
analog KEYS
FULL REFERENCE MANUAL

FCC compliance statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

European Union regulation compliance statement

This product has been tested to comply with the Low Voltage Directive 2006/95/EC and the Electromagnetic Compatibility Directive 2004/108/EC. The product meets the requirements of RoHS 2 Directive 2011/65/EU.

This symbol indicates that your product must be disposed of properly according to local laws and regulations.



IMPORTANT SAFETY INSTRUCTIONS

Carefully read these instructions and save them for future reference.

When using electric products, basic instructions must be followed, including the following:

1. Do not use this unit near water.
2. Never use any aggressive cleaners on the casing or the LCD overlay. Remove dust, dirt and fingerprints with a soft, dry and non-abrasive cloth. More persistent dirt can be removed with a slightly damp cloth using only water. Disconnect all cables while doing this. Only reconnect them once the unit is safely dry.
3. To avoid scratches or damage, never use sharp objects near the display. Also avoid applying any pressure to the display itself.
4. Install in accordance with the manufacturer's instructions. Make sure you place the unit on a stable surface before use.
5. Connect to an easily accessible power outlet close to the unit.
6. In the EU, only use CE approved power cords.
7. When transporting the unit, preferably use accessories recommended by the manufacturer or the box and padding the unit originally shipped with.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or any other equipment (including amplifiers) producing heat.
9. Make sure there is sufficient air circulation in the room where the unit is kept.
10. This product, by itself or in combination with amplifiers, headphones or speakers, is capable of producing sound levels that may cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable.
11. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the unit.
12. Only use attachments/accessories specified by the manufacturer.
13. Unplug this unit during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service technicians. Servicing is required when the unit has been damaged in any way, such as liquid having been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.

WARNING

To reduce the risk of fire, electrical shock or product damage:

- Do not expose the unit to rain, moisture, dripping or splashing and also avoid placing objects filled with liquid, such as vases, on the unit.
- Do not expose the unit to direct sunlight, nor use it in ambient temperatures exceeding 40°C.
- Do not unmount the enclosure. There are no user repairable or adjustable parts inside. Leave service and repairs to trained service personnel only.

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INTRODUCTION

Thank you for choosing Analog Keys. It is a digitally controlled analog synthesizer featuring, among many things, the renowned Elektron step sequencer. The innovative combination of modern technology and tried and trusted ways of sound generation will let you experience the analog realm in its entirety. To make the most of the machine, we recommend you to carefully read this manual. Tutorial videos, found on the Elektron website, are also available. They cover the basics of Analog Keys and are a great complement to this document.

CONVENTIONS IN THIS MANUAL

In this manual we have used certain conventions. They are listed below:

Buttons are written in upper case, bold style, enclosed in brackets. For instance, the button labeled “function” on the main panel is written **[FUNCTION]**.

Menu names are written in upper case. The OSC 1 menu is an example of that.

Parameter names and certain menu options where settings can be made or actions performed are written in bold, upper case, style. **VOL** for example.

Upper case style is used for parameter setting alternatives, for example OFF**,** and for certain menu settings, like LEGATO.

Messages visible on the screen are written in upper case with quotation marks. Like this, “BANK A: CHOOSE PTN”.

Knobs are written in upper case, bold, italic style. For instance, the knob “level” is written ***LEVEL***.

LED indicators like the record LED are written <RECORD>.

The following symbols are used throughout the manual:



This symbol indicates information that you need to pay attention to.



This indicates a tip that might make it easier interacting with Analog Keys.



This symbol is not used, but it shows a nice ear.

THE BACKGROUND OF ANALOG KEYS

Working with a proper synthesizer is a musical experience hard to beat. The tactility, the fluent interaction, and the expressive potential open up another – maybe more direct – way of making music. Less logic, more feeling. The musical output is bound to be different and more personal, and should one adhere to the French linguist Roland Barthes' idea about the humiliated repetition being one of the negative aspects of culture (The Pleasure of the Text, 1973), this difference can, so to speak, make all the difference.

The idea of the Analog Keys came to us after we had made the Analog Four; a groundbreaking analog tabletop synthesizer. We realized the spirit of the Analog Four would be very much at home in a larger, more performance oriented, machine. Just like its smaller sibling, the Analog Keys features the same deep approach to analog synthesis, the same brilliant effects, and the same capable Elektron step sequencer. Added were elements aimed at making it more suited for the stage. The keyboard, the joystick, the dedicated buttons, the individual outputs, and all the other design choices are results of this ambition. The Analog Keys has, in other words, been conceived with full focus on playability.

We are incredibly proud of the Analog Keys and we believe we have accomplished our goal of creating a flagship analog performance synthesizer. And we hope you will feel the same way.

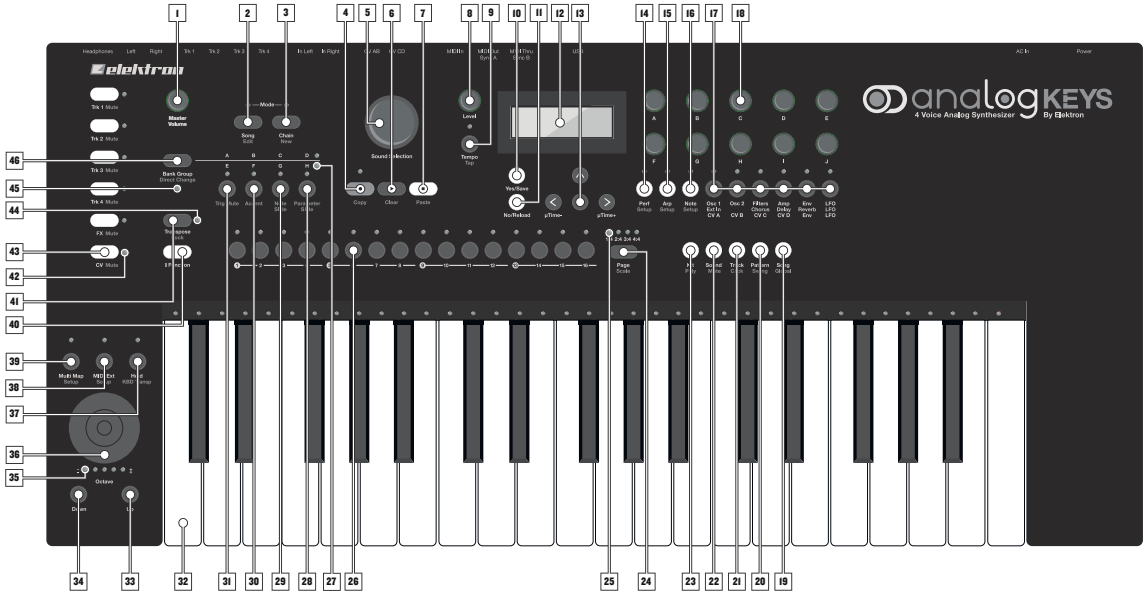
Enjoy the power of true hardware,

The Elektron Team

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PANEL LAYOUT AND CONNECTORS

FRONT PANEL

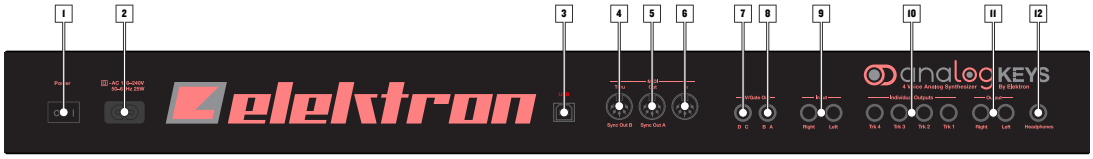


The Analog Keys Front Panel.

1. ***MASTER VOLUME*** sets the volume for the main outputs and the headphones output.
2. **[SONG MODE]** activates/deactivates SONG mode.
3. **[CHAIN MODE]** activates/deactivates CHAIN mode.
4. **[RECORD]** key. activates/deactivates GRID RECORDING mode. Starts LIVE RECORDING if held while pressing **[PLAY]**. The secondary function is a copy operation.
5. ***SOUND SELECTION*** wheel allows quick access to Sounds. It is also used to scroll through menus and set some parameter values.
6. **[PLAY]** starts the playback of the sequencer. The secondary function is a clear operation.
7. **[STOP]** stops playback. The secondary function is a paste operation.
8. ***LEVEL*** sets the overall volume level of the active track.
9. **[TEMPO]** opens the TEMPO menu. **[FUNCTION]** + **[TEMPO]** makes it possible to tap the tempo.
10. **[YES/SAVE]** key. Used for entering sub-menus and for confirming choices.
11. **[NO/RELOAD]** key. Used for exiting an active menu and backing one step.
12. The LCD window.
13. The **[ARROW]** keys. Used for menu navigation. They are called **[UP]**, **[DOWN]**, **[LEFT]** and **[RIGHT]**.
14. **[PERFORMANCE]** enters PERFORMANCE mode.
15. **[ARP]** key. Controls for the arpeggiator of the active track are found here.
16. **[NOTE]** key. Note settings for the active track are made here.
17. **[PARAMETER]** keys switch between the PARAMETER pages of the active track. The upper white text legend indicates the pages for the four synth tracks. The gray text is for the FX track pages and the white text line beneath indicates the CV track pages. A second press on the **[PARAMETER]** key will open secondary PARAMETER pages. <PARAMETER> LED indicates if the first (red) or second (green) page is active.
18. ***DATA ENTRY*** knobs. Used for adjusting parameters.

19. **[SONG]** key opens the SONG menu. The secondary function opens the GLOBAL menu.
20. **[PATTERN]** key opens the PATTERN menu. The secondary function opens the pattern SWING settings.
21. **[TRACK]** key opens the TRACK menu. The secondary function opens the CLICK menu.
22. **[SOUND]** key opens the SOUND menu. Secondary function accesses the trig-activated track muting.
23. **[KIT]** key opens the KIT menu. The secondary function opens the POLYPHONY configuration menu.
24. **[PAGE]** selects the active pattern page in GRID RECORDING mode. The active pattern page is indicated by the four LEDs above the key. The secondary function accesses the SCALE menu.
25. <PATTERN PAGE> LEDs indicate how many pattern pages the active pattern consists of and which pattern page is currently active. The LED flashes on the pattern page currently playing.
26. **[TRIG]** keys are used for entering sequencer trigs, as well as choosing patterns.
27. <BANK GROUP> LED indicates if bank group A-D or E-H is accessed by the **[BANK]** keys.
28. **[BANK D/H]** accesses pattern selection for either bank D or H. The secondary function opens the PARAMETER SLIDE menu.
29. **[BANK C/G]** accesses pattern selection for either bank C or G. The secondary function opens the NOTE SLIDE menu.
30. **[BANK B/F]** accesses pattern selection for either bank B or F. The secondary function opens the ACCENT menu.
31. **[BANK A/E]** accesses pattern selection for either bank A or E. The secondary function opens the TRIG MUTE menu.
32. ***KEYBOARD*** spans three octaves and has 37 semi-weighted, after-touch and velocity sensitive keys.
33. **[OCTAVE UP]** shifts the ***KEYBOARD*** range up one octave.
34. **[OCTAVE DOWN]** shifts the ***KEYBOARD*** range down one octave.
35. <OCTAVE> LEDs shows the octave transposition for the ***KEYBOARD***.
36. ***JOYSTICK*** for up to 15 custom assigned parameters, such as pitch bend and modulation.
37. **[HOLD]** key holds all pressed ***KEYBOARD*** keys until deactivated. Secondary function activates/deactivates ***KEYBOARD*** transpose according to sequencer track settings.
38. **[MIDI EXT]** activates/deactivates ***KEYBOARD*** and ***DATA ENTRY*** knob MIDI control of external equipment. Secondary function opens the MIDI CONFIGURATION menu.
39. **[MULTI MAP]** activates/deactivates the custom mapping of the ***KEYBOARD***. Secondary function brings up the MULTI MAP EDIT menu.
40. **[FUNCTION]** key. Press and hold to access secondary functions. Secondary functions are generally written in red text on the panel of the Analog Keys.
41. **[TRANSPOSE]** key transposes the sequencer track. Secondary function is transpose lock.
42. **<TRACK>** LEDs indicating the active track and muted tracks. Red is active, green is unmuted, off is muted and yellow is active but muted.
43. **[TRACK]** keys select the active track. Four synth tracks, one FX track and one CV track are available. **[FUNCTION]** + **[TRACK]** mutes a track
44. <TRANSPOSE> LED indicates if the transpose lock function is activated or not.
45. <PATTERN MODE> LED indicates the selected PATTERN mode: sequential (off), direct start (red) or direct jump (green).
46. **[BANK GROUP]** key. Selects the active bank group (A-D or E-H). The secondary function activates different PATTERN modes.

REAR CONNECTORS



The Analog Keys Rear Connectors.

1. **Power on/off switch.**
2. **Power in (100-250 V AC, 50-60 Hz).** Use the included C7 power cable, or equivalent, connected to a power outlet.
3. **Full-speed USB 2.0 Connection.** Connect using the included A to B USB 2.0 connector cable to a computer host.
4. **MIDI Thru.** Use standard MIDI cable to connect another MIDI unit in chain. Duplicates incoming MIDI In data stream.
5. **MIDI Out.** Use standard MIDI cable to connect to MIDI In of an external MIDI unit in order to control it.
6. **MIDI In.** Use standard MIDI cable to connect MIDI Out of an external MIDI unit in order for it to control Analog Keys.
7. **CV outputs C and D.** Connect to external synth with CV inputs. Use either standard 1/4” mono phone plug or 1/4” insert/Y cable.
8. **CV outputs A and B.** Same recommended connector as above.
9. **Audio input L/R.** Use standard 1/4” mono phone plug to input sound from other synthesizers or mixers.
10. **Individual stereo outputs Track 1-4.** Use 1/4” insert/Y cable in order to access both left and right channels.
11. **Main Out L/R.** Use either 1/4” mono phone plug (unbalanced connection) or 1/4” stereo (Tip/Ring/Sleeve) phone plug (balanced connection).
12. **Headphones Output.** Connect standard headphones with 1/4” stereo phone plug.

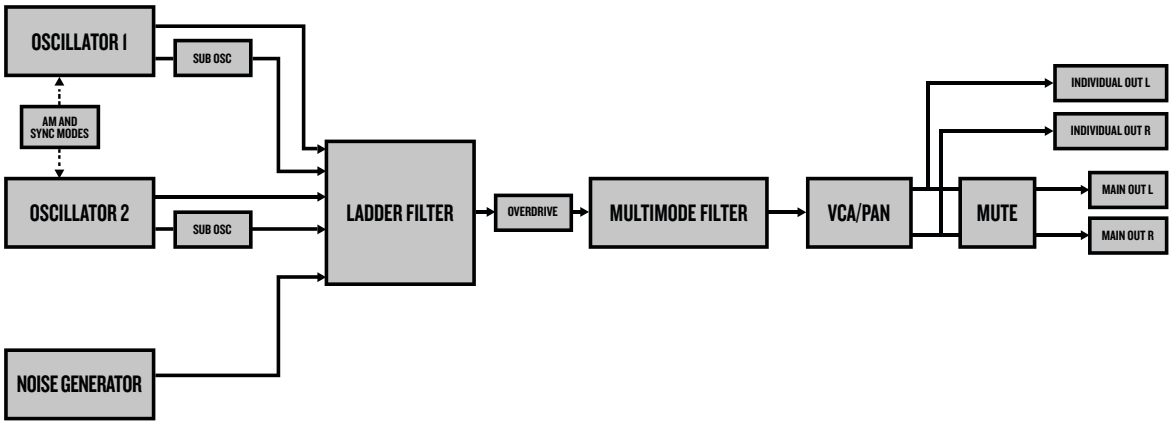
CONNECTING THE UNIT

Make sure you place the Analog Keys on a stable support, such as a sturdy table with sufficient cable space or a synth stand capable of a 10 kg load.

1. Before you connect the Analog Keys to other equipment, make sure all units are switched off.
2. Plug the included AC cable into a power outlet and the Analog Keys.
3. Connect the main out L/R from the Analog Keys to your mixer or amplifier.
4. If MIDI control is desired, connect the MIDI OUT port of the device you wish send data from to the MIDI IN port of the Analog Keys. The MIDI THRU port duplicates the data arriving at the MIDI IN port. It is used for chaining several MIDI units together.
5. Switch on all units. Switch on the unit by pressing the Power rocker switch located at the back of the unit. Before restarting the unit, wait 2 seconds after the LCD backlight goes out.

ANALOG KEYS SIGNAL PATH

Below is an image outlining the signal path of Analog Keys.



ABOUT THE COMPONENTS

Both oscillators of each voice are analog. All their elaborate waveshaping abilities are completely analog, with digitally controlled pitches. The noise generator is digital. The two filters and the overdrive circuit between them are completely analog. The amplifiers are analog. The envelopes and LFOs are digital. They are designed for maximum efficiency and versatility.

COMMENTS ON THE SIGNAL PATH

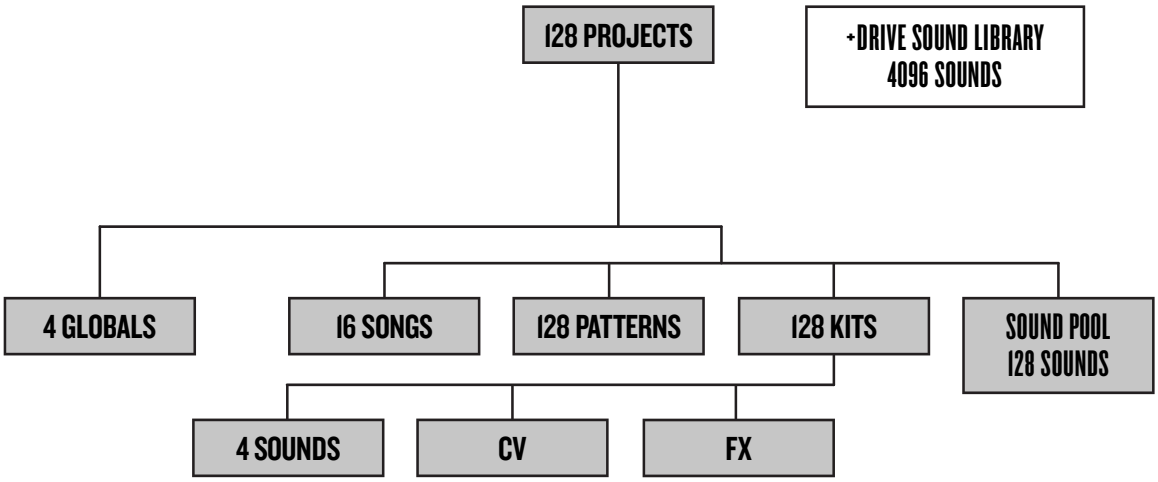
The signal path from the oscillators to the audio outputs is completely analog. The signal path from the external inputs to the audio outputs is also completely analog. The digital send effects are parallel to the main audio path, and the wet signals from the digital send effects are mixed with the dry analog signal before the main output stage.

ABOUT THE OSCILLATORS AND FILTERS

The oscillators are designed and built from scratch, in order to obtain a lush sound and provide an array of control features. The ladder filter utilizes discrete low-noise transistors, the multimode filter uses high quality VCAs. The combination of tradition and innovation ensures a unique sound with a wide range of possibilities. For a more complete image of Analog Keys architecture, see “Appendix E: ANALOG KEYS ARCHITECTURE“.

OVERVIEW OF THE ANALOG KEYS STRUCTURE

The image below outlines the data structure of Analog Keys.



+DRIVE

The +Drive is a non-volatile memory capable of storing up to 128 projects (thousands of patterns, kits and songs) internally. The +Drive also contains the +Drive Sound library, with the capacity of storing 4096 Sounds. Every project has access to these Sounds.

DATA STRUCTURE

PROJECT

A project contains 128 patterns, 128 kits, 16 songs, 4 global slots, and a project Sound pool consisting of up to 128 Sounds. Generic settings and states (tempo, mutes et cetera) are also stored in each project. When a project is loaded it becomes the active working state of Analog Keys. From here it is possible to edit the patterns, kits, songs and globals of the project. Analog Keys always retains the active working state, the active project, even when switched off. However, it must be manually saved in a project slot before another project is loaded or it will be lost. Projects are saved, loaded et cetera in the GLOBAL menu. Read more about projects in the section “PROJECTS” on page 15.

KIT

Kits contain four Sounds, one for each synth track, and settings for the FX and CV tracks. Up to 128 kits are available for each Analog Keys project. Each pattern is linked to a kit. Read more in section “KITS AND SOUNDS” on page 17.

SOUND

A Sound consists of stored synth track parameter settings. Each synth track contains one Sound. Sounds can be stored either in the Sound pool of the active project or in the +Drive Sound library. The Sound pool contains 128 Sounds and the +Drive library has the capacity of 4096 Sounds. Read more in section “KITS AND SOUNDS” on page 17.

BANK
Eight banks exist for each project and each bank contains 16 patterns. Read more in section “THE SEQUENCER” on page 31.

PATTERN
For each of the 8 banks 16 patterns are available, which means 128 patterns are always readily available. A pattern consists of sequencer data like trigs, parameter locks, time signature and individual track lengths for the synth tracks and the FX and CV tracks, as well as ARP and NOTE page settings. Read more in section “THE SEQUENCER” on page 31.

SONG
16 songs are available for each project. They are used to sequence the playback of chains. Read more about songs in the section “SONGS” on page 47.

CHAINS
A chain is a sequence of patterns. Up to 256 pattern slots are possible to allocate between 64 chains. Chains are covered in detail on page 46.

GLOBAL
The GLOBAL menu is where you save, load and manage projects, handle SysEx data and perform OS upgrades. It also contains general settings for the synth and sequencer as well as MIDI and CV configurations. Four global slots are available for every project, each with its own individual settings. Read more about the global settings in the section “GLOBAL MENU” on page 49.

ABOUT THE TRACK TYPES

THE SYNTH TRACKS
The synth tracks consist of track 1-4. To edit one of them, press **[TRACK]** key 1-4. Sounds are loaded to the synth tracks. Sounds can be played polyphonically.

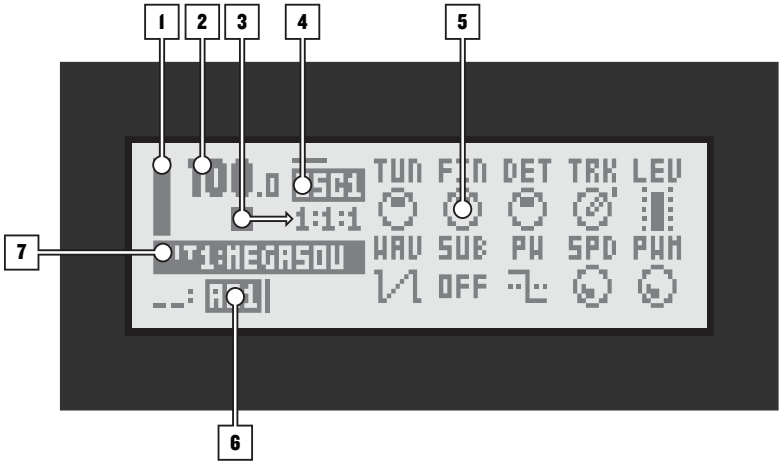
THE FX TRACK
The FX track controls Analog Keys internal send effects. To edit the FX track, press the **[TRACK]** key 5.

THE CV TRACK
The CV track is used for controlling external equipment capable of receiving analog CV and Gate signals. To edit the CV track, press **[TRACK]** key 6.

EDITING THE TRACKS
The six **[PARAMETER]** keys open pages that are used for editing the tracks. They contain different parameters depending on the track type. Edit parameters using the ***DATA ENTRY*** knobs. Press and turn a knob to adjust parameters in larger increments.

THE USER INTERFACE

The center of Analog Keys editing is the LCD display. The main interface screen is shown below:



1. Bar indicating the main volume setting of the active track.
2. The current tempo displayed with one decimal.
3. The playback/recording status of the sequencer shown by the standard “record”, “play”, “pause” and “stop” symbols; ●, ▶, ❚❚ and ■. To the right is a counter displaying how many bars, beats and steps the sequencer has played.
4. Information about which PARAMETER page is active. The line above the text indicates the active sub page of the PARAMETER page. A completely drawn line means no sub page is available.
5. Up to ten track parameters. They show what the ***DATA ENTRY*** knobs control and also indicate the current parameter values. Press and turn a knob to adjust its parameters in larger increments.
6. The currently active pattern. To the left the active song row is visible. A “_ _:” representation indicates the scratch pad row is active.
7. The currently active kit. When turning a ***DATA ENTRY*** knob, the full name of the parameter being adjusted is shown here.

- **All windows can be closed using the [NO/RELOAD] key.**
- **Buttons or knobs not used by an active menu retain their original function. For example, the TEMPO menu makes use of the *SOUND SELECTION* wheel, but you can still use the *DATA ENTRY* knobs to control the parameters of the active track.**

PARAMETER EDITING

The ***DATA ENTRY*** knobs are used to change the value of the track parameters. The physical location of the knobs on the front panel correspond to the layout of the parameters on the screen.

QUICK PARAMETER EDITING

If the ***DATA ENTRY*** knob is pressed down while being turned parameters will be adjusted in larger increments. This makes it much quicker to sweep through a whole parameter range.

PARAMETER VALUE JUMP

Keeping **[FUNCTION]** pressed while editing certain parameters will make the parameter values jump to relevant positions. For instance the delay time of Saturator Delay, which will jump between 16, 32, 64 and 128, or the oscillator tuning, which will jump in octaves.

QUICK SCROLLING

Scroll through menus using the ***SOUND SELECTION*** wheel. In many menus, quick scrolling is also available. Press **[FUNCTION]** + the **[UP]** or **[DOWN]** arrow keys to move the cursor one menu page at a time.

COPY, CLEAR AND PASTE

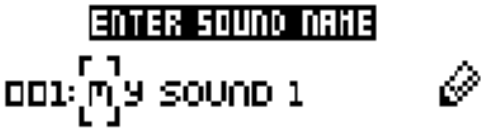
Copy, clear and paste commands are available in a lot of contexts. A copy operation is performed by pressing **[FUNCTION]** + **[REC]**. A paste operation is performed by pressing **[FUNCTION]** + **[STOP]**. A clear operation is performed by pressing **[FUNCTION]** + **[PLAY]**. Paste and clear operations can be undone by repeating the button press combination. See the different sections in the manual for more information about where these commands are available.

ONE-HANDED OPERATION

The functional layout of the Analog Keys ensures many complex operations can be done using only one hand, leaving the other hand free to play the ***KEYBOARD*** or tweak sounds**.** With the **[FUNCTION]** key in the vicinity of the **[TRACK]** keys, one-handed track muting is possible. As is one-handed transpose locking, copy, clear and paste commands, pattern play mode change, and more.

THE NAMING MENU

The naming procedure is identical for the various naming menus that exist.



The **[LEFT]** and **[RIGHT]** arrow keys are used to navigate between the letters. Turning the ***SOUND SELECTION*** wheel or pressing the **[UP]** or **[DOWN]** arrow keys select the letter. **[FUNCTION]** + **[NO/RELOAD]** will erase letters.

POP-UP MENU NAMING

While in a NAMING menu it is possible to open a pop up-menu displaying all available letters, symbols and digits. Entering characters in the pop up-menu is often a considerably faster naming method. When a NAMING menu is open, press the **[FUNCTION]** key to access the pop up-menu.



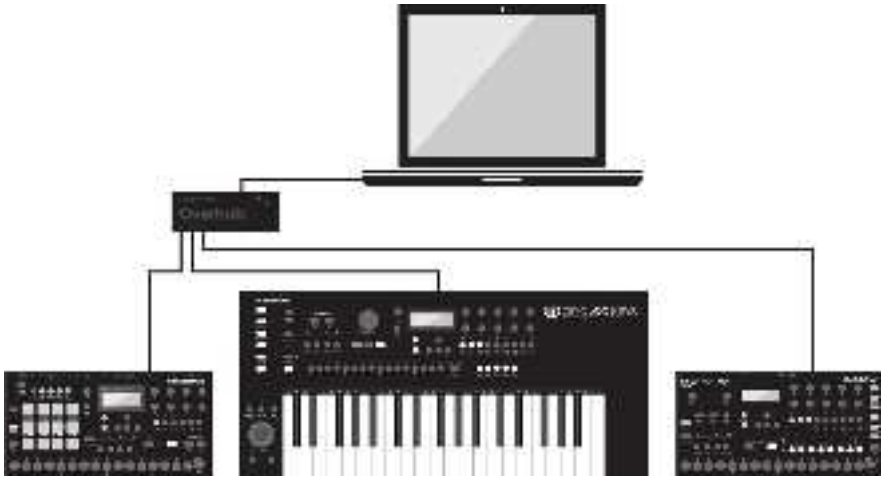
While keeping **[FUNCTION]** pressed use the **[ARROW]** keys to navigate to the character you want to insert. Once there, release **[FUNCTION]** to insert the character.



- **Copy, paste and clear commands are available in the naming menus.**

OVERBRIDGE

This manual primarily focuses on how to play and program the Analog Keys as a standalone instrument. Since the dawn of Overbridge, however, that is not the only way to interact with your device.



The Overbridge software suite enables a tight integration between the Analog instruments (Analog Rytm, Analog Keys, Analog Four) and a computer DAW.

When using the Overbridge setup, the user interface for your Analog device will present itself as a clearly laid out plugin window in your DAW. Enjoy multitrack audio, browse through and organize sounds, edit kits, even set up the CV communication via a simple point-and-click workflow. Access all parameters for sound shaping, including oscillator settings, filters, amp, envelopes and LFOs, on screen at once. Always find your device settings in the same state as you left them when you return to your DAW project, with the convenient, optionally automatic, Machine State Total Recall functionality.

All that is required is an Elektron Analog instrument, a USB cable, a computer running Overbridge, and a DAW.

If you want to hook up multiple machines to a computer, we suggest acquiring the Elektron Overhub, a Multi-TT hub tailored for Overbridge use.

Overbridge is available as a complimentary download from the Elektron webpage. Please read the Overbridge manual (also available from the Elektron webpage, Support section) in order to learn more about its uses and capabilities.

Once installed, in order for Overbridge to work together with your Analog instrument, two basic measures must be taken:

First - Make sure the OS of your Analog Keys, and the OS of Overbridge, match. Simply put, always have the most recent OS installed on both computer and device. You will find the most recent versions of both operating systems included with the Overbridge download package.



Second - set your Analog Keys device to Overbridge mode on the USB CONFIG screen. You will find this setting in the SYSTEM menu, located at the far south of the GLOBAL menu. Press **[YES/SAVE]** to tick the box and activate OVERBRIDGE MODE.

