held SEQ step or a note LATCH holds, and under SHIFT lights bright on a key that holds a screen or a state open, such as HELP while it is latched or LOOP on TAPE while the tape loops; there the LED is that key's only sign, where LIGHT and DARK fill the key (3.4.2).



Figure 14.2 THEME in TN-1 on an iPhone: six housings to choose from. TN-1's screens have no scan lines, so that row says so and can't be changed.

14.2.2 Scan lines

Scan lines are the faint horizontal lines over the black screen windows, like an old display. They are **ON** when you install on iPhone and **OFF** on iPad. Set **OFF** for plain black windows. Both windows change at once, and nothing else does.

TN-1 and TN-1 DARK draw their screens without scan lines, so while one of them is the housing the row reads **NONE IN TN-1** and **VALUE** is drawn off there. Your choice is kept for the other housings. TN-XY uses the classic screens, so Scan lines works in it as in LIGHT and DARK.

14.2.3 Haptics

Haptics are the small taps you feel under your finger. **ON** when you install. With it on, you feel:

- a tick for each step as you drag a stepped slider, such as a **CURSOR** lane;
- a firmer tap when a held slider goes into fine adjust (2.4.1);
- a light tap when a double-tap resets a slider, or SHIFT + double-tap puts one back (2.4.4);
- a tick for each bar as **POSITION** moves the tape a bar at a time (11.5.1), and for each step as a pinch zooms TAPE's tracks (11.18);
- a short buzz when a quick slot saves a sound (3.6.1).

The keyboard, DRUM's pad map and the keys of the button row don't tick, with Haptics on or off. **OFF** stops all of them. The device's own **Settings › Sounds & Haptics › System Haptics** has to be on as well for any of them to reach your finger.

14.3 MIDI

MIDI pairs Bluetooth MIDI gear, shows the MIDI devices Tonaut can hear and send to, and decides which lanes a MIDI keyboard plays: the lane you have chosen, or each lane on its own channel. How to connect a keyboard and what it plays is in 3.8; playing your own synths and drum machines from Tonaut is chapter 16. The word at the right of the header counts what is connected: inputs Tonaut hears and outputs it can send to, such as **1 IN · 1 OUT**, or **NONE**. A keyboard that is also a sound module counts once each way.

ROW	WHAT IT SAYS
Bluetooth	**PRESS MIDI**: pairing is ready; press the **BLUETOOTH** key, or the lit **MIDI** key again (14.3.1). **NOT ALLOWED**: you told iOS no when it asked about Bluetooth. **BLOCKED**: a restriction such as Screen Time stops apps using Bluetooth.
Input	The name of the first MIDI device Tonaut hears, or **NONE**.
MIDI in	Which lanes a MIDI keyboard plays. **LANE**, as Tonaut comes: everything it hears goes to the lane you have chosen on the lane buttons, the focused lane, through the Channel filter below. **BY CHANNEL**: each lane listens on its own channel, set in the Lane rows (14.3.2).
Channel	While MIDI in is LANE: **OMNI** listens to all sixteen channels. **CH 01** to **CH 16** listens to that one only and ignores everything on the others: notes, bend, pedal and controllers. It filters what comes in, not what Tonaut sends. Drawn off while MIDI in is BY CHANNEL.
Lane 1 to **Lane 8**	While MIDI in is BY CHANNEL: the channel each lane listens on, **CH 01** to **CH 16**. Lanes 1 to 8 are on channels 1 to 8 until you change them. Drawn off while MIDI in is LANE.
Output	The name of the first MIDI output Tonaut can send to, in capitals, with **+1**, **+2** after it when there are more, or **NONE**. Every output gets every note a MIDI lane sends (16.2), so there is nothing to choose here.

To make Tonaut listen to one channel, with MIDI in on LANE:

01 Press **MIDI**. The cursor lands on Bluetooth.

02 Move the cursor down three rows to Channel, or tap it.

03 Drag **VALUE**. It has seventeen positions: **OMNI** at the left end, then **CH 01** to **CH 16**.

NOTE

> Channel is not remembered. Every time Tonaut starts, it listens on OMNI again. MIDI in and the Lane rows are kept, like every other setting.

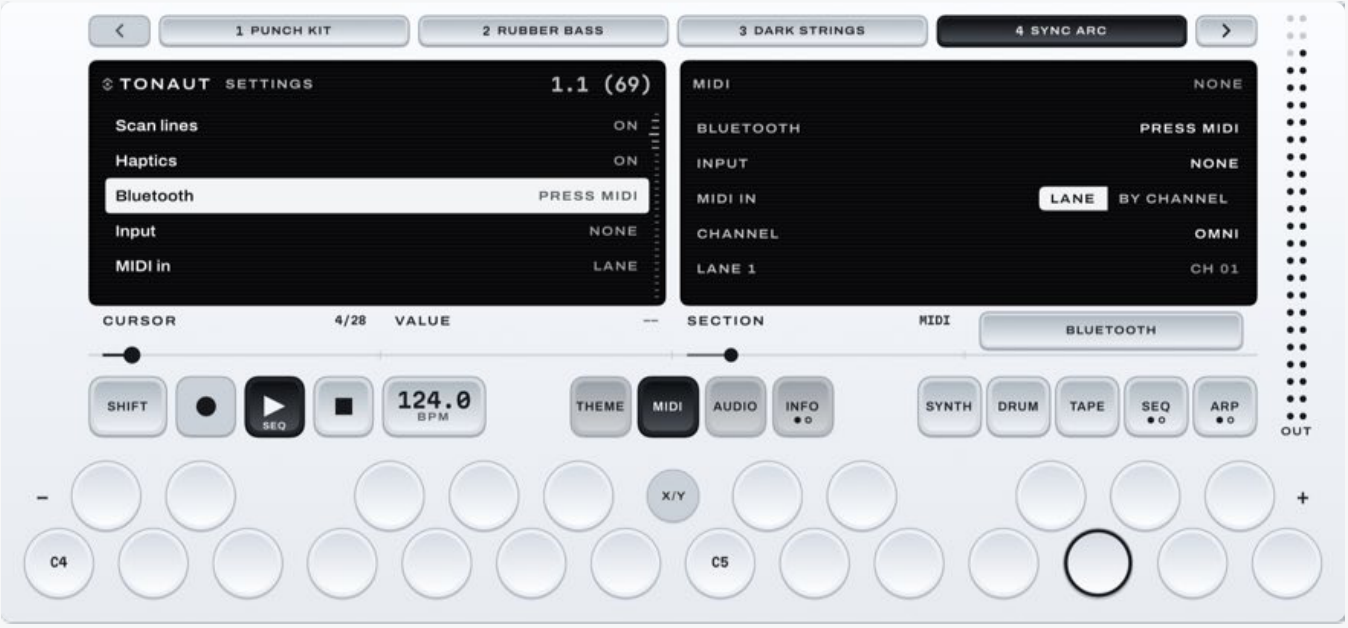


Figure 14.3 MIDI with nothing plugged in and MIDI in on LANE: Channel is live and the Lane rows are drawn off. The BLUETOOTH key opens Apple's pairing list.

14.3.1

Pairing Bluetooth MIDI gear

Bluetooth MIDI keyboards, controllers and synths pair inside Tonaut, in Apple's own Bluetooth MIDI list:

01 Turn the device on, in pairing mode if it has one.

02 Open Settings and press MIDI. The cursor is on Bluetooth, which reads PRESS MIDI, and the band's fourth place is the BLUETOOTH key.

03 Press BLUETOOTH (or MIDI again). Apple's list opens over the panel. The first time, iOS asks whether Tonaut may use Bluetooth: tap Allow.

04 Tap your device in the list.

05 Tap Done, the check mark at the top left of the list, or swipe the list down. The MIDI header counts the device: Input names the first device Tonaut hears, and Output the first it can send to.

The music keeps playing under the list, and a keyboard plays as soon as it connects, before you tap Done. Paired gear that receives MIDI can then be played from an EXTERNAL lane (chapter 16).

The list always closes: Done stays at the top left, a swipe down closes it, and so does leaving Tonaut for another app. Once a device is connected, Apple's list shows Edit on the right; while you edit, its own buttons take the top of the list, and Cancel brings Done back. You come back to MIDI with the panel as you left it. On iPad the list opens as a pop-up pointing at the key.

NOTE

> If Bluetooth reads **NOT ALLOWED**, the BLUETOOTH key is drawn flat, and pressing it says **ALLOW BLUETOOTH IN THE SETTINGS APP** and opens nothing: turn it on in your device's Settings › Apps › Tonaut › Bluetooth. If it reads **BLOCKED**, the press says **BLUETOOTH IS BLOCKED BY A RESTRICTION**. If a paired keyboard stops playing after Tonaut has been closed, open the list again and tap it.

14.3.2 Each lane on its own channel: BY CHANNEL

With MIDI in on **BY CHANNEL**, every lane listens on a channel of its own, so a controller with split zones, or a computer sequencer, can play several lanes at once, whichever lane is focused.

To play lanes by channel:

01 Open Settings and press MIDI. The cursor lands on Bluetooth.

02 Move the cursor down two rows to MIDI in, or tap it.

03 Drag **VALUE** to **BY CHANNEL**. The eight Lane rows come on, and Channel is drawn off.

04 To move a lane to another channel, put the cursor on its Lane row and drag **VALUE**: sixteen positions, **CH 01** to **CH 16**.

05 Set each part of your controller or sequencer to send on the channel of the lane it should play.

- **Everything on a channel goes to its lane**: notes, the sustain pedal, pitch bend, pressure, the mod wheel, breath and expression (3.8.4).
- **Two lanes on one channel both play it**, so you can layer two sounds from one keyboard.
- **A channel no lane listens on is ignored.** In a six-lane project, lanes 7 and 8 hear nothing (13.15).
- **The focused lane still matters for two things**: the keys on the screen light, and SEQ's step entry hears a note (8.3.6), only when it reaches the focused lane.
- Changing MIDI in, or any lane's channel, ends every note your keyboard is holding, so nothing is left sounding.
- What Tonaut sends to your gear doesn't change: MIDI out is set on each EXTERNAL lane (chapter 16).

MIDI in and the Lane rows belong to the device, not to a project: opening another project keeps them, and they are kept when Tonaut quits.

Next in the list, between MIDI and AUDIO, comes CHORD PAD: how the chord pad voices its chords, which lanes share a key, and what the stick does. It is described at the end of this chapter (14.11).

14.4 AUDIO

AUDIO sets the audio buffer Tonaut asks for, and shows what iOS has given it to make sound with. The word at the right of the header is **RUNNING** while the audio engine is running and **STOPPED** while it isn't. A readout reads –– when iOS hasn't said.

ROW	WHAT IT MEANS
Rate	A readout. The sample rate: how many times a second the sound is measured. **`48.0 K`** is 48,000. Tonaut asks for 48,000.
Buffer	A choice: how many samples Tonaut works out at a time (a block). A block takes its own length to play, so it is also part of the delay between your finger and the sound. **`256 · 5.3 MS`**, as Tonaut comes, gives the device twice the time to make each block, which keeps the sound clean when it is busy. **`128 · 2.7 MS FAST`** halves that delay, for playing the keys with the least lag, and leaves the device less room. The change takes effect at once, with a short fade.
Latency	A readout of three things, such as **`5.8 MS · 256 · 0 LATE`**: how long the device's audio output takes to deliver the sound once Tonaut has made it, as iOS reports it; the buffer iOS actually gave, which can be bigger than the one you chose (locking the screen or playing through Bluetooth can raise it); and how many blocks came out late since the transport last started, held at **255+**. A late block is a gap in the sound, heard as a click. Wired headphones and the speaker are quick; Bluetooth headphones add a lot of delay.

To change the buffer, press AUDIO, move the cursor down one row to Buffer, and drag **VALUE**. Like every setting, it belongs to the device and is kept. Read the rows when you hear a crackle or a delay (14.10.6).



Figure 14.4 AUDIO: Buffer is the one row you can change. Latency says what iOS gave, here a bigger buffer than the one asked for, and counts the late blocks.

14.5 EXPORT

EXPORT is one readout, **Folder**, which reads **EXPORTS**: the folder your exported audio and MIDI files go to. It is **Files › On My iPhone › Tonaut › Exports** (**On My iPad** on an iPad). Nothing here starts an export. You export from a browser with REC (14.8).

14.6 SYNC

SYNC switches iCloud sync on and off and shows what it is doing. How sync behaves is in 14.9. The word at the right of the header is `OFF` while sync is off, and the same word as the Status row while it is on.

ROW	CHOICES	WHEN YOU INSTALL	WHAT IT DOES
iCloud	`ON`, `OFF`	`OFF`	The master switch. Nothing leaves the device while it is off.
Tape audio	`OFF`, `OPEN PROJECT`	`OPEN PROJECT`	Whether the tape goes too, for the project you have open (14.6.2).
Over cellular	`ON`, `OFF`	`OFF`	Whether sync may use cellular data when there's no Wi-Fi (14.6.3).
Status	a readout		What sync is doing or last did (14.9.2).
In iCloud	a readout		How much tape your projects in iCloud add up to, such as `46 MB OF YOUR WORK` or `1.4 GB OF YOUR WORK`. It leaves out the sounds, patterns and lane recordings, which are small. A project sent while Tape audio was OFF still counts at its tape's size, though its tape stayed on the device. It is not how full your iCloud is. `--` while sync is off, and until Tonaut has asked iCloud since it started.



Figure 14.5 SYNC as Tonaut comes: iCloud off. SYNC has no page key, and the two switches under iCloud move only while it is on.

14.6.1 Turning sync on

Sync uses the iCloud account your iPhone or iPad is signed in to. Each device needs Tonaut, the same account, and the switch on.

To turn sync on:

01 Drag **SECTION** to **SYNC**. The cursor lands on iCloud.

02 Drag **VALUE** to **ON**.

03 With a project open, the screen tells you how big it is, tape included, before anything moves: `THIS PROJECT IS 46 MB IT WILL GO TO YOUR ICLOUD`. It says this each time you switch sync on.

Nothing is sent at that moment. The open project goes up the next time it saves, about a second after you change something, or when you leave Tonaut (14.9.1).

- **No iCloud account on the device**: the switch still turns on, and Status reads `NO ICLOUD ACCOUNT` until you sign in.
- **VALUE reads –– on the iCloud row**: iOS isn't letting Tonaut use iCloud on this device, and the switch won't move. If sync was already on when that happened, Status and the SYNC header read `ICLOUD UNAVAILABLE` instead. Check that the device is signed in to iCloud in the Settings app, then come back to Tonaut. If it stays that way, write to us (14.10).

Switching iCloud back to **OFF** stops sync. It removes nothing, from the device or from iCloud. A delete that was waiting to go is dropped (14.9.3).

14.6.2 Tape audio

A project's tape is the big part: up to 30 minutes of tape per project, on eight tracks or six. Tape audio decides whether it travels.

- **OPEN PROJECT**: the tape of the project you have open goes up when you stop recording and when you leave Tonaut. Only the stretches of the tracks that hold sound are sent, in one-minute pieces: after a change, only the minutes that changed go up again, and an upload that is cut off carries on from where it stopped. On your other device, a project's tape comes down when you open that project there.
- **OFF**: no tape goes up. Everything else still crosses: sounds, patterns, mix, tempo and the recordings on your lanes.

Tape audio decides only what this device sends. Tapes your other device sent still come down here when you open their projects, whatever this device's Tape audio says.

Turning Tape audio off leaves the tapes already in iCloud where they are, and the screen says so: `NO NEW TAPES TO ICLOUD · OLD ONES STAY REMOVE A PROJECT: DELETE IN PROJECTS`. Deleting a project with `DELETE` in PROJECTS is the one way Tonaut takes anything out of iCloud. It takes the whole project, from your other device too (14.9.3, 14.9.4).

14.6.3 Over cellular

Over cellular decides whether sync may use your cellular data.

- `OFF`: while the device's only connection is cellular, nothing goes up or comes down, and Status reads **WAITING FOR WI-FI**. What waited goes by itself as soon as the device is back on Wi-Fi (or a cable), or when you turn the switch on.
- `ON`: sync uses cellular data too. A tape can be hundreds of megabytes.

14.7 ABOUT

ABOUT says which version you have and how hard the device is working. The page key reads INFO. The word at the right of the header is **TONAUT**.

ROW	WHAT IT SAYS
Version	The version you have. The same text is at the right of the list's header. Quote it whenever you write to us (14.10).
Render load	How much of the time the device allows for each block of audio Tonaut is using, as two numbers: the highest since Tonaut started, then right now. Both are averaged over about half a second. **`4.7 / 2.1%`** means the busiest moment took 4.7 percent of the time available and it is taking 2.1 percent now. After the first PLAY a third number joins them, such as **`· 34% MAX`**: the slowest single block since the transport last started, as a share of its time. Over 100 percent, that block was late. It updates while you watch.

- The highest reading starts counting three seconds after the audio starts, so the start-up itself is left out. It only ever goes up, and starts again from zero when Tonaut restarts.
- At 100 percent the device has run out of time to make the next block, and that is where crackles come from (14.10.6). A highest reading near 100 means it came close to that, or got there. Because the first two readings are averaged, one very short overload may not show in them; MAX, and the LATE count on AUDIO's Latency row (14.4), catch it.

The line at the foot of the right window on ABOUT is the license for the two typefaces the panel uses: **ARCHIVO · MARTIAN MONO — SIL OPEN FONT LICENSE 1.1**.

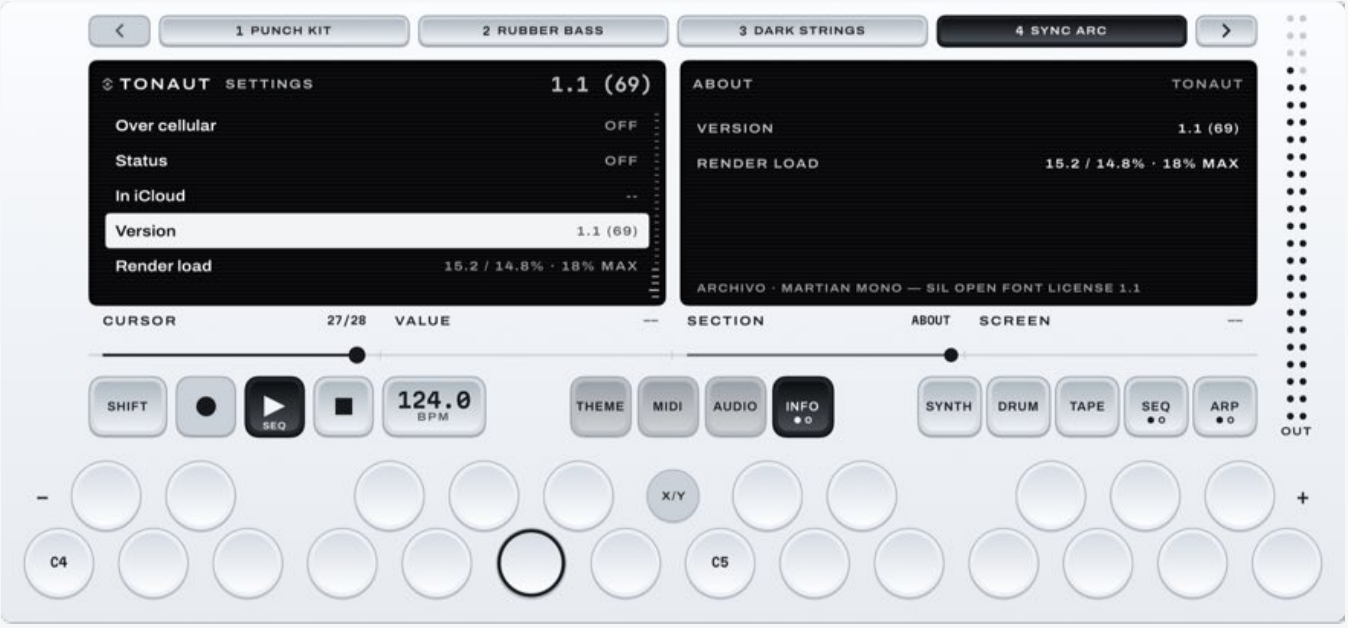


Figure 14.6 ABOUT. The Version row is the one to quote when you write to us; Render load is the one to read when you hear a crackle.

14.7.1

The speed test

The speed test measures how much of your device's processor each part of Tonaut needs, on your device, and says whether it all fits. Run it if you hear crackles, or before you fill all eight lanes with heavy sounds on an older iPhone.

To run it:

01 Stop the music. Nothing may be playing or sounding.

02 In Settings, press INFO, then INFO again. SPEED TEST opens. Opening it runs nothing.

03 Press RUN. While it runs, the key reads STOP and the list's header counts the measurements. Wait until it says it is done.

INFO takes you back to ABOUT. The test never changes what you hear and never touches your project: it measures a separate copy of the sound engine, whose sound is thrown away, and a copy of your project's tape. You can play while it runs, but anything you play shares the processor with the measurement, so those results are marked PLAYED.

RUN IS OFF AND SAYS	WHEN
STOP THE MUSIC FIRST	Anything is playing or sounding: the transport, a note, an arpeggio, a groove or the kit browser's preview
LOW POWER MODE IS ON	Low Power Mode slows the processor on purpose
PHONE TOO WARM (IPAD TOO WARM)	The device is hot enough to be slowing itself down
THE AUDIO IS NOT RUNNING	Tonaut has no audio output yet

A run stops if you press STOP, leave the screen, leave Tonaut, start the transport, if a call or another app takes the audio, or if the device gets too warm. The line at the bottom of the screen says why, such as SPEED TEST STOPPED: AUDIO CHANGED, and the left window's header keeps saying it.

The left window lists the results in groups: FULL (the whole instrument at its busiest), SOUNDS (each engine and kit), EFFECTS, TAPE, REAL TIME, OPEN (how long your project took to open) and MAC ONLY (measurements the device doesn't run, each with its reason). Each row is the percent of one processor core it needs. **CURSOR** moves through them and **SECTION** jumps between groups. The right window shows the verdict, your device, its audio settings, and the budget for the row under the cursor.

- EFFECTS has a row for every effect, Filter, Pump, Swirl, Lo-Fi and Tremolo included (4.7.2).
- FULL has three rows that are reported, not judged: **Space every lane**, **Space every slot** and **New effects every slot**. The first two measure Space at its heaviest, a minute-long tail with full shimmer and motion, in one effect slot of every lane or in all four slots of every lane, with a Space as the master effect too. The third measures Filter, Pump, Swirl, Lo-Fi and Tremolo at their heaviest in all four slots of every lane, each lane holding four of the five, with Lo-Fi as the master effect. Their budget reads **––**, and they never count toward the verdict. Read them before you put a long Space, or the newest effects, on many lanes of a busy song.

THE VERDICT	MEANS
PASS	Everything fits on this device, with no late block of audio
2 OVER	That many rows need more than their budget here. A row over budget reads OVER after its number
RUN AGAIN	Something else on the device got in the way of a measurement. Run it again with nothing else open

The REAL TIME row reads the late blocks and the slowest block's share of its time, such as LATE 0 · WORST 81 %; only a late block counts against the device, and a late block is a click you would hear. A finished run is saved as a text file in the Exports folder, named like

Tonaut speed test 2026-10-01 1456.txt (14.8.4), so you can send it to us. While a run is under way, and for two seconds after it, the highest Render load reading holds still, so the test isn't counted as your playing.

14.8 Exporting audio and MIDI

Exporting writes your music out as files you can use in other apps, on a computer, or send to someone. You export from the browsers: PROJECTS writes the tape as audio, or the patterns as MIDI files, and PATCHES and KITS write the focused lane's recording. To post a clip of your tape to a social app, use SHARE on TAPE instead: it makes a video, or audio alone, of what PLAY plays (11.19).

