CIRCUIT RHYTHM

CIRCUIT RHYTHM
User Guide

Trade Marks

The Novation trademark is owned by Focusrite Audio Engineering Ltd. All other brand, product and company names and any other registered names or trade marks mentioned in this manual belong to their respective owners.

Disclaimer

Novation has taken all possible steps to ensure that the information given here is both correct and complete. In no event can Novation accept any liability or responsibility for any loss or damage to the owner of the equipment, any third party, or any equipment which may result from use of this manual or the equipment which it describes. The information provided in this document may be modified at any time without prior warning. Specifications and appearance may differ from those listed and illustrated.

Copyright and Legal Notices

Novation and Circuit are trade marks of Focusrite Audio Engineering Limited.

Contents

Introduction

Circuit Rhythm is a versatile sampler for making and performing beats. Record samples directly to the hardware, then slice, sculpt and resample your sounds effortlessly. Capture your groove either quantised or off-grid into the sequencer, and layer up across eight sample tracks. Invigorate your live set with performance FX: embrace imperfection with vinyl simulation, stutter your mix with beat repeat... and more. Integrate Circuit Rhythm into your studio, or unplug and create anywhere using the built-in rechargeable battery.

Circuit Rhythm is both a compositional tool and a live performance instrument. It's an eight track sample-based groovebox with pitching and slicing capabilities. It lets you create music fast: getting patterns together is rapid and intuitive. If you're working in the studio, Novation's superior sound quality means you can use Circuit Rhythm as the basis of your finished track.

The playing grid is a set of 32 illuminated, velocity-sensitive pads, which act as a chromatic keyboard, sample slices, drum pads, sequencer steps and perform numerous other functions. The pads' internal illumination is RGB colour-coded*, so you can see at a glance what's going on.

Eight rotary controls are provided to let you tweak sample parameters to perfection and the Master Filter control is always available to further enhance your performance. You can start with a simple pattern of 16 of 32 steps and then rapidly assemble these together into more complex patterns of great length.

You can save your work in one of 64 internal Project memories. Additionally, Circuit Rhythm's powerful Packs feature lets you access, create, and save thousands of Projects, and samples on a removable microSD card.

Circuit Rhythm integrates with Novation Components, a powerful software application which lets you swap out your samples and store your work in the cloud.

For additional information, up to date support articles and a form to contact our Technical Support Team please visit the Novation Help Centre at: support.novationmusic.com

* RGB LED illumination means that each pad has internal red, blue and green LEDs, each of which can light at different intensities. By combining the three colours at different brightness levels, almost any colour of illumination can be achieved.

Key Features

- Eight sample tracks

- Slice samples or play them chromatically

- Flexible playback options: Loop, Reverse, One Shot, Gated & Choke

- RGB grid with 32 velocity-sensitive pads for playing and displaying information

- Eight customisable macro encoders for further "tweaking" of sounds

- Hands-on sequencing with eight chainable 32-step patterns, non-quantised record, step probability, pattern mutate, sync rates, and more

- Sample recording via stereo input, or resample internal audio

- Instant performance control with Grid FX

- Drum Pad performance mode with beat repeat functionality

- Reverb, delay and side chain FX

- DJ-style master filter (Low pass/High pass)

- microSD support – save thousands of samples and projects across 32 packs.

- Built-in rechargeable battery with 4 hours of battery life

- Novation Components integration – send samples, edit Grid FX and backup projects

- Full size 5-pin MIDI In, Out and Thru

- Analogue sync out

- Stereo audio output (L/R pair)

- Headphone output

About this manual

We've tried to make this manual as helpful as possible for all types of user, both newcomers to beatmaking and those with more experience. If you've already been beatmaking for a while, you may want to skip over certain parts of the manual. If you're just starting out, you may want to avoid certain parts until you're certain you've mastered the basics.

However, there are a few general points that are useful to know about before you continue reading the manual. We use some graphical conventions within the text, which we hope everyone will find helpful in navigating through the information to find what you need to know quickly:

Abbreviations, conventions, etc.

Where we refer to top panel controls or rear panel connectors, we've used a number thus: Ⓧ to cross-reference the top panel diagram, and thus: Ⓧ to cross-reference the rear panel diagram. (See pages 16 and 19). We've used **Bold** text to name physical things – the top panel controls and rear panel connectors, and have made a point of using the same names used on Circuit Rhythm itself. We've used *smaller Bold italics* to name the various Views that the grid can display.

Tips

	These include advice relevant to the topic being discussed that should simplify setting up Circuit Rhythm to do what you want. It's not mandatory that you follow them, but generally they should make life easier.

What's In The Box

Please check the list below against the contents of the packaging. If any items are missing or damaged, contact the Novation dealer or distributor where you purchased the unit.

- Novation Circuit Rhythm Groovebox
- USB Type A to Type C cable (1.5 m)
- Safety information sheet
- AC adaptor: 5 V DC, 2 A; includes interchangeable AC plugs

Getting Up and Running

We've made getting up and running with Circuit Rhythm as easy as possible, whether you're a brand new beatmaker or a seasoned producer. The Easy Start Journey will take you through the basics of making your first beat with Circuit Rhythm, with videos covering the fundamentals of the machine's workflow.

To access the Easy Start Journey, first connect your Circuit Rhythm to your computer with the USB-A to USB C cable supplied.

If you're on a Mac:

1. On your Desktop, find and open the folder named **RHYTHM**.
2. Inside the folder, click the file **Circuit Rhythm – Getting Started.**
3. Inside the drive click the link **Click Here to Get Started.html**.
4. You'll be taken to the Easy Start Journey where we'll get you set up.

Alternatively, if you have Google Chrome open when you connect Circuit Rhythm, a pop-up will appear that will take you straight to the Easy Start Journey.

If you're on Windows:

1. Click the Start button and type "This PC", then press Enter.
2. In the "This PC" window, find the drive named **RHYTHM** and double click it.
3. Inside the drive, click the link **Click Here to Get Started.html**.
4. You'll be taken to the Easy Start Tool where we'll get you set up.

Novation Components Overview

Visit Novation Components at components.novationmusic.com to unlock the full potential of Circuit Rhythm. Use Components software to load your own samples, get new artist-made packs, create Grid FX templates, back-up your work, and install the latest firmware updates.

IMPORTANT!
To ensure that your Circuit Rhythm has access to its full functionality, please update your unit using Components.

Having Trouble?

In case you're having any trouble getting set up, don't hesitate to contact our support team!
You can find more information and answers to FAQs in the Novation Help Centre at
support.novationmusic.com.

Power Requirements

Circuit Rhythm can be powered in any of three ways:

- from a computer with a USB 3.0 port, via the USB-C connection

- from AC mains, using the supplied AC adaptor and the USB-C connection

- from the internal lithium-ion battery

Powering from a computer

Circuit Rhythm can be powered from a computer or laptop via the USB connection. Use the supplied cable to connect the unit to a Type 'A' USB port on the computer or laptop. The internal battery will be charged while the unit is connected (provided that the computer is powered on and that its USB ports have an adequate power rating).

You can power your Circuit Rhythm with a USB-C to USB-C cable if required. A cable of similar length to the included USB-A to USB-C cable will offer the same performance.

Using the AC adaptor

The AC adaptor supplied with the unit is a 5 V DC, 2 A type with a Type 'A' USB output, and can operate on mains voltages from 100 V to 240 V, 50 or 60 Hz. The adaptor has interchangeable slide-in AC plug heads; different plug heads are supplied which make the adaptor compatible with AC outlets in many different countries. Plug heads can be swapped if necessary by pressing the spring-loaded semi-circular button in the centre of the adaptor and sliding the plug head upwards to separate it from the adaptor body. Then slide in the correct plug head (as shown by the arrows), ensuring that it locks firmly in place.
Use the supplied cable to connect the AC adaptor to the Type 'C' USB port on the rear panel of Circuit Rhythm (6 on page 19).

The use of AC adaptors of a type other than that supplied is not recommended. Please contact your Novation dealer for advice on alternative PSUs if necessary.

Using the internal battery

Circuit Rhythm will also operate from its internal Lithium-ion battery. The internal battery is not user-serviceable. If you are having issues with your battery, please contact your distributor or the Novation support team directly.

Circuit Rhythm will operate for up to 4 hours, depending on battery state. When powering on Circuit Rhythm, the remaining charge level will be displayed on the pads. If the central 12 pads are green, the charge level is high. As the charge level decreases, fewer of the central pads will be lit in the battery indication view:

Battery at 100%

Battery at 50%
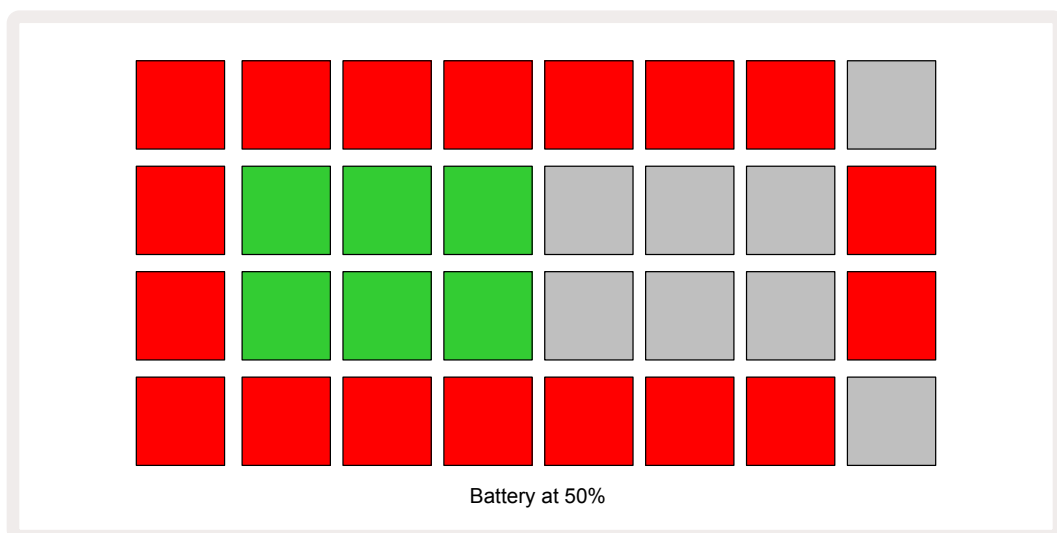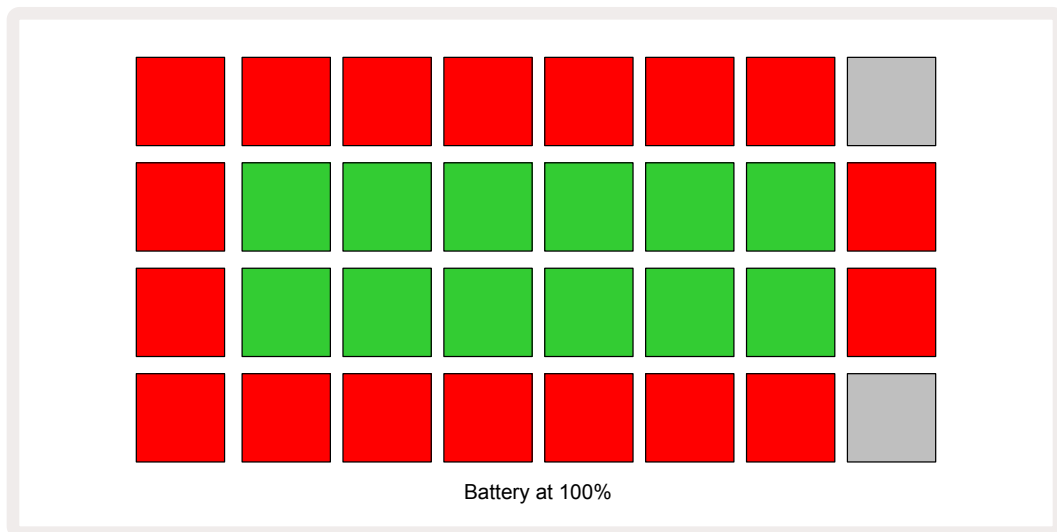
The battery will be charged while Circuit Rhythm is connected to the AC mains via the AC adaptor, or to a computer's USB 3.0 port: charging time is up to 4 hours, again depending on initial battery state. To indicate that Circuit Rhythm is charging, the power button (**8** on page 19) be lit green.

See also the Important Safety Instructions packed with the product for information regarding battery disposal: this information can also be downloaded from the Novation website.

Hardware Overview

Glossary

Some of the terms used in this manual have a specific meaning as applied to Circuit Rhythm. Here is a list:

Term	Button	Definition
Drum Pads View	**Shift + Sample Rec**	Lets you play the samples currently assigned to each track manually. You can play them manually, or with note repeat.
Expanded View	**Shift + Note**	Doubles the size of the note keyboard from one to two octaves.
Fixed	**Shift + Velocity**	Allows the velocity response of the grid pads to be disabled.
FX View	**FX**	Allows you to add reverb and delay to individual tracks.
Gate View	**Gate**	The Gate value of a sample is how many steps it sounds for. *Gate View* allows the length of a step to be edited. Individual gate values can be set for each sample assigned to a single step by using live record.
Grid FX	**Shift + Mixer**	A collection of seven different customisable live performance effects.
Grid pad		One of the 32 pads making up the main performance area.
Hold		Holding certain buttons down for more than half a second will produce a different result from "tapping" them. Such an action is termed a "hold". See also "Tap"
Input Attenuator		A switchable 12 dB pad to reduce sample recording level.
Input Monitoring		Choose whether or not audio from the inputs will be heard.
Latch		A function available in Grid FX and Drum Pads View which changes a button's behaviour from momentary to toggle.

Term	Button	Definition
Live Record	**Record**	Lets you add samples in real time to a pattern while it's playing. Also records any movements of the Macro controls.
Macro Controls		Eight rotary controls whose function varies with the currently selected View; used to "tweak" the sample sounds.
Manual Sample Entry		Assignment of samples to specific step in a pattern. With a step pad pressed, press the performance pad for the sample to be added. Can be done with the sequencer either running or stopped.
Micro step	**Shift + Gate**	The interval between consecutive Steps in a Pattern is further subdivided into six micro steps; these may be used for "off-grid" timing of samples.
Mutate	**Shift + Duplicate**	Randomises the Steps of a Pattern at which the assigned samples will play.
Note View	**Note**	A View that gives you a standard chromatic keyboard for playing the selected sample.
Pack		A complete set of Projects and Samples. Up to 32 Packs can be exported to a Micro SD card for external storage.
Pattern		A repeating sequence of up to 32 steps, on any of the eight tracks. Includes per-step data for velocity, gate, probability and automation.
Pattern Chain		A cyclic set of Patterns played continuously one after the other.
Pattern memory		Where a Pattern is stored; there are eight per track in each Project.
Pattern Settings View	**Pattern Settings**	A View that lets you set Pattern start and end points, Pattern rate relative to the BPM and Pattern play direction.
Patterns View	Patterns	This View displays the eight Pattern memories per track (as two pages of four), and allows their selection individually or as a Pattern Chain, deletion and duplication.

Term	Button	Definition
Playback Cursor		In playback, the white pad which moves through the pattern display, indicating which step is currently being played. Changes to red in Record Mode.
Probability		A parameter of each step in a Pattern which defines how likely it is that the step will be played.
Probability View	**Shift + Pattern Settings**	Lets you assign Probability values to each active step in a track.
Project		A set of all necessary data for full playback of all tracks, including Patterns, Sequences, automation data, etc. Up to 64 Projects can be saved internally, or as a Pack in flash memory.
Record Mode		Circuit Rhythm's operating mode when samples can be added to the pattern, or when adjustments using the Macro controls can be saved. The **Record** button will be lit bright red.
Recording Source		You can either record your samples from an external sound source, or "resample" internally processed sounds: selected in Sample Rec View.
Recording Threshold		A user-selectable option used in sample recording: when active, recording does not start until the signal level exceeds a preset level.
Sample View	**Sample**	A View that gives you access to all stored samples and the pattern sequence. You can assign samples to steps in Sample View.
Sample Mode View	**Shift + Sample**	A View that gives you options over how a sample is to be played, including direction, looping, gating and slicing.
Sample Record View	**Sample Rec**	The View used when recording new samples.
Project View	**Projects**	The View used to save and load Projects.
Scene	**Mixer**	One of 16 memories to which multiple Patterns and Pattern Chains can be assigned, so that a longer sequence can be triggered by a single pad. Scenes can be further chained to create a Sequence.

Term	Button	Definition
Secondary View	**Shift** + button, or double-tap a button	All views accessed via using **Shift** in combination with another button are referred to as secondary views. These views may also be accessed by pressing the corresponding button repeatedly to toggle between the secondary and primary views.
Setup View	**Shift + Save**	Allows control of MIDI clock and Tx / Rx settings, MIDI channel selection for each track and pad brightness adjustment. Normal operation is suspended while *Setup View* is open.
Side Chain	**Shift + FX**	A method of allowing the samples on one track to modify the dynamics of samples on another.
Step		Each Track in a Pattern is initially based on 16 or 32 Steps, though shorter Patterns of any length my be defined in *Pattern Settings View*. See also Micro step.
Step buttons		Collective name for the button group comprising the **Note**, **Velocity**, **Gate**, **Micro Step** and **Probability** buttons.
Tap		Touching certain buttons quickly (less than half a second) will produce a different result from "holding" them. Such an action is termed a "tap". See also "Hold".
Track		One of the eight elements which may contribute to a Project: When you press a Track button, you go to *Sample View* or *Note View* (whichever was last selected) for that track.
Velocity View	**Velocity**	Allows editing of the velocity of a step.
View		One of various ways the 32 grid pads can be used to display information and allow user interaction.
View Lock	**Shift + Patterns**	A function that maintains the Step display of the currently selected Pattern while letting you select a different Pattern, or playing other Patterns in a Pattern Chain.

Top View
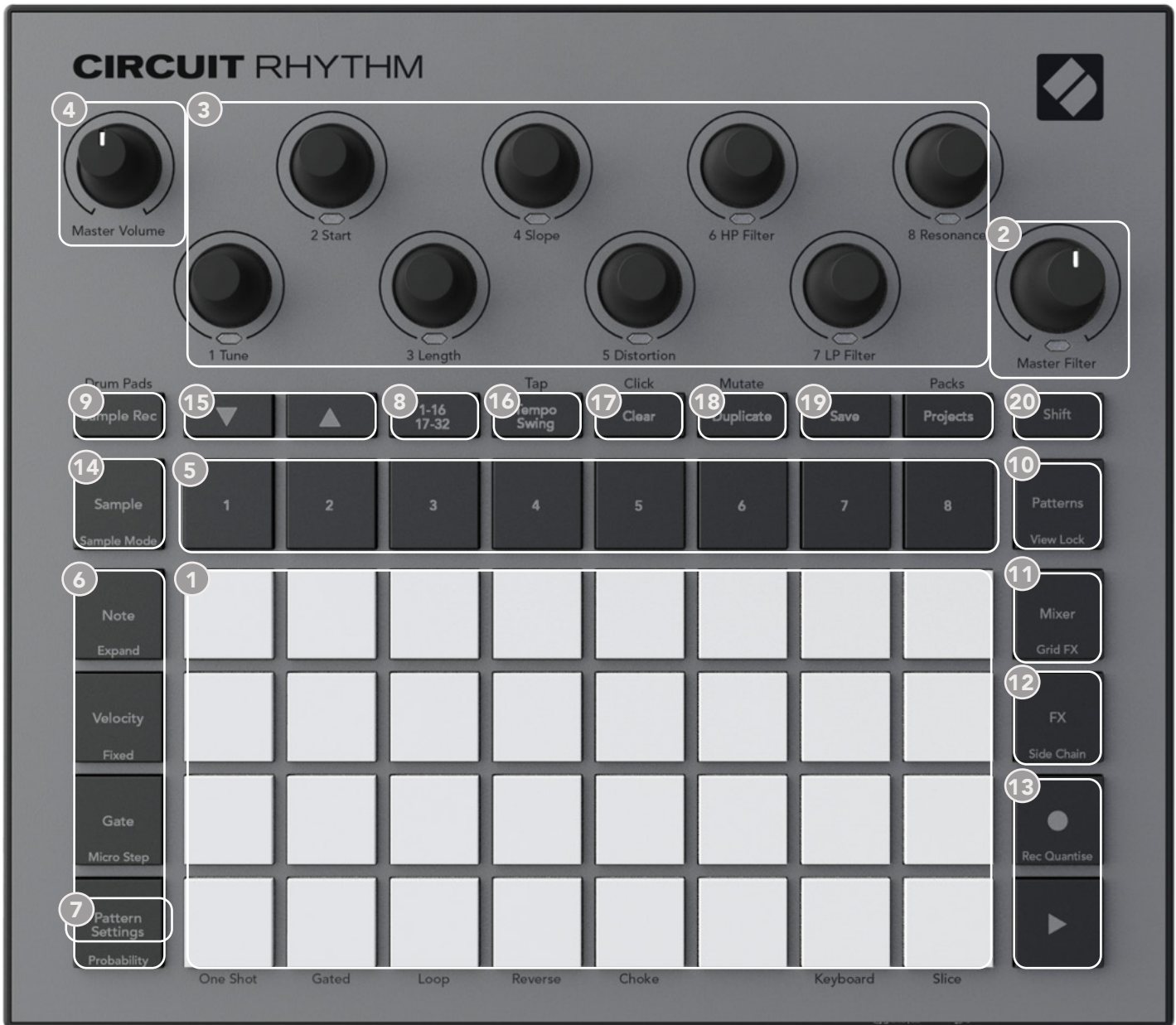
1. 32-pad playing grid – a 4 x 8 matrix of RGB pads. Depending on the view selected, the grid may be "split" into logical areas with different functions.

2. **Master Filter** – rotary control with a centre detent and RGB LED: controls filter frequency of the entire mix, like on an analogue synth. It is always active.

3. Macro controls **1** to **8** – eight multi-functional rotary encoders, with associated RGB LED. The availability and function of these controls varies with Circuit Rhythm's various views: however, the panel legends describe the encoders' functions when in *Sample View*, *Note View*, or any other track-focused view. The movement of Macro controls in performance may be recorded and replayed.

4 **Master Volume** – Controls the overall level of Circuit Rhythm's audio outputs.

Most of the remaining buttons select the 32-pad grid to display a specific *View*. Each *View* provides information and control of a particular aspect of a particular track, pattern or sound selection, timing adjustments, etc. Note also that several buttons have an additional 'Shift' function, indicated on (or above) the button by a legend in a smaller font.

Many buttons - including ● **Record** - have both a momentary (long press) and a latching (short press) mode. A long press will temporarily display that button's view, but only while the button is held down. When released the view will revert to whatever it was before the button was pressed. A short press on a button will switch the grid view to that programmed into the button.

The **Record** button is a special case as it does not invoke an alternative grid display, but its momentary action allows rapid punch-in and punch-out of Record Mode.

5 Track buttons: Tracks **1** to **8** – a tap changes the grid display to *Sample View* for that track; a press temporarily displays Sample View for that track, but on releasing the button the grid will revert to the View and track that was visible when it was pressed.

6 Step buttons: **Note**, **Velocity**, **Gate** and **Probability** – these switch the grid to further *Views*, and allow the parameters of each step of the pattern to be individually entered, deleted or modified, for the currently selected track. Note that **Probability** is the Shift function of the **Pattern Settings** button and that **Micro Step** is the Shift function of the **Gate** button.

7 **Pattern Settings** – switches the grid to a *View* that allows adjustment of pattern length, playback rate and direction for the currently selected track.

8 **Step Page** (**1-16**/**17-32**) – selects whether the Pattern for the currently selected track is 16 or 32 steps in length. When a 32-step Pattern is selected, the colour of the button legend changes when the sequence is running to indicate which "half" of the sequence the grid is currently displaying. You can choose to have a 16- or 32-step Pattern on any track.

9 **Sample Rec** – opens *Sample Record View*: this view can be used to record new samples to Circuit Rhythm via the audio inputs, or from the internal mix.

10 **Patterns** – opens *Patterns View*: lets you store multiple patterns for each track, and to join them together to make a pattern Chain.

11 **Mixer** – enables the *Mixer View*, where you can mute or adjust the level of each track making up the sequence, and also to pan each track across the stereo image.

12 **FX** – opens the *FX View*; lets you add reverb and delay effects to each track individually.

13 ● Record and ▶ Play – these two buttons start and stop the sequence **(Play)**, and enter Record mode **(Record)**. In Play mode anything you play on the grid will be heard; in Record mode, anything you play will be heard and also added to the sequence.

14 **Sample** – opens the *Sample View* for the currently selected track. Each track may select from 128 samples, arranged in eight pages of 16 on the two lower grid rows.

15 ▼ and ▲ - these two buttons have different actions (and colours) depending on the currently selected *View*, e.g., in *Keyboard Note View* they let you shift the pitch of the keyboard pads up or down by one to five octaves, while in *Sample View* they scroll through the eight pages of samples.

16 **Tempo** and **Swing** – **Tempo** lets you set the BPM (tempo) of the sequence, using Macro control 1; **Swing** alters the timing between steps to change the 'feel' of a pattern, using Macro 2 for adjustment. In this mode, Macro 5 adjusts the level of Click track..

17 **Clear** – allows deletion of individual sequence steps, Patterns, Projects, samples or stored Macro control movements.

18 **Duplicate** – operates like a copy-and-paste function for patterns and individual steps.

19 **Save** and **Projects** – let you save your current Project and open a previously-saved one.

20 **Shift** – Several of the buttons have a "second function", which is accessed by holding down the **Shift** button while pressing the button in question. It is also possible to configure the **Shift** button's action as a toggle function; this is done in *Setup View* (see page 88). In this case, a single press engages and latches the second function, a second press disengages it..

Rear view

1. **Outputs** - **L/Mono** and **R** – Circuit Rhythm's main audio outputs on two ¼" TS jack sockets. Max. output level is +5.3 dBu (+/-1.5 dBu). With no plug in the **R** socket, the **L/Mono** socket carries a mono mix of L and R channels.

2. **Sync** – a 3.5 mm TRS jack socket supplying a clock signal of 5 V amplitude, at a rate proportional to the tempo clock: the actual ratio can be set in *Setup View*. The default rate is two pulses per quarter note.

3. 🎧 (Headphones) – connect a pair of stereo headphones here. The main outputs ❶ remain active when headphones are connected. The headphone amplifier can drive +5 dBu into a pair of 150 ohm stereo headphones.

4. **MIDI In**, **Out** and **Thru** – three MIDI connectors on 5-pin DIN sockets. Allows external equipment to be triggered by Circuit Rhythm's sequences, or external controllers to trigger Circuit Rhythm's sequences and to alter samples, Grid FX and FX parameters. Note that the MIDI Thru port may be configured in *Advanced Setup View* to act as a clone of the MIDI Out port: see page 92 for details.

5. **Sample In L/Mono** and **R** - mono or stereo external audio inputs for recording samples into Circuit Rhythm. The inputs are unbalanced on 1/4" TS jack sockets.

6. ⟷ – USB-C port. This is also the DC power input to the unit for external powering and battery charging. A Type C-to-Type A cable is supplied with the unit. Connect to computers to interface with Novation Components. The port is MIDI class compliant; connect to other devices supporting MIDI via USB to transmit and receive MIDI data. Also used for firmware updates. NOTE – Circuit Rhythm's USB port does not carry audio.

7. **microSD** – insert a compatible microSD card in here to save or import Packs.

8. ⏻ – "soft" on/off switch; to prevent inadvertent power up/down, a press of approx. one second is needed to turn the unit on or off. The button has an LED which lights green to indicate that the internal battery is charging.

9. Kensington MiniSaver – secure your Circuit Rhythm to a suitable structure if desired.

Basics

Powering the unit on

Connect the supplied AC adaptor to the USB port ⑥ using the cable supplied and plug the adaptor into the AC mains. This will ensure that the internal battery becomes fully charged.

Connect the main outputs to a monitoring system (powered speakers or a separate amplifier and passive monitors); alternatively plug in a pair of headphones if you prefer.