QUICK START

This quick start will guide you through some of the basic operations to allow you to start using Analog Keys right away. First connect it as described in section “CONNECTING THE UNIT”, on page 5.

PLAYING THE FACTORY PRESETS

Analog Keys is shipped with several preset patterns, kits and Sounds. To immediately start experimenting with Analog Keys, just follow the instructions below.

1. Switch on Analog Keys.
2. Press **[PLAY]** to listen to pattern A01.
3. Select pattern A02, which is the second demo pattern, by first making sure bank group A-D is selected. The <BANK GROUP> indicates the selected bank group. If A-D is not selected, press the **[BANK GROUP]** key.
4. Pressing **[BANK A/E]** + **[TRIG]** key 2 will make pattern A02 play once the currently playing pattern finishes. Pattern A03 is selected by pressing **[BANK A/E]** + **[TRIG]** key 3 and so on.
5. Mute tracks by pressing **[FUNCTION]** + the **[TRACK]** key of the track you want to mute. Unmute by repeating the procedure.
6. Press **[STOP]** to stop playback.

PERFORMANCE MODE

The PERFORMANCE mode makes it possible for the ***DATA ENTRY*** knobs to control several PARAMETER page parameters at once. This is called a parameter macro.

1. Make sure a pattern is playing.
2. Press the **[PERFORMANCE]** key to access PERFORMANCE mode.
3. Turn the ***DATA ENTRY*** knobs and hear how the sound of the pattern changes.

ADJUSTING PARAMETERS

Each track contains six PARAMETER pages. Parameters affecting the sound of the track are found on these pages.

1. Make sure a pattern is playing.
2. Press the **[TRACK]** key of one of the four synth tracks.
3. To change the cutoff of the ladder filter, press the **[FILTERS]** key. The FILTERS page will open. The parameter labelled **FRQ** changes the cutoff of the ladder filter. Turn ***DATA ENTRY*** knob ***A*** to change the parameter value.
4. Try out the rest of the PARAMETER page parameters to experiment with the sound shaping possibilities.
5. To reload the Sound to its original state, press **[NO/RELOAD]** + **[SOUND]**.
6. To reload the whole kit to its original state, press **[NO/RELOAD]** + **[KIT]**.



- **Explore the Analog Keys factory presets. 32 sample patterns are available in the A and B banks of project slot 1, each with its own unique kit. The project 1 Sound pool contains 128 preset Sounds. Additionally, 512 Sounds are readily available in the +Drive Sound library. The Sounds are tagged to ensure ease of location and identification.**

KEYBOARD CONTROL

Analog Keys comes equipped with a versatile 37-key ***KEYBOARD***. It is made to suit the needs of both delicate and heavy-handed players. Precise studio sessions or intense live performances. On the left-hand side there are three sets of controls. From the top: three keys for the various keyboard modes, an assignable ***JOYSTICK*** and lastly a set of keys for shifting the octave up or down.

THE KEYBOARD

The entire keyboard is made up of 128 notes spanning 11 octaves. The ***KEYBOARD*** playable range has 37 semi-weighted, velocity sensitive keys with aftertouch. In its initial state, the playable range spans the middle three octaves, with C5 as the first note of the very middle octave.

A red LED above each individual key will show key activity. It will flash briefly when a key is tapped, whether manually or if played by the Analog Keys sequencer. The LED will light up full-bright if a key is held down manually, or half-bright if held down hands-free using the **[HOLD]** key (see page 14).

Customize the velocity sensitivity and aftertouch settings for the keys by pressing **[SOUND]** and select SOUND SETTINGS. See page 28 for more on velocity and aftertouch settings.

JOYSTICK

To the left of the keyboard you will find an omnidirectional ***JOYSTICK***. Its default functionality is pitch bend in the sideways direction, modulation in the upward direction and breath control in the downward direction. Press **[SOUND]** and select SOUND SETTINGS to customize the ***JOYSTICK*** functionality and the parameters it will control. See page 28 for further details.

OCTAVE SHIFT

The two keys **[OCTAVE DOWN]** and **[OCTAVE UP]** shift the playable keyboard range a whole octave down or up, respectively. The range spans eleven octaves. <OCTAVE> shows the position in the range with a full-bright red LED for the middle five octaves. For lower or higher octave positions (outside of the <OCTAVE> range), the LED light will be increasingly dim for each **[OCTAVE DOWN]** or **[OCTAVE UP]** key press.

KEYBOARD MODE KEYS

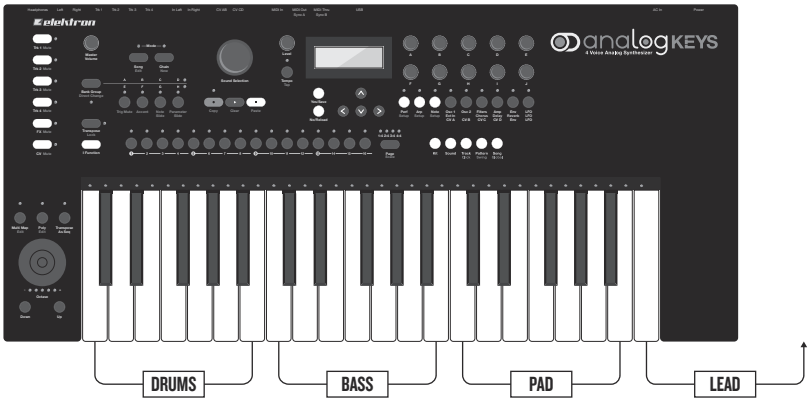
There are three main keys with which you change the keyboard mode of operation: **[MULTI MAP]**, **[MIDI EXT]** and **[HOLD]**. The red LEDs above these keys show if they are active (full-bright) or inactive (off).

MULTI MAP MODE

To activate the multi map of the ***KEYBOARD***, press the **[MULTI MAP]** key. To deactivate, press again. The factory preset default mapping is shown below. (In order to play the entire multi mapped LEAD Sounds reaching outside of the playable keyboard range, as seen in the illustration, press the **[OCTAVE UP]** key once to shift the ***KEYBOARD*** one octave up. This will push the DRUMS section outside of the playable range. Press **[OCTAVE DOWN]** once in order to reach the DRUMS again.) When starting new projects, the default mapping is a 2-split.

You can assign a wide variety of custom functions to the 128 available keyboard keys by using the MULTI MAP EDITOR. Press **[FUNCTION]**+**[MULTI MAP]** to open it. Read more about mapping the keyboard on page 53.

DEFAULT MULTI MAP



EXTERNAL KEYBOARD MODE

Pressing **[MIDI EXT]** will turn the keyboard controls of the Analog Keys into an external MIDI keyboard controlling other gear. The ***KEYBOARD*** keys, ***JOYSTICK***, ***DATA ENTRY*** knobs and the ***LEVEL*** knob will be dedicated to sending MIDI Out messages. Until deactivated, the Analog Keys synth and parameter settings will not be affected by these controls, only the external MIDI gear. Press the key again to deactivate. Note that the internal sequencer and synth tracks will continue to work normally even while the external keyboard mode is active.

Enter the setup menu to set the desired external MIDI channel and assign the appropriate MIDI CC messages for the ten ***DATA ENTRY*** knobs. Access by pressing **[FUNCTION]**+**[MIDI EXT]**.



HOLD MODE

To activate the **[HOLD]** key functionality, the **[HOLD]** key needs to be pressed in combination with at least one of the ***KEYBOARD*** keys. Play a note (or a chord in polyphonic mode), then press the **[HOLD]** key. The opposite order works equally well, pressing **[HOLD]**, then playing a note. The LED above the **[HOLD]** key will light up and stay lit as long as at least one note is held.

When held, the ***KEYBOARD*** key (or keys) will act as if held down continuously even after the key is released. The red LED above each affected ***KEYBOARD*** key will be lit for all held notes. You can repeat this and hold notes on any of the tracks without releasing the already held notes. You can also hold multi mapped sounds or other functions and hold notes on external synths without releasing notes already held on the ***KEYBOARD***. All notes held will remain so until the key of the held note is pressed a second time, in which case it is released, and the LED above it will be unlit. To release all of the held notes, press the **[HOLD]** key. The red LED above the **[HOLD]** key will then be unlit.

The secondary function of the **[HOLD]** key is the keyboard transpose. Press **[FUNCTION]**+**[HOLD]** to activate, press the same combination a second time to deactivate. The notes played will automatically conform to the track key note setting, making it impossible to play off key. The track key note is set in the NOTE MENU, accessed by pressing **[FUNCTION]**+**[NOTE].** See NOTES SETUP on page 37 for more details.

PROJECTS

A project is the top level structure of Analog Keys. A project contains 128 patterns, 128 kits, 16 songs, 4 global slots, and a project Sound pool consisting of up to 128 Sounds. Projects are handy when, for example, you want to save a specific setup for a live performance or when managing a select number of compositions. The +Drive can store 128 projects.

When a project is loaded it becomes the active working state of Analog Keys, independent of the +Drive. Analog Keys will keep track of what project slot the active project was loaded from. When a project is loaded it is possible to edit its patterns, kits, songs, and globals. The active project and any changes made to it are automatically remembered by Analog Keys, allowing you to edit patterns, kits et cetera, switch off the unit, switch it on again and have everything sound as it did prior to the power cycling. Please note that changes are not automatically written to the +Drive. To store the active working state of the project to a +Drive slot, the project needs to be saved manually.

PROJECT MENU

Projects are managed in the PROJECT menu, located in the GLOBAL menu. Open the GLOBAL menu by pressing **[FUNCTION]** + **[SONG]**.



Scroll through the list by using **[UP]**/**[DOWN]** or the ***SOUND SELECTION*** wheel and select PROJECT. Open the menu by pressing **[YES/SAVE]**.



LOAD PROJECT opens a project selection screen where you choose a project to be loaded. Note that the active project will not be saved before loading the new project. This menu can be accessed directly by pressing and holding **[FUNCTION]** + **[SONG]** for a second. If you wish to create a new project, select **CREATE NEW** at the very bottom of the list. The new project will be a blank slate.



SAVE PROJECT opens a project selection screen where you choose a slot to save the active project to.



- **The currently active project is linked to the slot indicated by a small arrow in front of the project name.**
- **Projects can be copied/cleared/pasted in the LOAD PROJECT and SAVE PROJECT menus.**
- **A lock symbol indicates the project is write protected.**

PROJECT MANAGER launches the PROJECT MANAGER menu. Selecting a project in this menu and pressing the **[RIGHT]** arrow key will bring up a list of commands.



CLEAR resets the project slot to a clean state.

INIT NEW initializes an empty file slot with a clean project. This operation is only available for empty project slots.

DELETE removes the project from the slot.

RENAME opens a screen where you can rename the project file.

LOAD FROM loads the selected project. This will overwrite the active project!

SAVE TO saves the active project to the selected slot.

TOGGLE toggles write protection on or off. Write protected projects can not be overwritten, renamed or erased. A write protected project is indicated by a lock symbol.

- **Multiple projects can be selected and deselected by highlighting them and pressing [YES/SAVE].**
- **The currently active project is linked to the slot indicated by a small arrow in front of the project name.**
- **Projects can be copied/cleared/pasted in this menu.**

- **LOAD FROM in the PROJECT MANAGER will overwrite the active project. Be sure to save your project before you load another.**

KITS AND SOUNDS

Kits and Sounds are the basic building blocks of Analog Keys soundcrafting. A kit is a collection of Sound, FX and CV track parameter settings. A Sound is essentially a synth track patch, made up by subtractive synthesis from the oscillators through the filters via its various parameter settings. Each of the 4 synth tracks contains one Sound.

Kits and Sounds are separated, meaning kits do not necessarily have to use any saved Sounds. When saving a kit, the PARAMETER page settings of the synth tracks, i.e. the settings that constitute a Sound, will be saved together with the kit. The synth track PARAMETER page settings of a kit can of course be saved as individual Sounds as well. When loading a Sound, it will become a part of the kit. Changes made to the track Sound will not affect the loaded Sound, only the kit. A specific kit is always assigned to a pattern which controls the playback of the kit.

A Kit contains:

- **Sound settings for the 4 synth tracks.**
- **FX track parameter settings.**
- **CV track parameter settings.**
- **LEVEL settings for the Synth and FX tracks.**
- **PERFORMANCE mode parameter settings.**
- **Polyphony settings.**

A Sound contains:

- **Settings for the PARAMETER pages of a synth track.**



- **The LCD graphics in the left part of the screen shows the name of the currently active kit. When the [TRACK] keys are pressed, this information will briefly change to reflect the name of the track. In the case of the synth tracks, the name of the track Sound will be displayed.**



- **Note that several patterns may use the same kit. Changes you make to the kit while editing one of the patterns will directly affect how the other patterns using the kit sound as well. Remember to save the kit to a new location if you wish to avoid this.**

THE +DRIVE SOUND LIBRARY AND THE SOUND POOL

Sounds can be loaded to a kit from either the +Drive Sound library or the Sound pool of the active project. The difference between the two is that the +Drive Sound library has the capacity of 4096 Sounds, available to all projects, while a Sound pool is a part of a project and limited to 128 Sounds. The major benefit of Sounds loaded to the Sound pool is the possibility for them to be Sound locked. This feature is not available for the Sounds in the +Drive Sound library. Read more about Sound locking on page 40.

KIT MENU

In the KIT menu commands relating to kits are found, most importantly kit save and load. Open the menu by pressing **[KIT].** Use the **[UP]** and **[DOWN]** arrow keys to move between the commands. Press **[YES/SAVE]** to confirm your selection. Exit the menu by pressing **[NO/RELOAD]**.



RELOAD KIT will reload either the active kit, reverting it to its saved status, or all kits. Using the **[LEFT]** and **[RIGHT]** keys selects whether only the active kit or all kits will be reloaded. **[NO/RELOAD]** + **[KIT]** offers a short cut to reloading the active kit.

LOAD KIT opens a menu where one of the up to 128 saved kits can be loaded. When this menu is opened the kit list will appear. The active kit is indicated by inverted graphics. Select the kit to be loaded by using the **[ARROW]** keys or the ***SOUND SELECTION*** wheel. **[LEFT]**/**[RIGHT]** will quickly scroll between the menu pages. Once a kit has been selected, press **[YES/SAVE]** to load it. The loaded kit will be linked to the active pattern. Loading the active kit will reload it.



SAVE KIT is where all the current, kit related, settings can be saved as a kit. The saved kit will be linked to the active pattern. **[YES/SAVE]** + **[KIT]** offers a short cut to this command.

When this menu is opened the kit list will appear. The active kit is indicated by inverted graphics. Select the slot to which the kit will be saved by using the **[ARROW]** keys or the ***SOUND SELECTION*** wheel. Press **[YES/SAVE]** to save to the selected slot. The NAMING menu, covered on page 10, will appear.

CLEAR KIT will clear the content of the currently loaded kit, basically initializing it. When selecting this option a prompt will appear. Press **[YES/SAVE]** to clear the kit or **[NO/RELOAD]** to cancel the operation. Note that no kit information will be permanently lost until the kit is saved to the same kit slot it was loaded from.

PERFORMANCE opens the PERFORMANCE SETUP menu, covered on page 19.

POLY CONFIG opens the POLYPHONY CONFIGURATION menu. See page 21.

VOICE ROUTING accesses VOICE ROUTING. See page 22.

- **Copy, clear and paste operations are available in the LOAD KIT, SAVE KIT and PERFORMANCE SETUP menus.**
- **Use the *SOUND SELECTION* wheel to scroll through the LOAD KIT and SAVE KIT menus.**
- **Once you have assembled a kit you like, you are advised to save it.**
- **Kits not used by any patterns are indicated by an asterisk after the kit name.**

PERFORMANCE MODE

The PERFORMANCE mode makes it possible to control five track parameters, that can be chosen from any track, at the same time by turning a single ***DATA ENTRY*** knob. This is called a performance macro. Track muting and an overview of all synth and FX track levels are available in this mode as well. PERFORMANCE mode settings are saved as a part of a kit.

Access the PERFORMANCE mode by pressing the **[PERFORMANCE]** key.



The ten available performance macros are seen in the PERFORMANCE menu. Turn the ***DATA ENTRY*** knobs to adjust the parameter macro settings. The graphics indicating the active kit will briefly change to reflect the mute status of the tracks.

PERFORMANCE SETUP

The ten performance macros available in the PERFORMANCE mode are set up in the PERFORMANCE SETUP menu. Access this menu by pressing **[FUNCTION]** + **[PERFORMANCE]**.



- **The collection of all ten performance macros can be copied, cleared and pasted while in this menu.**

PERFORMANCE CONFIGURE is where parameters are assigned to the performance macros. After selecting this option, the list of performance macros and the knobs they are assigned to will show up. In this menu, individual performance macros can be copied, cleared and pasted.



Use the **[UP]** and **[DOWN]** arrow keys to select the ***DATA ENTRY*** knob corresponding to the performance macro that will be edited. Press **[YES/SAVE]** to confirm the selection. You can also click on a knob to bring up its macro menu. The menu where track parameters are assigned to the selected performance macro will appear.



Up to five track parameters can be assigned to a performance macro. Parameters can be selected from all six tracks. Select from which tracks parameters will be assigned by clicking ***DATA ENTRY*** knobs ***A-E***. Select the track parameters that will be assigned by turning ***DATA ENTRY*** knobs ***A-E***. Confirm a selection by clicking the knob or by pressing **[YES/SAVE]**. ***DATA ENTRY*** knobs ***F-J*** are used to set the depth of the five track parameters. The depth is an offset of the original track parameter value.

By default the parameter macro knob spans a parameter value range of 0-127. A parameter macro value of 0 will not introduce any changes to the sound. Press the ***LEVEL*** knob to make the performance macro knob work in a bipolar fashion, making the parameter macro value range go from -64 to +63.

While a pattern or Sound is playing, turn the ***LEVEL*** knob to preview how the performance macro affects the sound.



- **PERFORMANCE mode parameters are not possible to parameter lock.**
- **If for example the depth of the OSC1 PITCH of track 1 is set to 63 and the parameter macro is set to a non-bipolar mode, turning the parameter macro knob to 127 will introduce a parameter value offset of +63 to the OSC1 PITCH parameter. If the macro knob is set to a bipolar mode, turning the parameter macro value to +63 will introduce a parameter value offset of +63 to the OSC1 PITCH parameter. Conversely, turning the parameter macro knob to -64 will introduce a parameter value offset of -64 to the OSC1 PITCH parameter.**



- **Use parameter macros to affect the most relevant parameters when playing live. By carefully setting up parameter macros you might find that you don't have to leave this mode at all during your live set.**

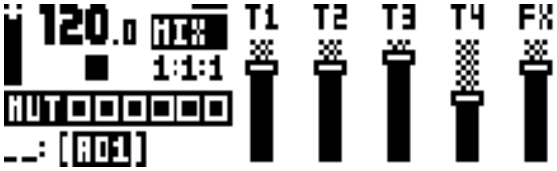
PERFORMANCE RENAME allows performance macro knobs to be named. Use the **[UP]** and **[DOWN]** arrow keys to select the ***DATA ENTRY*** knob corresponding to the performance macro that will be named. Press **[YES/SAVE]** to confirm the selection. The NAMING menu will appear.

PERFORMANCE MUTE

Track muting, also covered on page 30, can be carried out while in PERFORMANCE mode. When in PERFORMANCE mode, **[TRIG]** keys 1-6 mute the tracks. An outlined square in the track mute section and a full bright <TRIG> LED means a track is audible. A minus sign and a quarter-bright <TRIG> LED indicates the track is muted. While holding **[FUNCTION]** and pressing the six first **[TRIG]** keys, the mute changes will be held until **[FUNCTION]** is released. A track that is currently muted, but will be unmuted when **[FUNCTION]** is released, is indicated by a "+" sign and a half-bright <TRIG> LED. A track that is currently not muted, but will be muted when **[FUNCTION]** is released, is indicated by an asterisk and a half-bright, blinking <TRIG> LED.

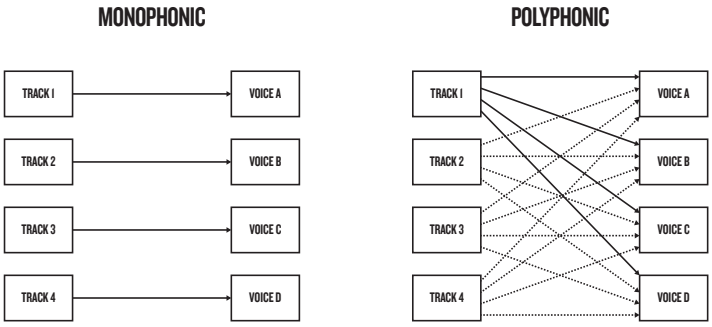
PERFORMANCE MIXER

When PERFORMANCE mode is active, pressing **[PERFORMANCE]** will open the PERFORMANCE MIXER menu. In this menu the level of the tracks can be controlled with ***DATA ENTRY*** knobs ***A-E***.



POLYPHONY

Four voice polyphony can be configured by selecting POLY CONFIG in the KIT menu. Analog Keys is capable of four voice multitimbral polyphony (as well as unison). This is possible due to the powerful sound engine which is able to change sound instantly and allow completely dynamic voice allocation (see figure below). The sequencer is completely polyphonic, allowing overlapping notes and chords to be programmed on the tracks. Any track can play up to four notes using its own track sound. Notes are distributed to the synth voices according to the selected allocation method. Any of the synth voices can also be poly-disabled, allowing tracks to have their dedicated, monophonic synth voice available at all times. The poly configuration is stored per kit, for maximum flexibility, allowing up to 128 different poly configurations per project.



POLYPHONY CONFIGURATION

The settings for up to four voice polyphony are found in the POLY CONFIG menu. Access by pressing **[FUNCTION]** + **[KIT]).**



VOICES Select any combination of the four voices to be poly activated by using the **[LEFT]** and **[RIGHT]** arrow keys. Tick or untick a box by pressing the **[YES/SAVE]** button.To activate/deactivate voice 1-4 directly, press **[TRIG]** key 1 through 4**.** When in the POLY CONFIG menu, the red LEDs above **[TRIG]** key 1-4 on the front panel will be half-bright. When a voice is activated, the corresponding LED will be full-bright. Voices that are not set to be poly enabled will be dedicated monophonic voices for their corresponding tracks. These will never be used for polyphonic playback. Voices that are poly enabled can be allocated dynamically by any of the poly enabled tracks.

ALLOCATION changes the allocation method of the poly voices, or sets all poly enabled voices to play simultaneously (RESET, ROTATE, REASSIGN or UNISON, respectively). Select method with the **[LEFT]** and **[RIGHT]** arrow keys. For a visual explanation of the different allocation methods, see illustrations on page 23 and page 24.

The LEDs above the first four **[TRIG]** keys will flash to show voice activity depending on the selected method. Select method, play a few notes on the ***KEYBOARD*** and watch the LEDs to get an immediate, visual impression of how the different allocation methods work.

RESET Picks the first available voice in increasing order, starting from track voice 1, for every new overlapping note played.

ROTATE For every new coinciding note played, the voices are allocated in a cyclic manner.

REASSIGN Uses the same voice as last time for every note played as long as its unused. Otherwise, the least recently used voice is used for the new note.

UNISON Uses all voices to play the same note. Employs the adjustable parameters DETUNE and PAN SPREAD shown below.

USE TRK SOUNDS forces the selected voices to use the Sounds of the four tracks, instead of letting the voices use the played Sound in a dynamic way. Tick/untick box to activate/deactivate using the **[YES/SAVE]** key or the **[LEFT]** and **[RIGHT]** arrow keys.

UNISON DETUNE sets the offset (0-127) by which the selected unison voices will be detuned. Decrease or increase the offset with the **[LEFT]** and **[RIGHT]** arrow keys.

UNISON PAN SPREAD set the width of the pan spread (0-127) around the center point of the unison sound. Use the **[LEFT]** and **[RIGHT]** arrow keys to set the value.

If no free voice is found, the least recently used voice is stolen and used for the played note. See illustration on page 24. This applies to all allocation methods described above.

VOICE ROUTING

Set custom voice routing by accessing VOICE ROUTING, found at the bottom position in the KIT menu.



Activate/deactivate routing of any the four voices to the main output and to the FX track. Navigate using the **[ARROW]** keys. Tick or untick box with the **[YES/SAVE]** key.

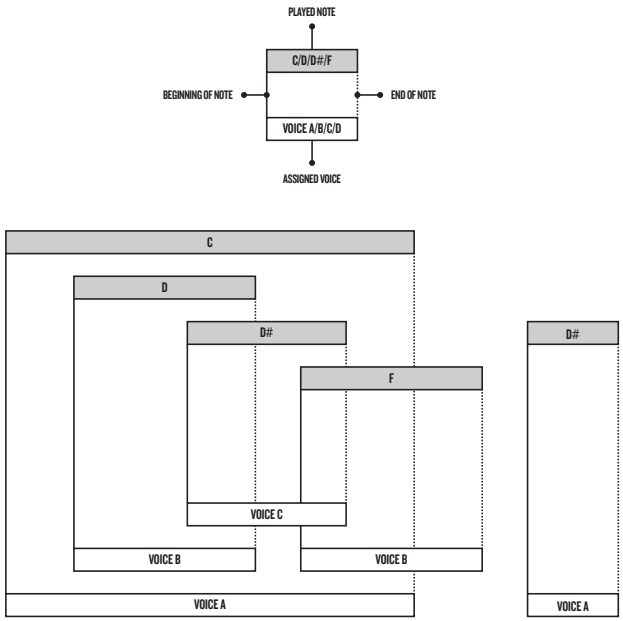
Alternatively, instantly activate or deactivate voice to main or voice to FX using the **[TRIG]** keys 1-4 and 9-12, respectively. Red LEDs above these sets of keys will indicate if the voice is active (full-bright) or inactive (half-bright).

Note that voice routing can be set and stored for each individual KIT. If you want to use the GLOBAL voice routing setting, tick the box USE GLOBAL SETTINGS using the **[YES/SAVE]** key.

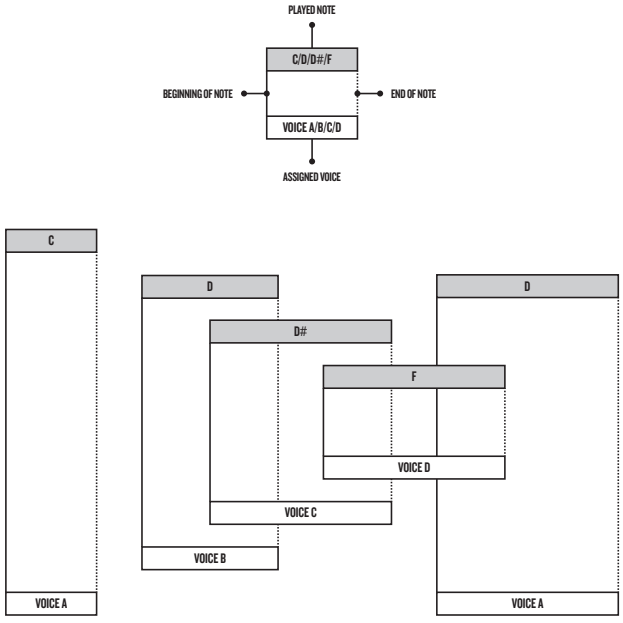


POLYPHONIC VOICE ALLOCATION METHOD: RESET

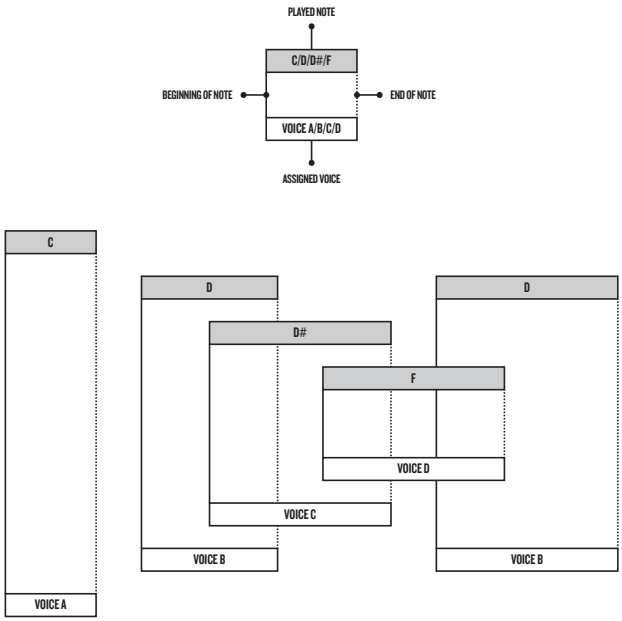
(SHOWN AS PLAYED FROM TRACK 1)



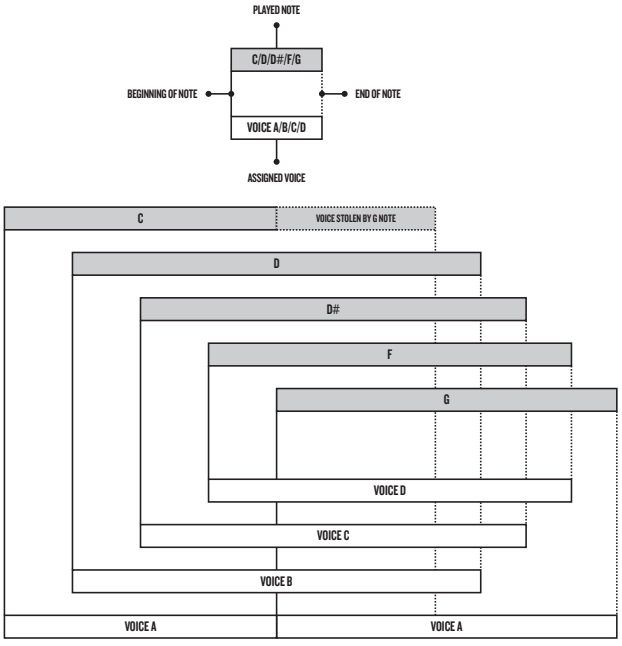
POLYPHONIC VOICE ALLOCATION METHOD: ROTATE



POLYPHONIC VOICE ALLOCATION METHOD: REASSIGN

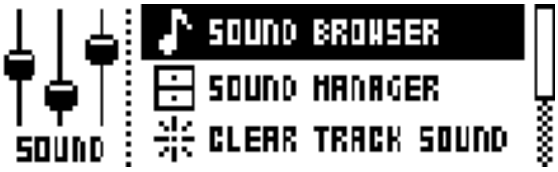


VOICE STEALING



SOUND MENU

In this menu Sounds in the +Drive Sound library or in the Sound pool of the active project can be browsed and managed. Other menu options let you clear the track Sound, rename the track Sound or change the settings for the track Sound. Open the menu by pressing **[SOUND].** Use the **[UP]** and **[DOWN]** arrow keys to move between the options. Press **[YES/SAVE]** to confirm your selection. Exit the menu by pressing **[NO/RELOAD]**.