In every browser it works the same way:

01 Open the browser (hold SHIFT and press PATCH, KITS or PROJ).

02 Drag the **EXPORT** lane, the last one on the band, to the format you want. Moving it writes nothing.

03 Press REC. The export starts.

BROWSER	EXPORT OFFERS	WHAT IT WRITES
PROJECTS	**MIX DOWN**, **STEMS**, **MIDI**	The open project's tape (14.8.1), or its patterns, one MIDI file a lane (14.8.7)
PATCHES and KITS	**WHOLE**, **TRIM**, and on a SLICER kit **SLICES**	The focused lane's recording (14.8.2)

Every audio file is a WAV file, 24-bit, which any audio app or computer can open; MIDI writes Standard MIDI Files, which any music app or sequencer can open. EXPORT offers only what there is something to export in. With one format on offer it is drawn off and reads ––, and REC writes that one; with nothing to export, REC says what is missing (14.8.6).

14.8.1 Exporting a project: MIX DOWN and STEMS

On PROJECTS the band is **CURSOR**, **SHAPE**, **TAPE** and **EXPORT** (13.3). EXPORT offers **MIX DOWN** and **STEMS** when the tape holds a take, and **MIDI** when a lane's pattern holds a note (14.8.7). It starts on **MIX DOWN**. Once you move it, it keeps your choice until Tonaut quits.

FORMAT	YOU GET	WHAT IS IN IT
MIX DOWN	One stereo file	The tape as you hear it: each track through TAPE MIX, its level, balance and mute (10.10), then the master EQ, the master effect, DRIVE, OUT and the limiter (10.5 to 10.7). A track muted on TAPE MIX is silent in it; muting a lane on MIX doesn't silence its tape track. After the last take the file runs on while the master effect rings out, up to ten seconds, and stops once the sound has died away.
STEMS	One stereo file for each tape track that holds a take, up to eight, in a folder of their own	Each track at its TAPE MIX level and balance, and nothing of the master section: no EQ, master effect, drive or limiter. A track muted on TAPE MIX, or with no take on it, writes no file. All the files are the same length, so they line up when you load them into another app.

Both start at 0:00 on the tape and run to the end of the last take on any track.

To export a mix of the open project:

01 Hold SHIFT and press PROJ. PROJECTS opens.

02 Leave **EXPORT** on **MIX DOWN**, or drag it to **STEMS**.

03 Press REC. The line says **EXPORTING MIX DOWN** (or **EXPORTING STEMS**), REC blinks red, and the counter in the list's header counts.

04 When it is done the line says **SAVED IN FILES · TONAUT / EXPORTS**, or for stems the number of files, such as **8 FILES IN FILES · TONAUT / EXPORTS**.

NOTE

> EXPORT always writes the *open* project, wherever the cursor is. To export another project, OPEN it first (13.4).

NOTE

> A mix down is the tape, not the patterns. Notes the sequencer plays, and what you play on the keys, are not in it until they are recorded onto tape (11.3; REC SEQ in 11.7). A lane that plays your own gear over MIDI reaches the tape only through the recorder (16.10). To take the patterns themselves to another app, export them as MIDI (14.8.7).

Room first. Before a mix down or stems writes anything, Tonaut checks the device has room for the files and still keeps 512 MB free. If it hasn't, nothing is written and the line says how much free space the export needs, such as **NOT ENOUGH SPACE · NEEDS 3.4 GB FREE**. Each file takes about 16 MB for every minute of tape it covers, so eight stems of a 20-minute tape need about 2.6 GB.



Figure 14.7 PROJECTS with EXPORT on MIX DOWN, where it starts. Drag it right for STEMS, and to its right end for MIDI.

14.8.2

Exporting a lane's recording: WHOLE, TRIM and SLICES

On PATCHES the band is **CURSOR** and **EXPORT**; on KITS it is **CURSOR**, **FROM** (IMP's, 5.7.3) and **EXPORT**, and on the USER list of either browser **CURSOR** and **EXPORT** (5.11). EXPORT writes the recording on the focused lane, the lane named at the top of the browser. A lane holds a recording when its sound is a SAMPLER patch or a SLICER kit: your own recording, a factory sample kit's drums, or a patch's stand-in (5.9). Any other sound, KNOCK and CINDER kits included, has nothing to export, and neither has a lane playing your gear over MIDI.

What EXPORT offers depends on the lane's sound, not on which of the two browsers you are in:

FORMAT	SAMPLER	SLICER	YOU GET
WHOLE	Yes	Yes	The whole recording, from its first sample to its last, ignoring any trim.
TRIM	Yes	Yes	One part of it. On SAMPLER, from **START** to **END** (4.4.3). On a SLICER kit, the slice of the pad you last played on the screen: from its **IN** to its **OUT** (6.4.2).
SLICES	No	Yes	A folder with one file per pad that has a slice, named by pad number: **01.wav** to **24.wav**. A pad whose slice is empty is skipped, so the numbers can have gaps.

EXPORT starts on **TRIM**. Once you move it, it keeps your choice until Tonaut quits, on both browsers; when the lane doesn't offer the format you chose, EXPORT reads TRIM. If there is no trim to write (on SAMPLER, START at or past END; on a kit, an empty slice on the pad you

last played), TRIM is not offered and EXPORT falls back to **WHOLE**. When only one format is on offer, EXPORT is drawn off and reads **––**, but REC still writes that one format.

To export one drum hit from a SLICER kit:

01 Focus the kit's lane. Hold SHIFT and press KITS.

02 Play the pad you want on the keyboard. That makes it the pad TRIM writes.

03 Leave **EXPORT** on **TRIM** and press REC. The line says **EXPORTING TRIM**, then **SAVED IN FILES · TONAUT / EXPORTS**.

To export every slice, drag EXPORT to **SLICES** before you press REC. The line ends with the number of files written, such as **24 FILES IN FILES · TONAUT / EXPORTS**.

NOTE

> Loading a kit makes pad 1 the pad TRIM writes, and so do moving the cursor in KITS (moving it loads a kit) and opening a project. Play your pad after the kit is loaded, not before.

A recording is exported at its own sample rate, never converted, and stays mono or stereo as it was recorded.

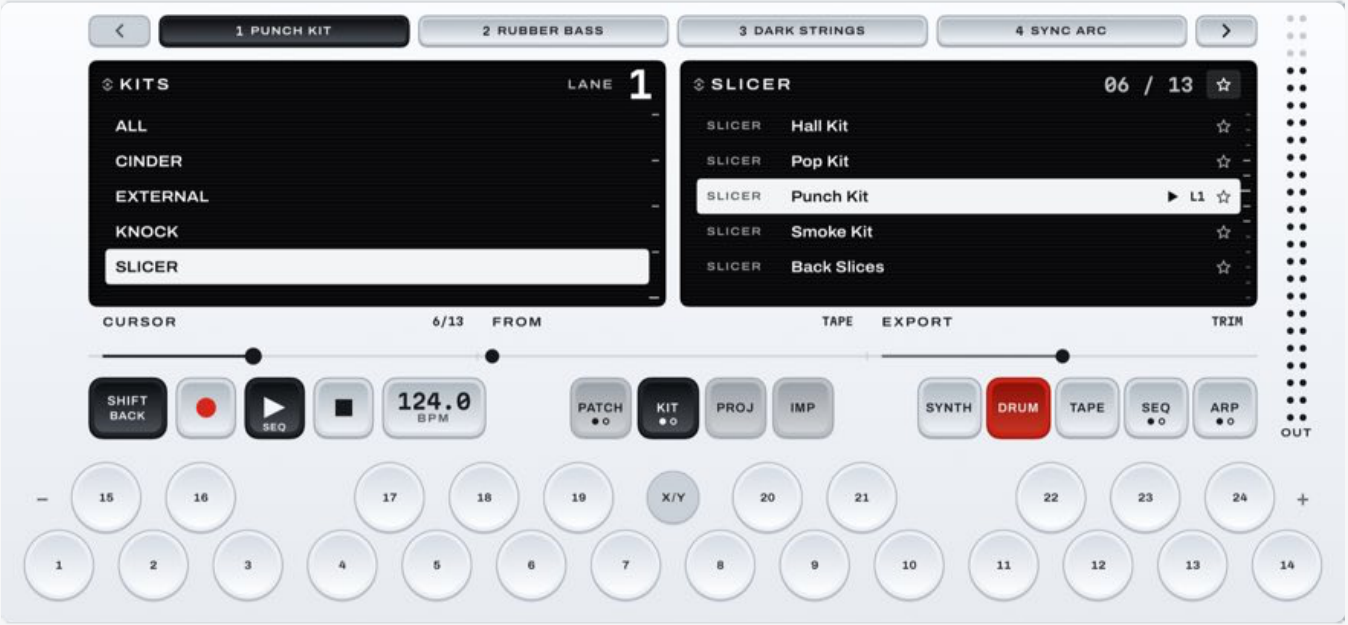


Figure 14.8 KITS on a sample kit. EXPORT offers WHOLE, TRIM and SLICES, and starts on TRIM.

14.8.3 While an export runs

- **The counter** replaces the list's position count in the header: in the left window on PROJECTS, in the right window on PATCHES and KITS. It counts what the job is made of: tape time for a mix down (`0:42 / 1:20`), files for stems, MIDI and slices (`02 / 08`, `03 / 24`). WHOLE and TRIM are one short file and show no counter. A mix down's counter waits at the end while the master effect rings out.
- REC **blinks** until the export ends, as it does while a take is written (11.3). Pressed again, it says AN EXPORT IS ALREADY RUNNING and starts nothing.
- STOP **cancels it**: EXPORT STOPPED · NOTHING KEPT. Nothing half-written is left in the folder.
- **You can leave the browser.** The export carries on and its line appears on whatever screen you are on when it ends. STOP cancels it only on a browser, so go back to one to stop it.
- **PROJECTS'** SAVE **,** SAVE AS **and** REVERT **are drawn off** while an export runs. Pressed, they say AN EXPORT IS ALREADY RUNNING and do nothing (13.10).
- **One job at a time.** While a song is being packed for SHARE, REC says A FILE IS STILL BEING PACKED; while an audio file is loading onto a lane, ALREADY LOADING · ONE MOMENT.

If an export fails, the line says EXPORT FAILED with the reason after it, such as EXPORT FAILED · EVERY TRACK MUTED for stems when TAPE MIX mutes every track that has a take. Nothing half-written is kept.

14.8.4 Where the files go, and their names

Exports go into a folder you can open in Apple's Files app.

To find your exports:

01 Open the Files app.

02 Tap **Browse**, then **On My iPhone** (**On My iPad** on an iPad).

03 Open **Tonaut**, then **Exports**.

Files are named after the project or the sound, then the date and time to the second, then the format:

FORMAT	NAME
MIX DOWN	**Night Drive 2026-10-01 14.32.05.wav**
STEMS	a folder **Night Drive 2026-10-01 14.32.05 stems** holding a file for each track with a take, named by its number: **track1.wav**, **track2.wav** and so on. A missing number is a track that was empty or muted.
WHOLE, TRIM	**Punch Kit 2026-10-01 14.32.05 whole.wav**, … **trim.wav**
SLICES	a folder **Punch Kit 2026-10-01 14.32.05 slices** holding **01.wav**, **02.wav** and so on
MIDI	a folder **Night Drive 2026-10-01 14.32.05 midi** holding a file for each lane, named by the project, the lane's number and its sound: **Night Drive – Lane 2 Rubber Bass.mid** and so on. A lane on EXTERNAL is named by its channel, such as … **Lane 4 MIDI CH 13.mid**

- A recording with no sound name, such as a track lifted with IMP, is named after the project and the lane: **Night Drive lane 3** ….
- Characters a file name can't hold become a hyphen.
- **Nothing is ever overwritten.** Two exports in the same second get **2**, **3** and so on added to the name.
- Exports stay on this device. iCloud sync doesn't carry them, and deleting a project doesn't delete them.

NOTE

> Deleting the Tonaut app deletes its Exports folder with it. Move the files you want to keep somewhere else first.

14.8.5 Sharing and deleting exports

A MIDI export opens the share sheet by itself when it is done (14.8.7). Audio exports have no share button of their own: share them from the Files app. Touch and hold a file, choose **Share**, then AirDrop, Messages, Mail or another app. Other things go straight through the share sheet: SHARE on TAPE makes a video, or audio alone, of your tape for a social app or a message (11.19); SHARE on PROJECTS sends a whole project as a song for someone with Tonaut to open (13.13); and SHARE in the USER list sends the sounds you ticked as one file (5.11.2). To keep a file in iCloud Drive, use **Move** in Files. To delete exports, delete them in Files; Tonaut never removes them.

14.8.6 When REC says no

In these cases REC exports nothing and the line says why. With nothing to export, EXPORT reads –– and REC is drawn off, but it still takes the press:

THE LINE SAYS	WHERE	WHY, AND WHAT TO DO
NO PROJECT TO EXPORT	PROJECTS	No project is open. OPEN one, or make one with NEW (13.8).
NOTHING ON THE TAPE OR IN THE PATTERNS	PROJECTS	The open project's tape has no takes, and no lane's pattern holds a note. Record something on TAPE (11.3), or put notes in a pattern on SEQ (8.3).
NOT ENOUGH SPACE · NEEDS 3.4 GB FREE	PROJECTS	The files wouldn't fit and leave 512 MB free. Free that much space in your device's Settings, under General › iPhone Storage (iPad Storage), and press REC again.
NO RECORDING ON THIS LANE	PATCHES, KITS	The focused lane's sound holds no recording. Load a SAMPLER patch or a SLICER kit, or focus another lane.
AN EXPORT IS ALREADY RUNNING	any browser	Wait for it, or press STOP to cancel it.

TIP

> With HELP latched, REC in a browser shows its help line, EXPORT TO A FILE · STOP CANCELS, instead of exporting. Turn HELP off first.

14.8.7

Exporting the patterns: MIDI

MIDI, the third place on PROJECTS' EXPORT lane, writes the open project's patterns as MIDI files, one for each lane, as they play. Load them into a computer sequencer or another app and every lane's part is there, note for note, ready to play with other sounds.

To export the patterns as MIDI:

01 Hold SHIFT and press PROJ. PROJECTS opens.

02 Drag **EXPORT** to **MIDI**, its right end. If the tape is empty, MIDI is the only format, and EXPORT is drawn off on it.

03 Press REC. The line says EXPORTING MIDI, REC blinks and the counter counts the files.

04 When the files are written, the share sheet opens with all of them: choose AirDrop to send them to your computer, or Mail, Messages or Files. The music keeps playing.

05 When the sheet closes, the line says SENT · 4 MIDI FILES, or, if you sent nothing, where the files are: 4 FILES IN FILES · TONAUT / EXPORTS.

The files are in the Exports folder either way (14.8.4). STOP cancels while they are being written: EXPORT STOPPED · NOTHING KEPT.

What goes in.

- **Each lane's pattern exactly as it plays from PLAY**: the pattern the lane is playing now, with its ratchets, chance, every-Nth steps, swing, nudges, note lengths and loudness, all as the sequencer plays them (chapter 8).
- **One file for each lane whose pattern holds a note** and that has a sound, or plays your gear on EXTERNAL. A lane with no notes writes no file.
- **Mutes don't count.** A lane muted on MIX, a pattern muted on SEQ and pads muted on DRUM are exported all the same, so you can mute them in the other app instead.
- **The patterns only.** What the arpeggiator or GROOVE plays from keys you hold is not in the files, and a pattern switch waiting on PATTERN PLAY is not followed: each lane's current pattern is exported.
- **Every file is the same length**: the fewest whole bars in which every exported lane comes all the way round, every-Nth steps included, from 1 bar to 128 at most. A 16-step pattern is one bar; a 12-step one makes it three. The files line up, and they loop cleanly.

How it is written. Each file carries the project's tempo, in 4/4, and one track named after the lane, such as `Lane 2 Rubber Bass`. A synth lane's notes are on the lane's own number as their channel (lane 3 on channel 3), a kit lane's on channel 10, and a lane on EXTERNAL on its own channel. Drums are written as General MIDI drum notes, the ones MIDI out sends (kick 36, snare 38, closed hat 42; 16.4.1). A slide is written as two notes that overlap very slightly, so a synth set to glide or play legato slides there too; the glide's own time isn't in the file.

14.9 iCloud sync

With iCloud sync on, your projects travel between your iPhones and iPads signed in to the same iCloud account, through your own iCloud storage. Tonaut has no servers of its own. Sync is off until you turn it on (14.6.1).

The screens say PHONE on an iPhone; on an iPad the same lines say IPAD or DEVICE, such as ON THIS IPAD ONLY.

14.9.1 What crosses, and when

WHAT	GOES UP FROM THIS DEVICE	COMES DOWN TO THIS DEVICE
A project: its sounds, patterns, mix, tempo and name, and the recordings on its lanes	Each time the open project saves, about a second after any change; when you leave Tonaut; and after SAVE AS, RENAME and REVERT	When Tonaut starts, each time you come back to it, and each time you OPEN a project
The tape of the project you have open (when Tape audio is on `OPEN PROJECT`)	When a take stops, and when you leave Tonaut. Only the minutes that changed (14.6.2)	When you OPEN that project
A deleted project	When you delete it with sync on, or as soon as iCloud can be reached (14.9.3)	When Tonaut next looks in iCloud

- **Only a project you open, keep with SAVE AS or rename goes up.** A project that sits on this device and is never opened, kept or renamed with sync on stays on this device. A kept or renamed project goes up without its tape; its tape goes up only after you open it.
- **Not synced**: Settings and the tempo page's MIDI rows (each device keeps its own), the quick slots, favorites, your USER sounds, and your exports.
- **On the other device, a project opens at once** with its sounds, patterns and mix, and its tape comes down behind them. When the tape has arrived the screen says `TAPE ARRIVED · PRESS OPEN TO LOAD IT`: press OPEN on the project once more, and wait for that before you record on it (13.12).
- **The project you have open is never changed while you are using it.** Changes to its sounds, patterns and mix from your other device load at once if you haven't touched it here (PLAY not lit, nothing recording, nothing waiting to save), and the screen says `LOADED YOUR OTHER PHONE'S CHANGES`. A groove or an arpeggio left playing on HOLD doesn't count. If you are using it, they wait for OPEN: `NEWER VERSION ARRIVED · PRESS OPEN` (13.12.1).
- Tonaut looks for projects from your other device when it starts, when you come back to it, and each time you OPEN a project. If one you expect isn't in PROJECTS, open any other project.

14.9.2 What the screens say

Sync speaks in three places: the Status row and SYNC header in Settings, the line at the foot of PROJECTS' right window (13.12), and a line at the foot of TAPE's deck (11.17).

THE SCREEN SAYS	WHAT IT MEANS
`OFF` (Status and the SYNC header)	Sync is off.
`ON THIS PHONE ONLY`	Nothing has crossed yet. PROJECTS' foot line reads it while sync is off, too.
`SYNCED JUST NOW`, `SYNCED 2 MIN AGO`, `SYNCED 3 H AGO`, `SYNCED 2 D AGO`	The last time something crossed.
`SENDING 84 MB OF 462 MB`	Going up now.
`FETCHING 12 MB OF 462 MB`	Coming down now.
`NO ICLOUD ACCOUNT`	The device isn't signed in to iCloud. Sign in from your device's Settings app; sync waits until you do.
`WAITING FOR WI-FI`	Tonaut can't reach iCloud right now: no connection, iCloud is busy, or the device is on cellular data with Over cellular off (14.6.3). What waits goes when it can.

ICLOUD IS FULL · NOTHING WAS LOST	Your iCloud storage is full. Nothing goes up; things still come down; nothing on the device changes. Make room: delete projects you no longer need, or free space used by other apps (14.9.4).
ICLOUD UNAVAILABLE (Status and the SYNC header)	Sync is on, but iOS isn't letting Tonaut use iCloud on this device. Nothing crosses; nothing on the device changes. Check that the device is signed in to iCloud, then come back to Tonaut (14.6.1).
ICLOUD DID NOT ANSWER	A transfer failed. Your work on the device is untouched; Tonaut tries again at the next save. If it keeps saying this, write to us.
3:42 CLOUD (PROJECTS' tape column) TAPE NOT ON THIS PHONE · 46 MB · PRESS OPEN TO FETCH	The project's tape is in iCloud and not on this device. OPEN the project to bring it down.
3:42 PHONE (PROJECTS' tape column) TAPE ON YOUR OTHER PHONE · NOT IN ICLOUD	The project's tape is only on your other device: it was recorded there with Tape audio off, or hasn't gone up yet. Opening it here won't bring it (13.12).
TAPE STILL IN ICLOUD · 46 MB (PROJECTS)	The same, on the project you have open: its tape is in iCloud and isn't coming down right now. Tonaut fetches a tape when you open its project, so if this line stays, open another project and then this one again.
1:10 / 3:42 (PROJECTS' tape column)	A tape on its way down or up: how much has crossed, of how long.
TAPE STILL IN ICLOUD, TAPE IS ON YOUR OTHER PHONE, TAPE ARRIVING 1:10 / 3:42, TAPE ARRIVED · PRESS OPEN TO LOAD IT (TAPE)	The open project's tape: in iCloud and not here yet, only on your other device, on its way, here and waiting (11.17).
LOADED YOUR OTHER PHONE'S CHANGES NEWER VERSION ARRIVED · PRESS OPEN BOTH PHONES CHANGED IT · KEPT BOTH YOUR VERSION IS NOW COULD NOT KEEP BOTH · NOT ENOUGH SPACE	What happened to a project changed on your other device, or on both (14.9.3).

NEWER (tape column) WRITTEN BY A NEWER TONAUT	Your other device saved this project with a newer Tonaut, or it uses a sound this version doesn't have. This one won't open it, change it or send it, so it can't damage it. Update Tonaut on this device. A project whose only new things are a lane EQ, LOCK, CHORDS or a SAMPLER filter doesn't read NEWER: an older Tonaut opens it without them (13.12.1).

14.9.3 Two devices, one project

Work on a project on one device at a time. Sync doesn't merge, and it doesn't throw anything away either. If only one device changed a project, that version wins on both. If both changed it before either had synced, both versions are kept, and both devices end up with the same two projects. The device that sends its change second keeps its own under the project's name, makes the other's into a project named with `(other)` after it, and says BOTH PHONES CHANGED IT · KEPT BOTH. On the first device the name then takes the second device's version, and its own comes back as the `(other)` project, with YOUR VERSION IS NOW over that name. Chapter 13 has the details (13.12.1).

- **Deleting** a project with DELETE in PROJECTS (13.9) deletes it on your other device too. If the other device had changed it and not yet sent the change, the change wins and the project comes back; delete it again if you meant to. If the other device had sent a change this one hadn't brought down yet, the delete doesn't go: the project stays there and in iCloud. If it is open on the other device, it stays there while it is open.
- **A delete waits for iCloud.** If iCloud can't be reached when you delete a project (Status shows WAITING FOR WI-FI, or the device is offline), the delete waits on this device, even if you quit Tonaut, and goes as soon as Tonaut can reach iCloud. If your other device changed the project in the meantime, its change wins and the project stays there. Turning iCloud off drops a delete that was waiting: it then removes the project from this device only.
- **Only a delete made in PROJECTS deletes.** A project that isn't in iCloud any more, for example after Tonaut's data was deleted in Manage Storage, is never deleted from a device: the device sends it up again the next time it syncs, its tape too if the tape is on that device and Tape audio is on.
- **Copies cost space.** The version SAVE AS keeps is a project of its own in iCloud, tape included once you open it. A save point (13.6) stays on the device and costs nothing in iCloud.
- **Same names.** Two devices can each make a project with the same name. Both are listed; rename one with RENAME (13.7).

14.9.4 Freeing iCloud space

The one control in Tonaut that removes something from iCloud is deleting a project: with sync on, DELETE in PROJECTS removes it from iCloud too (13.9). To stop new tapes going up without removing anything, set Tape audio to `OFF`.