Long-press the **POWER** button ⑧ , and the grid will show the boot-up display for approximately two seconds:
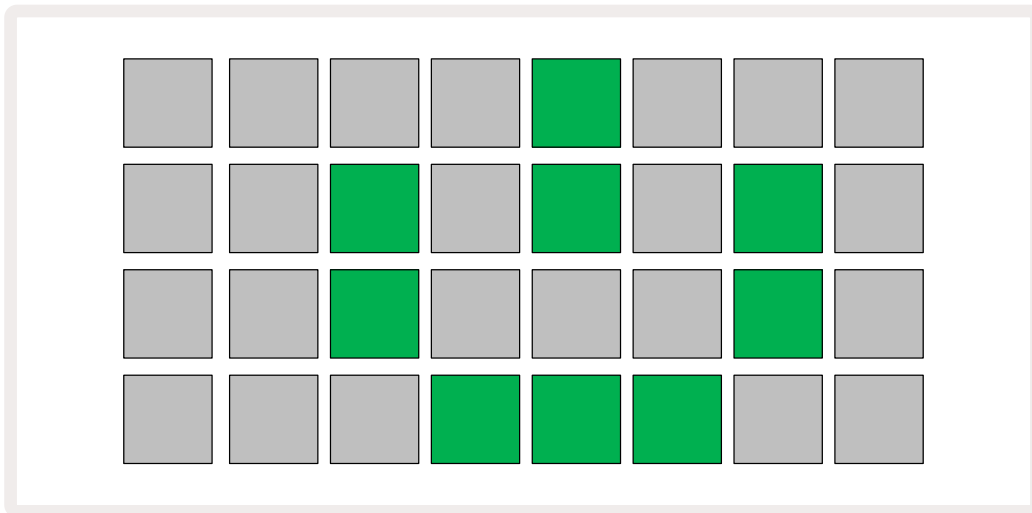
After initial boot-up, the display will change colour from pale red to bright green sequentially from top left to bottom right, indicating Pack loading.
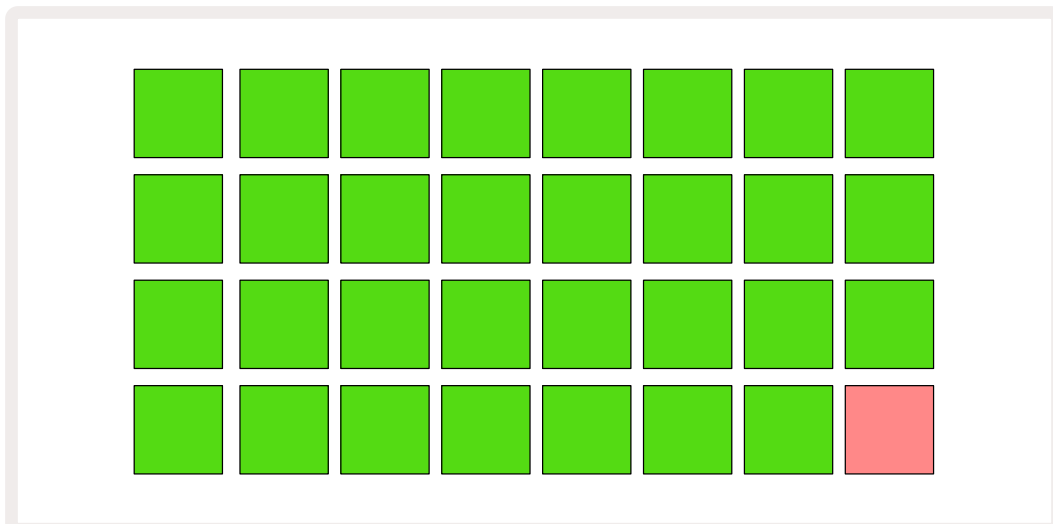
After boot-up, the grid display will change to something like that shown below:

Getting started

We've pre-loaded 16 demo Projects into the memories to give you an idea of how Circuit Rhythm works. Press the ▶ Play button **13**; you should hear the first demo Project.

If they're not already lit, press the **1** button **5** , to select Track 1 and **Sample** **14**; Circuit Rhythm is now displaying *Sample View* for Track 1. In this View, the two lower rows represent a bank of samples that may be triggered with a tap, while the two upper rows – the Pattern steps - show the progression through the Pattern. Press the **2** button *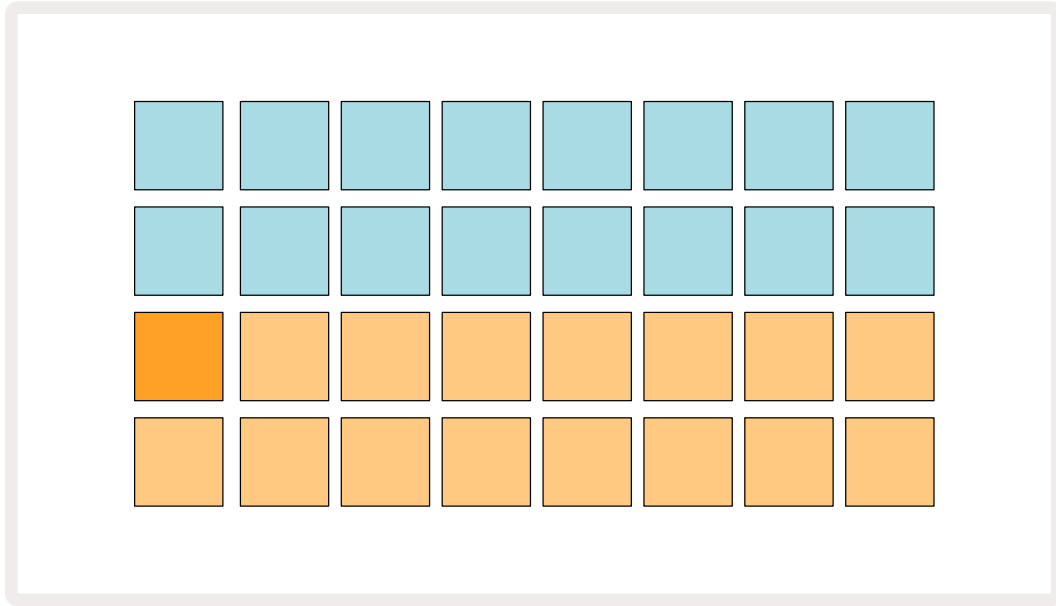*5** to trigger samples and enter steps on Track 2. Note that the sample pads of Track 1 are coded orange and those of Track 2 are yellow. The Pattern pads are pale blue, but turn white as the "play cursor" moves through the Pattern.

In *Sample View*, you can scroll through banks of samples using the ▼ and ▲ buttons **15**: you'll find that each of the first six pages represents a genre kit made up of 16 samples. Each kit has twelve percussive sounds and four melodic sounds. Bank 7 comprises additional melodic and harmonic sounds, while Bank 8 comprises 12 melodic loops plus four drum breaks.

Sample triggers may be entered at steps by tapping the dim blue pads that occupy the top half of the grid. A step that contains a trigger will be lit bright blue (or pink, if the step contains a flipped sample). To remove a trigger from a step, tap the corresponding pad again.

On Circuit Rhythm, various tracks use different colours for rapid identification: this principle applies throughout most of the grid Views. The colours are (approximately):

Track	Pad colour
1	Orange
2	Yellow
3	Purple
4	Aqua
5	Violet
6	Pale Green
7	Blue
8	Pink

Press the ▶ **Play** button to stop.

Later in the manual, we explain how you can choose the sound you want in your pattern, and also how you can manipulate the sounds in real-time.

Loading and Saving

When you press ▶ **Play** for the first time after powering on, the Project which Circuit Rhythm plays will be the last one used when it was powered off. The factory demo described in the previous section was loaded in to Memory Slot 1.

To load a different Project, you use *Projects View*. Press **Projects** ⑲ to open this:
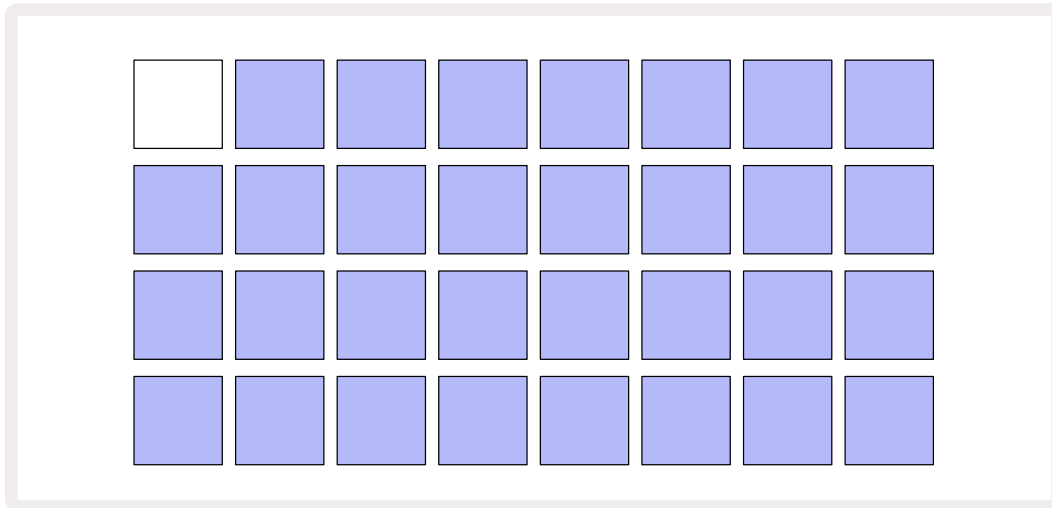
There are 64 memory slots, arranged as two pages of 32. Use the ▼ and ▲ buttons to scroll between the pages. Each pad corresponds to one of the memory slots. The pad's colour indicates the slot's status:

- White – the currently selected Project (only one pad will be white)
- Bright colour (initially blue) – slot contains either a Project saved by the user* or a factory demo Project
- Dim blue – slot is empty

* See paragraph on "Customising Session Colours" on page 82.

You can select a different factory demo to listen to and play around with. You can jump between saved Projects while in Play mode: the current Project will complete its current Pattern before the new Project starts. (But if you hold down **Shift** while selecting a different Project, the Project currently playing will stop immediately and the new one will start.)

> **t** Projects loaded when the sequencer is not running will play at the tempo used when the Project was saved.
>
> Projects loaded while the sequencer is running will play at the current tempo. This means that you can recall different Projects sequentially with the confidence that the tempo will remain constant.

There's nothing special about the slots containing factory demo Projects: you can overwrite these if you wish: you can always re-load them from Novation Components.

You don't need to be in *Projects View* to save a Project you've been working on. If you press **Save** 19 , the button flashes white; if you press it a second time, it flashes green rapidly to confirm the save process. However, in this case, your work will be saved in the last selected Project memory, which will most likely be the one that held an earlier version; the earlier version will be overwritten.

To save your work in a different Project memory (leaving the original version unchanged), enter *Projects View*. Press Save; both **Save** and the pad for the currently selected Project will flash white. Press a different memory pad: all the other pads will go dark, and the selected pad will flash green for a second or so to confirm the save process.

To make identifying Projects easier, you can assign one of 14 colours to any of the pads in Projects View. See "Changing Project Colour" on page 82.

Starting from Scratch

> If you're already familiar with producing music using hardware, you can probably skip this section! But if you're a novice, you may find it useful.

Once you've experimented with the factory demo patterns for a while, you will probably want to create a pattern from scratch.

Select **Projects** and select an empty memory slot (a pad showing dim blue). Now press **1** ⑤ to enter Track 1's *Sample View*. When you press ▶ **Play** you'll see the white pad (the play cursor) progressing across the 16 Pattern steps:
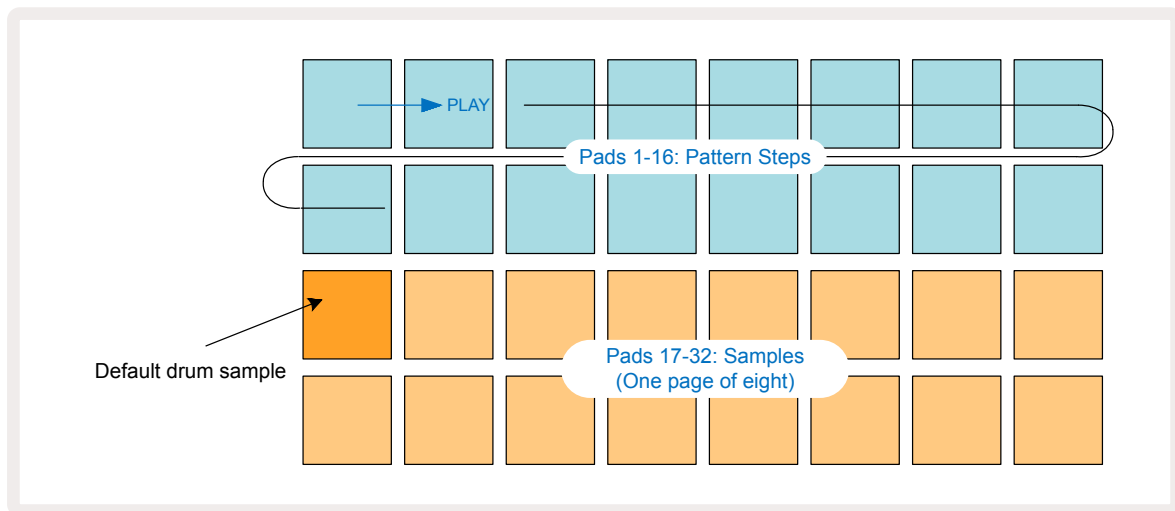
You won't hear anything just yet.

> **NOTE**: On Circuit Rhythm, Patterns are 16 steps long by default. This can be changed to 32 steps for any or all of the eight tracks. This topic is explained in "Step Page" on page 49.
>
> For simplicity, the discussion in this section uses 16-step Patterns as examples.

To build a beat, first tap sample slots 1 or 2 (slot 1 is pad 17, slot 2 is pad 18) to select a kick drum sample, then tap* steps to add triggers to the pattern. To make a basic hip-hop drum beat, add kicks on the steps seen in the picture below (1, 3, 8, 9, 11 and 14). Now press play to hear back your beat.

*Many of Circuit Rhythm's buttons produce different behaviours depending on whether the button is "tapped" (half a second or less) or "held". In this case, a holding a step pad will arm the step for a sample flip: this feature is discussed on page 31.

Play cursor (white pad) advances through Pattern

Brightly lit pads indicate steps (1, 3, 8, 9, 11 & 14) that trigger the selected kick sample

Pads 1-16: Pattern Steps

Selected kick drum sample

Pads 17-32: Samples
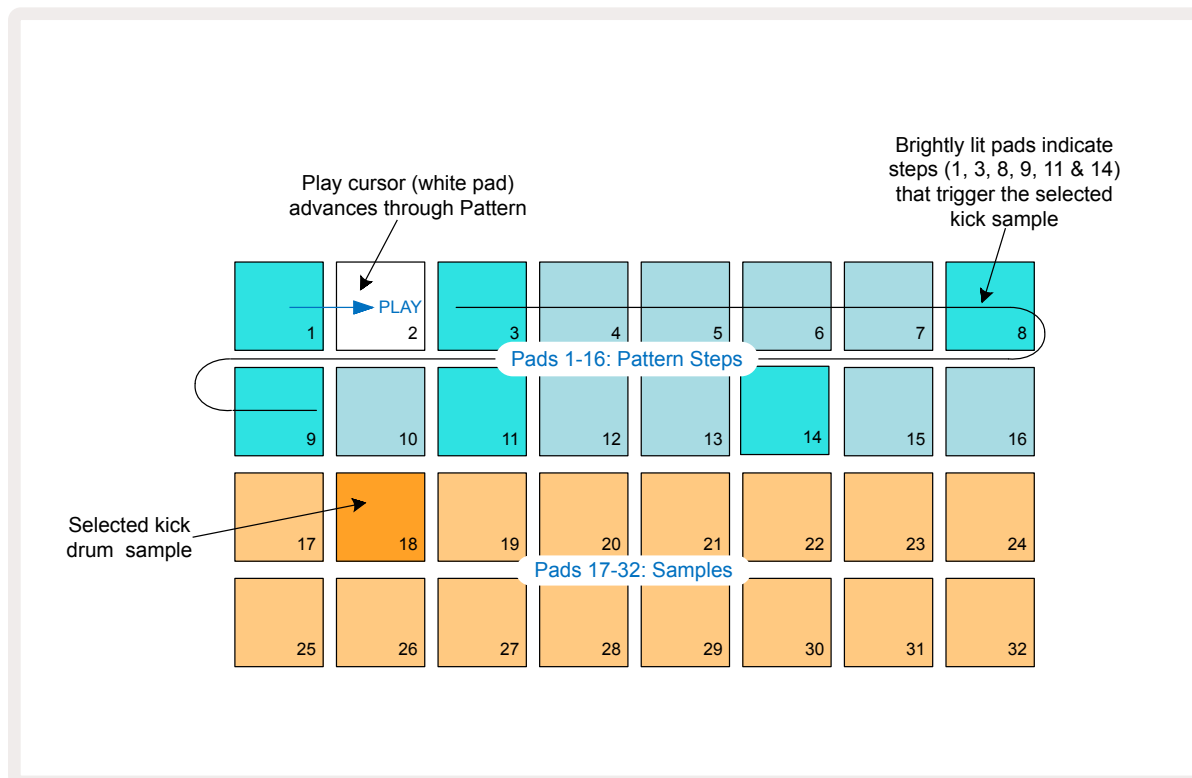
You can select a different sample while the Pattern is playing by pressing a different pad on the lower two rows: you can use any of the eight sample pages.

Now add a snare drum to other steps in the sequence in the same way. Press **2** ⑤ to enter Track 2's *Sample View*, then press sample slots 3 or 4 (pads 19 or 20) to select a snare sample. Tap steps 5 and 13 as seen below to add snares on the 2nd and 4th beat of the bar.

Selected snare sample is triggered on Steps 5 and 13

Pads 1-16: Pattern Steps

Selected snare drum sample

Pads 17-32: Samples
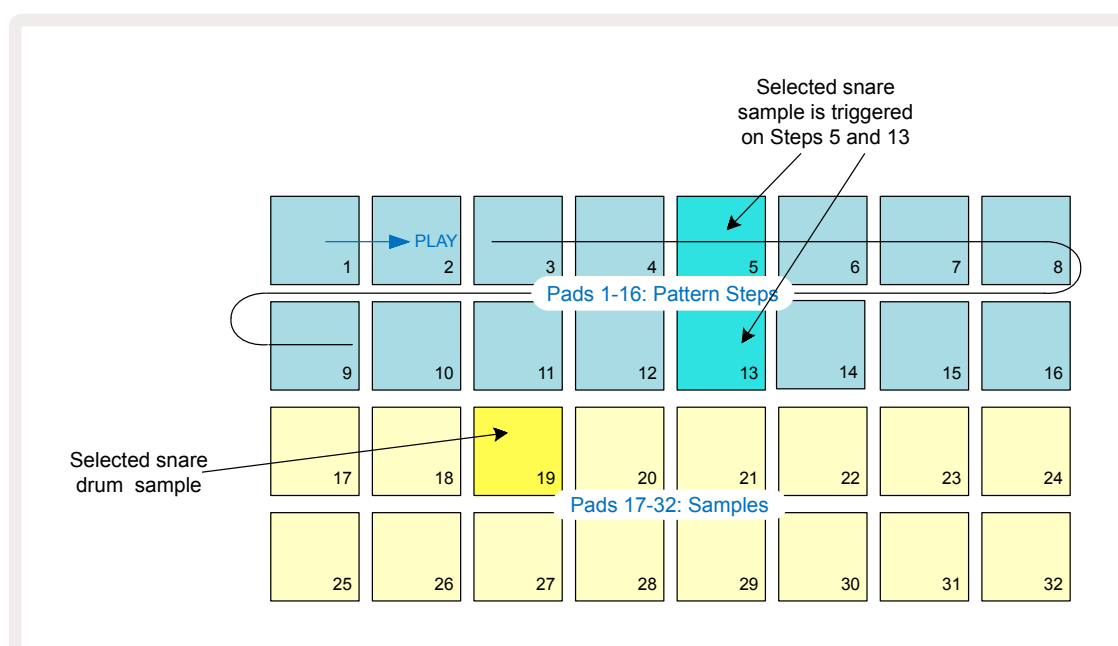
If you want to delete a drum hit, just press its pattern step pad again: you can do this while the sequence is playing or stopped. The brightly lit pads tell you where the hits are.

To add a melody to your beat, you'll need to use *Note View*. First, press **3** ⑤ to enter Track 3's *Sample View* and select a melodic sample from the last four slots of the bank (Pads 29 – 32). Now press **Note** ⑥ to enter Track 3's *Note View*. You'll now see that the bottom 16 pads have changed to represent a chromatic keyboard, with "white notes" on the bottom row and "black notes" above it. Press the pads to trigger the selected sample at different pitches. Use the ▼ and ▲ arrows ⑮ to scroll through higher and lower octaves. Pressing ▼ and ▲ together will reset the pitch to the default octave.

The root note of the default octave is 'middle C' on a standard piano keyboard.

Note View for Track 3. Keyboard pads for other tracks will be in the corresponding track colour.
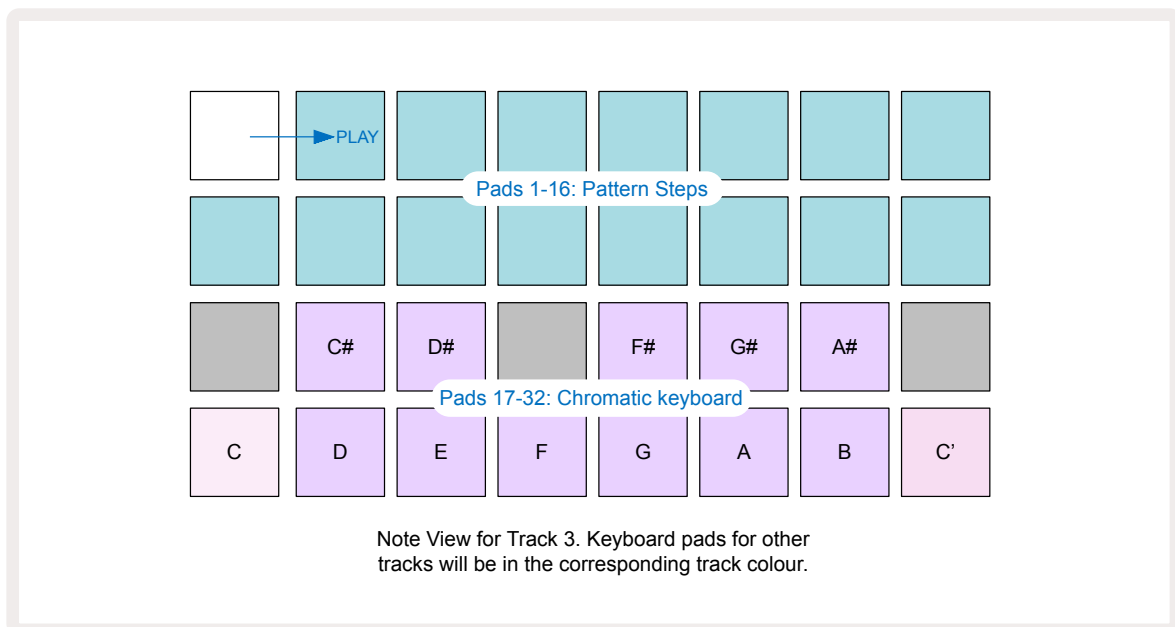
To enter notes into a Pattern, you may either tap a step to add the last played note to the step, or record your playing in real time (this is termed "live record"). To enable live record, press the **Record** button so that it lights red 🔴 – while live record is enabled, notes that are played will be recorded to steps. You can go back to **Sample View** at any time and change the selected sample – it will play back at the pitches chosen for each step.

You can press **Note** a second time to enter *Expanded Note View*. In this View, the sequencer steps are replaced by a second chromatic keyboard, which triggers samples one octave higher than the lower:

Expanded Note View for Track 3.
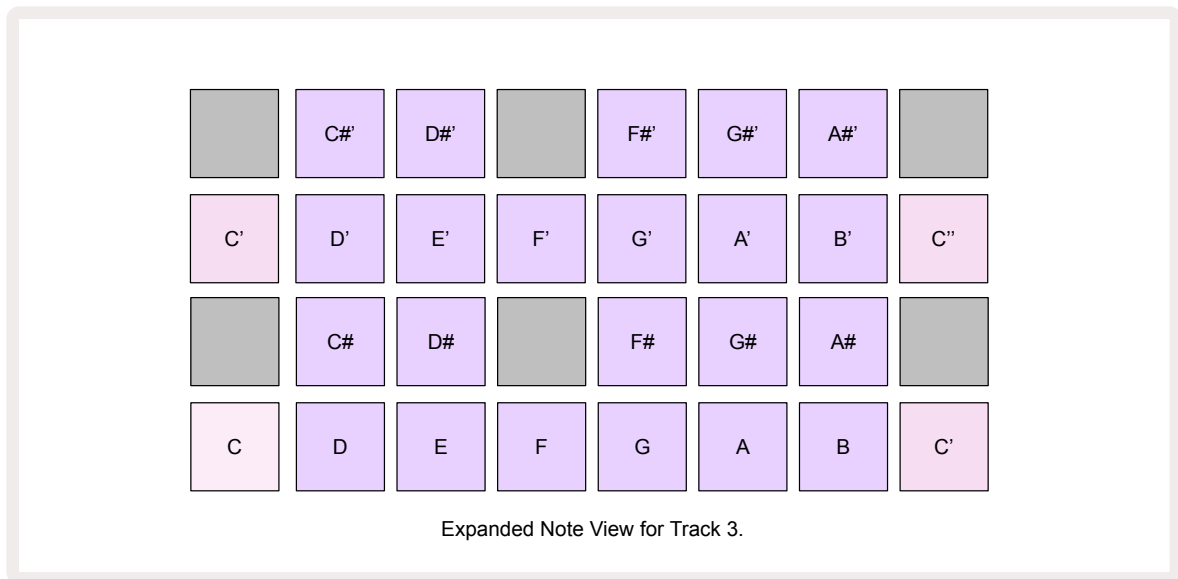
Press **Note** again to return to the standard *Note View*.

Using Sample Tracks

Circuit Rhythm has eight separate sample tracks, which correspond to the eight buttons **1** to **8** (5) above the main playing grid. Each of the 16 pads of the lower two rows triggers a different sample: there are eight pages of these (each with 16 samples), which can be selected with the ▼ and ▲ buttons (15). Note that when you are scrolling through the sample pages, the page you are currently viewing will be indicated by one of the **1** to **8** buttons momentarily illuminating bright white; i.e., if you scroll to page 5, the **5** button will briefly light. The intensity of the ▼ and ▲ buttons' illumination also indicate the page currently in use.

Each track may be selected and programmed independently using the track buttons **1** to **8**. The tracks use colour coding for the sample pads and elsewhere for ease of identification (see page 22).

The default sample page allocation is:

Track 1:	**Page 1, slot 1 (Kick 1)**
Track 2:	**Page 1, slot 3 (Snare 1)**
Track 3:	**Page 1, slot 5 (Closed hi-hat 1)**
Track 4:	**Page 1, slot 7 (Open hi-hat 1)**
Track 5:	**Page 1, slot 9 (Clap)**
Track 6:	**Page 1, slot 11 (Tom)**
Track 7:	**Page 1, slot 13 (Synth pluck)**
Track 8:	**Page 1, slot 15 (Synth lead)**

Each of the first six pages represents a kit: slots 1 and 2 are kick drums, 3 and 4 are snares, 5 and 6 are closed hi hats, 7 and 8 are open hi hats, 9 through 12 tend to be additional percussion, and 13 through 16 are melodic sounds. Page 7 provides a range of 16 melodic samples while Page 8 has 12 further melodic loops plus four drum breaks (slots 13 to 16).

Sample View

Sample View is the default view for each track. Pressing a track button will take you directly to that track's *Sample View*. This view is identical for each track, apart from the colour coding. The example below illustrates Track 1.