SOUND BROWSER is intended for convenient previewing and loading of Sounds. Opening the menu will show a list of all Sounds residing in either the +Drive Sound library or the Sound pool. Scroll the list by turning the ***SOUND SELECTION*** wheel or by pressing **[UP]**/**[DOWN]**. Load a Sound by pressing **[YES/SAVE]**. Compared to the SOUND MANAGER menu, it lacks the SOUND OPERATIONS menu. Also, empty Sound slots are not shown.



Pressing **[LEFT]** will access the SORTING menu. Press **[YES/SAVE]** to execute the commands. Press **[NO/RELOAD]** or the **[RIGHT]** arrow key to exit the menu.



POOL lists Sounds available in the Sound pool of the active project. The command is only available when browsing the +Drive Sound library.

+DRIVE lists Sounds available on the +Drive Sound library. The command is only available when browsing the Sound pool of the active project.

SORT ABC sorts the Sounds in alphabetical order. The command is only available when Sounds are being sorted by slot number.

SORT 123 sorts the Sounds by slot number. The command is only available when Sounds are being sorted alphabetically.

FILTER opens a list where Sounds can be arranged according to tags. Select and deselect tags by pressing **[YES/SAVE]**. Multiple tags can be selected. Exit the tag list by pressing **[NO/RELOAD]**.

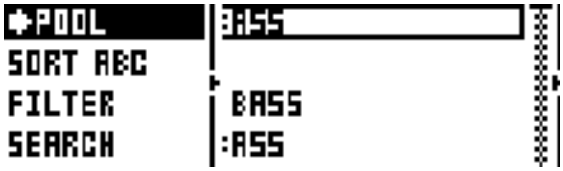
SEARCH will perform a text search and list all Sounds with names matching or including the text. See “THE NAMING MENU” on page 10 on how to enter text.

- **The SOUND BROWSER can be accessed directly by pressing or turning the *SOUND SELECTION* wheel. Turn the wheel to select the Sound of your choice, then press the wheel to load. SOUND BROWSER can also be instantly accessed by double-pressing [TRACK] key 1, 2, 3 or 4.**

SOUND MANAGER can be regarded as a more powerful version of the SOUND BROWSER. Here Sounds can be saved, loaded, tagged et cetera. Opening the menu will show a list of all Sounds residing in either the +Drive Sound library or the Sound pool. Scroll the list by turning the ***SOUND SELECTION*** wheel or by pressing **[UP]**/ **[DOWN]**.



Pressing **[LEFT]** will access the SORTING menu. The available commands are the same as those found in the SORTING menu of the SOUND BROWSER. Read more about the SORTING menu on page 25.



Pressing **[RIGHT]** will access the SOUND OPERATIONS menu. The available operations will affect the currently highlighted Sound. Press **[YES/SAVE]** to apply the commands to the selected Sound. Press **[NO/ RELOAD]** or the **[LEFT]** arrow key to exit the menu.



LOAD TO TRACK loads the selected Sound to the active track and makes it a part of the active kit.

COPY TO POOL copies the selected Sounds to the first free slots of the active project Sound pool. This command is only available when browsing the +Drive Sound library.

COPY TO +DRIVE copies the selected Sounds to the first free slots of the +Drive Sound library. This command is only available when browsing the Sound pool of the active project.

STORE TRACK SOUND saves the active track Sound to the selected slot. **[YES/SAVE]** + **[SOUND]** offers a short cut to this operation.

RENAME will rename the selected Sound.

EDIT TAGS opens a menu where Sounds can be tagged. Sounds can have any number of tags, but only the first two will be shown in the Sound list. Apply or remove tags by pressing **[YES/SAVE]**.

DELETE will delete the Sound.

TOGGLE will enable or disable write protection for the selected Sounds. When a Sound is write protected it cannot be overwritten, renamed, tagged or deleted.

SEND SYSEX sends the selected Sounds as SysEx data.

SELECT ALL selects all Sounds in the list.

DESELECT ALL deselects all Sounds in the list.

- **Sounds residing in the +Drive Sound library are organized into 16 banks, ranging from A to P. Each bank can contain 256 Sounds. Use the [TRIG] keys to view only Sounds located in a specific bank.**
- **You can preview the currently selected Sound with the *KEYBOARD* or via the MIDI auto-channel. The Sound will be played through the active track. Please note that if the previewed Sound is routed through the effects, the current effects settings will affect it.**
- **Several Sounds can be simultaneously affected by the commands available in the SOUND OPERATIONS menu. Select/deselect individual Sounds by highlighting them and pressing [YES/SAVE].**
- **Press [FUNCTION] + [UP]/[DOWN] for faster scrolling in the Sound list.**

CLEAR TRACK SOUND will set the PARAMETER page parameters of the active track to their default values. When selecting this option a prompt will appear. Press **[YES/SAVE]** to initialize the parameters or **[NO/RELOAD]** to cancel the operation. Note that no parameter information will be permanently lost until the kit is saved to the same slot it was loaded from.

RENAME TRACK SOUND opens a NAMING menu where the Sound of the active track can be renamed.

SOUND SETTINGS opens a menu where various Sound related settings are found. Use the **[UP]**/**[DOWN]** arrow keys or the ***SOUND SELECTION*** wheel to scroll in the menu. Use the **[LEFT]**/**[RIGHT]** arrow keys to change the settings. The parameters assignable to the controllers (modulation wheel, breath controller et cetera) will vary according to the type of track that is active: Synth, FX or CV.



OSCILLATOR DRIFT will when activated introduce a very subtle pitch drift to the oscillators, which can increase their perceived “warmth”.

F1 RESONANCE BOOST increases the amount of resonance from the first filter. Affects resonance and gain of both upper and lower frequencies.

- **F1 RESONANCE BOOST will introduce more resonant overtones into the overdrive. Very handy when you want your machine to howl, but be careful! It may cause peaks that can harm your ears if played at a high volume.**

LEGATO MODE can turned either off or on. When the mode is activated, envelopes will not be retrigged for overlapping notes played manually on the ***KEYBOARD*** or on incoming MIDI notes trigging Sounds. Note that notes on the sequencer are not affected.

PORTAMENTO will when active make the pitch slide between notes. The settings only affect notes played manually on the ***KEYBOARD*** or incoming MIDI notes trigging Sounds. Notes on the sequencer will not be affected. For sliding sequencer notes, the NOTE SLIDE menu, covered on page 43, is used.

- OFF turns portamento off. No played notes will be affected.
- ON turns portamento on. All played notes will be affected.

• LEGATO activates portamento for overlapping notes only. **LEGATO MODE** needs to be activated for this setting to function.

VELOCITY TO VOL selects how MIDI velocity will affect volume when playing the Sound on the Analog Keys ***KEYBOARD*** or on an external MIDI keyboard.

• OFF means velocity will not affect the volume of the Sound.

• LOG will apply a logarithmic velocity curve. The volume difference will be greater between softer keyboard presses than between harder.

• LIN will apply a linear velocity curve. The volume difference between keyboard presses will correspond linearly to the force applied.

• EXP will apply a exponential velocity curve. The volume difference will be greater between harder keyboard presses than between softer.

VELOCITY MOD gives access to a menu where up to 5 PARAMETER page parameters can be assigned to the velocity parameter. Both the **VEL** parameter of the NOTE menu and the velocity of incoming MIDI notes sent to Analog Keys from external devices will affect the assigned parameters. Open the menu by pressing **[YES/SAVE]**. Setting up the parameters works in the same way as setting up performance macros, covered on page 19.

PITCH BEND gives access to a menu where up to 5 PARAMETER page parameters can be assigned to the MIDI pitch bend command. If MIDI pitch bend messages are sent to Analog Keys from an external device, these messages will affect the parameters assigned in this menu. Open the menu by pressing **[YES/SAVE]**. Setting up the parameters works in the same way as setting up performance macros, covered on page 19.

MODULATION WHEEL gives access to a menu where up to 5 PARAMETER page parameters can be assigned to the MIDI mod wheel command (CC #1). Open the menu by pressing **[YES/SAVE]**. Setting up the parameters works in the same way as setting up performance macros, covered on page 19.

BREATH CONTROLLER gives access to a menu where up to 5 PARAMETER page parameters can be assigned to the MIDI breath controller command (CC #2). Open the menu by pressing **[YES/SAVE]**. Setting up the parameters works in the same way as setting up performance macros, covered on page 19.

AFTERTOUCH gives access to a menu where up to 5 PARAMETER page parameters can be assigned to the ***KEYBOARD*** or external MIDI keyboard aftertouch command. Open the menu by pressing **[YES/SAVE]**. Setting up the parameters works in the same way as setting up performance macros, covered on page 19.



- **Copy, clear and paste operations are available in the LOAD TRACK SOUND and SAVE TRACK SOUND menus.**
- **Use the *SOUND SELECTION* wheel to increase scrolling speed in the LOAD TRACK SOUND and SAVE TRACK SOUND menus.**
- **When in the LOAD TRACK SOUND and SAVE TRACK SOUND menus, Sounds being Sound locked are indicated by a little sequencer step icon at the end of the name of the Sound. Be careful overwriting a locked Sound, as it will change the sound of the pattern containing the Sound lock. Read more about Sound locks on page 40.**

PLAYING A SOUND

Play a Sound with the Analog Keys ***KEYBOARD***. Select the Sound to be played by pressing **[TRACK]** keys 1-4. The information in the LCD showing which kit is loaded will briefly change to reflect the name of the loaded Sound.

The ***KEYBOARD*** key range spans three octaves and one note. The first and last keys of the ***KEYBOARD*** play, by default, a C note. To change octave, press the **[OCTAVE UP]** or **[OCTAVE DOWN]** keys. The <OCTAVE> LEDs indicate which octave is selected. The range spans ten octaves, from -5 to 5.

Sounds can be played back in portamento or legato modes. Settings controlling this are found in the SOUND menu, covered on page 25.



- **When selecting the FX track, the <TRACK LED> of previously active track will become half-bright. This indicates that the *KEYBOARD* keys still trig notes on this track. This allows hearing how effect parameter changes will affect the previously active track. Press [TRACK] key 5 again to make the FX track completely active. The *KEYBOARD* keys will then control the FX track.**

PLAYING A SOUND WITH AN EXTERNAL MIDI KEYBOARD

Besides using the ***KEYBOARD,*** the synth voices are also possible to play with an external MIDI keyboard connected to Analog Keys. Which MIDI tracks the voices respond to are set up in the MIDI CHANNELS menu, covered on page 52.

EDITING A SOUND

To edit a Sound, first select one of the synth tracks by pressing **[TRACK]** keys 1-4. The Sound of the active synth track is the one that will be edited.

The overall volume level of the active track is adjusted with the ***LEVEL*** knob. In the PERFORMANCE MIXER menu, all track levels are visible at the same time and can be edited using the ***DATA ENTRY*** knobs. Read more on page 20.

Sounds are edited by adjusting the parameters found on the synth track PARAMETER pages. Access these pages by pressing the **[PARAMETER]** page keys. If a page contains a subpage, press the **[PARAMETER]** page key again to access it. Use the ***DATA ENTRY*** knobs to change the parameters.

Six different PARAMETER pages exist. For a complete description of the functions of the parameters, please see “Appendix A: SYNTH TRACK PARAMETERS“.

OSC1 controls oscillator 1. Contains one sub page for the noise generator.

OSC2 controls oscillator 2. The sub page hosts parameters relevant for both oscillators.

FILTERS controls the two filters and the overdrive. One 24 dB/octave 4-pole lowpass ladder filter and one 2-pole multimode filter are available, connected in series with the overdrive between them.

AMP contains parameters for the amplitude envelope. Effect sends are found here as well.

ENV offers two freely assignable envelopes. The first one also controls the filters. The second envelope is located in a subpage.

LFO is where parameters for the two freely assignable LFOs are found. Contains one subpage.

EDITING THE FX AND CV TRACKS

Editing the FX and CV tracks is very similar to editing the Sounds of the synth tracks. The PARAMETER pages contain parameters relevant for the two types of tracks. For complete explanations of the parameters for the FX and CV tracks, please see "Appendix B: FX TRACK PARAMETERS" and "Appendix C: CV TRACK PARAMETERS" respectively.



- **FX and CV track parameter settings are only saved as part of a kit.**

THE FX TRACK

The FX track controls Analog Keys internal send effects. To edit the FX track, press the **[TRACK]** key 5. Five PARAMETER pages exist for the FX track:

EXT IN contains parameters relating to the external inputs.

CHORUS controls the Wideshift Chorus effect.

DELAY controls the Saturator Delay effect.

REVERB controls the Supervoid Reverb effect.

LFO contains parameters for the two LFOs that can modulate the FX track parameters.

THE CV TRACK

The CV track is used for controlling external equipment capable of receiving CV/Gate signals. To edit the CV track, press **[TRACK]** key 6. A CV track contains six PARAMETER pages:

CV A controls the signal sent from the CV A output.

CV B controls the signal sent from the CV B output.

CV C controls the signal sent from the CV C output.

CV D controls the signal sent from the CV D output.

ENV offers two freely assignable envelopes which can be used to control the CV track parameters.

LFO offers two freely assignable LFOs which can be used to control the CV track parameters.

TRACK MUTING

Mute tracks by pressing **[FUNCTION]** + the **[TRACK]** key of the track you want to mute. Only the note trigs of the sequencer are muted. It is still possible to play a muted track manually using the ***KEYBOARD***. When changing patterns, the same track mutes will be present in the next pattern as well.

The <TRACK> LEDs indicate the mute status. Unlit <TRACK> LEDs indicate the muted tracks. Green <TRACK> LEDs indicate audible tracks. A red <TRACK> LED indicates the active, audible track. A yellow <TRACK> LED indicates an active, muted track.



- **Track muting can be performed while in PERFORMANCE mode as well. Read more on in section "PERFORMANCE MUTE" on page 20.**
- **Tracks can also be muted in SONG and CHAIN mode. This sort of muting, called song muting, works differently compared to track muting, most notably because song mutes are pattern exclusive. See page 48 for more info.**

THE SEQUENCER

The sequencer of Analog Keys stores information in patterns. A pattern controls the playback of the synth, FX and CV tracks and various aspects of these tracks. Each of the 8 banks, ranging from A to H, can host 16 patterns, meaning 128 patterns are available. All adjustments made to the patterns are automatically saved. Changes made to the active pattern can however be reverted. Read more in “PATTERN MENU” on page 34. A pattern contains:

- **Note trigs for all tracks.**
- **Trigless locks for all tracks.**
- **Parameter locks.**
- **Trig mutes.**
- **Accent trigs.**
- **Note and parameter slide trigs.**
- **Swing trigs.**
- **ARP and NOTE menu parameter settings.**
- **Information about which kit is linked to the pattern.**
- **Length and time signature for the tracks.**

BASIC PATTERN OPERATIONS

Analog Keys can seamlessly switch between patterns. This, plus the ability to chain patterns, are handy features when for example making live improvisations.

SELECTING A PATTERN

Press the **[BANK GROUP]** key to choose the bank group from which a pattern will be selected. If for example bank group A-D is chosen, patterns in banks A, B, C and D can be selected. Next, press a **[BANK]** key followed by a **[TRIG]** key to select a pattern within the selected bank. To select for example pattern B05, select bank group A-D using the **[BANK GROUP]** key. Then press and hold **[BANK B/F]** and press **[TRIG]** key 5.

Patterns containing data are indicated by half-bright red <TRIG> LEDs. The currently active pattern is indicated by a full-bright red <TRIG> LED. When selecting a pattern containing no data, the kit of the previous pattern will be used.

When a pattern is playing and a new pattern is selected, the new pattern position will blink on top of the graphics indicating the position of the current pattern.



- **Pattern selection can be made using only one hand. After a [BANK] key has been pressed, a window will appear for a short while, stating “CHOOSE PTN”. If a [TRIG] key is pressed while this window is visible, a pattern will be selected.**
- **Patterns can be changed while the sequencer is running.**
- **Patterns can be changed and queued by sending program change messages.**
- **After having selected a pattern, and before releasing any key, [REC], [PLAY] and [STOP] can be pressed to copy, clear or paste patterns. No new chain will be built, nor any pattern enqueued. It is possible to clear, copy or paste multiple patterns at the same time.**

PATTERN CONTROL

Pressing **[PLAY]** will start the playback of a pattern. Pressing **[STOP]** will stop the playback of all tracks. The sound will be cut off, but effects like the Saturator Delay will continue to be audible until the delay repeats have

faded out. When the sequencer is stopped, quickly pressing **[STOP]** + **[STOP]** will stop playback of all tracks and fade out the send effects.

When a pattern is playing and **[PLAY]** is pressed the playback will be paused. Press **[PLAY]** again to resume the playback.

If a pattern contains more than 16 sequencer steps, the <PATTERN PAGE> LEDs will indicate this. When a pattern is playing, the currently active pattern page is indicated by a blinking, full-bright, <PATTERN PAGE> LED.

TEMPO
Pattern tempo is global and will affect all patterns. Pattern tempo is set in the TEMPO menu. Press **[TEMPO]** to open it.



Use the ***SOUND SELECTION*** wheel to change the tempo setting. The **[UP]** and **[DOWN]** key changes the decimal part of the tempo. To tap a tempo setting, hold the **[FUNCTION]** key and tap the **[TEMPO]** key in a steady rhythm. After four consecutive taps the average tempo of the taps will be calculated. By continuing tapping, the average tempo will keep on updating.

The tempo can temporarily be shifted up or down by 10% by pressing the **[LEFT]** or **[RIGHT]** arrow keys. When the key is released the BPM will revert back to the original setting.

When in the TEMPO menu, holding **[FUNCTION]** while turning the ***SOUND SELECTION*** wheel will not change the tempo to the selected value until the **[FUNCTION]** key is released.



- **Tempo shift is very handy when manually syncing Analog Keys to a turntable or an external sound source. Note that you do not need to be in the TEMPO menu to perform tempo shifting.**

PATTERN MODES

When changing patterns, different modes affecting the way the active pattern will be changed exist. Toggle between the PATTERN modes by pressing **[FUNCTION]** + **[BANK GROUP].** The <PATTERN MODE> LED indicates which mode is selected. Three PATTERN modes exist.

DIRECT START will immediately change patterns. The new pattern will start playing from the beginning. This mode is indicated by a red <PATTERN MODE> LED.

DIRECT JUMP will immediately change patterns. The new pattern will start playing from the position where the previous pattern left off. This mode is indicated by a green <PATTERN MODE> LED.

SEQUENTIAL will change patterns after the currently playing pattern reaches its end. This mode is the default mode. It indicated by an unlit <PATTERN MODE> LED.

EDITING A PATTERN

Analog Keys offers two main modes of inputting trigs when editing or creating a pattern, GRID RECORDING mode and LIVE RECORDING mode. In these modes, two types of trigs can be entered: note trigs and trigless locks.

TRIG TYPES

Two types of trigs exist, note trigs and trigless locks. Note trigs trig notes while trigless locks can be used to apply parameter locks without trigging notes. Note trigs are indicated by full-bright <TRIG> LEDs and trigless locks are indicated by half-bright <TRIG> LEDs. Read more about parameter locks in section “PARAMETER LOCKS” on page 39. The two types of trigs are entered differently depending on whether GRID or LIVE recording mode is active.

GRID RECORDING MODE

GRID RECORDING is a method of composing where trigs are added by using the **[TRIG]** keys.

Enter GRID RECORDING mode by pressing the **[REC]** key. A lit red <REC> LED indicates GRID RECORDING mode is active. Select the track to which you want to add trigs by pressing the relevant **[TRACK]** button. Place note trigs on the sequencer by pressing the **[TRIG]** keys. To add note values to trigs of the synth tracks, press and hold a **[TRIG]** key while pressing a key on the ***KEYBOARD***. To add a trigless lock, press **[FUNCTION]** and **[TRIG]**. Add micro timing to a note trig by pressing and holding the **[TRIG]** key while pressing **[LEFT]** or **[RIGHT]**. A micro timing pop up menu will appear, showing the note offset.

If the pattern contains more than 16 steps, switch to the pattern page you want to edit by pressing the **[PAGE]** key. The active pattern page is being indicated by a fully lit <PATTERN PAGE> LED.

Press **[PLAY]** to listen to the sequence.



- **All trigs of a track can be shifted forwards or backwards on the sequencer. While in GRID RECORDING mode, hold down [FUNCTION] while pressing the [LEFT] or [RIGHT] arrow keys to perform the trig shift.**
- **Preview a note trig, complete with its parameter locks, by pressing [TRIG] + a key on the *KEYBOARD*.**

LIVE RECORDING MODE

LIVE RECORDING mode is the second method of adding trigs to the tracks. In this recording mode, the ***KEYBOARD***, or an external MIDI keyboard connected to Analog Keys, can be played in real time to input trigs to the tracks. It is also possible to enter parameter locks in real time. Trigs input in LIVE RECORDING mode will be placed on the sequencer in a micro timed fashion, meaning the **µTM** parameter in the NOTES SETUP menu will be locked accordingly to more accurately reflect the input timing of the trigs. This makes LIVE RECORDING mode record note inputs in a more expressive and un-quantized way. Micro timed trigs can be quantized, which is done in the NOTES SETUP menu. Read more about the **µTM** parameter on page 36. Quantizing is covered on page 37.

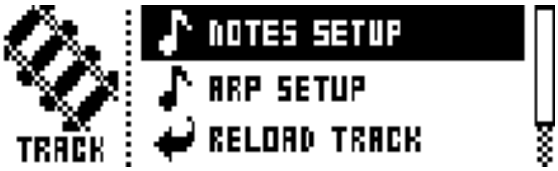
Hold **[RECORD]** and press **[PLAY]** to enter LIVE RECORDING mode. The sequencer will start to play and the <RECORD> LED will start to flash. You can now enter trigs to the active track in real time by pressing the keys on the ***KEYBOARD***. For the synth and CV tracks, note values according to the ***KEYBOARD*** key presses will be recorded. In order to activate quantization of the LIVE RECORDING, do as above but double-press **[PLAY]**.

To real time erase all trigs from a track, press and hold **[TRACK]** + **[NO/RELOAD]**. All trigs hit by the running LED of the sequencer will be erased from the active track. The trigs of more than one track can be removed by pressing several **[TRACK]** keys simultaneously.

To stop both the recording and the playback of the sequencer, press **[STOP]**. To exit LIVE RECORDING mode while keeping the sequencer playing, press **[PLAY]**. If LIVE RECORDING mode is active and **[REC]** is pressed, GRID RECORDING mode will be entered.

TRACK MENU

In this menu settings and options related to the active track are found. Open the menu by pressing the **[TRACK]** key. Navigate in the list using the **[UP]**/**[DOWN**] arrow keys or the ***SOUND SELECTION*** wheel. Select options by pressing **[YES]**. Change the track that the menu will affect by pressing the **[TRACK]** keys.



NOTES SETUP contains settings mainly relating to track quantization and scale. It is the same menu as accessed by pressing **[FUNCTION**] + **[NOTE]**. The NOTES SETUP menu is covered in section “NOTES SETUP” on page 37.

ARP SETUP contains settings for the track arpeggiators. It is the same menu as accessed by pressing **[FUNCTION]** + **[ARP].** The ARPEGGIATOR SETUP menu is covered on page 36.

RELOAD TRACK will reload the active track. Since tracks are a part of patterns which are automatically saved, it will either be reloaded to its original auto-saved state or to a specific saved state which can be determined by utilizing the **SAVE TRACK** command. Press **[NO/RELOAD]** + **[TRACK]** for a short cut to the **RELOAD TRACK** command.

SAVE TRACK will save changes made to the active track. This is a special feature available in addition to the general, automatic, saving of patterns which occurs when patterns are changed. The feature is useful in situations where an individual track is being worked on, the results are favorable and you want to keep on working with the track while having the ability to revert it to a specific saved state. The **SAVE TRACK** command makes this possible. When reloading the track, it will not be reloaded to its original, pattern auto-saved, state, but to the manually saved state. Press **[YES/SAVE]** + **[TRACK]** for a short cut to the **SAVE TRACK** command.

PATTERN MENU

In the PATTERN menu patterns can be saved and reloaded. Open the menu by pressing **[PATTERN]**. Select between the available commands by using the **[UP]**/**[DOWN]** arrow keys. Confirm selections with **[YES/SAVE]**.



RELOAD PATTERN will reload the active pattern. It will either be reloaded to its original auto-saved state or to a specific saved state which can be determined by utilizing the **SAVE PATTERN** command. Press **[NO/RELOAD]** + **[PATTERN]** for a short cut to the **RELOAD PATTERN** command.

SAVE PATTERN will save changes made to the active pattern. This is a special feature available in addition to the general, automatic, saving of patterns which occurs when patterns are changed. The feature is useful in situations where a pattern is being worked on, the results are favorable and you want to keep on working with the pattern while having the ability to revert to a specific saved state. The **SAVE PATTERN** command makes this possible. When reloading the pattern, it will not be reloaded to its original, auto-saved, state, but to the manually saved state. Press **[YES/SAVE]** + **[PATTERN]** for a short cut to the **SAVE PATTERN** command.

- **The RELOAD PATTERN command is great when improvising live. Any changes made to the active pattern, like adding bass line notes or similar, can immediately be undone.**

ARPEGGIATOR

The ARPEGGIATOR menu controls the six arpeggiators, one for each track. Arpeggiator settings are a part of the pattern, they are not stored together with kits. Select the track whose arpeggiator will be edited by pressing the relevant **[TRACK]** key. Open the ARPEGGIATOR menu by pressing **[ARP]**.



MOD activates the arpeggiator and controls how the arpeggiated notes will be cycled.

• OFF will deactivate the arpeggiator.

• TRU will play the notes in the same order as they were inserted.

• UP will play the notes in an ascending order, from the lowest note to the highest, on a per octave basis.

• DWN will play the notes in a descending order, from the highest note to the lowest, on a per octave basis.

• CYC will play the notes first in an ascending order, then in an descending order.

• SHF will play the notes randomly on an octave range basis. If the arpeggio for example has a **RNG** setting of 2, the notes of the first octave range will be played randomly and once all notes have been played, all the notes of the second octave will be played in a new random order.

• RND will randomize the playback of the arpeggiated notes.

• PLY will arpeggiate a complete chord (POLYPHONY must be activated, see page 21) in the same way an individual note is arpeggiated in TRU mode.

SPD sets the speed of the arpeggiator. It is synchronized to the BPM of the project. A setting of 6 equals 16th notes, a setting of 12 equals 8th notes and so on.

RNG sets the octave range of the arpeggiator. After each finished arpeggiator cycle the arpeggiated notes will be transposed one octave up. When the notes has reached the octave offset specified by the **RNG** setting the notes will be reset to their inital values. From there the octave transpose will be started all over again.

LEG controls the legato of the arpeggiator. This setting will affect the note trigs of the track even if the **MOD** setting is set to OFF.

• ON will play overlapping notes legato, releasing the old note after the new one. The NLEN setting adjusts the length of the notes when the arpeggiator is activated. If not activated the LEN setting will adjust the length of the notes.

• OFF will send out a MIDI note off message before the start of each arpeggiated note.

LEN controls the length of the arpeggiated notes.

NO2-NO4 selects the offset in semi-tones for three additional arpeggio notes. The offset is made from the original note trig. The **TRK KEY SCALE** and **TRK KEY NOTE** settings found in the NOTES SETUP menu will affect the note values of the arpeggiated notes.

- **Please note only the NO2-NO4 parameters can be parameter locked.**

ARPEGGIATOR SETUP

Pressing **[FUNCTION]** + **[ARP]** opens the ARPEGGIATOR SETUP menu. Here the arpeggiator length and note offsets are set.



Select the length of the arpeggio by turning ***DATA ENTRY*** knob ***E***. The max length is 16 sequencer steps. The <TRIG LEDS> indicate the length of the arpeggio and, when the arpeggio is playing, the number of played arpeggio notes.

Arpeggio note offsets can be inserted by pressing a **[TRIG]** key and turning ***DATA ENTRY*** knob ***J***. By pressing several **[TRIG]** keys simultaneously it is possible to adjust the note offsets of more than one step.

NOTE MENU

The NOTE menu controls general note settings for the active track. Open by pressing **[NOTE]**. NOTE menu settings are a part of the pattern, they are not stored together with kits.



The parameter settings seen in the NOTE menu settings are the default settings when placing trigs on the sequencer. Entering three note trigs, changing for example the note length parameter and then entering three more note trigs will thus make the last three note trigs share a different note length compared to the first three. To add individual settings per note, utilize parameter locks. Read more about this feature “PARAMETER LOCKS” on page 39. **µTM**, **ENV**, and **LFO** settings can only be changed when parameter locked.

NOT is the default note value.

VEL sets the velocity value. The higher the value, the higher the volume of the note. The default value is 100. Please note that this value will affect any VELOCITY MOD menu assignments. This menu is covered on page 28.

LEN sets the note length.

µTM controls the micro timing offset. A negative value will nudge the trig to a position before the quantized sequencer step, a positive after. Each micro timing value step is equal to one 1/384th of a note. When entering note trigs in the LIVE RECORDING mode, they will automatically be micro timed. Read more about this recording mode on page 33.

ENV controls whether the ENVF should be retrigged or not when a note trig or trigless lock is activated by the sequencer.

ENV controls whether the ENV2 should be retrigged or not when a note trig or trigless lock is activated by the sequencer.

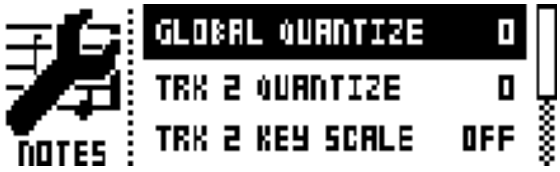
LFO controls whether the LFO1 should be retrigged or not when a note trig or trigless lock is activated by the sequencer.

LFO controls whether the LFO2 should be retrigged or not when a note trig or trigless lock is activated by the sequencer.

- **It is possible to real time record and real time erase NOT, VEL and LEN parameters. This is useful when for example inputting notes using an external MIDI keyboard sending MIDI velocity data. The same applies when entering notes using the mini-keyboard. In this case VEL changes will not be recorded though, as the mini-keyboard is not velocity sensitive. Read more about real time parameter lock record and erase on page 39.**
- **When real time erasing all locks by pressing [FUNCTION]+[NO/RELOAD], note parameters are not included.**

NOTES SETUP

In the NOTES SETUP menu, more settings relating to notes of the active track are found. Access the menu by pressing **[FUNCTION]** + **[NOTE]**. Navigate the menu using the **[UP]**/**[DOWN]** arrow keys or the ***SOUND SELECTION*** wheel. Change settings with the **[LEFT]**/**[RIGHT]** arrow keys.