Turning Tape audio off frees nothing: the tapes already in iCloud stay. To see how much Tonaut keeps there, read In iCloud in SYNC. Your device's Settings app shows it too: tap your name, then **iCloud**, then **Manage Storage** (**Manage Account Storage** on some iOS versions).

NOTE

Deleting Tonaut's data in Manage Storage doesn't delete projects from your devices (14.9.3). With sync on, though, each device sends its projects up again the next time it syncs, so the space fills again. To free space, delete the projects you no longer need in PROJECTS, or turn iCloud off in SYNC on every device before deleting the data there.

NOTE

iCloud sync is a copy, not a backup: it follows what you do, deletions included. Exports are the way to keep a song safe outside Tonaut (14.8).

14.10 Troubleshooting

Find the problem by its symptom. If the fix here doesn't help, email us at hello@coastcreative.studio with your iPhone or iPad model, its iOS version, the Tonaut version from Settings › ABOUT, and what you were doing in the ten seconds before it went wrong. A screen recording helps more than a paragraph.

14.10.1 Sound

No sound at all.

- Turn the volume up with the side buttons. The silent switch doesn't silence Tonaut.
- Check where the sound is going. Open Control Center and look at the audio output: it may be on Bluetooth headphones or a speaker in another room.
- Open Settings and press AUDIO. If the header reads STOPPED, leave Tonaut for the Home Screen and come back. If it still reads STOPPED, quit Tonaut (swipe it away in the app switcher) and open it again.

One lane, or one tape track, is silent. Tonaut has several mutes and they add up (10.4.1). Check, in this order:

- MIX: is the lane's channel muted, or its fader down (10.3, 10.4)? MIX sets the lanes as you play them.
- TAPE MIX: is the tape track muted, or its fader down (10.10)? TAPE MIX sets what you hear of the tape.
- SEQ's MUTE page: is the lane's pattern muted? That silences its pattern only (8.9).
- DRUM: are some pads muted on the pad map (6.7.2)?
- Is the lane on EXTERNAL? A lane that plays your own gear over MIDI makes no sound in Tonaut (chapter 16).

An effect amount at **00** on a sound's FX page is not a mute: the sound plays dry (4.7).

The sound stopped after a phone call, an alarm or Siri. It usually comes back by itself when the interruption ends. If it doesn't, leave Tonaut and come back to it: the audio restarts when Tonaut is in front again.

The sound keeps going after you leave Tonaut. Tonaut keeps running in the background while the transport is running, a take is recording, a lane is armed to capture, or a MIDI device is connected. Press STOP before you leave. With none of those, it goes quiet as you leave, even

with an arpeggio or groove on HOLD.

A SAMPLER or SLICER patch plays something that isn't your recording. That is the patch's stand-in recording. It plays your own once the lane holds one (5.9).

14.10.2 Keys and screens

Keys answer with a line instead of acting. HELP is latched: the HELP key is filled under SHIFT (in the TN looks, its LED is lit) and the help panel is showing. Page keys, REC, PLAY, STOP, the tempo key and the SHIFT-layer keys show their help line and do nothing else; a quick tap on a slider shows its line too. Press SHIFT + HELP to turn it off. On TAPE, HELP is the last key of the tool row under SHIFT (2.9.3).

A key is a flat well. It can't act right now. Press it anyway: many wells answer with a line saying why. Or latch HELP and tap it to read what it is for (2.3.1).

REC **does nothing.** REC works on SEQ, TAPE, the recorder and the browsers. Everywhere else it is a well (2.10). A take you started on TAPE keeps recording when you leave TAPE; go back there to stop it.

SHIFT seems stuck on. It is latched: it is filled and reads `LATCHED`. A tap on SHIFT latches it; tap it again to let go. To use SHIFT for one press only, hold it while you press (2.7.1).

You can't reach a SHIFT key in a browser, such as REVERT or SHARE in PROJECTS. In a browser a tap on SHIFT means BACK and leaves the browser. Hold SHIFT down and press the key while you hold it (2.7.3). RENAME and DELETE need no SHIFT: they are in PROJECTS' right window, under the project (13.7, 13.9).

Lanes 5 to 8 aren't on the lane buttons. In an eight-lane project the iPhone's lane buttons show four lanes at a time, and so do the iPad mini's. Press the arrow at either end to show the others (2.2). MIX, TAPE MIX, the tape tracks, SEQ's mute keys, ARP and GROOVE, PATTERN PLAY and PERFORM follow the same page. A six-lane project shows all six lanes at once and has no lanes 7 and 8 (13.15).

The housing turned dark (or light) by itself. Housing is on AUTO and follows your device, which may switch at sunset: between TN-1 and TN-1 DARK if you chose one of those last, otherwise between LIGHT and DARK. Set Housing to the one you want to keep, such as LIGHT or TN-1 (14.2.1).

In a TN look, a key's LED glows with nothing playing. A half glow marks a note of the selected or held SEQ step, or a note SEQ's LATCH holds; tap an empty cell or turn LATCH off (8.4, 8.5). A bright one under SHIFT marks a key that is on, such as HELP latched, or LOOP on TAPE (3.4.2).

Scan lines reads NONE IN TN-1 **and won't change.** TN-1 and TN-1 DARK have no scan lines. Choose another housing to use them (14.2.2).

No haptic ticks. Check Settings › THEME › Haptics, and your device's **Settings › Sounds & Haptics › System Haptics** (14.2.3).

14.10.3 Recording and the microphone

The microphone records silence onto tape. The input reaches the tape only through MONITOR, and on the device's own speaker MONITOR is refused so the speaker doesn't howl into the microphone. Plug in headphones and turn MONITOR on. REC says which one is missing: `TURN MONITOR ON TO RECORD INPUT` or `PLUG IN HEADPHONES TO RECORD INPUT` (12.3.2, 12.5). Capturing onto a lane works without headphones.

The recorder says `MICROPHONE ACCESS IS OFF`. You answered Don't Allow when iOS asked. Open your device's Settings app, go to **Privacy & Security** › **Microphone** and switch Tonaut on. Then quit Tonaut and open it again (12.7.1).

The recorder says `OPEN A PROJECT FIRST`. No project is open, so a recording has nowhere to go. Open one in PROJECTS (13.4).

The tape stopped by itself. Each project has up to 30 minutes of tape: eight tracks of 20 minutes, or six of 30 (13.15). At the end of a track the deck reads `TAPE FULL`, and a take that was running stops with `TAPE FULL - RECORDING STOPPED`. If the device runs out of storage first, the take stops with `PHONE FULL - RECORDING STOPPED`; when you press REC with less room left than tape, the line says how much, such as `ROOM FOR 4:10 ON THIS PHONE`. Either way the take is kept (11.16).

REC SEQ left a lane out. A lane on EXTERNAL plays your own gear, which the tape can't hear: `LANE 4 IS MIDI · NOT RECORDED TO TAPE`. Record the gear through the recorder (16.10).

14.10.4 MIDI

A MIDI keyboard plays nothing.

- Open Settings and press `MIDI`. If the header counts no input (it reads `NONE`, or `0 IN` before the outputs), Tonaut can't see the keyboard: unplug it and plug it in again, try another cable or adapter, and make sure the keyboard has power. A keyboard powered from the phone may need a powered hub.
- Check **MIDI in**. On `LANE`, the keyboard plays the *focused* lane through **Channel**: on a single channel, Tonaut ignores the other fifteen, so set `OMNI` or the channel your keyboard sends on. On `BY CHANNEL`, it plays the lane whose Lane row matches the channel it sends on, whichever lane is focused, and a channel no lane listens on plays nothing (14.3, 14.3.2).
- Check that the lane it should play isn't muted (14.10.1). If that lane is on EXTERNAL, your notes go out to your gear instead (chapter 16).
- On a kit lane, notes play pads through a fixed map, so some keys play pads you don't expect (3.3.2).

The MIDI channel went back to OMNI. Tonaut doesn't remember Channel between launches. Set it again after starting Tonaut, or use MIDI in's `BY CHANNEL`, whose Lane rows are kept (14.3.2).

A Bluetooth MIDI device isn't in the pairing list.

- Make sure it is on, charged and in pairing mode, and not connected to another phone, tablet or computer.
- Check that Bluetooth is on in Control Center.
- If Settings' Bluetooth row reads NOT ALLOWED or BLOCKED, the list can't open (14.3.1).

Your synth or drum machine plays nothing from an EXTERNAL lane.

- Look at the lane's card on SYNTH or DRUM. NO MIDI OUTPUT · PLUG IN A CABLE means Tonaut can't see the gear: check the cable, the interface and the gear's power, and Settings › MIDI › Output (16.2).
- Set the gear to receive on the lane's channel, the big number on the card. A drum machine usually listens on 10.
- Check that the lane isn't muted on MIX and its pattern isn't muted on SEQ (16.6), and that the gear's own volume is up: Tonaut sends volume only when you move the lane's fader.
- With a 5-pin interface, the cable goes from the interface's MIDI OUT to the gear's MIDI IN.

A note keeps sounding on your gear. Press STOP while stopped (twice if playing). The line reads MIDI · ALL NOTES OFF, and every MIDI lane's channel gets an all notes off (16.7).

Your gear plays a little early or late against Tonaut's own sounds. Set MIDI delay on the tempo page (16.8). A cable is tighter than Bluetooth.

Your gear starts playing by itself when you press PLAY. It is following Tonaut's Start: set Transport on the tempo page to `OFF` or `IN` (16.9.2).

A drum machine doesn't keep Tonaut's tempo. Turn Clock out on, and set the drum machine to follow external (MIDI) clock (16.9.1). Tonaut always sets the tempo; it never follows your gear's.

Tonaut starts or stops by itself. Transport is on `IN` or `BOTH`, so your gear's start and stop play and stop Tonaut. Set it to `OUT` or `OFF`.

A synth plays every note twice. You are playing its own keys into Tonaut and hearing them directly as well: turn the synth's Local Control off (16.2).

A drum machine plays the wrong drums. Tonaut sends General MIDI drum notes (16.4.1). Set the drum machine to a General MIDI layout if it has one, or remap its sounds to those notes.

14.10.5 Projects, export and iCloud

A project won't delete. It is the open one, and the screen says CANNOT DELETE THE OPEN PROJECT / OPEN ANOTHER PROJECT FIRST. OPEN another project, then delete this one (13.9).

Where are my exports? In the Files app, under On My iPhone › Tonaut › Exports (On My iPad on an iPad; 14.8.4). If there is no Tonaut folder, nothing has been exported yet.

REC on PROJECTS says NOTHING ON THE TAPE OR IN THE PATTERNS. An export writes the tape, or the patterns as MIDI, and the open project has neither a take nor a note in a pattern. Record onto TAPE or write a pattern first, or OPEN the project you meant (14.8.1, 14.8.7).

REC on PROJECTS says NOT ENOUGH SPACE. The files wouldn't fit with 512 MB to spare. Free the amount the line names and try again (14.8.1).

A track is missing from STEMS, or a part from a MIX DOWN. Exports are made from the tape through TAPE MIX. A track muted there is left out, and a track with no take writes no file. Patterns that were never recorded to tape, and a lane playing your own gear, aren't in an export (14.8.1).

A TRIM export of a kit holds the wrong drum. TRIM writes the pad you last played on the screen, and loading a kit resets that to pad 1. Play your pad, then press REC (14.8.2).

SAVE AS says NAME NOT WRITTEN, or a line starts COULD NOT. The device's storage refused the write, and the reason follows, usually NOT ENOUGH SPACE. Free some space in your device's Settings and try again. 13.10 says what each line leaves behind.

SAVE, SAVE AS or REVERT says ITS TAPE IS STILL IN ICLOUD, WAIT FOR THE TAPE TO ARRIVE or TAPE ARRIVED · PRESS OPEN FIRST. The open project came from your other device and its tape isn't loaded yet. Let it come down, then press OPEN on the open project (13.12).

A project from my other device isn't in PROJECTS. Check that both devices have sync on and that Status doesn't show a problem (14.9.2). A project goes up only once it has been opened, kept with SAVE AS or renamed on its device with sync on. This device looks when Tonaut starts, when you come back to it and when you OPEN a project.

14.10.6 Crackles, clicks and dropouts

A crackle, a click or a gap in the sound usually means the device ran out of time to make the next block of audio. To narrow it down:

- Open Settings › AUDIO and read **Latency** after the crackle: its last number counts the blocks that came out late since you pressed PLAY, such as **3 LATE**. Then read **Render load** on ABOUT: a highest reading near 100 percent, or a MAX over 100, confirms it (14.4, 14.7). A crackle with **0 LATE** and a MAX under 100 wasn't a late block: check the cable, the headphones or the output instead.
- **Set AUDIO's Buffer to 256 · 5.3 MS**, if it is on 128. It is how Tonaut comes, and it gives the device twice the time for each block, for 2.7 ms more delay between your finger and the sound.
- Stop the tape, or stop the patterns, and listen again. Then mute lanes one at a time on MIX until it stops: the last one you muted is the heavy one.
- Bluetooth headphones raise the delay and change the block size. Try wired headphones or the speaker.
- Turn off Low Power Mode, and let a hot device cool down: both slow the processor.

On an older iPhone, eight busy lanes can be more than it can play. Thick chords on DIVINER or SWARM, all four effect slots up on several lanes, and the tape running all add up. To get a busy song to play:

- Run the speed test (14.7.1). Its verdict says whether everything fits on your device, and the rows over budget say what is heaviest.
- Record the busiest lanes onto tape with REC SEQ (11.7), then mute their patterns on SEQ's MUTE page. Playing a take back costs the device far less than playing the same part live.
- Turn down effect slots you can do without, and hold fewer notes at once on the heaviest sounds.

If it still crackles, tell us. A message we can act on says:

- the version (Settings › ABOUT › Version) and your iPhone or iPad model;
- what was playing: each lane's engine or kit, how many notes you held, the effects that were up, whether the tape was running;
- the Render load line, and AUDIO's Buffer and Latency rows (14.4);
- what you were listening on: speaker, wired or Bluetooth headphones, an interface;
- the speed test's file from the Exports folder, if you ran it.

14.11 CHORD PAD

CHORD PAD holds how chords play on this device: how the chord pad voices its chords, whether a lane's chords and key belong to that lane alone or to every synth lane, and what the pad's stick does when you let go (3.11, 3.12). In the list it comes between MIDI and AUDIO as a single row, **Chord pad**, and the right window, headed CHORD PAD, lists its five settings. It has no page key: drag **SECTION** to **CHORD PAD**, or tap the row.

SETTING	CHOICES	WHAT IT DOES
Voice leading	**ON**, **OFF**; **OFF** as Tonaut comes	**OFF**: each key of the chord pad always plays the same notes for the key, the stick's place and the octave, close together with the root at the bottom. **ON**: each chord is voiced close to the one before, so a progression moves smoothly from chord to chord. A MIDI keyboard playing the pad follows it too (3.12.7).

Chords	**PER LANE**, **ALL SYNTH**; **PER LANE** as Tonaut comes	Whether turning CHORDS on or off (3.11.4) changes the focused lane alone, or every synth lane at once.
Key	the same	Whether KEY, SCALE and LOCK (3.11.2, 3.11.3) are each lane's own, or one key for every synth lane.
Chord pad	the same	Whether turning the chord pad on or off (3.12.2) changes the focused lane alone, or every synth lane at once.
Stick	**SPRING**, **HOLD**; **SPRING** as Tonaut comes	**SPRING**: the stick springs back to the center when you let go (3.12.4). **HOLD**: it keeps the direction you let go in until you tap it, which centers it, or push it another way, so your hand is free for the sliders. A MIDI keyboard's pitch bend or mod wheel coming back to center leaves it where it was too. The screen says **STICK HOLD · TAP THE STICK TO CENTER** or **STICK SPRING · BACK TO CENTER ON LIFT**.

SETTING picks, VALUE changes. While the cursor is on Chord pad, the band's fourth place is **SETTING**. It has five positions, one for each setting, and reads the one you are on, such as **VOICE LEADING** or **STICK**. **VALUE** then reads that setting's choice and moves it.



Figure 14.9 CHORD PAD as Tonaut comes. SETTING, the band's fourth slider, picks the row; VALUE changes it.

The Chord pad row in the list sums the five up: **FIXED** or **SMOOTH** for Voice leading; then **PER LANE** while Chords, Key and Chord pad are all on PER LANE, a count such as **2 ALL** while some are on ALL SYNTH, or **ALL LANES** while all three are; and **HOLD** at the end while Stick is

on HOLD. As Tonaut comes it reads **FIXED · PER LANE**; with voice leading on, two settings on ALL SYNTH and the stick on HOLD, **SMOOTH · 2 ALL · HOLD**.

To give every synth lane the same key:

01 Focus a synth lane and set the key you want on it (3.11.2).

02 Open Settings and drag **SECTION** to **CHORD PAD**. The cursor is on Chord pad.

03 Drag **SETTING** to **KEY**. **VALUE** reads **PER LANE**.

04 Drag **VALUE** to **ALL SYNTH**. The screen names the focused lane's key, such as **KEY · ALL SYNTH LANES NOW IN D MIN**, and every synth lane takes it.

- From then on, a change to KEY, SCALE or LOCK on any synth lane changes every synth lane. Chords and Chord pad on ALL SYNTH work the same way, and switching one to ALL SYNTH copies the focused lane's state to every synth lane, such as **CHORDS · ALL SYNTH LANES NOW ON**.
- **Drum lanes and lanes on EXTERNAL MIDI don't follow** (chapter 16). They keep their own key and chords. The one exception: with Key on ALL SYNTH, a key set while a lane on EXTERNAL MIDI is focused goes to that lane too, with every synth lane.
- Back on **PER LANE**, the screen says **KEY · EACH LANE KEEPS ITS OWN**: every lane keeps what it has at that moment, and from then on changes on its own.
- The five are the device's settings, not the project's: opening another project keeps them, and sync doesn't carry them. What each lane holds, its key and its chords, is saved with the project (13.1).

On iPad, where Settings shows every row in one window, the header does the right window's job: with the cursor on Chord pad it names the setting VALUE changes and its choice, and **SETTING** stands on the deck row in the **BLUETOOTH** key's place (chapter 17).

15 Playing live: PERFORM and the X/Y pad

Two ways to play your sounds while the song runs. PERFORM gives every lane two faders, TONE for brighter or darker and SPACE for drier or wetter, and STOP puts every sound back as it was. The X/Y pad turns the right-hand window into a pad for one finger: across bends the pitch, up and down is the mod wheel or the brightness.

15.1 PERFORM

PERFORM is for shaping the song as it plays: open the filter on the strings for the chorus, dry the lead out for a verse, darken the drums for a break. Nothing you do on PERFORM changes a saved sound, and STOP brings every sound back exactly as it was saved.

To open PERFORM on iPhone, go to SEQ and press SEQ again. It opens from the grid, PATTERN PLAY or PATTERNS (8.1.6), and the SEQ key's second dot fills. Press SEQ once more to go back to the grid. On iPad, the SEQ key goes round the grid, PATTERN PLAY, PERFORM and PATTERNS (chapter 17).

Each time PERFORM opens, the notice line says what STOP will do: PERFORM · STOP PUTS EVERY SOUND BACK, or with KEEP lit, KEEP · TONE AND SPACE STAY THROUGH STOP (15.4).

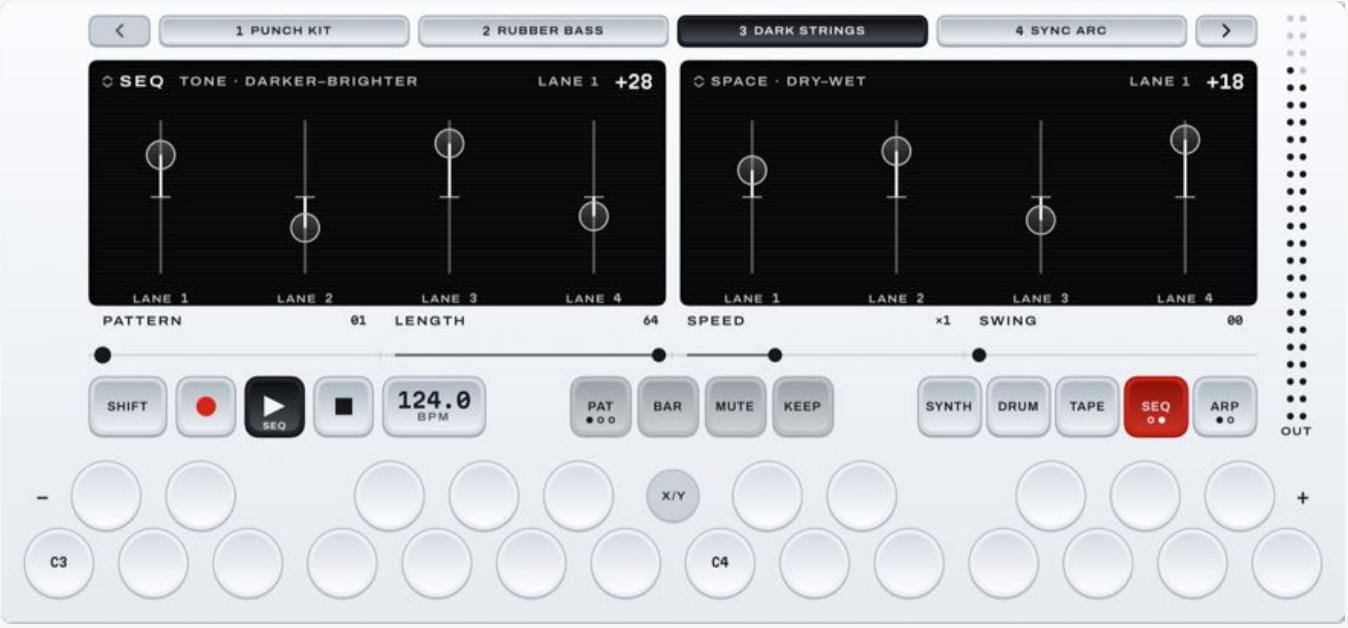


Figure 15.1 TONE on the left, SPACE on the right, one fader for each lane in each. The bright line shows how far each fader is from the sound as saved, and the headers give lane 1's: +28 and +18.

- **Two windows, one fader a lane in each.** The left window is TONE, headed `SEQ` and `TONE · DARKER–BRIGHTER`; the right is SPACE, headed `SPACE · DRY–WET`. Under each fader is its lane, `LANE 3`, or `3` where the column is narrow.
- **The middle is the sound as saved.** A tick crosses each fader's line at its middle, and a fader sitting there has a dot in its knob. Move it and a bright line runs from the middle to the knob, so you can see at a glance how far each lane is from its own sound.
- **The headers** read the lane you last touched in that window (the focused lane until you touch one) and where its fader stands, from `-50` through `0` at the middle to `+50`: for example `LANE 3` `+12`. While the pattern is armed to record, the left header carries SEQ's red dot and word, and its title may shorten to `TONE` to make room.
- **Which lanes show**: the lanes the lane row shows. On iPhone that is four at a time in an eight-lane project (the arrows at the ends of the lane row show lanes 1–4 or 5–8, 2.2) and all six in a six-lane one. Every iPad but the mini shows all eight; the iPad mini pages four at a time, as the iPhone does. Faders on the other page keep their places.
- **The page keys** on iPhone are `PAT`, `BAR`, `MUTE` and `KEEP`. PAT, BAR and MUTE go to that page of SEQ's grid; KEEP stands where LATCH does (15.4). Under SHIFT the four are SEQ's `UNDO`, `REDO`, `CLEAR` and `RESET` (8.10). On iPad the page keys are `UNDO`, `REDO`, `CLEAR` and `KEEP` (17.12).
- **The band** keeps the controls of the SEQ page you came from, and the keys play the focused lane, as on SEQ's other places. With the pattern armed, they record (8.8).