PLAY

Pattern step display

Samples (one page of eight)

Sample pads – colour coding:

Track 1	
Track 2	
Track 3	
Track 4	
Track 5	
Track 6	
Track 7	
Track 8	

Currently active sample
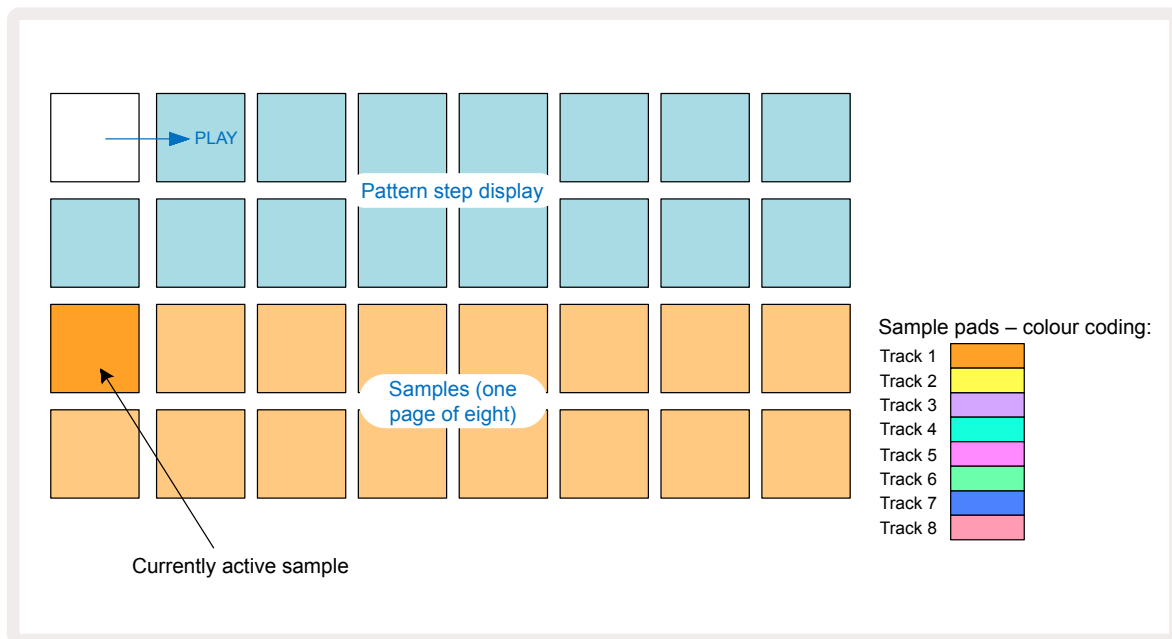
You can audition the samples by pressing the sample pads. To change the active sample, give a different sample pad a quick tap: a longer press will play the sample but leave the previous sample assigned as the active one.

To assign the active sample to Pattern steps, tap the Pattern step pads that correspond to where you want the samples to be triggered. The steps with hits will illuminate bright blue. The step pads are toggles – to delete the sample from a step, tap the step pad again.

To change the active sample, tap another sample pad. This will affect sequencer playback – bright blue steps will always trigger the track's currently active sample. Pressing a sample pad (as opposed to tapping) will not change the active sample. This behaviour is useful for Sample Flipping, which you can read more about on page 31 (see also below).

Sample triggers programmed by tapping in steps as described above will be assigned to the Pattern with default Velocity, Gate, Micro Step and Probability values: these parameters can then be edited.

Sample triggers may also be live-recorded to the sequencer. First, enable Record Mode by pressing the **Rec** button 13 so that it lights bright red 🔴. Now press Play ▶ and hit some sample pads – these hits will be recorded to steps. Note that these steps will be lit lilac – this indicates that the steps have an assigned sample. These steps will ignore the track's currently active sample, instead triggering the sample you just used. This behaviour is called Sample Flip, which you can read more about on page 31

Sample Flip

Although each track on Circuit Rhythm is monophonic, it is possible to assign different samples to individual steps on a single track. This is useful for creating interesting and intricate drum beats. The action of assigning different samples per-step is called Sample Flip.

Steps may be assigned a sample in two different ways:

- The first is via live recording in *Sample View*. To do this, first enable Record Mode by pressing the **Rec** button so that it lights bright red 🔴. Now press **Play** ▶ and hit some sample pads – these hits will be recorded to steps. Note that these steps will be lit lilac – this indicates that Sample Flip has been used to assign a different sample. These steps will ignore the track's currently active sample, instead playing back their assigned sample.

- The second is via manual assignment. Press and hold a sample pad (it will turn red after a moment) and then press the steps where you want to place the sample – the steps will turn red until you release the sample pad, at which point they will turn lilac to indicate that they have an assigned sample. If you press and hold the sample pad again, the steps that match the assigned sample will turn red to indicate the relationship. Pressing and holding a step with an assigned sample will also light the corresponding sample pad red – this behaviour is useful when you have many steps with different assigned samples in a single pattern.

Steps that are sample flipped will be lit bright lilac, while steps that will play back the active sample will be lit bright blue.

Steps with samples other than the current default are lit lilac

Steps with the default sample are lit bright blue

PLAY

Pattern step display

(HOLD)

Samples (one page of eight)

Press and hold a lilac pad to see which sample it triggers

Current default sample
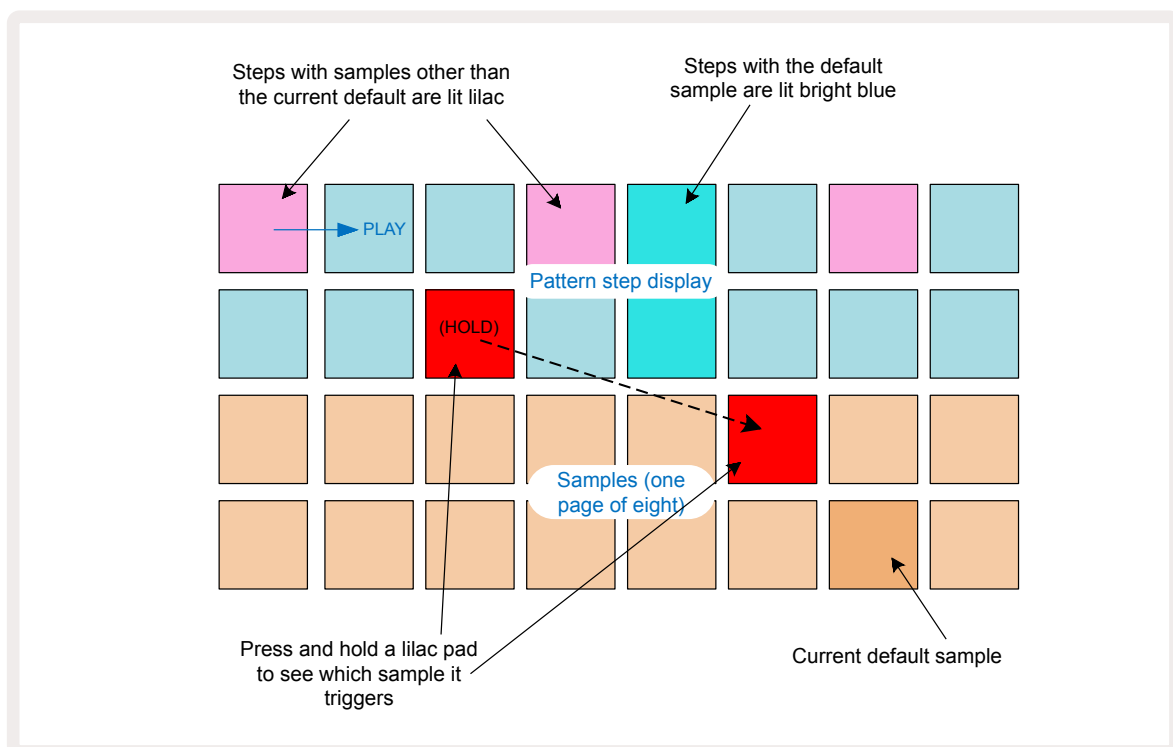
Sample Modes

Circuit Rhythm offers several sample play back options: these are selected in *Sample Mode View*. Enter *Sample Mode View* by pressing **Shift** 20 and **Sample** 6 , or press **Sample** again if you are already in *Sample View*. All the options on *Sample Mode View* can be applied independently to any of the eight tracks.

Sample Mode View in Keyboard Mode
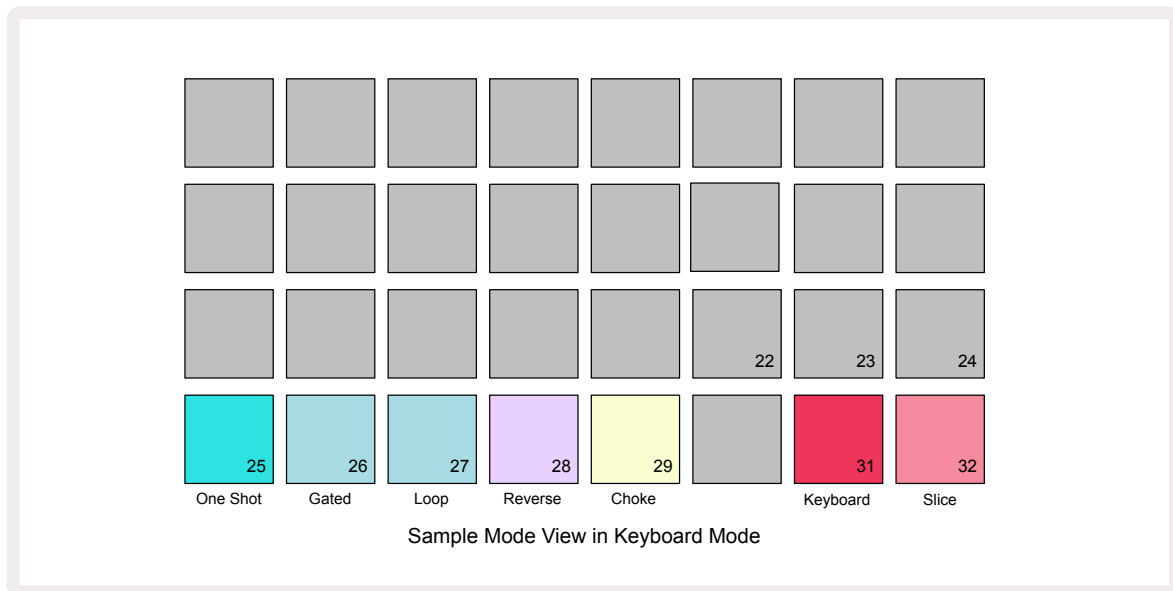
Sample Playback Modes

The three blue pads (Pads 25 to 27) determine how the currently active sample will be played when it is triggered.

- **One Shot** (the default setting) – the sample plays from start to end regardless of when Note Off occurs (i.e., when the keyboard pad is released).

- **Gated** – the sample plays once until Note Off occurs, at which point sample playback stops (according to the envelope).

- **Loop** – the sample will continuously loop from start to end until the Note Off occurs.

Reverse

Pad 28 – **Reverse** – selects the direction of sample playback. The default setting is off (lit dim pink), when sample playback behaviour will be as described above. When Reverse is selected (lit brightly), the sample will play - in the selected Sample Playback Mode – backwards, starting at its end.

Choke

Pad 29 – **Choke** – each track may be assigned to a single choke group. Only one track in the choke group may play back audio at a time. Press the pad to enable **Choke** (lit bright when active). When a sample is triggered for any track in the choke group, any other track in the choke group that is currently playing audio will be silenced, giving way to the most recently triggered track.

Keyboard and Slice Note Views

Pads 31 (**Keyboard**) and 32 (**Slice**) let you switch between these two modes; the mode changes the appearance of *Note View* (see page 25). Keyboard is the default for each track (Pad 31 is lit bright red and Pad 32 dim red).

Note Mode

Note View allows you to play samples either chromatically or sliced, allowing you to create bass lines, melodies, or chopped up beats with Circuit Rhythm

Keyboard Note View

By default, each track's *Note View* will be in Keyboard mode. In this mode, the lower two rows of *Note View* – selected with the **Note** button 6 – are laid out to represent one octave of a chromatic keyboard. (*Expanded Note View*, with two octaves of keyboard, is also available.)

Playing the keyboard will trigger playback of the track's active sample in semitone increments. Higher and lower pitches may be achieved by pressing the up and down arrows 15 to scroll through octaves. The maximum amount a sample may be pitched up or down is three octaves. Note that this is affected by the tuning parameter, such that if **Tune** is set to its maximum positive value (+1 octave), notes played on the keyboard which are higher than two octaves above middle C will play at a fixed maximum pitch. To reset the keyboard to its default position (with middle C on the bottom left pad), press both arrow buttons together.

Sample playback in *Keyboard Note View* may be live-recorded into patterns when sequencer playback is active by enabling Record mode. Alternatively, notes may be entered manually by tapping steps. Steps will be assigned with the currently selected note value, which is lit brightly on the keyboard. Unlike the active sample in *Sample View*, steps will always play the note selected at the time of assignment. To change the note assigned to a step while maintaining other step parameters (Velocity, automation, etc.), hold a note pad and press a step, or vice versa.

Slice Note View

Using *Slice Note View*, you may chop up samples and play back slices, allowing you to make loops your own.

To enable Slice Mode, enter *Sample Mode View*, then press the bottom right pad labelled **Slice**. Three pads will now be lit white on the row above, which may be used to select the number of slices that the sample will automatically be sliced into.

					4 SLICES 22	8 SLICES 23	16 SLICES 24
25	26	27	28	29		31	32
One Shot	Gated	Loop	Reverse	Choke		Keyboard	Slice

Sample Mode View in Slice Mode
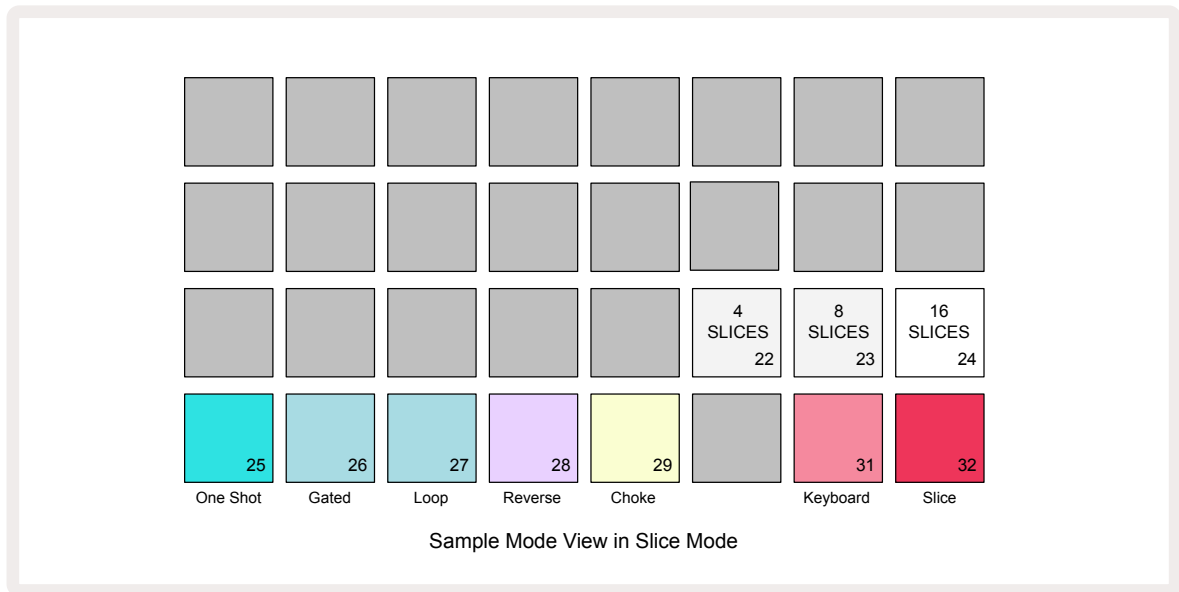
Selecting the left-most white pad will divide samples into 4 equal slices, the middle pad will do so with 8 slices, and the right-most pad will do so with 16 slices. The default setting is 16 slices. On resuming *Note View*, 4, 8 or 16 pads will be lit corresponding with your selection in *Sample Mode View*.

Pads 1-16: Pattern Steps

SLICE 1	SLICE 2	SLICE 3	SLICE 4	SLICE 5	SLICE 6	SLICE 7	SLICE 8
SLICE 9	SLICE 10	SLICE 11	SLICE 12	SLICE 13	SLICE 14	SLICE 15	SLICE 16

Pads 17-32: "Slice" keyboard

Note View for Track 3 in 16-slice mode
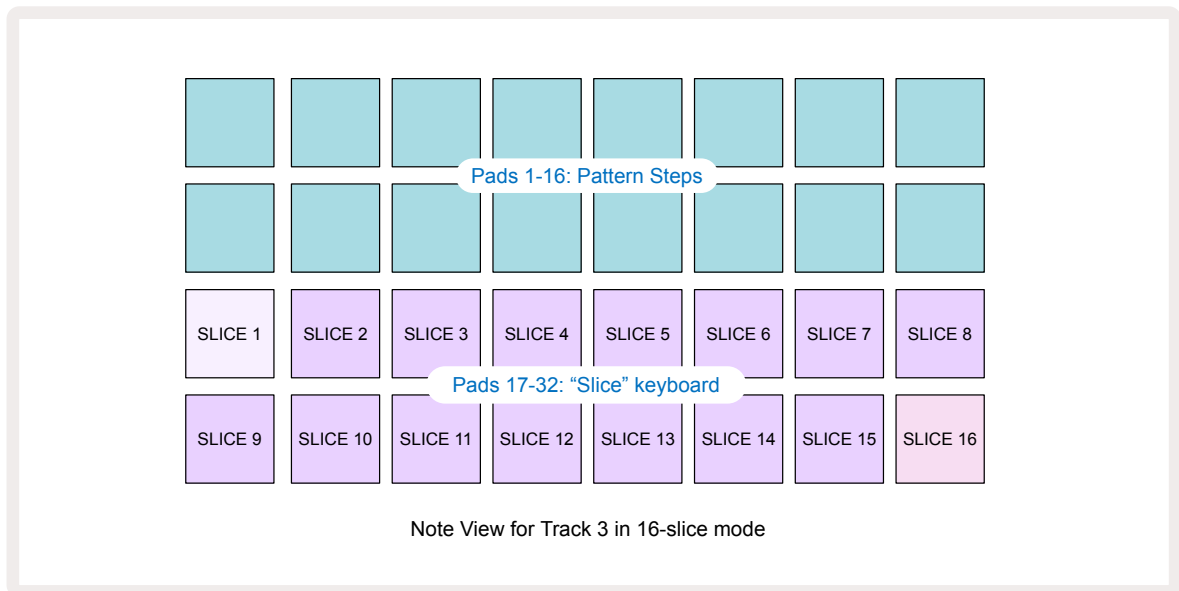
By default, each slice will start where the previous one ends, and together all slices make up the entire sample. In *Slice Note View*, each slice's start and length may be adjusted, allowing slices to overlap if desired. Hold **Shift** while adjusting the start and length to fine-tune these values.

Note that with Slice Mode active, the full sample will play back in *Sample View*, allowing you to browse your samples in their entirety. Further, macros 2 and 3 will not function and will be unlit in *Sample View*.

Step entry in *Slice Note View* will behave identically to *Keyboard Note View* described above. Switching between *Slice Note View* and *Keyboard Note View* can often lead to happy accidents, and may be used as a performance tool.

Live Slice Point Recording

Some samples won't divide into 4, 8 or 16 slices, and the points at which you want to place slices may be spread unevenly across the sample. This is where Live Slice Point Recording comes in very useful.

To live-record slice points, enter *Expanded Note View* while in *Slice Note View*. The slice pads will turn gold at this point, indicating Live Slice Point Recording is primed.

Tap a slice pad to initiate Live Slice Point Recording. The selected sample will now play from the start of the sample towards the end of the sample. As the sample plays back, tap a second pad to set that pad's start point, and the previous pad's end point. Continue this process until you reach the end of the sample. Now return to *Note View*, where you'll find that your slices' start and end points are set to the exact moment that you recorded in *Expanded Note View*. To make a another attempt at live recording your slice points, enter *Expanded Note View* again.

Note that Live Slice Point Recording cannot be used during sequencer playback

Using the Macros to sculpt samples

Circuit Rhythm's macro controls provide key parameters for tweaking the sound of your samples. The parameter that each macro controls is printed beneath it.

- Macro 1 - (**Tune**) will alter the tuning of samples on the track over a range of +/-1 octave. Tuning will change in increments of 20 cents (1/5 of a semitone). To change in increments of a semitone, hold **Shift** while adjusting.

- Macro 2 - (**Start**) will alter the start point of samples on the track, and Macro 3 (**Length**) will alter the length. That is, the point in the sample at which playback begins when triggered, and how much of the sample is played back from the start point. To fine-tune start or length, hold **Shift** to increase the resolution, and turn the corresponding Macro.

- Macro 4 - (**Slope**) will alter the slope that governs the sample's volume when triggered. Turning clockwise will add an attack phase, followed by a decay phase in gated or looped playback modes: the volume will ramp up following the trigger and decay after the gate is released in gated or looped playback modes. The greater the clockwise rotation, the longer the ramp will be. Turning anticlockwise will add a decay phase. After the sample is triggered, the volume will decrease. The greater the anticlockwise rotation, the faster the decay will be until only a short click remains.

- Macro 5 - (**Distortion**) will add harmonics to the sound in the form of distortion. As the control is increased, drum samples will begin to sound more aggressive while melodic sounds will have an overdriven character.

- Macro 6 - (**HP Filter**) adjusts the cutoff frequency of the high pass filter. Turning the control clockwise removes more low frequencies, which can make a sound sit better in the mix.

- Macro 7 - (**LP Filter**) works in the opposite sense to Macro 6, and adjusts the cutoff frequency of the low pass filter. Turning the control anticlockwise removes the upper frequency content of the sound. It can be used to remove high frequencies when they're not needed and for sculpting sounds.

- Macro 8 - (**Resonance**) adjusts the low pass filter's resonance. Instead of the filter's response smoothly falling away above the cutoff frequency, frequencies around the cutoff point are boosted. Use this in conjunction with Macro 7 to "tune in" on an aspect of the sound that you wish to accentuate.

Macro LEDs illuminate in the track colour; brightness is related to Macro parameter value.

2 Start   4 Slope   6 HP Filter   8 Resonance

1 Tune   3 Length   5 Distortion   7 LP Filter
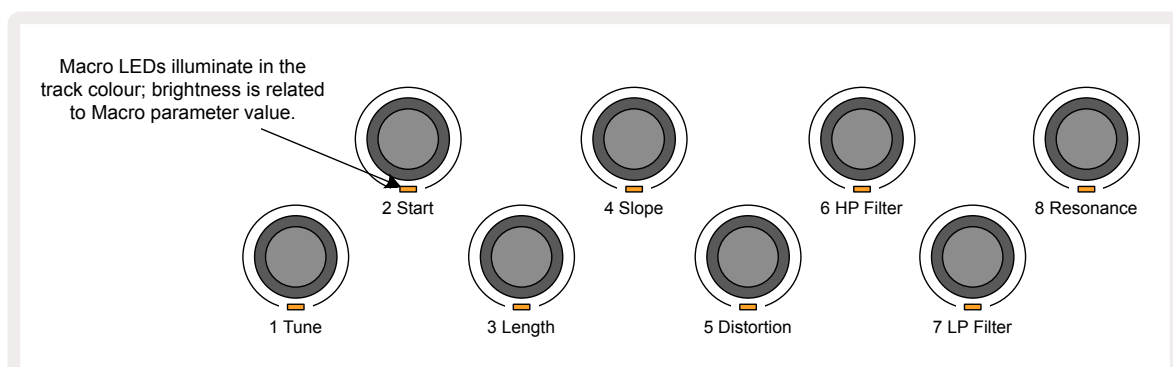
The table below summarises the functions of each Macro control as applied to the samples:

Macro	Function
1	Tuning
2	Start point
3	Sample length
4	Attack/decay
5	Distortion
6	HP Filter
7	LP Filter
8	LP Filter Resonance

Changes to Macro controls can be recorded to the Pattern – see for more information.

Macro controls may be reset to their default values by holding **Clear** 🔘 and turning the control clockwise until its LED lights blue.

Non-quantised record

Live playing of samples may be recorded quantised or non-quantised. Quantised recording will place drum hits on the closest step when recorded, while non-quantised recording will place hits directly on the intermediate micro steps. To toggle between quantised and non-quantised recording, hold **Shift** and press ⏺ **Record**. If Record Quantise is enabled, the **Record** button will light bright green when **Shift** is held. If Record Quantise is disabled (non-quantised), the **Record** button will light dim red when **Shift** is held.

Micro step edit

When Record Quantise is disabled, the timing of drum hits recorded in real time is assigned to one of six micro steps in between adjacent Pattern steps. Any drum hits added manually will always be assigned to the step's first micro step, which is on the exact beat of the step.
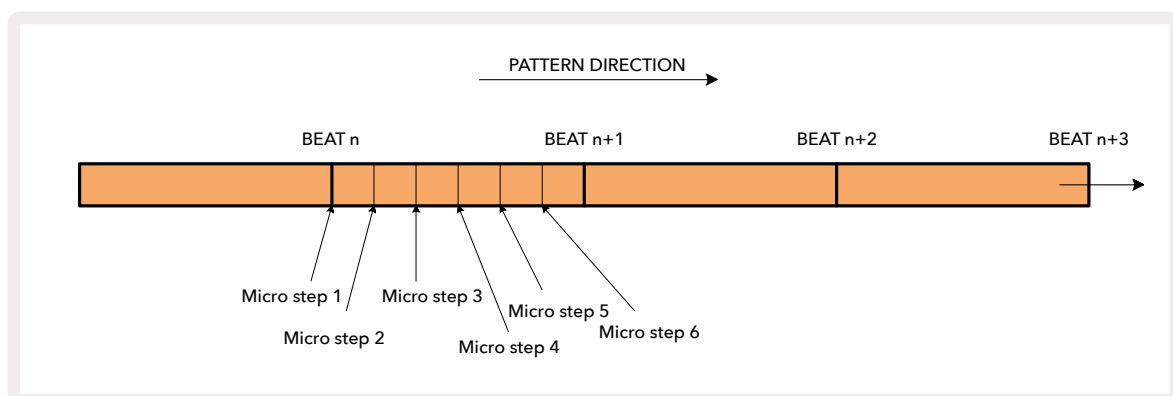
Enter *Micro Step View* by pressing **Shift** (20) and **Gate** (6), or press **Gate** again if you are already in *Gate View*. Pads 17 to 22 display the currently selected step's micro step values. Press another step pad to select it and view its micro steps.