GLOBAL QUANTIZE will affect all micro timed trigs of all tracks. The higher the quantize value, the more all micro timed trigs will be quantized.

TRK QUANTIZE will affect all micro timed trigs of the active track. The higher the quantize value, the more all micro timed trigs will be quantized.

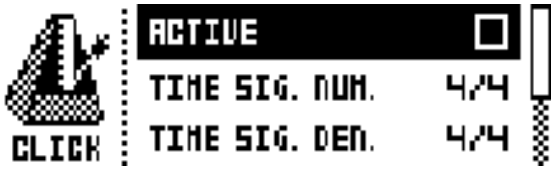
TRK KEY SCALE sets the key scale of the track. All notes on the sequencer track will be auto-adjusted to the selected scale. The setting is non-destructive, meaning if the setting is changed from for example MIN to OFF, the notes will start playing according to their original note values. This setting also affects how the track will be transposed when performing a transpose function. If for example MAJ is set, all notes of the track will be transposed according to a major scale. Read more about the transpose functionality on page 44.

TRK KEY NOTE sets the key note of the track. This setting affects how the track will be transposed when performing a transpose function. The transpose will be an offset from the key note.

TRK TRANSPOSABLE will when activated make the track transposable. If deactivated, the track can not be transposed, which can be a relevant setting for tracks containing drum sounds. A quick command for this setting exists. Press **[TRANSPOSE]** + **[TRACK]** to activate/deactivate the transpose functionality for a track. Read more about track transpose on page 44.

CLICK TRACK

The CLICK TRACK menu controls the internal metronome of Analog Keys. Open the menu by pressing **[FUNCTION]** + **[TRACK]**. Use the **[UP]**/**[DOWN]** arrow keys or the ***SOUND SELECTION*** wheel to scroll through the list of settings. Press **[LEFT]**/[**RIGHT]** to change the highlighted setting.



ACTIVE activates/deactivates the metronome. It is also possible to press **[FUNCTION]** and double-pressing **[TRACK]** to toggle the metronome on or off.

TIME SIG. NUM controls the note measure of the metronome time signature.

TIME SIG. DENOM controls the beat measure of the metronome.

PREROLL controls for how many bars the metronome will sound before the sequencer starts playing. This setting is only relevant when LIVE RECORDING mode is initiated.

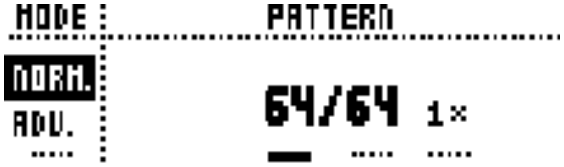
VOLUME controls the volume of the click.

SCALE MENU

Here the general length and timing of the active pattern is set. Two modes exist in the SCALE menu. In NORMAL mode all tracks share the same length. In ADVANCED mode each track can have different lengths. Access the SCALE SETUP menu by pressing **[FUNCTION]** + **[PAGE]**. Use the **[LEFT]** and **[RIGHT]** arrow keys to select between the available settings. Use the **[UP]** and **[DOWN]** keys to adjust the different settings and to select between the two modes. The ***SOUND SELECTION*** wheel can also be used to adjust the settings.

NORMAL MODE

This is the default mode. In this mode all tracks of the pattern share the same length and time signature. This screen will appear when the **NORMAL** setting is active.



The first two settings control the step length of the pattern. The leftmost number selects the number of steps in the pattern. The maximum number of steps available to the pattern is determined by the total length, set by the parameter to the right. This can be either 16, 32, 48 or 64 steps. If 17 steps or more are used in a pattern, the **[PAGE]** key is, while in GRID RECORDING mode, used to toggle between the different pattern pages.

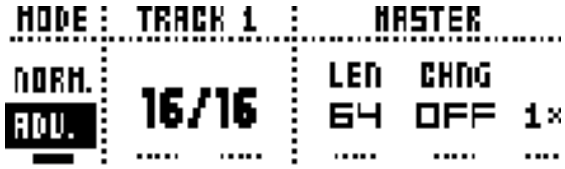
The rightmost parameter controls the time signature of the pattern. It offers seven possible settings, 1/8X, 1/4X, 1/2X, 3/4X, 1X, 3/2X and 2X. A setting of 1/8X will play back the pattern at one eighth of the set tempo. 3/4X plays the pattern back at three quarters of the tempo. 3/2X will play back the pattern twice as fast as the 3/4X setting. 2X will make the pattern play at twice the BPM.

- **Trigs are automatically copied when extending the length of a pattern. If a pattern consists of for example two pages and the pattern length is increased to four pages, the two added pattern pages will be copies of the first two pattern pages.**

- **Press the [PAGE] key for quickly changing the total length of the pattern. Press the [TRIG] keys to quickly change the number of steps of the pattern.**
- **A 2X time signature setting is useful for increasing the base resolution of the step sequencer to 32nd notes. A 3/4X setting is useful when Analog Keys is playing alongside other instruments set to the same BPM and you want Analog Keys to play triplets.**

ADVANCED MODE

In this mode the tracks of the pattern can be assigned individual lengths. Select ADVANCED mode by navigating to the SCALE column using the **[LEFT]** arrow key. Select **ADVANCED** by using the **[DOWN]** arrow key. In ADVANCED mode, two columns exist, TRACK and MASTER.



The TRACK column sets the step length of the track. It works just like setting the pattern length in NORMAL mode. The settings will only affect the active track. Press the **[TRACK]** keys to select the track whose scale settings will be edited.

The MASTER column is only available in ADVANCED mode. Here the master length, the master change length and the general time signature of the pattern are set.

LEN controls the amount of steps the pattern will play before all tracks are restarted. An INF setting will make the tracks of the pattern loop infinitely, without ever being restarted. Note that this setting also affects for how long the active pattern will play before a chained pattern will start playing. This can be overridden by the **CHNG** parameter.

CHNG controls for how long the active pattern will play before a cued or chained pattern will begin to play. This setting is important when for example **LEN** is set to INF. If no **CHNG** setting is made, the pattern will play infinitely and the next pattern will thus not be cued. But if **CHNG** for instance is set to 64, the pattern will behave like a pattern consisting of 64 steps in terms of cuing and chaining.

MASTER SCALE is the rightmost setting. It sets the general time signature of the pattern.



- **If INF is selected the active pattern will play infinitely, making it impossible to change to another pattern.**



- **Press [FUNCTION] + [UP]/[DOWN] to set the MASTER LENGTH in increments of 16.**

SEQUENCER FEATURES

PARAMETER LOCKS

Parameter lock is a powerful feature that allows trigs to have their own unique parameter values. The note trigs of a synth track can have, for example, different pitch or filter settings. All parameters found in the PARAMETER pages and the ARP and NOTE menus are possible to parameter lock and parameter locks can be applied to all types of tracks. Parameter locks can be removed by either performing a clear locks command, covered in section “COPY, PASTE AND CLEAR OPERATIONS” on page 44, or by simply removing the trig and entering it again.

To apply parameter locks in GRID RECORDING mode, press and hold the **[TRIG]** key of a trig. Adjust the parameters you want to lock using the ***DATA ENTRY*** knobs. The graphics in LCD will become inverted for the locked parameter and the locked parameter value will be displayed. The <TRIG> LED of the locked trig will begin to flash rapidly, indicating the trig now contains a parameter lock. Remove a single parameter lock by holding **[TRIG]** + pressing the ***DATA ENTRY*** knob of the locked parameter. By removing a note trig and entering it again, all parameter locks will be erased from the trig.

In LIVE RECORDING mode, turning a ***DATA ENTRY*** knob will input parameter locks to the active track. Note trigs will be locked accordingly and trigless locks containing the locks will be placed on the sequencer steps not containing note trigs.

To remove the parameter locks of all tracks while LIVE RECORDING mode is active, press and hold **[FUNCTION]** + **[NO/RELOAD]**. Sound locks will however not be erased. Remove specific parameter locks in real time by pressing **[NO/RELOAD]** while pressing the ***DATA ENTRY*** knob corresponding to the parameter that will be removed.



- **Up to 128 different parameters can be locked in a pattern. A parameter counts as one (1) locked parameter no matter how many trigs that lock it. If for example the cutoff parameter of the ladder filter of synth track 1 is locked on every sequencer step, there are still 127 other parameters that can be locked.**

SOUND LOCKS

All Sounds residing in the Sound pool of the active project can be changed per sequencer step, which is an immensely useful feature for adding variations to a track. Press and hold a note trig and turn the ***SOUND SELECTION*** wheel. The Sound pool list will appear. Scroll the list using the ***SOUND SELECTION*** wheel, select the Sound you want to assign to the note trig and then release the **[TRIG]** key. The <TRIG> LED will start to flash. Pressing and holding the **[TRIG]** key of the note trig will show the assigned Sound.



- **The first position in the Sound pool list, titled TRACK SOUND, is the default selection. It will play the track Sound belonging to the active kit.**

CONDITIONAL LOCKS

On the NOTE page, there is a parameter called TRC (Trig Condition) with which a set of conditional rules can be applied to any trig, using a parameter lock. Each setting is a logical condition, which will determine whether or not the sequencer note will be triggered.



The sequencer needs to be in fill mode in order to activate the parameter locks called FILL (see below). Fill mode is activated, for one pattern cycle, by pressing **[YES]** + **[SCALE]**. It will become active when the pattern loops, and remain active until it loops again.

It is also possible to activate fill mode at any time, and for any duration, by pressing the **[SCALE]** key when the pattern is playing (GRID RECORDING mode must not be active). The fill mode will be active for as long as the key is being held down.

The following conditional rules may be set using the TRC parameter, ***DATA ENTRY*** knob ***E*** (on the NOTE page), when a parameter lock is applied to a trig:

FILL is only true (will activate the note trig) when fill mode is active.

$\overline{\text{FILL}}$ is true when FILL is not.

PRE is true if the most recently evaluated note condition on the same track was true.

$\overline{\text{PRE}}$ is true when PRE is not.

NEI is true if the most recently evaluated note condition on the neighbour track (the track above the one being edited) was true.

$\overline{\text{NEI}}$ is true when NEI is not.

1ST is true the first pattern cycle (until the pattern has looped).

$\overline{\text{1ST}}$ is true when 1ST is not.

X% is a probability condition. There is an x% chance of it being true.

A:B will be true on the A:th pattern iteration, then true again after B iterations, repeating indefinitely.



- **Conditional parameter locks are a great way to add variety to a pattern. To set up a grid of mutually exclusive or conclusive note trigs across any of the synth tracks, and throwing some probability locks in there as well (perhaps, in turn, also sporting an array of logically conditioned trigs) is a neat way to make the most minimal of compositions come alive with fugal unexpectedness.**
- **Note that random or arbitrary variety, while fun and interesting, is not the only way of using conditional trigs. They may also be used, for example, to have two different melodic or percussive sequences on the same track, one of which is activated only when fill mode is active.**

TRIG MUTE

The TRIG MUTE menu makes it possible to add mute masks on a per trig basis. Each track can have its own trig mute trigs. Open the menu by pressing **[FUNCTION]** + **[BANK A/E]**.



Select the track to which you want to add trig mute trigs by pressing the corresponding **[TRACK]** key. While in the TRIG MUTE menu, entered trigs will mute any trigs placed of the active track, given the trigs are located on the same sequencer steps.

- **Trig mutes can be quickly added to note trigs or trigless locks. Keep the note trig or trigless lock pressed and press [BANK A/E]. A trig mute trig will automatically be placed on the same sequencer step as the note trig/trigless lock.**
- **Press a note trig/trigless lock to quickly see if a trig mute trig is placed on the same sequencer step as the trig. If that is the case, the <BANK A/E> LED will light up.**
- **Trig mutes are good for experimenting with the feel of tracks when playing live. The last eight steps of a bass line track could for example be muted to build suspense.**

ACCENT

Adding accent trigs is useful for quickly changing the volume and filter envelope behavior, or accentuation, for chosen steps of a track. Accent level is a destination for modulation, which means it can be affected by, for example, LFOs. Open the ACCENT menu by pressing **[FUNCTION]** + **[BANK B/F]**.



Select the track that will be affected by pressing the corresponding **[TRACK]** key. Select the accent value by turning the ***SOUND SELECTION*** wheel. The higher the value, the more accentuation will be added to accent trigs.

While the ACCENT menu is open, the sequencer will display accent trigs. Place or remove accent trigs by pressing the **[TRIG]** keys. If an accent trig is placed on the same sequencer step as a note trig, the note trig will be accentuated.

- **A note trig can be quickly accented. Keep the note trig pressed and press [BANK B/F]. An accent trig will automatically be placed on the same sequencer step as the note trig.**
- **Press a note trig/trigless lock to quickly see if an accent trig is placed on the same sequencer step as the trig. If that is the case, the <BANK B/F> LED will light up.**

NOTE SLIDE

The NOTE SLIDE menu makes it possible for the pitch of two separate note trigs to slide between each other. Open the menu by pressing **[FUNCTION]** + **[BANK C/G]**. When this menu is active and **[TRIG]** keys are pressed, note slide trigs will be placed on the sequencer.



If a note slide trig is placed on the same step as a note trig, the pitch of the previous note trig will slide. For instance, if a track contains two note trigs and a note slide trig is placed on the same step as the second note trig, the pitch of the first note trig will slide to the pitch of the second note trig. The speed of the pitch slide is determined by the **SLI** parameter, found in the second page of the OSC2 menu. Read more about this parameter in “Appendix A: SYNTH TRACK PARAMETERS“.



- **Note slides can be quickly added to note trigs. Keep the note trig pressed and press [BANK C/G]. A note slide trig will automatically be placed on the same sequencer step as the note trig.**
- **Press a note trig lock to quickly see if a note slide trig is placed on the same sequencer step as the trig. If that is the case, the <BANK C/G> LED will light up.**

PARAMETER SLIDE

The PARAMETER SLIDE menu makes it possible for the parameter values of two separate note trigs or trigless locks of a track to slide between each other. Open the menu by pressing **[FUNCTION]** + **[BANK D/H]**. When this menu is active and **[TRIG]** keys are pressed, slide trigs will be placed on the sequencer.



For a parameter value to slide between two trigs, it needs to be locked on one of the trigs. A locked parameter value will slide to the unlocked value and vice versa. To make the parameter value slide, place a slide trig on the same sequencer step as the trig whose parameters you want to slide. The speed of the slide is relative to the current tempo and the slide is completed when the next trig is reached. Several parameter values can slide at the same time.



- **Parameter slides can be quickly added to note trigs or trigless locks. Keep the note trig or trigless lock pressed and press [BANK D/H]. A parameter slide trig will automatically be placed on the same sequencer step as the note trig/trigless lock.**
- **Press a note trig/trigless lock to quickly see if a parameter slide trig is placed on the same sequencer step as the trig. If that is the case, the <BANK D/H> LED will light up.**

SWING
Sets the swing of the pattern, allowing for a different rhythmic groove. Access this menu by pressing **[FUNCTION**] + **[PATTERN]**.



TRACK TRANSPOSE
Tracks can be transposed up or down and the transpose function can be locked for one handed operation. The tracks that will be affected by the transpose functionality are set in the NOTES SETUP menu. Read more in section “NOTES SETUP” on page 37. A quick command for this also exists. Press **[TRANSPOSE]** + **[TRACK]** to activate or deactivate the transpose functionality for the tracks. When pressing and holding the **[TRANSPOSE]** key, lit <TRACK> LEDs indicate which tracks are transpose activated.

To transpose, press and hold **[TRANSPOSE]** and press a key on the ***KEYBOARD***. Select a different octave range to transpose to by pressing **[OCTAVE UP]** or **[OCTAVE DOWN]**. After having performed a transpose, a little pop-up window will show how many semitones the transpose consists of.

The notes of the tracks are transposed according the **TRK KEY NOTE** and **TRK KEY SCALE** settings, found in the NOTES SETUP menu covered on page 37. The transpose is an offset to the set key note, meaning all note trigs retain their original note values after having been transposed. If for example the key note is set to a C5 and F5 is pressed on the ***KEYBOARD***, the transpose activated tracks will be transposed +5 semitones.

The transpose offset can be applied permanently as well. After performing a transpose, press **[TRANSPOSE]** + **[YES/SAVE]**. The value of the transposed note trigs will be permanently altered.

If **[FUNCTION]** + **[TRANSPOSE]** are pressed, the transpose lock functionality will be activated. Transpose lock is indicated by a full-bright <TRANSPOSE> LED. When this function is activated, the **[TRANSPOSE]** key will act as if constantly pressed, enabling one-handed transpositions when pressing the ***KEYBOARD*** keys.



- **Please note that when transpose lock is activated, the *KEYBOARD* keys will not be able to play Sounds or set the note value of note trigs. They will only be used for transposing.**

DESTRUCTIVE TRANSPOSE
Tracks can be transposed destructively, altering the note values of the note trigs permanently. Do so by pressing **[TRACK]** + **[UP]/[DOWN]**. The value of the note trigs will be changed up or down in the selected amount of semitones. The tracks do not have to be transpose activated for this to work.

COPY, PASTE AND CLEAR OPERATIONS
Patterns, track pages, tracks and trigs can be copied, pasted and cleared.

The active pattern can be copied to either another location in the same bank or to a location in another bank. To perform a pattern copy operation, GRID RECORDING mode must not be active. Copy the pattern by pressing **[FUNCTION]** + **[REC]**. Select another pattern and paste the copied pattern to this location by pressing **[FUNCTION]** + **[STOP]**. The operation can be undone by pressing **[FUNCTION]** + **[STOP]** again. Clear a pattern by pressing **[FUNCTION]** + **[PLAY]**. Undo the operation by repeating the button presses.

After having selected a pattern, and before releasing any key, **[REC]**, **[PLAY]** and **[STOP]** can be pressed to copy, clear or paste patterns. No new chain will be built, nor any pattern enqueued. It is possible to clear, copy or paste multiple patterns at the same time.

Individual tracks can be copied, pasted and cleared in the same way as patterns. To do so, GRID RECORDING mode needs to be active.

A track page is one of the up to four pages of sequencer steps a pattern can consist of. It is similar to copy/paste/clear a track, but will only affect the active track page. GRID RECORDING mode needs to be active here as well. Select the track page that will be affected by pressing the **[PAGE]** key. Copy by pressing **[PAGE]** + **[REC]**. Select a new track page and press **[PAGE]** + **[STOP]** to paste. Undo by pressing **[PAGE]** + **[STOP]** again. Press **[PAGE]** + **[PLAY]** to clear the active track page. Undo the operation by repeating the button presses.

Copy the Sound of a synth track by pressing **[TRACK]** + **[REC]**. Select a new track to which the Sound will be pasted and press **[TRACK]** + **[STOP]** to paste.

Trigs, complete with all parameter lock settings, can be copied, pasted and cleared as well. GRID RECORDING mode needs to be active to access this functionality. Press and hold a trig and press **[REC]** to perform the copy operation. Paste by holding another **[TRIG]** key and pressing **[STOP]**. It is also possible to copy more than one trig. Hold several trigs and press **[REC]**. The trig first pressed will act as the starting point. When pasting, the other copied trigs will be placed in relation to this trig. Paste the copied sequence of trigs by holding another **[TRIG]** key and pressing **[STOP]**. Clear trig locks by holding one or more trigs and press **[PLAY]**.

QUICK SAVE AND RELOAD COMMANDS

Kits, Sounds, tracks, patterns and songs can instantly be saved and reloaded. When reloading, settings will revert to their saved state.

To quick save a kit, press **[YES/SAVE]** + **[KIT]**. This command is the same as the **SAVE KIT** command found in the KIT menu, covered on page 18.

To quick save the track Sound of the active track, press **[YES/SAVE]** + **[SOUND]**. This command is the same as the **STORE TRACK SOUND** command found in the SOUND MANAGER menu, covered on page 26.

To quick save a track, press **[YES/SAVE]** + **[TRACK]**. The operation is the same as the **SAVE TRACK** command, covered on page 45.

To quick save the active pattern, press **[YES/SAVE]** + **[PATTERN]**. The operation is the same as the **SAVE PATTERN** command, covered on page 34.

To quick save a song, press **[YES/SAVE]** + **[SONG]**. The command is the same as the **SAVE** command found in the SONG menu, covered on page 48.

To quick reload a kit, press **[NO/RELOAD]** + **[KIT]**. This command is the same as the **RELOAD KIT** command found in the KIT menu, covered on page 18.

To quick reload the track Sound of the active track, press **[NO/RELOAD]** + **[SOUND]**.

To quick reload a track, press **[NO/RELOAD]** + **[TRACK]**. The operation is the same as the **RELOAD TRACK** command, covered on page 45.

To quick reload the active pattern, press **[NO/RELOAD]** + **[PATTERN]**. The operation is the same as the **RELOAD PATTERN** command, covered on page 34.

To quick reload a song, press **[NO/RELOAD]** + **[SONG]**. The command is the same as the **RELOAD** command found in the SONG menu, covered on page 48.

CHAINS AND SONGS

Chains are sequences of several patterns. Chains and patterns are used to form songs.

256 pattern entries are available for the 64 chains, meaning for example one chain can be made of 256 patterns or two chains can be made of 128 patterns each. In most scenarios, 2-8 patterns per chain is sufficient.

One song is always active and being worked on. Songs contain two main forms of entries, song rows and a scratch pad row. The active song row is visible on the graphics located in the lower left part of the LCD. If a scratch pad row is active, the graphics will show "_ _:".

Each song row contains a chain or a pattern. These entries are saved together with the song. The scratch pad row also contains a chain or a pattern and is also saved as a part of the song. The intended use of the scratch pad row is for quickly experimenting with chains and patterns without affecting already programmed song rows.

CHAINS

If the active song row or scratch pad row contains a chain, all patterns of the chain will be played when activating the CHAIN mode by pressing **[CHAIN MODE]**. When deactivating the mode, and SONG mode is not active, the currently active pattern will be played over and over. The currently active pattern, and any other patterns in the chain, are visible in the lower left corner of the LCD screen. The active pattern is shown with inverted color.

Chains can be created even if CHAIN mode is deactivated. When creating chains this way, two methods exist: detailed chain mode and quick chain mode. Create chains according to detailed mode by pressing **[CHAIN MODE]** + **[LEFT]**/**[RIGHT]** to move the chain cursor. It can either be placed before a pattern, on a pattern, or after a pattern. If the cursor is placed before a pattern and a new pattern is selected by pressing **[BANK X/X]** + **[TRIG]**, the selected pattern will be inserted before the pattern located after the cursor. If the cursor is highlighting a pattern and a new pattern is selected, the highlighted pattern will be replaced. When activating CHAIN mode, the patterns in the chain will be played in sequence. The chain will be looped once the final pattern of the chain has played.

To create chains in quick mode, press and hold **[BANK X/X]** and then press the **[TRIG]** key for the pattern you want the chain to start with. As long as you keep the first **[TRIG]** key pressed, subsequent **[TRIG]** keys pressed will add patterns to the chain. In quick mode, it is only possible to chain patterns from the same bank. Please note that the previous chain will be erased when using quick mode. PATTERN mode must be set to SEQUENTIAL if you wish to create chains in quick mode.

Pressing **[CHAIN MODE]** + **[NO/RELOAD]** will, depending on the location of the chain cursor, either erase the pattern located before the cursor or the one highlighted by it.

Pressing **[CHAIN MODE]** + **[PLAY]** will clear the chain.

Pressing **[FUNCTION]** + **[CHAIN MODE]** will create a new, blank, scratch pad row "_ _:". The new scratch pad row will be moved down one step in the song row list, which can be seen when opening the SONG EDIT menu. The content of the previous scratch pad row will be added as a new song row. The position of the scratch pad row determines where the new song row is placed. See SONG EDIT MENU on how to relocate song rows (including the scratch pad row) within the song.



- **CHAIN mode is ideal when improvising live. When CHAIN mode is deactivated and only the currently active pattern is looping, create a chain and then activate CHAIN mode. At any time, exit CHAIN mode to loop one pattern only. Add and remove patterns to create a completely new chain and activate CHAIN mode again. By creating new chains through pressing [FUNCTION] + [CHAIN MODE], improvised songs can quickly be created.**

SONGS

Songs are essentially patterns and chains structured to form a long sequence. To enter SONG mode, press the **[SONG MODE]** key. The <SONG> LED will light up, indicating SONG mode is active. The active song will start to play, row by row. If the active song row is the scratch pad row, song row 00 will be played afterwards, given that the song has been programmed in SONG EDIT and that the scratch pad row has not been moved within the song. The currently playing song row is indicated in the lower left corner of the LCD screen.

SONG EDIT MENU

Songs are created in the SONG EDIT menu, which is accessed by pressing **[FUNCTION]** + **[SONG MODE]**.



Songs are played row by row, starting from the top and moving towards the bottom. If a song row contains a chain, all patterns in the chain will play before the song play position moves to the next row. The song play position is indicated by inverted pattern number graphics. In the top right corner of the LCD screen the BPM and the amount of played bars and beats is shown.

To navigate between song rows as well as patterns assigned to the song rows, use the **[ARROW]** keys. When the song cursor highlights a pattern position, the pattern number becomes enclosed by a square. When the song cursor is placed before or after a pattern, it will form a thin line.

To start playing a Song from the beginning, double-press **[STOP]**. The song play position will automatically be moved to the first pattern of the first song row, which normally is the scratch pad row. Songs can however start playing from any pattern position. Highlight a pattern position by moving the song cursor using the **[ARROW]** keys. Press **[YES/SAVE]** to select this position. The graphics will become inverted, indicating this is the song play position. Press **[PLAY]** to start playing the Song from this position.



- **Copy, paste and clear commands can be executed on the song rows.**

ADDING SONG ROWS AND ASSIGNING PATTERNS AND CHAINS

Press **[FUNCTION]** + **[YES/SAVE]** to add a song row. The new song row will be inserted below the row on which the cursor is, and the pattern A01 will automatically be assigned to the new row. To assign another pattern to the song row, use the **[ARROW]** keys to move the song cursor so the pattern assigned to the row becomes highlighted and then press a **[BANK X/X]** key + a **[TRIG]** key. In general, the pattern assigning procedure is the same as when selecting a pattern, covered in the section “SELECTING A PATTERN” on page 31.

To add a chain to a song row, select a song row and press the **[RIGHT]** arrow key. The song cursor will move from the pattern position and form a thin, standing line. Press a **[BANK X/X]** key + a **[TRIG]** key to select the pattern that will be added to the chain.

Remove a pattern in a chain by highlighting it with the song cursor and pressing **[FUNCTION]** + **[NO/RELOAD]**.

If a song row contains a chain, individual patterns can be rearranged in the chain. Select the pattern by highlighting it with the song cursor and press **[FUNCTION]** + **[LEFT]**/**[RIGHT]**.

Move a song row up or down in the song by moving the song cursor to the song row and pressing **[FUNCTION]** + **[UP]**/**[DOWN]**. Note that the scratch pad row “_ _:” can be moved up or down in the list in the same way. The position of the scratch pad row is important, because it determines where the new song row will be located, when a new chain (and a new scratch pad row) is created outside of the SONG EDIT menu. The new song row will be inserted above the new scratch pad row, and it will have the same number as the song row below the previous scratch pad row.

Erase an entire song row, one pattern at a time, by repeatedly pressing **[FUNCTION]** + **[NO/RELOAD]**.

ADDING REPEATS, MUTES AND TRANSPOSE INFORMATION

Various extra information can be entered for song rows and pattern or patterns assigned to the song rows.

Repeat a song row with a chosen factor by moving to the leftmost position of the song row. Turn ***DATA ENTRY*** knob ***A*** to select how many times the song row will be repeated.

Add song mutes to a pattern by highlighting it and pressing **[FUNCTION]** + **[TRACK]**. The mute graphics to the right in the LCD screen shows which tracks have been muted. Tracks muted from a song are also indicated by half-bright <TRACK> LEDs. Unlike track mutes, song mutes are pattern specific. Different patterns can have different song muted tracks. When not in SONG EDIT menu and song muted tracks are manually muted by pressing **[FUNCTION]** + **[TRACK]**, the <TRACK> LEDs will become unlit, i.e. track muted. The track mute method is covered on page 30. Adding song mutes when not in the SONG EDIT menu can also be achieved by pressing **[SONG MODE]** + **[TRACK]** or **[CHAIN MODE]** + **[TRACK]**.

Transpose a pattern by highlighting it with the song cursor and pressing **[TRANSPOSE]** + a ***KEYBOARD*** key. A song transpose works like a track transpose, albeit automated. The track transpose functionality is covered on page 44.

SONG MENU

In the SONG menu, songs can be saved, loaded renamed et cetera. Access the menu by pressing **[FUNCTION]** + **[SONG]**.



RELOAD will reload the active song. It will be restored to its saved version. Press **[NO/RELOAD]** + **[SONG]** for a short cut to this command.

LOAD will open a menu where saved songs can be loaded. The active song is indicated by inverted graphics.

SAVE will save the active song to one of the 16 song slots. The active song is indicated by inverted graphics. Press **[YES/SAVE]** + **[SONG]** for a short cut to this command.

CLEAR will clear the active song from all conten**t.**

EDIT will open the EDIT menu. It is the same menu as accessed by pressing **[FUNCTION]** + **[SONG MODE]**. See page 47 for more info about this menu.

RENAME will open a menu where the active song can be renamed.

GLOBAL MENU

The GLOBAL menu offers settings that affect Analog Keys on a global level. Global tune, MIDI and CV settings are made here. Up to four Global slots, where each can have individual settings, are available.

Access the menu by pressing **[FUNCTION]** + **[SONG]**. Scroll the list by using **[UP]**/**[DOWN]** or the ***SOUND SELECTION*** wheel. Open a highlighted menu by pressing **[YES/SAVE]**.



PROJECT

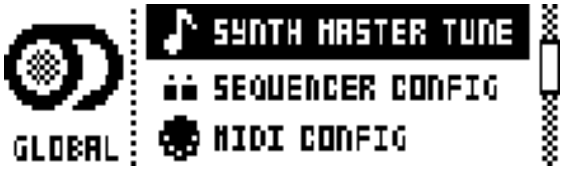
Manage projects here. This menu is covered in the section “PROJECTS” on page 15.

GLOBAL SLOT

Selects which of the four Global slots to use. Select the active slot by using the **[LEFT]**/**[RIGHT]** arrow keys. Press **[YES/SAVE]** to confirm the selection. All changes made to a Global slot are automatically saved. A slot stores the current configuration of the synth, sequencer, CV and MIDI settings. All changes made to a Global slot are automatically saved.

SYNTH MASTER TUNE

The Analog Keys master tune settings are found here.