15.1.1 Moving a fader

Touch anywhere in a lane's column and drag up or down. The fader moves from where it is; it does not jump to your finger. A drag the whole height of the fader's travel takes it from one end to the other, and up is always more: brighter on TONE, wetter on SPACE.

- Near the middle the fader catches on a small detent and reads `0`: the sound exactly as saved. That makes the middle easy to find again.
- With HELP latched, the help window covers the left window on iPhone. A tap on a SPACE fader says its line; a drag still moves it.

15.2 TONE: darker or brighter

TONE moves each lane's brightness: on most sounds the filter's cutoff, the point above which the high frequencies are cut away. Drag it up for a brighter sound, down for a darker one. Its help line says `BRIGHTER UP, DARKER DOWN · STOP RESETS`.

- **The fader's whole travel is the control's whole range**, with the middle at the sound's own setting. At the top the control is at the top of its range; at the foot, at the bottom. On a filter that means fully open at the top and fully closed, very dark, at the foot.
- **Above the middle, TONE adds a little resonance** (the ringing edge at the filter's cutoff) on the engines that have one: up to a quarter of its range more, never past three quarters, and never less than the sound's own. Below the middle the resonance stays as saved.

What TONE moves on each engine:

ENGINE	TONE MOVES
SLOPE	**TONE**; above the middle, a little **EDGE**
DIVINER	**CUTOFF**; above the middle, a little **RESONANCE**
SCAN, PULSE, SWARM	**TONE**
DUST	**TONE**, which takes each grain from a pure tone toward a band of noise
CROSS	**DEPTH**, how strongly the operators modulate each other; above the middle, a little **FOLD**
GUT	**PLUCK** up and **DAMP** down together, so the string rings brighter
SLICER	every pad's **CUTOFF**; above the middle, a little of each pad's **RESONANCE**
KNOCK	every pad's **TONE**
CINDER	the **PITCH** of every pad's noise layers, which on a noise is its filter. Sine and saw layers keep their tuning
SAMPLER	nothing: TONE is drawn off and reads `NO TONE`

NOTE

A control already at the top of its range leaves TONE nothing to add above the middle. A SLICER pad's CUTOFF starts fully open, so on a kit nobody has darkened, TONE darkens below the middle and above it adds only a touch of resonance. A CINDER kit with no noise layer sounding has nothing for TONE either, and reads NO TONE.

15.3 SPACE: drier or wetter

SPACE moves every effect on the lane's sound together: the MIX of each of its four effect slots (4.7). Drag it down for a drier sound, up for a wetter one. Its help line says **WETTER UP, DRIER DOWN · STOP RESETS**.

PERFORM's SPACE is not the effect called SPACE, the long reverb you can put in an effect slot (4.7). The fader moves whatever effects the sound has, a SPACE reverb's MIX included.

- At the middle every effect is at its own MIX, as saved.
- Down, they all come down together, keeping their balance; at the foot every one is dry.
- Up, they all rise together; at the top the effect that was highest is fully wet and the others are in the same proportion to it.
- An effect whose MIX is at zero stays off, and so does an empty slot: SPACE never switches on an effect you haven't turned up.
- A sound with no effect turned up has nothing for SPACE to move. Its SPACE fader is drawn off and reads **NO FX**. Turn up an effect's MIX on the FX page and the fader comes to life.

15.4 STOP and KEEP

Every press of **STOP**, on any screen, playing or already stopped, glides every PERFORM fader back to the middle over 0.15 seconds, and every sound comes back exactly as it was saved. A Stop from your MIDI gear does the same when Tonaut takes transport in from it (chapter 16). If you touch a fader on its way home, it leaves the glide and follows your finger.

To keep the faders where they are through STOP:

01 Press **KEEP**, the fourth page key. It lights, the right window's title reads **SPACE · DRY–WET · KEEP** (on iPad, KEEP joins the right window's header), and the notice says **KEEP · TONE AND SPACE STAY THROUGH STOP**.

02 Press **STOP** as often as you like. The faders stay, and so do the sounds they make.

03 Press **KEEP** again when you want the sounds back. It goes dark, the notice says **KEEP OFF · EVERY SOUND IS BACK**, and every fader glides home, playing or not.

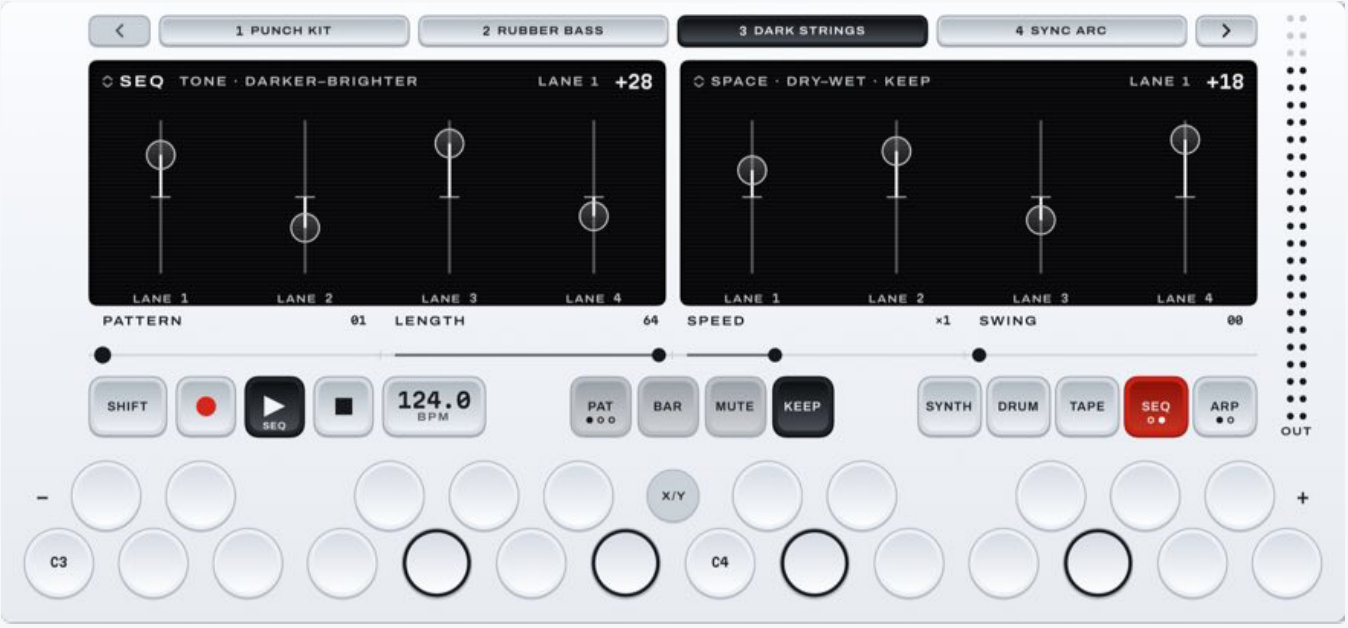


Figure 15.2 With KEEP lit, KEEP joins the SPACE title and STOP leaves the faders where they are.

KEEP's help line says KEEP TONE AND SPACE THROUGH STOP. KEEP is not saved: opening a project turns it off (15.5).

15.5 What PERFORM keeps, and faders that are off

- Nothing PERFORM does is saved, into the sounds or the project. SAVE, SAVE AS, a sound saved to USER, a song you share and iCloud all carry the sounds as they were saved. Opening a project, NEW, REVERT and a change of SHAPE start PERFORM again with every fader in the middle and KEEP off.
- **Leaving PERFORM doesn't put the sounds back.** Go to another page or another screen and the faders keep their places, and the sounds keep sounding the way the faders make them, until STOP.
- **The tape records what you hear.** A take recorded while you move the faders keeps the moves (11.3).
- **The saved sound can change under a moved fader**: move a slider on SYNTH, load another sound, change an effect. The fader keeps its place and works from the new saved values; a fader left with nothing to move goes back to the middle. Swap two lanes and each lane's faders go with its sound (2.12).

A fader that can move nothing is drawn off: a faint dotted line with no knob, and one word under it that says why. Its header reads --. Tap it and the notice line gives the whole reason.

WORD	WHY	A TAP SAYS
EMPTY	nothing has been put on the lane yet: it holds SLOPE's ENGINE DEFAULT, untouched, with nothing in its patterns. Change anything on it and its faders come to life	LANE 7 IS EMPTY
MIDI	the lane is on EXTERNAL MIDI and plays your own gear, so there is no sound of Tonaut's to shape (chapter 16)	LANE 2 IS MIDI · NO SOUND TO SHAPE
NO FX	SPACE only: no effect on the sound is turned up	LANE 3 · NO EFFECT IS UP ON THIS SOUND
NO TONE	TONE only: the sound has nothing TONE can move (15.2)	LANE 3 · THIS SOUND HAS NO TONE CONTROL

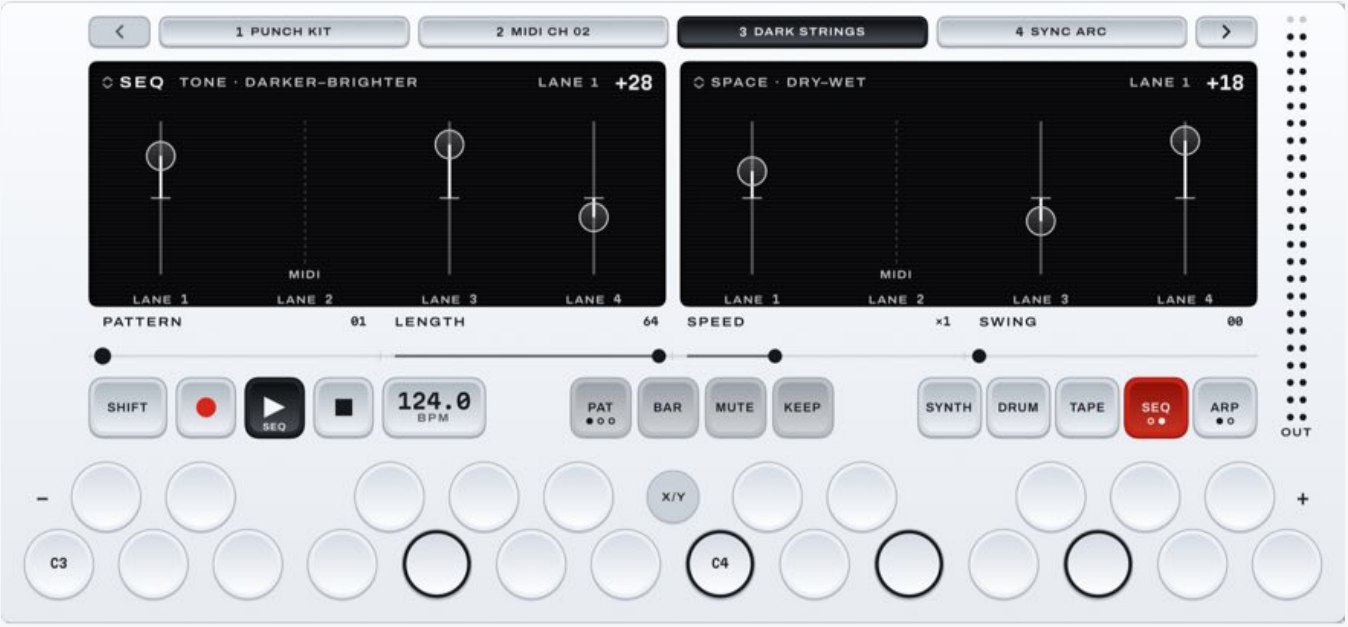


Figure 15.3 A fader with nothing to move says why in one word. Lane 2 plays outside gear, so it has no sound here to shape.

15.6 The X/Y pad

The X/Y pad turns the right-hand window into a pad you play with one finger while the other hand plays the keys. Across, X, is pitch bend: it slides the notes you play up or down. Up and down, Y, is the mod wheel, or the brightness on a sound that doesn't use the wheel. It plays the focused lane.

The X/Y key is the small round key in the middle of the keyboard's top row, in the gap among the black keys between the B and the second C. (On iPad it is in the same gap, before its middle C: chapter 17.) In the iPhone's TN looks it is a raised disc with an LED near its top, like the keys' (3.4.2).

To play the pad:

01 Go to SYNTH, DRUM, TAPE or ARP (GROOVE on a kit lane): the screens whose right-hand window is a picture beside what you play.

02 Press X/Y. It acts when you lift your finger: the key lights (in the TN looks, its LED alone, bright for as long as the pad shows), and the right-hand window becomes the pad, with the live scope still drawing behind it.

03 Play keys with one hand and drag on the pad with the other (15.7).

04 Press X/Y again to put the window back.

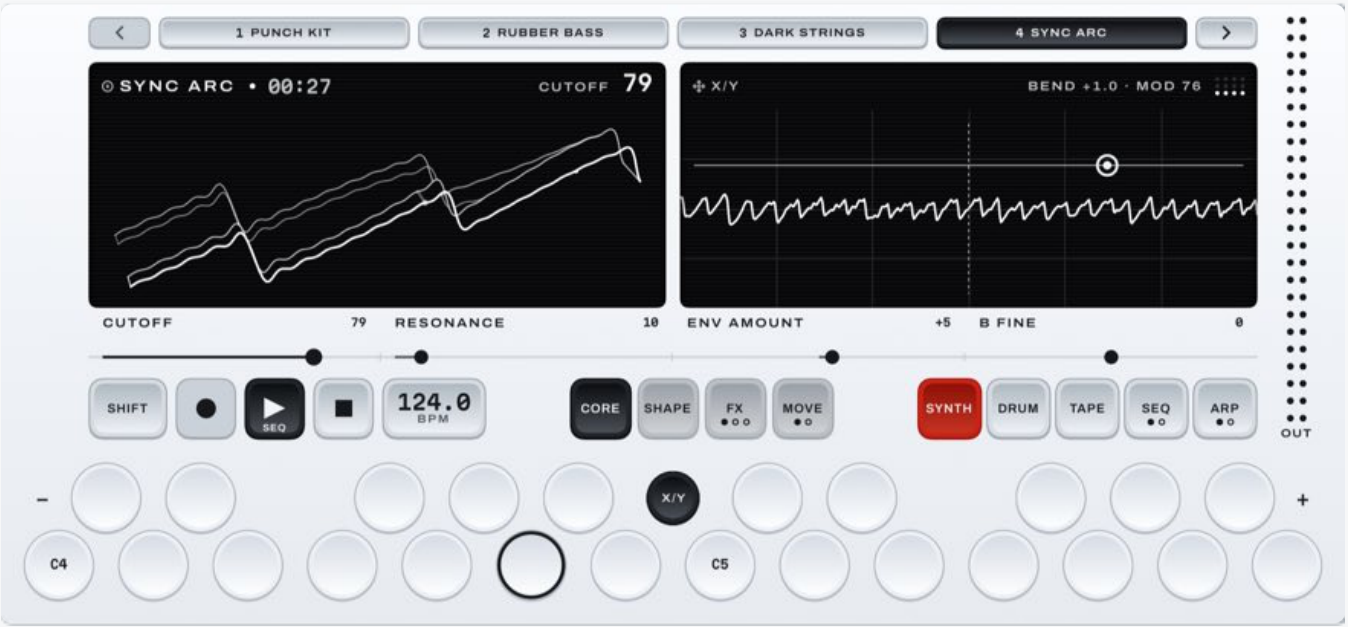


Figure 15.4 X bends the pitch, Y is the mod wheel. The dot shows where the values are, and with a finger on the pad the header gives them: a bend of +1.0 semitone and the wheel at 76.

- **Off its four screens** (SEQ and its other places, MIX, EDIT, the browsers, PROJECTS, Settings and the rest), the X/Y key is a well. A press says X/Y PAD: SYNTH, DRUM, TAPE OR ARP and changes nothing. If the pad was on, it waits, and is there again when you go back to one of the four.
- **On a lane on EXTERNAL MIDI** the key is a well and says A MIDI LANE HAS NO SOUND OF ITS OWN: Tonaut sends your gear notes, not a bend or a mod wheel (chapter 16).
- With HELP latched, the key says PAD ON THE RIGHT: BEND, MOD OR TONE.

The pad's header says what each axis reaches on the focused lane's sound: X first, then Y, such as BEND ±2 · MOD 45.

THE HEADER READS	MEANS
BEND ±2	X bends up to 2 semitones each way: the sound's own bend range (4.6.2)
BEND +1.4	while your finger bends: how far, in semitones, with – for down
NO BEND	the sound's bend range is 0, so X moves nothing
MOD 45	Y is the mod wheel, at 45 of 100 (15.9)
TONE	Y is PERFORM's TONE for this lane
NO TONE	Y has nothing to move on this sound

15.7 Playing the pad: drag from anywhere

The pad is relative. Put a finger down anywhere on it and nothing moves. Drag, and X and Y move from where they are by as far as you drag: the pad's whole width is X's whole range, so half the width takes it from the middle to one end, and its whole height is Y's whole range. Its help line says DRAG FROM ANYWHERE · Y HOLDS TILL STOP.

- **The dot shows the values, not your finger.** Across, it is where X is; up, where Y is. A dashed line down the middle marks no bend, and a line across marks Y's level.
- A value at the end of its range stays there however far you keep dragging, and comes back the moment you turn.
- X has a small detent at the middle, so a drag straight up or down doesn't bend.
- What Y moves is decided when your finger lands, and kept until you lift it.
- With HELP latched, a tap on the pad says its line and moves nothing; a drag still plays.

15.8 X: pitch bend

X bends the pitch of everything the focused lane plays, like a keyboard's pitch-bend wheel: drag right to bend up, left to bend down, as far as the sound's bend range (BEND on SHAPE, 4.6.2). The header shows the bend in semitones as you go.

- Lift your finger and X springs back to the middle at once, as a bender's spring does.
- A MIDI keyboard's pitch-bend wheel still works; the two bends add together.

15.9 Y: the mod wheel, or TONE

Y is the mod wheel: the second wheel on a keyboard, which a sound can use for vibrato, a filter sweep or whatever its modulation is set to. On the pad it does exactly what a MIDI keyboard's mod wheel does: it moves the sound through its Expression modulator with SOURCE set to WHEEL (4.8.8). The foot of the pad is none, the top is all of it, and the header reads MOD with the amount, 0 to 100. With a MIDI keyboard's mod wheel up as well, the higher of the two counts.

Most factory sounds don't use the mod wheel. On those, Y is the lane's PERFORM TONE (15.2) and the header reads TONE: the middle of Y's travel is the sound as saved, up is brighter, down is darker. It is the very fader PERFORM draws, so moving one moves the other, and the dot sits where TONE stands. On a sound TONE can't move either, such as a SAMPLER patch, the header reads NO TONE and Y moves nothing.

- **Y holds.** Lift your finger and Y stays where you left it, until STOP (15.10).
- **Changing lane**: a mod wheel you left up moves to the newly focused lane, as a MIDI keyboard's wheel would. A TONE you set stays on its own lane, because it is that lane's PERFORM fader; the pad then shows the new lane's.

TIP

> To give a sound a mod wheel, choose Expression as its modulator on MOVE and set its SOURCE to WHEEL (3.8.6). A sound has one modulator, so this replaces the one it had. From then on Y is the wheel on that sound.

15.10 Back to rest: STOP, the key and a new project

- **STOP**, every press, on any screen: X and the mod wheel go back to rest at once. A TONE that Y set glides home with PERFORM's faders, unless KEEP is lit (15.4).
- **Turning the pad off** with X/Y leaves Y where it is until STOP, as PERFORM's faders stay when you leave PERFORM.
- **Opening a project**, NEW, REVERT or a change of SHAPE rests the pad as STOP does. A finger still on the pad moves nothing more until you lift it.
- Nothing about the pad is saved, and the tape records what you hear, bends and all.

16 MIDI out: playing your own gear

Any lane can play a hardware synth or a drum machine instead of a Tonaut sound. Set the lane to **EXTERNAL**, pick a MIDI channel, and the lane's patterns, its keys, its arpeggiator or groove and your MIDI keyboard all play your gear.

16.1 What MIDI out is for

MIDI is the language instruments use to send each other notes: which key, how hard, and when to let go. It carries no sound. With MIDI out, Tonaut is the sequencer and the keyboard, and your synth or drum machine makes the sound.

A lane set to **EXTERNAL** is a MIDI lane. It keeps its patterns, its arpeggiator or groove settings, its MIX strip and its tape track. It has no Tonaut sound while it is on EXTERNAL, so it uses none of the phone's processing for one.

A MIDI channel is one of sixteen numbered lanes inside a MIDI connection. One cable can play several instruments at once, each listening to its own channel. Each MIDI lane sends on the channel you give it, **CH 01** to **CH 16**.

CHOOSE EXTERNAL IN	FOR	THE LANE PLAYS	ITS CHANNEL STARTS ON
PATCHES	a synth	notes, as you play them	the lane's own number: lane 4 on **CH 04**
KITS	a drum machine	the 24 pads, each sending its own drum note (16.4.1)	**CH 10**, where most drum machines listen

A lane for a synth behaves as a synth lane everywhere: SYNTH, ARP, note names in SEQ. A lane for a drum machine behaves as a kit lane: DRUM, GROOVE, pad numbers in SEQ.

16.2 Connecting your gear

Tonaut sends MIDI to whatever is connected to the phone:

- **A synth or drum machine with USB MIDI.** Connect a cable from the phone's port, through an adapter if your phone needs one, to the instrument's USB socket. It needs to be class compliant: it works without a driver, as most do.
- **Gear with only round 5-pin MIDI sockets.** Put a class-compliant USB MIDI interface between the phone and the gear, its MIDI OUT into the gear's MIDI IN.
- **Bluetooth MIDI gear.** Pair it in Settings with the BLUETOOTH key (14.3.1). Bluetooth adds a little delay; a cable is tighter.

Every connected MIDI output gets every note, each on its lane's channel, and so does another music app on the same device that offers a MIDI input. There is no output to choose: give each instrument its own channel instead.

To check the connection, open Settings and press MIDI (14.3). **Output** reads the name of the first output Tonaut can send to, with **+1**, **+2** after it when there are more, or NONE. The lane's own screen says the same (16.5).

- While a lane is on EXTERNAL, plugging in an output says MIDI OUT CONNECTED · *name*, and unplugging the last one says MIDI OUT DISCONNECTED. A device that is also a MIDI keyboard announces itself once, as MIDI CONNECTED · *name* (3.8.1).
- **Unplugging never stops the song.** The patterns run on; only the notes stop reaching that instrument. When an output comes back, Tonaut first sends it an all notes off on your MIDI lanes' channels, so nothing is left hanging from before.

On the instrument, set the channel it receives on to the lane's channel. A drum machine usually listens on 10 already.

TIP

> If your synth has its own keys and you also play them into Tonaut as a MIDI keyboard, turn the synth's Local Control off. Local Control joins the synth's keys to its own sound; with it off, the keys reach the sound only through Tonaut, so each note sounds once. A synth that echoes Tonaut's notes straight back (MIDI thru) can't start a loop: Tonaut ignores its own notes coming back in.

16.3 Making a lane EXTERNAL

EXTERNAL is a row in the engine column of PATCHES and KITS, sorted A to Z among the engines: between DUST and GUT in PATCHES, between CINDER and KNOCK in KITS. It is not under **ALL**, and USER doesn't have it.

To play a synth on lane 4, channel 4:

01 Press the lane button for lane 4. (In an eight-lane project the iPhone's lane buttons show four lanes at a time; the arrows at either end show the others, 2.2.)

02 Tap SHIFT and press PATCH. PATCHES opens. For a drum machine, press KITS instead.

03 In the engine column, the left half of the left window, tap **EXTERNAL** (5.2.2). The type column holds **ALL** alone, and the right window lists the sixteen channels, **CH 01** to **CH 16**. The cursor waits on lane 4's own number, **CH 04**, or on **CH 10** in KITS. Nothing has changed yet.