Press a lit step pad to
display the micro step
value at the step

PLAY

(PRESS)

Pattern step display

Micro steps

1   2   3   4   5   6

When only micro step 1 is
bright, the sample at the
selected step will be
exactly on the beat

PLAY

Pattern step display

(PRESS)

Micro steps

1   2   3   4   5   6

Micro step 4 is bright: the
sample at the selected step
will be delayed by three
ticks (half a step interval)
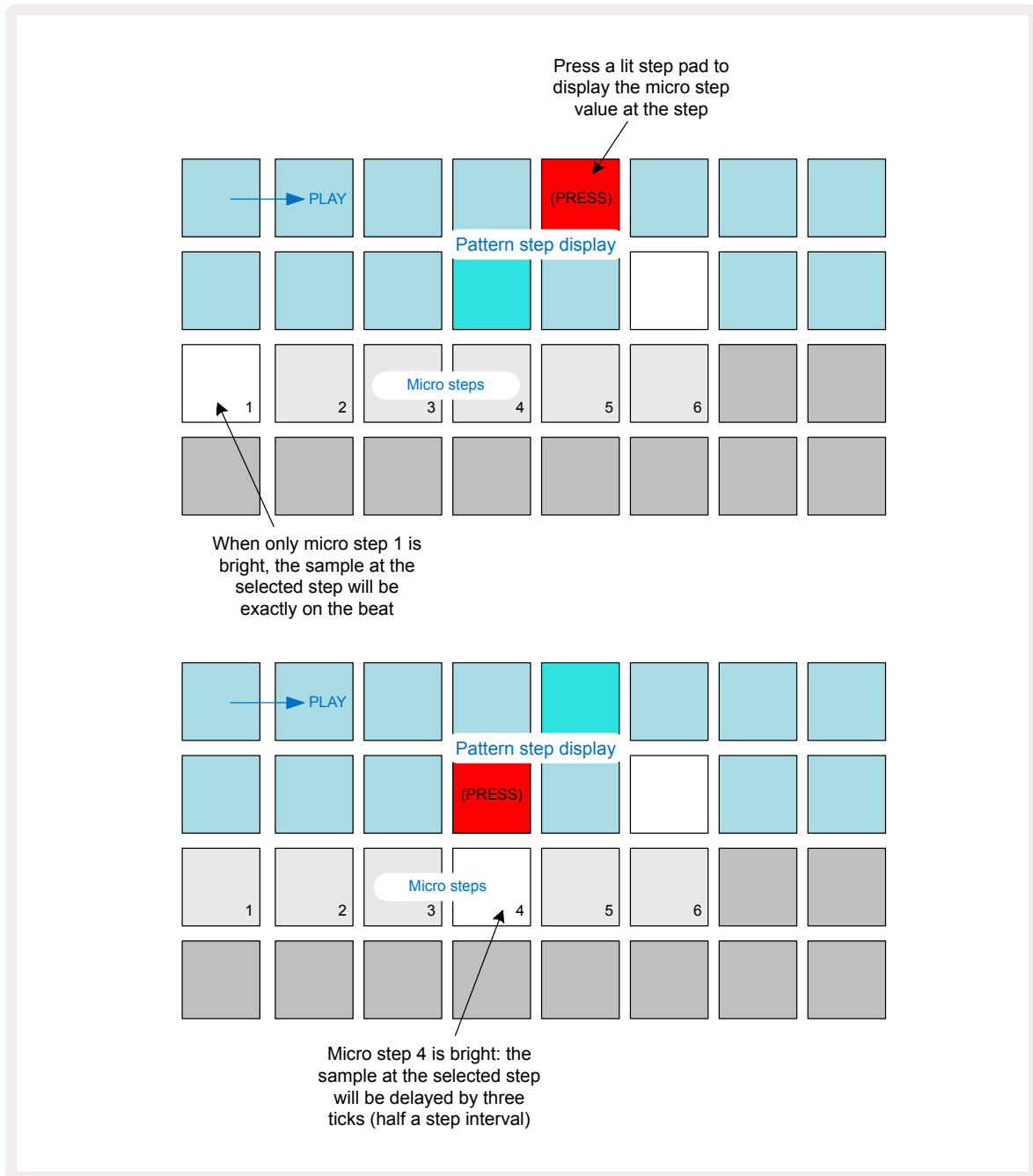
If the first pad is illuminated (as in the first example above), it indicates that the sample at the selected step will be precisely "on the beat" at the pattern step. In the second example above, deselecting micro step 1 and selecting micro step 4 delays the hit by three-sixths of the interval between steps.

You are not limited to tweaking sample timing – you can have the hit on as many micro steps as you want: each micro step pad can be turned "on" or "off". In the example below, Step 5 will trigger the sample assigned to it three times, once on the beat and twice more two and four ticks later.

The selected step now triggers the assigned sample three times, two ticks apart
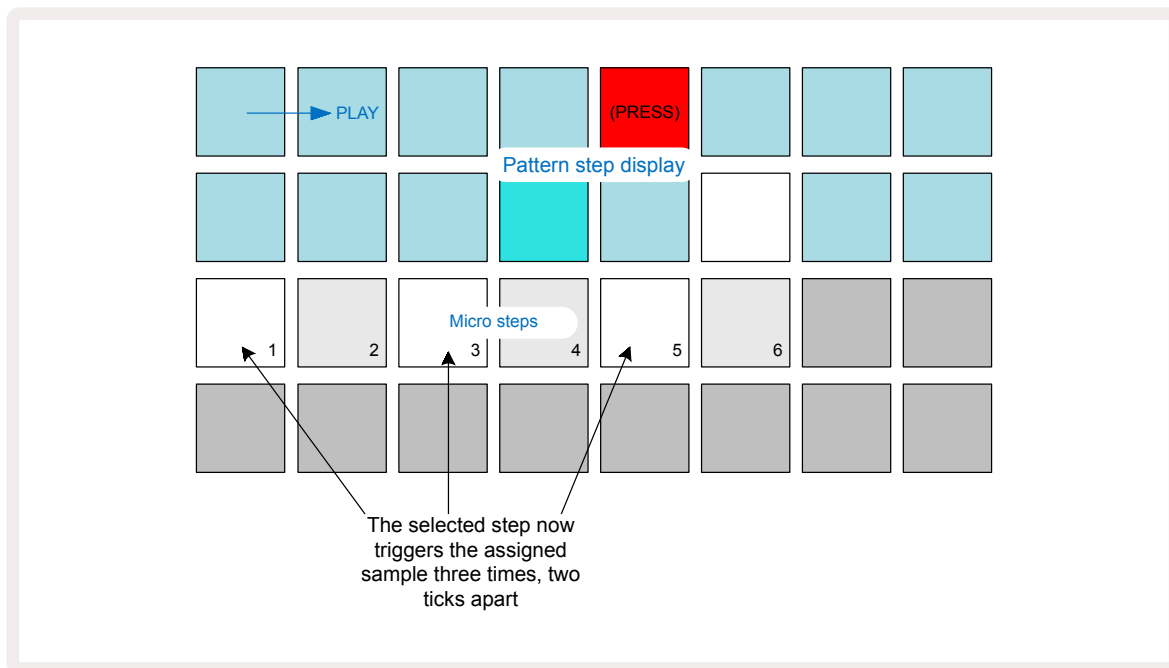
If you are entering samples in Record Mode (with Rec Quantise disabled) and can play fast enough, you can (depending on the BPM!) generate multiple hits within a single step. Inspect the micro step display to see this.

Using micro steps can add a whole new range of rhythmic possibilities to any pattern, and can create subtle rhythmic effects, or dramatically wonky grooves. As with many other aspects of Circuit Rhythm, we urge you to experiment!

Note that you can modify elements of a pattern from within **Micro Step View**, and also add additional hits by adding micro step values to empty steps: these will be populated with the current default sample for the drum track in use.

Note also that all micro step hits adopt the velocity value and sample assigned to the step they are contained within (see below).

Velocity

Samples entered in **Note View** may use Fixed or Variable Velocity. Variable Velocity is the default setting; if you press **Shift**, you will see that **Velocity** 6 illuminates red confirming this. With Variable Velocity selected, samples recorded live will have Velocity values determined by how hard the sample pads are struck. This applies to **Note View** (both **Slice** and **Keyboard**), **Expanded Keyboard Note View**, **Sample View** and **Drum Pads View**.

To select Fixed Velocity, hold **Shift** 20 and press **Velocity** 6 : the **Velocity** button changes colour to green. Now all samples entered using the sample pads will always have a fixed velocity of 96 (12 pads

lit in *Velocity View* – see below). This also applies to *Note View* (both *Slice* and *Keyboard*), *Expanded Keyboard Note View*, *Sample View* and *Drum Pads View*.

Samples programmed using the pattern step pads will always use Fixed Velocity, regardless of the selected velocity mode. Note that the selection of fixed or variable velocity is global, i.e., it applies to all tracks.

You can change the Velocity value of a step after you've created a pattern. This is done in *Velocity View*, which is selected by pressing **Velocity** 6 .

These four steps have drum hits associated with them

One step pad pulses blue/white; this is the step whose Velocity value is displayed

Pattern step display

Velocity value display

This indicates that Step 10 has a Velocity value of 5
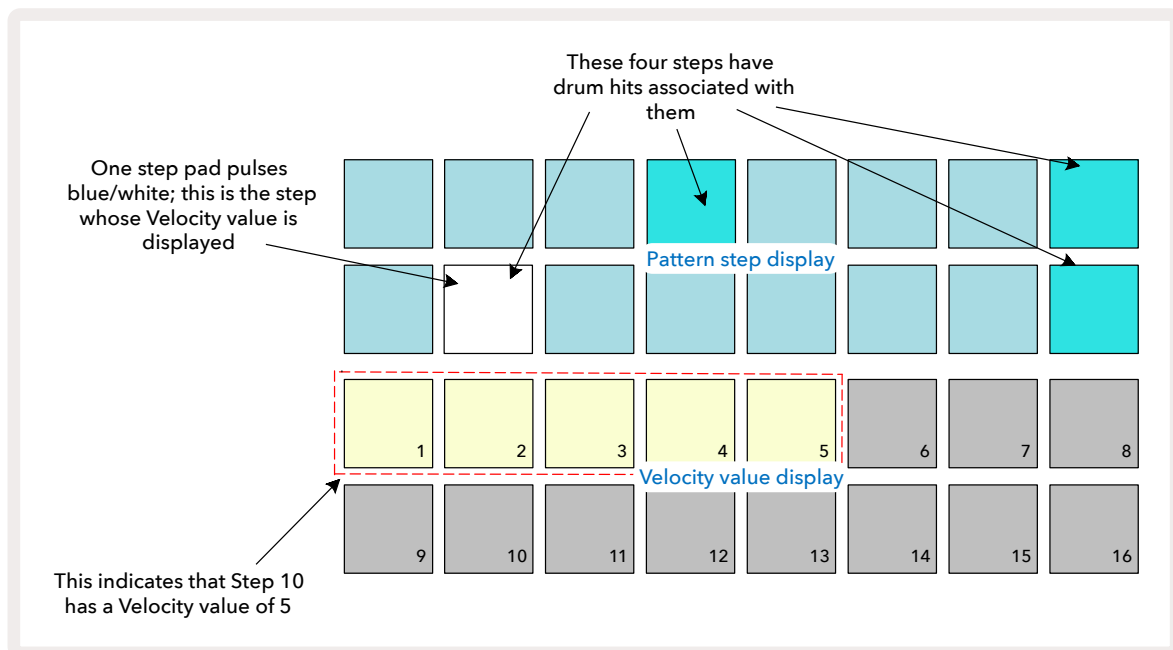
In *Velocity View*, the two upper rows of the grid represent the 16-step pattern for the currently selected sample, while the two lower rows represent a 16-segment "fader", spilt across two rows; the number of pads illuminated sand represent the Velocity value for the selected step.

In the example above, Steps 4, 8,10 and 16 are brightly lit, indicating that these steps have samples associated with them. One pad in the Pattern step display will flash alternate blue/white: this is the step whose Velocity value is being displayed. In the example, the Velocity value for this step is 40; the first five pads of Row 3 are lit sand (because 5 x 8 = 40), the remainder of the Velocity value display is unlit. If the Velocity value is not a multiple of 8, the "last" pad in the Velocity display will be dimly lit to indicate that it is between pad values. Such values may be recorded via live playing, but may not be programmed in manually.

Note also that you hear the sample at the step when you press the step pad.

You can change Velocity value by pressing the pad in the Velocity value display rows that corresponds to the Velocity value. If you wanted the hit at Step 12 in the example above to have a Velocity value of

96 instead of 40, you would press pad 12; Pads 1 to 12 now illuminate sand. If you want to decrease a Velocity value, press the pad corresponding to the required value.

No. of lit pads	Velocity value	No. of lit pads	Velocity value
1	8	**9**	**72**
2	16	**10**	**80**
3	24	**11**	**88**
4	32	**12**	**96**
5	40	**13**	**104**
6	48	**14**	**112**
7	56	**15**	**120**
8	64	**16**	**127**

You can also use *Velocity View* to change Velocity values while a pattern is playing. In this case, you need to press and hold the pad for the step to have its Velocity value changed; you can do this at any point in the pattern. The held step pad will illuminate red, and the other two rows will "freeze" to display the Velocity value of the selected step. Press the pad corresponding to the new value required. The pattern continues to play, so you can experiment with different Velocity values in real time.

> **t** You can also add samples in *Velocity View*. Hold down the pad corresponding to the step where a hit is to be added, and press a pad on the two lower rows; the pad defines the velocity of that hit. This is great for adding a series of "ghost" hits at low volume.
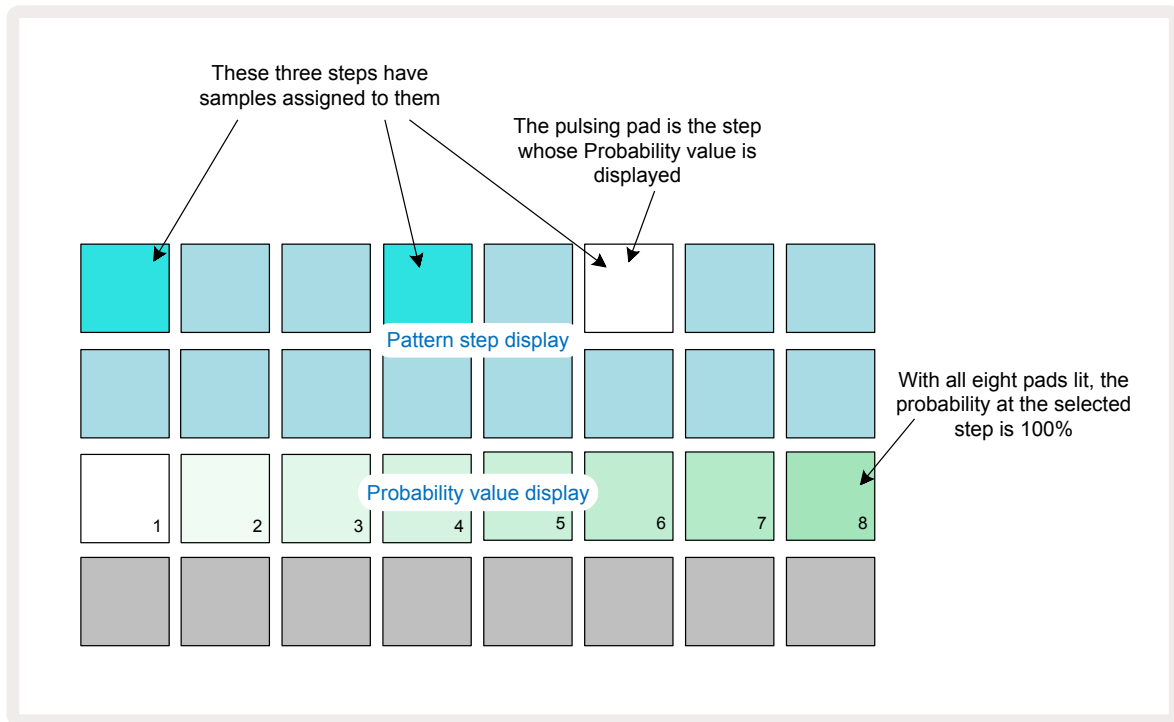
Probability

Circuit Rhythm's Probability function can be applied to individual steps on any track. Probability introduces a degree of random variation into a pattern. It is essentially a further step parameter, which decides whether or not the notes on the step will be played during each pass of the Pattern.

All steps are initially assigned with a Probability value of 100%, meaning that all steps will always be played, unless their Probability value is reduced: this is done using *Probability View*.

Probability View is the secondary view of the *Pattern Settings* button **7**. Open it by holding **Shift** and pressing **Pattern Settings**, or press **Pattern Settings** a second time if already in *Pattern Settings View* to toggle the View.

Select the step in the Pattern display for which it is wished to alter the probability of the notes at that step. Pads 17 – 24 constitute a "probability meter": initially all eight pads will be lit, with the colour deepening from 17 to 24.

There are eight possible values of Probability determining the likelihood that the notes on the chosen step will play in any one pass through the Pattern. The number of lit pads indicates the Probability value: the higher pads in the row will be dark. The possible Probability values are:

Lit pads (Row 3)	Probability
1 – 8	100%
1 – 7	87.5%
1 - 6	75%
1 - 5	62.5%
1 - 4	50%
1 - 3	37.5%
1 - 2	25%
1 only	12.5%

To assign a Probability to a step while sequencer playback is stopped, press and release the pad for the step you wish to edit and press the pad in Row 3 corresponding to the Probability value. To assign Probability to a step while sequencer playback is active, you must keep the step pad held while you set a probability. All micro steps contained within the step will have a collective chance of being played according to the percentages above. This means that either all of the micro steps at the step will play, or none of them will.

- A Probability of 100% means that the samples at the step will always be played.

- A Probability of 50% means that on average, the samples at the step will be played in half of the patterns.

- A Probability of 25% means that on average, the samples at the step will be played in a quarter of the patterns.

Clearing steps, Patterns and Projects will also reset all Probabilities to 100%. Live recording of a new sample to a step will also reset the probability at that step to 100%.

Recording Knob Movements (Automation)

You can tweak the sonic parameters of assigned samples in real time using the Macro controls ③. Circuit Rhythm features automation, which means you can add the effect of these tweaks to the recorded pattern by entering Record Mode (by pressing ● **Record** ⑬) while moving the knobs.

On entering Record Mode, the LEDs below the active Macro controls initially retain the colour and brightness they had previously, but as soon as you make an adjustment, the LED turns red to confirm that you are now recording the knob movement.

In order for the knob movements to be retained, you must exit Record Mode before the sequence loops back beyond the point in the pattern where you initially turned the Macro, otherwise Circuit Rhythm will overwrite the automation data with that corresponding to the new knob position. Provided you do this, you'll hear the effect of the Macro control being replayed when the sequence next loops round, at the point in the pattern where you turned the control.

You can also record Macro control changes when the sequence isn't playing: in *Velocity View*, *Gate View* or *Probability View*, press ● **Record**, select the step at which the change should occur by pressing and holding the pad corresponding to the step; this will play the sample at that step. Then adjust the Macro control(s) as desired; the new value(s) will be written to the automation data; press **Record** again to exit Record Mode.

When the sequence is running, you will hear the effect of the Macro knob movements at that step. In the same manner, you may also edit the automation of Macro controls for specific steps in this way while the sequencer is playing back. With Record Mode enabled, hold down a step pad and turn a Macro control.

Any changes made to Macro values which are recorded as part of the pattern will be retained even if the sample is changed during the pattern (see "Sample Flip" at page 31). You can tweak the sound at a specific step and then change the sample at that step: the tweak will still be effective.

You can delete any Macro automation data you don't want to keep by holding down **Clear** 17 and moving the knob in question anticlockwise by at least 20% of its rotation – the LED below the knob will turn red to confirm. But note this will clear the automation data for that Macro for the whole Pattern, not just at the sequencer's current step.

Clear and Duplicate

To remove a step from a Pattern, hold **Clear** 17 and press the step pad. This will remove the sample trigger well as all automated parameters (Velocity, Micro Steps & Probability) that were assigned to the step.

To duplicate a step within a pattern, hold **Duplicate** 18 and press a step. The copied step will light bright green. While still holding **Duplicate**, press the step pads to paste the original step's data. This will duplicate sample flip, step parameters (Velocity, Micro Steps, Gate and Probability), and macro automation to the new step.

Drum Pads View

Drum Pads View is great for playing live. You can trigger samples for all eight tracks manually, and also automatically repeat each trigger at one of eight tempo-related rates. This View lets you add rapid bursts of drum beats, especially trap-style hi-hat patterns with a triplet feel.

Drum Pads View is the secondary view of the *Sample Rec* button ⑨. Open it by holding **Shift** and pressing **Sample Rec**, or press **Sample Rec** a second time if already in *Sample Rec View* to toggle the View.

The default configuration of *Drum Pads View* is illustrated below:
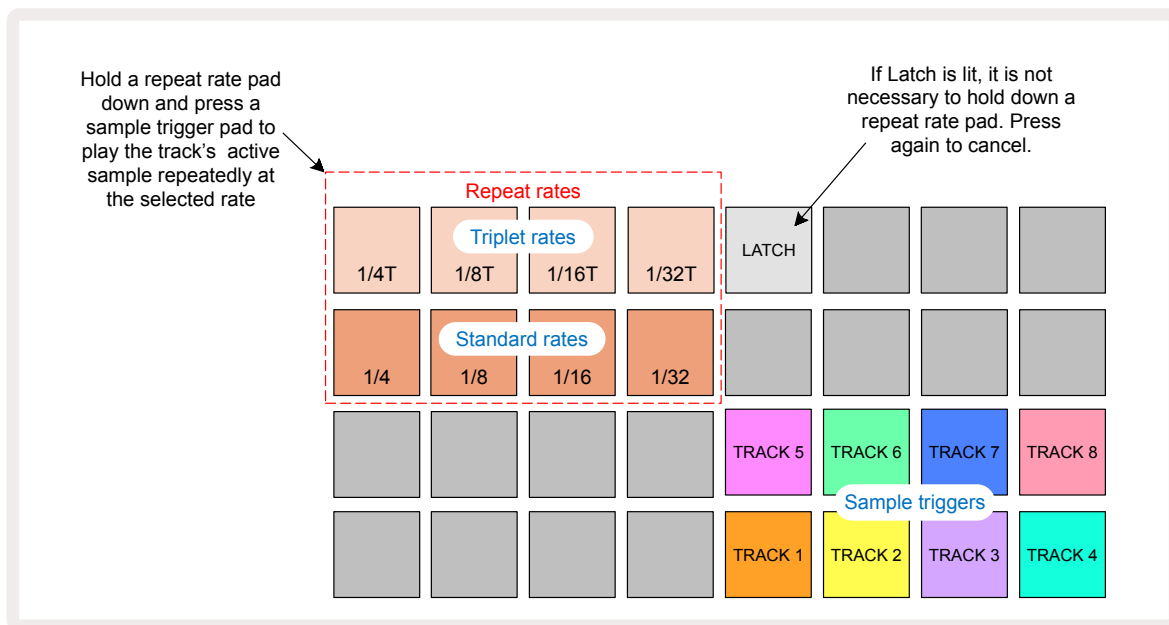
If you are left-handed, you may prefer to reverse the pad layout by pressing the ▼ button:

Drum Pad View in Left-handed mode
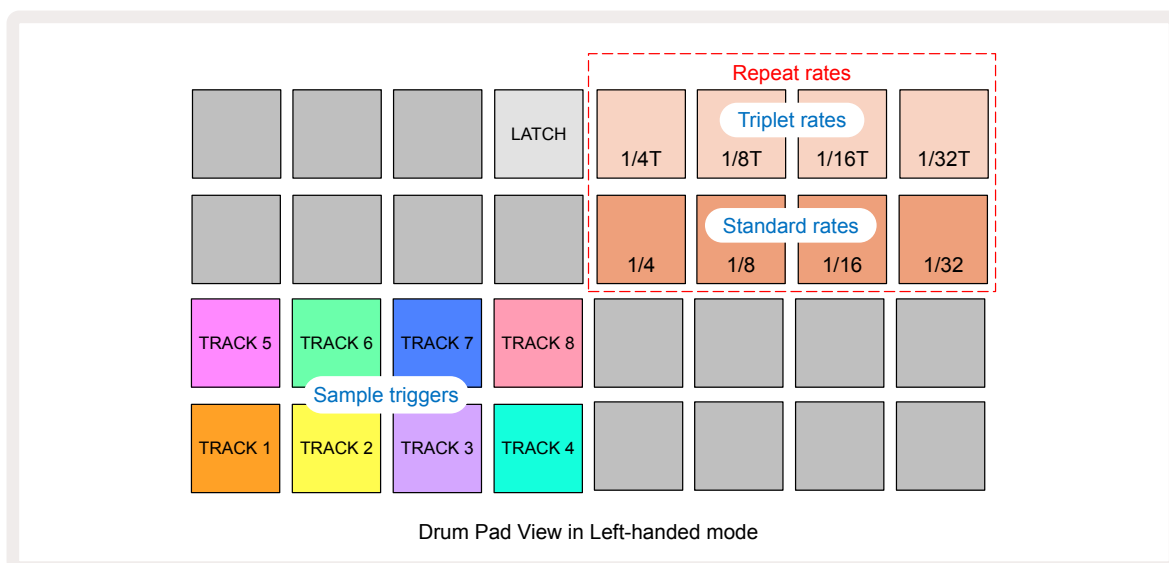
Press ▲ to revert to swap back. The descriptions below reference the right-handed version.

The eight pads at the right of the two lower rows are trigger pads for each track. Pressing one of these will trigger the currently active sample for that track: this applies whether or not the sequence is running. If you want to add further live samples to the Pattern while it's playing, enter Record Mode by pressing **Rec** 🔴: any additional samples added in real time will now be added to the Pattern on a per-track basis. When a trigger pad is pressed, the macro knobs will update to display the track parameters for the most recently triggered track – this provides a quick way to tweak the sound of each track with reference to each other.

Note Repeat Rates

The eight pads at the left of the two upper rows let you select a note repeat rate. Pads 9 to 12 on Row 2 select standard rates at multiples of the currently set BPM, with Pad 9 being the BPM itself. Pads 1 to 4 on Row 1 select triplet multiples of these rates.

To play a sample with note repeat, hold down a Repeat Rate pad and press the sample trigger pad for the required track. The sample will repeat for as long as both pads are pressed. You can remove the need to use two fingers by pressing Pad 5, which makes the Repeat Rate pads latch on when they are tapped. Pad 5 illuminates bright white when the latch function is active. Press it a second time to turn the latch function off. Note repeat playback will over-ride any existing step data within a pattern. For example, if you are performing with a ¼ note repeat rate, but the existing pattern is made of steps that each contain six micro steps, you will only hear ¼ note rates for the duration of note repeat being active. This can be very useful to create dramatic fills while performing live.

You can record repeat note performances directly into patterns while Record Mode is active. Recording note repeat is destructive and will overwrite any micro steps that currently exist in the pattern – what you hear during recording is what the pattern will become.

See the grid images at page 45 to see which pad in Drum Pads View selects each repeat rate.
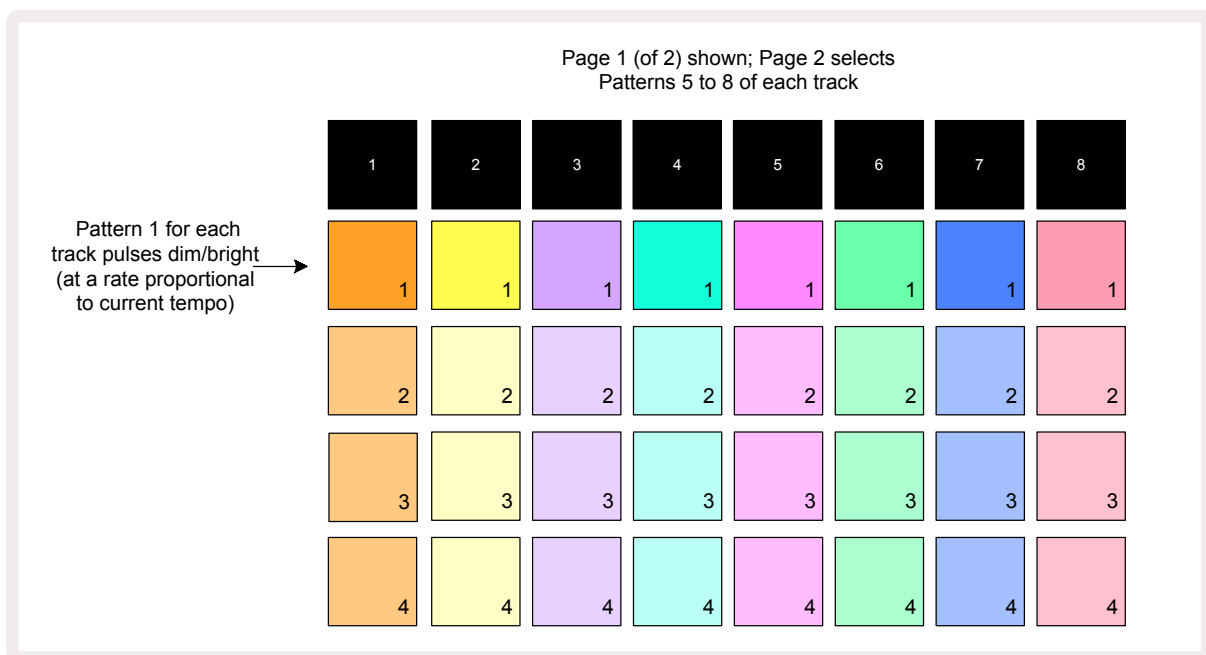
Patterns

Each Project in Circuit Rhythm has memory space for eight separate Patterns per track.