SYNTH MASTER TUNE Sets the master tune for the analog oscillators. The default setting is the international standard middle A, 440.0 Hz. The tuning across all octaves is done according to the 12-TET convention.



SEQUENCER CONFIG

Sequencer settings are found here. Change settings by using the **[LEFT]**/**[RIGHT]** arrow keys.



QUANTIZE LIVE REC will when active quantize notes entered in LIVE RECORDING mode to complete sequencer steps. When the setting is deactivated, live recorded notes will where applicable be affected by micro timing. Read more about micro timing in the section “NOTE MENU” on page 36.

KIT RELOAD ON CHG will cause kits to reload to their saved state automatically as soon as a new kit becomes active. This is useful if you for example play live and have tweaked a kit, want to save it and then return to a pattern featuring the same kit, but with its original settings.

MIDI CONFIG

In this menu various sub-menus dealing with the MIDI functionality of Analog Keys are found.



MIDI SYNC

Controls how Analog Keys receives and sends MIDI clock and transport commands. Change settings by using the **[LEFT]**/**[RIGHT]** arrow keys.



CLOCK RECEIVE will when active make Analog Keys respond to MIDI clock sent from external devices.

CLOCK SEND will when active make Analog Keys transmit MIDI clock.

TRANSPORT RECEIVE will when active make Analog Keys respond to system realtime messages like play, stop, continue and song position pointer.

TRANSPORT SEND will when active make Analog Keys send out system realtime messages like play, stop, continue and song position pointer.

PRG CH RECEIVE will when active make Analog Keys respond to incoming program change messages, which is useful when wanting to select patterns externally. The MIDI channel that will listen to incoming program change messages is set in the MIDI CHANNELS menu, covered on page 52.

PRG CH SEND will when active send program change messages when patterns are changed. The MIDI channel that will send program change messages is set in the MIDI CHANNELS menu, covered on page 52.

MIDI PORT CONFIG

MIDI port related settings are found in this menu. Change settings by using the **[LEFT]**/**[RIGHT]** arrow keys.



TURBO SPEED selects the multiplier of the MIDI transfer rate that will be used when Analog Keys MIDI IN/OUT ports are connected to the MIDI OUT/IN ports of a turbo protocol compatible device. The **[LEFT]**/**[RIGHT]** arrow keys are used to select the multiplier. If AUTO is chosen, press **[YES/SAVE]** to start the turbo speed negotiation.

OUT PORT FUNCTIONALITY selects what type of signal the MIDI OUT port will send.

- MIDI makes it possible for the port to send out MIDI data.
- DIN 24 will make the port send DIN 24 sync messages. No MIDI data can be sent when this option is selected.
- DIN 48 will make the port send DIN 48 sync messages. No MIDI data can be sent when this option is selected.



- **On DIN 24/48 operation: When the [STOP] key is pressed twice quickly, the DIN sync outputs are put in a ready to start mode. In this mode, the synced unit will start directly when the sequencer starts. When in this mode, an external unit (for example a TB-303) cannot be programmed. Exit the ready to start mode by pressing [STOP] once.**

THRU PORT FUNCTIONALITY selects what type of signal the MIDI THRU port will send. The same settings as for **OUT PORT FUNCTIONALITY** exist.

INPUT FROM selects the source Analog Keys will receive MIDI data from.

- DISABLED will make Analog Keys disregard any incoming MIDI data.
- MIDI will make Analog Keys listen only to MIDI data sent to the MIDI IN port.
- USB will make Analog Keys listen only to MIDI data sent to the USB port.
- MIDI+USB will make Analog Keys listen to MIDI data sent to both the MIDI IN and USB ports.

OUTPUT TO selects the destination to which Analog Keys will send MIDI data.

- DISABLED will stop Analog Keys from sending out any MIDI data.
- MIDI will make Analog Keys send MIDI data to the MIDI OUT port only.
- USB will make Analog Keys send MIDI data to the USB port only.
- MIDI+USB will make Analog Keys send MIDI data to both the MIDI OUT and USB ports.



- **If MIDI+USB is selected in the INPUT FROM and/or OUTPUT TO settings, MIDI data transfers may limit the USB speed.**

OUTPUT CH selects whether the ***KEYBOARD*** and the knobs will send data on the auto channel or the MIDI channel of the selected track.

PARAM OUTPUT selects what type of MIDI messages the ***DATA ENTRY*** knobs will send. For information about which CC/NRPN parameters that will be sent, please see “Appendix D: MIDI“.

- NRPN will make the knobs send out NRPN MIDI messages.
- CC will make the knobs send out CC MIDI messages.

ENCODER DEST controls whether the ***DATA ENTRY*** and ***LEVEL*** knobs will send MIDI data or not. When set to INT, no MIDI data will be sent. When set to INT + EXT, MIDI will be sent internally as well as externally.

KEYBOARD DEST controls whether the keys of the ***KEYBOARD*** will send MIDI note data or not. When set to INT, no MIDI data will be sent. When set to INT + EXT, MIDI will be sent internally as well as externally. When set to EXT, MIDI will only be sent externally.

MUTE DEST controls whether track mute/unmute will send MIDI CC/NRPN messages or not. When set to INT, no MIDI data will be sent. When set to INT + EXT, messages will be sent internally as well as externally. When set to EXT, messages will only be sent externally.

RECEIVE NOTES will, when active, make it possible to play Analog Keys using an external MIDI keyboard.

RECEIVE CC/NRPN will when active make it possible to control Analog Keys parameters from an external MIDI device sending CC/NRPN data.

LIVE REC ON TRACK CHANNEL when the box is ticked, active LIVE RECORDING will record incoming MIDI notes on each of the specified track channels (see below). When unticked, LIVE RECORDING will not (but still record on the currently active track via the auto channel).

MIDI CHANNELS

This menu handles the MIDI channel configuration.



TRACK 1-4, FX, CV selects dedicated MIDI tracks that will control the synth, FX and CV tracks. An OFF setting will make the track disregard any incoming MIDI messages.

PERF CHANNEL selects the MIDI channel the knobs will send MIDI data on when PERFORMANCE mode is active.

AUTO CHANNEL selects the MIDI channel that will give access to the currently active track. If an external MIDI keyboard connected to Analog Keys sends MIDI data on this channel, the

keyboard will control the active track. This is useful when for example quickly changing between the active synth tracks to play different Sounds.

PROGRAM CHANGE IN CHANNEL selects the MIDI channel that will listen for incoming program change messages. An AUTO setting will use the AUTO channel. Enable Analog Keys to respond to program change messages in the MIDI SYNC menu, covered on page 50.

PROGRAM CHANGE OUT CHANNEL selects the MIDI channel that will send program change messages when changing patterns. An AUTO setting will use the AUTO channel. Enable Analog Keys to send program change messages in the MIDI SYNC menu, covered on page 50.

MULTI MAP EDIT

Opens an editor for mapping the functions of single notes or note ranges on the ***KEYBOARD*** or on an external MIDI keyboard. The functions that can be mapped include: Internal trigging of Sounds on any track, trigging of MIDI notes on any MIDI channel and the ability to trig patterns with custom transpose settings. Multi map allows custom mapped keyboards splits, custom pattern trigging per key, individual Sound trig per key, MIDI trig of external synths, and more. In the Multi map mode, for example, complete analog drum kits, bass lines, and lead sounds can be played simultaneously. Ideal for performances and live improvisations.

Additionally, the internal multi map trigs can be recorded with the Analog Keys sequencer. At most, one unique function may be mapped to each of the 128 keys of the entire MIDI keyboard range. One multi map setting is stored for each global slot, which means 4 different keyboard maps per project can be used.

Press **[FUNCTION]** + **[MULTI MAP]** to open the multi map editor instantly. To enable/disable the multi maps you have created (or the default keyboard split), press **[MULTI MAP]**.



ENTRIES are the basic building blocks of the multi map. They define what function will be assigned to each key or key range**.** Up to 128 entries may be created per multi map. If no entries exist, select **ENTRIES,** and then **CREATE NEW ENTRY.** If you wish to erase all entries to start anew, select **ENTRIES** and choose **CLEAR ALL ENTRIES.** If you wish to use the default multi map, a keyboard split, clear all entries and choose **CREATE SPLIT.** Select the entry to edit in the left part of the display by using the **[UP]/[DOWN]** arrow keys or the ***SOUND SELECTION*** wheel and press **[YES/SAVE].** The cursor will move to the right part of the display where the list of mapping alternatives is visible.

To edit a multi map entry, navigate by using the **[UP]/[DOWN]** arrow keys or the ***SOUND SELECTION*** wheel. Change the highlighted item in the list by pressing the **[LEFT]** or **[RIGHT]** arrow keys**.** Note that the map entries may be instantly tried by playing the specified range on the Analog Keys ***KEYBOARD*****.**



FUNCTION selects one of the four main types of functionality for the MIDI mapping.

• NONE sets a ***KEYBOARD*** or external MIDI keyboard key or range that will not be used for any function. Convenient for defining a 'no-play' zone on the keyboard between two or more sections with different Sounds or functions.

RANGE LOW sets the note on the keyboard on which to start the desired keyboard range.

RANGE HIGH sets the note on the keyboard on which to end the desired keyboard range.

DELETE ENTRY deletes the whole entry. Select and confirm by pressing **[YES/SAVE].**

INSERT BEFORE will create a new entry with a range ending on the note preceding the current entry. Select by pressing **[YES/SAVE]**.

INSERT AFTER will create a new entry with a range beginning on the note succeeding the current entry. Select by pressing **[YES/SAVE]**.

• PAT.PLAY maps a chosen pattern to a specific ***KEYBOARD*** or external MIDI keyboard key or range.

RANGE LOW sets the note on the keyboard on which to start the desired keyboard range.

RANGE HIGH sets the note on the keyboard on which to end the desired keyboard range.

PATTERN selects which pattern A01 - H16 of the active project will be played when pressing a keyboard key in the range specified above. Set to CUR if the current pattern is to be played.

PATTERN INC selects the increment with which the pattern will increase for each successive key press in the specified range. For example, if set to 1, each successive key will start pattern A01, A02, A03 and so on. Set to 2 it will play pattern A01, A03, A05 et cetera. Set to 0 if the same pattern as set in PATTERN above is to be played for every key in the range.

TRANSPOSE transposes the pattern up or down 1-36 octaves. No transpose if set to 0.

TRANSPOSE INC sets the increment by which the transpose will be increased for each step of the chosen keyboard range. No increase if set to 0.

CHG MODE sets the mode of starting the pattern. D.START starts the selected pattern directly from its first step. D.JUMP starts the selected pattern on the step following the current sequencer step. SEQ. starts the pattern from its first step once the current pattern has reached its final step.

DELETE ENTRY deletes the whole entry. Select and confirm by pressing **[YES/SAVE].**

INSERT BEFORE will create a new entry with a range ending on the note preceding the current entry. Select by pressing **[YES/SAVE]**.

INSERT AFTER will create a new entry with a range beginning on the note succeeding the current entry. Select by pressing **[YES/SAVE]**.

• INT.TRIG sets the chosen ***KEYBOARD*** or external MIDI keyboard key or range to control specific Sounds from the Sound pool or from the +Drive Sound library.

RANGE LOW sets the note on the keyboard on which to start the desired keyboard range.

RANGE HIGH sets the note on the keyboard on which to end the desired keyboard range. If a single key is to be mapped, set to the same note as RANGE LOW.

TRACK sets which track the selected keyboard range or key will play. AUTO will play the active track, while TRK 1, TRK 2, TRK 3, TRK 4, FX TRK and CV TRK sets the range to play the specific synth, FX or CV track of your choice.

NOTE sets which note the start of the chosen keyboard range will play. If no offset is desired, it should be set to the same note as RANGE LOW.

NOTE INC defines by what increment the subsequent notes played will increase. For instance, if this value is set to 2, and the first note in the range is C5, the following note in the range will play D5, the one after that E5 and so on. If set to 0, all notes in the keyboard range will play the same note (as set in NOTE above). If a 1:1 correspondence is desired, set to 1.

SOUND SLOT sets which one of the 128 Sounds, found in the Sound pool of the active project, the keyboard range will play. If set to OFF, the track Sound of the chosen TRACK above will be played.

SOUND INC sets by what increment the next key in the chosen keyboard range will play the next sound slot Sound. If set to 0, the same Sound as defined above will be played across the whole defined range. If set to 1, it will play the next successive sound slot Sound for each successive key pressed. Setting the value to 2 will play every other Sound starting from the sound slot, setting it to 4 every fourth and so on.

FIXED VEL will, if set to OFF, make the velocity sensitivity of the keyboard work as usual. It may also be set to a constant specific value between 1 and 127, 1 being the lowest and 127 the highest possible velocity.

DELETE ENTRY deletes the whole entry. Select and confirm by pressing **[YES/SAVE].**

INSERT BEFORE will create a new entry with a range ending on the note preceding the current entry. Select by pressing **[YES/SAVE]**.

INSERT AFTER will create a new entry with a range beginning on the note succeeding the current entry. Select by pressing **[YES/SAVE]**.

• EXT.TRIG allows MIDI control of external equipment for a chosen ***KEYBOARD*** or external MIDI keyboard key or range.

CHANNEL sets which specific MIDI channel on which the MIDI note messages are to be sent, or AUTO.

NOTE sets which note the start of the chosen keyboard range will play.

NOTE INC defines by what increment the subsequent notes played will increase.

FIXED VEL will, if set to OFF, make the velocity sensitivity of the MIDI keyboard work as usual. It may also be set to a constant specific value between 1 and 127.

DELETE ENTRY deletes the whole entry. Select and reconfirm by pressing **[YES/SAVE].**

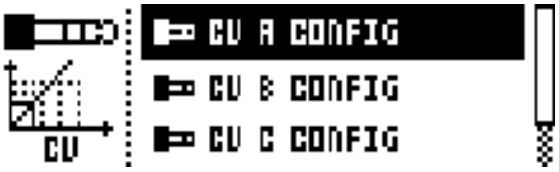
INSERT BEFORE will create a new entry with a range ending on the note preceding the current entry. Select by pressing **[YES/SAVE]**.

INSERT AFTER will create a new entry with a range beginning on the note succeeding the current entry. Select by pressing **[YES/SAVE]**.

- **In MULTI MAP EDIT, Setting a specific SOUND SLOT and setting SOUND INC to 1 is convenient if you wish to define, for example, a succession of drum sounds that you have stored in a given sound slot range to be mapped to a certain section of the keyboard. Instant access to those snares, kicks and hihats!**
- **If you intend to use your custom multi map with an external MIDI keyboard, remember to set the external MIDI keyboard to the assigned PERF CHANNEL (or change the performance channel in the MIDI CHANNEL menu to that of the MIDI keyboard)**

CV CONFIG

CV/Gate output signals are calibrated and set up in this menu.



CV A-D CONFIG

Each of the subpages are identical and one for each CV/Gate output exists. The list of available parameters in this menu will depend on the menu settings. When the CV Track is active, pressing **[FUNCTION]** + **[CV A-D]** is an alternate way of opening this menu for each corresponding CV/Gate output.



Please read the following paragraphs on how to set up CV pitch control. CV pitch is configured by finding the voltages generating two different notes from the synthesizer you wish to control. To get a good result you should select the notes two or three octaves apart.

Before configuring the pitch output you should setup a gate output so that notes can be triggered on the receiving end. You should also set up the gate and pitch parameters so that they use the same source track for triggering notes.



Select NOTE 1, it could for example be C3. Then highlight VOLTAGE 1 and press the **[YES/SAVE]** key. This will trigger a C3 note which is played for as long as you hold down the key. While keeping **[YES/SAVE]** pressed, adjust the voltage until the controlled synthesizer actually plays the note C3 using **[ARROW]** keys **[LEFT]/ [RIGHT]** or ***DATA ENTRY*** knob ***A***. If you don't have a tuning device, we recommend you play the corresponding note on one of the Analog Keys internal tracks and tune by ear.

Repeat the process for NOTE 2 and VOLTAGE 2, but choose, for example, C5 or C6. Finally play some random notes to see if they are in tune. If not, then you probably need to change from PITCH V/OCT to PITCH HZ/V, or vice versa.

TYPE selects the type of signal that will be sent from the output. GROUNDED, PITCH V/OCT, PITCH HZ/V, VALUE LIN, TRIG and GATE settings can be made. Depending on the selection, different parameters will be available.

- GROUNDED turns the CV output off. No additional parameters available.

- PITCH V/OCT should be chosen for controlling the pitch of equipment using the volt per octave standard, which applies to most analog synthesizers.

- PITCH HZ/V should be chosen for controlling the pitch of equipment using the herz per volt standard, which applies to for example older Korg and Yamaha synths.

- VALUE LIN is used to send out arbitrary control voltages, useful when for instance sequencing or parameter locking any voltage-controlled parameters on analog equipment.

  VALUE MIN sets the lowest allowed voltage level that can be sent from the CV/ Gate output.

  VALUE MAX sets the highest allowed voltage level that can be sent from the CV/Gate output. Normally it is not dangerous to connect voltages within +/- 15 V to analog equipment, but use these limitations if you are unsure.

- TRIG is used to send out short trig pulses at the start of note events.

  LENGTH selects the length of trig signals sent. Some equipment might not trig correctly on the shortest pulses, so try different lengths if you experience problems when trying to trig.

  POLARITY selects the polarity of trig signals sent. V-TRIG and S-TRIG options exist. V-trig (voltage trigger) is a trig pulse going from 0 V to a user-defined voltage level. S-TRIG (short circuit trigger) goes the other way, from a user-defined voltage level to 0 V. V-TRIG is the most common trig polarity. S-TRIG is primarily used by older Moog, Korg and Yamaha synths.

  LEVEL selects the level of trigs sent, measured in volts. The standard logic level of +5 V is enough to trig most equipment, but some might need higher voltages to react.

• GATE gives a longer pulse, with a duration of the whole note length.

POLARITY works as the same parameter available when **TYPE** is set to TRIG.

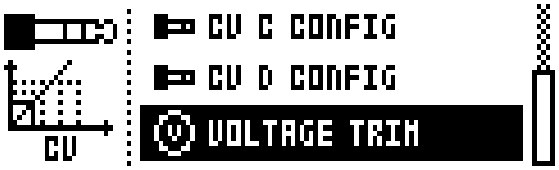
LEVEL works as the same parameter available when **TYPE** is set to TRIG.

• CLOCK will send periodical pulses with a period synced to the sequencer step length.

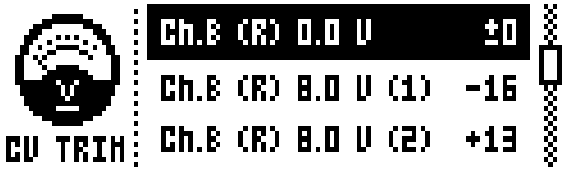
CLK sets the clock division of the pulse.

VOLTAGE TRIM

It is possible to trim the CV out voltage levels. These settings are stored in the machine without being connected to any specific Project. Adjusting these values is mainly useful if you wish to send pulses with very exact voltage levels, or to generate very specific voltages as a linear value and you believe that the factory trim is off.



Make sure you have a good voltmeter before proceeding. Connect a TRS cable to the output you want to trim. Connect the volt meter's negative terminal to the sleeve of the connector. Connect the positive terminal to either the tip or the ring of the connector, depending on the channel you wish to trim.

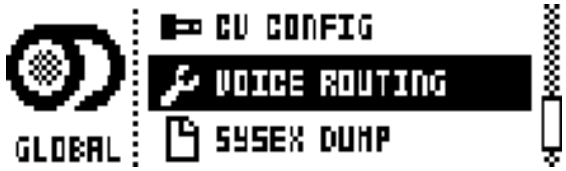


Each CV output has three trim settings. Begin by selecting 0 V, then press and hold the **[YES/SAVE]** key. 0 V is output as long as **[YES/SAVE]** is held down. Use **[ARROW]** keys **[LEFT]** / **[RIGHT]** or ***DATA ENTRY*** knob ***A*** to adjust the voltage until your voltmeter shows exactly 0 V. Repeat the process for both 8 V settings (the first one is for continuous voltage, the second is for pulse).

Note that adjusting the CV does not actually improve CV pitch control. If you have set up pitch control of an external synth properly then any linear error has already been compensated for by that calibration. In fact, you will have to reconfigure the CV pitch control after changing the values in the VOLTAGE TRIM Menu, because you will have changed the point of reference.

VOICE ROUTING

This menu item accesses the global routing of the four voices.



Activate/deactivate routing of any the four voices to the main output and to the FX track. Navigate using the **[ARROW]** keys. Tick or untick box with the **[YES/SAVE]** key.

Alternatively, instantly activate or deactivate voice to main or voice to FX using the **[TRIG]** keys 1-4 and 9-12, respectively. Red LEDs above these sets of keys will show if the voice is active (full-bright) or inactive (half-bright).



Note that voice routing can be set and stored for each individual kit, and that these settings override the GLOBAL voice routing unless they are set not to (see KIT MENU, page 18).

SYSEX DUMP

In the SYSEX DUMP menu, kits, Sounds, patterns, songs and global slots can be sent and received. Select a menu option using **[UP]**/**[DOWN]** or the ***SOUND SELECTION*** wheel. Press **[YES/SAVE]** to open the highlighted menu selection.



When receiving or sending SysEx data, the MIDI ports or the USB port of Analog Keys must be connected to the external sending/receiving device.

- **If Analog Keys is sending or receiving SysEx data through the MIDI ports, use the Elektron TM-1 USB MIDI interface for up to 10x transfer speeds.**
- **If the external device is a computer, we recommend using our free SysEx utility C6, which can be downloaded from the Elektron website.**

SYSEX SEND

Here kits, Sounds, patterns, songs and global slots can be sent to an external device via the MIDI OUT port or the USB port of Analog Keys.



The column to the left selects what will be backed up. Select the column using the **[LEFT]** arrow key. Use the **[UP]**/**[DOWN]** keys or the ***SOUND SELECTION*** wheel to scroll through the column. The SysEx data send alternatives located in the column to the right will change depending on the selection made in the left column. Press the **[RIGHT]** arrrow key to access this column. Use the **[UP]**/**[DOWN]** keys or the ***SOUND SELECTION*** wheel to select what will be sent. Press **[YES/SAVE]** to initiate the SysEx send procedure.

ALL offers the possibility to do complete backups of various data.

• WHOLE PROJECT will send all kits, Sounds, patterns, songs and global slots to the receiving device. I.e. the complete project.

• ALL KITS will send all kits to the receiving device.

• ALL PATTERNS will send all patterns to the receiving device.

• ALL SONGS will send all songs to the receiving device.

• ALL GLOBALS will send all global slots to the receiving device.

KIT will send the selected kit to the receiving device. An asterisk at the end of the kit name indicates the kit is not linked to any pattern.

SOUND will send the selected Sound to the receiving device.

PATTERN will send the selected pattern to the receiving device. To the right of the pattern slot, the name of the kit linked to the pattern is visible. An asterisk indicates the pattern is not linked to a kit.

PATTERN + KIT will send the send the selected pattern plus its associated kit to the receiving device.

SONG will send the selected Song to the receiving device.

GLOBAL will send the selected Global slot to the receiving device.

- **Backing up your data regularly is important!**
- **Before initiating a SysEx send, first make sure the receiving device is listening for data to be sent.**

SYSEX RECEIVE
Here kits, Sounds, patterns, songs and global slots can be received from an external device via the MIDI IN port or the USB port of Analog Keys.



The column to the left selects what will be received. Select the column using the **[LEFT]** arrow key. Use the **[UP]**/**[DOWN]** keys or the ***SOUND SELECTION*** wheel to scroll through the column. The SysEx data receive alternatives located in the column to the right will change depending on the selection made in the left column. Press the **[RIGHT]** arrrow key to access this column. Use the **[UP]**/**[DOWN]** keys or the ***SOUND SELECTION*** wheel to select what will be received. Press **[YES/SAVE]** to initiate the SysEx receive procedure. Analog Keys will start listening to incoming data. Press **[NO/RELOAD]** to stop listening.

ANYTHING will listen to and receive any viable SysEx data sent.

KIT

• ACTIVE KIT will when receiving kit SysEx data replace currently active kit with the received kit.

• KIT 01-128 will store a received kit to the selected kit slot. An asterisk at the end of the kit name indicates the kit is not linked to any pattern.

SOUND POOL will store a received Sound to the selected slot of the Sound Pool of the active project.

+DRIVE SOUND will store a received Sound to the selected slot of the +Drive Sound library. The option ANYWHERE will place the Sound in the first free slot available. To the right of the bank indication, the amount of free slots can be seen.

PATTERN will store a received pattern to the selected pattern slot. To the right of the pattern slot, the name of the kit linked to the pattern is visible. An asterisk indicates the pattern is not linked to a kit.

SONG will store a received song to the selected song slot.

GLOBAL will store a received global to the selected global slot.

- **Initiate the SysEx send from the sending device after Analog Keys has started listening to incoming data.**
- **When receiving to a specific list position, any subsequent data will be received on the next position, or positions, in the list.**
- **Analog Keys can receive SysEx data at any time, regardless of the currently active menu. The data will loaded into the position specified when it was saved, or the first free slot if unspecified.**

SYSTEM

Accesses the menus USB CONFIG, OS UPGRADE, FORMAT +DRIVE and CALIBRATION described below.

USB CONFIG

In order to use the Analog Keys as an Overbridge device (see “OVERBRIDGE” on page 11), you must set it to Overbridge mode. Do so by selecting the OVERBRIDGE MODE menu item and ticking the box by pressing **[YES/SAVE]**.



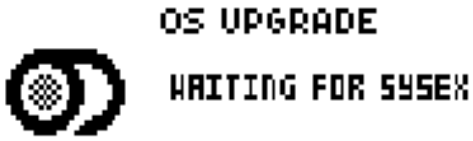
Should you, for some reason, wish to disable the Overbridge integration functionality, select the item called USB-MIDI ONLY and press **[YES/SAVE]**.

OS UPGRADE

Select this option when you want to upgrade the Analog Keys OS.



Press **[YES/SAVE]** to make the Analog Keys start listening for incoming OS SysEx data.



For the transfer to be possible, the device sending the OS syx-file should be connected to either the MIDI IN or USB port of the Analog Keys. Cancel the waiting state by pressing **[NO/RELOAD]**.

When receiving the OS a progress bar will be visible. Once the bar has been filled, the texts “ERASING FLASH” and “WRITING FLASH” will appear. When successful the machine will automatically reboot.

- **When performing the sending of the OS syx file, we recommend using our free SysEx utility C6. It can be downloaded from the Elektron website.**
- **If the Analog Keys is receiving the OS upgrade through the MIDI ports, use the Elektron TM-1 USB MIDI interface for up to 10x transfer speeds.**

FORMAT +DRIVE

Offers the possibility to erase all content, all projects and sounds, stored on the +Drive. A prompt will appear asking if the formatting procedure should be executed. Press **[YES/SAVE]** to proceed with the formatting.



CALIBRATION

Willl start the calibration routine for the oscillators, pulse widths and filters. After selecting this option, a popup window asking to confirm the calibration will appear.



Press **[YES/SAVE]** to proceed with the calibration. Please note the calibration routine takes a while to complete.

The Analog Keys is factory calibrated. It should not be re-calibrated unless specifically stated by Elektron Support.

EARLY STARTUP MENU

To access this menu, hold down the **[FUNCTION]** key while powering up Analog Keys. From here you can perform a variety of tasks. To choose the different alternatives, press the corresponding **[TRIG]** key.



TEST MODE

To enter this mode, press the first **[TRIG]** key. If you have any trouble with your Analog Keys and suspect it may be due to a hardware problem, perform this self test. No errors should be reported as shown below. If that is not the case, contact Elektron support or the retailer you bought Analog Keys from.



EMPTY RESET

To perform this operation, press the second **[TRIG]** key. All kits, patterns, Sounds and songs will be erased.

FACTORY RESET

When performing a factory reset on Analog Keys it will overwrite and re-initialize the active project (including all pattern, kit, sound pool and global data). The +Drive project slot 1 will be overwritten and re-initialized. Sound bank A and B will be overwritten with the factory Sounds. Factory pre-set patterns, kits, Sounds and settings will be re-initialized.

If you wish to keep the active project, remember to save it to a +Drive project slot higher than 1 before you perform a factory reset. To perform a factory reset, press **[TRIG]** key 3.

OS UPGRADE

Choose this option by pressing the fourth **[TRIG]** key. Analog Keys will enter a waiting stage, listening for incoming OS data. For the transfer to be possible, the device sending the OS syx-file should be connected to the MIDI IN port of Analog Keys. USB MIDI transfers is not possible when in the EARLY START UP menu.

As Analog Keys receives the OS a progress bar will indicate the how much of the OS that has been received. When upgrading, the <TRIG> LEDs will light up one after another. Please note that this procedure takes a while. When the transfer is finished the message “PREPARING FLASH” appears. “PREPARING FLASH” is shortly followed by “UPDATING FLASH”. When this process is finished the OS is updated.



- **When performing the sending of the OS syx file, we recommend using our free SysEx utility C6. It can be downloaded from the Elektron website.**
- **If Analog Keys is receiving the OS upgrade through the MIDI ports, use the Elektron TM-1 USB MIDI interface for up to 10x transfer speeds.**

MORE ON OSCILLATORS, FILTERS AND ENVELOPES

In this chapter the functionality of the oscillators, filters and envelopes will be explained in further detail.

OSCILLATORS

Several waveforms are available to the two oscillators of each synth track. By adjusting the **PW** parameter, the waveshape can be changed on all types of waveforms, changing their timbre. Furthermore, each oscillator has a dedicated PWM LFO, giving animation to the sound by means of pulsewidth modulation.

SAW. This waveform has a biting, buzzy and distinct sound. It contains all harmonics, both odd and even, of the fundamental frequency. Classic synth basses, strings and brass sounds are often created using sawtooth waveforms. The **PW** parameter brings in a second sawtooth, out of phase with the first one. Changing the **PW** value or engaging **PWM** varies the phase difference between the two, similar to having two slightly detuned oscillators running. This is useful to get a thicker sawtooth sound with more movement as different harmonics interfere with each other. To get a regular single sawtooth, set **PW** to mid position or either extreme value.

TRANSISTOR PULSE Transistor pulse is special sort of pulse waveform, suitable when you want to achieve acid-like sounds. It sounds a bit more shrill compared to the regular pulse waveform available to the oscillators. **PW** sets the width of the upper and lower parts of the wave, just like on the regular pulse waveform described below. The major difference is that one part of the transistor pulse waveform is not flat, but rather sloping a bit, thus displaying a slightly similar form as a sawtooth waveform. This introduces more even harmonics, making the sound less hollow. Extreme **PW** settings, positive or negative, will mute the waveform as the upper or lower part disappears completely. A change in pitch also changes the waveform and pulsewidth a bit, giving slightly different sound at different pitches.