04 Tap the channel row you want, or drag **CURSOR** to it. The lane is on EXTERNAL now, and the row wears the lane's chip.

From then on the lane's name reads MIDI CH 04 wherever lanes are named: its lane button, its header on SYNTH or DRUM, SEQ, ARP and PROJECTS. Moving the cursor to another channel row moves the lane there; the notes it was holding on the old channel go off first.

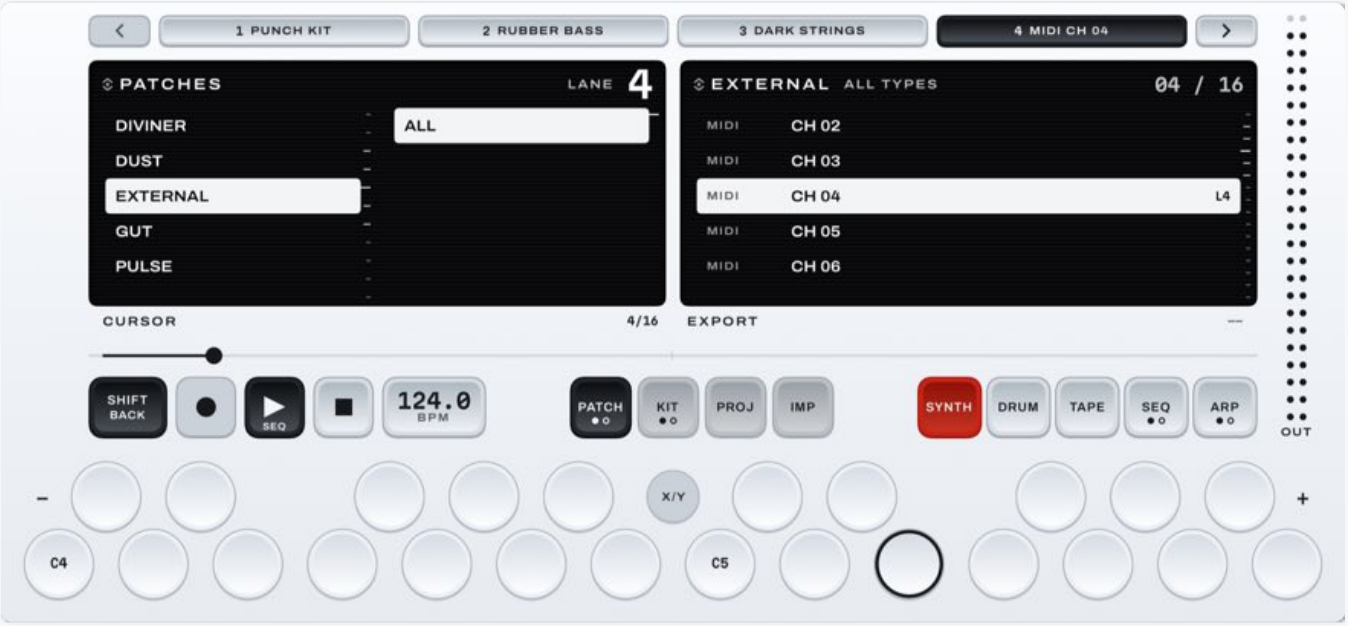


Figure 16.1 EXTERNAL in PATCHES lists the sixteen channels. The row a lane plays on wears its chip, as a sound would.

- **In KITS, tap the row the lane is already on** and it plays two bars of the lane's groove through your drum machine: a quick way to check the cable, the channel and the drum sounds (5.5.1). Moving the cursor stops it.
- **Back to a Tonaut sound:** load any patch or kit on the lane, from a browser or a quick slot. The lane leaves EXTERNAL; its patterns stay.
- **Two lanes can share a channel.** A note both of them hold sounds once, and goes off when the last one lets go.
- **The lane's EXTERNAL setting and channel are part of the project.** They are saved with it, kept by SAVE AS and sent with a song you share (13.13) and by iCloud sync. Clock out, Transport and MIDI DELAY belong to the phone instead (16.8, 16.9).

16.4 What plays your gear

Everything that would play the lane's sound plays your gear instead:

SOURCE	WHAT GOES OUT
SEQ	The lane's patterns (8.1), PATTERN PLAY included (8.13). Each step goes out at its own **LOUDNESS**, as the note's velocity. Tapping a step to hear it sends it too.
The keys	On a lane for a synth, notes at the lane's own octave (3.2). On a lane for a drum machine, the 24 pads. Notes from the glass all go out at the same strength, about 102 of 127.
A MIDI keyboard	The focused lane (3.8.3), or with Settings' **MIDI in** on **BY CHANNEL**, the lane listening on the keyboard's channel (3.8.8), with your velocity. The sustain pedal holds the notes: Tonaut holds back their note-offs until you lift it, and sends no pedal message of its own.
ARP	On a lane for a synth, the arpeggiator runs as on any synth lane (9.1).
GROOVE	On a lane for a drum machine, a held pad plays the groove through it (9.4).

On a lane for a synth, the KEY page's LOCK and CHORDS work as on any synth lane (3.11), in the lane's own key and scale, from the keys and from a MIDI keyboard. Your gear gets what Tonaut would have played: with LOCK on, the note moved into the scale rather than the key you pressed, and with CHORDS on, every note of the chord, so a mono synth takes one of them and a polyphonic one plays the chord. The chord pad works on such a lane too, and sends every note of its chords, BASS's note included, in the voicing the pad plays: the same notes for each key every time, unless Voice leading is on (3.12.3). A lane for a drum machine ignores all of them.

Settings › CHORD PAD can put every synth lane in one key, or switch CHORDS or the chord pad on every synth lane at once (3.11.1). A MIDI lane is left out of all three: it keeps its own key, CHORDS and chord pad, so the gear it plays stays as you set it. The one exception is a key you set while the MIDI lane itself is focused: with **Key** on **ALL SYNTH**, that key goes to the MIDI lane and to every synth lane, and other MIDI lanes keep theirs.

Writing a MIDI lane's pattern works as on any lane: on SEQ, a key on the glass or on a MIDI keyboard puts its note into the selected cell (8.3), live recording takes what you play (8.8), and STEP REC writes it a step at a time (8.8.8). The pattern then plays your gear.

Tonaut sends each note a moment ahead, timed to land when its own sound for that beat reaches your ears, so your gear and Tonaut's lanes play together. MIDI DELAY trims what is left (16.8).

16.4.1 The drum map

A lane for a drum machine sends each pad as its own note, in the General MIDI layout: the standard set of note numbers for drums that most drum machines and drum sounds follow. The first twelve pads follow the layout every Tonaut kit shares, so a groove's kick, snare and hat (pads 1 to 3) play notes 36, 38 and 42 on any General MIDI drum machine. A MIDI keyboard plays a lane for a drum machine through the same map as a kit (3.3.2), and each pad then sends its note from this table.

PAD	NOTE	NAME	PAD	NOTE	NAME
1	36	KICK	13	35	KICK 2
2	38	SNARE	14	40	SNARE 2
3	42	CLOSED HAT	15	41	FLOOR LO
4	46	OPEN HAT	16	43	FLOOR HI
5	45	LOW TOM	17	44	PEDAL HAT
6	47	MID TOM	18	53	RIDE BELL
7	50	HIGH TOM	19	54	TAMBO
8	39	CLAP	20	55	SPLASH
9	37	RIM	21	57	CRASH 2
10	56	METAL BELL	22	63	HI CONGA
11	51	RIDE	23	64	LO CONGA
12	49	CRASH	24	70	SHAKER

The names are what each note plays on a General MIDI drum machine; yours may lay its sounds out differently. Pad mutes, the groove's choice of kick, snare and hat pads, and SEQ's pad numbers work as on any kit lane.

16.5 The lane's screens

On a MIDI lane, SYNTH (or DRUM, for a drum machine) shows where the notes go instead of a sound's controls.

PART	WHAT IT SHOWS
Header	The lane's name, **MIDI CH 04**, with the MIDI and ARP marks and the tape position, as on any lane (2.3.2).
Left window	A card with four lines: the channel in large digits, such as **CH 04**; what the lane plays, **NOTES**, or on a lane for a drum machine the pad you last played on the keys or picked (the one outlined in PADS), its note and its General MIDI name, such as **PAD 08 · NOTE 39 · CLAP**; where the notes go, **TO** and the first output's name, or **NO MIDI OUTPUT · PLUG IN A CABLE**; and whether Tonaut sends its clock, **CLOCK OUT ON** or **CLOCK OUT OFF** (16.9).
Right window, lane for a synth	**MIDI OUT**: each note as it leaves the phone, drawn as a line at its pitch from note-on to note-off. The newest is at the right, and the last four beats scroll to the left. While the transport runs, thin lines mark the beats, and with Clock out on, a tick at the foot marks each beat of clock sent. With nothing going out it holds still.
Right window, lane for a drum machine	PADS, as on any kit lane: a pad flashes for each hit sent, and a tap mutes it for the pattern and the groove (6.7).
Page keys	**MIDI**, lit, then **SHAPE**, **FX** and **MOVE** drawn flat (on DRUM: **KEY**, **FX**, **MOVE**). A press on a flat key says **A MIDI LANE HAS NO SOUND OF ITS OWN**. **MIDI** pressed again does nothing.
The band	One control across the whole band, **CHANNEL**, `CH 01` to `CH 16`. A double-tap puts it back on the lane's own number, or on `CH 10` for a drum machine; **SHIFT** + double-tap puts back your last change (2.4.4). There is nothing under SHIFT.

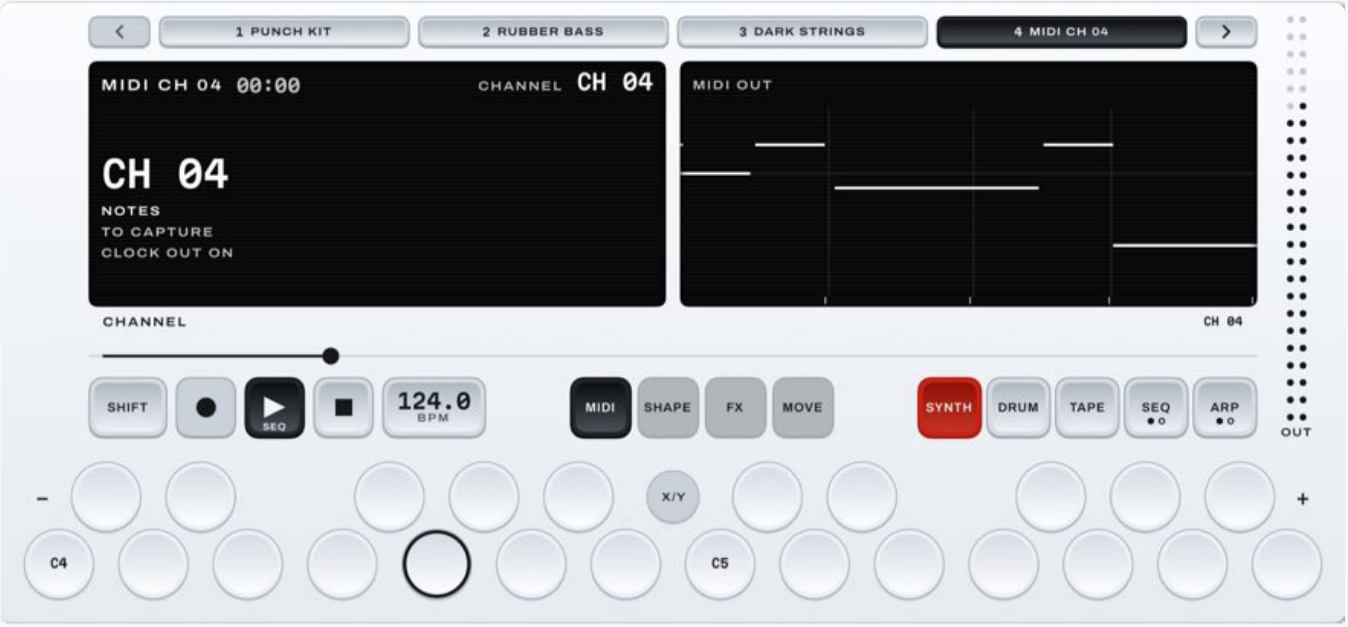


Figure 16.2 A lane playing a synth: where its notes go on the left, the notes themselves on the right, and one control, its channel.



Figure 16.3 A lane playing a drum machine keeps its pads on the right, lighting as hits go out. The card names the outlined pad, its note and what that note is on a General MIDI drum machine.

A MIDI lane has no sound to change, keep or shape, so these say why instead of acting:

CONTROL	ON A MIDI LANE
EDIT (SHIFT + EDIT), DIE and UNDO, the X/Y key	A MIDI LANE HAS NO SOUND OF ITS OWN
SEQ's **SLIDE** and **GLIDE** on the lane's pattern	Drawn off; a tap says A MIDI LANE HAS NO SOUND OF ITS OWN
Holding a quick slot to save, and SAVE in USER	A MIDI LANE HAS NO SOUND TO SAVE. Loading a slot onto the lane works, and gives it that sound.
PERFORM's TONE and SPACE faders (15.1)	Drawn off, with MIDI under them; a tap says LANE 4 IS MIDI · NO SOUND TO SHAPE

The help panel's LEAN and SAMPLE cells are hidden on a MIDI lane, and RECORD and SETTINGS share the row (2.9.1).

If the lane's effect list, its effect CONTROLS, the modulator list, EDIT or the sample editor is showing when you focus a MIDI lane, Tonaut leaves it and says A MIDI LANE HAS NO SOUND OF ITS OWN. On iPad the MIDI page is one row of controls; see chapter 17.

16.6 MIX on a MIDI lane

A MIDI lane keeps its MIX strip (10.3), and the strip reaches your gear:

- **The fader sends volume** on the lane's channel, and **the lane's BAL sends pan**. Each is a control change: MIDI's message for moving a knob, number 7 for volume and 10 for pan. The fader at 0 dB sends 102 of 127; BAL in the middle sends 64.
- **They go out only as you move them**: never when a project opens or an instrument connects. Your synth keeps its own volume until you touch the fader.
- **MUTE stops the lane's notes** (10.4). The notes it was holding go off at once, and nothing goes out until you unmute it. Muting the lane's pattern on SEQ's MUTE page works as on any lane (8.9).
- The master EQ, the master effect and OUT don't touch your gear's sound: it never passes through the phone.

With HELP latched, BAL on a MIDI lane says `ALSO PANS THE EXTERNAL SYNTH`.

16.7 Turning every note off

Tonaut sends a note-off for every note it starts. Whenever it stops notes itself, your gear's notes stop too: on STOP, a mute, a channel change, a sound loaded onto the lane, a phone call, or Tonaut going quiet when you leave it.

If a note keeps sounding on your gear all the same, press `STOP` while the transport is stopped (press it twice if it is playing). With any lane on EXTERNAL, that turns off every note a MIDI lane holds and sends an all notes off (control change 123) on every MIDI lane's channel. The line reads `MIDI · ALL NOTES OFF`. STOP then does its usual job too, taking the tape back to the start, or to the loop's start while LOOP is on (2.10).

With no lane on EXTERNAL, STOP while stopped does only its usual job.

16.8 MIDI DELAY: lining your gear up

Some gear sounds a little late after a note arrives, some a little early. **MIDI delay** moves everything Tonaut sends earlier or later to make up for it.

It is a row of the tempo page's SYNC section. To set it:

01 Hold the tempo key to open the tempo page (3.9.1).

02 Press `SYNC`, then move the cursor down to **MIDI delay**, the last row.

03 Play a pattern where your gear and a Tonaut drum lane hit on the same beats, and drag **VALUE** until they land together.

READS	WHAT IT DOES
`-50 MS` to **`-1 MS`**	Sends earlier, for gear that answers slowly
`0 MS`	As Tonaut times it. The setting when you install.
`+1 MS` to **`+50 MS`**	Sends later, for gear that sounds ahead of Tonaut

- VALUE moves a millisecond a step. A double-tap doesn't reset it: drag it back to **`0 MS`**.
- It moves everything Tonaut sends: notes, MIX's volume and pan, all notes off, the clock, Start and Stop. Only the all notes off Tonaut sends when the sound stops without warning, such as for a phone call, goes at once.
- **Earlier has a limit.** Tonaut can send only as far ahead as the phone's own audio delay allows. Past that, every earlier setting sends at once. Later settings always work in full.
- Tonaut already allows for the phone's own output delay, wired or Bluetooth. MIDI DELAY is for your gear's.
- It belongs to the phone, not the project: every project uses it, and sync doesn't carry it.

16.9 Clock out and Transport

The tempo page's SYNC section has four rows: **Source**, **Clock out**, **Transport** and **MIDI delay**. Its header reads INTERNAL: **Tonaut always keeps its own tempo and never follows an incoming MIDI clock.** **Source** has nothing to choose (3.9.4). Your gear follows Tonaut, not the other way round. Clock out and Transport both belong to the phone, like MIDI DELAY.

16.9.1 Clock out: sending Tonaut's tempo

Clock out is **`ON`** or **`OFF`**, and **`ON`** when you install. On, Tonaut sends its tempo as MIDI clock, 24 pulses a beat, to every output while the transport runs, so a drum machine or an arpeggiator set to follow MIDI clock plays at Tonaut's tempo.

- The pulses start with the transport, from PLAY on any screen, TAPE's included. None go out while stopped or during a count-in.
- They stay steady when a pattern swings: swing is Tonaut's to play, not the clock's.
- A MIDI lane's card shows CLOCK OUT ON or CLOCK OUT OFF.

Clock goes out whether or not a lane is on EXTERNAL, so gear can follow Tonaut's tempo while you play it from its own sequencer.

16.9.2 Transport: Start and Stop

Transport decides whether Tonaut's PLAY and STOP start and stop your gear, and whether your gear's start and stop play and stop Tonaut. **VALUE** moves it through four settings, in this order:

READS	TONAUT SENDS START AND STOP	YOUR GEAR STARTS AND STOPS TONAUT
`OFF`	No	No
`OUT` (the setting when you install)	Yes	No
`BOTH`	Yes	Yes
`IN`	No	Yes

- **Sending** (`OUT`, `BOTH`): PLAY on any screen sends Start, and STOP sends Stop. Tonaut always sends Start, never Continue or a song position, so gear that follows it starts from its beginning each time.
- **Receiving** (`IN`, `BOTH`): your gear's Start, or Continue, acts as PLAY on the screen you are on: SEQ plays the patterns, TAPE rolls the tape, and with REC armed it records. Its Stop acts as STOP. A Start while Tonaut is already playing or counting in does nothing, and Tonaut ignores its own Start and Stop coming back. At `BOTH`, your gear's own Start or Stop isn't sent back to it. Tonaut still plays at its own tempo.
- **Switching sending off while your gear runs** sends it Stop at once, so nothing is left running. It then stays stopped until a PLAY that sends Start again.

TIP

> If a keyboard's own sequencer or arpeggiator starts whenever you press PLAY, it is following Tonaut's Start: set Transport to `OFF` or `IN`. If a drum machine starts but drifts out of time, set it to follow external (MIDI) clock and turn Clock out on.

16.10 MIDI lanes and the tape

A MIDI lane isn't recorded to tape: its sound is made by your gear, outside the phone. REC SEQ (11.7) leaves MIDI lanes out of the take, so it never writes silence over their tracks, and says so as you set the take up, when REC SEQ goes on or the tape arms with it on: LANE 4 IS MIDI · NOT RECORDED TO TAPE, or for several lanes LANES 2 4 ARE MIDI · NOT ON TAPE, and past five lanes a count, such as ALL 6 LANES ARE MIDI · NOT ON TAPE. Their patterns still play during the take, and their notes still go out.

To get your gear's sound onto the tape, bring it back into the phone:

01 Connect the gear's audio output to a USB audio interface on the phone. The interface has to run at the same sample rate as Tonaut, usually 48 kHz; the recorder says so if it doesn't (12.7).

02 Open the recorder. **SOURCE** should read **USB**. Turn **MONITOR** on, because the input reaches the tape only through it, and set **DEST** (under SHIFT) to **TAPE** (12.5).

03 Record a take while the MIDI lane's pattern plays. The take lands in time: notes go out timed to the phone's output, and the recorder allows for the input's delay.

Exports are made from the tape (14.8), so a MIDI lane is in a MIX DOWN or STEMS only once it is recorded this way.

16.11 What Tonaut doesn't send

Tonaut sends notes with their velocity, MIX's volume and pan, all notes off, and the clock with Start and Stop. Nothing else:

- **No pitch bend, mod wheel, aftertouch or other controllers.** A MIDI keyboard's wheels and pressure, and the X/Y pad, don't reach your gear.
- **No program changes.** Tonaut can't switch your synth's sounds; choose them on the synth.
- **No SysEx** (the messages synths use to send and receive their patches), and no Continue or song position.
- **No sustain pedal message.** Tonaut holds the notes itself (16.4).

Coming in, Tonaut keeps its own tempo whatever clock arrives, and it doesn't act on program changes or SysEx that arrive over MIDI (3.8.4). Your patterns can leave the app as MIDI files, though: see 16.12.

If your gear stays silent, a note hangs or the timing is off, 14.10.4 has the fixes.

16.12 Exporting patterns as MIDI files

To take your patterns into music software on a computer, or into another sequencer, export them as MIDI files. Each lane whose pattern has notes becomes one Standard MIDI File (a **.mid** file, which every music app reads), holding the pattern as played: exactly what you hear.

To export the open project's patterns:

01 Hold SHIFT and press PROJ. PROJECTS opens.

02 Drag **EXPORT** to **MIDI**, its position after **MIX DOWN** and **STEMS**. It is there whenever a lane's pattern holds a note, with or without anything on the tape; with no take on the tape it is the only one.

03 Press REC. The line says **EXPORTING MIDI** and the counter counts the files.

04 Apple's share sheet opens with every file in it: send them by AirDrop, Mail or Messages, or save them to Files. Closing it says how many went, such as **SENT · 4 MIDI FILES**, or, if you sent nothing, where they are, such as **4 FILES IN FILES · TONAUT / EXPORTS**.

The files are always in Files as well, in a folder of their own inside Tonaut's Exports folder, named after the project and the time. Each file is named after the project and its lane, such as **Night Drive – Lane 2 RUBBER BASS.mid**. Chapter 14 covers exporting and where exports go (14.8).

What is in each file:

- **The pattern as played, from PLAY.** Ratchets are their repeated hits, chance and every-Nth steps are decided as PLAY decides them, swing and nudge sit where you hear them, and each note keeps its length and its step's LOUDNESS as its velocity.
- **Every file is the same length**: the fewest whole bars in which every exported lane comes all the way round, from 1 bar to 128. A 16-step pattern makes one bar; a 12-step pattern makes three. So the files line up and loop together in your software.
- **The pattern each lane is playing**, the one selected on SEQ. A section waiting on PATTERN PLAY isn't followed.
- **Patterns only.** The arpeggiator and GROOVE play what your hands hold, so they are not in the files; record them into a pattern first (9.7).
- **No mutes.** A lane muted on MIX, a pattern muted on SEQ and pads muted on DRUM are all exported, so you decide in your software what to leave out.
- **Channels**: a lane on EXTERNAL keeps its own channel, a kit lane uses channel 10 with the drum notes in 16.4.1, and any other lane uses its lane number. The file carries the project's tempo, 4/4 time, and the lane's name.
- **Slides** on a synth lane are written as a short overlap of the two notes, so a synth set to legato or glide in your software slides between them.

A lane with no notes in its pattern, or with no sound on it, writes no file. With nothing on the tape and no notes in any pattern, REC says **NOTHING ON THE TAPE OR IN THE PATTERNS**.