The true potential of Circuit Rhythm begins to be realised when you start to create interesting variations of a Pattern and then segue them together to be played out as a complete chain of up to 256 (8 x 32) steps. Furthermore, not all the Patterns for each track need to be chained in the same way: you could have 64-step drum patterns on Tracks 1 and 2 combined with a longer sequence of bass and/or synth lines on Tracks 3 and 4, for example. There is no restriction on how you combine the Patterns from different tracks (though Patterns may only be chained sequentially; for more information).

Patterns View

To arrange and organise your Patterns, use *Patterns View*, accessed by pressing **Patterns** ⑩. The first time you open *Patterns View* in a new Project, it will look like this:

Patterns View has two pages, selected by the ▼ and ▲ buttons ⑮. The pages are identical and the Pattern memories arranged vertically; on Page 1 the pads select Patterns 1 to 4 for each track, on Page 2 they select Patterns 5 to 8.

How each pad is lit indicates its status. A dim pad means that the Pattern is not currently selected to play. One pad per track will be pulsing between dim and bright: this is the Pattern that was playing when Play was last stopped. Initially (i.e., when a new Project is started), Pattern 1 in each track will be in this state with all the other memories empty, and the pads dimly lit.

To select a different Pattern for any track, press its pad. If you do this while another Pattern is already playing, the new Pattern will be "queued" to begin playing at the end of the current one, giving you a smooth transition between Patterns. In this case, the pad for the next Pattern will flash quickly while it is being "queued", until it starts to play. However, if you hold down **Shift** while selecting the next Pattern, it will start playing immediately from the corresponding Pattern step, thereby ensuring that the overall timing maintains continuity. For example, if the current Pattern had reached Step 11 when you press a second Pattern's pad while holding down **Shift**, Circuit Rhythm will remember where the cursor is, and the second Pattern will start playing from Step 12.

Every time you press **Play** ▶ , the currently selected Pattern restarts from Step 1 (or the chosen Start point – selectable in *Pattern Settings View*). If you want to continue the Pattern from the point at which the sequencer was last stopped, press **Shift** and **Play** together.

Clearing Patterns

Pattern memories may be cleared in *Patterns View* by holding down **Clear** 17 (it lights red) and pressing the corresponding pad. The selected Pattern pad will light bright red - to confirm deletion - while you press it. While playback is stopped, if the Pattern that is cleared is not the currently active Pattern (indicated by the track colour pulsing), and is not part of a Pattern Chain, it will light white. This indicates that this Pattern will be displayed in all step views for the track. This matches the behaviour of View Lock, see page 54.

Duplicating Patterns

In *Patterns View*, the **Duplicate** button 18 can be used to perform a copy-and-paste function, letting you copy a Pattern from one memory to another. This is a very useful function, as it lets you use an existing Pattern as the basis for another, slightly different one: it is often easier to modify an existing Pattern to be how you want it than create a new one from scratch.

To copy a Pattern from one memory to another, hold down **Duplicate** (it lights green), press the pad with the Pattern you want to copy (it lights green while you press it), and then press the pad for the memory where you want the copy to be stored: it will light red, then, if playback is stopped, it will turn white once you release **Duplicate**, indicating that this Pattern will be displayed when you switch to a step view. You now have an identical copy of the Pattern. If you want to copy the Pattern data to several memories, you can continue to hold the **Duplicate** button down, and repeat the "paste" part of the operation to the other memories.

It is possible to duplicate Patterns between tracks, as well as within a single track.

Step Page and 16/32-step Patterns

The default length of a Pattern in Circuit Rhythm is 16 steps, but you can double the length to 32 steps with the Step Page button **8** (labelled **1-16/17-32**). A Pattern length of 16 steps or fewer is indicated by the Step Page button showing dim blue. To extend the length of the Pattern currently being viewed beyond 16 steps, press the Step Page button: it now shows bright blue for Page 1 - while displaying Steps 1 to 16, and orange for Page 2 - while displaying Steps 17 to 32.

This feature lets you create more interesting and varied loops within the scope of a single Pattern. If some tracks are 16 steps long and some 32 steps long, the 16-step Patterns will repeat after Step 16, while the 32-step Patterns will continue for Steps 17 to 32, so you will hear two repetitions of the shorter tracks for every one of the longer.
Pressing Step Page (**1-16**/**17-32**) while a 32-step Pattern is playing changes the display to the other page but does not interrupt the Pattern. You can set a Pattern length back to the default of 16 steps by holding down **Clear** and pressing the Step Page button: the Pattern will now revert to 16 steps in length. Samples assigned to all 32 steps are preserved, though you will only hear those assigned to the first 16 steps after using **Clear**. If you extend the Pattern length to 32 steps once again, all notes/hits previously assigned to steps 17 to 32 will still be there.

You can also use **Duplicate** with the Step Page button. Holding down **Duplicate** and pressing the Step Page button will extend the Pattern length for the currently selected track to 32 steps, and copy all data at Steps 1 to 16 to Steps 17 to 32 respectively, including automation data. Any data already present on Page 2 will be overwritten by this operation.

Chaining Patterns

Once you've created several Patterns for one or more tracks, you can start to chain them together to make a longer sequence. Press **Patterns** 10 to open *Patterns View*.

Patterns can be chained on a per-track basis. When Patterns are chained, they play sequentially, e.g., a Pattern Chain comprising four Patterns will play them in numerical order one after the other, and then repeat. If they are all 32-step Patterns, the chain will be 128 steps in length. Another track with just a single 32-step Pattern will be played four times during each chain; a 16-step Pattern will be played eight times.

To create a Pattern Chain, press and hold the pad for the lowest-numbered Pattern required and then press the pad for the highest-numbered Pattern required. (Or indeed, the other way round.) For example, if you want to chain a track's Patterns in memories 1 to 3 together, hold Pad 1 down and then press Pad 3. You'll see that all three pads now illuminate brightly in the track colour, indicating that they now form a chained sequence.

If you want to select a chain from Patterns across the Page boundary, selection works the same way: for example, to select Patterns to 3 to 6 as a chain, press and hold the pad for Pattern 3, then press ▼ to move to Page 2, then press the pad for Pattern 6. You'll now find that the pads for Patterns 3, 4, 5 and 6 are all lit. To chain Patterns that use the same pad on the two pages as the start/end points (e.g. 1 and 5), hold the pad for the first Pattern, move to Page 2, then release the pad. In this example, a chain of Patterns 1 to 5 is then created.

What's important to remember is that the Patterns you chain together must be consecutive. You can chain Patterns 1, 2, 3 and 4 together, or 5, 6 and 7 together, or 4 and 5 together, but you can't chain 1,2 and 6 together. (However, Circuit Rhythm's Scenes feature allows you to overcome this restriction: see page 59 for details of to use Scenes.)

The following example will illustrate chaining:

Patterns View – Page 1

Patterns View – Page 2
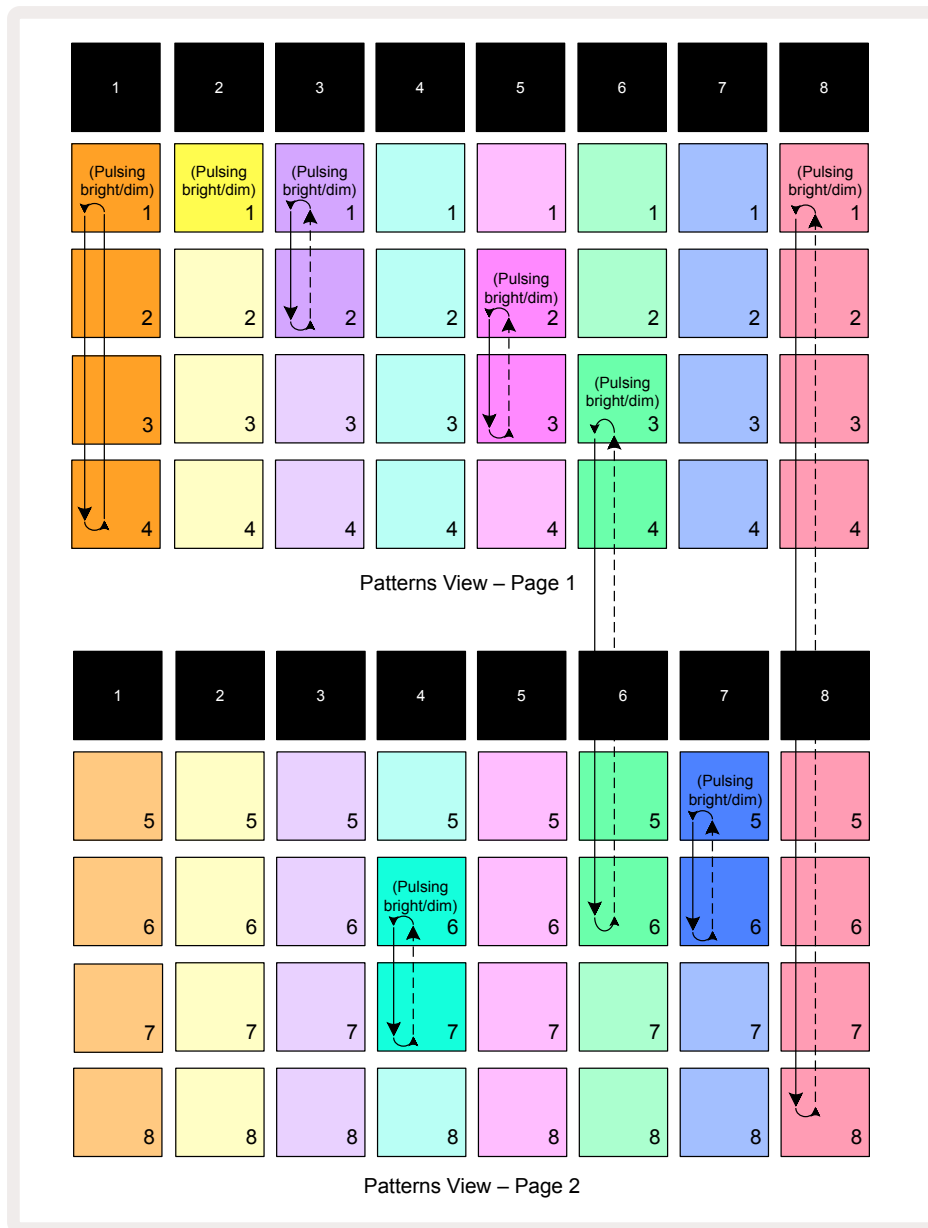
The *Patterns View* example above shows a possible arrangement of Patterns for an 8-pattern sequence. We are using the following Patterns, and for simplicity we will assume that all the Patterns are of 16 steps:

- Track 1 - Patterns 1 to 4
- Track 2 - Pattern 1 only
- Track 3 - Patterns 1 and 2
- Track 4 - Patterns 6 and 7
- Track 5 - Patterns 2 and 3
- Track 6 - Patterns 3 to 6
- Track 7 - Patterns 5 and 6
- Track 8 - Patterns 1 to 8

When you press Play, each track will loop round its own chain of Patterns. The longest chain is Track 8 – this defines the overall length of the sequence, in this case, 128 (8 x 16) steps. Track 8 will play Patterns 1 to 8 in order, then loop back to Pattern 1 and start again. Against this, Track 1 will play Patterns 1 to 4 in order, and then loop back and repeat; Track 2 only has one Pattern, so this will repeat eight times in the 8-pattern sequence. Tracks 5 and 7 have two Patterns in their chains, so they will each be played through four times and Track 6 has four Patterns in its chain, so it will played through twice. What you hear is illustrated in the timeline below:

BEATS																
0	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128

Track 1

Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 1	Pattern 2	Pattern 3	Pattern 4

LOOPS BACK AFTER 128 BEATS

Track 2

Pattern 1	Pattern 1	Pattern 1	Pattern 1	Pattern 1	Pattern 1	Pattern 1	Pattern 1

LOOPS BACK AFTER 128 BEATS

Track 3

Pattern 1	Pattern 2	Pattern 1	Pattern 2	Pattern 1	Pattern 2	Pattern 1	Pattern 2

LOOPS BACK AFTER 128 BEATS

Track 4

Pattern 6	Pattern 7	Pattern 6	Pattern 7	Pattern 6	Pattern 7	Pattern 6	Pattern 7

LOOPS BACK AFTER 128 BEATS

Track 5

Pattern 2	Pattern 3	Pattern 2	Pattern 3	Pattern 2	Pattern 3	Pattern 2	Pattern 3

LOOPS BACK AFTER 128 BEATS

Track 6

Pattern 3	Pattern 4	Pattern 5	Pattern 6	Pattern 3	Pattern 4	Pattern 5	Pattern 6

LOOPS BACK AFTER 128 BEATS

Track 7

Pattern 5	Pattern 6	Pattern 5	Pattern 6	Pattern 5	Pattern 6	Pattern 5	Pattern 6

LOOPS BACK AFTER 128 BEATS

Track 8

Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6	Pattern 7	Pattern 8

LOOPS BACK AFTER 128 BEATS

The above example illustrates the basic points involved in chaining Patterns together to make a longer sequence. Creating longer, more complex and more interesting sequences is an extension of these principles. Circuit Rhythm allows Pattern chains of up to 256 (8 x 32) steps, where any of the eight tracks can change their pattern every 16 steps (or fewer if start/end points are also altered from the default).

Every time you press ▶ **Play**, the Pattern Chain restarts from the start point of the first Pattern in the chain. You can restart the Chain from the point at which the sequencer was stopped by pressing **Play** while holding down **Shift**.

Pattern Octave

You can shift the pitch of the currently viewed Pattern up or down one or more octaves by holding down
Shift 20 and then pressing ▼ or ▲ 15 . You can do this either during playback, or when the sequencer is
stopped. Pattern Octave can be changed in any of the Step Views excluding *Sample View*, *Slice Note View*
and *Slice Point Record View*. Only the pitch of the currently selected track is adjusted, that of the others
will remain unaffected.

If the pattern contains notes which are already in the highest octave that Circuit Rhythm can generate,
they will remain unaffected by an upward Pattern Octave shift; the same applies to the lowest notes and
a downward octave shift. If this is the case, the ▼ or ▲ button will light red to indicate that the command
cannot be executed. There is also an upper limit to sample playback pitch (as described in the section on
Keyboard Note View – see page 33) – you may encounter this prior to reaching the maximum playable
octave, depending on the setting of the **Tune** parameter (Macro 1).

View Lock

By default, the Pattern Step display on the upper two rows changes with the selected Pattern (and current Page), so that the play cursor is always visible. If you want to edit one Pattern while continuing to play another Pattern or complete Pattern Chain, you can make use of View Lock. One use of View Lock is to "freeze" the Pattern Step display to the current Pattern (and Page) by holding down **Shift** and pressing **Patterns** ⑩. The upper two rows will now be locked to the Pattern that was displayed when you selected **View Lock**.

In *Patterns View*, tthe currently viewed Patterns will be lit white. A pulsing white pad indicates that a Pattern is being both viewed and played, while steady white indicates that a Pattern is being viewed while another (of the same track) is being played: this pad will be pulsing in the track colour. To change the viewed Pattern, hold **Shift** and press a Pattern pad. You can still change which Patterns and Pattern Chains are playing in the usual way, described in Patterns View at page 47.

View Lock also lets you freeze the Step display on the current Page of the Pattern when you are working on a 32-step Pattern. When **View Lock** is active, the Pattern will continue to play through both Pages, but only the Page that was in view when **View Lock** was selected is now displayed. The alternative Step Page can be displayed by pressing the Step Page button ⑧.

While **Shift** is held, the **Patterns** button lights green when **View Lock** is active; when inactive it is red. You can press **Shift** at any time: the button colour will confirm whether **View Lock** is active or not.

View Lock is applied to all tracks, and also applies to all Views that have a Pattern Step display (i.e., *Velocity View*, *Gate View*, etc., as well as *Note View*). It can be cancelled by pressing **Shift** + **Patterns** again. Note that the state of **View Lock** is not saved. It will default to 'inactive' whenever Circuit Rhythm is powered on.

Pattern Settings

Although default Pattern lengths are either 16 or 32 steps (see also "Step Page and 16/32-step Patterns" at page 49), it is possible for the Pattern in any track to be any other number of steps in length, up to the maximum of 32 steps. Furthermore, the start and end points of a Pattern may be independently defined, so that sub-sections of a Pattern, of any length, may be played against other tracks with different Pattern lengths, creating some very interesting effects. You can also choose Pattern play order and set the speed of the track relative to that of other tracks.

All these options are set in the *Pattern Settings View*; press **Pattern Settings** to open this:
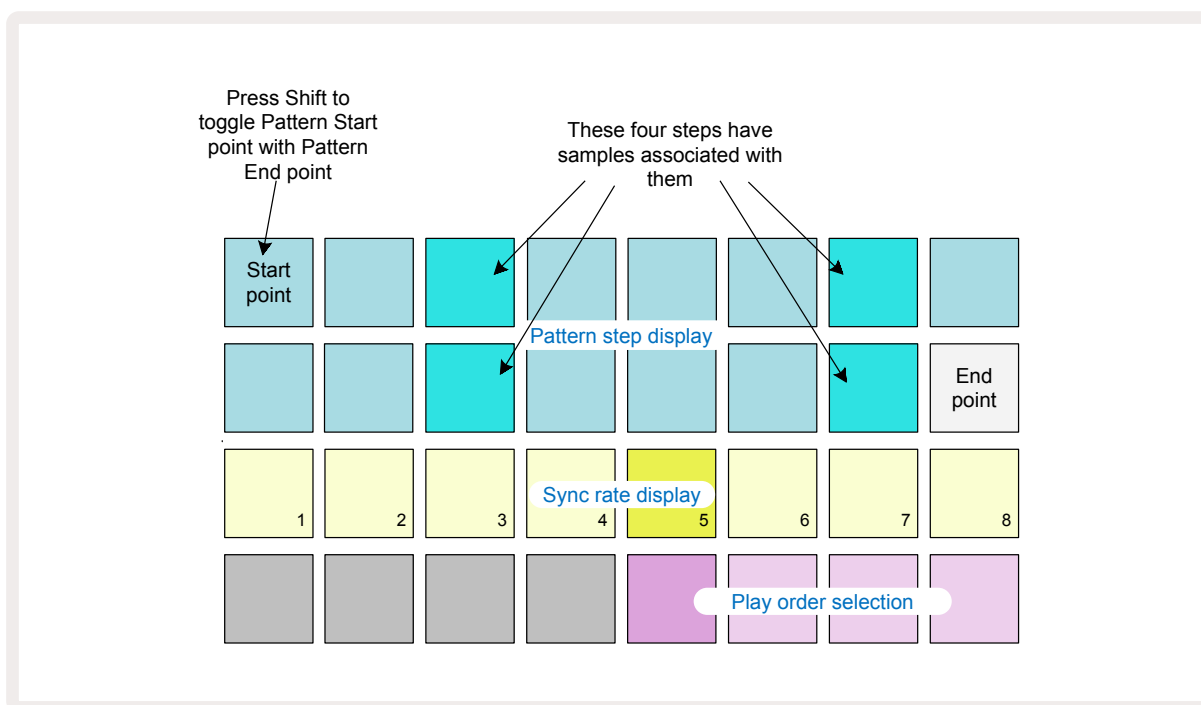
Any alterations to patterns made in *Pattern Settings View* can be saved to the Project in the usual way: press **Save** 19 – it flashes white, press it again – it flashes green to confirm the Save. (Remember that this overwrites the previous version of the Project; select a different Project memory if you want to keep the earlier version.)

Start and End points

The upper two rows of the *Pattern Settings View* show the Pattern steps for the currently selected track. If no adjustments have yet been made to Pattern length, Pad 16 will be illuminated sand: this indicates the last step in the Pattern. However if the Pattern length is 32 steps, you will need to press the Step Page button 8 to open Page 2 in order to see the end step indication. To see which step is currently the Pattern start point, press and hold **Shift**. The end point step returns to blue and a different step pad lights sand: this will be Pad 1 if Pattern length has not yet been altered.

You can change the end point for the track – and hence shorten the Pattern length - by pressing a different Pattern step pad. The new end point is indicated by a sand illumination, and the "higher" pads either go dark or dim red, the latter indicating that note/hit data has previously been assigned to that step. If you reselect the original end point, this data will still be there and will be played.
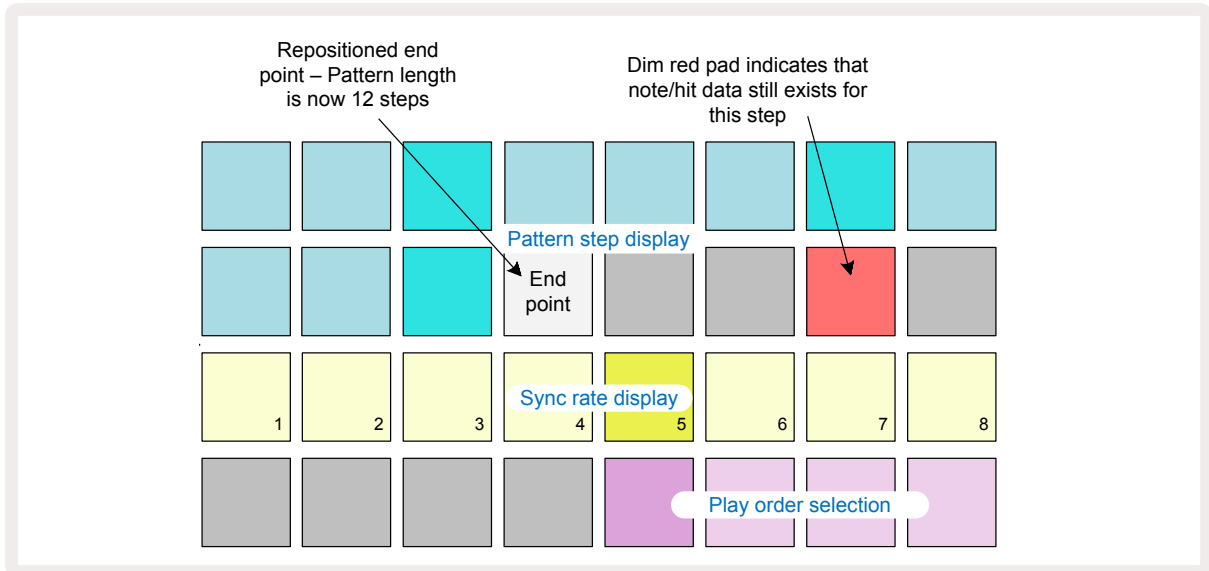

Altering the start point is exactly the same process, except that **Shift** needs to be held down while selecting the new start point:
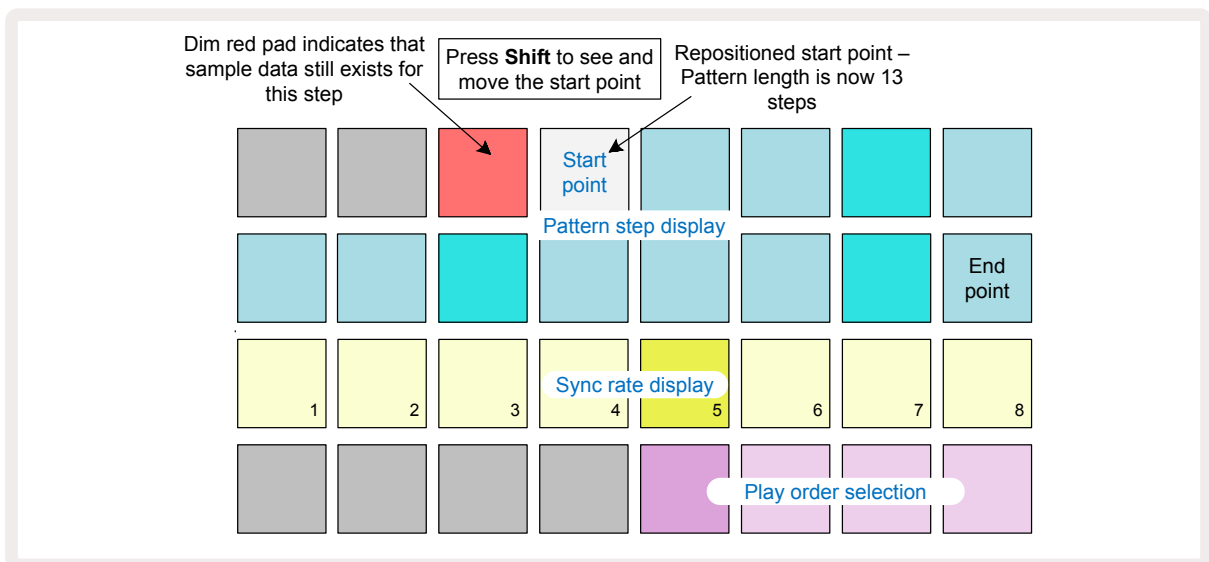
If you are working with 32-step Patterns, be careful about which of the two Step Pages you are on. The colour of the Step Page button **8** always indicates this – blue for Page 1 (Steps 1 to 16) and orange for Page 2 (Steps 17 to 32).

Play order

Pads 29 to 32 in *Pattern Settings View* let you choose the play order the currently selected Pattern will use. The pad for the selected play order illuminates brightly: the default play order is forwards (i.e., normal), indicated by Pad 29.
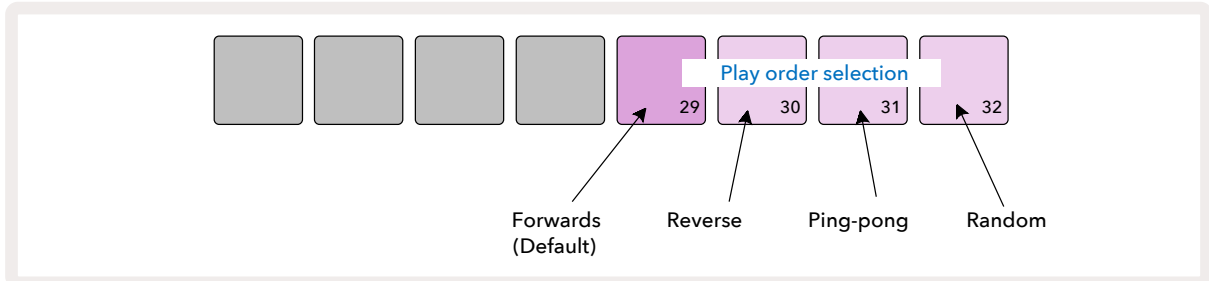

Alternatives to the normal forward play order are:

- **Reverse** (Pad 30). The Pattern starts playing at the end point, plays the steps in reverse order to the start point, and repeats.

- **Ping-pong** (Pad 31). The Pattern plays forwards from start to end, reverses back to the start point, and repeats.

- **Random** (Pad 32). The track steps are played randomly, regardless of note/hit assignment, though still at step intervals.

If the play order is changed in Play Mode, the Pattern always completes its current cycle before starting a cycle with the new direction. This applies regardless of the current Pattern length or Step Page selection.

Pattern Sync rate

The third row of *Pattern Settings View* determines the speed at which the track plays relative to the Project's BPM. It is effectively a multiplier/divider of the BPM.
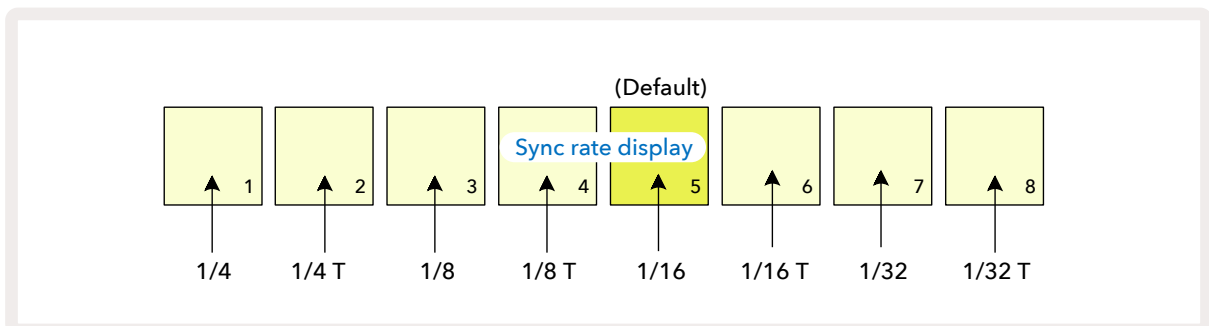
The selected sync rate is indicated by the brightly-lit pad: the default rate is "x1" (pad 5 in row 3), which means the track will play at the set BPM. Selection of a higher-numbered pad increases the rate at which the play cursor progresses through the Pattern relative to the previous one. Similarly the a

lower-numbered pads will decrease the play rate. The sync rates available are 1/4, 1/4T, 1/8, 1/8T, 1/16, 1/16T, 1/32, 1/32T, with T representing triplets.