PULSE When the PW parameter is set to its middle value of 0, a square wave will be produced. A square wave contains only odd-numbered harmonics of the fundamental frequency and has a hollow sound, not quite as full as a sawtooth waveform. Changing the **PW** makes the pulse waveform asymmetric, introducing even harmonics and making the sound thinner and more nasal. Using **PWM** to introduce pulsewidth modulation is the most classic way of adding animation to a synthesizer waveform. When you want to recreate the sounds of old video games, square waves are very handy. Extreme PW settings, positive or negative, will mute the waveform, as the upper or lower part disappears completely.

TRIANGLE A triangle waveform has a mellow and dampened sound, reminiscent of a mix between a pure sine wave and a square wave. A triangle wave contains only odd-numbered harmonics, but at lower levels than a square wave. A low-pass filtered triangle wave will sound very much like a sine wave. The **PW** parameter introduces an edge in the waveform, gradually changing it from a pure triangle at mid position to a reversed sawtooth waveform at extreme **PW** settings.

SUB OSCILLATORS

Each oscillator features a sub oscillator, running at a fixed interval below the oscillator. By activating a sub oscillator, more depth and body will be added to the sound. The sub oscillators work as an extension of the regular oscillator pitch, but will however not be affected by neither waveshaping nor pulse width modulation. Four sub oscillator waveforms exist.

1OCT This option will add a square waveform one octave below the root note. The sub oscillator frequency is 1/2 of the oscillator frequency.

2OCT This option will add a square waveform two octaves below the root note. The sub oscillator frequency is 1/4 of the oscillator frequency.

2PUL This option will add a 25% pulse waveform two octaves below the root note. This selection sounds a bit similar to mixing the 1OCT and 2OCT types.

5TH This option adds a 33% pulse waveform one perfect fifth, which is equivalent to seven semitones, below the oscillator. The sub oscillator thus operates at 2/3 of the oscillator frequency. If, for instance, the oscillator plays a G, then the sub oscillator will play the C below it. Together with the other oscillator, this makes it possible to play a simple chord using just one track of Analog Keys.



- **To get a C minor chord (C, Eb, G), set the oscillator TUN parameter to +7 semitones (for the G), set the sub oscillator to 5TH (for the C), and set the other oscillator to +3 semitones (for the minor third, Eb). To get a C major chord, set the other oscillator to +4 instead (for the major third, E). Suspended chords are created by setting TUN of the other oscillator to +5 (the perfect fourth, F) for a Csus4 chord, or to +2 (the major second, D) for a Csus2 chord. Moreover, four-note chords like the major 7th chord (maj7) and minor 7th chord (m7) is possible by using both oscillators' sub oscillators in 5TH modes, as these chords consists of two perfect fifths. With oscillator coarse tune settings of +7 and +11 semitones (G and B, respectively) the sub oscillators will be placed at C and E notes, forming a C major 7th (Cmaj7) chord. Tuning the oscillators to +7 and +10 semitones instead (G and Bb) the sub oscillators end up at C and Eb, forming a C minor 7th (Cm7) chord. The desired chord can be heard when the keyboard or the sequencer plays a C note. When playing other notes, the chord will transpose accordingly, enabling simple chord progressions. Transitions between the minor and major variants can be done on step basis in the sequencer by parameter locking the TUN parameter of the other oscillator to +3 or +4 where desired.**

OFF This turns off the sub oscillator completely. Note that it is otherwise on, regardless of the regular oscillator waveform setting. The oscillator's LEV setting then determines the level of the oscillator and sub oscillator combined.

OTHER OSCILLATOR WAVEFORM SELECTIONS

IN L Will use audio coming from the left external input as the audio source instead of the oscillator waveforms. The incoming audio can then be affected by the AM, the filters, the overdrive and the amplitude envelope of the track.

IN R Equivalent to IN L, but using the right external input.

FDB This setting is only available to OSCILLATOR 1. Instead of using the oscillator waveform as the audio source, the audio coming from the ladder filter output will be used. Just as with the oscillator, the **LEV** parameter sets the level of this signal path. Turning it up high can introduce a self-oscillating feedback useful for drums or uncontrolled screams. The filter cutoff and resonance settings also affect the feedback behavior. On more moderate levels, it will give a more overloaded sound character to whatever enters the filter from OSC2, similar to the external feedback patch known from certain 1970s synths.

NEI This setting is only available in the OSCILLATOR 2 menu. It will route the audio of the multimode filter output of the track preceding the track being edited. This audio can then be affected by the AM, the filters, the overdrive and the amplitude envelope of the track. In this way track 1 can be sent to track 2, track 2 to track 3, track 3 to track 4. For a completely serial routing, turn down the **LVL** setting of the routed track completely. This setting does nothing on track 1.

OFF This will turn off the oscillator completely. The sub oscillator is not affected though.



- **The AM functionality between the oscillators still exists when using filter feedback, neighbor, and external inputs as the OSC1/OSC2 waveforms. I.e., other signals than oscillator signals can be subject to amplitude modulation.**

FILTERS

4-POLE LADDER FILTER

There is no way to turn the ladder filter completely off, but turning up the cutoff frequency will pass all frequencies through. It should be noted that zero resonance does not give the flattest frequency response – instead it drops some decibels both in the treble and in the bass. The flattest response is reached when resonance is somewhere around 25, which is also the default value.

2-POLE MULTI MODE FILTER

There is no way to turn the multimode filter completely off, but if no filtering is desired there are a number of good ways to let all audio pass through unaffected by the filter:

HP2 at minimum frequency, no resonance.

BS at minimum frequency, no resonance.

LP2 at maximum frequency, no resonance.

PK at max frequency, no resonance.

PK at min frequency, no resonance. Note: this gives an inverted signal.

LP2 This 12 dB/octave lowpass mode attenuates frequencies above the cutoff frequency with twelve decibels per octave, similarly to most other classic 2-pole VCFs. The amount of resonance determines how much the frequencies around the cutoff frequency will be boosted. The sound of this filter is cleaner than the ladder filter, and their different sonic characters are both worth trying out. If combined, they can add up to an extraordinarily steep 6-pole filter.

LP1 This unorthodox 6 dB/octave lowpass mode has a less steep attenuation slope above the cutoff frequency than the LP2 mode. More high frequency content will thus be retained, making the filtering less aggressive. The slope is gentle like a 1-pole filter – which normally cannot have resonance – but works in essence like a 2-pole filter with a resonance peak. The amount of resonance determines how much the frequencies around the cutoff frequency will be boosted. The LP1 mode is useful for equalizer duties without resonance, or for adding a resonance with just a hint of lowpass softness.

BP The bandpass filter gradually attenuates frequencies above and below the cutoff frequency with a slope of 6 dB/octave. The resonance setting controls how much the frequencies around the cutoff frequency will be boosted. The bandpass filter is good for isolating a sound in the frequency spectrum, making it easier to blend with other sounds in a mix.

HP1 This unusual 6 dB/octave highpass filter attenuates frequencies below the cutoff frequency with a less steep slope than the HP2 mode. The amount of resonance determines how much the frequencies around the cutoff point will be boosted. Besides ordinary highpass filter effects, the HP1 mode without resonance is useful for removing some of the bass of a sound, which in turn is helpful when you want to avoid a muddy mix.

HP2 This is a classic 12 dB/octave highpass filter, attenuating frequencies below the cutoff frequency. The filter slope is steeper compared to the highpass 1 filter, thus filtering out more low-frequency content. The amount of resonance determines how much the frequencies around the cutoff point will be boosted. A highpass filter is suitable when creating lead sounds or hi-hats.

BS The band-stop filter, also known as a band-reject or notch filter, works as an inverted bandpass filter. Signals around the cutoff frequency will be attenuated the most, while frequencies above and below the cutoff frequency gradually will become less and less affected. The higher the resonance, the narrower the filter notch will be. This means that in contrast to the other filter modes, the effect of the resonance parameter is greatest at a low setting, giving a wider notch. This filter shape is useful for both basic equalizer duties and for unique filter effects. For example: sweeping the cutoff frequency with an LFO gives a phaser-sounding filter effect. Controlling it with an envelope while at the same time using the ladder filter gives a more complex filter sound. Static filter settings can give a somewhat acoustic resonant quality to sounds, especially transient-heavy ones.

PK The peak filter passes all the sound, boosting frequencies around the cutoff frequency. The higher the resonance, the more they will be boosted. A peak filter comes in handy when you want to highlight a certain characteristic of a sound, by for example adding more low end or more mid end. It can be used either statically, like the peak of a parametric equalizer, or dynamically, controlled by for example an LFO or envelope.

ENVELOPES

The amplitude envelopes and the assignable envelopes offer 12 different shapes, consisting of six basic shapes each with two different trigging behaviors. The envelope shape graphics give an indication of how the envelope will affect the modulation destination. The left portion of the graphics shows how the envelope behaves when it is rising, i.e. the attack phase, and to the right the falling behavior is shown, i.e. decay and release. The rise and fall can each be either linear or exponential, useful in different applications as described below. A dot to the left of the visual representation of the envelope indicates that the envelope will restart from level zero each time it is trigged. Envelope shapes without a dot means the envelope will start from the level it had when being trigged.

0-1: Linear attack and decay/release. An envelope shape suitable for controlling the filters if linear attack/decay/release sweeps are desired. When used as an amplitude envelope the decay and release phase appears to drop quicker towards the end, making it most useful for sounds that should fade out without a tail.

2-3 This can be considered the standard envelope shape. Decay and release fall quicker in the beginning of their phase, behaving more snappy and – just like acoustic sounds tend to do – leaving a tail instead of ending abruptly. This envelope shape is useful for creating distinct sounds, for example kick drums and basses, but also lengthier sounds like pads.

4-5 Exponential attack, linear decay/release. This shape makes the envelope rise quicker and quicker. This envelope is suitable when for example creating sounds appearing to be played in reverse or for sounds requiring a sudden attack.

6-7 Exponential attack, exponential decay/release. Since our hearing perceives loudness exponentially, this shape is primarily useful as an amplitude envelope for very long sounds that are supposed to fade in and fade out at a very constant rate. When used as a filter envelope, very clicky, whip lash-like sounds can also be obtained by using this shape.

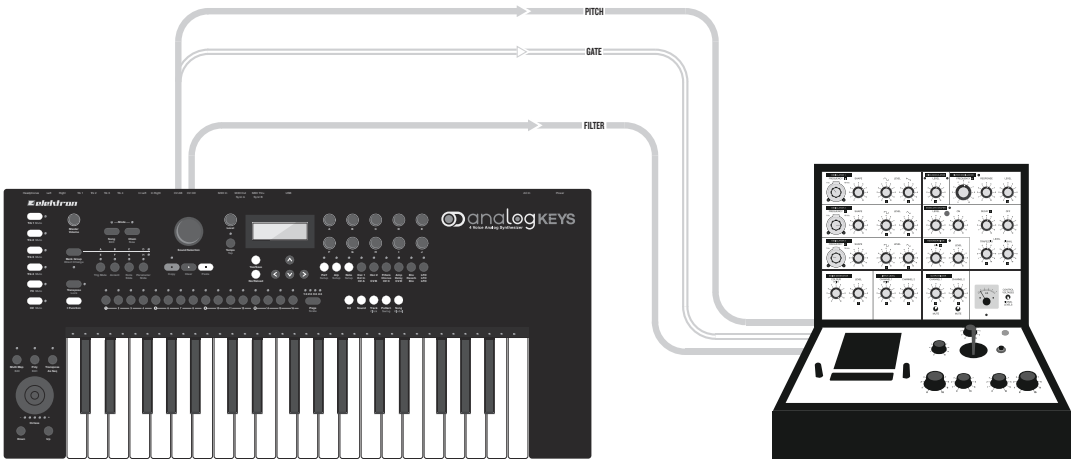
8-9 Full attack, linear decay/release. The envelope will immediately rise to the full envelope level and stay there for the whole attack phase. The **ATK** parameter sets the duration of this attack phase. The envelope shape is useful as amplitude envelope for certain percussive sounds that need a punch at full volume followed by a quick decay, or for other sounds that should contain a full body before being entering the decay phase.

10-11 Full attack, exponential decay/release. The envelope behaves like the aforementioned shape 8-9, but decay and release will fall in a more snappy fashion, ending with a tail. This makes it even more useful for percussive sounds.

SETUP EXAMPLES

The versatile Analog Keys yearns to play with other machines. Whether it uses its ability to sequencer control and play other analog synths using CV, plays its part in a MIDI chain of machines or processes amplified incoming audio: Analog Keys gets along with other gear. Vintage or modern. Five examples are shown here.

ANALOG KEYS CONTROL OF AN EXTERNAL ANALOG SYNTHESIZER



The CV/Gate track of Analog Keys is made for controlling external, CV/Gate equipped, analog gear. In this scenario, a vintage analog synthesizer is controlled by Analog Keys. The pitch and filter cutoff will be controlled.

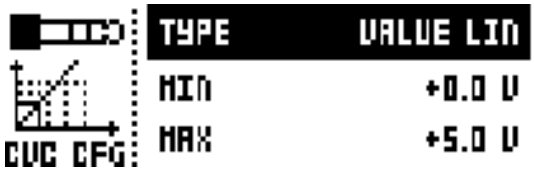
1. Connect two standard insert/Y cables (or one Y cable and a standard mono phone cable) to Analog Keys CV AB and CV CD outputs.
2. Connect the tip cable of the CV AB insert cable to the external synth pitch CV control input. This cable will control the pitch of the external synth.
3. Connect the ring cable of the CV AB insert cable to the external synth gate input. This cable will open the envelope of the external synth.
4. Connect the tip cable of the CV CD insert/Y cable (or the mono phone cable) to the external synth filter CV input. This cable will control the filter cutoff of the external synth.
5. While on the CV track, press **[FUNCTION]** + **[CV A]**. In this menu, set TYPE to PITCH V/OCT. For instructions on how to calibrate the pitch CV so that it matches the tuning of your CV-controlled synth, please see “CV CONFIG” on page 56.



6. Press **[FUNCTION]** + **[CV B]**. In this menu, set TYPE to GATE. Exit the menu.



7. Press **[FUNCTION]** + **[CV C].** In this menu, set TYPE to VALUE LIN. Exit the menu.

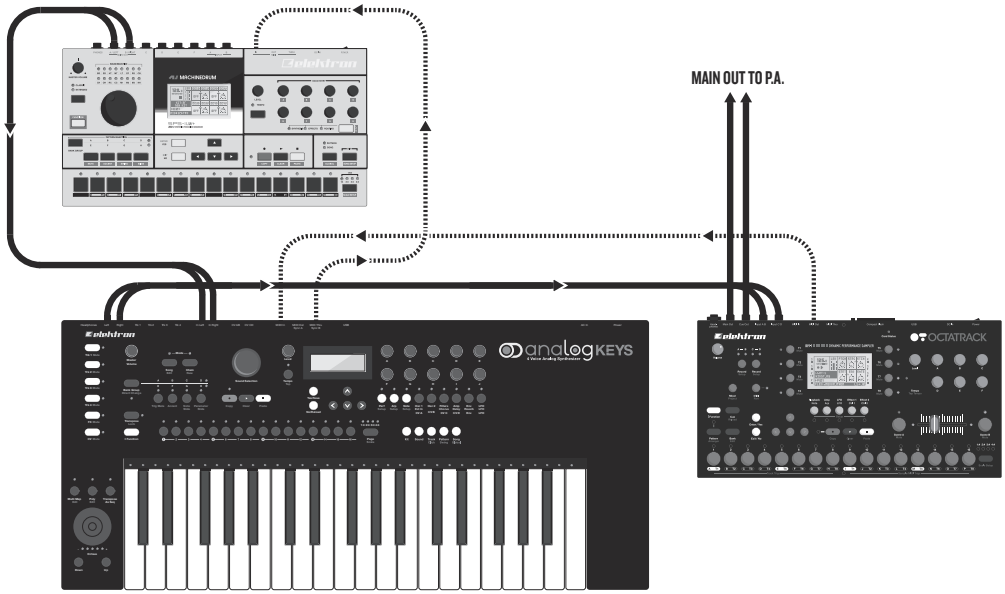


8. Analog Keys is now ready to control the external synthesizer. On the CV A, CV B and CV C pages, the controllable parameters are indicated by arrows pointing from the parameters to the cable plug graphics. These parameters can of course be parameter locked.



- **For controlling the pitch of for example old analog Korg or Yamaha gear, use the PITCH Hz/V.**
- **For CV pages containing TYPE selections of PITCH V/OCT, PITCH Hz/V, TRIG and GATE, the SRC parameter selects from which tracks note trigs will be derived. Pitch could for example be controlled from the CV track while gate signals could be controlled from the FX track. When setting another track as the SRC selection, the arpeggiator of that track can be used as well to send note trigs.**

ANALOG KEYS WITH OTHER ELEKTRON GEAR



Analog Keys really thrives with other Elektron gear. In this example it is used with an Octatrack and a Machinedrum. The Machinedrum main output is connected to Analog Keys inputs. Analog Keys main output is connected to one of the input pairs of the Octatrack. The main outputs of the Octatrack goes to the PA. The Machinedrum and Analog Keys are MIDI slaved to the Octatrack.

The Machinedrum creates the beats. Analog Keys is responsible for basses and synth sounds. The Octatrack plays back loops and can also be used to sample the audio from Analog Keys plus Machinedrum.

Because the Machinedrum is connected to Analog Keys inputs, the internal effects of Analog Keys can be used to affect the incoming signal. This can be used to add sudden washes of reverb or delay to the beat.

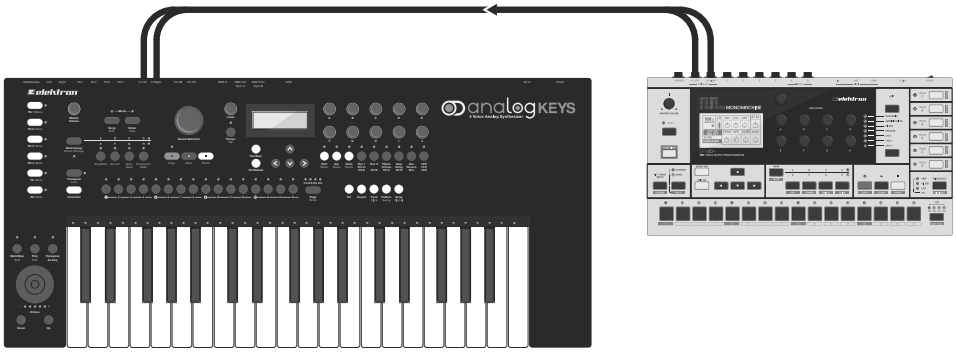
1. Press the fifth **[TRACK]** key, the FX track, on Analog Keys. Select the EXT IN page.
2. Turn up the volume on both channels to 100.



3. Make a performance macro controlling the CHO, DEL and REV parameters, located on the EXT IN page of the FX track, for both the left and right channel. See page 19 on how to make a performance macro.



ANALOG KEYS AS A FILTER BANK

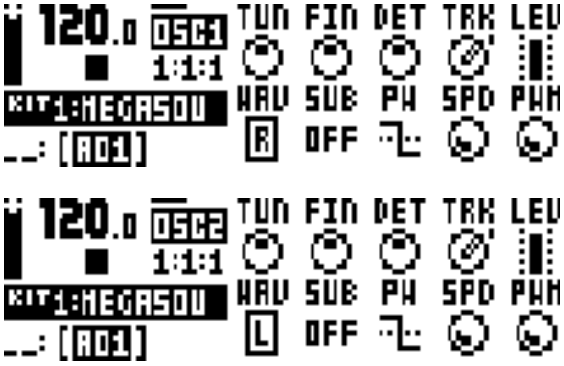


Thanks to the neighbor routing, all the filters of Analog Keys can be used for providing an immense mono filter-bank consisting of 8 filters plus 4 overdrive circuits. The setup can be either serial or parallel. It can of course be set up for stereo filtering as well. In this scenario 4 filters are available for the left and right channels.

In this example, the two filters of each track will be used in parallel with the filters of the other tracks.

Bild

1. Connect the outputs of for example a Machinedrum to the inputs of Analog Keys.
2. For all four synth tracks, set the **WAV** parameter in the OSC1 page to IN R, and the **WAV** parameter of OSC2 to IN L. This will sum the left and right channels.



3. Set all other **WAV** parameters to OFF. Make sure all **SUB** parameters is set to OFF as well.

4. On the AMP page for all tracks, make sure **ATK** is 0, **DEC** 0, SUS **127** and **REL** INF.



5. On the FILTER page for all tracks, the **DEP** parameters should be set to 0.

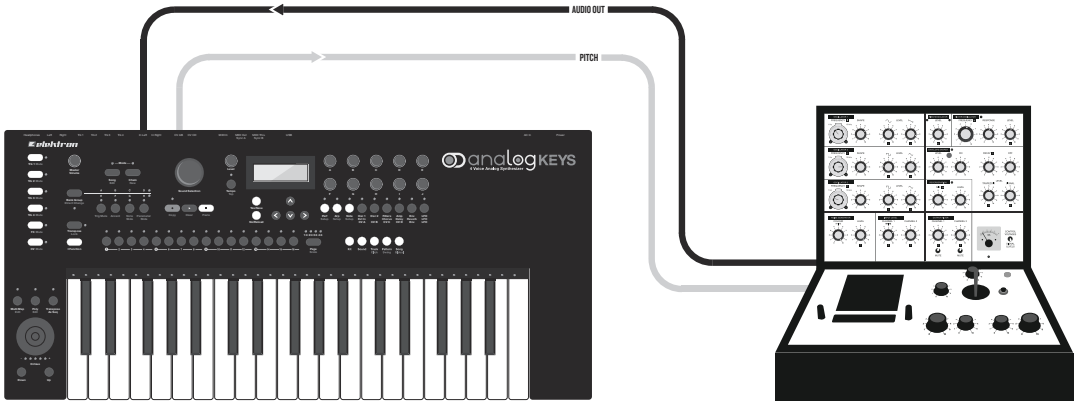


6. Place note trigs on the first step of the sequencer. It is necessary to trig the amplitude envelope.
7. Press play on the Machinedrum.
8. Press play on Analog Keys. The filters of the synth tracks can now be used to shape the incoming Machinedrum sound.



- **For serial filtering, make either one or both oscillators of synth track 1 listen to the external inputs. Set the WAV parameter of oscillator 2 to NEI on the other tracks. Turn off oscillator 1 on tracks 2-4. Turn down the track level to 0 for tracks 1-3.**
- **Make Analog Keys listen to MIDI clock and transport controls sent from the Machinedrum. When pressing play on the Machinedrum sequencer, both units will start to play at the same time and in the same BPM. Experiment with the tempo-synced LFOs of Analog Keys controlling the filter parameters.**
- **Place other note trigs on Analog Keys sequencer and experiment with the filter envelope settings.**
- **When using Analog Keys as a stereo filter, let track 1-2 take care of the left signal and track 3-4 take care of the right. Don't forget to pan the synth tracks responsible for the left and right channels hard left and right. If you wish to control the FRQ or RES parameters of the left and right tracks simultaneously, use a performance macro.**

USING AN EXTERNAL OSCILLATOR WITH ANALOG KEYS



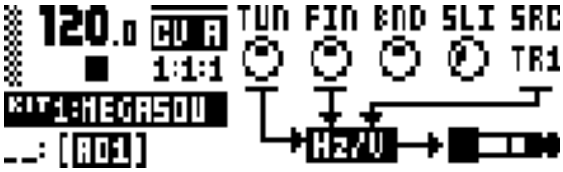
The CV/Gate outputs and the external inputs allow an external oscillator to be used with the internal Analog Keys oscillators. Use this trick when you want a different (perhaps old, quirky and unpredictable yet charming) oscillator to provide the fundamental tone but still want the control and modulation power of Analog Keys.

In this setup example, the CV track will trig the oscillator of an external analog synth. The output of this oscillator will be routed to left input of Analog Keys. Synth track 1 of Analog Keys will control the pitch of both the internal oscillators and the external oscillator. The filters and envelopes of track 1 will shape both the internal and the external oscillators.

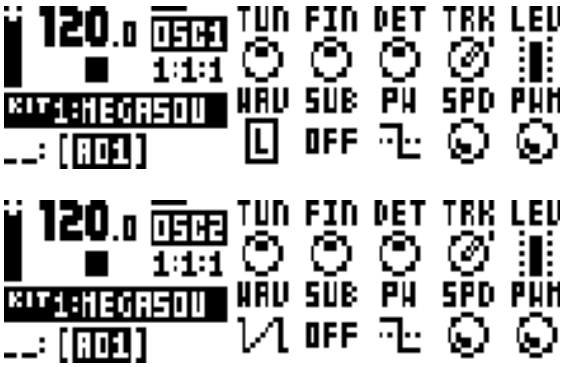
1. Connect a standard mono phone (or insert/Y) cable to Analog Keys CV AB output.
2. Connect the output of the external oscillator to the left external input
3. Connect the mono phone (or tip of the insert/Y) cable from CV AB to the pitch CV control input of the external synth.
4. Select the CV track and press **[FUNCTION]** + **[CV A]**. In this menu, depending on the specification of the external analog synth, set TYPE to either PITCH V/OCT or PITCH Hz/V. For instructions on how to calibrate the pitch CV so that it matches the tuning of your CV-controlled synth, please see “CV CONFIG” on page 56.



5. Set the **SRC** parameter of the CV A page to TR1. This will make the CV track send out pitch voltages according to the note trigs on synth track 1.



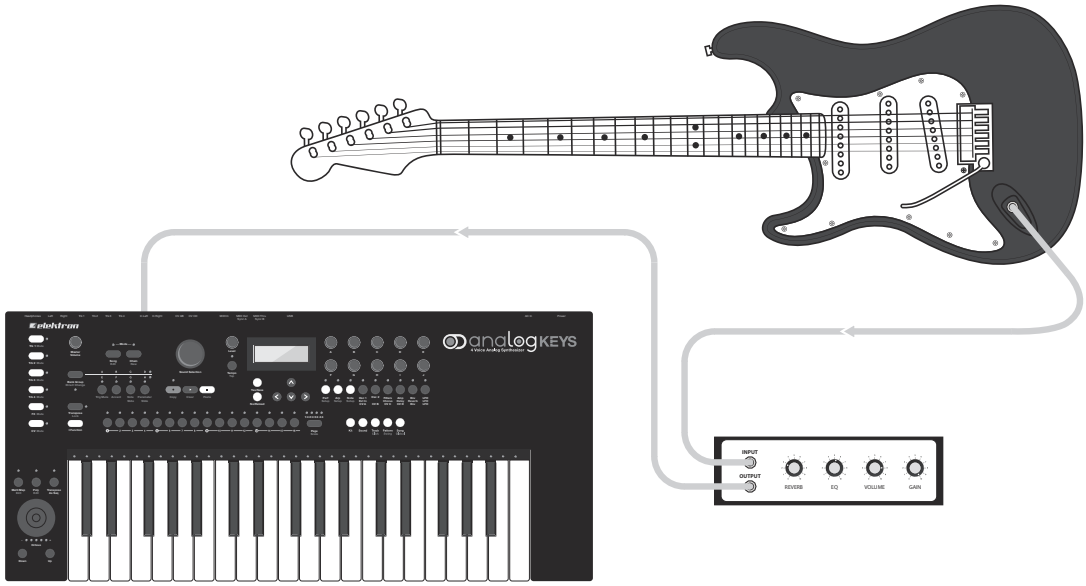
6. Select track 1. Set **WAV** on the OSC1 page to IN L. For oscillator 2, choose one of the internal Analog Keys waveforms.



7. Note trigs placed on track 1 will now control both the internal and the external oscillators.

- **Use parameter locks to alternate the waveform of oscillator 1 between external/internal selections.**
- **This example can use more than one external oscillator. If two separate external oscillators are connected to Analog Keys external inputs, both oscillators can be used on for example track 1. Track 2-4 could then use only internal oscillators.**

ANALOG KEYS WITH AN ELECTRIC GUITAR



In this setup example Analog Keys is used for processing the sound output from an electric guitar. The first, most basic method uses the FX track to turn Analog Keys into an effects box sporting the Wideshift Chorus, Saturator Delay and Supervoid Reverb effects. The second, more elaborate method routes the sound through Track 1 and allows all the sound-shaping possibilities offered by the FILTERS, AMP, ENV and LFO.

1. Connect the electric guitar to the audio input of an amplifier using a standard mono phone cable.
2. Connect the audio out from the amplifier to the left audio input of Analog Keys.
3. First method: Select the FX track on Analog Keys with **[TRACK]** key 5.To make use of the Wideshift Chorus, press **[PARAMETER]** key 3, CHORUS. Change the volume and other aspects of the effect using the ***DATA ENTRY*** knobs. Use Saturator Delay and Supervoid Reverb effects in a similar manner by pressing **[PARAMETER]** key 4, DELAY and key 5, REVERB respectively.



4. Second method: Select Track 1 on Analog Keys by pressing **[TRACK]** key 1.
5. On the OSC1 menu page, set the **WAV** parameter to IN L using ***DATA ENTRY*** knob ***F***. Set **SUB**, the sub oscillator, to off. Turn the **LEV** all the way up.



6. Make a custom set of filtering, amplifier, envelope and LFO processing of the sound feed from the electric guitar by setting the values of your choice on the corresponding parameter menu page, **[PARAMETER]** key 3-6. Remember to set the **LEV** to a high value on the AMP page.



7. Place a note trig on the first step of the sequencer for Track 1. This is required in order to start the envelope processing of the feed from the electric guitar.
8. Press play on Analog Keys.

- **The three main send effects are a perfect choice when performing at large arenas. Let your sounds expand in all dimensions of the time-space continuum with the Wideshift Chorus, Saturator Delay and Supervoid Reverb!**
- **Experiment with different filter and LFO settings when sending the guitar feed through one of the synth tracks, as outlined in the second method above. Try setting the second filter type (TYP) to BP or HP on the FILTERS page at mid-to high cutoff frequency (FRQ). Then, experiment with high low-frequency oscillation speeds (SPD) and different distortion settings (DST) on the LFO page to produce wildly flanging or cool robotic phaser effects.**

USEFUL KEY COMBINATIONS (QUICK KEYS)

Use the key combinations below in order to quickly perform certain tasks.

GENERAL

[FUNCTION] + **[REC]** will perform a copy command. Action depends on the currently active page or mode.

[FUNCTION] + **[PLAY]** will perform a clear command. Action depends on the currently active page or mode.

[FUNCTION] + **[STOP]** will perform a paste command. Action depends on the content that was copied.