17 Tonaut on iPad

On an iPad, Tonaut draws a panel of its own for the bigger screen: the same instrument, sounds and projects, with every slider of a page in view, a 32-key keyboard, and keys of their own for what the iPhone keeps under SHIFT. This chapter covers what is different. Everything else in this manual works on the iPad as written.

17.1 Which iPads get the iPad panel

Tonaut needs iPadOS 26 or later. Every iPad that runs it gets the iPad panel this chapter describes, except three older ones that play the iPhone panel (17.1.1). How much of the iPad panel you see at once depends on the size of the screen:

IPAD	ROWS OF SLIDERS	LANE BUTTONS IN AN EIGHT-LANE PROJECT
The 8.3-inch iPad mini: iPad mini (6th generation) and iPad mini (A17 Pro)	2	Four at a time, with an arrow key at each end
The 10.9- and 11-inch models: iPad (10th generation) and iPad (A16), iPad Air (4th and 5th generation), iPad Air 11-inch, and every iPad Pro 11-inch	3	All eight in a row
The 12.9- and 13-inch models: iPad Pro 12.9-inch (3rd generation and later), iPad Pro 13-inch and iPad Air 13-inch	4	All eight in a row

A six-lane project shows all six lane buttons on every iPad.

Tonaut plays in landscape only, either way round, and it always fills the screen: it doesn't run in Split View or Slide Over beside another app. Turn the iPad upright and the panel stays sideways.

17.1.1 The older iPads that play the iPhone panel

Three older iPads are a little too narrow for the iPad panel: the 10.2-inch iPad (8th and 9th generation), the 10.5-inch iPad Air (3rd generation) and the 7.9-inch iPad mini (5th generation). On them Tonaut plays the whole iPhone panel at full size, with a margin at each side and the iPhone's light and dark housings (the TN looks are not offered on any iPad), and every other chapter of this manual describes exactly what you see. Of this chapter, only the lines that name the iPad (17.1.2), the pop-ups (17.16), the scan lines (17.17) and moving projects (17.18) apply to them.

17.1.2 Lines that name the iPad

A few lines on the screen name the device. On any iPad they say IPAD where this manual quotes PHONE or IPHONE, such as `ON THIS IPAD ONLY` and `NOT ENOUGH SPACE ON THIS IPAD`. A line about your other device says DEVICE, because it may be an iPhone or another iPad: `TAPE IS ON YOUR OTHER DEVICE`, `LOADED YOUR OTHER DEVICE'S CHANGES`, and `2:05 DEVICE` in PROJECTS' tape column. HELP's line for LEAN reads `TILT THE IPAD TO CHANGE THE SOUND`.

17.2 The panel, top to bottom

The iPad panel is built in six bands. They sit in the same place on every screen; what they carry changes with the screen.

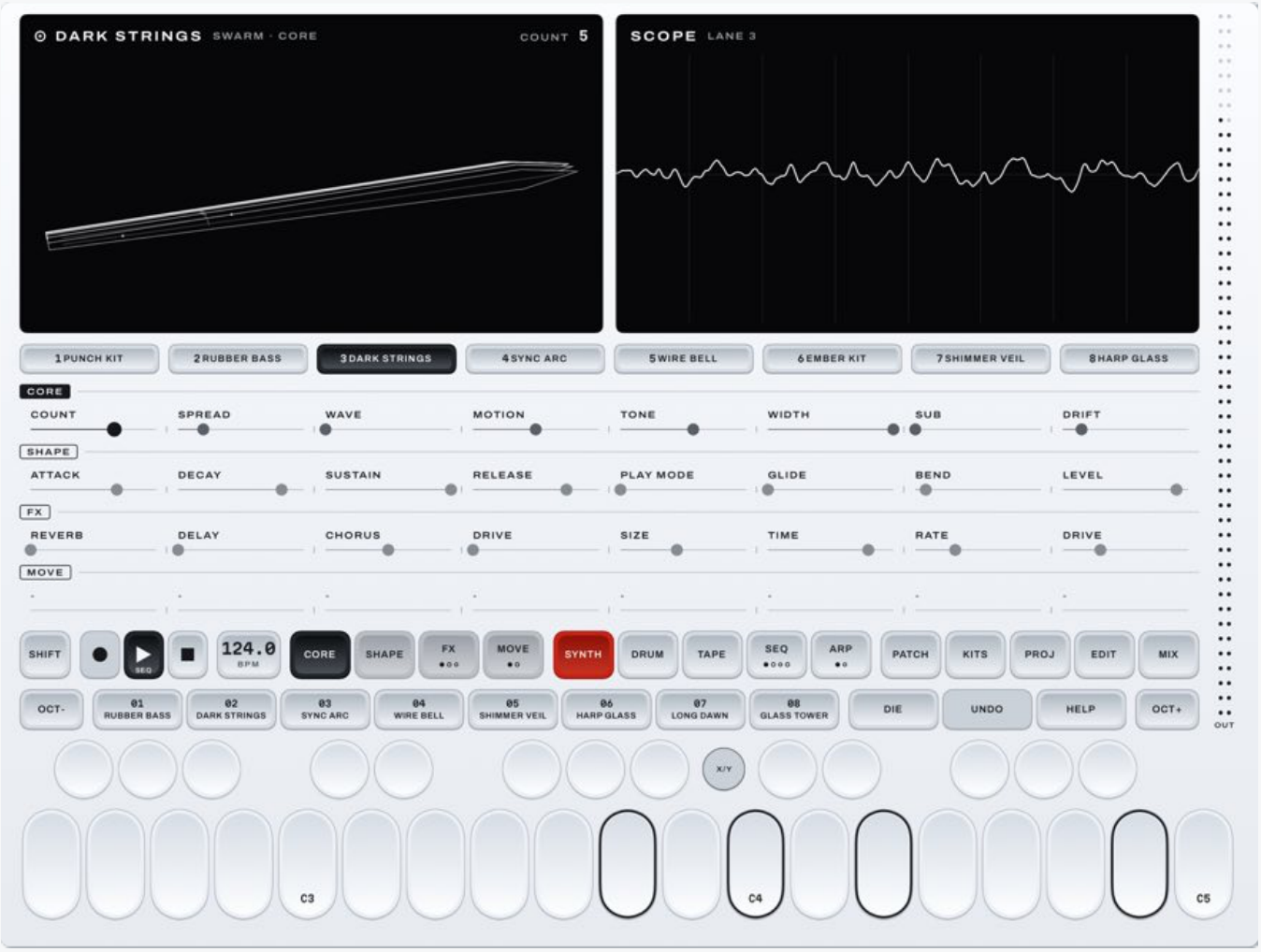


Figure 17.1 The iPad panel: the windows, the lane buttons under them, four rows of sliders on a 13-inch iPad, the button row with its five door keys, the strip, and 32 keys, with the OUT meter in the right margin.

01 **The screen windows.** Two black windows side by side, or one across the width on SEQ's grid, PATTERN PLAY, PATTERNS and Settings. The windows take the height the bands below leave, so a screen that uses fewer rows of sliders has taller windows.

02 **The lane buttons**, under the windows. On the iPhone they are at the top. Each names its lane's number and sound; the focused lane is filled. Tap one to focus its lane; hold SHIFT down and tap one to swap two lanes, as on the iPhone (2.2, 2.12). Where an eight-lane project shows four at a time, the arrow keys at the row's ends page between lanes 1 to 4 and 5 to 8, and every window that shows lanes or tracks (MIX, TRACKS, SEQ's mutes, PERFORM) pages with them, as on the iPhone. On a screen with fewer rows of sliders, such as a browser or Settings, the lane buttons sit lower, always right under the windows.

03 **The slider rows**: two to four rows of eight sliders, each row a whole page (17.4). They take the place of the iPhone's band.

04 **The button row**: SHIFT, REC, PLAY, STOP, the tempo key, four page keys, the five mode keys, and five door keys, PATCH KITS PROJ EDIT MIX (17.5).

05 **The strip**: OCT-, quick slots 01 to 08, DIE, UNDO, HELP and OCT+, one tap each (17.6).

06 **The keyboard**: 32 keys, 19 tall and 13 round (17.7).

The OUT meter stands in the right margin, from the top of the windows to the foot of the strip. It has two columns of 48 dots, one decibel a dot, from −48 dBFS at the bottom to full scale at the top, so a level fills the same share of it as of the iPhone's 24. The top of a column turns red when that channel clips, as on the iPhone (2.1).

17.3 Reading this manual on an iPad

The other chapters describe the iPhone's panel. Where they name an iPhone key, press or layer, here is where the same control is on the iPad:

THE MANUAL SAYS	ON THE IPAD
The band, and its second four under SHIFT, marked SH (2.4)	A row of sliders with all eight side by side, and no SHIFT (17.4)
A page key shows that page	The same, and touching a row of sliders does it too (17.4.2)
SHIFT + PATCH, KITS, PROJ, EDIT or MIX (2.6)	The door key of that name, with no SHIFT (17.5)
SHIFT + a quick slot, UNDO, DIE or HELP on the keyboard (2.8.1)	The same key on the strip, with no SHIFT (17.6)
– and + in the keyboard's end gaps (2.8.3)	OCT- and OCT+ on the strip
TAPE + SHIFT: the tool row on the keyboard (11.8)	The TOOLS row of keys on TAPE, with no SHIFT; ERASE, TRACK and RESET under SHIFT (17.14)

SHARE in TAPE's tool row, under SHIFT (11.19)	The SHARE key at the end of the TAPE row of sliders, with no SHIFT (17.14)
SHIFT + a track key on TAPE, which reads MUTE (11.2.1)	The MUTE keys along the foot of TRACKS, with no SHIFT
SHIFT + MUTE 1 and the other channel mutes on MIX (10.4)	The MUTE key on each strip, with no SHIFT (17.15)
SEQ's PAT, BAR and MUTE pages	In view at once: four bars in the window (two on the iPad mini), and the PATTERN, STEP and REC rows (17.10)
PAT OCT- and PAT OCT+ on PAT's band, or on the keyboard's end keys, under SHIFT (8.6.5, 2.8.1)	SHIFT + the first two page keys on SEQ's grid (17.10)
PAT pressed again for PATTERN PLAY and PATTERNS; SEQ pressed again for PERFORM	SEQ pressed again goes round the grid, PATTERN PLAY, PERFORM and PATTERNS (17.11)
SHIFT + SHARE on PROJECTS (13.13)	The SHARE key in PROJECTS' row of sliders, with no SHIFT
SHIFT + SHARE or ALL in USER (5.11)	Keys in USER's row of sliders, with no SHIFT. RENAME and DELETE are at the foot of the list, as on the iPhone

17.4 The slider rows: every slider of a page in view

Between the lane buttons and the button row, the iPad has rows of sliders in place of the iPhone's band. Each row is one page of the band, with all eight of its controls side by side: the four the iPhone shows first, then the four SHIFT brings up. Nothing in a row is hidden, so there is no **SH** badge and no SHIFT layer.

- A small label at the row's top left names it, such as **CORE** or **SHAPE**. The label of the row you are using is filled.
- Each slider has its name, a thin line and a round handle at its value. The slider you touched last has the biggest handle. A place with nothing to set shows only a dash, as the whole MOVE row does for a sound with no modulator.
- There are no numbers on the rows. The value of the control you touched last reads at the right of the window header (on EDIT, the SCOPE's). On SYNTH and DRUM it stands on the line of the sound's name, in smaller digits than the other screens use.
- A slider drags as on the iPhone: the value moves from where it was, slow for fine and quick for far, and holding still before you drag gives the finest steps (2.4.1). A double-tap puts it back to its starting value, and SHIFT + double-tap puts back its last change (2.4.4).

17.4.1 How many rows each iPad shows

An iPad shows as many rows as leave its windows tall enough to read: two on the 8.3-inch iPad mini, three on the 10.9- and 11-inch models, four on the 12.9- and 13-inch (17.1). On SYNTH:

IPAD	SYNTH'S ROWS
iPad mini	**CORE**, **SHAPE**
10.9- and 11-inch	**CORE**, **SHAPE**, **FX**
12.9- and 13-inch	**CORE**, **SHAPE**, **FX**, **MOVE**

A page key whose row isn't showing brings that row into the last row's place: MOVE on an 11-inch iPad shows **CORE**, **SHAPE** and **MOVE**. Nothing shows twice. A screen with fewer rows of its own, such as a browser, uses fewer and gives the room to its windows.

17.4.2 Touching a row chooses its page

On SYNTH, DRUM and MIX, where each row is a page, touching any slider in a row makes that page the one you are on, exactly as pressing its page key does: the windows show that page, its page key lights and its label fills, and the same touch goes on moving the slider. So on SYNTH you can move between CORE and SHAPE without pressing a key. On EDIT a touch chooses the slider's group the same way.

A page key's second press works as on the iPhone: CORE opens the filter page on a SAMPLER sound, and on SLOPE showing CLASSIC goes to the next view; FX opens the effect list and then CONTROLS; MOVE opens the modulator list (4.2). On the SAMPLER's filter page the **CORE** row holds the filter's four, **CUTOFF**, **RESONANCE**, **ENV AMOUNT** and **KEY TRACK**, and the window's header reads SAMPLER · FILTER. A list takes the place of the row whose key opened it, with **CURSOR** to move through it (a lane's effect list also has **SLOT** beside it), and CONTROLS puts the effect's eight there. The other rows stay live: touching one closes the list and goes to that page. While FX is the row you are using, a tap on a slot's name, the word above its slider, opens that slot's effect list at once, as on the iPhone (4.7.1). The iPad's effect lists hold every effect the iPhone's do, the five newest, Filter, Pump, Swirl, Lo-Fi and Tremolo, included, for a sound's four slots and for MIX's master effect (4.7.2).

17.5 The button row and the door keys

From left to right: SHIFT; REC, PLAY and STOP, which work and look as on the iPhone, PLAY's word under its triangle and REC's blink included (2.10); the tempo key, a tap for the click, a hold for the tempo page and SHIFT + tap for TAP TEMPO (2.5.2); four page keys, which rest a shade apart from the mode keys in LIGHT and DARK, as on the iPhone (2.5.1); the five mode keys, SYNTH DRUM TAPE SEQ ARP; and five door keys.

The **door keys**, PATCH, KITS, PROJ, EDIT and MIX, each do what SHIFT + the mode key under it does on the iPhone (2.6):

- PATCH opens PATCHES, KITS opens KITS, PROJ opens PROJECTS, EDIT opens EDIT and MIX opens MIX.
- Press the same key again to close its screen; a mode key closes it too and takes you to that mode.
- A door key is lit while its screen is in front.
- They keep working while HELP is latched, as the mode keys do.
- On TAPE, SHIFT + MIX opens TAPE MIX (17.15).

Because the doors have keys of their own, **the mode keys have no SHIFT layer on the iPad**: under SHIFT they keep their names and do the same. The mode you are on is red, as on the iPhone; while MIX, TAPE MIX or another door screen is in front, no mode key is red and its door key is lit. SEQ wears four dots, one for each place it goes round (17.11), and ARP two, for the arpeggiator (GROOVE on a kit lane) and KEY (17.19).

17.5.1 Page keys that differ on the iPad

Most screens keep the iPhone's page keys. These differ:

SCREEN	PAGE KEYS	UNDER SHIFT
SEQ	UNDO REDO CLEAR LATCH; during a STEP REC pass UNDO REDO REST TIE, with SHIFT or without (chapter 8)	PAT OCT- and PAT OCT+ on the first two, RESET on the fourth; the third blank
PATTERN PLAY	UNDO REDO CLEAR LATCH	RESET on the fourth; the others blank
PERFORM	UNDO REDO CLEAR KEEP	RESET on the fourth; the others blank
PATTERNS	COPY SWAP CLEAR BACK	COPY ALL, SWAP ALL and CLEAR ALL, which work on every lane; the fourth blank
MIX, TAPE MIX	LEVEL EQ FX OUT	Nothing: the MUTE keys are on the strips
TAPE	TRK 1 and on	Nothing: the MUTE keys are in TRACKS
EDIT	The sound's sections	As on the iPhone
PROJECTS	SAVE SAVE AS NEW OPEN	REVERT on the second; SHARE is in the row of sliders
USER	PATCH KIT SAVE TICK	Nothing: SHARE and ALL are in the row of sliders, RENAME and DELETE at

the foot of the list

On EDIT a section key goes round *its rows* rather than its groups, with a dot for each row (7.3).

The lane keys, TRK 1 and on (TAPE, the recorder) and LANE 1 and on (ARP, GROOVE and KEY), share the four page keys' room. In an eight-lane project on every iPad but the mini they show the focused lane's four, 1 to 4 or 5 to 8, so each stays a finger wide: to reach a lane in the other four, tap its lane button. On the iPad mini they follow the lane buttons' page. A six-lane project has six narrower keys.

17.6 The strip: slots, DIE, UNDO, HELP and the octave

The strip above the keyboard holds thirteen keys, always in reach: the quick slots, DIE, UNDO and HELP, which the iPhone keeps under SHIFT on its keyboard, and OCT- and OCT+, the iPhone's – and +. From left to right: OCT-, 01 to 08, DIE, UNDO, HELP, OCT+. Each is one tap, with no SHIFT.

KEY	WHAT IT DOES
OCT-, OCT+	Move the focused lane's keyboard down or up an octave (3.2). Each lane keeps its own octave. On a kit lane they are wells and say A KIT HAS 24 SOUNDS, NOT 24 PITCHES.
01 to 08	The quick slots (3.6). Each shows its number and the name of the sound saved in it, or **EMPTY**. Tap to load the slot onto the focused lane; hold for a little over half a second to save the lane's sound into it, while a ring grows round the key. Synth lanes and kit lanes have separate sets of eight, and the strip shows the set for the focused lane.
DIE	A new random set for the page you are on, every press (3.7). On SEQ and TAPE it is a well: DIE WORKS ON THE SOUND PAGES. With a lane on EXTERNAL MIDI focused it is a well everywhere and says A MIDI LANE HAS NO SOUND OF ITS OWN.
UNDO	Takes back DIE's last roll, and pressed again the one before, up to eight (2.8.1). A well while there is nothing to take back, and where DIE is one.
HELP	Latches HELP (17.6.1).

17.6.1 HELP on the iPad

HELP is a key of its own on the strip. Press it once to latch HELP, and again to turn it off, with no SHIFT, on every screen, browsers included. It is filled while latched, and SHIFT reads **HELP** under its word, as on the iPhone.

The help window fills the left window (on SEQ, the left half of the grid). Its header reads HELP and the screen, and under it are two lines, TAP ANY CONTROL TO READ WHAT IT DOES and HOLD A KEY AND TILT TO LEAN, and the cells LEAN, SAMPLE, RECORD and SETTINGS, less any that can't act right now; the cells shown share the window's width (2.9.1). Tap a control and its line shows at the right of the header. While Settings, the recorder

or the sample editor is showing, HELP closes it and takes you back to where you were, with HELP off. Everything else HELP does is as on the iPhone (2.9.2).

17.7 The 32-key keyboard

The iPad's keyboard has 32 keys: 19 tall keys along the bottom, the naturals, like a piano's white keys, and 13 round keys above them, the sharps, like its black keys.

- **On a synth lane** the keys run up in semitones from F to C, two octaves and a fifth: F2 to C5 at the starting octave. The three C keys name the note they play, **C3**, **C4** and **C5** to start with, and change when you move the octave. The keys from C3 to B4 are the iPhone's two octaves, so a lane's octave means the same on both devices.
- **On a kit lane** each key is a pad and reads its number, as on the iPhone (3.3): tall keys 1 to 14 play pads 1 to 14, and the first ten round keys play pads 15 to 24. The last five tall keys and the last three round keys have no job on a kit lane and are wells.
- **It always plays.** SHIFT changes nothing on the keyboard, on any screen, TAPE included: the tape's tools are keys on TAPE's own rows (17.14).
- Keys light while held and ring while the focused lane's sequencer, arpeggiator or groove plays their note, and they light for a MIDI keyboard, as on the iPhone (3.4). On SEQ, tap a cell, then a key, as on the iPhone (8.3).

The X/Y key sits in the round row's gap before the middle C (C4 at the starting octave), where the iPhone's sits (17.13). There are no – and + keys in the iPad keyboard's gaps: OCT- and OCT+ are on the strip.

17.7.1 CHORD PAD on the iPad

With CHORD PAD on (3.12), the pad takes the keyboard's area, laid out as on the iPhone: the stick's panel on the left, with its knob and eight words, and the seven chord keys on the right, 5 to 7 over 1 to 4. Everything is larger, so the stick has more room to push. OCT- and OCT+ stay on the strip, with the slots, DIE, UNDO and HELP, so the pad has no keys at its ends, and the slots and UNDO still work with the pad on. Turn it on with SHIFT + CHORD on SYNTH, or with CHORD PAD in KEY's row (17.19).

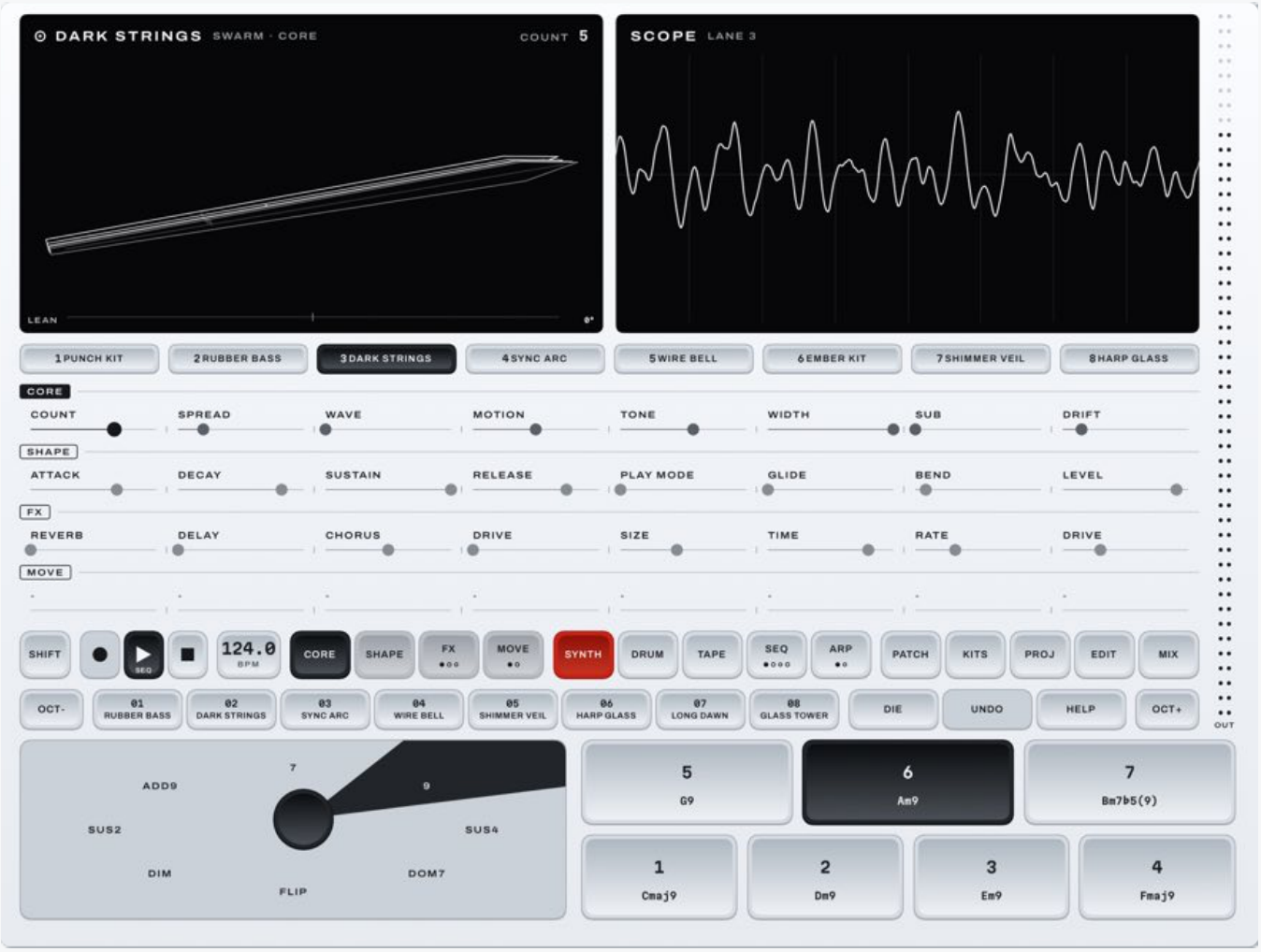


Figure 17.2 CHORD PAD on the iPad: chord 6 held with the stick pushed up and right, Am9, and every key showing its ninth chord.