1/16 is the default sync rate, where each step corresponds to a 16th note. Increasing the sync rate is a great way to increase the sequencer's step resolution at the cost of overall playback time. Reducing the sync rate is useful for creating longer patterns that don't require quite as fine detail, such as triggering slices of a long sample.

If the sync rate is changed while sequencer playback is active, the Pattern always completes the current cycle at the existing rate, and changes to the new rate at the end of the cycle. This applies regardless of the current Pattern length or Step Page selection.

Mutate

Mutate is a feature that lets you introduce further random variations into individual Patterns on a per-track basis. Mutate "shuffles" the notes or hits in the current Pattern, to different steps. The number of notes/hits in the Pattern and drum samples themselves are unchanged, they are just reassigned to different steps. All step parameters are reassigned by Mutate, including micro steps, gate values, sample flips, probability and automation data.

To mutate a Pattern, hold **Shift** 20 and press **Duplicate** 18. You can do this in any View that has a Pattern steps display, i.e., *Note View*, *Velocity View*, *Gate View* or *Pattern Settings View*. Mutate only affects the Pattern currently playing, so if it is part of a Pattern Chain, the other Patterns in the chain will be unaffected. The reassignment of notes/hits will take account of the Step Page length. You can apply Mutate as many times as you wish for any one Pattern by repeatedly pressing **Shift** + **Duplicate**: the notes/hits in the Pattern will be randomly reassigned each time.

Note that Mutate cannot be "undone"; it is a good idea to save the original Project so that you can return to it after applying Mutate.

Scenes

Scenes let you assign multiple Patterns and Pattern Chains within a project to a single pad, allowing you to trigger different parts of a song easily. Scenes themselves can also be chained to arrange much longer sequences and thus build up complete song structures.

Scenes are accessed in *Mixer View*: press **Mixer** to open this:
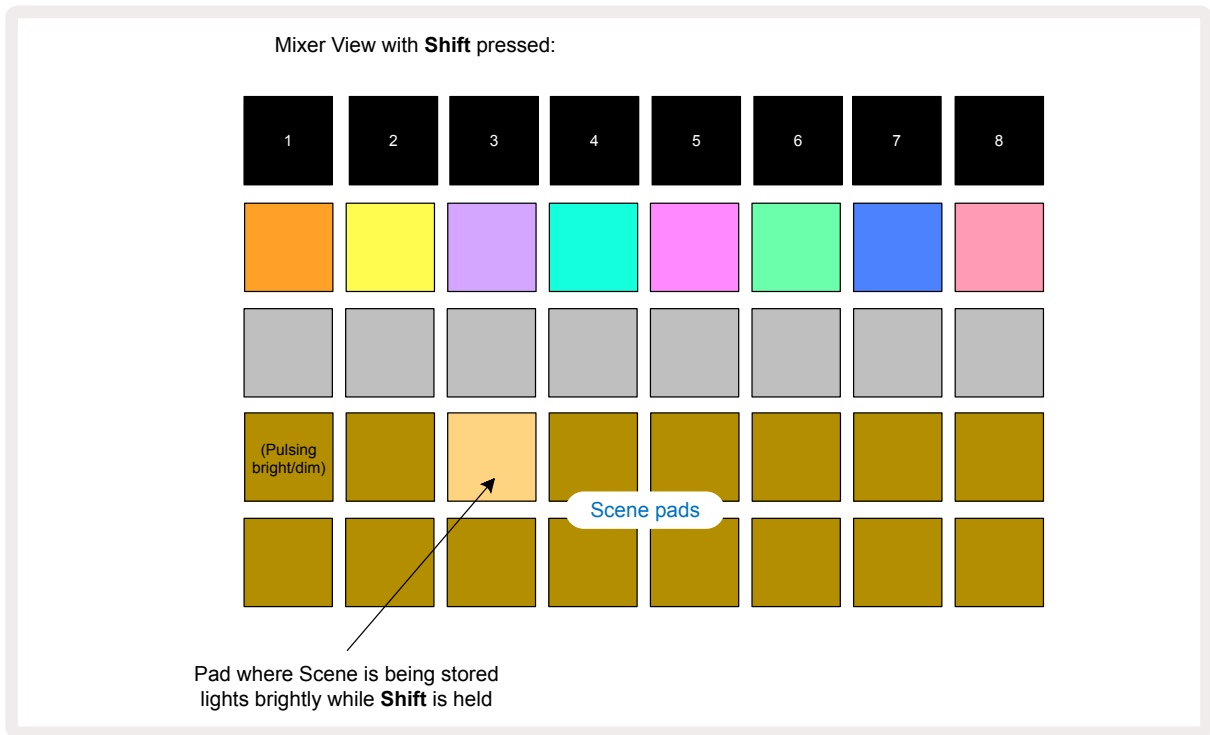

Mixer View when **Shift** is released:
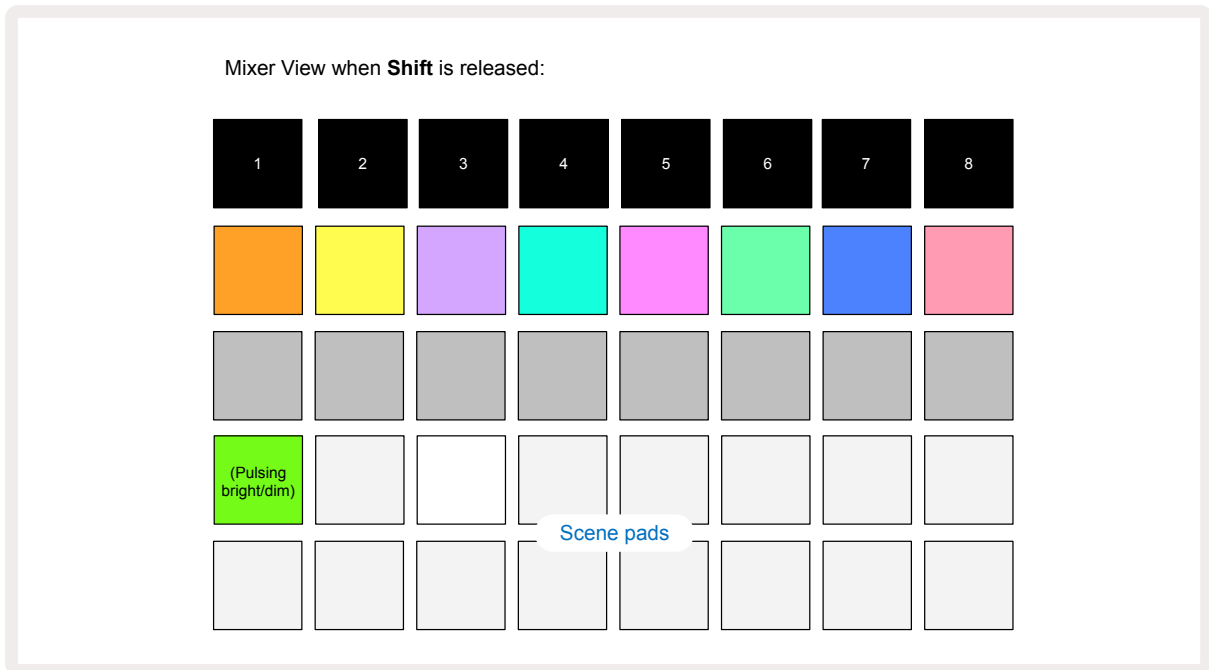
The two lower rows of pads in *Mixer View* represent the 16 Scenes that are available in the current Project. In a new Project, all the pads will trigger Pattern 1 of all eight tracks as no Pattern Chains have been defined or assigned yet. The first (Pad 17) will be pulsing bright green. which indicates that the currently playing Patterns correspond with the last selected Scene (Scene 1 by default).
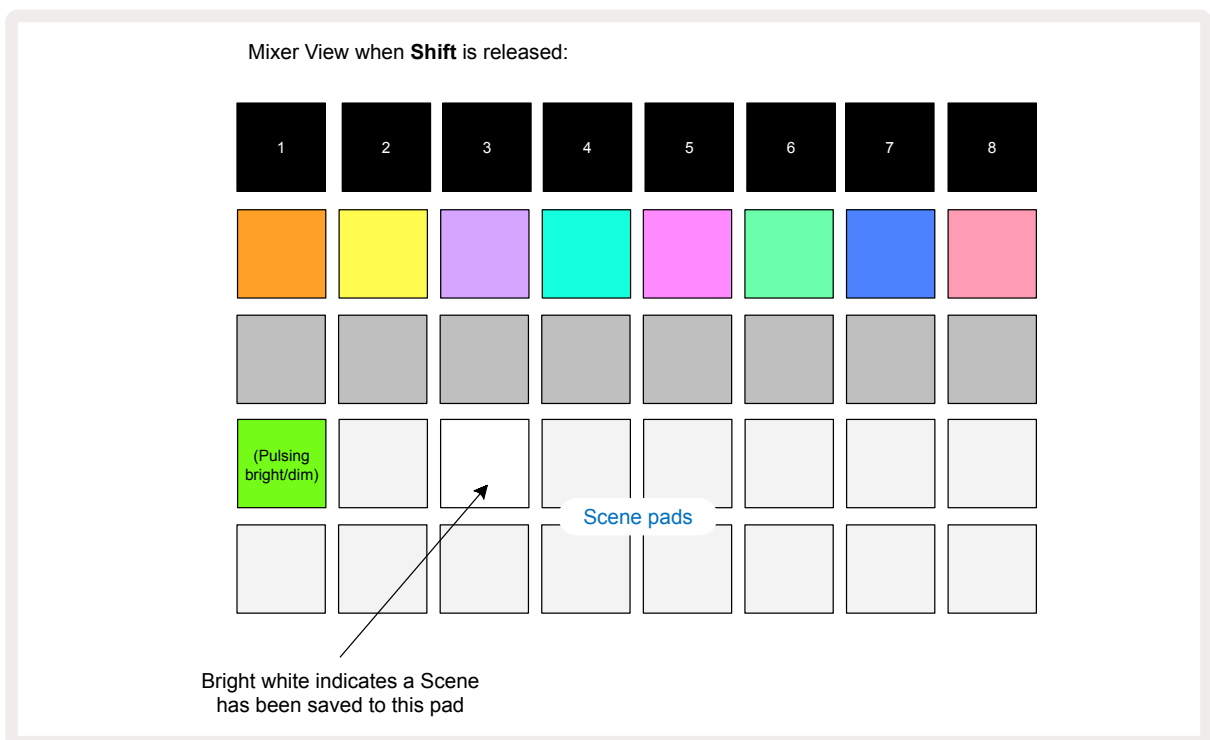
> The pre-loaded factory Patterns make extensive use of Scenes functionality – be sure to check these out to see how they're used in action.

Assigning Patterns to Scenes

Open *Patterns View* and define all the Pattern Chains for each track that are to constitute a Scene. Change to *Mixer View*, press and hold **Shift**: the Scene pads change colour to dim gold. Press a Scene pad (while still holding **Shift**) – it will light bright gold while pressed, indicating that Patterns are now assigned to it.

Mixer View with **Shift** pressed:

Scene pads

(Pulsing bright/dim)

Pad where Scene is being stored lights brightly while **Shift** is held

All the selected pattern chains are now stored as that Scene. On releasing **Shift**, the pad with the stored Scene now shows bright white:

Mixer View when **Shift** is released:

Scene pads

(Pulsing bright/dim)

Bright white indicates a Scene has been saved to this pad

Now when you press the pad, the Scene is selected and will play the set of Pattern Chains which were assigned to it next time you press Play ▶.
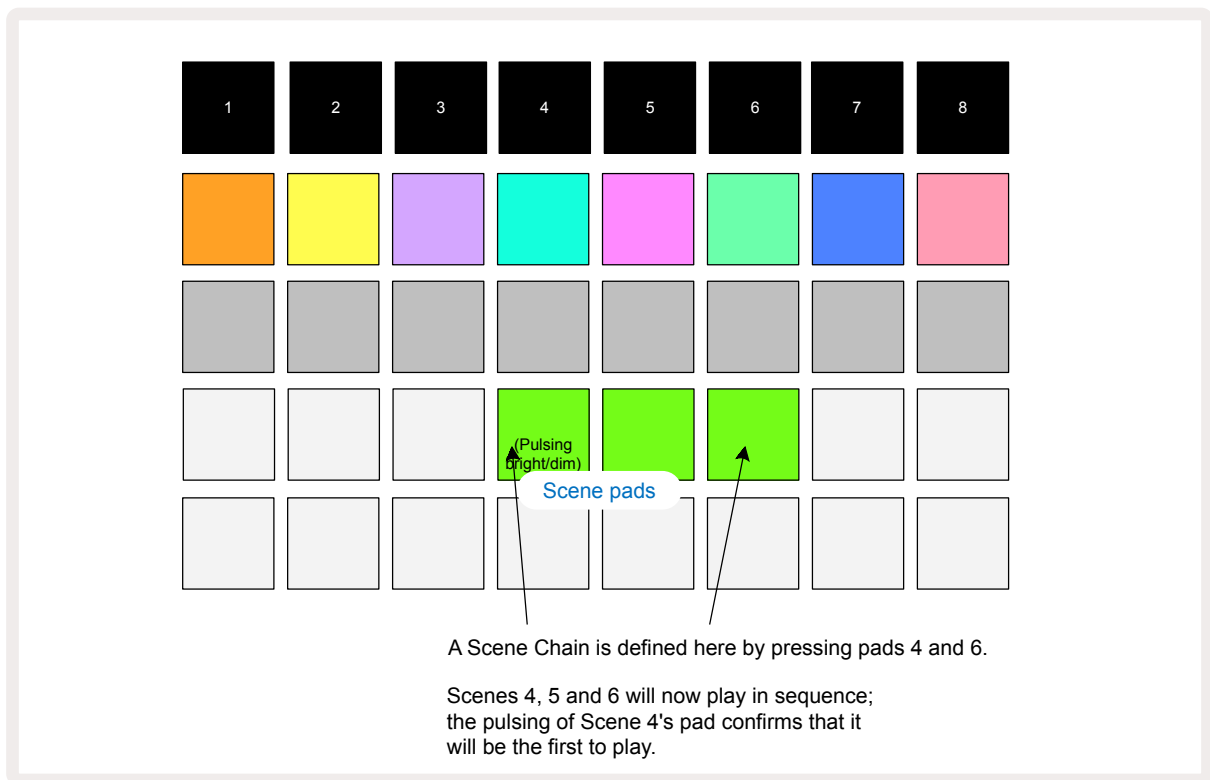
When you select *Mixer View*, you will immediately be able to see where Scenes are already stored, as their pads will be lit bright white, or bright gold when you press **Shift**.

Assigning Pattern Chains to a Scene does not affect current playback and will not select the Scene nor change your Scene Chain (see below) if you are already in Play Mode: the selected Scene will start when the current Pattern or Pattern Chain is completed – see "Queuing Scenes" page 62.

Scene data is stored with the current Project when you perform a Save by pressing **Save** 19 twice. If a Scene pad is pulsing green, it indicates i) that this is the currently selected Scene, and ii) that the currently selected Patterns match those assigned to the Scene. If the selected Patterns are changed in *Patterns View*, the Scene pad will return to dim white. If the matching Patterns are selected once again, the Scene pad will once again pulse green. Note that this behaviour will only occur for the most recently selected Scene – if you select the Patterns of a Scene other than the most recently selected one, the corresponding pad will not turn green.

Chaining Scenes to create an arrangement

Just as you can chain Patterns together in *Patterns View*, you can chain Scenes together in *Mixer View* to create longer sequences. You do this by holding down the pad for the first Scene, then pressing the pad for the last Scene: these pads and all those between them will illuminate green. The Scene Chain to be played will now comprise the Scenes assigned to all the pads between the two you pressed; e.g., if you want a Scene Chain made up of Scenes 1 to 5, hold the Scene 1 pad and press the Scene 5 pad. Each Scene will play the Pattern Chain assigned to it once and then switch to the next Scene. The Scenes will play in numerical order, and then repeat.

A Scene Chain is defined here by pressing pads 4 and 6.

Scenes 4, 5 and 6 will now play in sequence; the pulsing of Scene 4's pad confirms that it will be the first to play.

Note that you can use Scenes to overcome the restriction in *Patterns View* of not being able to define a Pattern Chain of non-sequential Patterns. You can assign the sequential groups of Patterns to consecutive Scene memories and then play them out as a Scene Chain. For example, if you wanted to play Patterns 1, 2, 5 and 6 in order, you can make a Pattern Chain of Patterns 1 and 2 and assign it to a Scene memory, and then another Pattern Chain of Patterns 5 and 6 and assign it to the next Scene memory. Then you can define a Scene Chain of those two Scenes, and will get the four required Patterns in sequence.

Queuing Scenes

Scenes may be "pre-selected" in the same way as Patterns, so if a Scene is already playing, the next one is queued. The pad for a queued Scene flashes green and at the end of the Track 1 Pattern currently playing, the new Scene will begin playing from the start without losing sync.

Clearing Scenes

To clear a Scene memory, hold down **Clear** 17 and press the pad for the Scene you wish to clear. This will return the Scene memory to its default state - Pattern 1 for all tracks.

Duplicating Scenes

To copy a Scene, hold down **Duplicate** 18, press the pad for the Scene to be copied, then press the pad for the Scene memory where you want the copy to be stored. Release **Duplicate**. However, you can paste the copied Scene multiple times (into different memory locations) if you keep **Duplicate** held.

Tempo and Swing

Tempo and Swing are closely related and the methods of adjusting them are very similar.

Tempo

Circuit Rhythm will operate at any tempo in the range 40 to 240 BPM; the default tempo for a new Project is 90 BPM. The tempo can be set by the internal tempo clock, or by an external MIDI clock source. External MIDI clock can be applied either via the USB port or the **MIDI In** port.

To display and adjust the BPM of the internal tempo clock, press the **Tempo/Swing** button 16 to open *Tempo View*. (Like most of Circuit Rhythm's buttons, you can short-press to switch the grid to *Tempo View*, or long-press to check the BPM momentarily.)

The BPM is displayed on the pad grid as two or three large digits in blue and white. The "hundreds" digit (which can only ever be a "1", "2" or off) occupies grid columns 1 and 2, while the "tens" and "units" digits occupy three columns each, How the digits 0 to 9 are depicted is illustrated below.
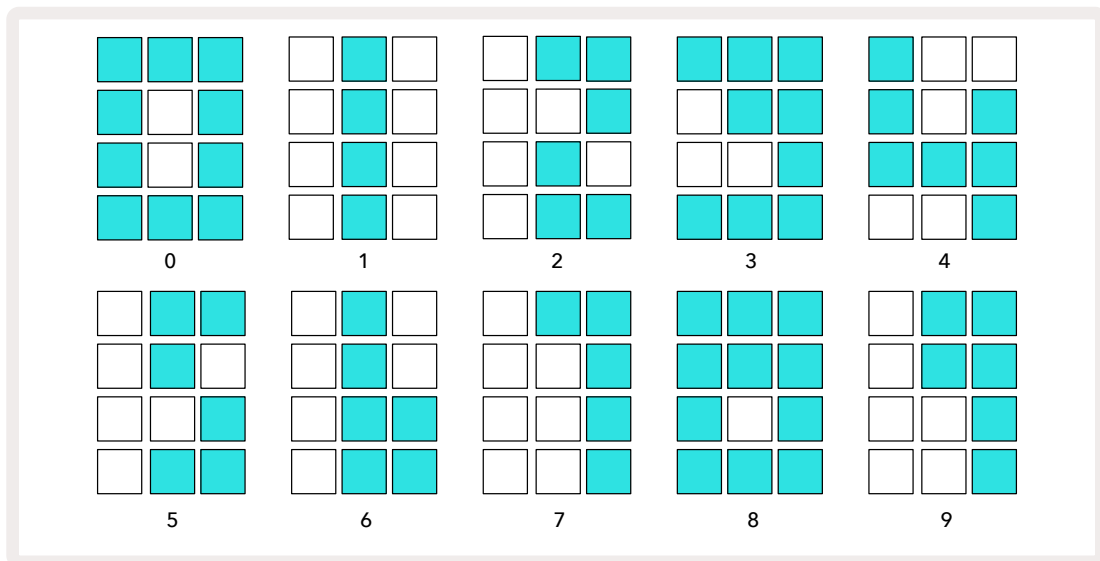
Macro control 1 (**Tune**) is used to adjust the tempo; its LED illuminates bright blue.

External clock

No switching is required to allow Circuit Rhythm to be synced to a source of external MIDI clock (subject to clock settings – see "Clock settings" on page 91). If a valid external clock is applied, it will automatically be selected as the clock source, and the grid will display "**SYN**" in red if Macro 1 is turned. Adjusting Macro 1 will not alter the internal tempo when an external clock is in use.

While the internal tempo clock only allows integer BPMs (i.e., no fractional tempo values), Circuit Rhythm will synchronise to any external clock rates – including fractional values - in the range 30 to 300 BPM.

If an external clock is removed (or goes out of range), Circuit Rhythm will stop playing. "**SYN**" remains displayed until **Play** is pressed. The grid then shows the BPM that was saved with the Project, Macro 1 will be re-enabled and you can adjust the tempo.

Tap Tempo

If you want to match Circuit Rhythm's' tempo to an existing piece of music but you don't know its BPM, you can use Tap Tempo. Hold down **Shift** and tap the **Tempo/Swing** button in time with the track you're listening to. You need at least three taps for Circuit Rhythm to change its tempo setting to your manual input, and it will then calculate the BPM by averaging the last five taps.

You can use Tap Tempo at any time, but if you're in *Tempo View*, you'll see the BPM display update itself to the tap tempo.

Swing

By default, all steps in a pattern are equally spaced in time. At tempo of 120 BPM, a 16-step pattern will repeat every 2 seconds, making the steps one-eighth of a second apart. Changing the Swing parameter from its default value of 50 (the range is 20 to 80) changes the timing of even-numbered steps (the off-beats); a lower swing value shortens the time between an even step and the previous odd step, a higher Swing value has the opposite effect.
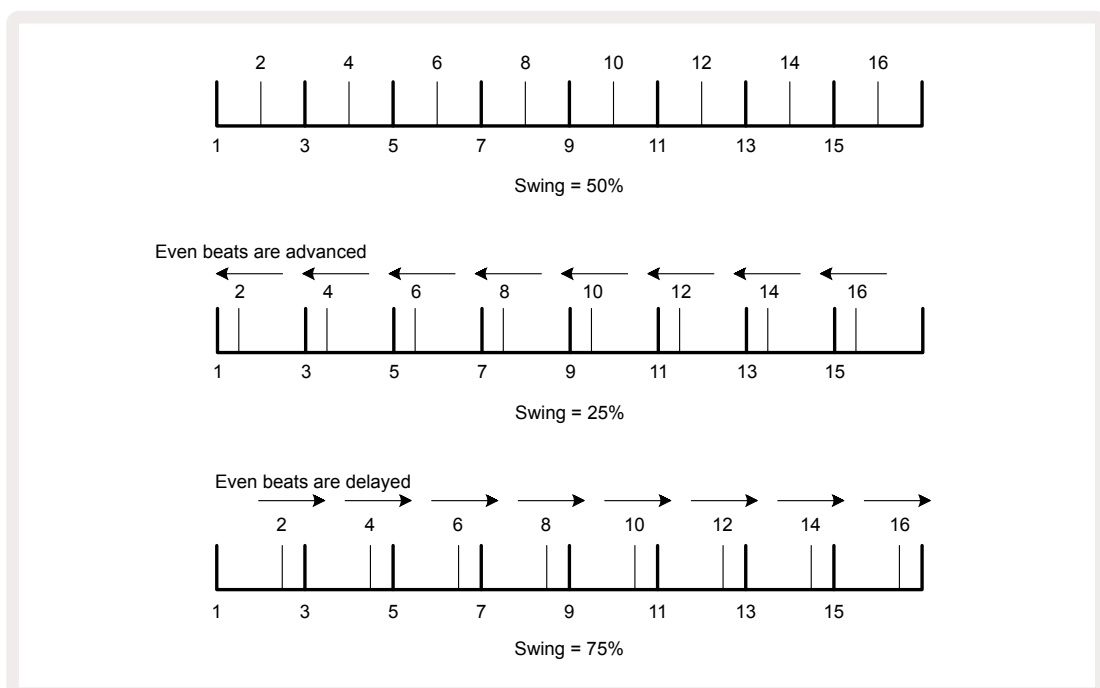
Swing is adjusted with Macro 2, while in *Tempo View*; its LED illuminates orange. Note that when adjusting tempo and swing alternately, you may notice a short delay before the knob adjustment takes effect. This is to allow you to check the current Tempo and Swing values without altering them.

Swing can be used to add an extra "groove" to your pattern. Note that as it is the even steps that are "swung", these can be interpreted as 1/16-notes (semiquavers).

Click track

The Click (or metronome) can be activated or deactivated by holding **Shift** and pressing **Clear** (17). **Clear** will light bright green when Click is enabled and dim red when it is not. When enabled, you will hear a metronome tick at every quarter note on all audio outputs whenever the sequencer is playing. This is a global setting, therefore Click will remain on or off regardless of Pack or Project changes. The setting is not saved when Circuit Rhythm is powered off.

To adjust the volume of the Click, press **Tempo/Swing** and use Macro 5 (**Distortion**). Click level is also a global setting and therefore applies to all Packs and Projects. The level setting is saved when the device is powered off using the power button (8).

Analogue Sync Out

You can synchronise external equipment – e.g., analogue synths – to Circuit Rhythm with the rear panel **Sync Out** connector (2). This provides a sync pulse at a rate proportional to the tempo clock (BPM); the actual ratio can be set in *Setup View* – see page 88. The default rate is two pulses per quarter note.

Mixer

Circuit Rhythm includes an eight-channel mixer to let you adjust the volume of each track relative to the others. By default, all the tracks play at a volume level of 100 (arbitrary units, range 0-127), leaving you with the **Master Volume** control ④ to adjust the output level as required.

Press **Mixer** ⑪ to open *Mixer View*:
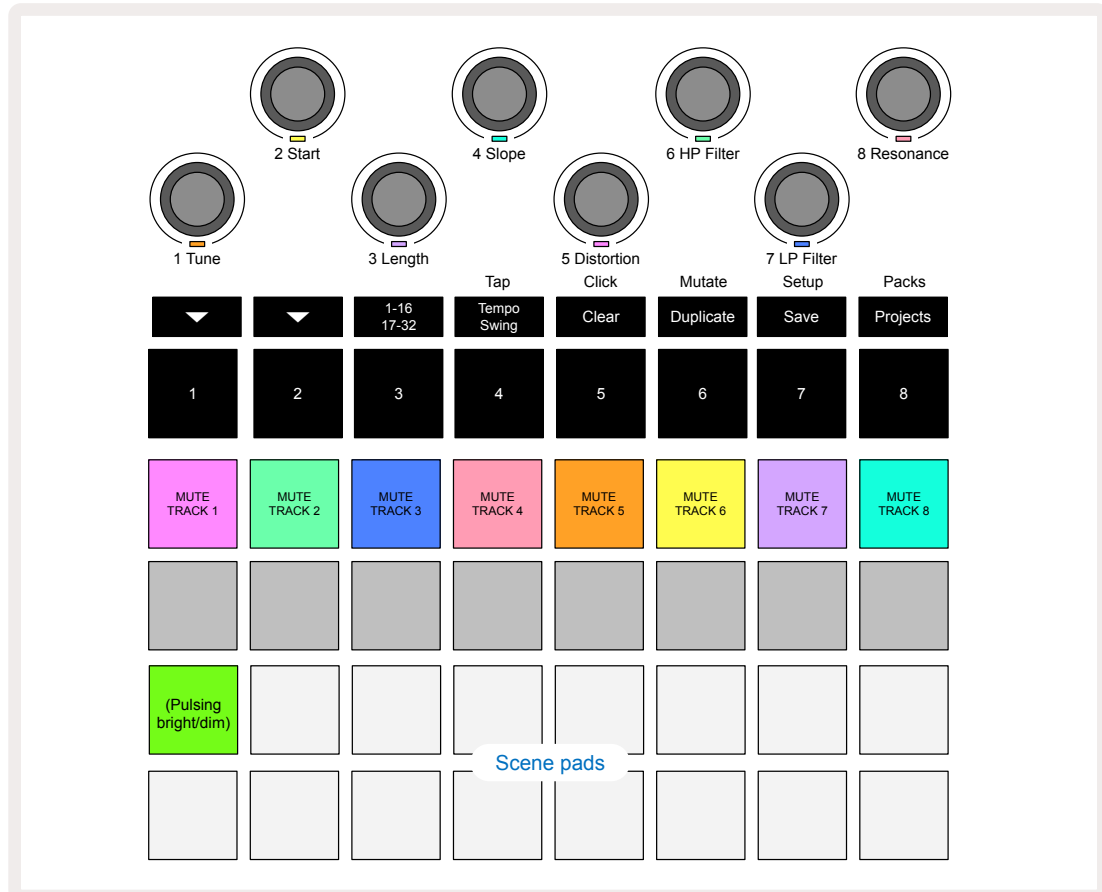
The illuminated pads on Row 1 are Mute buttons for each track. Press a pad to stop the sequencer triggering a track's samples and CC automation; this will in turn mute the track. Press again to unmute. The pad's illumination dims to indicate a Mute state.