NAMING

[FUNCTION] + **[ARROW]** (on the NAMING screen) to choose letter.

[FUNCTION] + **[NO/RELOAD]** (on the NAMING screen) to erase letter.

SOUND BROWSER

Nudge the ***SOUND SELECTION*** wheel to open the SOUND BROWSER. Turn clockwise/counterclockwise to scroll down/up the list. Click the wheel to load the highlighted Sound to the active Track.

Alternatively, double-tap a **[TRACK]** key to quickly access the SOUND BROWSER.

Use **[ARROW]** keys to browse. Press **[YES/SAVE]** to load the sound to the track.

SAVING AND RELOADING

[YES/SAVE] + **[KIT]** will save Kit.

[NO/RELOAD] + **[KIT]** will reload Kit.

[YES/SAVE] + **[SOUND]** to save Sound.

[NO/RELOAD] + **[SOUND]** will reload Sound.

[YES/SAVE] + **[TRACK]** will save Track.

[NO/RELOAD] + **[TRACK]** will reload Track.

[YES/SAVE] + **[PATTERN]** will save Pattern.

[NO/RELOAD] + **[PATTERN]** will reload Pattern.

[YES/SAVE] + **[SONG]** will save Song.

[NO/RELOAD] + **[SONG]** will reload Song.

MENU ACCESS

[FUNCTION] + **[SONG]** (GLOBAL) to open the GLOBAL menu.

SEQUENCER SETTINGS

[FUNCTION] + **[TEMPO]** to tap tempo.

[FUNCTION] + **[TRACK]** (CLICK) to access the CLICK settings.

[FUNCTION] + **[NOTE]** to access the QUANTIZE settings for the active track.

[FUNCTION] + **[PAGE]** to access the pattern / track SCALE settings. Increase pattern length by 16 steps a pop by pressing **[PAGE]** repeatedly.

MUTES

[FUNCTION] + **[TRACK]** will mute/unmute one or several Tracks.

SEQUENCER RECORDING

[RECORD] + **[PLAY]** to start LIVE RECORDING.

[RECORD] + double-tap **[PLAY]** will activate/deactivate QUANTIZE LIVE RECORDING.

CLEAR TRACK / CLEAR PATTERN

[FUNCTION] + **[PLAY]** (while in GRID RECORDING mode) to clear active Track.

[FUNCTION] + **[PLAY]** (while in no mode or LIVE RECORDING mode) to clear Pattern.

SHIFTING TRIGS AROUND

[FUNCTION] + **[LEFT/RIGHT]** to move all trigs a whole step, left or right.

[TRIG] + **[LEFT/RIGHT]** to nudge a single trig a fractional step left or right.

CHAIN EDITING

[FUNCTION] + **[CHAIN]** to create new scratch pad row.

[CHAIN] + **[LEFT/RIGHT]** to move chain cursor.

[CHAIN] + **[NO/RELOAD]** to remove Pattern from the chain before cursor (or selected).

[BANK X/X] + **[TRIG]** to enter a new Pattern into the chain (positioned where the cursor is at).

TECHNICAL INFORMATION

SPECIFICATIONS

THE SEQUENCER

4 synth tracks
1 FX track
1 CV/Gate track
128 projects (+Drive)
4096 sounds (+Drive Sound library)
128 patterns (per project)
Up to 64 steps per pattern
128 Sounds (per project)
128 Kits (per project)
16 Songs (per project)
6× arpeggiators
Individual track lengths
Swing, slide and accent functions
Track transpose
Micro timing
Parameter locks
Live friendly Performance mode
Sound-per-step change
Instant kit, pattern, track and Sound reload
Complete real-time control

SEND EFFECTS

Wideshift Chorus
Saturator Delay
Supervoid Reverb

SYNTH VOICE (x4)

Completely analog signal path
2× analog oscillators
Variable waveshape on all waveforms
Oscillator AM and Sync modes
2× sub-oscillators
1× noise generator
1× 4-pole analog lowpass ladder filter
1× 2-pole analog multi-mode filter
1× analog overdrive circuit
Filter feedback
2× assignable LFOs
1× dedicated vibrato LFO
2× dedicated waveshape LFOs
1× amp envelope
2× assignable envelopes
2× dedicated LFO fade envelopes
1× dedicated noise fade envelope
1× dedicated vibrato envelope
1× dedicated autobend envelope
3x individual effect sends
MIDI control

FEATURES

Up to 4-Note Polyphony/Multitimbral/Unison
Dynamic voice allocation for the 4 tracks
+Drive enables multiple (x128) projects

ELECTRICAL SPECIFICATIONS

Impedance balanced audio outputs:
Main outputs level: +19 dBu

Output impedance: 440 Ω unbalanced

Headphones output:
Headphones out level: +19 dBu

Output impedance: 55 Ω

Unbalanced audio inputs:
Input level: +19 dBu maximum

Audio input impedance: 9 kΩ

Digital S/N ratio: 102 dBFS (20-20.000 Hz)
Stereo Separate Track Outputs:
Output level: +19 dBu

Output Impedance: 1.2 kΩ

Acceptable power supply: 100-250 VAC, 50-60 Hz
Unit power consumption: 14 W typical, 25 W maximum.
Power inlet type: IEC 60320 C8
Recommended power cable type: IEC 60320 C7, rated for 240V and at least 2.5A

HARDWARE

122x32 pixel backlit LCD
MIDI In/Out/Thru with DIN Sync out
2 x 1/4" impedance balanced audio out jacks
2 x 1/4" audio in jacks
1 x 1/4" stereo headphone jack
2 x 1/4" dual CV/Gate outputs
4 x 1/4" stereo (TRS) individual track outputs
37-key semi-weighted, velocity sensitive Keyboard with aftertouch
Assignable omnidirectional joystick
48 kHz, 24-bit D/A and A/D converters
Flash-EEPROM upgradable OS
Electrically isolated USB 2.0 port

PHYSICAL SPECIFICATIONS

Aluminum casing
Dimensions: W660xD309xH93mm (26.0x12.2x3.7")
(including audio outputs, knobs and rubber feet)
Weight: approximately 5.4 kg (11.9 lbs)

CREDITS AND CONTACT INFORMATION

CREDITS

PRODUCT DESIGN AND DEVELOPMENT
Oscar Albinsson
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Jimmy Myhrman
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Appendix A: SYNTH TRACK PARAMETERS

In this appendix, the parameters of the synth tracks are explained.

OSCILLATOR 1

The OSC1 pages control the first oscillator, its suboscillator, plus the noise generator.

OSC 1 (page 1)



TUN (OSC1 Coarse Tune) sets the pitch of the oscillator in semitones. To jump a whole octave, press the knob while turning it.

FIN (OSC1 Fine Tune) fine tunes the pitch of the oscillator. This knob can be continuously tweaked several turns. **TUN** is increased or decreased one semitone for every turn on **FIN**.

DET (OSC1 Linear Detune) offsets the frequency of the oscillator by a certain number of hertz (unlike **FIN**, which adjusts the pitch in cents). This unique feature gives more detune in the bass notes, and allows for a different kind of chorus-like detune that reminds of very old and big analog synthesizers.

TRK (OSC1 Keytrack) decides whether the oscillator pitch should follow the notes you play. When off, the pitch is constant, which can come in handy for some drum or effect sounds.

LEV (OSC1 Level) controls the level of the oscillator. Normal level is 100. The sound can get dirtier at higher levels; lower levels gives a cleaner signal through the filters and also makes filter resonances more pronounced. Try different levels for different kinds of sounds.

WAV (OSC1 Waveform) sets the oscillator waveform to Sawtooth, Transistor Pulse, Pulse, or Triangle. It is also possible to choose one of the two External Inputs (to send external sounds through the filters) or to activate Filter Feedback. Note that selecting a waveform does not change the **PW** parameter, which affects the waveshape of the chosen waveform.

SUB (OSC1 Sub Oscillator) sets the oscillator's Sub Oscillator waveform, or turns it off. The Sub oscillator pitch is fixed at one or two octaves below the oscillator.

PW (OSC1 Pulsewidth) sets the oscillator waveshape. The mid position (64) gives the default waveshape. Unlike on most synths, all four waveforms, selected by **WAV**, have variable waveshapes.

SPD (OSC1 PWM Speed) sets the speed of the oscillator's **PWM** LFO, which can be used to modulate the waveshape back and forth around the set **PW** parameter.

PWM (OSC1 PWM Depth) controls the amount of the oscillator's Pulsewidth Modulation around the set **PW** parameter. Use this to add subtle or drastic motion to the sound.

NOISE (page 2)



S&H (Sample & Hold) sets the tuning of the noise spectrum.

COL (Color) lets you control a filter that changes the frequency content of the noise oscillator. Negative values render lowpass-filtered noise. For example, a setting of -64 is red (-6dB/oct) and -32 is pink (-3dB/oct) noise. Positive values render highpass-filtered noise. A setting of zero disables the filter, making the output white noise.

FAD (Noise Fade) controls the fade-in or fade-out of the noise. The mid position (0) gives a constant noise output. Positive values give a fade-out, negative values give a fade-in. The graphics will illustrate the slope of the fade, across the spectrum, as you tweak the encoder.

LEV (Noise Level) sets the level of the noise.

OSCILLATOR 2

The OSC2 pages control the second oscillator and the accompanying suboscillator. Settings that will affect both oscillators are found here as well.

OSC 2 (page 1)



TUN (OSC2 Coarse Tune) sets the pitch of the oscillator in semitones. To jump a whole octave, press the knob while turning it.

FIN (OSC2 Fine Tune) fine tunes the pitch of the oscillator. This knob can be continuously tweaked several turns. **TUN** is increased or decreased one semitone for every turn on **FIN**.

DET (OSC2 Linear Detune) offsets the frequency of the oscillator by a certain number of hertz (unlike **FIN**, which adjusts the pitch in cents). This unique feature gives more detune in the bass notes, and allows for a different kind of chorus-like detune that reminds of very old and big analog synthesizers.

TRK (OSC2 Keytrack) decides whether the oscillator pitch should follow the notes you play. When off, the pitch is constant, which can come in handy for some drum or effect sounds.

LEV (OSC2 Level) controls the level of the oscillator. Normal level is 100. The sound can get dirtier at higher levels; lower levels gives a cleaner signal through the filters and also makes filter resonances more pronounced. Try different levels for different kinds of sounds.

WAV (OSC2 Waveform) sets the oscillator waveform to Sawtooth, Transistor Pulse, Pulse, or Triangle. It is also possible to choose one of the two External Inputs (to send external sounds through the filters) or to activate Neighbor, which will route the audio of the previous track to the currently active track. Note that selecting a waveform does not change the **PW** parameter, which affects the waveshape of the chosen waveform.

SUB (OSC2 Sub Oscillator) sets the oscillator's Sub Oscillator waveform, or turns it off. The Sub oscillator pitch is fixed at one or two octaves below the oscillator.

PW (OSC2 Pulsewidth) sets the oscillator waveshape. The mid position (64) gives the default waveshape. Unlike on most synths, all four waveforms, selected by **WAV**, have variable waveshapes.

SPD (OSC2 PWM Speed) sets the speed of the oscillator's **PWM** LFO, which can be used to modulate the waveshape back and forth around the set **PW** parameter.

PWM (OSC2 PWM Depth) controls the amount of the oscillator's Pulsewidth Modulation around the set **PW** parameter. Use this to add subtle or drastic motion to the sound.

OSC (page 2)



AM1 (Osc1 AM) engages Amplitude Modulation on Oscillator 1, which means that its signal is switched on/off (multiplied) by the pulse wave of Oscillator 2. This introduces new harmonics with frequencies being the sum and difference frequencies of the harmonics of the two oscillators. The result is related to ring modulation and can give metallic, hollow, or disharmonic sound qualities. Note that the waveform and pulse width of Oscillator 2 also affects the result, even if that oscillator is not heard.

SMD (Sync Mode) enables oscillator sync between the two oscillators, either Osc2 synchronized to Osc1, Osc1 to Osc2, or Metal Sync where both oscillators reset each other in a special manner.

SNC (Sync Amount) sets the amount or "hardness" of the oscillator sync, meaning how hard the synced oscillator will lock to the syncing oscillator's frequency. Maximum value gives so-called "hard sync" with the strongest sync sound. Lower values gives "soft sync" where the synced oscillator can lock also to subharmonics of the syncing oscillator. The value zero gives no sync at all.

BND (Bend Depth) controls the amount of the autobend feature. The higher the setting, the more the pitch of a trigged note will be offset. The sound will then glide towards its right pitch. This parameter is particularly useful in drum sounds or sync sweeps; if oscillator sync is engaged (**SMD**) then only the synced oscillator will bend.

SLI (Note Slide time) controls the slide time of note slides, set in the NOTE SLIDE menu, and also the autobend time (**BND**).

AM2 (Osc2 AM) engages Amplitude Modulation on Oscillator 2, which means that its signal is switched on/off (multiplied) by the pulse wave of Oscillator 1. See **AM1** above.

TRG (Oscillator Retrig) lets the two oscillators start each note in phase with each other. This can give a stronger and more consistent bass punch thanks to constructive interference, and can also change the sound character in other ways.

FAD (Vibrato Fade) controls the fade-in or fade-out of the vibrato. The mid position (0) gives a constant vibrato. Positive values give a fade-out, negative values give a fade-in.

SPD (Vibrato Speed) controls the frequency of the vibrato LFO affecting both oscillators.

VIB (Vibrato Depth) sets the amount of vibrato, ranging from subtle variations to wild sweeps.

FILTERS

In the FILTERS page, settings that will affect the two track filters are found.

FILTERS



FRQ (Filter1 Frequency) controls the cutoff frequency of Filter 1, the 4-pole lowpass transistor ladder filter.

RES (Filter1 Resonance) controls the resonance of Filter 1. Increased resonance introduces a peak in the spectrum at the cutoff frequency. By design, Filter 1 has a stronger resonance in the higher frequencies, which gives a characteristic electronic filter sound when the resonance starts sharp and then falls during a falling filter envelope.

OVR (Filter1 Overdrive) introduces distortion in the signal path. In mid position (0) the signal is kept clean. Increasing positive values gives a clipping distortion after Filter 1. Increasing negative values also distorts the signal, but with a softer overdrive inside the filter.

TRK (Filter1 Keytrack) lets the cutoff frequency follow the pitch of the sound played. A setting of 32 will make the filter track the oscillator frequency in note intervals, making it possible to play the Filter 1 resonance the same way as an oscillator is played.

DEP (Filter1 EnvF Depth) controls the amount of cutoff frequency modulation from the filter envelope EnvF. The knob is bipolar, meaning that both negative and positive modulation depth is available. Note that **ENV** always affects Filter1, regardless of which modulation destinations are chosen.

FRQ (Filter2 Frequency) controls the cutoff frequency of Filter 2, which is the 2-pole multimode filter located after Filter 1 and Overdrive.

RES (Filter2 Resonance) controls the resonance of Filter 2. Increased resonance introduces a peak in the spectrum at the cutoff frequency. (Except for the Bandstop filter type, which has a notch instead of a peak. This notch is widest at the lowest Resonance setting.) Compared to Filter 1, Filter 2 has a more uniform resonance behavior over the whole audio spectrum.

TYP (Filter2 Type) selects the filter type of Filter 2. Seven types are available: 2-pole Lowpass, 1-pole Lowpass, Bandpass, 1-pole Highpass, 2-pole Highpass, Bandstop, and Peak. Technically all of them are 2-pole filters with resonance, but the "1-pole" types have a flatter spectrum like simple 1-pole filters and can be very useful also for equalizer duties.

TRK (Filter2 Keytrack) lets the cutoff frequency follow the pitch of the sound played. A setting of 32 will make the filter track the oscillator frequency in note intervals.

DEP (Filter2 EnvF Depth) controls the amount of cutoff frequency modulation from the filter envelope EnvF. The knob is bipolar, meaning that both negative and positive modulation depth is available. Note that **ENV** always affects Filter2, regardless of which modulation destinations are chosen.

AMPLITUDE

The AMP page contains settings for the amplitude envelope and the effects sends, as well as panning and volume of the sound.

AMP



ATK (EnvA Attack) controls the attack time of the EnvA envelope, which controls the amplitude of the track.

DEC (EnvA Decay) controls the decay time of the EnvA envelope.

SUS (EnvA Sustain) controls the sustain level of the EnvA envelope.

REL (EnvA Release) controls the release time of the EnvA envelope.

SHP (EnvA Shape) controls the general shape of the EnvA envelope. Several linear and exponential shapes are available. A dot to the left of the visual representation of the envelope indicates that the envelope will restart from level zero. In other cases it will start from the level it had when being trigged.

CHO (Chorus Send) controls how much of the synth track signal that will be sent to the Wideshift Chorus effect.

DEL (Delay Send) controls how much of the synth track signal that will be sent to the Saturator Delay effect.

REV (Reverb Send) controls how much of the synth track signal that will be sent to the Supervoid Reverb effect.

PAN (Pan) positions the Sound of the synth track in the stereo field.

VOL (Volume) controls the volume of the Sound. This parameter is separate from the overall **LEV** overall gain control.

ENVELOPES

Here parameters controlling the two assignable envelopes are found. The first envelope, ENVF, is hard-linked to the cutoff parameters of the two filters but can also modulate two user-selectable destinations.

ENVF (page 1)



ATK (EnvF Attack) controls the attack time of the EnvF envelope.

DEC (EnvF Decay) controls the decay time of the EnvF envelope.

SUS (EnvF Sustain) controls the sustain level of the EnvF envelope.

REL (EnvF Release) controls the release time of the EnvF envelope.

SHP (EnvF Shape) controls the general shape of the EnvF envelope. Several linear and exponential shapes are available. A dot to the left of the visual representation of the envelope indicates that the envelope will restart from level zero. In other cases it will start from the level it had when being trigged.

LEN (EnvF Gate length) makes it possible to choose another gate length than whatever trigged the envelope.

DST (EnvF Destination A) selects the first of the two assignable destinations for the EnvF envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (EnvF Depth A) controls how much the envelope will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (EnvF Destination B) selects the second of the two assignable destinations for the EnvF envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (EnvF Depth B) controls how much the envelope will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

ENV2 (page 2)



ATK (Env2 Attack) controls the attack time of the Env2 envelope.

DEC (Env2 Decay) controls the decay time of the Env2 envelope.

SUS (Env2 Sustain) controls the sustain level of the Env2 envelope.

REL (Env2 Release) controls the release time of the Env2 envelope.

SHP (Env2 Shape) controls the general shape of the Env2 envelope. Several shapes are available.

LEN (Env2 Gate length) makes it possible to choose another gate length than whatever trigged the envelope.

DST (Env2 Destination A) selects the first of the two available destinations for the Env2 envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (Env2 Depth A) controls how much the envelope will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available

DST (Env2 Destination B) selects the second of the two available destinations for the Env2 envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (Env2 Depth B) controls how much the envelope will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

LFO

The two track LFOs can be used to modulate the other synth track parameters.

LFO1 (page 1)



SPD (LFO1 Speed) controls the speed of LFO1. It is synced to the BPM. For LFO1 to be synced to straight beats, try settings of 16, 32 or 64. The value is bi-polar, meaning the LFO shape can be played backwards by using negative values.

MUL (LFO1 Multiplier) multiplies the **SPD** parameter by the set factor. (x) multiplies the current tempo, (dot) syncs the LFO to 120 BPM regardless of the tempo, and (tuning fork) syncs the LFO to OSC1.

FAD (LFO1 Fade In/Out) offers the possibility to fade in/out the LFO modulation. Positive values give a fade-out, negative values give a fade-in. A mid position (0) will result in no fade in/out.

SPH (LFO1 Start Phase) controls where in the waveform the LFO1 will start when being trigged.

MOD (LFO1 Trig Mode) controls LFO1 trig behaviour:

- FRE is the default free-running mode. It makes LFO1 run continuously, never restarting or stopping.
- TRG makes LFO1 restart when a note is played.
- HLD makes LFO1 run free in the background, but when a note is played the output LFO1 level is latched and held still until the next note is played.
- ONE will make LFO1 start from the beginning when a note is played, run for one cycle and then stop. This makes it function similarly to an envelope.
- HLF will make LFO1 start from the beginning when a note is played, run for half a cycle and then stop.

WAV (LFO1 Waveform) controls the LFO1 waveform.

DST (LFO1 Destination A) selects the first of the two available destinations for LFO1. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO1 Depth A) controls how much LFO1 will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (LFO1 Destination B) selects the second of the two available destinations for LFO1. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO1 Depth B) controls how much the LFO1 will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

LFO2 (page 2)



SPD (LFO2 Speed) controls the speed of LFO2. It is synced to the BPM. For LFO2 to be synced to straight beats, try settings of 16, 32 or 64. The value is bi-polar, meaning the LFO shape can be played backwards by using negative values.

MUL (LFO2 Multiplier) multiplies the **SPD** parameter by the set factor. (x) multiplies the current tempo, (dot) syncs the LFO to 120 BPM regardless of the tempo, and (tuning fork) syncs the LFO to OSC2.

FAD (LFO2 Fade In/Out) offers the possibility to fade in/out the LFO modulation. Positive values give a fade-out, negative values give a fade-in. A mid position (0) will result in no fade in/out.

SPH (LFO2 Start Phase) controls where in the waveform the LFO2 will start when being trigged.

MOD (LFO2 Trig Mode) controls LFO2 trig behaviour:

- FRE is the default free-running mode. It makes LFO2 run continuously, never restarting or stopping.
- TRG makes LFO2 restart when a note is played.
- HLD makes LFO2 run free in the background, but when a note is played the output LFO2 level is latched and held still until the next note is played.
- ONE will make LFO2 start from the beginning when a note is played, run for one cycle and then stop. This makes it function similarly to an envelope.
- HLF will make LFO2 start from the beginning when a note is played, run for half a cycle and then stop.

WAV (LFO2 Waveform) controls the LFO2 waveform.

DST (LFO1 Destination A) selects the first of the two available destinations for LFO2. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO2 Depth A) controls how much LFO2 will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (LFO2 Destination B) selects the second of the two available destinations for LFO2. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO2 Depth B) controls how much the LFO2 will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

Appendix B: FX TRACK PARAMETERS

In this appendix, the parameters of the external input page and the three send effects are explained.

EXTERNAL IN

The EXT IN page controls the signal path from the two audio inputs to the main mixer. These external signals can be routed to the effects and panned just like the four synth tracks.

EXT



CHO (Ext. L Chorus) controls how much of the signal coming from the left external input that will be sent to the Wideshift Chorus effect.

DEL (Ext. L Delay) controls how much of the signal coming from the left external input that will be sent to the Saturator Delay effect.

REV (Ext. L Reverb) controls how much of the signal coming from the left external input that will be sent to the Supervoid reverb effect.

PAN (Ext. L Pan) positions the signal coming from the left external input in the stereo field. When using the audio inputs as a stereo pair, it would be normal to pan this signal hard left.

VOL (Ext. L Volume) adjusts the volume of the signal coming from the left external input.

CHO (Ext. R Chorus) controls how much of the signal coming from the right external input that will be sent to the Wideshift Chorus effect.

DEL (Ext. R Delay) controls how much of the signal coming from the right external input that will be sent to the Saturator Delay effect.

REV (Ext. R Reverb) controls how much of the signal coming from the right external input that will be sent to the Supervoid reverb effect.

PAN (Ext. R Pan) positions the signal coming from the right external input in the stereo field. When using the audio inputs as a stereo pair, it would be normal to pan this signal hard right.

VOL (Ext. R Volume) adjusts the volume of the signal coming from the right external input.

WIDESHIFT CHORUS

The Wideshift Chorus can be used to widen sounds, enhance the stereo image or add subtle movement to sounds.

CHORUS



PRE (Predelay) controls the predelay time of the Wideshift Chorus.

SPD (Speed) sets the low frequency modulation speed of the chorus taps.

DEP (Depth) controls the depth of the modulation of the chorus taps.

WID (Width) controls the stereo width of the Wideshift Chorus.

FDB (Feedback) controls the feedback of the chorus taps.

HPF (HP Filter) controls the highpass filtering of the input signal.

LPF (LP Filter) controls the lowpass filtering of the delay taps.

DEL (Delay Send) controls how much of the wet Wideshift Chorus signal that will be sent to the Saturator Delay.

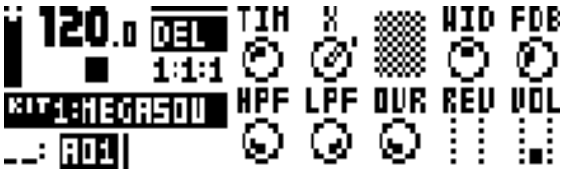
REV (Reverb Send) controls how much of the Wideshift Chorus signal that will be sent to the Supervoid Reverb.

VOL (Mix Volume) adjusts the volume of the Wideshift Chorus signal.

SATURATOR DELAY

The Saturator Delay adds an echo-like effect to the audio. Thanks to the special features of this effect, it can also be used to subtly warm or severely distort the delay signal.

DELAY



TIM (Time) sets the delay time. It is relative to the current BPM and is measured in 128th notes. For instance, a setting of 32 equals a one beat delay (four 1/16th notes).

X (Pingpong) controls how the delay signal will act in the stereo field.

- 0 makes it possible to manually situate the delay signal in the stereo field. The **WID** parameter controls the placement.
- 1 will make the delay signal alternate between left and right pan positions. The **WID** parameter controls the amount of panning.

WID (Width) controls the stereo width or placement of the delay signal.

FDB (Feedback) controls how much of the delay output that will be fed back into the input of the delay. With higher parameter settings, infinite and/or swelling delays are possible to achieve. Please be aware that high feedback can lead to a very loud signal, and that the **OVR** parameter can further increase the feedback.

HPF (HP Filter) controls the highpass filtering of the delay taps.

LPF (LP Filter) controls the lowpass filtering of the delay taps.

OVR (Overdrive) controls how much the delay signal will be overdriven. Please note that higher settings will affect the feedback of the delay.

REV (Reverb Send) controls how much of the Saturator Delay signal that will be sent to the Supervoid Reverb.

VOL (Mix Volume) adjusts the volume of the Saturator Delay signal.

SUPERVOID REVERB

The Supervoid Reverb is perfect for positioning sounds in the mix.It can simulate everything from vast locations to small spaces.

REVERB



PRE (Predelay) controls the predelay time of the Supervoid Reverb.

DEC (Decay Time) sets the decay time of the reverberated signal, essentially setting the size of the room.

FRQ (Shelving Frequency) controls the frequency of a shelving filter. Together with the **GAI** parameter it can be used to dampen the reverberated signal above a chosen frequency, making the reverberation sound darker.

GAI (Shelving Gain) affects the damping of the reverberated signal above the shelving frequency set by the **FRQ** parameter. At max value the treble is included in the reverberations; lowering the value gradually dampens it.

HPF (HP Filter) controls the highpass filtering of the input to the reverb.

LPF (LP Filter) controls the lowpass filtering of the input to the reverb.

VOL (Mix Volume) adjusts the volume of the Supervoid Reverb signal.

FX LFO

The FX LFO menu consists of two LFOs dedicated to modulating FX track parameters.

LFO1 (page 1)



SPD (LFO1 Speed) controls the speed of LFO1. It is synced to the BPM. For LFO1 to be synced to straight beats, try settings of 16, 32 or 64. The value is bi-polar, meaning the LFO shape can be played backwards by using negative values.

MUL (LFO1 Multiplier) multiplies the **SPD** parameter by the set factor.

FAD (LFO1 Fade In/Out) offers the possibility to fade in/out the LFO modulation. Positive values give a fade-out, negative values give a fade-in. A mid position (0) will result in no fade in/out.

SPH (LFO1 Start Phase) controls where in the waveform the LFO1 should start when being trigged.

MOD (LFO1 Trig Mode) controls how the LFO1 should react when a note is played. Five settings exist.

- FRE is the default free-running mode. It makes LFO1 run continuously, never restarting or stopping.
- TRG makes LFO1 restart when a note is played.
- HLD makes LFO1 run free in the background, but when a note is played the output LFO1 level is latched and held still until the next note is played.
- ONE will make LFO1 start from the beginning when a note is played, run for one cycle and then stop. This makes it function similarly to an envelope.
- HLF will make LFO1 start from the beginning when a note is played, run for half a cycle and then stop.

WAV (LFO1 Waveform) controls the LFO1 waveform.

DST (LFO1 Destination A) selects the first of the two available destinations for LFO1. Confirm a selection by pressing **[YES/SAVE]**.

DEP (LFO1 Depth A) controls how much LFO1 will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (LFO1 Destination B) selects the second of the two available destinations for LFO1. Confirm a selection by pressing **[YES/SAVE]**.

DEP (LFO1 Depth B) controls how much the LFO1 will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

LFO2 (page 2)



SPD (LFO2 Speed) controls the speed of LFO2. It is synced to the BPM. For LFO2 to be synced to straight beats, try settings of 16, 32 or 64. The value is bi-polar, meaning the LFO shape can be played backwards by using negative values.

MUL (LFO2 Multiplier) multiplies the **SPD** parameter by the set factor.

FAD (LFO2 Fade In/Out) offers the possibility to fade in/out the LFO modulation. Positive values give a fade-out, negative values give a fade-in. A mid position (0) will result in no fade in/out.

SPH (LFO2 Start Phase) controls where in the waveform the LFO2 should start when being trigged.

MOD (LFO2 Trig Mode) controls how the LFO2 should react when a note is played. Five settings exist.

- FRE is the default free-running mode. It makes LFO2 run continuously, never restarting or stopping.
- TRG makes LFO2 restart when a note is played.
- HLD makes LFO2 run free in the background, but when a note is played the output LFO2 level is latched and held still until the next note is played.
- ONE will make LFO2 start from the beginning when a note is played, run for one cycle and then stop. This makes it function similarly to an envelope.
- HLF will make LFO2 start from the beginning when a note is played, run for half a cycle and then stop.

WAV (LFO2 Waveform) controls the LFO2 waveform.

DST (LFO1 Destination A) selects the first of the two available destinations for LFO2. Confirm a selection by pressing **[YES/SAVE]**.

DEP (LFO2 Depth A) controls how much LFO2 will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (LFO2 Destination B) selects the second of the two available destinations for LFO2. Confirm a selection by pressing **[YES/SAVE]**.

DEP (LFO2 Depth B) controls how much the LFO2 will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

Appendix C: CV TRACK PARAMETERS

In this appendix, the CV/Gate track parameters are explained.

CV A-D

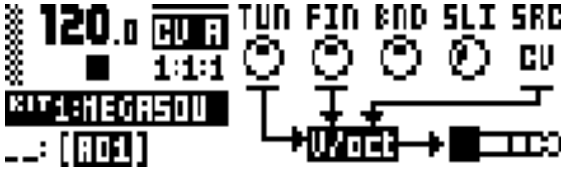
The CV A-D pages control the signals sent from the 2 dual CV/Gate outputs. Depending on the CV type chosen in the CV CONFIG menu, the available parameters will change.