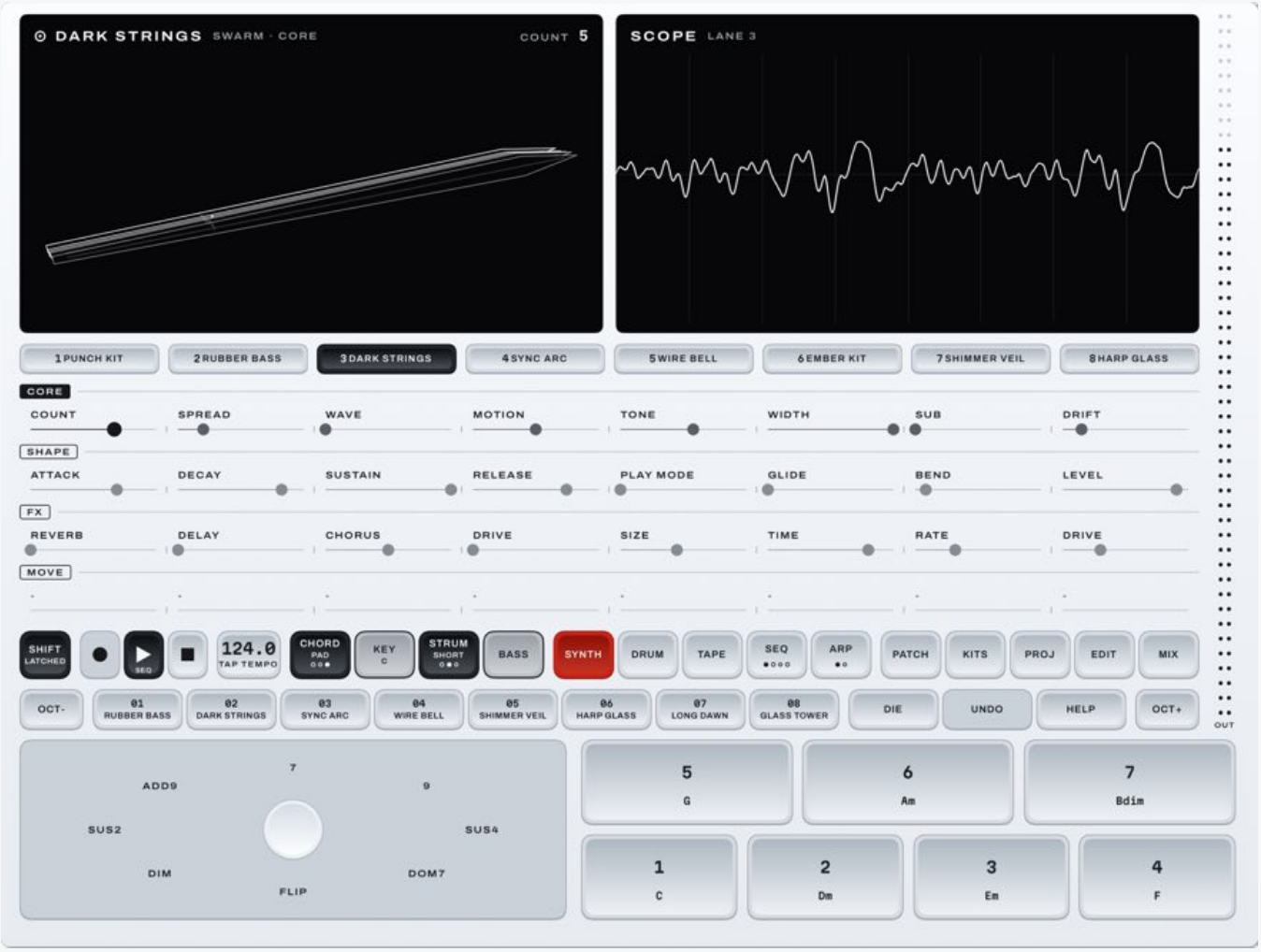


Figure 17.3 SHIFT on the iPad's SYNTH: the chord keys on the first four page keys. The pad stays, and the strip keeps the slots, DIE, UNDO, HELP and the octave.

17.8 What SHIFT still does

With every slider of a page in view, the keyboard's SHIFT layer on the strip and the doors on keys of their own, SHIFT on the iPad is kept for a few things, several of them things that erase. You tap it to latch it or hold it, as on the iPhone (2.7.1), and in a browser it reads BACK (2.7.3).

WHERE	SHIFT + ...	DOES
Every screen	the tempo key	TAP TEMPO (2.5.2)
SYNTH, on a synth lane	CHORD, KEY, STRUM or BASS, the first four page keys	The chord keys, as on the iPhone (3.12.1)
SYNTH, DRUM, EDIT, SEQ, MIX, ARP, GROOVE,	a double-tap on a slider	Puts back its last change (2.4.4)

an effect's CONTROLS		
Transport stopped, SHIFT held down	a lane button	Picks the lane to swap; with SHIFT latched a lane button only focuses its lane (2.12)
SEQ, PATTERN PLAY, PATTERNS, PERFORM	REC	Changes the record mode, LIVE or STEP, with two dots under REC while SHIFT is on (2.10)
SEQ, PATTERN PLAY, PERFORM	RESET, the fourth page key	Erases every pattern, after a second press (8.10.3)
SEQ's grid	PAT OCT- or PAT OCT+, the first two page keys	Moves every note of the pattern the header names down or up an octave (17.10)
PATTERNS	COPY ALL, SWAP ALL or CLEAR ALL	The same on every lane (8.14.4)
TAPE	the TOOLS row	Shows ERASE, TRACK and RESET (17.14)
TAPE	MIX	Opens TAPE MIX (17.15)
PROJECTS	REVERT, the second page key	Goes back to the save point, after a second press (13.6)
EDIT on a CINDER kit	COPY and PASTE, the first two section keys	Copies a pad onto another (7.5.8)
Sample editor	LOAD, the first page key	Audio files onto the pad (12.8.7)
Recorder	MUTE on a track key	Mutes that tape track (12.2.3)

Beyond that, SHIFT changes nothing. The rows' sliders, the strip, the keyboard, the mode keys, MIX's and TAPE's page keys, PLAY and STOP, REC everywhere but SEQ's screens, and every door key but MIX on TAPE do the same with SHIFT as without it.

17.9 The other screens on the iPad

SEQ, PATTERN PLAY, PATTERNS, PERFORM, the X/Y pad, TAPE and MIX have sections of their own below. The rest keep the iPhone's controls and jobs, laid out like this:

SCREEN	THE WINDOWS	THE ROWS OF SLIDERS
SYNTH (4.1)	Left: the picture for the row you are using, headed with the sound's name, its engine and the page. On CORE it is the engine's picture, NEW or CLASSIC as on the iPhone: a tap on the window switches it while you stay on the lane (4.5). Right: the SCOPE.	**CORE**, **SHAPE**, **FX**, **MOVE**, as many as fit (17.4.1)
DRUM (6.2)	Left: the kit's recording and its slices on a sampled kit; on KNOCK and CINDER the kit's 3D picture, NEW or CLASSIC (the pad's own plots) as on the iPhone, with KNOCK's plate numbers showing on the iPad. Right: PADS, three rows of eight.	**KIT** (labelled with the pad or slice, such as **KIT · PAD 03**), **KEY** (**KEY · WHOLE KIT**), then **FX** and **MOVE** as they fit. On a CINDER kit, **RESONATOR + DIRT** comes third on every iPad but the mini; it has no page key, so touch it to use it.
EDIT (7.2)	Left: the group list. Right: the SCOPE, its header reading the control you touched last.	A group a row, and two small groups of one section share a row. The rows start at the chosen section's first, and the next sections' rows fill the rest of the iPad's rows
ARP, GROOVE (9.2, 9.4.1)	Left: the pattern, or the groove. Right: LANES.	The arpeggiator's eight (the groove player's), and the lane's **SHAPE** row (on a kit lane, **KEY**). **ARP** pressed again puts KEY's eight in the first row's place (17.19)
PATCHES, KITS (5.1)	As on the iPhone	One row: **CURSOR** and **EXPORT**, with **FROM** between them on the factory KITS list; in USER, the **SHARE** and **ALL** keys after them, with **RENAME** and **DELETE** at the foot of the list
PROJECTS (13.3)	As on the iPhone, with RENAME and DELETE on the right	One row: **CURSOR**, **SHAPE**, **TAPE**, **EXPORT** and the **SHARE** key

Settings (14.1)	One window across the width with every row at once, in three columns: THEME and MIDI down to Lane 4 in the first; the rest of MIDI, CHORD PAD and AUDIO in the second; EXPORT, SYNC and ABOUT in the third. Nothing scrolls. A tap chooses the row under it and never changes a value. With the cursor on the **Chord pad** row, the header names the chord pad setting VALUE changes, such as Voice leading, and its value, since there is no second window to list them.	**CURSOR**, **VALUE**, **SECTION** and the BLUETOOTH key, in every section; on the **Chord pad** row **SETTING** takes BLUETOOTH's place and picks which chord pad setting VALUE changes (chapter 14)
Tempo page (3.9.1)	Left: all nine rows, Tempo to MIDI delay, each section's word beside its first row, and the cursor's place in the header, such as `01 / 09`. Right: the section the cursor is in, headed such as `SECTION 1 OF 4`, with a line at its foot saying what the cursor's row does.	**CURSOR**, **VALUE**, **SECTION**, **TEMPO**
Recorder (12.2)	Left: the counter and its lines, with no spools. Right: INPUT.	The band's eight in one row
Sample editor (12.8.2)	As on the iPhone	The slice's row, labelled such as **SLICE 01**, with the four page keys' pairs side by side, then **VIEW**, with **ZOOM**

Controls that have no job yet aren't on the iPad: TAPE's MEMO A and MEMO B, the sample editor's **PLAY** and Settings' **SCREEN**. On a lane on EXTERNAL MIDI, SYNTH and DRUM have one row, **MIDI**, with the lane's **CHANNEL** across it, and ARP keeps only the arpeggiator's row (chapter 16).

17.10 SEQ: four bars at once

On the iPad, SEQ's one window shows the focused lane's pattern four bars at once (two on the iPad mini): a row of sixteen steps for each bar, with the bar's number at its left. The header reads the lane, the pattern and its length, such as `LANE 8 · PATTERN 01 · 4 BARS`, and at its right the bar you are in, such as `BAR 3/4`: the bar of the cell you touched last, or the bar playing while the pattern plays. A control you touch shows its value there while your finger is on it and for a moment after. A bar past the pattern's LENGTH is drawn faint; its steps are kept and play when LENGTH reaches them (8.6.2). Under the grid, small maps show the other lanes' patterns.



Figure 17.4 The whole four-bar pattern at a glance, with the pattern's settings, the lane mutes and live recording's settings all in reach. STEP stays drawn off until you choose a step with notes.

SEQ's rows of sliders:

- **PATTERN**: **PATTERN**, **LENGTH**, **SPEED** and **SWING** (8.6.1), then a MUTE key for each lane the lane buttons show, the iPhone's MUTE page (8.9).
- **STEP**: the chosen step's settings (8.6.3), drawn off until you choose a step with notes. Its label then names the step, such as **STEP · S05**.
- **REC**: live recording's settings (8.7.2, 8.8).

The 12.9- and 13-inch iPads show all three. The 10.9- and 11-inch iPads and the iPad mini show **PATTERN** and **REC**, and **STEP** takes REC's place while a step with notes is chosen. On the iPad mini, **BAR**, the last slider of REC and of STEP, picks which two bars the window shows (8.7.1).

The page keys are UNDO, REDO, CLEAR and LATCH, and under SHIFT the fourth is RESET (8.10, 8.5). There are no PAT, BAR and MUTE keys: everything they show is already in view. REC records in the record mode, LIVE or STEP, and SHIFT + REC changes it, as on

the iPhone (2.10); during a STEP REC pass the page keys read UNDO, REDO, REST and TIE (chapter 8).

Under SHIFT on the grid, the first two page keys are PAT OCT- and PAT OCT+, the iPhone's two keys on PAT's band. Each press moves every note of the pattern the header names an octave down or up, and is one step for UNDO. They are drawn off on a drum lane, while a take records, on a pattern with no notes, and when a note would leave the range, and pressed they say why, such as A NOTE WOULD GO ABOVE THE TOP (8.6.5).

17.11 PATTERN PLAY and PATTERNS

The iPad has no PAT key. Press SEQ's own mode key again instead. Each press goes one place on, and the filled one of the four dots on the key shows where you are:

01 The grid (17.10).

02 PATTERN PLAY.

03 PERFORM (17.12).

04 PATTERNS, and the next press is back at the grid.

On all four the slider rows keep SEQ's, so the pattern's settings and the lane mutes stay in reach.

PATTERN PLAY is one wide window with the sixteen boxes in two rows of eight. Its header reads PATTERN PLAY · ALL LANES, and at the right PLAYING 01, or NEXT and the number while a switch waits. Tapping a box works as on the iPhone (8.13). The page keys are SEQ's.

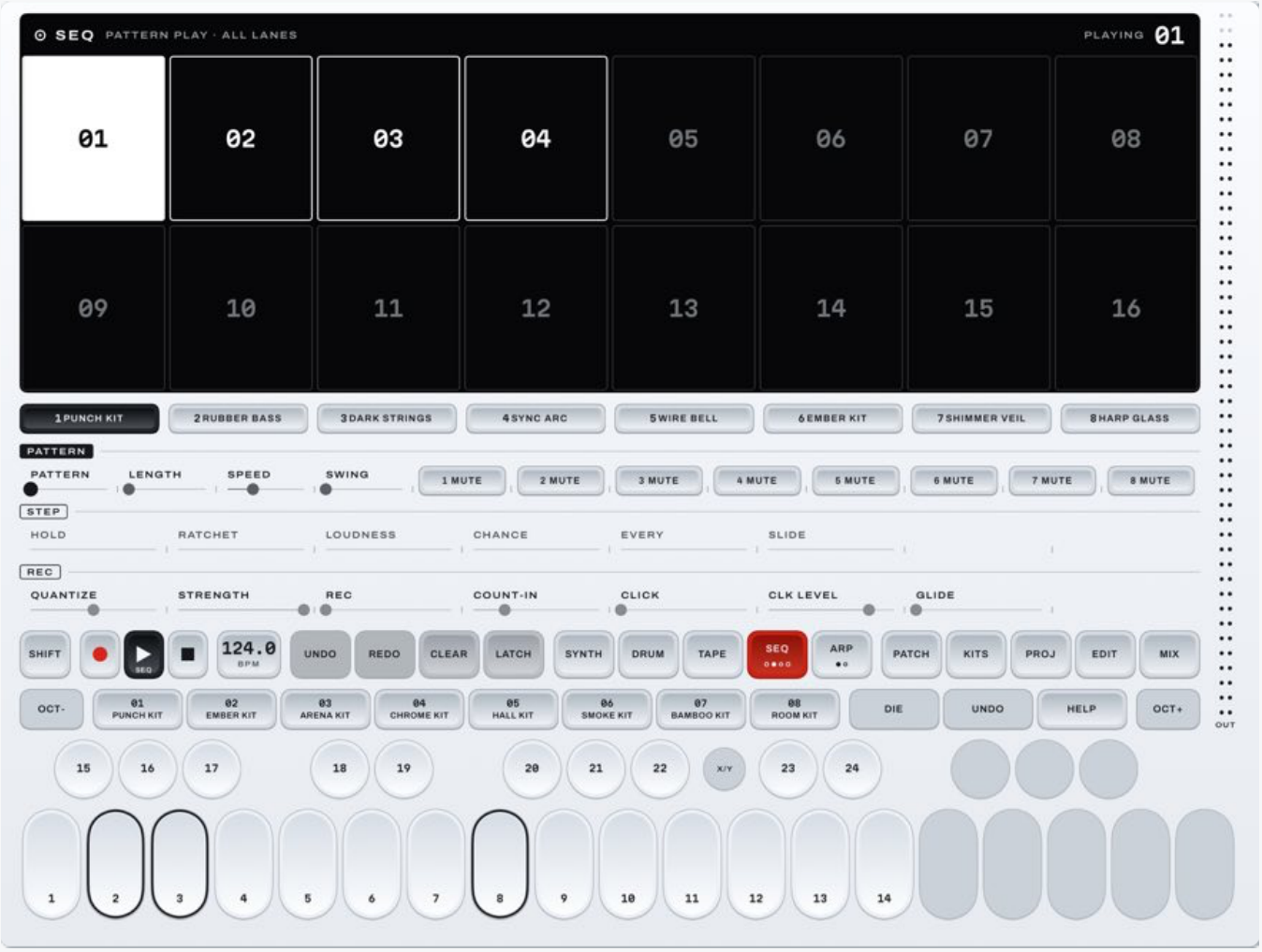


Figure 17.5 All sixteen patterns in one grid. The solid box is playing on every lane; an outlined one holds notes and waits for a tap. The second dot on SEQ's key is filled: PATTERN PLAY is its second place.

PATTERNS is one wide window with the focused lane's sixteen patterns as tiles, two rows of eight, headed with the lane, such as `LANE 1 · PATTERNS`, and at the right `PLAYING` and the number the lane is playing. The page keys are `COPY`, `SWAP`, `CLEAR` and `BACK`: BACK goes to the grid, where the iPhone has PAT. Under SHIFT the first three read `COPY ALL`, `SWAP ALL` and `CLEAR ALL` and work on every lane, BACK is blank, and the header reads `ALL LANES · PATTERNS`. How each one works: 8.14.

17.12 PERFORM

PERFORM is the third place of SEQ's key on the iPad. Its two windows hold one fader a lane: TONE's on the left, headed SEQ and `TONE · DARKER–BRIGHTER`, and SPACE's on the right, headed SPACE and `DRY–WET`. At the right, each header reads the lane last touched in it and where its fader stands, such as `LANE 3` and **+12**. Every iPad but the mini shows all eight lanes of an eight-lane project; the iPad mini shows the four on the lane buttons' page.

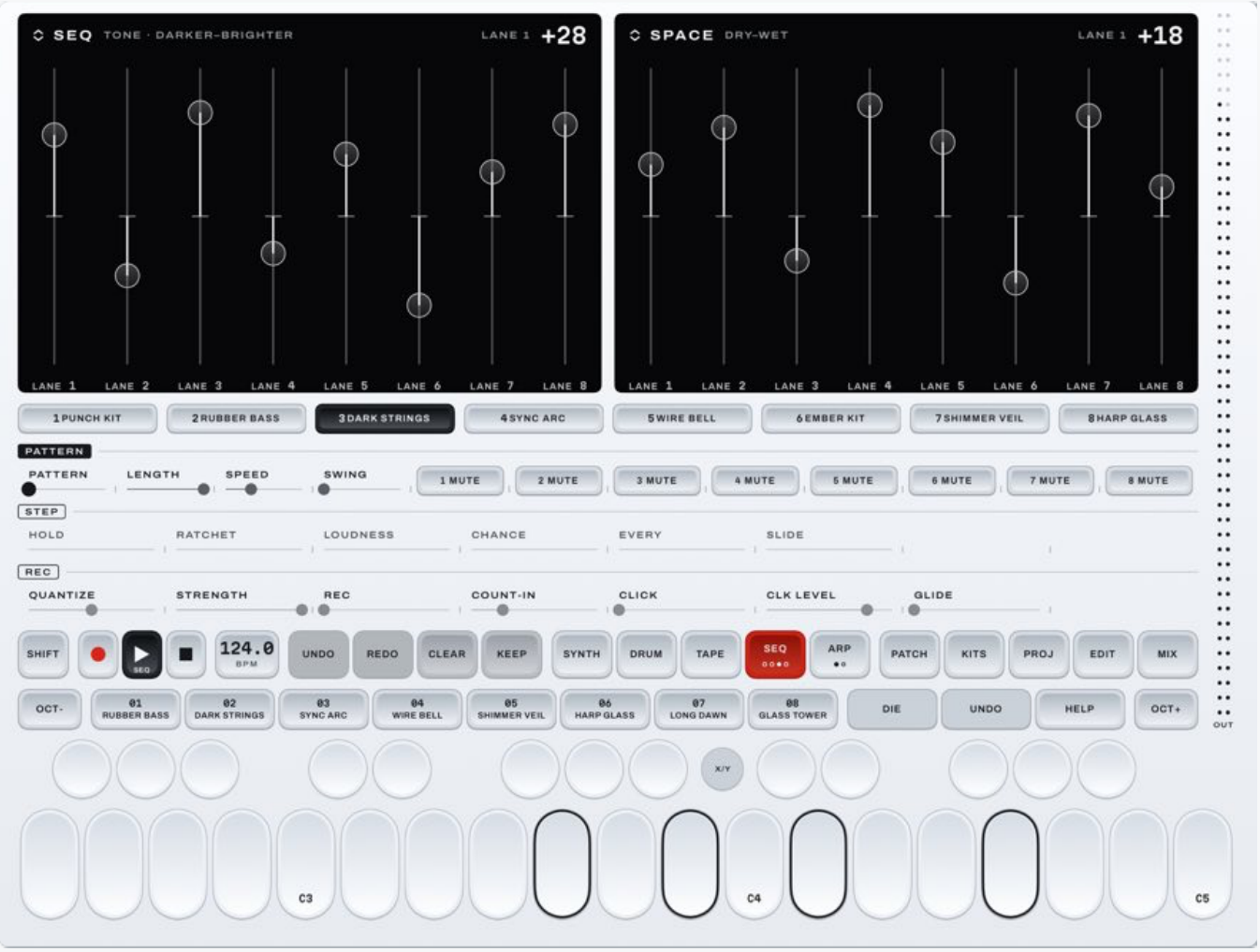


Figure 17.6 Every lane's TONE and SPACE side by side. STOP glides them all home unless KEEP is lit.

The page keys are UNDO, REDO, CLEAR and KEEP. KEEP is lit while on, and KEEP then joins the right window's header, a small grey word after DRY–WET. Under SHIFT the fourth key is RESET and the other three are blank. How the faders, STOP and KEEP work: 15.1.

17.13 The X/Y pad

Press X/Y, in the keyboard's round row before the middle C, on SYNTH, DRUM, TAPE or ARP (GROOVE), and the right-hand window becomes the pad, with the scope still drawn behind it. The key is lit while the pad shows; press it again to put the window back.