Track level

By default, in *Mixer View* the Macros control volume level of each track. This is indicated by the ▼ button ⑮ being lit. Macro LEDs light in the corresponding track colour, and dim as the track level is reduced.

Track level adjustment with the Macros may be automated. If Circuit Rhythm is in Record Mode, changes to the individual track levels will be recorded to the Pattern. To delete Volume Level automation, hold **Clear** ⑰ and turn the Macro control. The Macro LED will light red to indicate that the deletion has been completed.

Panning

You can also position each track anywhere in the stereo image (but you'll need to be monitoring both left and right outputs or using headphones to hear any effect). Pressing the ▼ button **15** converts the Macro controls to pan controls for each track. The ▼ button goes out and the ▲ button illuminates. The default pan position of every track is stereo-centre, indicated by the Macro LEDs showing white. Panning a track left turns the LED increasingly bright blue; panning to the right turns it increasingly bright pink.

To quickly return a panned track to the centre of the stereo image, hold down **Clear** **17** and turn the Macro control clockwise. The Macro LED will light purple to indicate that the action has been completed.

The Pan controls are automated in the same way as the Level controls. To delete Pan automation, hold **Clear** and turn the Macro control anticlockwise. The Macro LED will light red to indicate that the action has been completed.

Pressing ▲ will return the Macros to their level control function.

Performing with Muted Tracks

Muting can be used for more creative purposes than simply silencing a track; it lets you perform in real time over the unmuted tracks. When a track is muted, its sequencer step pads become inactive. However, they then become available to play samples in real time in *Velocity View*, *Gate View* or *Probability View*.

To experiment with this, select a Project and mute a track in *Mixer View*. Select *Velocity View*, *Gate View* or *Probability View* for the muted track: the step pads will still show the sequence in progress, but because the track is muted, no samples will be triggered by the sequencer. The step pads may now be used to play the samples "manually" – in real time. This functionality becomes especially powerful when used in conjunction with a pattern that contains macro automation, as each step will play back with its saved automation, allowing you to build up a palette of sounds to perform with.

Note that while playback of steps in this way may be recorded to other patterns using View Lock, automation data from the steps will not be recorded.

FX Section

Circuit Rhythm includes a digital effects processor (FX) which lets you add delay and/or reverb effects to any or all of the tracks making up your Project. There is also a master compressor which is applied to your mix by default.

Sixteen delay and eight reverb presets are provided, and you can select any one of each type. The send levels from each track – i.e., how much reverb and/or delay is added – are individually adjustable for each track using the Macro controls. Any effects added can be saved to the Project in the usual way.

Press **FX** 12 to open *FX View*.
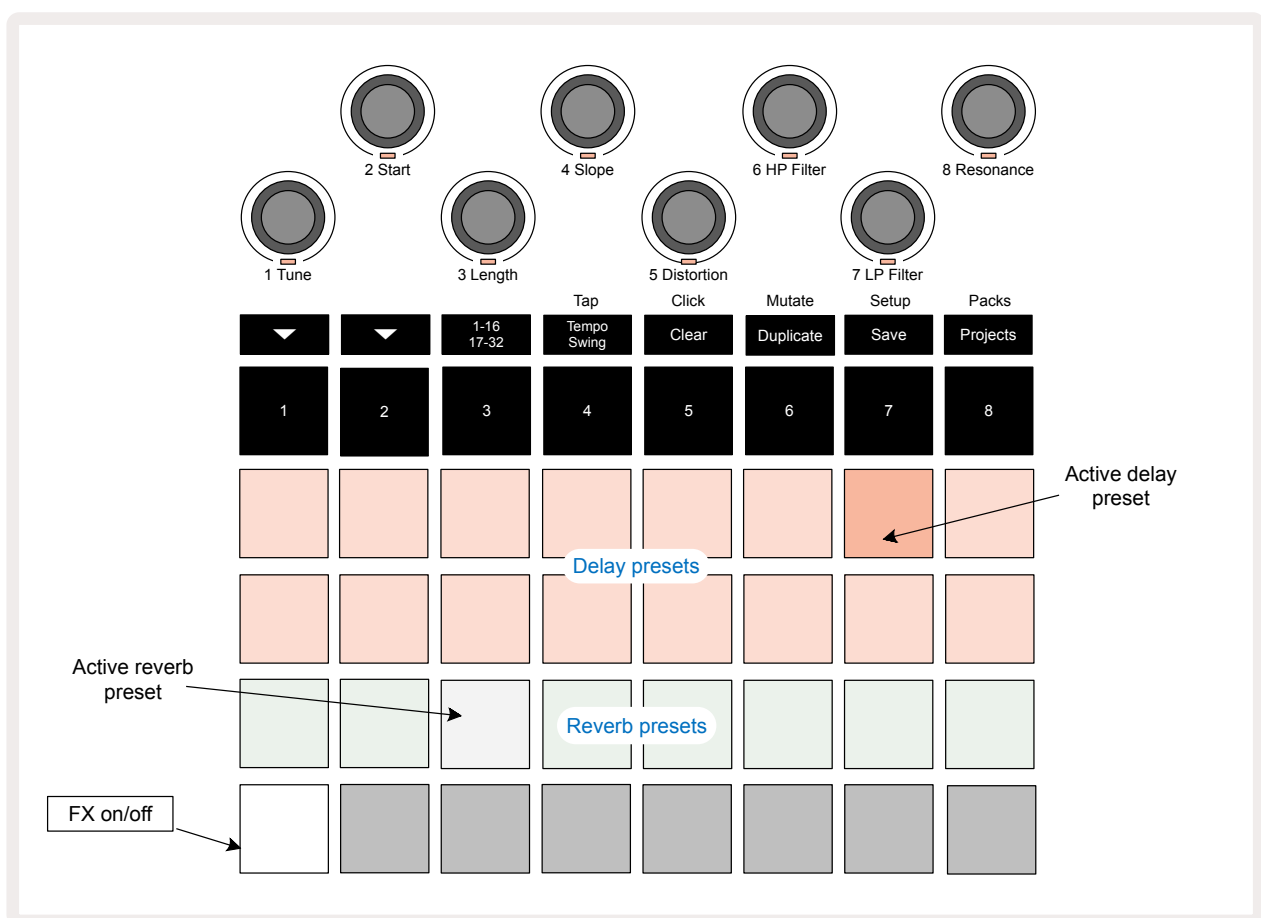
Each of the "peach" pads on Rows 1 and 2 calls up a delay preset, and similarly, the "cream" pads on Row 3 enable reverb presets. By far the best way to evaluate the various effects is to listen to them, most effectively using a single repeating hit like a snare drum. As a general rule though, the reverb presets are arranged with increasing reverberation time from Pad 17 to Pad 24, and the delay presets with increasing complexity from Pad 1 to Pad 16. All the delay presets feature feedback for multiple echoes, and some include swung timing and stereo "ping-pong" effects as well. For presets 3 to 16, delay time is related to the BPM: see the table on page 70 for a full list of presets.

Reverb

To add reverb to one or more tracks, select a reverb preset. The pad corresponding to the active preset illuminates brightly. The Macros are now the reverb send level controls for the eight tracks: this is exactly the same arrangement as used in *Mixer View*. The Macro LEDs are now dimly lit cream; as you increase a send level you will hear reverb being added to the track it controls and the LED will increase in brightness.

You can add the selected reverb effect to any or all tracks to different degrees by using the other Macro controls. It is not possible to use different reverb presets on different tracks, however.

Details of the eight reverb presets are given below:

PRESET	DELAY TYPE
1	Small Chamber
2	Small Room 1
3	Small Room 2
4	Large Room
5	Hall
6	Large Hall
7	Hall – long reflection
8	Large Hall – long reflection

Delay

Adding delay is the same process as reverb: to add delay to your tracks, select an effect from the pads on Rows 1 and 2. The Macros are now per-track delay send level controls; you'll see that their LEDs are now showing peach to confirm their reassignment to the delay FX.

Although the same Macros are used as reverb send levels and delay send levels, the two effects remain independent: the Macros adopt one function or the other according to whether the last FX pad pressed was a reverb preset or a delay preset.

Details of the 16 delay presets are given the table below:

PRESET	DELAY TYPE	MUSICAL DESCRIPTION
1	Slapback Fast	Very rapid repeats
2	Slapback Slow	Rapid repeats
3	32nd Triplets	48 cycles per bar
4	32nd	32 cycles per bar
5	16th Triplets	24 cycles per bar
6	16th	16 cycles per bar
7	16th Ping Pong	16 cycles per bar
8	16th Ping Pong Swung	16 cycles per bar with swing
9	8th Triplets	12 cycles per bar
10	8th dotted Ping Pong	8 cycles per 3 beats with Stereo Spread
11	8th	8 cycles per bar
12	8th Ping Pong	8 cycles per bar
13	8th Ping Pong Swung	8 cycles per bar with swing
14	4th Triplets	6 cycles per bar
15	4th dotted Ping Pong Swung	4 cycles per 3 bars with swing
16	4th Triplets Ping Pong Wide	6 cycles per bar

Note that below certain BPM values, the delay presets will not match the above rates.

Automating FX sends

The reverb and delay send levels may be automated by turning a Macro control while Record Mode is active. You can alter the amount of an effect during a sequence. The **Clear** button ⑰ can be used to delete automation data for the FX send control: hold **Clear** and turn the send control for which you no longer require automation; the LED turns red to confirm the action.

See also "Recording Knob Movements" on

Master Compressor

This is enabled or disabled by the **FX** button in *Advanced Setup View*:

Side Chains

Each of the tracks may be independently Side Chained. Side Chain allows the hits of one track to duck the audio level of another track. Using Side Chains, you can add a pumping feel to your beats - this is a staple sound of hip-hop and EDM. Try Side Chaining your bassline or main chord sequence with your kick.

Seven Side Chain presets are available, each allowing the selected Side Chain trigger source to duck the track with increasing intensity from the leftmost preset to the rightmost preset. The default state is for Side Chain to be OFF for all tracks.

Side Chain View is the secondary view of the **FX** button 12 . Open by holding **Shift** and pressing **FX**, or press **FX** a second time if already in *FX View* to toggle the View.

Side Chain View will display either the Side Chain controls for the track which was displayed when **Shift + FX** was pressed. You can use the ▼ and ▲ buttons 15 to scroll through the four pages of *Side Chain Views*: each page displays the Side Chain controls for a pair of tracks (as shown above).

The two lower rows of pads correspond to the seven Side Chain Presets (Pads 2 to 8 in each row) for an odd-numbered and even-numbered track respectively; the first pad in each row is the 'OFF button' – this disables side chain processing for the track. Pad 1 is illuminated bright red when the Side Chain

is OFF; press any other pad in the row to enable one of the Side Chain Presets: Pad 1 becomes dim and the selected Pad shows bright in the track colour.

Pads 1 to 8 on the top row let you select which track will be the Side Chain trigger source for the chosen track (selected by pressing a Side Chain Preset for the track).

As with many of Circuit Rhythm's other features, by far the best way of understanding Side Chain processing is to experiment and listen. A good starting point is to set a track to play a long sample so that it sounds continuously, and make another track play a few kick drum samples. As you select different Side Chain Presets, you'll hear the different ways in which the continuous sample is "interrupted" by the drum. Also note that the effect will be more or less impactful depending on the relative timings of the sample being ducked and its trigger source.

Side Chain ducking will continue even when the level of the source track is reduced to zero in the *Mixer View*. This is a feature which can be used quite creatively! However, if you mute the drum track selected as the key in *Mixer View*, side chain triggering is disabled.

The Filter Knob

The entire audio output of Circuit Rhythm – the sum of the sounds from all eight tracks - is fed through a traditional DJ-style filter section. The control for this is the large **Master Filter** knob ②. The Filter knob is one of the key performance controls and can be used to radically change the overall sound.

The Filter encompasses both low-pass and high-pass types. A high-pass filter removes low frequencies (bass) from the output and a low-pass filter removes high frequencies (treble).

Circuit Rhythm's **Master Filter** knob controls a low-pass filter when you turn it anticlockwise from the centre position and a high-pass filter when you turn it clockwise from the centre position. Note that the control has a detent in the centre – in this position, no filtering takes place and the LED below the knob is dimly lit white.

As you turn the knob clockwise, you'll hear the lower frequencies disappear leaving you with a much thinner sound; in the opposite direction, the high frequencies disappear first, leaving you with a muffled sound. The LED changes to pale blue when either filter type is active, with the brightness increasing as the control is turned.
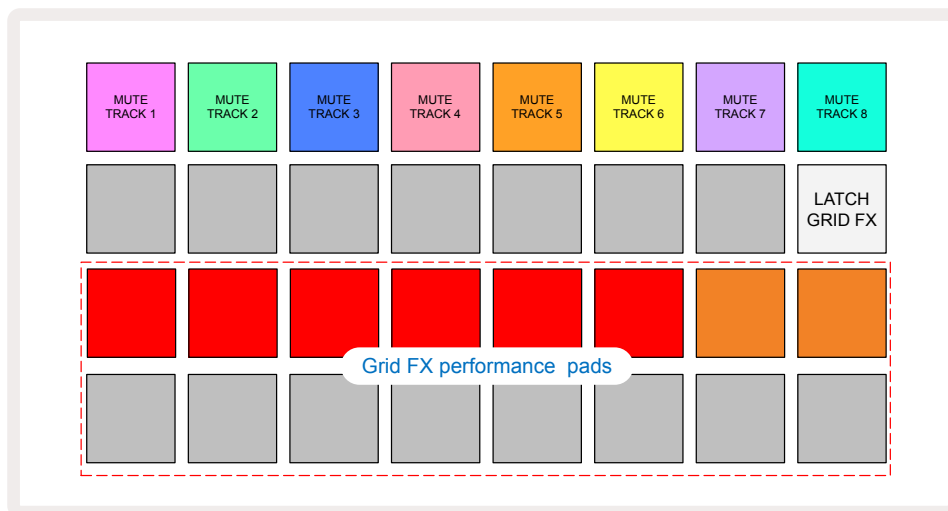
Grid FX

Circuit Rhythm's Grid FX let you rapidly add a range of additional audio effects from a dedicated set of pads: it's a great way of adding variations to your patterns in live performance.

Grid FX are accessed in *Grid FX View*, which is the secondary view of the **Mixer** button ⑪. Open by holding **Shift** and pressing **Mixer**, or press **Mixer** a second time if already in *Mixer View* to toggle the View. The Macro controls remain active as the Mixer's track level controls and the top row of the grid is also unchanged from *Mixer View*, continuing to be the Mute buttons for each track. The two lower rows (Pads 17 to 32) are available as Grid FX performance pads. By default, the Grid FX on Circuit Rhythm are:

SLOT	EFFECT
1	Beat Repeat, 1/4 rate
2	Beat Repeat, 1/8 rate
3	Beat Repeat, 1/16 rate
4	Beat Repeat, 1/32 rate
5	Beat Repeat, 1/8T rate
6	Beat Repeat, 1/16T rate
7	Reverser, 1/4 rate
8	Reverser, 1/16 rate
9	Gater, 1/4 rate
10	Gater, 1/8 rate
11	Gater, 1/16 rate
12	Gater, 1/32 rate
13	Phaser, light
14	Phaser, heavy
15	Vinyl, light
16	Vinyl, heavy

Grid FX may be configured using Novation Components. In Components you may assign each effect to any of 16 slots. Seven different effect types are available, each with its own set of parameters to explore. You are able to use multiple versions of the same effect with different parameters on different pads. The set of Grid FX is saved with each Pack (see page 83) and any Project within that Pack can access the Grid FX configurations that were saved with the Pack.

With a set of Grid FX loaded, pressing a pad that has an effect loaded to it triggers the effect, which remains active until the pad is released. You can press multiple Grid FX pads to trigger several effects at once, but if you have variants of the same effect on multiple pads (i.e., with different parameters), only the last pressed will be active. If you then release the pad while another pad for a variant of the same effect is being held down, the earlier one will take over.

The seven types of effect available in Grid FX are:

Effect	Pad colour
Beat Repeat	Red
Reverser	Amber
Gater	Sand
Auto-Filter	Green
Digitise	Blue
Phaser	Indigo
Vinyl Simulation	Magenta

The effects are colour-coded, so you can identify the various types available once you have uploaded them into Circuit Rhythm.

As with many other features of Circuit Rhythm, we recommend experimentation with Grid FX to gain an understanding of which type and setting of effect works well your particular style of choice of samples. Briefly, the basic effects are:

- **Beat Repeat** – capture a short segment of tempo-synced audio from the master mix and repeat it for a stutter effect. Beat Repeat playback is not synced to sequencer playback.

- **Reverser** – immediately reverse playback of the master mix in short tempo-related segments. Reverser playback is not synced to sequencer playback.

- **Gater** – a square-wave LFO that affects the volume of the master mix at tempo-related rates. When pressed, the Gater will always be at maximum volume. Gater playback is not synced to sequencer playback.

- **Auto-Filter** – a variable state (Low/Band/High-Pass) 12/6 dB/octave filter with a tempo-synced LFO. The LFO shape may be set to Triangle, Square, ramp-up, or ramp-down, and key-synced such that it restarts when the effect is triggered. The modulation depth may also be customised.

- **Digitise** – reduce the sample rate of the master mix and apply a bit-crush effect.

- **Phaser** – a 4-pole phasing effect to the master mix with a tempo-synced LFO. The LFO depth may be customised, and feedback may be introduced

- **Vinyl Simulation** – a Lo-Fi effect to the master mix that simulates the sound of a bad vinyl record. Apply varying degrees of pitch-wobble, crackle, and hiss, alongside a width parameter that cuts high and low frequencies.

Effect Latching

Pad 16 in *Grid FX View* enables a Latch function. By default it is dimly lit white; when pressed it illuminates bright white, and any Grid FX effect pad now selected will remain active until either it, or the Latch button, is pressed again. Note that when disabling an effect directly (i.e., not via pressing the Latch button), the effect will be disabled upon release.

When latching is enabled, multiple effects will be latched on when they are selected, however, only one effect of each of the seven types may be latched at any one time.

The Latch state for each effect type is saved with the Project, so that some or all effects can be made active immediately on loading the Project.

Using Grid FX with external audio

Audio signals applied to the external audio inputs ⑤ will be processed by Grid FX. While monitoring is enabled in *Sample Record View*, incoming audio will be routed through Grid FX (in stereo). This allows Circuit Rhythm to be used as a stereo FX unit. Furthermore, with resample enabled in *Sample Record View*, Grid FX active during sample recording will be committed to the recorded sample as heard.

MIDI control of Grid FX

Enhanced control of Grid FX parameters is possible using external MIDI control, e.g., from a MIDI controller or sequencer. Full details are available in the separate document **Circuit Rhythm Programmer's Reference Guide**, which may be downloaded from novationmusic.com/downloads.

Recording Samples (Sample Rec View)

Circuit Rhythm has the capability to record samples via the external inputs ⑤.

You do this in *Sample Rec View*: press the **Sample Rec** button ⑨ to open this:
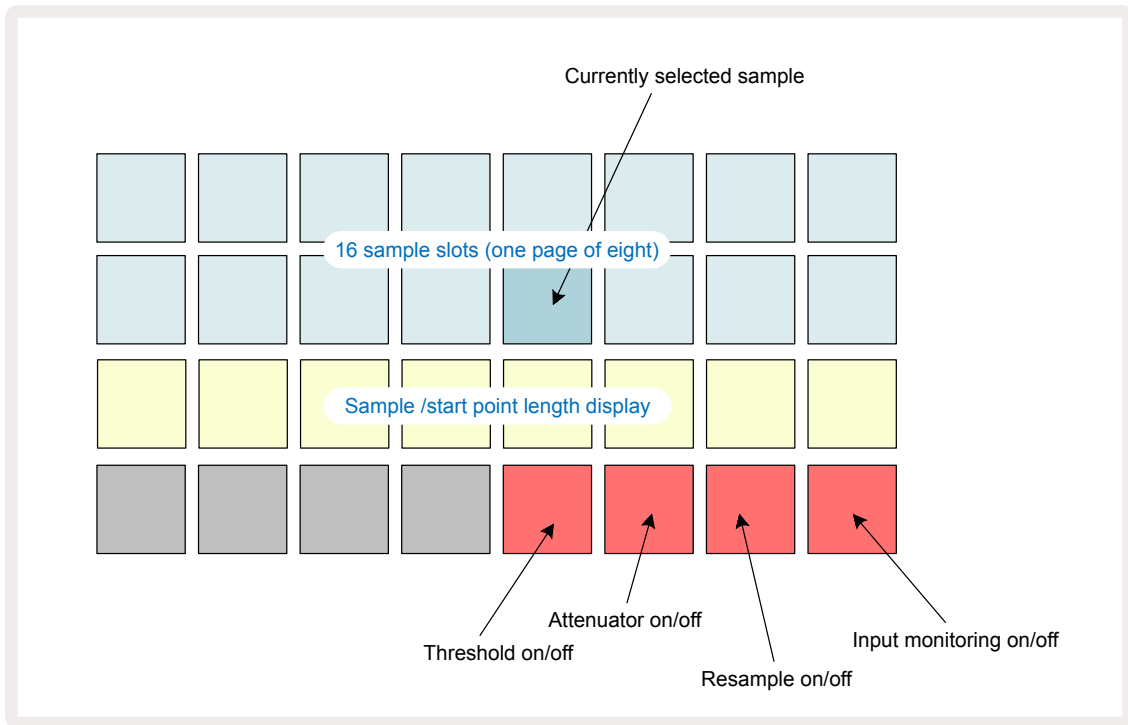
The top two rows in *Sample Rec View* represent one of eight pages of 16 samples; they correspond to the eight pages of samples displayed in *Sample View*. You can scroll through the pages using the ▼ and ▲ buttons. Note that when you scroll through the sample pages, the page you are currently viewing will be indicated by one of the **1** to **8** buttons momentarily illuminating bright white; i.e., if you scroll to page 5, the **5** button will briefly light. The intensity of the ▼ and ▲ buttons' illumination also indicate the page currently in use.

A dim grey pad indicates an occupied memory slot – one which already has a sample; an empty slot is indicated by a dim red pad. The pad for the currently selected sample will be lit in a brighter shade of white or red.

Pressing the pad for an occupied slot will play back the sample. If you want to clear an occupied slot so that you can use it for a new sample, hold down **Clear** ⑰ and press the slot pad to delete it from flash memory.

Note that the sample selection will reset if a new Pack is loaded.

Recording

To record a new sample, enter *Sample Rec View* and select an empty sample slot: the **Record** (13). button will light dim orange, confirming that you can record to the slot. Press **Record**, it will light bright orange and the two lower grid rows will initially light dim grey, but will change colour through to orange one pad at a time, beginning with Pad 17 (the first pad on Row 3). This acts as a progress bar, and shows how much of the maximum recording length that has been used. The maximum recording time per sample slot is 32 seconds, so each of the 16 pads on the two lower grid rows represents two seconds.

If less than 32 seconds worth of sample storage remains on Circuit Rhythm, fewer than 16 pads will be lit. The number of pads that are lit corresponds to the remaining time available. For example, if 6 seconds remain, the first three pads will be lit dim grey, with the remaining pads being unlit.

To stop recording, press **Record** again. If the maximum sample time of 32 seconds is reached, or no sample storage remains available, recording will stop automatically.

While sample recording is in progress the **Record** button is available in other Views, so that sample recording can be stopped from other views.

If you need to record for more than 32 seconds, you can select another empty slot. In this case, recording to the first slot will stop, but will continue directly to the second slot, allowing seamless recording across multiple slots.

Samples will be normalised following recording, ensuring that all recorded samples are at a suitable volume level. Beware that if silence is recorded, the low-level noise floor will be normalised, resulting in a very loud sample.

After recording a sample, it will be available for use immediately, but it will take some time to save to the pack. While the sample is saving, the sample slot will flash green in *Sample Rec View* – do not power off Circuit Rhythm or remove the microSD card while this process is taking place, or data loss may occur.

Record settings

There are four additional settings which affect how sample recording operates: Threshold, Attenuator, Recording Source and Input Monitor. These settings are saved at power-off.

Recording Threshold On/Off

Pad 29 in Row 4 (above the **Choke** text) toggles the recording threshold function on or off.

With threshold off (pad lit dim red), recording will start immediately upon the **Record** button being pressed. With threshold on (pad lit bright green and grid briefly displays '**Thr**'), recording will only start once the signal level exceeds a certain threshold (-54 dBFS) after the **Record** button is pressed. Enabling threshold is useful when you want to prime recording to begin as soon as audio commences, preventing the need to trim silence from the start of a sample.

Attenuator On/Off

Pad 30 in Row 4 toggles an 12 dB attenuator on or off as part of the recording signal path. By default, the attenuator is off (pad lit dim red, grid briefly displays '**0**', representing 0 dB reduction in level). When the attenuator is enabled (pad lit bright green and grid briefly displays '**-12**') the recording level is reduced by 12 dB. Use the attenuator if the signal level from an external sound source is too high and causing unwanted distortion on the recording.

Resample On/Off

Pad 31 in Row 4 (above the **Keyboard** text) selects the audio source for sample recording.

The default setting (pad lit dim red) enables recording from the external audio inputs. Pressing the pad (lights bright green and grid briefly displays '**RSP**') selects the internal audio engine as the recording source: select this option if you want to resample internally processed sounds, or sample the external inputs after being processed by Grid FX. With resample enabled, you may record audio from external and internal sources at the same time.