CV (GROUNDED)



No parameters available. The CV output will not send any signal.

CV (PITCH V/OCT)



TUN (Coarse Tune) sets the coarse tuning of the CV in semi-tones.

FIN (Fine Tune) sets the fine tuning of the CV.

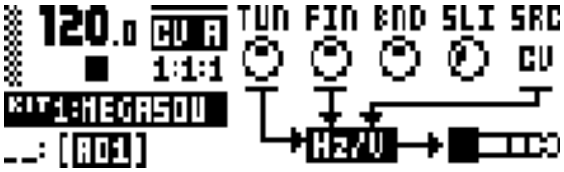
BND (Bend Depth) controls the bend depth. The higher the setting, the more the pitch of a trigged note will be offset.

SLI (Note Slide time) sets the CV control of the slide time of note slides.

SRC (Source Track) selects the track whose notes should be used for sending CV signals. The CV track, FX track and synth tracks 1-4 can be used as source.

A note about the LCD graphics: The audio plug graphics in the CV A-D PARAMETER pages flashes, indicating whether tip or ring of the audio cable plug is used for sending the CV/Gate signals the active PARAMETER page controls.

CV (PITCH HZ/V)



TUN (Coarse Tune) sets the coarse tuning of the CV in semitones.

FIN (Fine Tune) sets the fine tuning of the CV.

BND (Bend Depth) controls the bend depth. The higher the setting, the more the pitch of a trigged note will be offset.

SLI (Note Slide time) sets the CV control of the slide time of note slides.

SRC (Source Track) selects the track whose notes should be used for sending CV signals. The CV track, FX track and synth tracks 1-4 can be used as source.

CV (VALUE LIN)



VAL (Value) sets the voltage level of the CV. Applicable when the chosen CV type is VALUE LIN.

CV (TRIG)



SRC (Source Track) selects the track whose notes should be used for sending trig signals. The CV track, FX track and synth tracks 1-4 can be used as source.

CV (GATE)



SRC (Source Track) selects the track whose notes should be used for sending gate signals. The CV track, FX track and synth tracks 1-4 can be used as source.

CV (CLOCK)



CLK (Clock Division) sets the clock division. This setting relates to the BPM of the sequencer.

CV ENVELOPES

Here parameters controlling the two assignable CV envelopes are found. The CV envelopes can modulate parameters found on the CV track. They can also be sent to the CV/Gate outputs, by setting up a CV channel's type as VALUE LIN.

ENV1 (page 1)



ATK (Env1 Attack) controls the attack time of the Env1 envelope.

DEC (Env1 Decay) controls the decay time of the EnvF envelope.

SUS (Env1 Sustain) controls the sustain level of the EnvF envelope.

REL (Env1 Release) controls the release time of the EnvF envelope.

SHP (Env1 Shape) controls the general shape of the Env1 envelope. Several linear and exponential shapes are available. A dot to the left of the visual representation of the envelope indicates that the envelope will restart from level zero. In other cases it will start from the level it had when being trigged.

LEN (Env1 Gate length) makes it possible to choose another gate length than whatever trigged the envelope.

DST (Env1 Destination A) selects the first of the two available destinations for the EnvF envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (Env1 Depth A) controls how much the envelope will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (Env1 Destination B) selects the second of the two available destinations for the EnvF envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (Env1 Depth B) controls how much the envelope will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

ENV2 (page 2)



ATK (Env2 Attack) controls the attack time of the Env2 envelope.

DEC (Env2 Decay) controls the decay time of the Env2 envelope.

SUS (Env2 Sustain) controls the sustain level of the Env2 envelope.

REL (Env2 Release) controls the release time of the Env2 envelope.

SHP (Env2 Shape) controls the general shape of the Env2 envelope. Several shapes are available.

LEN (Env2 Gate length) makes it possible to choose another gate length than whatever trigged the envelope.

DST (Env2 Destination A) selects the first of the two available destinations for the Env2 envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (Env2 Depth A) controls how much the envelope will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available

DST (Env2 Destination B) selects the second of the two available destinations for the Env2 envelope. Confirm a selection by pressing **[YES/SAVE]**.

DEP (Env2 Depth B) controls how much the envelope will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

CV LFO

The two CV LFOs can be used to modulate other CV track parameters. They can also be sent to the CV/Gate outputs, by setting up a CV channel's type as VALUE LIN and then letting the LFO modulate its VAL parameter.

LFO1 (page 1)



SPD (LFO1 Speed) controls the speed of LFO1. It is synced to the BPM. For LFO1 to be synced to straight beats, try settings of 16, 32 or 64. The value is bi-polar, meaning the LFO shape can be played backwards by using negative values.

MUL (LFO1 Multiplier) multiplies the **SPD** parameter by the set factor.

FAD (LFO1 Fade In/Out) offers the possibility to fade in/out the LFO modulation. Positive values give a fade-out, negative values give a fade-in. A mid position (0) will result in no fade in/out.

SPH (LFO1 Start Phase) controls where in the waveform the LFO1 should start when being trigged.

MOD (LFO1 Trig Mode) controls how the LFO1 should react when a note is played. Five settings exist.

- FRE is the default free-running mode. It makes LFO1 run continuously, never restarting or stopping.
- TRG makes LFO1 restart when a note is played.
- HLD makes LFO1 run free in the background, but when a note is played the output LFO1 level is latched and held still until the next note is played.
- ONE will make LFO1 start from the beginning when a note is played, run for one cycle and then stop. This makes it function similarly to an envelope.
- HLF will make LFO1 start from the beginning when a note is played, run for half a cycle and then stop.

WAV (LFO1 Waveform) controls the LFO1 waveform.

DST (LFO1 Destination A) selects the first of the two available destinations for LFO1. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO1 Depth A) controls how much LFO1 will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (LFO1 Destination B) selects the second of the two available destinations for LFO1. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO1 Depth B) controls how much the LFO1 will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

LFO2 (page 2)



SPD (LFO2 Speed) controls the speed of LFO2. It is synced to the BPM. For LFO2 to be synced to straight beats, try settings of 16, 32 or 64. The value is bi-polar, meaning the LFO shape can be played backwards by using negative values.

MUL (LFO2 Multiplier) multiplies the **SPD** parameter by the set factor.

FAD (LFO2 Fade In/Out) offers the possibility to fade in/out the LFO modulation. Positive values give a fade-out, negative values give a fade-in. A mid position (0) will result in no fade in/out.

SPH (LFO2 Start Phase) controls where in the waveform the LFO2 should start when being trigged.

MOD (LFO2 Trig Mode) controls how the LFO2 should react when a note is played. Five settings exist.

- FRE is the default free-running mode. It makes LFO2 run continuously, never restarting or stopping.
- TRG makes LFO2 restart when a note is played.
- HLD makes LFO2 run free in the background, but when a note is played the output LFO2 level is latched and held still until the next note is played.
- ONE will make LFO2 start from the beginning when a note is played, run for one cycle and then stop. This makes it function similarly to an envelope.
- HLF will make LFO2 start from the beginning when a note is played, run for half a cycle and then stop.

WAV (LFO2 Waveform) controls the LFO2 waveform.

DST (LFO1 Destination A) selects the first of the two available destinations for LFO2. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO2 Depth A) controls how much LFO2 will modulate the destination chosen by the first **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

DST (LFO2 Destination B) selects the second of the two available destinations for LFO2. Confirm a selection by pressing **[YES/ SAVE]**.

DEP (LFO2 Depth B) controls how much the LFO2 will modulate the destination chosen by the second **DST** parameter. The knob is bipolar, meaning that both negative and positive modulation depth is available.

Appendix D: MIDI

In this appendix, the MIDI CC and NRPN implementation is covered.

PERFORMANCE PARAMETERS

The following messages affect the performance parameters on all tracks. They are also sent when adjusting the knobs controlling the parameters.

PERFORMANCE NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Performance Parameter A	A	0	0	0-127	-
Performance Parameter B	B	0	1	0-127	-
Performance Parameter C	C	0	2	0-127	-
Performance Parameter D	D	0	3	0-127	-
Performance Parameter E	E	0	4	0-127	-
Performance Parameter F	F	0	5	0-127	-
Performance Parameter G	G	0	6	0-127	-
Performance Parameter H	H	0	7	0-127	-
Performance Parameter I	I	0	8	0-127	-
Performance Parameter J	J	0	9	0-127	-

PERFORMANCE CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
Performance Parameter A	A	3	-	0-127	-
Performance Parameter B	B	4	-	0-127	-
Performance Parameter C	C	8	-	0-127	-
Performance Parameter D	D	9	-	0-127	-
Performance Parameter E	E	11	-	0-127	-
Performance Parameter F	F	64	-	0-127	-
Performance Parameter G	G	65	-	0-127	-
Performance Parameter H	H	66	-	0-127	-
Performance Parameter I	I	67	-	0-127	-
Performance Parameter J	J	68	-	0-127	-

MODULATION PARAMETERS

The following CC messages affect modulation parameters. Which parameters they will in turn affect are set in the SOUND SETTINGS menu (where modulation parameters for velocity, pitch bend and aftertouch can also be found), covered on page 28.

MODULATION CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
Modwheel	-	1	33	0-127	0-127
Breath Controller	-	2	34	0-127	0-127

SYNTH TRACK PARAMETERS

The following messages affect the synth track parameters. They are also sent when adjusting the knobs controlling the parameters.

OSC 1 NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Pitch	A	1	0	0-127	0-127
	B	1		0-127	-
Detune	C	1	2	0-127	-
Keytracking	D	1	3	0-127	-
Level	E	1	4	0-127	-
Waveform	F	1	5	0-127	-
Sub Oscillator	G	1	6	0-127	-
Pulsewidth	H	1	7	0-127	-
PWM Speed	I	1		0-127	-
PWM Depth	J	1	9	0-127	-

OSC 1 CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
Pitch	A	16	48	0-127	0-127
	B	-	-	0-127	-
Detune	C	-	-	0-127	-
Keytracking	D	-	-	0-127	-
Level	E	69	-	0-127	-
Waveform	F	70	-	0-127	-
Sub Oscillator	G	71	-	0-127	-
Pulsewidth	H	72	-	0-127	-
PWM Speed	I	73	-	0-127	-
PWM Depth	J	74	-	0-127	-

NOISE NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Noise S&H	A	1	10	0-127	-
	B	1		0-127	-
Noise Fade	C	1	12	0-127	-
	D	1		0-127	-
Noise Level	E	1	14	0-127	-
	F	1		0-127	-
	G	1		0-127	-
	H	1		0-127	-
	I	1		0-127	-
	J	1		0-127	-

NOISE CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
Noise S&H	A	75	-	0-127	-
	B	-	-	0-127	-
Noise Fade	C	76	-	0-127	-
	D	-	-	0-127	-
Noise Level	E	77	-	0-127	-
	F	-	-	0-127	-
	G	-	-	0-127	-
	H	-	-	0-127	-
	I	-	-	0-127	-
	J	-	-	0-127	-

OSC 2 NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Pitch	A	1	20	0-127	0-127
	B	1		0-127	-
Detune	C	1	22	0-127	-
Keytracking	D	1	23	0-127	-
Level	E	1	24	0-127	-
Waveform	F	1	25	0-127	-
Sub Oscillator	G	1	26	0-127	-
Pulsewidth	H	1	27	0-127	-
PWM Speed	I	1		0-127	-
PWM Depth	J	1	29	0-127	-

OSC 2 CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
Pitch	A	17	49	0-127	0-127
	B	-	-	0-127	-
Detune	C	-	-	0-127	-
Keytracking	D	-	-	0-127	-
Level	E	78	-	0-127	-
Waveform	F	79	-	0-127	-
Sub Oscillator	G	80	-	0-127	-
Pulsewidth	H	81	-	0-127	-
PWM Speed	I	82	-	0-127	-
PWM Depth	J	83	-	0-127	-

OSC COMMON NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
OSC1 AM	A	1	30	0-127	-
Sync Mode	B	1	31	0-127	-
Sync Amount	C	1	32	0-127	-
Bend Amount	D	1	33	0-127	-
Slide Time	E	1	34	0-127	-
OSC2 AM	F	1	35	0-127	-
Note Sync	G	1	36	0-127	-
Vibrato Fade	H	1	37	0-127	-
Vibrato Speed	I	1	38	0-127	-
Vibrato Depth	J	1	39	0-127	-

OSC COMMON CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
OSC1 AM	A	-	-	0-127	-
Sync Mode	B	-	-	0-127	-
Sync Amount	C	84	-	0-127	-
Bend Amount	D	85	-	0-127	-
Slide Time	E	5	-	0-127	-
OSC2 AM	F	-	-	0-127	-
Note Sync	G	-	-	0-127	-
Vibrato Fade	H	-	-	0-127	-
Vibrato Speed	I	87	-	0-127	-
Vibrato Depth	J	88	-	0-127	-

FILTERS NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Filter1 Frequency	A	1	40	0-127	0-127
Filter1 Resonance	B	1	41	0-127	-
Filter Overdrive	C	1	42	0-127	-
Filter1 Keytracking	D	1	43	0-127	-
Filter1 Envelope Amount	E	1	44	0-127	-
Filter2 Frequency	F	1	45	0-127	0-127
Filter2 Resonance	G	1	46	0-127	-
Filter2 Type	H	1	47	0-127	-
Filter2 Keytracking	I	1	48	0-127	-
Filter2 Envelope Amount	J	1	49	0-127	-

FILTERS CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
Filter1 Frequency	A	18	50	0-127	0-127
Filter1 Resonance	B	89	-	0-127	-
Filter Overdrive	C	-	-	0-127	-
Filter1 Keytracking	D	-	-	0-127	-
Filter1 Envelope Amount	E	102	-	0-127	-
Filter2 Frequency	F	19	51	0-127	0-127
Filter2 Resonance	G	90	-	0-127	-
Filter2 Type	H	-	-	0-127	-
Filter2 Keytracking	I	-	-	0-127	-
Filter2 Envelope Amount	J	103	-	0-127	-

AMP NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
EnvA Attack Time	A	1	50	0-127	-
EnvA Decay Time	B	1	51	0-127	-
EnvA Sustain Level	C	1	52	0-127	-
EnvA Release Time	D	1	53	0-127	-
EnvA Env Shape	E	1	54	0-127	-
Chorus Send Level	F	1	55	0-127	-
Delay Send Level	G	1	56	0-127	-
Reverb Send Level	H	1	57	0-127	-
Pan	I	1	58	0-127	-
Volume	J	1	59	0-127	-

AMP CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
EnvA Attack Time	A	104	-	0-127	-
EnvA Decay Time	B	105	-	0-127	-
EnvA Sustain Level	C	106	-	0-127	-
EnvA Release Time	D	107	-	0-127	-
EnvA Env Shape	E	-	-	0-127	-
Chorus Send Level	F	91	-	0-127	-
Delay Send Level	G	92	-	0-127	-
Reverb Send Level	H	93	-	0-127	-
Pan	I	10	-	0-127	-
Volume	J	7	-	0-127	-

ENVF NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
EnvF Attack Time	A	1	60	0-127	-
EnvF Decay Time	B	1	61	0-127	-
EnvF Sustain Level	C	1	62	0-127	-
EnvF Release Time	D	1	63	0-127	-
EnvF Env Shape	E	1	64	0-127	-
EnvF Gate Length	F	1	65	0-127	-
EnvF Destination A	G	1	66	0-127	-
EnvF Depth A	H	1	67	0-127	0-127
EnvF Destination B	I	1	68	0-127	-
EnvF Depth B	J	1	69	0-127	0-127

ENVF CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
EnvF Attack Time	A	108	-	0-127	-
EnvF Decay Time	B	109	-	0-127	-
EnvF Sustain Level	C	110	-	0-127	-
EnvF Release Time	D	111	-	0-127	-
EnvF Env Shape	E	-	-	0-127	-
EnvF Gate Length	F	-	-	0-127	-
EnvF Destination A	G	-	-	0-127	-
EnvF Depth A	H	20	52	0-127	0-127
EnvF Destination B	I	-	-	0-127	-
EnvF Depth B	J	21	53	0-127	0-127

ENV2 NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Env2 Attack Time	A	1	70	0-127	-
Env2 Decay Time	B	1	71	0-127	-
Env2 Sustain Level	C	1	72	0-127	-
Env2 Release Time	D	1	73	0-127	-
Env2 Env Shape	E	1	74	0-127	-
Env2 Gate Length	F	1	75	0-127	-
Env2 Destination A	G	1	76	0-127	-
Env2 Depth A	H	1	77	0-127	0-127
Env2 Destination B	I	1	78	0-127	-
Env2 Depth B	J	1	79	0-127	0-127

ENV2 CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
Env2 Attack Time	A	112	-	0-127	-
Env2 Decay Time	B	113	-	0-127	-
Env2 Sustain Level	C	114	-	0-127	-
Env2 Release Time	D	115	-	0-127	-
Env2 Env Shape	E	-	-	0-127	-
Env2 Gate Length	F	-	-	0-127	-
Env2 Destination A	G	-	-	0-127	-
Env2 Depth A	H	22	54	0-127	0-127
Env2 Destination B	I	-	-	0-127	-
Env2 Depth B	J	23	55	0-127	0-127

LFO1 NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
LFO1 Speed	A	1	80	0-127	-
LFO1 Speed Multiplier	B	1	81	0-127	-
LFO1 Fade	C	1	82	0-127	-
LFO1 Start Phase	D	1	83	0-127	-
LFO1 Mode	E	1	84	0-127	-
LFO1 Waveform	F	1	85	0-127	-
LFO1 Destination A	G	1	86	0-127	-
LFO1 Depth A	H	1	87	0-127	0-127
LFO1 Destination B	I	1	88	0-127	-
LFO1 Depth B	J	1	89	0-127	0-127

LFO1 CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
LFO1 Speed	A	116	-	0-127	-
LFO1 Speed Multiplier	B	117	-	0-127	-
LFO1 Fade	C	-	-	0-127	-
LFO1 Start Phase	D	-	-	0-127	-
LFO1 Mode	E	-	-	0-127	-
LFO1 Waveform	F	-	-	0-127	-
LFO1 Destination A	G	-	-	0-127	-
LFO1 Depth A	H	24	56	0-127	0-127
LFO1 Destination B	I	-	-	0-127	-
LFO1 Depth B	J	25	57	0-127	0-127

LFO2 NRPN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
LFO2 Speed	A	1	90	0-127	-
LFO2 Speed Multiplier	B	1	91	0-127	-
LFO2 Fade	C	1	92	0-127	-
LFO2 Start Phase	D	1	93	0-127	-
LFO2 Mode	E	1	94	0-127	-
LFO2 Waveform	F	1	95	0-127	-
LFO2 Destination A	G	1	96	0-127	-
LFO2 Depth A	H	1	97	0-127	0-127
LFO2 Destination B	I	1	98	0-127	-
LFO2 Depth B	J	1	99	0-127	0-127

LFO2 CC					
Parameter	Encoder	CC MSB	CC LSB	Data Range MSB	Data Range LSB
LFO2 Speed	A	118	-	0-127	-
LFO2 Speed Multiplier	B	119	-	0-127	-
LFO2 Fade	C	-	-	0-127	-
LFO2 Start Phase	D	-	-	0-127	-
LFO2 Mode	E	-	-	0-127	-
LFO2 Waveform	F	-	-	0-127	-
LFO2 Destination A	G	-	-	0-127	-
LFO2 Depth A	H	26	58	0-127	0-127
LFO2 Destination B	I	-	-	0-127	-
LFO2 Depth B	J	27	59	0-127	0-127

FX TRACK PARAMETERS

The following messages affect the FX track parameters. They are also sent when adjusting the knobs controlling the parameters.

EXT IN					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Ch1 Chorus Send	A	2	0	0-127	-
Ch1 Delay Send	B	2	1	0-127	-
Ch1 Reverb Send	C	2	2	0-127	-
Ch1 Pan	D	2	3	0-127	-
Ch1 Level	E	2	4	0-127	-
Ch2 Chorus Send	F	2	5	0-127	-
Ch2 Delay Send	G	2	6	0-127	-
Ch2 Reverb Send	H	2	7	0-127	-
Ch2 Pan	I	2	8	0-127	-
Ch2 Level	J	2	9	0-127	-

CHORUS					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Predelay	A	2	40	0-127	-
Speed	B	2	41	0-127	-
Depth	C	2	42	0-127	-
Width	D	2	43	0-127	-
Feedback	E	2	44	0-127	-
HP Filter	F	2	45	0-127	-
LP Filter	G	2	46	0-127	-
Delay Send	H	2	47	0-127	-
Reverb Send	I	2	48	0-127	-
Send Level	J	2	49	0-127	-

DELAY					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Time	A	2	50	0-127	-
Mode	B	2	51	0-127	-
	C	2	52	0-127	-
Width	D	2	53	0-127	-
Feedback	E	2	54	0-127	-
HP Filter	F	2	55	0-127	-
LP Filter	G	2	56	0-127	-
Overdrive	H	2	57	0-127	-
Reverb Send	I	2	58	0-127	-
Send Level	J	2	59	0-127	-

REVERB					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Predelay	A	2	60	0-127	-
Decay Time	B	2	61	0-127	-
Shelving Freq	C	2	62	0-127	-
Shelving Gain	D	2	63	0-127	-
	E	2	64	0-127	-
HP Filter	F	2	65	0-127	-
LP Filter	G	2	66	0-127	-
	H	2	67	0-127	-
	I	2	68	0-127	-
Send Level	J	2	69	0-127	-

LFO1					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
LFO1 Speed	A	2	80	0-127	-
LFO1 Speed Multiplier	B	2	81	0-127	-
LFO1 Fade	C	2	82	0-127	-
LFO1 Start Phase	D	2	83	0-127	-
LFO1 Mode	E	2	84	0-127	-
LFO1 Waveform	F	2	85	0-127	-
LFO1 Destination 1	G	2	86	0-127	-
LFO1 Depth 1	H	2	87	0-127	0-127
LFO1 Destination 2	I	2	88	0-127	-
LFO1 Depth 2	J	2	89	0-127	0-127

LFO2					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
LFO2 Speed	A	2	90	0-127	-
LFO2 Speed Multiplier	B	2	91	0-127	-
LFO2 Fade	C	2	92	0-127	-
LFO2 Start Phase	D	2	93	0-127	-
LFO2 Mode	E	2	94	0-127	-
LFO2 Waveform	F	2	95	0-127	-
LFO2 Destination 1	G	2	96	0-127	-
LFO2 Depth 1	H	2	97	0-127	0-127
LFO2 Destination 2	I	2	98	0-127	-
LFO2 Depth 2	J	2	99	0-127	0-127

CV TRACK PARAMETERS

The following messages affect the CV track parameters. They are also sent when adjusting the knobs controlling the parameters.

CV A					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
CV A Coarse Tune	A	3	0	0-127	-
CV A Fine Tune	B	3	1	0-127	-
CV A Value	C	3	2	0-127	-
CV A Clock	D	3	3	0-127	-
CV A Source	E	3	4	0-127	-
CV A Bend Depth	C	3	5	0-127	-
CV A Note Slide time	D	3	6	0-127	-
	H	3		0-127	-
	I	3		0-127	-
	J	3		0-127	-

CV B					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
CV B Coarse Tune	A	3	20	0-127	-
CV B Fine Tune	B	3	21	0-127	-
CV B Value	C	3	22	0-127	-
CV B Clock	D	3	23	0-127	-
CV B Source	E	3	24	0-127	-
CV B Bend Depth	C	3	25	0-127	-
CV B Note Slide time	D	3	26	0-127	-
	H	3		0-127	-
	I	3		0-127	-
	J	3		0-127	-

CV C					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
CV C Coarse Tune	A	3	40	0-127	-
CV C Fine Tune	B	3	41	0-127	-
CV C Value	C	3	42	0-127	-
CV C Clock	D	3	43	0-127	-
CV C Source	E	3	44	0-127	-
CV C Bend Depth	C	3	45	0-127	-
CV C Note Slide time	D	3	46	0-127	-
	H	3		0-127	-
	I	3		0-127	-
	J	3		0-127	-

CV D					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
CV D Coarse Tune	A	3	50	0-127	-
CV D Fine Tune	B	3	51	0-127	-
CV D Value	C	3	52	0-127	-
CV D Clock	D	3	53	0-127	-
CV D Source	E	3	54	0-127	-
CV D Bend Depth	C	3	55	0-127	-
CV D Note Slide time	D	3	56	0-127	-
	H	3		0-127	-
	I	3		0-127	-
	J	3		0-127	-

ENV1					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Env1 Attack Time	A	3	60	0-127	-
Env1 Decay Time	B	3	61	0-127	-
Env1 Sustain Level	C	3	62	0-127	-
Env1 Release Time	D	3	63	0-127	-
Env1 Env Shape	E	3	64	0-127	-
Env1 Gate Length	F	3	65	0-127	-
Env1 Destination 1	G	3	66	0-127	-
Env1 Depth 1	H	3	67	0-127	0-127
Env1 Destination 2	I	3	68	0-127	-
Env1 Depth 2	J	3	69	0-127	0-127

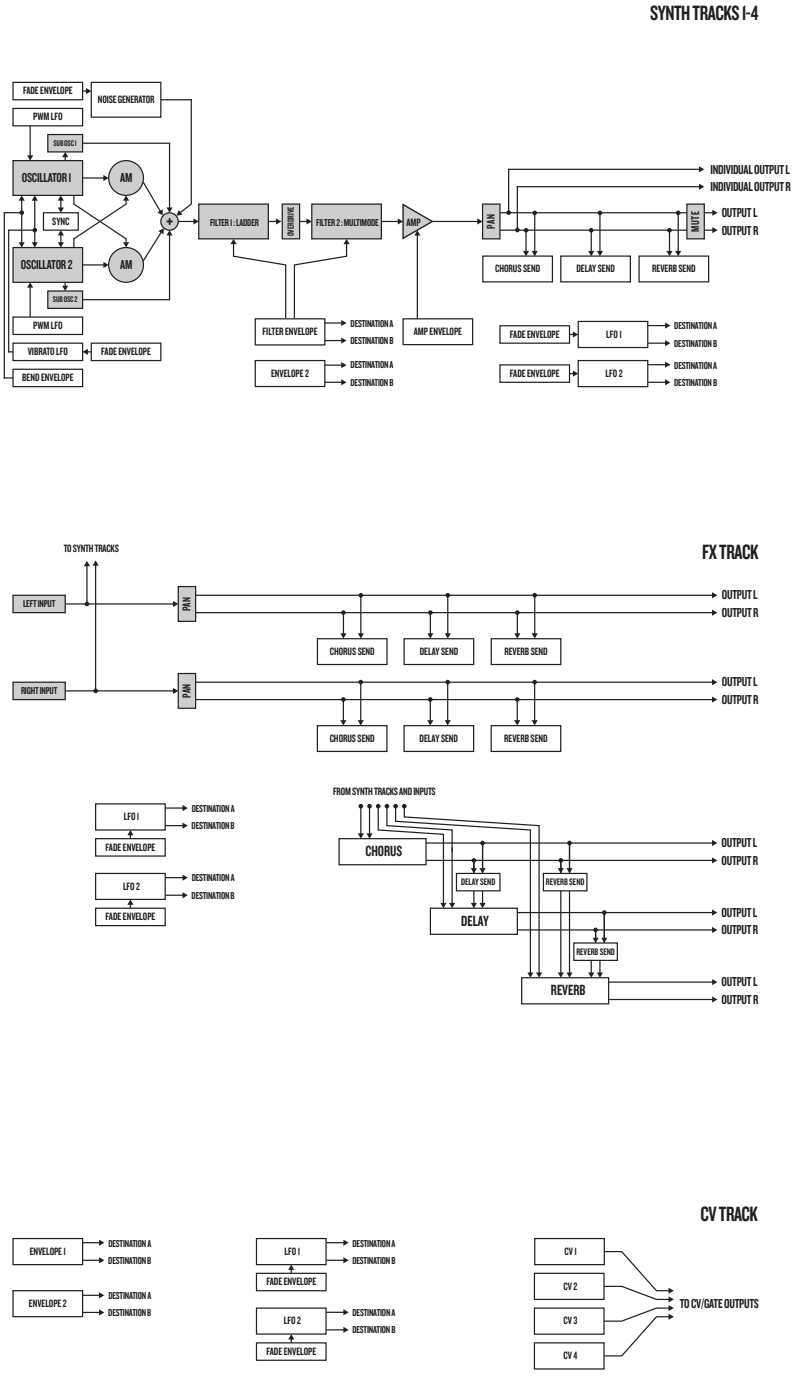
ENV2					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
Env2 Attack Time	A	3	70	0-127	-
Env2 Decay Time	B	3	71	0-127	-
Env2 Sustain Level	C	3	72	0-127	-
Env2 Release Time	D	3	73	0-127	-
Env2 Env Shape	E	3	74	0-127	-
Env2 Gate Length	F	3	75	0-127	-
Env2 Destination 1	G	3	76	0-127	-
Env2 Depth 1	H	3	77	0-127	0-127
Env2 Destination 2	I	3	78	0-127	-
Env2 Depth 2	J	3	79	0-127	0-127

LFO1					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
LFO1 Speed	A	3	80	0-127	-
LFO1 Speed Multiplier	B	3	81	0-127	-
LFO1 Fade	C	3	82	0-127	-
LFO1 Start Phase	D	3	83	0-127	-
LFO1 Mode	E	3	84	0-127	-
LFO1 Waveform	F	3	85	0-127	-
LFO1 Destination 1	G	3	86	0-127	-
LFO1 Depth 1	H	3	87	0-127	0-127
LFO1 Destination 2	I	3	88	0-127	-
LFO1 Depth 2	J	3	89	0-127	0-127

LFO2					
Parameter	Encoder	NRPN MSB	NRPN LSB	Data Range MSB	Data Range LSB
LFO2 Speed	A	3	90	0-127	-
LFO2 Speed Multiplier	B	3	91	0-127	-
LFO2 Fade	C	3	92	0-127	-
LFO2 Start Phase	D	3	93	0-127	-
LFO2 Mode	E	3	94	0-127	-
LFO2 Waveform	F	3	95	0-127	-
LFO2 Destination 1	G	3	96	0-127	-
LFO2 Depth 1	H	3	97	0-127	0-127
LFO2 Destination 2	I	3	98	0-127	-
LFO2 Depth 2	J	3	99	0-127	0-127

Appendix E: ANALOG KEYS ARCHITECTURE

This appendix shows the complete architecture and constituent parts of the Analog Keys. Gray boxes show analog elements. White boxes show digital elements.



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