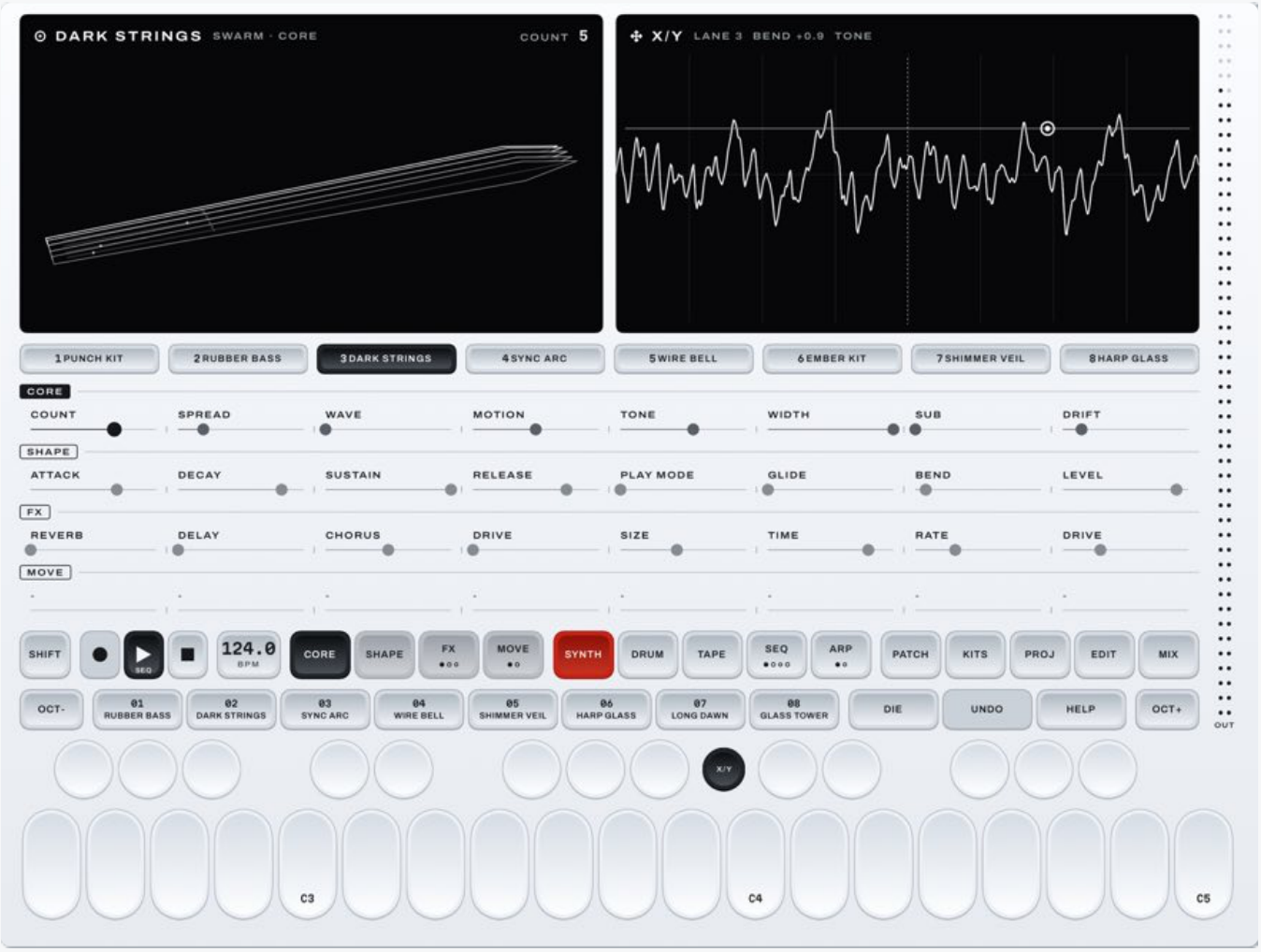


Figure 17.7 The X/Y pad in SYNTH's right window, with the scope still running behind it. A finger is bending lane 3 up 0.9 of a semitone with X; Dark Strings has no mod wheel set up, so Y moves its TONE.

- The header names X/Y and the focused lane, then what X reaches, such as **BEND ±2** or **NO BEND**; while your finger bends, it reads the bend in semitones, such as **BEND +1.4**. On a sound that routes the mod wheel, **MOD** and its amount read at the right; on any other sound the header says **TONE** or **NO TONE** beside BEND.
- On every other screen the key is a well and says **X/Y PAD: SYNTH, DRUM, TAPE OR ARP**. The pad stays on and comes back when you return to one of those four. On those four screens, with a lane on EXTERNAL MIDI focused, the key says **A MIDI LANE HAS NO SOUND OF ITS OWN**.

How to play the pad, and what STOP does to it: 15.6.

17.14 TAPE

The left window, **TAPE**, shows the counter and the tape itself running toward you past the head. There are no spools on the iPad. Drag across the window to wind the tape, as on the iPhone (11.6). The header reads the TAPE row's control you touched last; POSITION reads on the counter instead.

The right window, **TRACKS**, has a row for each tape track with its takes, the loop and the playhead (11.1.2): all eight in an eight-lane project on every iPad but the mini, which shows the four on the lane buttons' page. A track's number turns red while it is armed. Along the foot is a `MUTE` key for each track, `MUTE 1` and on: a tap mutes or unmutes it, with no SHIFT, and a muted track's key is filled and its takes' waveforms are drawn dim. Pinch to zoom the rows and double-tap to go back to 8 bars (11.18). The header names the zoom, the loop's bars and the tape clock.

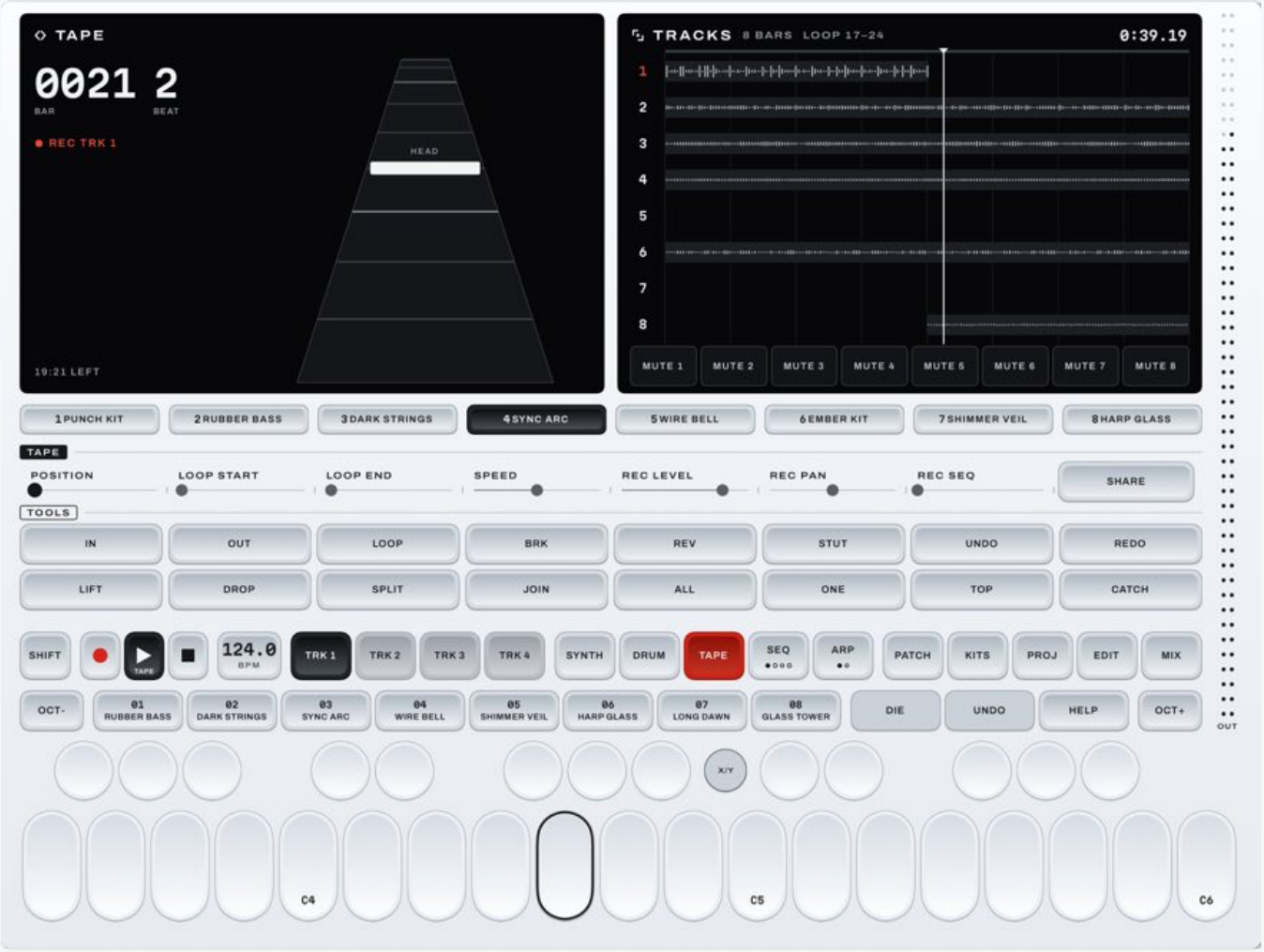


Figure 17.8 On the iPad the tape's tools are keys of their own, one tap each, and each track has its MUTE key.

TAPE's rows of sliders:

- **TAPE**: **POSITION**, **LOOP START**, **LOOP END**, **SPEED**, **REC LEVEL**, **REC PAN** and **REC SEQ** (11.5, 11.7), then the SHARE key in the row's last place, with or without SHIFT. It shares what PLAY would play as a video or as audio alone, as the iPhone's SHARE in the tool row does (11.19).
- **TOOLS**: the tape's tools as keys, with no SHIFT, in two lines of eight (one line of sixteen on the iPad mini): IN OUT LOOP BRK REV STUT UNDO REDO, then LIFT DROP SPLIT JOIN ALL ONE TOP CATCH. Under SHIFT, ERASE, TRACK and RESET take the last three places and every other key is blank. What each tool does: 11.8 to 11.14.

The page keys, TRK 1 and on, choose the track to record onto (11.2) and have no SHIFT layer. Which of them show is in 17.5.1. The keyboard keeps playing under SHIFT, and DIE and UNDO are wells on TAPE.

17.15 MIX and TAPE MIX

Press MIX. The left window holds a strip for each lane, **CHAN 1** and on: a fader with the channel's meter beside it, a **BAL** line, and a MUTE key, MUTE 1 and on. A muted channel's name turns red. Every iPad but the mini shows all eight strips of an eight-lane project; the iPad mini shows the four on the lane buttons' page.

- Drag a fader up or down for the level, and drag BAL across for the balance (10.3).
- A MUTE key mutes or unmutes its channel at a touch, with no SHIFT (10.4).
- The header reads what you touched last.
- The right window is an EQ curve with its three handles: the focused lane's own EQ, headed such as LANE 3 EQ, or, after EQ pressed again, the master's, headed MASTER EQ (10.5). Tap a lane button to show that lane's EQ. On the FX page the window shows the master effect's eight controls and their values.

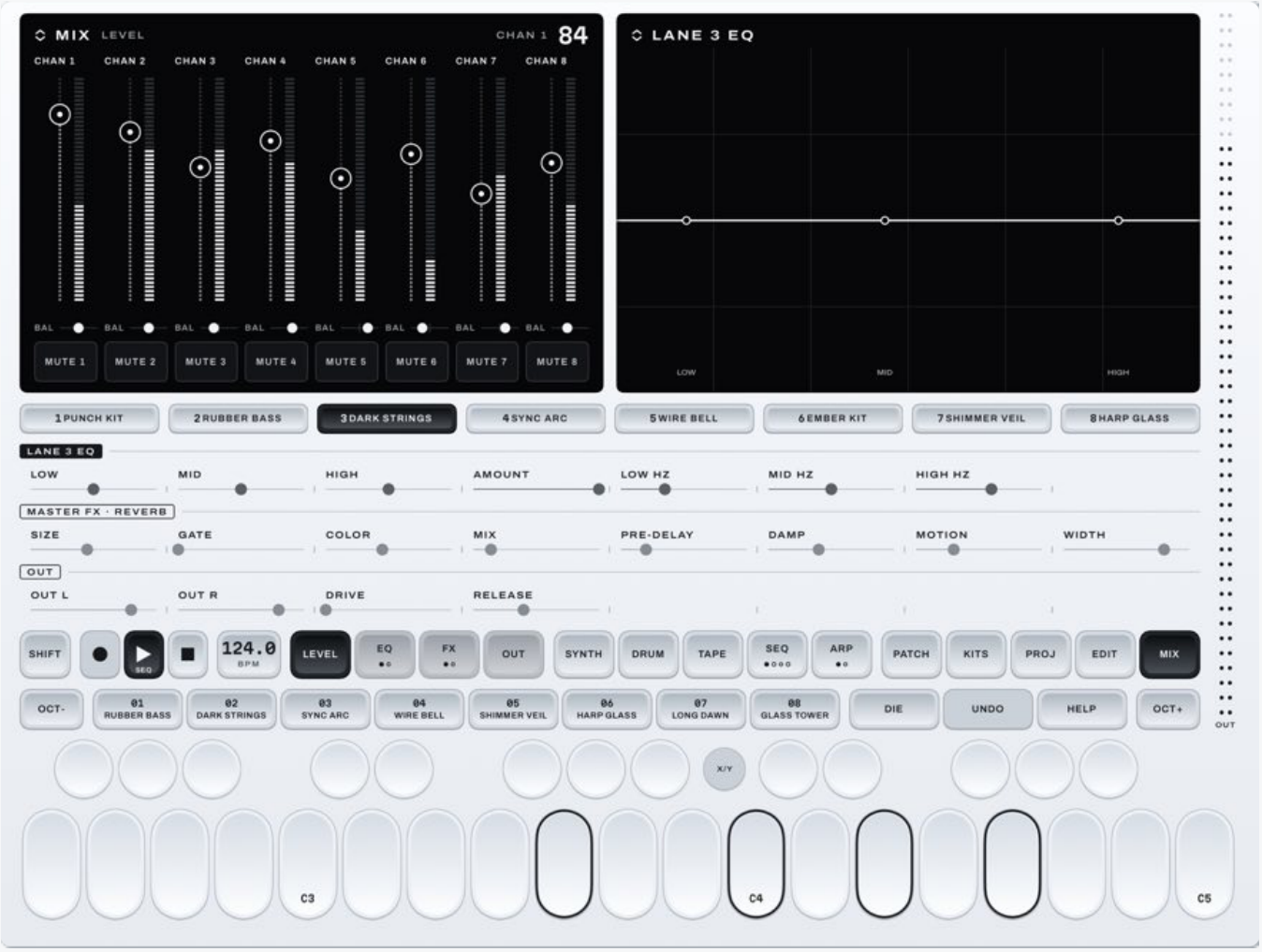


Figure 17.9 The whole mix on one screen: every lane's strip, the focused lane's EQ, and the master effect and OUT on the rows below. EQ pressed again shows the master EQ instead.

MIX's rows of sliders are the EQ row, titled like the right window, **LANE 3 EQ** or **MASTER EQ**, with that EQ's seven (**LOW**, **MID**, **HIGH**, **AMOUNT**, **LOW HZ**, **MID HZ**, **HIGH HZ**), **MASTER FX**, labelled with the master effect, with its eight controls (10.6), and **OUT** (**OUT L**, **OUT R**, **DRIVE**, **RELEASE**; 10.7). The iPad mini shows the first two, and OUT's page key brings OUT in. The page keys are LEVEL (the strips), EQ, FX and OUT. EQ wears two dots: pressed again, it goes between the focused lane's EQ and the master's, and MIX remembers which until Tonaut quits. FX pressed again opens the master effect list.

TAPE MIX: on TAPE, press SHIFT + MIX. It is the same screen for the tape tracks: the header reads TAPE MIX, the strips are **TRK 1** and on with their own balances, the MUTE keys mute tape tracks, and the EQ is always the master's (10.10). The same press closes it. MIX on its own opens MIX, the lanes' mixer, from every screen, TAPE included, and switches to it from TAPE MIX.



Figure 17.10 TAPE MIX: all eight tape tracks' levels, balances and mutes at once.

17.16 Pop-ups

Two of the iPhone's sheets open as smaller pop-ups on any iPad:

- **The Bluetooth MIDI list.** Press BLUETOOTH in Settings' row of sliders, or MIDI again on the MIDI section. Apple's list opens in a pop-up pointing at the BLUETOOTH key. Its Done, or a tap outside it, closes it (14.3.1).
- **The share sheet.** It opens in the middle of the screen for SHARE on PROJECTS (13.13), in USER (5.11.2) and on TAPE (11.19), and after a MIDI export (14.8.7). TAPE's SHARE first asks VIDEO or AUDIO ONLY in a small pop-up of its own, as on the iPhone.

17.17 Light and dark housings

The iPad has a light and a dark housing, chosen in Settings on the **Housing** row, as on the iPhone (14.2.1). On an iPad the row offers **AUTO**, **LIGHT** and **DARK**, and AUTO follows the iPad's own light or dark appearance. The iPhone's TN looks, TN-1, TN-1 DARK and TN-XY (2.1.1), aren't offered on any iPad, the older ones that play the iPhone panel included. On the iPad panel the windows are the same black in both housings; the dark housing darkens the panel and the keys around them. The page keys rest a shade apart from the mode keys, greyer in LIGHT and a step lighter in DARK, as on the iPhone (2.5.1).

On any iPad the windows start without scan lines. To turn them on, use the **Scan lines** row in Settings (14.2.2).

17.18 Moving projects between iPhone and iPad

An iPhone and an iPad play the same projects. There are two ways to move one across:

- **SHARE** sends a project as one song file, by AirDrop, Messages, Mail or Files (13.13). On the iPad panel, SHARE is a key in PROJECTS' row of sliders and needs no SHIFT. The file opens on an iPhone or an iPad as a new project (13.14). Your own sounds go the same way, with SHARE in USER (5.11.2).
- **iCloud sync**: turn it on on both, signed in to the same iCloud account, and a project you open on one can be opened on the other (14.9). On the iPad, the lines about the other device say DEVICE (17.1.2).

A project keeps its shape, eight lanes or six (13.15), on both. An eight-lane project shows four of its lanes at a time on the iPhone and the iPad mini, and all eight in a row on the other iPads. Each device keeps its own Settings and quick slots: they don't travel with a project or through iCloud.

17.19 KEY: the scale and chords in one row

KEY is ARP's second place, as on the iPhone: press ARP, then ARP again. The second of its two dots fills, a third press goes back to the arpeggiator, and leaving ARP leaves KEY. Each lane has its own key, scale and LOCK, as on the iPhone, unless Settings' CHORD PAD section sets them for every synth lane at once (chapter 14), and the page keys, LANE 1 and on, choose the lane. What the scale, LOCK and the chords do is in 3.11, and CHORDS with the arpeggiator in 9.9. SCALE lights the keys as on the iPhone (3.11.2), on all 32 of them.

On the iPad, KEY's eight controls stand in one row in the arpeggiator's row's place, titled **KEY**, with no SHIFT: **KEY**, **SCALE**, **LOCK** and **CHORDS**, then **TYPE**, **7THS** and the LEARN key, which the iPhone keeps under SHIFT, and **CHORD PAD** (3.12). The row under it stays the lane's **SHAPE** (on a kit lane, **KEY · WHOLE KIT**).

- **The left window**, headed KEY and the lane, shows the twelve notes with the scale's notes boxed and the root's box heavier, the scale and LOCK, such as `A MINOR · LOCK ON`, how a key plays on this lane, such as `CHORDS ON · TRIADS IN THE KEY`, and the last key's notes with the chord's name, such as `A MIN · A3 C4 E4`, so it changes as you play. At the right of the header, the value of the control you touched last.
- **The right window** is LANES, as on ARP (9.2.3).
- **A control drawn off says why** when you tap it: LOCK with no scale, `CHOOSE A SCALE FOR LOCK TO KEEP TO`; TYPE with a scale, `WITH A SCALE THE CHORDS FOLLOW THE KEY`; 7THS with no scale, `7THS IS FOR CHORDS IN A SCALE`. On a kit lane CHORDS, TYPE, 7THS and LEARN are drawn off and say `A DRUM LANE PLAYS NO CHORDS`.

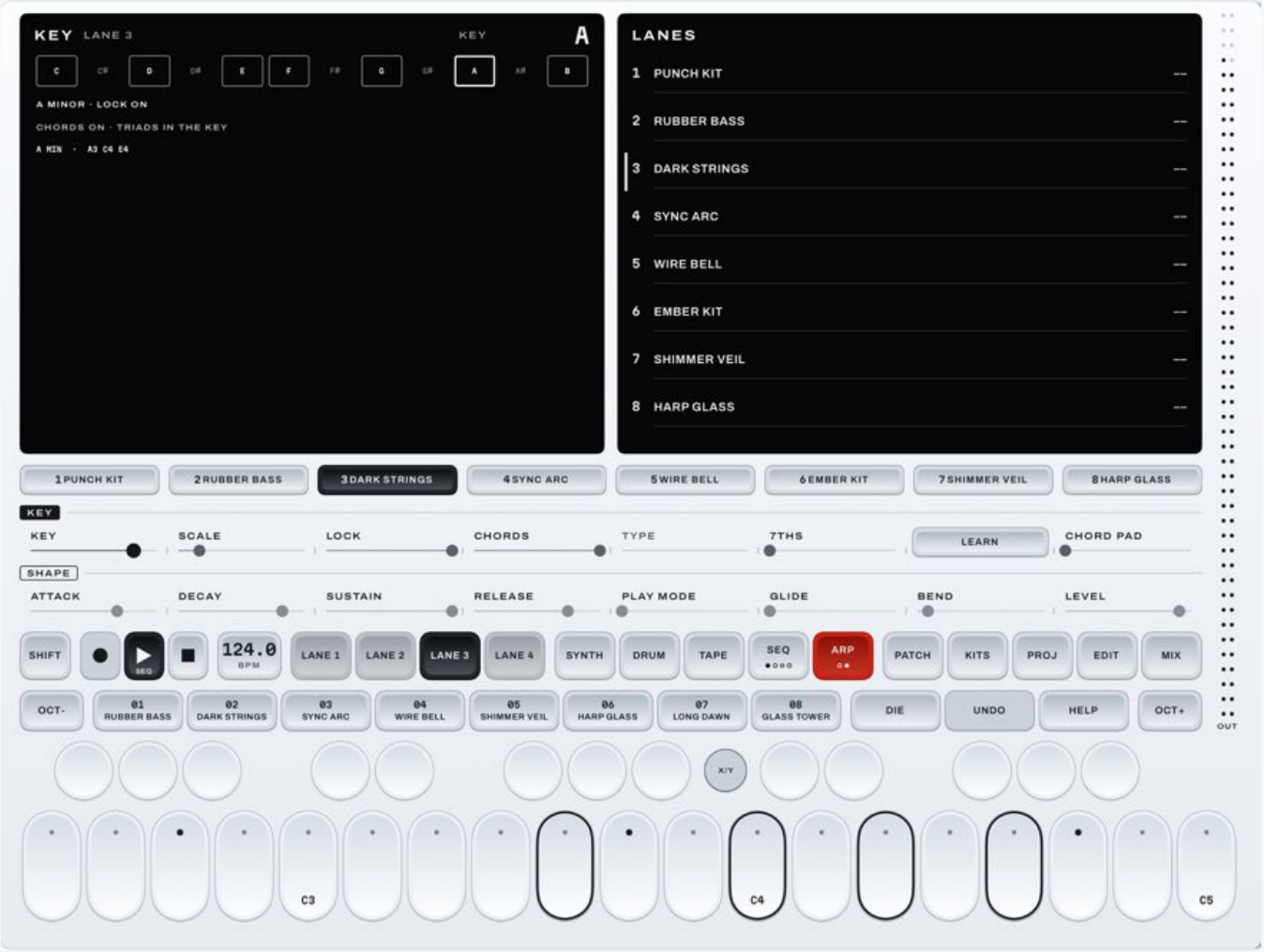


Figure 17.11 KEY on the iPad: the iPhone's KEY band and its SHIFT layer in one row. TYPE is drawn off because a scale is set; the dots on the keys show the scale.

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