Input Monitoring

Pad 32 on Row 4 (above the **Slice** text) activates input monitoring. When input monitoring is active (pad lit bright green and grid briefly displays '**Mn**')

Disable input monitoring to mute incoming audio – this can be useful as part of a wider setup where audio may be routed both through Circuit Rhythm for sampling, and directly from the source to a mixer or audio interface.
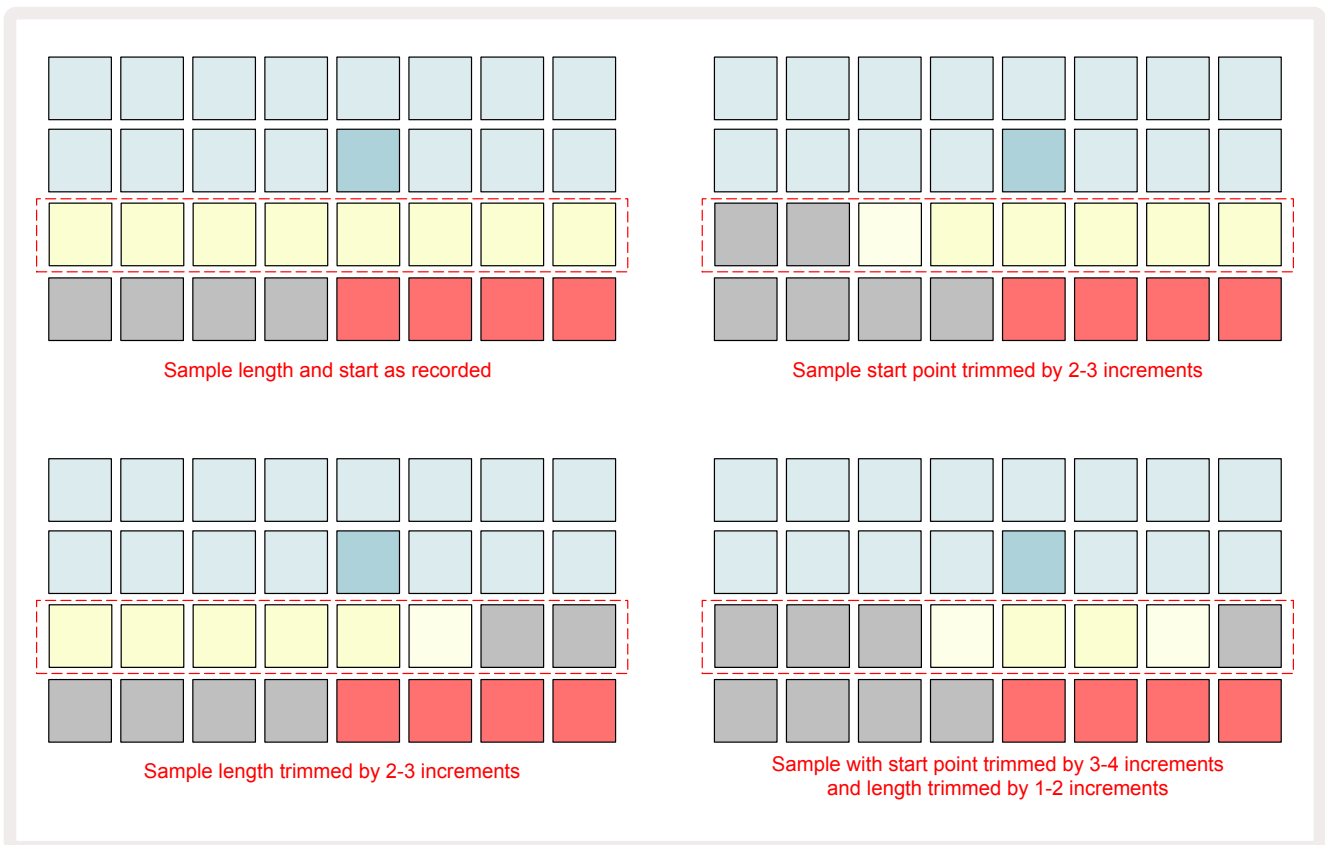
This pad may also be used as a performance kill-switch for external audio, which is useful when using Circuit Rhythm as an effects unit for external audio.

Monitor level

Use Macro 8 to apply digital gain to incoming audio. This will default to 0 dB upon power-on and is never saved. This value may be increased to +12 dB or reduced to silence.

Sample Trimming

You can use Macro control 2 (**Start**) to trim the start point of the recorded sample and Macro control 3 (**Length**) to trim its duration. When either Macro control is moved, the pads in Row 3 of the grid illuminate sand to indicate the start and duration of the sample. With all eight pads lit, the sample will play for its full original duration, from the point at which recording commenced. The start point can be moved "forward" with the **Start** control, and the end point moved "back" with the **Length** control: both controls have the effect of shortening the overall sample length. The pads go dark to illustrate the effect of trimming; note that start point and length can have values which are not integral numbers of increments: this is indicated by the illumination on the "end" pad dimming. The graphics below illustrate this:

Sample length and start as recorded

Sample start point trimmed by 2-3 increments

Sample length trimmed by 2-3 increments

Sample with start point trimmed by 3-4 increments and length trimmed by 1-2 increments

As soon as the start or length are adjusted, **Save** will begin to pulse. Press Save to commit the new start and length. Once a sample is saved it may be trimmed further, but it is not possible to revert saved changes.

Note that Row 3 does not indicate absolute sample time: a short sample and a long sample will both display their full duration as eight lit pads. Note also that samples can only be shortened – you can't add silence at the start or end of a sample.

The default precision of the start and end positions is 10 ms per pad, hold **Shift** to increase the precision to 1 ms.

Playback Modes

Sample playback in *Sample Record View* may be set to One Shot, Gated or Looped; Reverse may additionally be enabled or disabled. These modes behave identically to tracks 1-8 (see Sample Modes at page 32). The default mode is One Shot, which will be selected upon power-on. This selection is not saved with the project.

Setting playback to Looped is useful for ensuring that looped samples (such as drum breaks) are trimmed perfectly.

	Reversing playback can be useful to fine-tune the end point of a sample. For example, you may want to isolate a single hit in a drum loop and remove the transient of the next hit while maintaining as much of the previous tail as possible - with reverse enabled you don't have to wait for the sample to play through in its entirety to check if you have trimmed correctly.

Projects

A basic overview of loading and saving Projects can be found at page 23. This chapter looks at some additional aspects surrounding the use of Projects.

Switching Projects

There are some rules governing how Circuit Rhythm responds when you change from one Project to another. If sequencer playback is stopped when you select a new Project in *Projects View*, on pressing the ▶ **Play** button, the new Project always begins at the step defined as the Start Point of the Pattern (Step 1 by default) for each track; if the Project comprises chained Patterns, it will begin at the Start Point of the first Pattern. This will be the case regardless of which step the sequencer was at when it was last stopped. The tempo of the new Project will replace that of the previous one.

There are two options for changing Projects while sequencer playback is active:

1. If you select a new Project by pressing its pad, the current Pattern will play through to its last step (note – only the current Pattern, not a Scene or complete chain of Patterns), and the pad for the new Project will flash white to indicate that it is being "queued". The new Project will then begin playing from the Start point (Step 1 by default) of its Pattern, or the Start Point of the first Pattern in a chain or its first Scene, as the case may be.

2. If you hold down **Shift** when selecting a new Project, the newly selected Project will begin playing immediately. The new Project will play from the same step in the Pattern chain that the previous Project had reached. Instant Project switching can become particularly interesting when the two Projects either contain Patterns of different lengths, or different numbers of Patterns making up a Pattern chain.

As we have mentioned elsewhere in this User Guide, experimentation is often the best way of understanding how Circuit Rhythm deals with this

Clearing Projects

Clear 17 may be used in *Projects View* to delete unwanted Projects. Press and hold **Clear**; it illuminates bright red and all the grid pads extinguish except that for the currently selected Project, which shows bright white. Press this pad to delete the Project.

Note that this procedure makes it only possible to delete the currently selected Project; thus providing a safeguard against deleting the wrong Project. Always check that a Project pad contains the Project you want to delete by playing it before you use **Clear**.

Saving Projects to new slots

Use **Save** ⑲ to store the tracks you've been working on to a Project memory slot. **Save** needs to be pressed twice to complete the store process: the first press will flash the **Save** button; a second press will save your work to the last Project memory that was in use. This means that if your current work was based on a previously-saved Project, the original version will be overwritten.

To ensure that your work gets saved in a different Project memory, switch to *Projects View*. You will see that the first press of **Save** causes the pad for the last-selected Project to pulse white. If you want to save your work in a new memory slot, press the pad for that slot: all other pads will go dark and the selected pad will flash green for a couple of seconds.

Note that you can "abort" the Save routine after the first press of **Save** by pressing any other button.

Changing Project Colours

You can also assign a different colour to any of the pads in *Project View* – this can be a great help in live performance. You choose the colour as part of the Save procedures described above.

After pressing **Save** for the first time, the LED under Macro 1 rotary control will light in the current colour of the pad for the currently selected Project: if you've not already changed the colour, it will be dark blue. You can now scroll through a palette of 14 colours by rotating the Macro 1 knob. When you see the colour you want, either press **Save** for a second time, or press the pad corresponding to the memory location: this completes the Save process with a flashing green pad as described above.

Note that the pad will become white after the Save operation, so you won't immediately see the new colour, but you will do so as soon as you select a different Project.
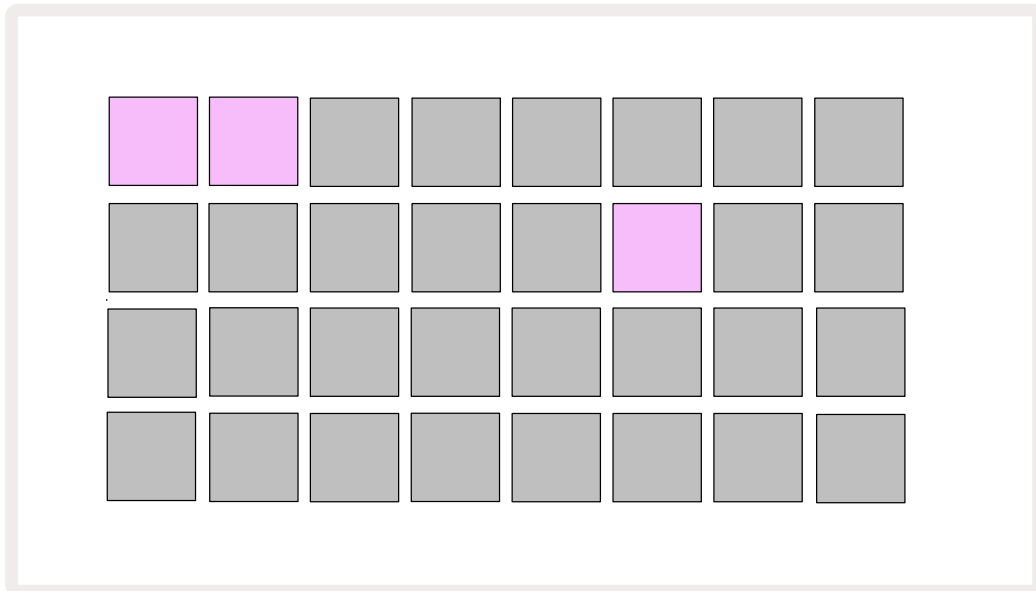
Packs

A Pack is defined as a full set of Samples, Projects, and Grid FX: you can export the current Pack to a removable microSD card. The card slot is on the rear panel **7**.

A Pack contains the totality of Circuit Rhythm's current operation, including the contents of all 64 Project memories, all 128 samples and 16 Grid FX presets. A card can hold 31 additional Packs: this enables you to safely save an enormous amount of working content, and can include Projects of greatly differing genres, complete with personalised samples as appropriate. The principle can be extended further still, as you can, of course, use as many microSD cards as you wish.

Packs View is the secondary view of the **Projects** button **19**. Open by holding **Shift** and pressing **Projects**, or press **Projects** a second time if already in *Projects View* to toggle the View.

IMPORTANT:
You can only access *Packs View* when a microSD card is present in the rear panel slot.

Packs may be sent to Circuit Rhythm using Novation Components at components.novationmusic.com. Each pad represents a Pack: the currently loaded will be lit white and the other pads will lit in their assigned colours, which are set in Novation Components.

Loading a Pack

First select a Pack by pressing any lit pad other than that for the currently loaded Pack. It will start pulsing between dim and bright (in its assigned colour) to confirm that it is "primed" and can now be loaded. Empty pack slots may be loaded, which provides you with a blank canvas for recording new samples. It is also not possible to reload the current pack.

[If you do not wish to load a primed Pack, either prime a different Pack for loading or exit *Packs View*. When you return to *Packs View*, no Pack will display as primed.]

Once a Pack is primed, press the play button to load the Pack. An animation will play on the pads for a few seconds while the Pack loads, and once the load is complete, *Packs View* will be displayed again with the pad for newly loaded pack lit white.

You can create a new Pack with no samples or projects by loading a blank Pack slot. Newly created Packs will include the default Grid FX layout (matching the factory pack).

Duplicating Packs

If you run out of Projects in a Pack, but would like to continue working on new Projects with the same set of samples, you may duplicate the current pack.

To duplicate the current pack, first enter *Packs View*. Hold **Duplicate** 18 and the currently selected Pack will pulse green, while the available Pack slots will be lit dim blue. Press a dim blue slot to write the current pack to the new location.

Note that Packs may only be removed by deleting the file from the SD card, and cannot be cleared from the device directly.

Using microSD Cards

> **WARNING:**
> Do not remove the microSD card from Circuit Rhythm during Save or Load operations. Doing so may result in the loss of previously saved work. Note that Save operations include the process of duplicating a pack, transferring content from Components, and saving newly recorded and trimmed samples.

A microSD card inserted into the rear panel card slot allows access to multiple Packs. Circuit Rhythm's internal memory holds only a single Pack: the microSD card can hold a further 31 Packs, thus allowing the availability of up to 32 Packs for loading to Circuit Rhythm while the card is inserted.

If a microSD card has not been inserted since powering up, *Packs View* will display a red and yellow icon that means "no SD available":
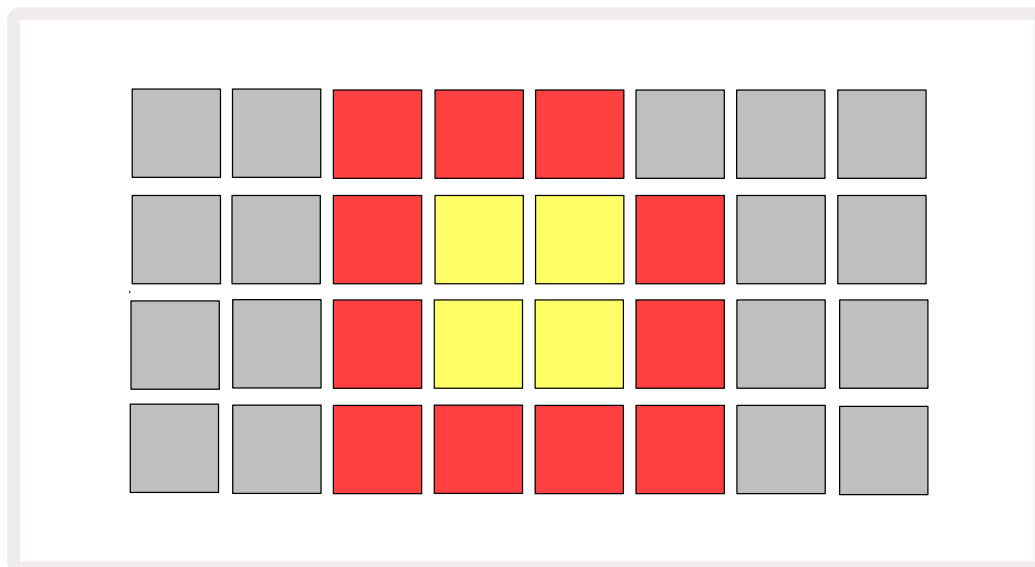
The "no SD" icon is also displayed in other situations, see 'Removing a MicroSD card' below for more details. Circuit Rhythm is fully operational without a MicroSD card, but you will only have access to the internal Pack. If a microSD card is present, Packs View will display the available Packs and allow you to load a new Pack as described in 'Loading a Pack' above.

If the unit is powered on with no microSD card present (resulting in the internal Pack being loaded), one can be inserted at any point to gain access to the card's content. If the card has previously been removed, reinserting it will allow access to the card's content again, and normal operation will continue if removing the card previously had disrupted any functionality.

Removing a microSD card

If a microSD card is removed while the internal Pack is loaded, Circuit Rhythm will behave as described above for operating from power-up without a card present. Doing so does not hinder your ability to load samples, or to save and load Projects.

It is possible to remove the microSD card while a Pack loaded from the SD card is that currently in use. Sequencer playback will not stop, and any unsaved changes will not be lost at this point. However, as the card is not present, there is no data available to load. The Project will continue to play as the current Project data is loaded into the unit's RAM, but it is not possible to change Project or save the current Project while in this state. However, you can change sample during Pack load. As such, *Projects View* will display the 'No SD' icon as described above, and the **Save** button (19) will not be lit until the card is re-inserted. *Packs View* will also display the 'No SD' icon until the card is re-inserted. If you wish to load the internal Pack without re-inserting the microSD card, you must power the unit down and back up again to load the internal Pack.

If you insert a different microSD card, Circuit Rhythm's behaviour is undefined. If you need to load a Pack from a different microSD card, you should power the unit down and back up again. The new microSD card can be inserted any time before, during or after the power cycle, but the power cycle must be completed before loading the new card content to avoid undefined behaviour.

MicroSD card compatibility

MicroSD cards need to be Class 10 as a minimum, and use FAT32 format. For more information on specific microSD cards recommended for use with Circuit Rhythm, please see the Novation Help Centre.

Components

About Components & Navigating to Circuit Rhythm

Novation Components is the online companion for Circuit Rhythm. With Components, you can:

- Download new content

- Load your own samples

- Edit Grid FX

- Backup your projects

- Load new packs

- Update to the latest firmware version

Components requires a Web MIDI enabled browser to communicate with your device. We recommend using Google Chrome or Opera. Alternatively, you can download a standalone version of Components from your Novation account once you have registered your product.

You can access Components at components.novationmusic.com.

NOTE:

If you are having issues using the web version of Components, try installing the standalone application from the Novation Customer Portal. Additionally, if you are on Windows, we recommend that you install the Novation Driver from novationmusic.com/downloads.

Appendix

Firmware Updates

In order to access all features, you may need to update Circuit Rhythm to the latest firmware version. Components will let you know whether the connected unit is up to date and, if it's not, Components can update the unit's firmware to the latest version.

Setup View

Setup View is provided to allow "global" unit settings to be made: these include MIDI channel assignment, MIDI I/O configuration, clock source selection, external clock rate and brightness adjustment. It is entered by holding down Shift and pressing Save 19, and exited by pressing ▶ Play 13.

Opening **Setup View** produces the display shown below:

Track 1 is currently selected: the track number lights brightly.

Tracks 2 to 8 are assigned to MIDI Channels 2 to 8 by default. The pads for these Channels illuminate dimly in the colour of the track that is assigned to them.

Pad 1 is brightly illuminated, indicating that the currently selected track (Track 1) is assigned to MIDI Channel 1 (the default)

MIDI channels 1 -16

MIDI Channel 16 is reserved for the Project

Default external clock sync rate is 2 ppqn

Clock sync rates

Brightness adjustment

MIDI data control

| MIDI Note data | MIDI CC data | MIDI Program Change data | MIDI Clock control |

Brightness

Pad 24 (illuminated white) controls the brightness of the grid pads. The default setting is for full brightness, but pressing Pad 24 dims them by about 50%. This can be of benefit if you are running Circuit Rhythm on its internal battery. You may also wish to run with reduced brightness if performing in conditions of low ambient lighting.

The brightness setting is saved when Circuit Rhythm is powered down.

MIDI Channels

The factory default MIDI channels are as follows:

Track	MIDI channel
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

You can change the MIDI channel which each track uses in *Setup View*. Each track can be set to any of MIDI channels 1-15. Channel 16 is reserved for the Project.

To change the MIDI channel that will be used by a track, press the track select button ⑤ or the required track. The top two rows of pads in Setup View represent the MIDI channels 1-16. Press the pad for the required MIDI channel.

Important: No two tracks can transmit on the same MIDI channel.

The graphic on page 88 illustrates the display when Track 1 is selected and shows the default MIDI channel assignments: the colours of the pads for the unused MIDI channels are orange (Track 1's colour), but they will follow the colour of the currently selected track. The pads for MIDI Channels 2 to 8 are dimly lit in the colour of the track that is assigned to them: in the example, these are the default assignments.

As with all *Setup View* changes, press **Play** to save your changes and exit *Setup View*.

MIDI I/O

Circuit Rhythm is able to send and/or receive MIDI data both via the **USB** port 6 and the **MIDI In/ Out/Thru** sockets 4 .

Setup View allows you to decide how you want Circuit Rhythm to operate with other MIDI equipment for four categories of MIDI data independently: Note, CC (Control Change), Program Change (PGM) and MIDI Clock. This ensures you have a high degree of flexibility in how Circuit Rhythm integrates with the rest of your system.

MIDI Rx (receive) and Tx (transmit) can be enabled independently for each of the data categories. Pads 25 to 32 are arranged as four pairs of buttons as shown in the table:

Pad	Function	Colour
25	MIDI Note Rx on/off	Green
26	MIDI Note Tx on/off	Green
27	MIDI CC Rx on/off	Orange
28	MIDI CC Tx on/off	Orange
29	MIDI Program Change Rx on/off	Purple
30	MIDI Program Change Tx on/off	Purple
31	MIDI Clock Rx on/off	Pale Blue
32	MIDI Clock Tx on/off	Pale Blue

By default, both MIDI Rx and MIDI Tx are ON (buttons brightly lit) for all data categories.

Clock settings

When Clock Rx is OFF, the clock is in internal mode and Circuit Rhythm's BPM is defined only by the internal tempo clock. Any external clock will be ignored. When Clock Rx is ON, Circuit Rhythm is in AUTO mode and the BPM will be set by an externally applied MIDI clock at either the **MIDI In** or the USB ports if a valid one is applied; if this is not the case, Circuit Rhythm will automatically switch to its internal clock.

If Clock Tx is ON, Circuit Rhythm is the clock leader and its clock – whatever the source - will be available as MIDI Clock at the rear panel USB and **MIDI Out** connectors. Setting Clock Tx to OFF will result in no clock data being transmitted.

See also "External clock" on page 63.

Analogue clock rates

Circuit Rhythm outputs a continuous analogue clock from the rear panel **Sync Out** connector ❷ at an amplitude of 5 V. The frequency of this clock is related to the tempo clock (internal or external). The output clock rate is set with the first five buttons on the third row of the grid (Pad Nos. 17-21). You can select the rate to be 1, 2, 4, 8 or 24 ppqn (pulse per quarter note) by pressing the appropriate pad. The default value is 2 ppqn. The following table summarises the settings:

Pad	Analogue clock rate
17	1 ppqn
18	**2 ppqn**
19	4 ppqn
20	8 ppqn
21	24 ppqn

Note that Swing (if set to something other than 50%) is not applied to the analogue clock output.

Sticky Shift

Sticky Shift is an accessibility feature that allows the **Shift** button to function as a toggle instead of a momentary control. To enable Sticky Shift, press **Shift** in *Setup View* so that it is lit bright green. To disable the functionality, press **Shift** again so that it is lit dim red.

Advanced Setup View

Some additional preferences may be set in *Advanced Setup View*. This View is entered by holding down **Shift** while powering the unit on, and exited by pressing Insert play icon ▶ **Play**.

The 8 x 4 grid is not illuminated in *Advanced Setup View*; adjustments are made using various other buttons.

Easy Start Tool (Mass Storage Device)

The Easy Start Tool may be disabled in *Advanced Setup View* if you do not wish Circuit Rhythm to appear as a Mass Storage Device when connecting it to a computer.

To toggle the Easy Start Tool on/off, press the **Note** button ⑥. If **Note** is lit bright green, it is enabled, if **Note** is lit dim red, it is disabled.

For more information on the Easy Start Tool, see page 8.

MIDI Thru configuration

You can determine the behaviour of the **MIDI Thru** port on Circuit Rhythm's rear panel in *Advanced Setup View*. The options are for the port to act as a regular **MIDI Thru** port (this is the default), or to duplicate the output of the **MIDI Out** port. This is useful if you have two pieces of hardware that you wish to control that don't have MIDI thru ports themselves.

Use the **Duplicate** button ⑱ to set the behaviour. When **Duplicate** is lit bright green, the **MIDI Thru** port will act as a second MIDI Out. When it is lit dim red, a hardware thru switch is activated and the port acts as a regular MIDI Thru.

Master Compressor

Circuit Rhythm includes a master compressor, which is applied to all audio outputs from the device. It can be enabled or disabled by pressing **FX** ⑫ while in in *Advanced Setup View*. When the compressor is enabled, the **FX** button lights bright green and the grid briefly displays 'CMP'. When it is disabled, the FX button lights dim red.

Save Lock

The Save Lock feature allows you to temporarily disable the Save function. This can be useful if you have a live set prepared on your Circuit Rhythm, and you don't want to risk accidentally overwriting any important projects. To enable Save Lock, hold both **Shift** and **Save** down while powering the unit on. While Save Lock is enabled, the **Save** button is unlit at all times.

Save Lock status is retained during subsequent power cycles. Disabling it is the same procedure as enabling: power the unit on while holding down **Shift** and **Save**.

By default, Save Lock is disabled, so that Projects can be saved and overwritten freely.

Project loading problems

Circuit Rhythm loads the last Project in use when it is powered-up. It is possible that if the power was interrupted while a Project was being saved it may have become corrupted in some way. This might mean that Circuit Rhythm ends up in some anomalous state at power-on.

Although this is an unlikely occurrence, we have included a method of turning Circuit Rhythm on and forcing it to load a blank Project instead. To do this, hold down both **Shift** and **Clear** while turning Circuit Rhythm on.

If any Projects do become corrupted in any way it is always possible to delete them by clearing the Project (see page 81).

MIDI parameters

Circuit Rhythm has been designed to respond in various ways to external MIDI data. MIDI Note On/ Note Off, Program Change (PGM) and Continuous Controller (CC) messages are all recognised.

Full details of MIDI settings and parameters are available in a separate document: **Circuit Rhythm Programmer's Reference Guide**, which may be downloaded from novationmusic.com/downloads.

Bootloader Mode

In the event of a problem with your Circuit Rhythm, it may become necessary to enable Bootloader Mode. This is an "engineering mode", and all normal unit functions become inoperative. You should not use Bootloader Mode without instructions to do so from Novation's Technical Support team.

Bootloader Mode lets you check the version of the currently installed firmware, and also to update firmware (and factory Patches) should the Firmware Update procedure described above not work correctly for any reason.

To enter Bootloader Mode:

1. Turn Circuit Rhythm off
2. Hold down the **Sample Rec** 9 , **Sample** 14 and **Note** 6 buttons
3. Power Circuit Rhythm on again

Circuit Rhythm will now be in Bootloader Mode, and the grid display will display a selection of green lit pads (which may differ from that shown below):
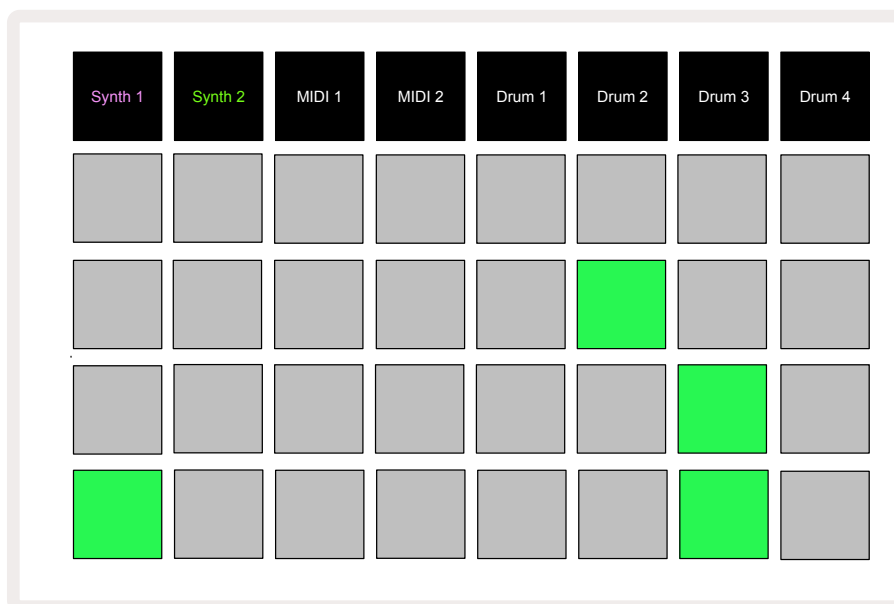
Track buttons **1** and **2** are lit; selecting either of these displays a pattern of illuminated pads; the pattern represents the version numbers of the three firmware elements in binary form. You may need to describe these patterns to Novation's Technical Support Team in the event of a problem.

Bootloader Mode is most easily exited by simply pressing the ▶ **Play** button. Circuit Rhythm will then reboot into the normal operating state.